Acronis Backup & Recovery 11.5

Update 2

User Guide

Applies to the following editions:

- ☑ Advanced Server
- ☑ Virtual Edition
- ☑ Advanced Server SBS Edition
- ☑ Advanced Workstation
- ☐ For Microsoft Exchange Server
- ☑ For Microsoft SQL Server (single-pass)
- ☑ For Microsoft Active Directory (single-pass)
- ☐ Server for Windows
- ☐ Server for Linux
- ☐ Workstation

Copyright Statement

Copyright © Acronis International GmbH, 2002-2013. All rights reserved.

“Acronis” and “Acronis Secure Zone” are registered trademarks of Acronis International GmbH.

"Acronis Compute with Confidence", “Acronis Startup Recovery Manager”, “Acronis Active Restore”, “Acronis Instant Restore” and the Acronis logo are trademarks of Acronis International GmbH.

Linux is a registered trademark of Linus Torvalds.

VMware and VMware Ready are trademarks and/or registered trademarks of VMware, Inc. in the United States and/or other jurisdictions.

Windows and MS-DOS are registered trademarks of Microsoft Corporation.

All other trademarks and copyrights referred to are the property of their respective owners.

Distribution of substantively modified versions of this document is prohibited without the explicit permission of the copyright holder.

Distribution of this work or derivative work in any standard (paper) book form for commercial purposes is prohibited unless prior permission is obtained from the copyright holder.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Third party code may be provided with the Software and/or Service. The license terms for such third-parties are detailed in the license.txt file located in the root installation directory. You can always find the latest up-to-date list of the third party code and the associated license terms used with the Software and/or Service at http://kb.acronis.com/content/7696

Acronis patented technologies

Technologies used in this product are covered by the following patents: U.S. Patent # 7,047,380; U.S. Patent # 7,246,211; U.S. Patent # 7,318,135; U.S. Patent # 7,366,859; U.S. Patent # 7,636,824; U.S. Patent # 7,831,789; U.S. Patent # 7,886,120; U.S. Patent # 7,934,064; U.S. Patent # 7,949,635; U.S. Patent # 7,979,690; U.S. Patent # 8,069,320; U.S. Patent # 8,073,815; U.S. Patent # 8,074,035.

Table of contents

1 Introducing Acronis Backup & Recovery 11.5 11

1.1 What's new in Update 2 11

1.2 What's new in Update 1 11

1.3 What's new in Acronis Backup & Recovery 11.5 12

1.4 Acronis Backup & Recovery 11.5 components 14

1.4.1 Agent for Windows 15
1.4.2 Agent for Microsoft SQL Server (single-pass) 16
1.4.3 Agent for Microsoft Active Directory (single-pass) 16
1.4.4 Agent for Linux 16
1.4.5 Agent for VMware vSphere ESX(i) 17
1.4.6 Agent for Hyper-V 18
1.4.7 Components for centralized management 18
1.4.8 Management Console 19
1.4.9 Bootable Media Builder 20
1.4.10 Acronis Wake-on-LAN Proxy 20

1.5 About using the product in the trial mode 20

1.6 Supported file systems 21

1.7 Technical Support 21

2 Getting started 22

2.1 Using the management console 25

2.1.1 "Navigation" pane 26
2.1.2 Main area, views and action pages 28
2.1.3 Console options 31

3 Understanding Acronis Backup & Recovery 11.5 34

3.1 Owners 34

3.2 Credentials used in backup plans and tasks 34

3.3 User privileges on a managed machine 36

3.4 List of Acronis services 36

3.5 Full, incremental and differential backups 39

3.6 What does a disk or volume backup store? 41

3.7 About dynamic and logical volumes 41

3.7.1 Backup and recovery of dynamic volumes (Windows) 41
3.7.2 Backup and recovery of logical volumes and MD devices (Linux) 43

3.8 Support for Advanced Format (4K-sector) hard disks 49

3.9 Support for UEFI-based machines 50

3.10 Support for Windows 8 and Windows Server 2012 51

3.11 Compatibility with encryption software 52

3.12 Support for SNMP 53

4 Backup 55

4.1 Back up now 55

4.2 Creating a backup plan 55

Copyright © Acronis International GmbH, 2002-2013.

4.2.1 Selecting data to back up 57
4.2.2 Access credentials for source 59
4.2.3 Source files exclusion 60
4.2.4 Backup location selection 61
4.2.5 Access credentials for archive location 64
4.2.6 Backup schemes 65
4.2.7 Archive validation 75
4.2.8 Backup plan's credentials 75
4.2.9 Label (Preserving machine properties in a backup) 76
4.2.10 Sequence of operations in a backup plan 77
4.2.11 Why is the program asking for the password? 78
4.3 Simplified naming of backup files 78
4.3.1 The [DATE] variable 79
4.3.2 Backup splitting and simplified file naming 80
4.3.3 Usage examples 80
4.4 Scheduling 83
4.4.1 Daily schedule 84
4.4.2 Weekly schedule 86
4.4.3 Monthly schedule 88
4.4.4 On Windows Event Log event 90
4.4.5 Advanced scheduling settings 92
4.4.6 Conditions 94
4.5 Replication and retention of backups 97
4.5.1 Supported locations 99
4.5.2 Setting up replication of backups 100
4.5.3 Setting up retention of backups 100
4.5.4 Retention rules for the Custom scheme 101
4.5.5 Replication/cleanup inactivity time 103
4.5.6 Usage examples 103
4.6 How to disable backup cataloging 106
4.7 Default backup options 106
4.7.1 Additional settings 109
4.7.2 Archive protection 110
4.7.3 Backup cataloging 111
4.7.4 Backup performance 112
4.7.5 Backup splitting 113
4.7.6 Compression level 114
4.7.7 Disaster recovery plan (DRP) 114
4.7.8 Error handling 115
4.7.9 Event tracing 116
4.7.10 Fast incremental/differential backup 117
4.7.11 File-level backup snapshot 118
4.7.12 File-level security 118
4.7.13 LVM snapshotting 119
4.7.14 Media components 120
4.7.15 Mount points 121
4.7.16 Multi-volume snapshot 122
4.7.17 Notifications 122
4.7.18 Pre/Post commands 124
4.7.19 Pre/Post data capture commands 125
4.7.20 Replication/cleanup inactivity time 127
4.7.21 Sector-by-sector backup 128
4.7.22 Tape management 128
4.7.23 Task failure handling 130

Copyright © Acronis International GmbH, 2002-2013.

4.7.24 Task start conditions ... 130
4.7.25 Volume Shadow Copy Service ... 131

5 Recovery ... 134

5.1 Creating a recovery task ... 134
5.1.1 What to recover ... 136
5.1.2 Access credentials for location ... 140
5.1.3 Access credentials for destination ... 141
5.1.4 Where to recover ... 141
5.1.5 When to recover ... 150
5.1.6 Task credentials ... 150
5.2 Acronis Universal Restore ... 150
5.2.1 Getting Universal Restore ... 151
5.2.2 Using Universal Restore ... 151
5.3 Recovering BIOS-based systems to UEFI-based and vice versa ... 154
5.3.1 Recovering volumes ... 155
5.3.2 Recovering disks ... 156
5.4 Acronis Active Restore ... 158
5.5 Bootability troubleshooting ... 160
5.5.1 How to reactivate GRUB and change its configuration ... 161
5.5.2 About Windows loaders ... 162
5.6 Reverting a Windows system to its factory settings ... 163
5.7 Default recovery options ... 163
5.7.1 Additional settings ... 165
5.7.2 Error handling ... 166
5.7.3 Event tracing ... 166
5.7.4 File-level security ... 167
5.7.5 Mount points ... 168
5.7.6 Notifications ... 168
5.7.7 Pre/Post commands ... 170
5.7.8 Recovery priority ... 171

6 Conversion to a virtual machine ... 172

6.1 Conversion methods ... 172
6.2 Conversion to an automatically created virtual machine ... 173
6.2.1 Considerations before conversion ... 173
6.2.2 Setting up regular conversion to a virtual machine ... 174
6.2.3 Recovery to the "New virtual machine" destination ... 177
6.3 Recovery to a manually created virtual machine ... 180
6.3.1 Considerations before conversion ... 180
6.3.2 Steps to perform ... 181

7 Storing the backed up data ... 182

7.1 Vaults ... 182
7.1.1 Working with vaults ... 183
7.1.2 Centralized vaults ... 184
7.1.3 Personal vaults ... 193
7.1.4 Changing the default cache folder for catalog files ... 195
7.2 Acronis Secure Zone ... 196
7.2.1 Creating Acronis Secure Zone ... 197
7.2.2 Managing Acronis Secure Zone ... 199

 Copyright © Acronis International GmbH, 2002-2013.

7.3 Removable devices ... 200
7.4 Tape devices ... 201
7.4.1 What is a tape device? ... 201
7.4.2 Overview of tape support ... 202
7.4.3 Getting started with a tape device ... 206
7.4.4 Tape management ... 210
7.4.5 Vaults on tapes ... 218
7.4.6 Usage examples ... 219
7.5 Storage nodes ... 222
7.5.1 What is a storage node? ... 222
7.5.2 Supported types of storage ... 223
7.5.3 Operations performed by storage nodes ... 223
7.5.4 Getting started with a storage node ... 223
7.5.5 User privileges on a storage node ... 225
7.5.6 Operations with storage nodes ... 226
7.5.7 Deduplication ... 234
8 Operations with archives and backups ... 241
8.1 Validating archives and backups ... 241
8.1.1 Archive selection ... 242
8.1.2 Backup selection ... 242
8.1.3 Vault selection ... 243
8.1.4 Access credentials for source ... 243
8.1.5 When to validate ... 244
8.1.6 Task credentials ... 244
8.2 Exporting archives and backups ... 244
8.2.1 Archive selection ... 247
8.2.2 Backup selection ... 247
8.2.3 Access credentials for source ... 248
8.2.4 Destination selection ... 248
8.2.5 Access credentials for destination ... 249
8.3 Mounting an image ... 250
8.3.1 Archive selection ... 251
8.3.2 Backup selection ... 251
8.3.3 Access credentials ... 251
8.3.4 Volume selection ... 252
8.3.5 Managing mounted images ... 252
8.4 Operations available in vaults ... 253
8.4.1 Operations with archives ... 253
8.4.2 Operations with backups ... 254
8.4.3 Converting a backup to full ... 255
8.4.4 Deleting archives and backups ... 256
9 Bootable media ... 257
9.1 How to create bootable media ... 258
9.1.1 Linux-based bootable media ... 258
9.1.2 WinPE-based bootable media ... 263
9.2 Connecting to a machine booted from media ... 265
9.3 Working under bootable media ... 266
9.3.1 Setting up a display mode ... 267
9.3.2 Configuring iSCSI and NDAS devices ... 267
9.4 List of commands and utilities available in Linux-based bootable media ... 268

Copyright © Acronis International GmbH, 2002-2013.

9.5 Acronis Startup Recovery Manager ... 269
9.6 Acronis PXE Server ... 270
9.6.1 Acronis PXE Server Installation ... 270
9.6.2 Setting up a machine to boot from PXE ... 270
9.6.3 Work across subnets ... 271
10 Disk management ... 272
10.1 Supported file systems ... 272
10.2 Basic precautions ... 272
10.3 Running Acronis Disk Director Lite ... 273
10.4 Choosing the operating system for disk management ... 273
10.5 "Disk management" view ... 274
10.6 Disk operations ... 274
10.6.1 Disk initialization ... 275
10.6.2 Basic disk cloning ... 275
10.6.3 Disk conversion: MBR to GPT ... 277
10.6.4 Disk conversion: GPT to MBR ... 278
10.6.5 Disk conversion: basic to dynamic ... 278
10.6.6 Disk conversion: dynamic to basic ... 279
10.6.7 Changing disk status ... 280
10.7 Volume operations ... 280
10.7.1 Creating a volume ... 281
10.7.2 Delete volume ... 284
10.7.3 Set active volume ... 285
10.7.4 Change volume letter ... 285
10.7.5 Change volume label ... 286
10.7.6 Format volume ... 286
10.8 Pending operations ... 287
11 Protecting applications with disk-level backup ... 288
11.1 Backing up an application server ... 288
11.1.1 Locating database files ... 290
11.1.2 Truncating transaction logs ... 293
11.1.3 Best practices when backing up application servers ... 297
11.2 Recovering SQL Server data ... 299
11.2.1 Recovering SQL Server databases from a disk backup ... 299
11.2.2 Accessing SQL Server databases from a disk backup ... 300
11.2.3 Attaching SQL Server databases ... 300
11.3 Recovering Exchange Server data ... 301
11.3.1 Recovering Exchange Server database files from a disk backup ... 301
11.3.2 Mounting Exchange Server databases ... 302
11.3.3 Granular recovery of mailboxes ... 302
11.4 Recovering Active Directory data ... 303
11.4.1 Recovering a domain controller (other DCs are available) ... 303
11.4.2 Recovering a domain controller (no other DCs are available) ... 304
11.4.3 Restoring the Active Directory database ... 304
11.4.4 Restoring accidentally deleted information ... 305
11.4.5 Avoiding a USN rollback ... 306
11.5 Recovering SharePoint data ... 308
11.5.1 Recovering a content database ... 308

Copyright © Acronis International GmbH, 2002-2013.

11.5.2 Recovering configuration and service databases ... 309
11.5.3 Recovering individual items ... 311

12 Protecting Microsoft SQL Server with single-pass backup ... 312

12.1 General information ... 312
12.1.1 Agent for SQL (single-pass) ... 312
12.1.2 Supported operating systems ... 313
12.1.3 Supported Microsoft SQL Server versions ... 313
12.1.4 Permissions for SQL Server backup and recovery ... 313
12.1.5 What else you need to know about single-pass backup ... 314
12.2 Installation of Agent for SQL (single-pass) ... 315
12.3 Backing up Microsoft SQL server ... 316
12.3.1 Single-pass backup settings ... 316
12.4 Recovering Microsoft SQL Server data ... 317
12.4.1 Recovering SQL databases to instances ... 317
12.4.2 Extracting the database files to folders ... 319
12.5 Mounting SQL Server databases from a single-pass backup ... 320
12.5.1 Unmounting mounted SQL Server databases ... 320
12.6 Protecting clustered SQL Server instances and AAG ... 321

13 Protecting Microsoft Active Directory with single-pass backup ... 323

13.1 Agent for Active Directory (single-pass) ... 323
13.2 Supported operating systems ... 323
13.3 Installation of Agent for Active Directory (single-pass) ... 323
13.4 Backing up Microsoft Active Directory ... 324
13.5 Recovering Microsoft Active Directory ... 324
13.5.1 Re-promoting the domain controller ... 325
13.5.2 Recovering the Active Directory data from a single-pass backup ... 325

14 Administering a managed machine ... 327

14.1 Backup plans and tasks ... 327
14.1.1 Actions on backup plans and tasks ... 327
14.1.2 States and statuses of backup plans and tasks ... 329
14.1.3 Export and import of backup plans ... 332
14.1.4 Deploying backup plans as files ... 335
14.1.5 Backup plan details ... 336
14.1.6 Task/activity details ... 337
14.2 Log ... 338
14.2.1 Actions on log entries ... 338
14.2.2 Log entry details ... 339
14.3 Alerts ... 339
14.4 Changing a license ... 340
14.5 Collecting system information ... 342
14.6 Adjusting machine options ... 342
14.6.1 Additional settings ... 342
14.6.2 Acronis Customer Experience Program ... 343
14.6.3 Alerts ... 343
14.6.4 E-mail settings ... 344
14.6.5 Event tracing ... 345

 Copyright © Acronis International GmbH, 2002-2013.

14.6.6 Log cleanup rules ... 347
14.6.7 Machine management ... 348
14.6.8 Online backup proxy ... 348

15 Centralized management ... 350

15.1 Understanding centralized management ... 350
15.1.1 Basic concepts ... 350
15.1.2 Privileges for centralized management ... 351
15.1.3 Communication between Acronis Backup & Recovery 11.5 components ... 356
15.2 Back up now ... 360
15.3 Creating a centralized backup plan ... 360
15.3.1 Selecting data to back up ... 361
15.3.2 Selection rules for files and folders ... 363
15.3.3 Selection rules for volumes ... 364
15.3.4 Backup location selection ... 367
15.3.5 Centralized backup plan's credentials ... 368
15.3.6 What if a machine does not have data meeting the selection rules ... 369
15.4 Administering Acronis Backup & Recovery 11.5 Management Server ... 369
15.4.1 Dashboard ... 369
15.4.2 Machines with agents ... 371
15.4.3 Virtual machines ... 384
15.4.4 Backup plans and tasks ... 385
15.4.5 Storage nodes ... 387
15.4.6 Licenses ... 388
15.4.7 Alerts ... 390
15.4.8 Reporting ... 391
15.4.9 Log ... 396
15.4.10 Management server options ... 398
15.5 Configuring Acronis Backup & Recovery 11.5 components ... 404
15.5.1 Parameters set through administrative template ... 404

16 Online backup ... 420

16.1 Introduction to Acronis Backup & Recovery Online ... 420
16.1.1 What is Acronis Backup & Recovery Online? ... 420
16.1.2 What data can I back up and recover? ... 420
16.1.3 How long will my backups be kept in the online storage? ... 421
16.1.4 How do I secure my data? ... 421
16.1.5 How do I back up virtual machines to the online storage? ... 421
16.1.6 Supported operating systems and virtualization products ... 422
16.1.7 Backup and recovery FAQ ... 423
16.1.8 Initial Seeding FAQ ... 424
16.1.9 Large Scale Recovery FAQ ... 429
16.1.10 Subscription lifecycle FAQ ... 431
16.2 Where do I start? ... 434
16.3 Choosing a subscription ... 434
16.4 Activating online backup subscriptions ... 435
16.4.1 Activating subscriptions ... 435
16.4.2 Reassigning an activated subscription ... 436
16.5 Configuring proxy settings ... 437
16.6 Retrieving files from the online storage by using a Web browser ... 438
16.7 Limitations of the online storage ... 439

 Copyright © Acronis International GmbH, 2002-2013.

16.8 Terminology reference 440

17 Glossary..... 442

 Copyright © Acronis International GmbH, 2002-2013.

1 Introducing Acronis Backup & Recovery 11.5

1.1 What's new in Update 2

- Single-pass backup of Microsoft Active Directory data (p. 323)
  - Back up a domain controller to any backup destination including Acronis Online Backup Storage.
  - Recover the entire domain controller without a risk of a USN rollback.
  - Extract Microsoft Active Directory data from a backup and replace the corrupted data in a few simple steps.
- Recovery of Exchange 2013 mailboxes and their contents from database backups to .pst files.
- Support for volume subscriptions to Acronis Backup & Recovery Online (p. 434).
- Support for WinPE 5.0.
- Support for Ubuntu 13.10.

1.2 What's new in Update 1

Improvements added in build 37975

- Basic support for Windows 8.1 and Windows Server 2012 R2.
- Installation of Acronis Backup & Recovery 11.5 in the trial mode without a license key.
- Upgrade from a stand-alone product to the advanced platform without reinstalling the software.
- Backup and recovery with Agent for ESX(i): VMware vSphere 5.5.
- Backup and recovery from inside a guest system: Red Hat Enterprise Virtualization 3.2, Oracle VM VirtualBox 4.x.
- Support for Linux kernel up to version 3.9.
- Support for Ubuntu 12.10, 13.04, and Fedora 18.

Added support for Microsoft Exchange Server 2013 (starting with build 37687)

- Back up and recover Microsoft Exchange Server 2013 databases by using Agent for Exchange. Backup and recovery of Exchange 2013 mailboxes (including mailbox recovery from database backups) are not yet supported, but will be added in future updates.
- Microsoft Exchange Server 2013 Cumulative Update 1 (CU1) and later are supported.

Single-pass backup of Microsoft SQL Server data (p. 312)

- Use a single solution and a single backup plan for both disaster recovery and data protection purposes.
- Back up a machine and recover disks, volumes, files, or Microsoft SQL databases.
- Recover Microsoft SQL databases directly to a running SQL Server instance, or extract them as files onto a file system.
- Truncate SQL Server logs after a backup.
- Use any backup destination including Acronis Online Backup Storage.
- Microsoft SQL Server 2012 is supported, as well as the previous Microsoft SQL Server versions.

Copyright © Acronis International GmbH, 2002-2013.

Basic support for Windows 8 and Windows Server 2012 (p. 51)

- Install Agent for Windows, Agent for SQL (single-pass), and management components in Windows 8 and Windows Server 2012.
- Boot a machine from bootable media that is based on WinPE 4.
- Use bootable media on a machine where UEFI Secure Boot is enabled.
- Back up and recover (without resize) volumes that have the ReFS file system or any data on these volumes.
- Back up storage spaces and recover them to the original location, to different storage spaces or as ordinary disks.
- Back up and recover (at a disk level) volumes where the Data Deduplication feature is enabled.

Virtualization

Support for new virtualization platforms:

- Back up and recover with Agent for ESX(i): VMware vSphere 5.1.
- Back up and recover with Agent for Hyper-V: Hyper-V 3.0.

  Agent for Hyper-V cannot be installed in Windows 8, even though this operating system includes the Hyper-V feature.
- Back up and recover from inside a guest system: Oracle VM Server 3.0, Red Hat Enterprise Virtualization 3.1.

Linux

- Support for Oracle Linux 5.x, 6.x – both Unbreakable Enterprise Kernel and Red Hat Compatible Kernel

Other

- Completely disable backup cataloging (p. 106) on a managed machine, storage node, or the management server.
- Save a Disaster Recovery Plan (p. 114) to a local or network folder, in addition to sending it via e-mail.
- Enable VSS Full backup (p. 131) to truncate logs of VSS-aware applications after a disk-level backup.
- Boot a UEFI machine from bootable media that is based on 64-bit WinPE (p. 263).
- Add the **%description%** variable (the description shown in system properties of a Windows machine) to the e-mail notification subject (p. 122).

1.3 What's new in Acronis Backup & Recovery 11.5

Expanding the backup and recovery capabilities in physical, virtual, and cloud environments, Acronis has now added backup and recovery of the Microsoft Exchange Server data.

The following is a summary of the product's new features and enhancements.

Backup and recovery of Microsoft Exchange Server data

Key features

- **Support for Microsoft Exchange Server 2010**

 Copyright © Acronis International GmbH, 2002-2013.

Acronis Backup & Recovery 11.5 supports Microsoft Exchange Server 2010 as well as Microsoft Exchange Server 2003/2007.

- **Express full backup method**

  This method is based on monitoring changes of the Exchange database files. Once the initial full backup is taken, all subsequent backups will only back up changes to this database without needing to read the entire database file. Combining this method with the data deduplication functionality makes it possible to back up large databases of 1TB or more during business hours and even over WANs.

- **Exchange clustering support**

  Acronis Backup & Recovery 11.5 supports SCC, CCR and DAG cluster configurations. You can choose to back up database replicas rather than active databases for minimal production impact. If the Mailbox role is moved to another server due to a switchover or a failover, the software will track all relocations of the data and safely back it up.

- **Continuous Data Protection**

  By using Continuous Data Protection, you can revert Exchange data to almost any point in time. If the most recent transaction log file survived, you can revert Exchange data to the point of failure.

- **Backup destinations**

  The backups can be saved to any type of storage supported by Acronis Backup & Recovery 11.5, except for Acronis Online Backup Storage, Acronis Secure Zone, and removable media.

- **Enhanced granular recovery**

  Browse Exchange Server database or mailbox backups and recover single or multiple mailboxes or just specific e-mails. You can also recover calendar items, notes, tasks and journal entries.

- **New recovery destinations**

  Besides being able to recover data to a live Exchange server, you can recover

  - Exchange databases to regular disk folders.
  - E-mails and mailboxes to .pst files.

Virtualization

- **Support for UEFI-based virtual machines (p. 50)** (applies to VMware ESXi 5 only)

  Back up and recover virtual machines that use Unified Extensible Firmware Interface (UEFI). Convert a UEFI-based physical machine (p. 172) to a virtual machine that uses the same boot firmware.

- **File-level recovery**

  Recover individual files and folders to the agent's local file system (in Windows only), a network share, FTP or SFTP server.

- Support for **Changed Block Tracking (CBT)** (applies to VMware ESX(i) 4.0 and later)

  Perform faster incremental and differential backups of ESX(i) virtual machines by using the Changed Block Tracking (CBT) feature of ESX(i).

- **Support for VM templates**

  Back up and recover virtual machine templates the same way as normal ESX(i) virtual machines.

- **Bare-metal recovery of Microsoft Hyper-V hosts**

  Back up an entire Hyper-V host along with its virtual machines without interrupting its normal operation. You can then recover the host to the same or a different hardware.

- **Enhanced support for Red Hat Enterprise Virtualization environments**

 Copyright © Acronis International GmbH, 2002-2013.

Back up and recover virtual machines running in a RHEV environment. Migrate physical machines to the RHEV environment (P2V); and migrate a virtual machine from a different virtualization platform to the RHEV platform (V2V).

Installation

- Remote installation of Acronis Backup & Recovery 11.5 Agent for Linux.

Support for various types of storage

Acronis Online Backup Storage (only for machines running Windows and virtual machines)

- Replicating or moving backups to Acronis Online Backup Storage (p. 104).
- The Grandfather-Father-Son and Tower of Hanoi backup schemes are now available when backing up to Acronis Online Backup Storage.

Tapes (only for advanced editions)

- File-level recovery is possible from disk backups stored on tapes.

  This feature can be enabled or disabled by setting the corresponding tape management option (p. 128).

Centralized management

- Vault selection in Data catalog (p. 138)

  You can select the vault to recover the data from, if the backed-up data has multiple replicas stored in more than one managed vault.

Linux

- **Support for Linux kernel up to 3.6**
- **Support for the following Linux distributions:**
  - Ubuntu 11.04, 11.10, 12.04
  - Fedora 15, 16, 17
  - Debian 6
  - CentOS 6.x
- **Support for Unified Extensible Firmware Interface (UEFI)** (p. 50)

  Back up a UEFI-based machine running Linux and recover it to the same or a different UEFI-based machine.

Bootable media

- New Linux kernel version (3.4.5) in Linux-based bootable media. The new kernel makes for better hardware support.

Usability

- Support for 800x600 screen resolution

1.4 Acronis Backup & Recovery 11.5 components

This section contains a full list of Acronis Backup & Recovery 11.5 components with a brief description of their functionality.

Acronis Backup & Recovery 11.5 includes the following main types of components.

 Copyright © Acronis International GmbH, 2002-2013.

Components for a managed machine (agents)

These are applications that perform data backup, recovery and other operations on the machines managed with Acronis Backup & Recovery 11.5. Agents require a license to perform operations on each managed machine. Agents have multiple features, or add-ons, that enable additional functionality and so might require additional licenses.

Components for centralized management

These components, delivered with the advanced editions, provide centralized management capability. Usage of these components is not licensed.

Console

The console provides Graphical User Interface and remote connection to the agents and other Acronis Backup & Recovery 11.5 components. Usage of the console is not licensed.

Bootable media builder

With bootable media builder, you can create bootable media in order to use the agents and other rescue utilities in a rescue environment.

Bootable Media Builder does not require a license if installed together with an agent. All add-ons to the agent, if installed, will be available in a rescue environment. To use a media builder on a machine without an agent, you need to enter the license key or have at least one license on the license server. The license may be either available or assigned.

1.4.1 Agent for Windows

This agent enables disk-level and file-level data protection under Windows.

Disk backup

Disk-level data protection is based on backing up either a disk or a volume file system as a whole, along with all the information necessary for the operating system to boot; or all the disk sectors using the sector-by-sector approach (raw mode). A backup that contains a copy of a disk or a volume in a packaged form is called a disk (volume) backup or a disk (volume) image. It is possible to recover disks or volumes as a whole from such backup, as well as individual folders or files.

File backup

File-level data protection is based on backing up files and folders residing on the machine where the agent is installed or on a network share. Files can be recovered to their original location or to another place. It is possible to recover all files and folders that were backed up or select which of them to recover.

Other operations

Conversion to a virtual machine

Agent for Windows performs the conversion by recovering a disk backup to a new virtual machine of any of the following types: VMware Workstation, Microsoft Virtual PC, Citrix XenServer Open Virtual Appliance (OVA) or Red Hat Kernel-based Virtual Machine (KVM). Files of the fully configured and operational machine will be placed in the folder you select. You can start the machine using the respective virtualization software or prepare the machine files for further usage.

 Copyright © Acronis International GmbH, 2002-2013.

Disk management

Agent for Windows includes Acronis Disk Director Lite - a handy disk management utility. Disk management operations, such as cloning disks; converting disks; creating, formatting and deleting volumes; changing a disk partitioning style between MBR and GPT or changing a disk label, can be performed either in the operating system or using bootable media.

1.4.1.1 Universal Restore

The Universal Restore add-on enables you to use the restore to dissimilar hardware functionality on the machine where the agent is installed and create bootable media with this functionality. Universal Restore handles differences in devices that are critical for the operating system start-up, such as storage controllers, motherboard or chipset.

1.4.1.2 Deduplication

This add-on enables the agent to back up data to deduplicating vaults managed by Acronis Backup & Recovery 11.5 Storage Node.

1.4.2 Agent for Microsoft SQL Server (single-pass)

Acronis Backup & Recovery 11.5 Agent for Microsoft SQL Server (single-pass) enables you to create single-pass disk and application backups and to recover Microsoft SQL databases from them. The databases can be recovered directly to a running SQL Server instance or extracted to a folder on a file system.

The agent uses Microsoft VSS to ensure the consistency of the backed-up databases. After a successful backup, the agent can truncate the SQL Server transaction log.

The agent is installed as an add-on to Agent for Windows (p. 15).

Acronis Backup & Recovery 11.5 Agent for Microsoft SQL Server (single-pass) is also referred to as Agent for SQL (single-pass) in this document.

1.4.3 Agent for Microsoft Active Directory (single-pass)

Acronis Backup & Recovery 11.5 Agent for Microsoft Active Directory (single-pass) enables you to create single-pass disk and application backups and to extract Microsoft Active Directory data from them to a folder on a file system.

The agent uses Microsoft VSS to ensure the consistency of the backed-up data.

The agent is installed as an add-on to Agent for Windows (p. 15).

Acronis Backup & Recovery 11.5 Agent for Microsoft Active Directory (single-pass) is also referred to as Agent for Active Directory (single-pass) in this document.

1.4.4 Agent for Linux

This agent enables disk-level and file-level data protection under Linux.

 Copyright © Acronis International GmbH, 2002-2013.

Disk backup

Disk-level data protection is based on backing up either a disk or a volume file system as a whole, along with all information necessary for the operating system to boot; or all the disk sectors using the sector-by-sector approach (raw mode.) A backup that contains a copy of a disk or a volume in a packaged form is called a disk (volume) backup or a disk (volume) image. It is possible to recover disks or volumes as a whole from such backup, as well as individual folders or files.

File backup

File-level data protection is based on backing up files and directories residing on the machine where the agent is installed or on a network share accessed using the smb or nfs protocol. Files can be recovered to their original location or to another place. It is possible to recover all files and directories that were backed up or select which of them to recover.

Conversion to a virtual machine

Agent for Linux performs the conversion by recovering a disk backup to a new virtual machine of any of the following types: VMware Workstation, Microsoft Virtual PC, Citrix XenServer Open Virtual Appliance (OVA) or Red Hat Kernel-based Virtual Machine (KVM). Files of the fully configured and operational machine will be placed in the directory you select. You can start the machine using the respective virtualization software or prepare the machine files for further usage.

1.4.4.1 Universal Restore

The Universal Restore add-on enables you to use the restore to dissimilar hardware functionality on the machine where the agent is installed and create bootable media with this functionality. Universal Restore handles differences in devices that are critical for the operating system start-up, such as storage controllers, motherboard or chipset.

1.4.4.2 Deduplication

This add-on enables the agent to back up data to deduplicating vaults managed by Acronis Backup & Recovery 11.5 Storage Node.

1.4.5 Agent for VMware vSphere ESX(i)

Acronis Backup & Recovery 11.5 Agent for VMware vSphere ESX(i) enables backup and recovery of ESX(i) virtual machines without installing agents into the guest systems. This backup method is known as agent-less backup or backup at a hypervisor level.

The agent is delivered in two versions:

- Agent for VMware vSphere ESX(i) (Virtual Appliance) can be imported or deployed to a VMware ESX(i) host.
- For off-loaded backup, Agent for VMware vSphere ESX(i) (Windows) can be installed on a machine running Windows.

Acronis Backup & Recovery 11.5 Agent for VMware vSphere ESX(i) is referred to as Agent for ESX(i) later in this document.

Copyright © Acronis International GmbH, 2002-2013.

1.4.6 Agent for Hyper-V

Acronis Backup & Recovery 11.5 Agent for Hyper-V protects virtual machines residing on a Hyper-V virtualization server. The agent allows for backing up virtual machines from the host without having to install agents on each virtual machine.

Agent for Hyper-V can be installed in the following operating systems:

Windows Server 2008 (x64) with Hyper-V

Windows Server 2008 R2 with Hyper-V

Microsoft Hyper-V Server 2008/2008 R2

Windows Server 2012/2012 R2 with Hyper-V

Microsoft Hyper-V Server 2012/2012 R2

Agent for Hyper-V cannot be installed in Windows 8/8.1, even though this operating system includes the Hyper-V feature.

1.4.7 Components for centralized management

This section lists the components included in the Acronis Backup & Recovery 11.5 editions that provide the centralized management capability. Besides these components, Acronis Backup & Recovery 11.5 Agents have to be installed on all machines that need data protection.

1.4.7.1 Management Server

Acronis Backup & Recovery 11.5 Management Server is the central server that drives data protection within the enterprise network. The management server provides the administrator with:

- a single entry point to the Acronis Backup & Recovery 11.5 infrastructure
- an easy way to protect data on numerous machines (p. 452) using centralized backup plans and grouping
- integration with VMware vCenter to discover virtual machines for protection
- enterprise-wide monitoring and reporting functionality
- built-in license management
- the ability to create centralized vaults (p. 446) for storing enterprise backup archives (p. 443)
- the ability to manage storage nodes (p. 454)
- the centralized catalog (p. 447) of all data stored on the storage nodes.

If there are multiple management servers on the network, they operate independently, manage different machines and use different centralized vaults for storing archives.

1.4.7.2 Storage Node

Acronis Backup & Recovery 11.5 Storage Node is a server designed to optimize the usage of various resources (such as the corporate storage capacity, the network bandwidth, or the managed machines' CPU load) which are required to protect the enterprise data. This goal is achieved by organizing and managing the locations that serve as dedicated storages of the enterprise backup archives (managed vaults).

Copyright © Acronis International GmbH, 2002-2013.

The most important function of a storage node is deduplication (p. 234) of backups stored in its vaults. This means that identical data will be backed up to this vault only once. This minimizes the network usage during backup and storage space taken by the archives.

The storage nodes enable creating highly scalable and flexible, in terms of the hardware support, storage infrastructure. Up to 50 storage nodes can be set up, each being able to manage up to 20 vaults.

The administrator controls the storage nodes centrally from the Acronis Backup & Recovery 11.5 Management Server (p. 18). Direct console connection to a storage node is not possible.

1.4.7.3 Components for Remote Installation

These are Acronis component installation packages used by the management console (p. 19) for installation on remote machines.

Components for Remote Installation need to be installed on the machine with the console or with the management server (p. 18). During installation, the setup program saves the components in the default location and saves this location path in the registry. As a result, the components are readily available in the Remote Installation Wizard as "registered components".

1.4.7.4 PXE Server

Acronis PXE Server allows for booting machines into Acronis bootable components through the network.

The network booting:

- Eliminates the need to have a technician onsite to install the bootable media (p. 445) into the system that has to be booted
- During group operations, reduces the time required for booting multiple machines as compared to using physical bootable media.

1.4.7.5 License Server

The server enables you to manage licenses of Acronis products and install the components that require licenses.

You can install a license server as a separate component or use the one integrated into the management server. The functionality of the license server (p. 388) is similar for both types of installation.

1.4.8 Management Console

Acronis Backup & Recovery 11.5 Management Console is an administrative tool for remote or local access to Acronis Backup & Recovery 11.5 agents and, in the product editions that include the centralized management capability, to the Acronis Backup & Recovery 11.5 Management Server.

The console has two distributions: for installation on Windows and installation on Linux. While both distributions enable connection to any Acronis Backup & Recovery 11.5 agent and Acronis Backup & Recovery 11.5 Management Server, we recommend that you use the console for Windows if you have a choice between the two. The console that installs on Linux has limited functionality:

- Remote installation of Acronis Backup & Recovery 11.5 components is not available.

 Copyright © Acronis International GmbH, 2002-2013.

- The Active Directory-related features, such as browsing the AD, are not available.

1.4.9 Bootable Media Builder

Acronis Bootable Media Builder is a dedicated tool for creating bootable media (p. 445). There are two media builder distributions: for installation in Windows and installation in Linux.

The media builder that installs on Windows can create bootable media based on either Windows Preinstallation Environment, or Linux kernel. The media builder that installs on Linux creates bootable media based on Linux kernel.

The Universal Restore (p. 16) add-on enables you to create bootable media with the restore to dissimilar hardware functionality. Universal Restore handles differences in devices that are critical for the operating system start-up, such as storage controllers, motherboard or chipset.

The Deduplication (p. 16) add-on enables you to create bootable media with the back up to a deduplicating vault functionality. This add-on can be installed to either of the media builder distributions.

1.4.10 Acronis Wake-on-LAN Proxy

Acronis Wake-on-LAN Proxy enables Acronis Backup & Recovery 11.5 Management Server to wake up for backup machines located in another subnet. Acronis Wake-on-LAN Proxy installs on any server in the subnet where the machines to be backed up are located.

1.5 About using the product in the trial mode

Before buying an Acronis Backup & Recovery 11.5 license, you may want to try the software. This can be done without a license key.

To install the product in the trial mode, run the setup program locally or use the remote installation functionality. Unattended installation and other ways of installation are not supported.

Limitations of the trial mode

When installed in the trial mode, Acronis Backup & Recovery 11.5 has the following limitation:

- The Universal Restore functionality is disabled.

Additional limitations for bootable media:

- The disk management functionality is not available. You can try the user interface, but there is no option to commit the changes.
- The recovery functionality is available, but the backup functionality is not. To try the backup functionality, install the software in the operating system.

Upgrading to the full mode

After the trial period expires, the product GUI displays a notification requesting you to specify or obtain a license key.

To specify a license key, click **Help** > **Change License** (p. 340). Specifying the key by running the setup program is not possible.

 Copyright © Acronis International GmbH, 2002-2013.

If you have activated a trial or purchased subscription for the online backup service (p. 420), online backup will be available until the subscription period expires, regardless of whether you specify a license key.

1.6 Supported file systems

Acronis Backup & Recovery 11.5 can back up and recover the following file systems with the following limitations:

- FAT16/32
- NTFS
- ReFS - volume recovery without the volume resize capability. Supported in Windows Server 2012/2012 R2 (p. 51) only.
- Ext2/Ext3/Ext4
- ReiserFS3 - particular files cannot be recovered from disk backups located on Acronis Backup & Recovery 11.5 Storage Node
- ReiserFS4 - volume recovery without the volume resize capability; particular files cannot be recovered from disk backups located on Acronis Backup & Recovery 11.5 Storage Node
- XFS - volume recovery without the volume resize capability; particular files cannot be recovered from disk backups located on Acronis Backup & Recovery 11.5 Storage Node
- JFS - particular files cannot be recovered from disk backups located on Acronis Backup & Recovery 11.5 Storage Node
- Linux SWAP

Acronis Backup & Recovery 11.5 can back up and recover corrupted or non-supported file systems using the sector-by-sector approach.

1.7 Technical Support

Maintenance and Support Program

If you need assistance with your Acronis product, please go to http://www.acronis.eu/support/

Product Updates

You can download the latest updates for all your registered Acronis software products from our website at any time after logging into your **Account** (http://www.acronis.eu/my>) and registering the product. See **Registering Acronis Products at the Website** (http://kb.acronis.com/content/4834) and **Acronis Website User Guide** (http://kb.acronis.com/content/8128).

Copyright © Acronis International GmbH, 2002-2013.

2 Getting started

Step 1. Installation

These brief installation instructions enable you to start using the product quickly. For the complete description of installation methods and procedures, please refer to the Installation documentation.

Before installation, make sure that:

- Your hardware meets the system requirements.
- You have license keys for the edition of your choice.
- You have the setup program. You can download it from the Acronis Web site.

Procedure

When following the instructions below, you can select more than one machine role.

1. Install the management server to be able to manage multiple machines.
   a. Run the setup program and click **Install Acronis Backup & Recovery 11.5**.
   b. After accepting the terms of the license agreement, select the **Centrally monitor and configure the backing up of physical and virtual machines** check box.
   c. Type your license keys or import them from a text file.
   d. Follow the on-screen instructions.

   Details. The console will also be installed so that you can control the management server locally.
2. Install an agent on each machine you want to back up.
   a. Run the setup program and click **Install Acronis Backup & Recovery 11.5**.
   b. After accepting the terms of the license agreement, select the **Back up this machine's data** check box.
   c. Select **I purchased a license or a subscription**.
   d. Click **Add licenses**, select the **Use the following license server** check box, and then enter the name or IP address of the previously installed management server.
   e. When prompted, register the machine on the management server.
   f. Follow the on-screen instructions.

   Details. The console will also be installed on each machine.
3. [Optional] Install the storage node on the machine that will serve as a storage for backups of other machines.
   a. Run the setup program and click **Install Acronis Backup & Recovery 11.5**.
   b. After accepting the terms of the license agreement, select the **Store the backups of other machines on this machine** check box.
   c. When prompted, register the storage node on the management server.
   d. Follow the on-screen instructions.
4. [Optional] Install the console on a machine from which you prefer to operate, if this machine is not the management server and does not have an agent.
   a. Run the setup program and click **Install Acronis Backup & Recovery 11.5**.

Copyright © Acronis International GmbH, 2002-2013.

b. After accepting the terms of the license agreement, select the **Connect to remote machines** check box.

c. Follow the on-screen instructions.

Step 2. Running

Run Acronis Backup & Recovery 11.5 Management Console.

- In **Windows** — Start the console by selecting **Acronis Backup & Recovery 11.5** from the **Start** menu.
- In **Linux** — Log in as root or log in as an ordinary user and then switch user as required. Start the console with the command

```
/usr/sbin/acronis_console
```

For understanding of the GUI elements see "Using the management console" (p. 25).

Step 3. Bootable media

To be able to recover an operating system that fails to start, or deploy it on bare metal, create bootable media.

1. Select **Tools >** **Create bootable media** in the menu.
2. Click **Next** in the welcome screen. Keep clicking **Next** until the list of components appears.
3. Proceed as described in "Linux-based bootable media" (p. 258).

Step 4. Connection

Connect the console to the managed machine, or to the management server.

On the first page of the console, click one of the following:

Manage this machine
If the agent is installed on the same machine as the console.

Manage a remote machine
If the agent is installed on a remote machine.

Connect to a management server
To manage multiple physical and virtual machines.

Step 5. Backup

Back up now (p. 55)

Click **Back up now** to do a one-time backup in a few simple steps. The backup process will start immediately after you perform the required steps.

To save your machine to a file:

 Copyright © Acronis International GmbH, 2002-2013.

Under **Where to back up**, click **Location**, and select the location where the backup will be saved. Click **OK** to confirm your selection. Click **OK** at the bottom of the window to start the backup.

Tip. Using the bootable media, you can do off-line ("cold") backups in the same way as in the operating system.

Create backup plan (p. 55)

Create a backup plan if you need a long-term backup strategy including backup schemes, schedules and conditions, timely deleting of backups, or moving them to different locations.

Notes for users of advanced editions: When creating a backup plan on the management server, you can:

- Select entire machines or groups of machines.

- Select different data items on each machine.

- Use selection rules to select the same data items on different machines.

This way, you will create a centralized backup plan to be deployed to the selected machines. For more information, please refer to "Creating a centralized backup plan" (p. 360).

Step 6. Recovery

Recover (p. 134)

To recover data, you need to select the backed-up data and the destination the data will be recovered to. As a result, a recovery task will be created.

Recovery of a disk or volume over a volume locked by the operating system requires a reboot. After the recovery is completed, the recovered operating system goes online automatically.

If the machine fails to boot or if you need to recover a system to bare metal, boot the machine using the bootable media and configure the recovery operation in the same way as the recovery task.

Notes for users of advanced editions: You cannot control operations under bootable media using the management server. But you can disconnect the console from the server and connect it to the machine booted from the media.

Step 7. Management

The **Navigation** pane (at the left part of the console) enables you to navigate across the product views that are used for different administering purposes.

- Use the **Backup plans and tasks** view to manage backup plans and tasks: run, edit, stop and delete plans and tasks, view their states and progress.
- Use the **Alerts** view to rapidly identify and solve the problems.
- Use the **Log** view to browse the operations log.
- The location where you store backup archives is called a vault (p. 455). Navigate to the **Vaults** (p. 182) view to obtain information about your vaults. Navigate further to the specific vault to view backups and their contents. You can also select the data to recover and perform manual operations with backups (mounting, validating, deleting).

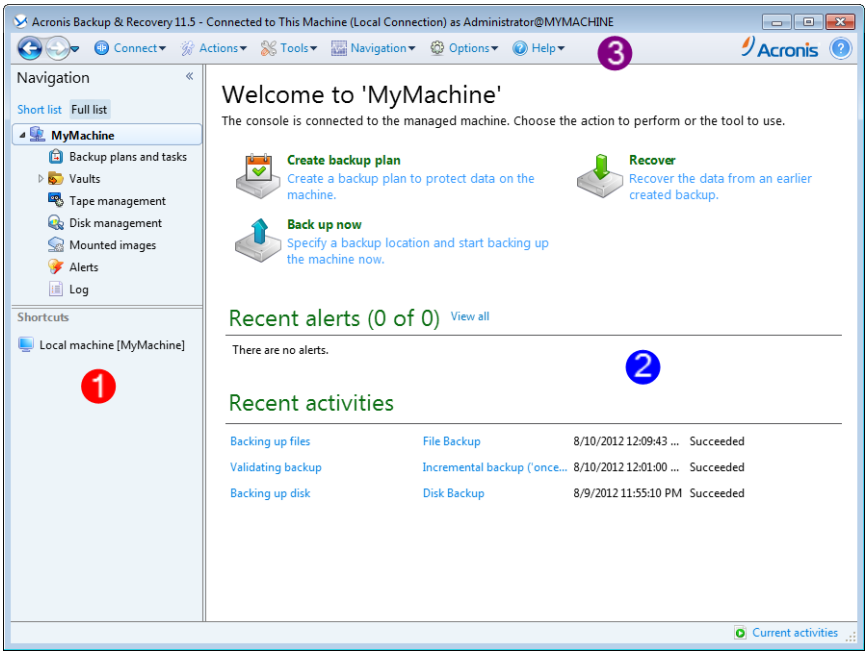
 Copyright © Acronis International GmbH, 2002-2013.

Administering the management server

- Use the **Machines with agents** view to manage machines registered on the management server. To effectively work with a large number of machines, organize them into groups (p. 371).
- Use the **Virtual machines** (p. 384) view to manage supported virtualization environments.
- If you opt for storing all backup archives in a single or a few networked locations, create centralized vaults in these locations. After a vault is created, you can view and administer its content by selecting **Vaults >** **Centralized >** **'Vault name'** in the **Navigation** pane. The shortcut to the vault will be deployed to all the registered machines. The vault can be specified as a backup destination in any backup plan created by you or by the registered machines' users.
- Create centralized managed vaults on the storage node (p. 223) to be able to:
  - Search the **Data catalog** (p. 138) for the required version of backed up data in all of the managed vaults.
  - Back up multiple machines to tape devices (p. 201) attached to the storage node.
  - Use deduplication (p. 234) to minimize storage space taken by the data and reduce network load during backup.

2.1 Using the management console

As soon as the console connects to a managed machine (p. 452) or to a management server (p. 452), the respective items appear across the console's workspace (in the menu, in the main area with the **Welcome** screen, or in the **Navigation** pane) enabling you to perform agent-specific or server-specific operations.



Acronis Backup & Recovery 11.5 Management Console - Welcome screen

Key elements of the console workspace

	Name	Description
1	**Navigation** pane	Contains the **Navigation** tree and the **Shortcuts** bar. Lets you navigate to the different views. For details, see Navigation pane (p. 26).

Copyright © Acronis International GmbH, 2002-2013.

2	Main area	Here you configure and monitor backup, recovery and other operations. The main area displays views and action pages (p. 28) depending on the items selected in the menu or **Navigation** tree.
3	**Menu** bar	Appears across the top of the program window. Lets you perform most of operations available in Acronis Backup & Recovery 11.5. The menu items change dynamically depending on the item selected in the **Navigation** tree and the main area.

2.1.1 "Navigation" pane

The navigation pane includes the **Navigation** tree and the **Shortcuts** bar.

Navigation tree

The **Navigation** tree enables you to navigate across the program views. Views depend on whether the console is connected to a managed machine or to the management server. In both cases, you can choose between the **Full list** or the **Short list** of views. The **Short list** contains the most frequently used views from the **Full list**.

Views for a managed machine

When the console is connected to a managed machine, the following views are available in the navigation tree.

The **Short list** displays

- **[Machine name]**. This is the root of the tree also called a **Welcome** screen. It displays the name of the machine the console is currently connected to. Use this view for quick access to the main operations, available on the managed machine.
  - **Backup plans and tasks**. Use this view to manage backup plans and tasks on the managed machine: run, edit, stop and delete plans and tasks, view their progress.
  - **Vaults**. Use this view to manage personal vaults and archives stored in there, add new vaults, rename and delete the existing ones, validate vaults, explore backup content, perform operations on archives and backups, etc. If the machine is registered on the management server, you can browse the centralized vaults and perform operations on the archives for which you have the appropriate permissions.
  - **Alerts**. Use this view to examine warning messages for the managed machine.

The **Full list** additionally displays

- **Tape managemen**t. Use this view to perform operations with tapes.
- **Disk management**. Use this view to perform operations on the machine's hard disk drives.
- **Log**. Use this view to examine information on operations performed by the program on the managed machine.
- **Mounted images**. This node is displayed if at least one volume is mounted. Use this view to manage mounted images.

Views for a management server

When the console is connected to a management server, the following views are available in the navigation tree.

Copyright © Acronis International GmbH, 2002-2013.

The **Short list** displays

- **[Management server name]**. This is the root of the tree also called a **Welcome** screen. Displays the name of the management server the console is currently connected to. Use this view for quick access to the main operations, available on the management server.
  - **Dashboard**. Use this view to estimate at a glance whether the data is successfully protected on the machines registered on the management server.
  - **Machines with agents**. Use this view to manage machines registered on the management server.
  - **Backup plans and tasks**. Use this view to manage centralized backup plans and tasks on the management server.
  - **Vaults**. Use this view to manage centralized vaults and archives stored in there: create new centralized vaults, rename and delete the existing ones, assign vault users and administrators, perform operations on archives and backups.
  - **Alerts**. Use this view to examine warning messages for the management server and all the registered machines.

The **Full list** additionally displays

- **Data catalog**. Use this view for quick search of the required version of backed up data in the centralized managed vaults.
- **Virtual machines**. Use this view to manage supported virtualization environments.
- **Storage nodes**. Use this view to manage storage nodes. Add a storage node to be able to create centralized vaults that will be managed by the node.
- **Tape management**. Use this view to perform operations with tapes.
- **Licenses**. Use this view manage licenses.
- **Reports**. Use this view to generate reports.
- **Log**. Use this view to examine the history of centralized management operations, as well as the history of operations logged in the local logs of the registered machines and the storage nodes.

Shortcuts bar

The **Shortcuts** bar appears under the navigation tree. It offers you an easy and convenient way of connection to the machines in demand by adding them as shortcuts.

To add a shortcut to a machine

1. Connect the console to a managed machine.
2. In the navigation tree, right-click the machine's name (a root element of the navigation tree), and then select **Create shortcut**.

   If the console and agent are installed on the same machine, the shortcut to this machine will be added to the shortcuts bar automatically as **Local machine [Machine name]**.

Operations with pane

How to expand/minimize panes

By default, the **Navigation** pane appears expanded. You might need to minimize the pane in order to free some additional workspace. To do this, click the chevron (). The pane will be minimized and the chevron changes its direction (). Click the chevron once again to expand the pane.

 Copyright © Acronis International GmbH, 2002-2013.

How to change the panes' borders

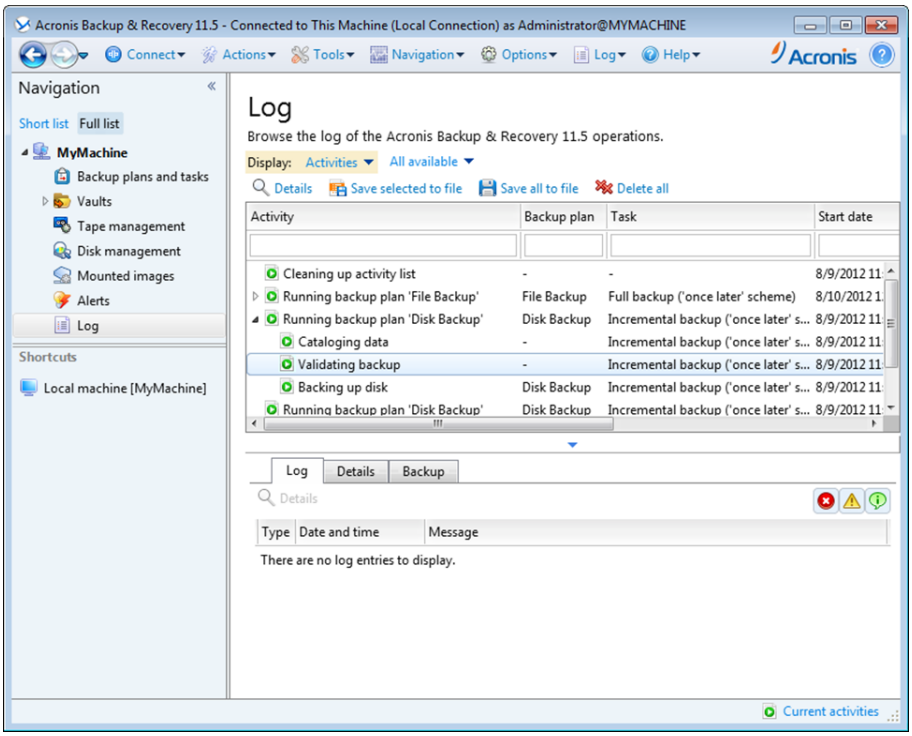
1. Point to the pane's border.
2. When the pointer becomes a double-headed arrow, drag the pointer to move the border.

2.1.2 Main area, views and action pages

The main area is a basic place where you work with the console. Here you create, edit and manage backup plans, recovery tasks and perform other operations. The main area displays different views and action pages according the items you select in the menu, or **Navigation** tree.

2.1.2.1 Views

A view appears on the main area when clicking any item in the **Navigation** tree in the Navigation pane (p. 26).



"Log" view

Common way of working with views

Generally, every view contains a table of items, a table toolbar with buttons, and the **Information** panel.

- Use filtering and sorting (p. 29) capabilities to search the table for the item in question.
- In the table, select the desired item.
- In the information panel (collapsed by default), view the item's details. To expand the panel, click the arrow mark (▲).
- Perform actions on the selected item. There are several ways of performing the same action on selected items:
  - By clicking the buttons on the table toolbar.

Copyright © Acronis International GmbH, 2002-2013.

- By selecting the items in the **Actions** menu.
- By right-clicking the item and selecting the operation in the context menu.

Sorting, filtering and configuring table items

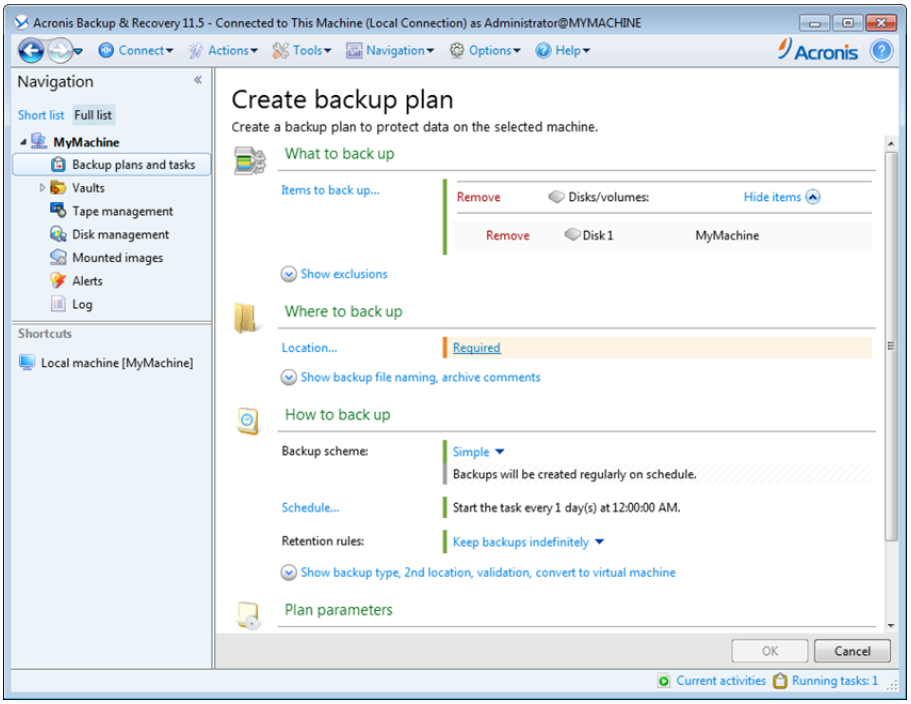
The following is a guideline to sort, filter and configure table items in any view.

To	Do the following
Sort items by any column	Click a column's header to sort items in ascending order. Click it once again to sort items in descending order.
Filter items by predefined column value	In a field below the corresponding column's header, select the required value from the drop-down list.
Filter items by entered value	In a field below the corresponding column's header, type a value. As a result you will see the list of values, fully or just partly coincide with the entered value.
Filter items by predefined parameters	Click the appropriate buttons above the table. For example, in the **Log** view, you can filter the log entries by event type (Error, Warning, Information) or by the period when the event occurred (**For last 24 hours**, **For last week**, **For last three months**, or **For custom period**).
Show or hide table columns	By default, any table has a fixed number of columns that are shown, others are hidden. If required, you can hide the shown columns and show the hidden ones. To show or hide columns 1. Right-click any column header to open the context menu. 2. Click the items you want to be displayed/hidden.

2.1.2.2 Action pages

An action page appears in the main area when clicking any action item in the **Actions** menu. It contains steps you need to perform in order to create and launch any task or a backup plan.

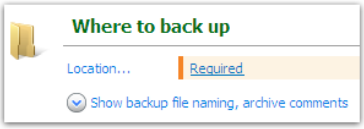
Copyright © Acronis International GmbH, 2002-2013.



Action page - Create backup plan

Using controls and specifying settings

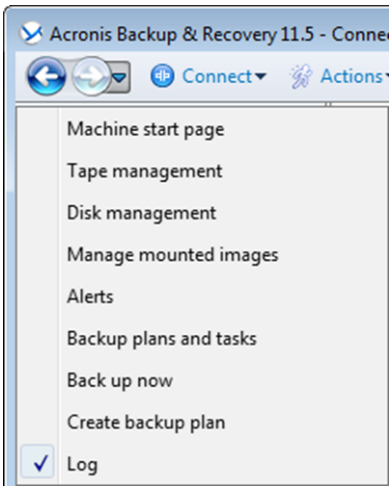
Use active controls to specify a backup plan or recovery task settings and parameters. By default, such fields as credentials, options, comments, and some others are hidden. Most settings are configured by clicking the respective **Show…** links. Others are selected from the drop-down list, or typed manually in the page's fields.



Action page - Controls

Acronis Backup & Recovery 11.5 remembers the changes you made on the action pages. For example, if you started to create a backup plan, and then for any reason switched to another view without accomplishing the plan creation, you can click the **Back** navigation button on the menu. Or, if you have passed several steps forward, click the **Down** arrow and select the page where you started the plan creation from the list. Thus, you can perform the remaining steps and accomplish the backup plan creation.

Copyright © Acronis International GmbH, 2002-2013.



Navigation buttons

2.1.3 Console options

The console options define the way information is represented in the Graphical User Interface of Acronis Backup & Recovery 11.5.

To access the console options, select **Options > Console** options from the top menu.

2.1.3.1 Alert display options

The option specifies which alerts to show and which to hide in the **Alerts** view.

The preset is: **All alerts**.

To show (hide) alerts, select (clear) the check boxes next to the respective alert types.

2.1.3.2 Credentials cache

The option specifies whether to store the credentials entered while using the management console.

The preset is: **Enabled**.

If the option is enabled, the credentials for various locations that you enter during a console session are saved for use during later sessions. In Windows, the credentials are stored in the Windows Credential Manager. In Linux, the credentials are stored in a special encrypted file.

If the option is disabled, the credentials are stored only until the console is closed.

To clear the credentials cache for the current user account, click the **Clear credentials cache** button.

2.1.3.3 Fonts

The option defines the fonts to be used in the Graphical User Interface of Acronis Backup & Recovery 11.5. The **Menu font** setting affects the drop-down and context menus. The **Application font** setting affects all other GUI elements.

The preset is: **System Default** font for both the menus and the application interface items.

Copyright © Acronis International GmbH, 2002-2013.

To make a selection, choose the font from the respective combo-box and set the font's properties. You can preview the font's appearance by clicking **Browse** to the right.

2.1.3.4 Pop-up messages

These options are effective when the console is connected to a managed machine or to the management server.

The “Activities Need Interaction” dialog

This option defines whether to display a pop-up window when one or more activities require user interaction. This window enables you to specify your decision, such as to confirm reboot or to retry after freeing-up the disk space, on all the activities in the same place. Until at least one activity requires interaction, you can open this window at any time from the managed machine's welcome screen. Alternatively, you can review the task execution states in the **Backup plans and tasks** view and specify your decision on each task in the information panel.

The preset is: **Enabled.**

To make a selection, select or clear the **The “Activities Need Interaction” dialog** check box.

The “Feedback Confirmation” dialog

This option defines whether to display a pop-up window with the information about your system after an error occurs. You can send this information to Acronis technical support.

The preset is: **Enabled.**

To make a selection, select or clear the **The “Feedback Confirmation” dialog** check box.

Notify if bootable media is not created

This option defines whether to display a pop-up window when the management console is launched on a machine and no bootable media has been created on that machine.

The preset is: **Enabled.**

To make a selection, select or clear the **Notify if bootable media is not created** check box.

Notify when the management console is connected to a component of a different version

This option defines whether to display a pop-up window when a console is connected to an agent/management server and their versions differ.

The preset is: **Enabled.**

To make a selection, select or clear the **Notify when the management console is connected to a component of a different version** check box.

Request description when ejecting a tape

This option defines whether to display a prompt for you to describe a tape when you eject (p. 214) it from a tape device by using Acronis Backup & Recovery 11.5. For example, you may describe the physical location where the tape will be kept (recommended). If a tape is ejected automatically according to the **Eject tapes after successful backups** option (p. 128), no such prompt is displayed.

 Copyright © Acronis International GmbH, 2002-2013.

The preset is: **Enabled.**

To make a selection, select or clear the **Request description when ejecting a tape** check box.

About the task execution results

This option is effective only when the console is connected to a managed machine.

The option defines whether to display the pop-up messages about task run results: successful completion, failure or success with warnings. When the displaying of pop-up messages is disabled, you can review the task execution states and results in the **Backup plans and tasks** view.

The preset is: **Enabled** for all results.

To make a setting for each result (successful completion, failure or success with warnings) individually, select or clear the respective check box.

2.1.3.5 Startup page

This option defines whether to show the **Welcome** screen or the **Dashboard** view on the console connection to the management server.

The preset is: the **Welcome** screen.

To make a selection, select or clear the check box for **Show the "Dashboard" view**.

This option can also be set on the **Welcome** screen. If you select the check box for **At startup, show the Dashboard instead of the current view** on the **Welcome** screen, the setting mentioned above will be updated accordingly.

Copyright © Acronis International GmbH, 2002-2013.

3 Understanding Acronis Backup & Recovery 11.5

This section attempts to give its readers a clear understanding of the product so that they can use the product in various circumstances without step-by-step instructions.

3.1 Owners

This section explains the concept of a backup plan (task) owner and an archive owner.

Plan (task) owner

A local backup plan owner is the user who created or last modified the plan.

A centralized backup plan owner is the management server administrator who created or last modified the centralized backup plan.

Tasks, belonging to a backup plan, either local or centralized, are owned by the backup plan owner.

Tasks that do not belong to a backup plan, such as the recovery task, are owned by the user who has created or last modified the task.

Managing a plan (task) owned by another user

Having Administrator privileges on the machine, a user can modify local backup plans and tasks owned by any user registered in the operating system.

When a user opens a plan or task for editing, which is owned by another user, all passwords set in the task are cleared. This prevents the "modify settings, leave passwords" trick. The program displays a warning each time you are trying to edit a plan (task) last modified by another user. On seeing the warning, you have two options:

- Click **Cancel** and create your own plan or task. The original task will remain intact.
- Continue editing. You will have to enter all credentials required for the plan or task execution.

Archive owner

An archive owner is the user who saved the archive to the destination. To be more precise, this is the user whose account was specified when creating the backup plan in the **Where to back up** step. By default, the plan's credentials are used.

3.2 Credentials used in backup plans and tasks

This section explains the concept of access credentials, backup plan's credentials and task credentials.

Access credentials

When browsing backup locations, setting up backups, or creating recovery tasks, you may need to provide credentials for accessing various resources, such as the data you are going to back up or the location where the backups are (or will be) stored.

If the **Credentials cache** (p. 31) option is enabled (it is enabled by default), the credentials which you provide during a console session are saved for use during the later sessions. Thus, there is no need to

 Copyright © Acronis International GmbH, 2002-2013.

enter the credentials next time. The credentials are cached independently for each user who uses the console on the machine.

Backup plan's credentials

Any backup plan running on a machine runs on behalf of a user.

In Windows

By default, the plan runs under the agent service account, if created by a user having administrative privileges on the machine. If created by a regular user, such as a member of the **Users** group, the plan runs under this user's account.

When creating a backup plan, you will only be asked for credentials in specific cases. For example:

- You are scheduling backups as a regular user and did not enter credentials when connecting the console to the machine. This may be the case when you are using a stand-alone product edition or connected the console by clicking **Manage this machine**.
- You are backing up a Microsoft Exchange cluster to a storage node.

Specifying the credentials explicitly

You have the option to explicitly specify a user account under which the backup plan will run. To do this, on the backup plan creation page:

1. In the **Plan parameters** section, click **Show plan's credentials, comments, label**.
2. Click **Plan's credentials**.
3. Enter the credentials under which the plan will run. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).

In Linux

You do not need to specify backup plan's credentials. In Linux, backup plans always run under the root user account.

Task credentials

Like a backup plan, any task runs on behalf of a user.

In Windows

When creating a task, you have the option to explicitly specify an account under which the task will run. Your choice depends on whether the task is intended for manual start or for executing on schedule.

- **Manual start**

  Every time you manually start the task, the task will run under the credentials with which you are currently logged on. Any person that has administrative privileges on the machine can also start the task. The task will run under this person's credentials.

  The task will always run under the same credentials, regardless of the user who actually starts the task, if you specify the task credentials explicitly.

- **Scheduled or postponed start**

  The task credentials are mandatory. You cannot complete the task creation until you specify the task credentials. Task credentials are specified on the task creation page in a similar manner as the plan’s credentials are specified.

 Copyright © Acronis International GmbH, 2002-2013.

In Linux

You do not need to specify task credentials. In Linux, tasks always run under the root user account.

3.3 User privileges on a managed machine

Windows

When managing a machine running Windows, the scope of a user's management rights depends on the user's privileges on the machine.

Regular users

A regular user, such as a member of the Users group, has the following management rights:

- Perform file-level backup and recovery of the files that the user has permissions to access—but without using a file-level backup snapshot (p. 118).
- Create backup plans and tasks and manage them.
- View—but not manage—backup plans and tasks created by other users.
- View the local event log.

Backup operators

A user who is a member of the Backup Operators group, also has the following management right:

- Back up and recover the entire machine or any data on the machine, with or without using a disk snapshot. Using a hardware snapshot provider may still require administrative privileges.

Administrators

A user who is a member of the Administrators group, also has the following management right:

- View and manage backup plans and tasks owned by any user on the machine.

Linux

When managing a machine running Linux, the user has or obtains the root privileges, and so can:

- Back up and recover any data or the entire machine, having full control over all Acronis Backup & Recovery 11.5 agent operations and log files on the machine.
- Manage local backup plans and tasks owned by any user registered in the operating system.

To avoid routine logging on to the system as root, the root user can log on with the ordinary user credentials and then switch user as required.

3.4 List of Acronis services

During installation, Acronis Backup & Recovery 11.5 creates several services.

- Main services present the main components of Acronis Backup & Recovery 11.5: the agent, the management server, the storage node.
- Auxiliary services enable certain functionalities of the main components.
- Common services assist multiple Acronis Backup & Recovery 11.5 components and other Acronis products.

Copyright © Acronis International GmbH, 2002-2013.

Services of Acronis Backup & Recovery 11.5 components

A main service can run under a dedicated account or under an account you specify during installation. Either account is given privileges that are needed for the service to work. The privileges include a set of user rights, membership in security groups, and the **Full Control** permissions on respective registry keys in the following key: HKEY_LOCAL_MACHINE\SOFTWARE\Acronis. There are no permissions granted on other registry keys.

The following table lists the services of Acronis Backup & Recovery 11.5 components and the privileges for their accounts.

Service name	Purpose	Account used by the service	Privileges added to the account		
			User rights	Group membership	Permissions on registry keys
Services for Acronis Backup & Recovery 11.5 agents					
Acronis Managed Machine Service (Main service)	Backing up and recovering data on the machine	**Acronis Agent User** *(new account)* or user-specified account	**Log on as a service** **Adjust memory quotas for a process** **Replace a process level token** **Modify firmware environment values**	**Backup Operators** *(for any account)* **Administrators** *(for new account only)*	BackupAndRecovery Encryption Global MMS
Acronis VSS Provider (Auxiliary service; created only for Agent for Windows in a Windows Server operating system)	Using a Volume Shadow Copy (VSS) provider (p. 131) that comes with Acronis Backup & Recovery 11.5	**Local System**	No additional privileges		
Acronis Removable Storage Management Service (Auxiliary service)	Managing locally attached tape devices. Can be also used by the Storage Node Service.	**Local System**	No additional privileges		
Services for Acronis Backup & Recovery 11.5 Management Server					

Copyright © Acronis International GmbH, 2002-2013.

Service name	Purpose	Account used by the service	Privileges added to the account		
			User rights	Group membership	Permissions on registry keys
Acronis Management Server Service (Main service)	Centrally managing backup operations on multiple machines	**AMS User** *(new account)* or user-specified account	**Log on as a service**	**Acronis Centralized Admins**	AMS BackupAndRecovery
SQL Server (ACRONIS) (Auxiliary service; created only if a new SQL server is installed)	Running a Microsoft SQL Server that is optionally installed with the management server	**Local System**	No additional privileges		
Acronis Web Server Service (Auxiliary service)	Hosting the management server Web page	Same as for Acronis Management Server Service			
Services for Acronis Backup & Recovery 11.5 Storage Node					
Acronis Storage Node Service (Main service)	Managing and deduplicating backup archives, maintaining the centralized data catalog	**ASN User** *(new account)* or user-specified account	**Log on as a service**	**Backup Operators** *(for any account)* **Administrators** *(for new account only)*	ASN BackupAndRecovery Encryption
Acronis Removable Storage Management Service (Auxiliary service)	Managing locally attached tape devices. Can also be used by the Managed Machine Service.	**Local System**	No additional privileges		

Common services

The following services can be used by multiple components of Acronis Backup & Recovery 11.5 and by other Acronis products. These services always run under a system account. No additional privileges are given to the account.

Service name	Purpose	Account used by the service
Services for Acronis PXE Server		
Acronis PXE Server Service	Booting machines into Acronis bootable components over the network	**Local System**
Acronis File Server Service	Providing bootable components for Acronis PXE Server	**Local System**
Remote-access and scheduling services		

Copyright © Acronis International GmbH, 2002-2013.

Acronis Remote Agent Service	Providing connectivity among Acronis components	**Local System** (Windows Vista and later) or **NetworkService** (earlier than Windows Vista)
Acronis Scheduler2 Service	Providing scheduling for tasks performed by Acronis components	**Local System**

Dependencies on other services

The main services depend on Acronis Scheduler2 Service and on the following standard Windows services: **Remote Procedure Call (RPC)** and **Protected Storage**. Acronis Managed Machine Service and Acronis Storage Node Service also depend on the **Windows Management Instrumentation** standard service.

To view the list of dependencies for a service, do the following:

1. In the **Services** snap-in, double-click the name of the service.
2. On the **Dependencies** tab, examine the **This service depends…** field.

3.5 Full, incremental and differential backups

Acronis Backup & Recovery 11.5 provides the capability to use popular backup schemes, such as Grandfather-Father-Son and Tower of Hanoi, as well as to create custom backup schemes. All backup schemes are based on full, incremental and differential backup methods. The term "scheme" in fact denotes the algorithm of applying these methods plus the algorithm of the archive cleanup.

Comparing backup methods with each other does not make much sense because the methods work as a team in a backup scheme. Each method should play its specific role according to its advantages. A competent backup scheme will benefit from the advantages of all backup methods and lessen the influence of all the methods' shortcomings. For example, weekly differential backup facilitates archive cleanup because it can be easily deleted along with the weekly set of daily incremental backups depending on it.

Backing up with the full, incremental or differential backup method results in a backup (p. 443) of the corresponding type.

Full backup

A full backup stores all data selected for backup. A full backup underlies any archive and forms the base for incremental and differential backups. An archive can contain multiple full backups or consist of only full backups. A full backup is self-sufficient - you do not need access to any other backup to recover data from a full backup.

It is widely accepted that a full backup is the slowest to do but the fastest to restore. With Acronis technologies, recovery from an incremental backup may be not slower than recovery from a full one.

A full backup is most useful when:

- you need to roll back the system to its initial state
- this initial state does not change often, so there is no need for regular backup.

 Copyright © Acronis International GmbH, 2002-2013.

Example: An Internet cafe, school or university lab where the administrator often undoes changes made by the students or guests but rarely updates the reference backup (in fact, after installing software updates only). The backup time is not crucial in this case and the recovery time will be minimal when recovering the systems from the full backup. The administrator can have several copies of the full backup for additional reliability.

Incremental backup

An incremental backup stores changes to the data against the **latest backup**. You need access to other backups from the same archive to recover data from an incremental backup.

An incremental backup is most useful when:

- you need the possibility to roll back to any one of multiple saved states
- the data changes tend to be small as compared to the total data size.

It is widely accepted that incremental backups are less reliable than full ones because if one backup in the "chain" is corrupted, the next ones can no longer be used. However, storing multiple full backups is not an option when you need multiple prior versions of your data, because reliability of an oversized archive is even more questionable.

Example: Backing up a database transaction log.

Differential backup

A differential backup stores changes to the data against the **latest full backup**. You need access to the corresponding full backup to recover the data from a differential backup. A differential backup is most useful when:

- you are interested in saving only the most recent data state
- the data changes tend to be small as compared to the total data size.

The typical conclusion is: "differential backups take longer to do and are faster to restore, while incremental ones are quicker to do and take longer to restore." In fact, there is no physical difference between an incremental backup appended to a full backup and a differential backup appended to the same full backup at the same point of time. The above mentioned difference implies creating a differential backup after (or instead of) creating multiple incremental backups.

An incremental or differential backup created after disk defragmentation might be considerably larger than usual because defragmentation changes file locations on the disk and the backup reflects these changes. It is recommended that you re-create a full backup after disk defragmentation.

The following table summarizes the advantages and shortcomings of each backup type as they appear based on common knowledge. In real life, these parameters depend on numerous factors such as the amount, speed and pattern of data changes; the nature of the data, the physical specifications of the devices, the backup/recovery options you set, to name a few. Practice is the best guide to selecting the optimal backup scheme.

Parameter	Full backup	Differential backup	Incremental backup
Storage space	Maximal	Medium	Minimal
Creation time	Maximal	Medium	Minimal
Recovery time	Minimal	Medium	Maximal

Copyright © Acronis International GmbH, 2002-2013.

3.6 What does a disk or volume backup store?

A disk or volume backup stores a disk or a volume **file system** as a whole and includes all of the information necessary for the operating system to boot. It is possible to recover disks or volumes as a whole from such backups as well as individual folders or files.

Windows

A volume backup stores all files and folders of the selected volume independent of their attributes (including hidden and system files), the boot record, the file allocation table (FAT) if it exists, the root and the zero track of the hard disk with the master boot record (MBR).

A disk backup stores all volumes of the selected disk (including hidden volumes such as the vendor's maintenance partitions) and the zero track with the master boot record.

The following items are not included in a disk or volume backup (as well as in a file-level backup):

- The swap file (pagefile.sys) and the file that keeps the RAM content when the machine goes into hibernation (hiberfil.sys). After recovery, the files will be re-created in the appropriate place with the zero size.
- Windows shadow storage. The path to it is determined in the registry value **VSS Default Provider** which can be found in the registry key **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\BackupRestore\FilesNotToBackup**. This means that in operating systems starting with Windows Vista, Windows Restore Points are not backed up.

Linux

A volume backup stores all files and directories of the selected volume independent of their attributes, a boot record, and the file system super block.

A disk backup stores all disk volumes as well as the zero track with the master boot record.

With the **sector-by-sector (raw mode)** option enabled, a disk backup stores all the disk sectors. The sector-by-sector backup can be used for backing up disks with unrecognized or unsupported file systems and other proprietary data formats.

3.7 About dynamic and logical volumes

3.7.1 Backup and recovery of dynamic volumes (Windows)

This section explains in brief how to back up and recover dynamic volumes (p. 450) using Acronis Backup & Recovery 11.5.

A dynamic volume is a volume located on dynamic disks (p. 449), or more exactly, on a disk group (p. 448). Acronis Backup & Recovery 11.5 supports the following dynamic volume types/RAID levels:

- simple/spanned
- striped (RAID 0)
- mirrored (RAID 1)
- a mirror of stripes (RAID 0+1)
- RAID-5.

Copyright © Acronis International GmbH, 2002-2013.

Backing up dynamic volumes

Dynamic volumes are backed up in the same way as basic volumes. When creating a backup plan through the GUI, all types of volumes are available for selection as **Items to back up**. When using the command line, specify the dynamic volumes with the DYN prefix.

Command line examples

```
acrocmd backup disk --volume=DYN1,DYN2 --loc=\\srv1\backups
--credentials=netuser1,pass1 --arc=dyn1_2_arc
```

This will back up volumes DYN1 and DYN2 to a network shared folder.

```
acrocmd backup disk --volume=DYN --loc=\\srv1\backups --credentials=netuser1,pass1
--arc=alldyn_arc
```

This will back up all dynamic volumes of the local machine to a network shared folder.

Recovering dynamic volumes

A dynamic volume can be recovered:

- Over any type of existing volume.
- To unallocated space of a disk group.
- To unallocated space of a basic disk.
- To a disk which has not been initialized.

Recovery over an existing volume

When a dynamic volume is recovered over an existing volume, either basic or dynamic, the target volume's data is overwritten with the backup content. The type of target volume (basic, simple/spanned, striped, mirrored, RAID 0+1, RAID-5) will not change. The target volume size has to be enough to accommodate the backup content.

Recovery to disk group unallocated space

When recovering a dynamic volume to disk group unallocated space, the software preserves the volume's original type and size. If the disk group configuration does not allow for the original volume type, the volume will be recovered as a simple or spanned volume. If this volume does not fit the unallocated space, the volume will be resized by decreasing its free space.

Examples of when the disk group configuration does not allow the original type of the volume

Example 1. The group contains fewer disks than is required for the dynamic volume. Assume you are going to recover an 80 GB RAID-5 volume that had resided on three disks, to a disk group consisting of two disks. The total size of unallocated space is 100 GB: 40 GB on the first disk and 60 GB on the second. The RAID-5 volume will be recovered as a spanned volume across two disks.

Example 2. Unallocated space distribution does not allow recovery of certain types of dynamic volumes. Assume you are going to recover a 30 GB striped volume to a disk group consisting of two disks. The total size of unallocated space is 50 GB: 10 GB on the first disk and 40 GB on the second. The striped volume will be recovered to the second disk as simple.

Recovery to a disk that has not been initialized

In this case, the target disk will be automatically initialized to the MBR partitioning style. The dynamic volumes will be recovered as basic ones. If the volumes cannot fit into unallocated space, they will be proportionally resized (by decreasing their free space).

 Copyright © Acronis International GmbH, 2002-2013.

The table below demonstrates the resulting volume types depending on the backed-up source and the recovery target.

	Backup (source):	
Recovered to:	**Dynamic volume**	**Basic volume**
Dynamic volume	Dynamic volume Type as of the target	Dynamic volume Type as of the target
Unallocated space (disk group)	Dynamic volume Type as of the source	Dynamic volume Simple
Basic volume or unallocated space on a basic disk	Basic volume	Basic volume

Moving and resizing volumes during recovery

You can manually resize the resulting basic volume during recovery, or change the volume's location on the disk. A resulting dynamic volume cannot be moved or resized manually.

Preparing disk groups and volumes

Before recovering dynamic volumes to bare metal you should create a disk group on the target hardware.

You also might need to create or increase unallocated space on an existing disk group. This can be done by deleting volumes or converting basic disks to dynamic.

You might want to change the target volume type (basic, simple/spanned, striped, mirrored, RAID 0+1, RAID 5). This can be done by deleting the target volume and creating a new volume on the resulting unallocated space.

Acronis Backup & Recovery 11.5 includes a handy disk management utility which enables you to perform the above operations both under the operating system and on bare metal. To find out more about Acronis Disk Director Lite, see the Disk management (p. 272) section.

3.7.2 Backup and recovery of logical volumes and MD devices (Linux)

This section explains how you would back up and recover volumes managed by Linux Logical Volume Manager (LVM), called logical volumes; and multiple-disk (MD) devices, called Linux Software RAID.

To learn more about LVM please visit http://tldp.org/HOWTO/LVM-HOWTO/ or http://www.centos.org/docs/5/html/5.1/Deployment_Guide/ch-lvm.html.

3.7.2.1 Backing up logical volumes

Acronis Backup & Recovery 11.5 Agent for Linux can access, back up, and recover logical volumes when running in Linux starting with 2.6.x kernel or under Linux-based bootable media.

Backup

In Acronis Backup & Recovery 11.5 GUI, logical volumes appear under **Dynamic volumes** at the end of the list of volumes available for backup. If you select logical volumes for backup, the logical volume

 Copyright © Acronis International GmbH, 2002-2013.

structure will be saved to the backup along with the volume contents. This structure can be automatically recreated when you recover these volumes under a Linux-based bootable media.

To back up all available disks, specify all logical volumes plus basic volumes not belonging to them. This is the default choice when you open the **Create backup plan** page.

Basic volumes included in logical volumes are shown in the list with **None** in the **File system** column. If you select such volumes, the program will back them up sector-by-sector. Normally this is not required.

Recovery

When recovering logical volumes, you have two options:

- **Recovering volume contents only**. The type or other properties of the target volume will not change.

  This option is available both in the operating system and under bootable media.

  This option is useful in the following cases:

  - When some data on the volume was lost, but no hard disks were replaced.
  - When recovering a logical volume over a basic disk or volume. You can resize the resulting volume in this case.

    A system, recovered from a logical volume backup to a basic disk, cannot boot because its kernel tries to mount the root file system at the logical volume. To boot the system, change the loader configuration and /etc/fstab so that LVM is not used and reactivate your boot loader (p. 161).

  - When recovering a basic or logical volume to an existing logical volume.

    If the boot partition (/boot) was located on a basic volume, we recommend recovering it to a basic volume, even if your boot loader supports booting from logical volumes.

- **Recovering both the structure of logical volumes and their contents**.

  Such is the case when recovering on bare metal or on a machine with different volume structure. The structure of logical volumes can be automatically created at the time of recovery (p. 46).

  This option is available only under bootable media.

For detailed instructions on how to recover logical volumes, see Recovering MD devices and logical volumes (p. 45).

3.7.2.2 Backing up MD devices

MD devices, known as Linux Software RAID, combine several volumes and make solid block devices (**/dev/md0, /dev/md1, ..., /dev/md31**). The information about MD devices is stored in **/etc/raidtab** or in dedicated areas of those volumes.

You can back up active (mounted) MD devices in the same way as logical volumes. The MD devices appear at the end of the list of volumes available for backup. If you select MD devices for backup, the structure of the MD devices will be backed up along with their contents.

Backing up volumes included in MD devices does not make sense when an MD device is mounted, as it won't be possible to recover them.

When recovering MD devices under bootable media, the structure of MD devices can be recreated automatically. For detailed information about recovering MD devices under bootable media, see Recovering MD devices and logical volumes (p. 45).

 Copyright © Acronis International GmbH, 2002-2013.

For information about assembling MD devices when performing recovery in Linux, see Assembling MD devices for recovery (Linux) (p. 45).

3.7.2.3 Backing up hardware RAID arrays (Linux)

Hardware RAID arrays under Linux combine several physical drives to create a single partitionable disk. The special file related to a hardware RAID array is usually located in /dev/ataraid. You can back up hardware RAID arrays in the same way as ordinary hard disks.

Physical drives that are part of hardware RAID arrays may be listed alongside other disks as if they had a bad partition table or no partition table at all. Backing up such disks does not make sense as it won't be possible to recover them.

3.7.2.4 Assembling MD devices for recovery (Linux)

In Linux, when performing recovery from a disk backup to an existing MD device (also called Linux Software RAID), make sure that this **device is assembled** at the time of recovery.

If the device is not assembled, assemble it by using the **mdadm** utility. Here are two examples:

Example 1. The following command assembles the device /dev/md0 combined from the volumes /dev/sdb1 and /dev/sdc1:

```
mdadm --assemble /dev/md0 -ayes /dev/sdb1 /sdc1
```

Example 2. The following command assembles the device /dev/md0 combined from the disks /dev/sdb and /dev/sdc:

```
mdadm --assemble /dev/md0 -ayes /dev/sdb /dev/sdc
```

If the recovery requires the machine to be rebooted (usually, when the volumes to recover include the boot partition), follow these guidelines:

- If all parts of the MD device are volumes (a typical case, such as in the first example), make sure that each volume type—called partition type or system ID—is **Linux raid automount**; the hexadecimal code of this partition type is 0xFD. This will guarantee that the device will be automatically assembled following the reboot. To view or change the partition type, use a disk partitioning utility such as **fdisk**.
- Otherwise (such as in the second example), perform the recovery from bootable media. No reboot will be required in that case. In bootable media, you may need to create the MD device manually or automatically, as described in Recovering MD devices and logical volumes (p. 45).

3.7.2.5 Recovering MD devices and logical volumes

Recovering MD devices and/or volumes created by Logical Volume Manager (logical volumes) assumes that the corresponding volume structure will be recreated.

In Linux-based bootable media, you can choose to recreate the volume structure automatically (p. 46).

This functionality is intended primarily for bare-metal recovery of an entire machine. The software backs up and recreates the entire logical volume structure, even if not all MD devices or logical volumes are being backed up or recovered. Therefore, you need at least as many disks as the original volume structure used.

 Copyright © Acronis International GmbH, 2002-2013.

Do not try to recreate the volume structure automatically in any of the following cases:

- The machine has **data that must be preserved.** The software will destroy all data on the disks that it chooses to recreate the volume structure on.
- The machine has **fewer physical disks** than the original volume structure used. The software will fail to recreate the volume structure even if the capacity of the physical disks is enough to fit all the data being recovered.
- The backup **does not contain the volume structure information.** This information might be absent in backups created by Acronis Backup & Recovery 10, because saving it was optional.

In these cases, create the volume structure manually (p. 46) prior to recovery. You can do this by using the **mdadm** and **lvm** utilities, either in Linux-based bootable media or in Linux.

Creating the volume structure automatically

Use the following procedure to automatically recreate the logical volume structure on a machine.

Caution *As a result of the following procedure, the current volume structure on the machine will be replaced with the one stored in the backup. This will destroy the data that is currently stored on some or all of the machine's hard disks.*

If disk configuration has changed. An MD device or a logical volume resides on one or more disks. If you replaced any of these disks between backup and recovery (or if you are recovering the volumes to a different machine), ensure that the new disk configuration includes at least the same number of disks as the original volume structure did. The capacity of the disks must be enough to fit all the data being recovered.

To create the volume structure automatically

1. Boot the machine from a Linux-based bootable media.
2. Click **Acronis Bootable Agent**. Then, click **Run management console**.
3. In the management console, click **Recover**.

   Under the archive contents, Acronis Backup & Recovery 11.5 will display a message saying that it detected information about the volume structure.
4. Click **Details** in the area with that message.
5. Review the volume structure, and then click **Apply RAID/LVM** to create it.

Creating the volume structure manually

The following is a general procedure for recovering MD devices and logical volumes by using a Linux-based bootable media, and an example of such recovery. You can use a similar procedure in Linux.

To create the volume structure manually

1. Boot the machine from a Linux-based bootable media.
2. Click **Acronis Backup & Recovery 11.5**. Then, click **Run management console**.
3. On the toolbar, click **Actions**, and then click **Start shell**. Alternatively, you can press CTRL+ALT+F2.
4. If necessary, examine the structure of volumes which are stored in the archive, by using the `acrocmd` utility. Also, you can use this utility to mount one or more of these volumes as if they were regular volumes (see "Mounting backup volumes" later in this topic).

 Copyright © Acronis International GmbH, 2002-2013.

5. Create the volume structure according to that in the archive, by using the `mdadm` utility (for MD devices), the `lvm` utility (for logical volumes), or both.

   Note: *Logical Volume Manager utilities such as `pvcreate` and `vgcreate`, which are normally available in Linux, are not included in the bootable media environment, so you need to use the `lvm` utility with a corresponding command. For example: `lvm pvcreate`, `lvm vgcreate`, and `lvm lvcreate`.*

6. If you previously mounted the backup by using the `acrocmd` utility, use this utility again to unmount the backup (see "Mounting backup volumes" later in this topic).
7. Return to the management console by pressing ALT+F1.

   (Do not reboot the machine at this point. Otherwise, you will have to create the volume structure again.)
8. Click **Recover**, then specify the path to the archive and any other required parameters, and then click **OK**.

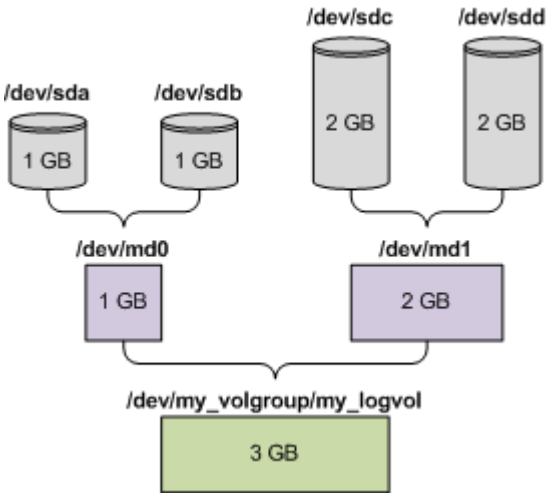
Note: *This procedure will not work if you connect to Acronis Backup & Recovery 11.5 Bootable Agent remotely, because the command shell is not available in this case.*

Example

Suppose that you previously performed a disk-level backup of a machine with the following disk configuration:

- The machine has two 1-gigabyte and two 2-gigabyte SCSI hard disks, mounted on **/dev/sda**, **/dev/sdb**, **/dev/sdc**, and **/dev/sdd**, respectively.
- The first and second pairs of hard disks are configured as two MD devices; both are in the RAID-1 configuration, and are mounted on **/dev/md0** and **/dev/md1**, respectively.
- A logical volume is based on the two MD devices and is mounted on **/dev/my_volgroup/my_logvol**.

The following picture illustrates this configuration.



Do the following to recover data from this archive.

Step 1: Creating the volume structure

1. Boot the machine from a Linux-based bootable media.
2. In the management console, press CTRL+ALT+F2.
3. Run the following commands to create the MD devices:

Copyright © Acronis International GmbH, 2002-2013.

```
mdadm --create /dev/md0 --level=1 --raid-devices=2 /dev/sd[ab]
mdadm --create /dev/md1 --level=1 --raid-devices=2 /dev/sd[cd]
```

4. Run the following commands to create the logical volume group:

Caution: *The* `pvcreate` *command destroys all data on the* ***/dev/md0*** *and* ***/dev/md1*** *devices.*

```
lvm pvcreate /dev/md0 /dev/md1
lvm vgcreate my_volgroup /dev/md0 /dev/md1
lvm vgdisplay
```

The output of the `lvm vgdisplay` command will contain lines similar to the following:

```
--- Volume group ---
VG Name     my_volgroup
...
VG Access   read/write
VG Status   resizable
...
VG Size     1.99 GB
...
VG UUID     0qoQ4l-Vk7W-yDG3-uF1l-Q2AL-C0z0-vMeACu
```

5. Run the following command to create the logical volume; in the **-L** parameter, specify the size given by **VG Size**:

```
lvm lvcreate -L1.99G --name my_logvol my_volgroup
```

6. Activate the volume group by running the following command:

```
lvm vgchange -a y my_volgroup
```

7. Press ALT+F1 to return to the management console.

Step 2: Starting the recovery

1. In the management console, click **Recover**.
2. In **Archive**, click **Change** and then specify the name of the archive.
3. In **Backup**, click **Change** and then select the backup from which you want to recover data.
4. In **Data type**, select **Volumes**.
5. In **Items to recover**, select the check box next to **my_volgroup-my_logvol**.
6. Under **Where to recover**, click **Change**, and then select the logical volume that you created in Step 1. Click the chevron buttons to expand the list of disks.
7. Click **OK** to start the recovery.

For a complete list of commands and utilities that you can use in the bootable media environment, see List of commands and utilities available in Linux-based bootable media (p. 268). For detailed descriptions of the `acrocmd` utility, see the Acronis Backup & Recovery 11.5 command-line reference.

Mounting backup volumes

You may want to mount a volume stored in a disk backup, for example, to view some files in it before starting the recovery.

To mount a backup volume

1. Use the `acrocmd list content` command to list the disks and volumes that are stored in the backup. For example, the following command lists the content of the latest backup of the **linux_machine** archive:

 Copyright © Acronis International GmbH, 2002-2013.

```
acrocmd list content --loc=\\server\backups --credentials=user,MyPassWd
--arc=linux_machine
```

The output will contain lines similar to the following:

```
type: disk
Num         Partition             Flags       Size        Type           GUID
----------  --------------------  ----------  ----------  -------------  ------
--
Dyn1        my_volgroup-my_lo...              4 GB        Ext 3
Dyn2        md0                               2.007 GB    Ext 2
Disk 1      sda                               16 GB       DT_FIXED
1-1         sda1                  Act,Pri     203.9 MB    Ext 2
1-2         sda2                  Pri         11.72 GB    Reiser
1-3         sda3                  Pri         1.004 GB    Linux swap
Disk 2      sdb                               8 GB        DT_FIXED
2-1         sdb1                  Pri         2.007 GB    Ext 2
2-2         sdb2                  Pri         2.007 GB    None
Disk 3      sdc                               1 GB        DT_FIXED
Disk 4      sdd                               8 GB        DT_FIXED
4-1         sdd1                  Pri         2.007 GB    Ext 2
4-2         sdd2                  Pri         2.007 GB    None
```

2. Use the `acrocmd mount` command, specifying the volume's name in the `--volume` parameter. For example:

```
acrocmd mount --loc=\\server\backups --arc=linux_machine --mount_point=/mnt
--volume=DYN1
```

This command mounts the logical volume DYN1 on the mount point /mnt.

To unmount a backup volume

- Use the `acrocmd umount` command, specifying the volume's mount point as a parameter. For example:

```
acrocmd umount --mount_point=/mnt
```

3.8 Support for Advanced Format (4K-sector) hard disks

Acronis Backup & Recovery 11.5 can back up hard disks with a sector size of 4 KB (known as Advanced Format disks), as well as traditional hard disks that have 512-byte sectors.

Acronis Backup & Recovery 11.5 can recover data from one disk to another as long as *both disks have the same logical sector size*. (This is the sector size presented to the operating system.) Acronis Backup & Recovery 11.5 automatically aligns the disk's volumes (p. 148) if necessary. This way, the start of a cluster in the file system always matches the start of a physical sector on the disk.

The disk management (p. 272) functionality of Acronis Backup & Recovery 11.5 is not available for disks with a 4-KB logical sector size.

Determining the logical sector size

By disk specification

Development of the Advanced Format technology is coordinated by the International Disk Drive Equipment and Materials Association (IDEMA). For more details, see http://www.idema.org/?page_id=2.

In terms of the logical sector size, IDEMA specifies two types of Advanced Format disks:

 Copyright © Acronis International GmbH, 2002-2013.

- **512 Byte emulation (512e)** disks have a 512-byte logical sector size. These disks are supported in Windows starting with Windows Vista, and in modern Linux distributions. Microsoft and Western Digital use the term “Advanced Format” exclusively for this type of disk.
- **4K native (4Kn)** disks have a 4-KB logical sector size. Modern operating systems can store data on these disks, but they generally cannot boot from these disks. These disks are commonly external drives with USB connection.

By running the appropriate command

To find out the logical sector size of a disk, do the following.

In Windows:

1. Make sure that the disk contains an NTFS volume.
2. Run the following command as an administrator, specifying the drive letter of the NTFS volume:
   ```
   fsutil fsinfo ntfsinfo D:
   ```
3. Examine the value in the **Bytes Per Sector** line. For example, the output may be the following:
   ```
   Bytes Per Sector : 512
   ```

In Linux:

1. Determine the device name of the disk, such as /dev/sdb.
2. Run the following command as the root user, specifying the device name:
   ```
   parted /dev/sdb print
   ```
3. Examine the first value in the **Sector size (logical/physical)** line. For example, the output may be the following:
   ```
   Sector size (logical/physical): 512B/4096B
   ```

3.9 Support for UEFI-based machines

Acronis Backup & Recovery 11.5 can back up and recover machines that use 64-bit Unified Extensible Firmware Interface (UEFI) in the same way as it does for machines that use BIOS for booting.

This applies to both physical and virtual machines, no matter if the virtual machines are backed up at a hypervisor level or from inside a guest OS.

Backup and recovery of devices that use 32-bit UEFI are not supported.

Limitations

- WinPE-based bootable media of versions earlier than 4.0 and Acronis PXE Server do not support UEFI booting.
- Acronis Active Restore (p. 442) is not available on UEFI machines.
- Acronis Startup Recovery Manager (ASRM) (p. 442) is not supported on UEFI machines running Linux. On UEFI machines running Windows, activate ASRM in Windows rather than under bootable media.
- A machine running Linux cannot be transferred between UEFI and BIOS. For details about transferring Windows machines, see "Recovering BIOS-based systems to UEFI-based or vice versa" (p. 154).

 Copyright © Acronis International GmbH, 2002-2013.

3.10 Support for Windows 8 and Windows Server 2012

This section describes how Acronis Backup & Recovery 11.5 supports features that are introduced in the Windows 8 and Windows Server 2012 operating systems.

The information in this section also applies to Windows 8.1 and Windows Server 2012 R2.

Limitations

- Acronis Disk Director Lite (p. 272) is not available under Windows 8 and Windows Server 2012.
- Disk management operations under bootable media may work incorrectly if storage spaces are configured on the machine.
- The Windows To Go feature of Windows 8 is not supported.

WinPE 4.0 and WinPE 5.0

Acronis Media Builder can create bootable media based on these versions of Windows Preinstallation Environment (WinPE).

These bootable media support new features of Windows 8 and Windows Server 2012 (see later in this section). They can boot on machines that use Unified Extensible Firmware Interface (UEFI).

To create bootable media based on these versions of WinPE, you need Windows Assessment and Deployment Kit (ADK). For more details, see the “WinPE-based bootable media” (p. 263) section.

UEFI Secure Boot

On a machine that runs Windows 8 or Windows Server 2012 and uses UEFI, the Secure Boot feature of UEFI may be turned on. Secure Boot ensures that only trusted boot loaders can boot the machine.

By using Acronis Media Builder, you can create a bootable media that has a trusted boot loader. To do this, choose to create a 64-bit Linux-based media or a 64-bit media based on WinPE 4 or later.

Resilient file system (ReFS)

In Windows Server 2012, you can format a volume by using the ReFS file system. This file system provides a more reliable way of storing data on the volume as compared with the NTFS file system.

In **Windows Server 2012** and under a **bootable media based on WinPE 4 or later,** you can back up and recover a ReFS volume. Resizing a ReFS volume during recovery is not supported.

Linux-based bootable media and bootable media based on **WinPE version earlier than 4.0** cannot write files to a ReFS volume. Therefore, you cannot recover files to a ReFS volume by using these media; and you cannot select a ReFS volume as a backup destination.

Storage spaces

In Windows 8 and Windows Server 2012, you can combine several physical disks into a *storage pool*. In this storage pool, you can create one or more logical disks, called storage spaces. As with ordinary disks, storage spaces can have volumes.

In **Windows 8,** in **Windows Server 2012,** and under a **bootable media based on WinPE 4 or later,** you can back up and recover storage spaces. In Windows Server 2012 and under a bootable media based on WinPE 4 or later, you also can recover a storage space to an ordinary disk or vice versa.

Copyright © Acronis International GmbH, 2002-2013.

Linux-based bootable media does not recognize storage spaces. It backs up the underlying disks sector-by-sector. The same applies to **Agent for ESX(i)** and **Agent for Hyper-V.** If you recover all of the underlying disks to the *original* disks, the storage spaces will be recreated.

Data Deduplication

In Windows Server 2012, you can enable the Data Deduplication feature for an NTFS volume. Data Deduplication reduces the used space on the volume by storing duplicate fragments of the volume's files only once.

You can back up and recover a data deduplication–enabled volume at a disk level without limitations. File-level backup and file recovery, including file recovery from a disk backup, are not supported.

The Data Deduplication feature of Windows Server 2012 is unrelated to the Acronis Backup & Recovery 11.5 Deduplication feature.

3.11 Compatibility with encryption software

Acronis Backup & Recovery 11.5 fully retains its functionality when interacting with file-level encryption software.

Disk-level encryption software encrypts data on the fly. This is why data contained in the backup is not encrypted. Disk-level encryption software often modifies system areas: boot records, or partition tables, or file system tables. These factors affect disk-level backup and recovery, the ability of the recovered system to boot and access to Acronis Secure Zone.

Under some conditions, Acronis Backup & Recovery 11.5 is compatible with the following disk-level encryption software:

- Microsoft BitLocker Drive Encryption
- McAfee Endpoint Encryption
- PGP Whole Disk Encryption.

To ensure reliable disk-level recovery, follow the common rules and software-specific recommendations.

Common installation rule

The strong recommendation is to install the encryption software before installing Acronis Backup & Recovery 11.5.

The way of using Acronis Secure Zone

Acronis Secure Zone must not be encrypted with disk-level encryption. This is the only way to use Acronis Secure Zone:

1. Install encryption software; then, install Acronis Backup & Recovery 11.5.
2. Create Acronis Secure Zone.
3. Exclude Acronis Secure Zone when encrypting the disk or its volumes.

Common backup rule

You can do a disk-level backup in the operating system. Do not try to back up using bootable media or Acronis Startup Recovery Manager.

 Copyright © Acronis International GmbH, 2002-2013.

Software-specific recovery procedures

Microsoft BitLocker Drive Encryption

To recover a system that was encrypted by BitLocker:

1. Boot from the bootable media.
2. Recover the system. The recovered data will be unencrypted.
3. Reboot the recovered system.
4. Turn on BitLocker.

If you only need to recover one partition of a multi-partitioned disk, do so under the operating system. Recovery under bootable media may make the recovered partition undetectable for Windows.

McAfee Endpoint Encryption and PGP Whole Disk Encryption

You can recover an encrypted system partition by using bootable media only.

If the recovered system fails to boot, rebuild Master Boot Record as described in the following Acronis knowledge base article: http://kb.acronis.com/content/1507 and reboot.

3.12 Support for SNMP

SNMP objects

Acronis Backup & Recovery 11.5 provides the following Simple Network Management Protocol (SNMP) objects to SNMP management applications:

- Type of event

  Object identifier (OID): 1.3.6.1.4.1.24769.100.200.1.0

  Syntax: OctetString

  The value may be "Information", "Warning", 'Error" and "Unknown". "Unknown" is sent only in the test message.
- Text description of the event

  Object identifier (OID): 1.3.6.1.4.1.24769.100.200.2.0

  Syntax: OctetString

  The value contains the text description of the event (it looks identical to messages published by Acronis Backup & Recovery 11.5 in its log).

Example of varbind values:

1.3.6.1.4.1.24769.100.200.1.0:Information

1.3.6.1.4.1.24769.100.200.2.0:I0064000B

Supported operations

Acronis Backup & Recovery 11.5 **supports only TRAP operations**. It is not possible to manage Acronis Backup & Recovery 11.5 using GET- and SET- requests. This means that you need to use an SNMP Trap receiver to receive TRAP-messages.

Copyright © Acronis International GmbH, 2002-2013.

About the management information base (MIB)

The MIB file **acronis-abr.mib** is located in the Acronis Backup & Recovery 11.5 installation directory. By default: %ProgramFiles%\Acronis\BackupAndRecovery in Windows and /usr/lib/Acronis/BackupAndRecovery in Linux.

This file can be read by a MIB browser or a simple text editor such as Notepad or vi.

About the test message

When configuring SNMP notifications, you can send a test message to check if your settings are correct.

The parameters of the test message are as follows:

- Type of event
  OID: 1.3.6.1.4.1.24769.100.200.1.0
  Value: "Unknown"
- Text description of the event
  OID: 1.3.6.1.4.1.24769.100.200.2.0
  Value: "?00000000"

Copyright © Acronis International GmbH, 2002-2013.

4 Backup

4.1 Back up now

Use the **Back up now** feature to configure and run a one-time backup in a few simple steps. The backup process will start immediately after you perform the required steps and click **OK**.

For a long-time backup strategy that includes schedules and conditions, timely deleting of backups or moving them to different locations, consider creating a backup plan.

Configuring immediate backup is similar to creating a backup plan (p. 55) except for the following:

- There are no options to schedule backups and to set up retention rules.
- Simplified naming of backup files (p. 78) is used, if the backup destination supports it. Otherwise, the standard backup naming is used.

  The following locations do not support simplified file naming: managed vaults, tape, Acronis Secure Zone or Acronis Online Backup Storage.

  Due to simplified file naming, an RDX drive or USB flash drive can only be used in the removable media (p. 200) mode.
- Conversion of a disk-level backup to a virtual machine is not available as a part of the backup operation. You can convert the resulting backup afterwards.

4.2 Creating a backup plan

Before creating your first backup plan (p. 444), please familiarize yourself with the basic concepts used in Acronis Backup & Recovery 11.5.

To create a backup plan, perform the following steps.

What to back up

Items to back up (p. 57)

Select the type of data to back up and specify the data items. The type of data depends on the agents installed on the machine.

Access credentials, exclusions

To access these settings, click **Show access credentials, exclusions**.

Access credentials (p. 59)

Provide credentials for the source data if the plan's account does not have access permissions to the data.

Exclusions (p. 60)

Set up exclusions for the specific types of files you do not wish to back up.

Where to back up

Location (p. 61)

Specify a path to the location where the backup archive will be stored and the archive name. The archive name has to be unique within the location. Otherwise, backups of the newly created backup plan will be placed to the existing archive that belongs to another backup

Copyright © Acronis International GmbH, 2002-2013.

plan. The default archive name is Archive(N) where N is the sequence number of the archive in the location you have selected.

Select the mode the removable device will be used in (p. 200)

If the specified location is an RDX drive or USB flash drive, select the device mode: **Removable media** or **Fixed drive**.

Backup file naming, access credentials, archive comments

To access these settings, click **Show backup file naming, access credentials, archive comments**.

File naming (p. 78)

[Optional] Select the **Name backup files using the archive name, as in Acronis True Image Echo, rather than auto-generated names** check box if you want to use simplified file naming for the archive's backups.

Not available when backing up to a managed vault, tape, Acronis Secure Zone, or Acronis Online Backup Storage. When backing up to an RDX drive or USB flash drive, the file naming scheme is determined by the removable device mode (p. 200).

Access credentials (p. 64)

[Optional] Provide credentials for the location if the plan account does not have access permissions to the location.

Archive comments

[Optional] Enter comments on the archive.

Single-pass disk and application backup (p. 316)

Applies only to machines that have a license for single-pass backup

Specify settings related to single-pass disk and application backup.

How to back up

Backup scheme (p. 65)

Specify when and how often to back up your data; define for how long to keep the created backup archives in the selected location; set up schedule for the archive cleanup procedure (see "Replication and retention settings" below).

Replication and retention settings (p. 97)

Not available for removable media or when simplified naming of backup files (p. 78) is chosen.

Define whether to copy (replicate) the backups to another location, and whether to move or delete them according to retention rules. The available settings depend on the backup scheme.

2nd location

[Optional] To set up replication of backups, select the **Replicate newly created backup to another location** check box. For more information about backup replication, see Setting up replication of backups (p. 100).

Validation, convert to virtual machine

To access these settings, click **Show validation, convert to virtual machine**.

When to validate (p. 75)

[Optional] Depending on the selected backup scheme, define when and how often to perform validation and whether to validate the entire archive or the latest backup in the archive.

Convert to virtual machine (p. 174)

 Copyright © Acronis International GmbH, 2002-2013.

[Optional] Applies to: disk or volume backup, backup of entire virtual machines or volumes of a virtual machine.

Set up a regular conversion of a disk or volume backup to a virtual machine.

Plan parameters

Plan name

[Optional] Enter a unique name for the backup plan. A conscious name lets you identify the plan among others.

Backup options

[Optional] Configure parameters of the backup operation, such as pre/post backup commands, maximum network bandwidth allocated for the backup stream or the backup archive compression level. If you do nothing in this section, the default values (p. 106) will be used.

After any of the settings is changed against the default value, a new line that displays the newly set value appears. The setting status changes from **Default** to **Reset to default**. Should you modify the setting again, the line will display the new value unless the new value is the default one. When the default value is set, the line disappears. Therefore, in this section you always see only the settings that differ from the default values.

To reset all the settings to the default values, click **Reset to default**.

Plan's credentials, comments, label

To access these settings, click **Show plan's credentials, comments, label**.

Plan's credentials (p. 75)

[Optional] Specify the credentials under which the plan will run.

Comments

[Optional] Type a description of the backup plan.

Label (p. 76)

[Optional] Type a text label for the machine you are going to back up. The label can be used to identify the machine in various scenarios.

After you have performed all the required steps, click **OK** to create the backup plan.

After that, you might be prompted for the password (p. 78).

The plan you have created will be accessible for examination and managing in the **Backup plans and tasks** (p. 327) view.

4.2.1 Selecting data to back up

To select the data to back up

1. In **Data to back up** section, select the type of data you want to be backed up. The list of available data types depends on the agents running on the machine and the types of licenses:

   Disks/volumes

   To be able to back up this data, you must have Administrator or Backup operator privileges.

   Select this option to back up:

   - Entire physical machines or their individual disks or volumes, if Acronis Backup & Recovery 11.5 Agent for Windows or Acronis Backup & Recovery 11.5 Agent for Linux is installed.

Copyright © Acronis International GmbH, 2002-2013.

A disk-level backup enables you to recover the entire system in case of severe data damage or hardware failure. Also, you can individually recover files and folders. The backup procedure is faster than copying files, and may significantly speed up the backup process when backing up large volumes of data.

- Microsoft SQL databases by means of single-pass disk and application backup, if Acronis Backup & Recovery 11.5 Agent for Microsoft SQL Server (single-pass) is installed.

  Agent for SQL (single-pass) enables you to create application-aware disk backups and to recover Microsoft SQL databases from such backups. For more information, see the "Protecting Microsoft SQL Server..." (p. 312) section.

- Microsoft Active Directory data by means of single-pass disk and application backup, if Acronis Backup & Recovery 11.5 Agent for Microsoft Active Directory (single-pass) is installed.

  Agent for Active Directory (single-pass) enables you to create application-aware disk backups and to recover Microsoft Active Directory data from such backups. For more information, see the "Protecting Microsoft Active Directory ..." (p. 323) section.

Folders/files

Available if Acronis Backup & Recovery 11.5 Agent for Windows or Acronis Backup & Recovery 11.5 Agent for Linux is installed.

Select this option to back up specific files and folders.

A file-level backup is not sufficient for recovery of the operating system. Choose file backup if you plan to keep safe only certain data (the current project, for example). This will reduce the archive size, thus saving storage space.

In order to recover your operating system along with all the settings and applications, you have to perform a disk backup.

Virtual machines

Available if Acronis Backup & Recovery 11.5 Agent for ESX(i) or Acronis Backup & Recovery 11.5 Agent for Hyper-V is installed.

Select this option to back up entire virtual machines residing on a virtualization server or their disks or volumes.

Backing up an entire virtual machine, its disks, or volumes yields a standard disk backup (p. 448). In addition, this backup stores the virtual machine configuration. This configuration will be suggested by default when recovering the backup content to a new virtual machine. For more information about backing up virtual machines see "Backing up virtual machines".

Microsoft Exchange information store

Available if Acronis Backup & Recovery 11.5 Agent for Microsoft Exchange Server is installed.

Select this option to back up information store, individual storage groups or databases of Microsoft Exchange servers. In case of disaster, you will be able to recover lost or corrupted databases or storage groups. Also, you can individually recover mailboxes, public folders, single emails, contacts, calendar events, and other items.

To be able to back up Exchange data, a domain user account that has administrative privileges on the Exchange server is required. In a cluster, the account must have administrative privileges on each of the cluster’s nodes.

For more information about backing up Microsoft Exchange data see "Backing up Microsoft Exchange Server data".

Microsoft Exchange mailboxes

Available if Acronis Backup & Recovery 11.5 Agent for Microsoft Exchange Server is installed.

 Copyright © Acronis International GmbH, 2002-2013.

Select this option to back up individual mailboxes and public folders without backing up the entire Microsoft Exchange database. By using the exclusion filters, you can specify items to be skipped during mailbox backups.

To be able to back up Exchange data, a domain user account that has administrative privileges on the Exchange server is required. In a cluster, the account must have administrative privileges on each of the cluster's nodes.

For more information about backing up Microsoft Exchange data see "Backing up Microsoft Exchange Server data".

2. In the tree below **Data to back up** section, select the items to back up.

   To back up all items of the selected data type present on a machine, select the check box next to the machine. To back up individual data items, expand the machine and select check boxes next to the required items.

   Notes for Disks/volumes

   - If your operating system and its loader reside on different volumes, always include both volumes in the backup. The volumes must also be recovered together; otherwise there is a high risk that the operating system will not start.
   - Note for Linux users: Logical volumes and MD devices are shown under **Dynamic volumes**. For more information about backing up such volumes and devices, see "Backup and recovery of logical volumes and MD devices (Linux)" (p. 43).
   - Note for Linux users: We recommend that you unmount any volumes that contain non-journaling file systems—such as the ext2 file system—before backing them up. Otherwise, these volumes might contain corrupted files upon recovery; recovery of these volumes with resize might fail.

   Notes for Virtual machines

   - Backing up entire virtual machines comes in handy when having small (in terms of virtual disks size) but numerous legacy servers such as those resulting from workload consolidation. A separate archive will be created for each machine.
   - Backing up individual disks or volumes within a virtual machine comes in handy when the operating system and applications, such as a database server, run on a virtual disk, but the data, such as a database, is stored on a large capacity physical disk added to the same machine. You will be able to use different backup strategies for the virtual disk and the physical storage.

3. Having specified the data to back up, click **OK**.

4.2.2 Access credentials for source

Specify the credentials required for access to the data you are going to back up.

To specify credentials

1. Select one of the following:

   - **Use the plan's credentials**

     The program will access the source data using the credentials of the backup plan account specified in the **Plan parameters** section.

   - **Use the following credentials**

     The program will access the source data using the credentials you specify.

     Use this option if the plan's account does not have access permissions to the data.

     Specify:

 Copyright © Acronis International GmbH, 2002-2013.

- **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
- **Password**. The password for the account.
- **Confirm password**. Re-enter the password.

2. Click **OK**.

4.2.3 Source files exclusion

This option is effective for Windows and Linux operating systems and bootable media.

This option is effective for *disk-level* backup of NTFS, FAT, Ext3, and Ext4 file systems only. This option is effective for *file-level* backup of all supported file systems.

The option defines which files and folders to skip during the backup process and thus exclude from the list of backed-up items.

Note: *Exclusions override selection of data items to back up. For example, if you select to back up file MyFile.tmp and to exclude all .tmp files, file MyFile.tmp will not be backed up.*

To specify which files and folders to exclude, set up any of the following parameters.

Exclude all hidden files and folders

Select this check box to skip files and folders that have the **Hidden** attribute (for file systems that are supported by Windows) or that start with a period (.) (for file systems in Linux such as Ext2 and Ext3). If a folder is hidden, all of its contents (including files that are not hidden) will be excluded.

Exclude all system files and folders

This option is effective only for file systems that are supported by Windows. Select this check box to skip files and folders with the **System** attribute. If a folder has the **System** attribute, all of its contents (including files that do not have the **System** attribute) will be excluded.

Tip: *You can view file or folder attributes in the file/folder properties or by using the* ***attrib*** *command. For more information, refer to the Help and Support Center in Windows.*

Exclude files matching the following criteria

Select this check box to skip files and folders matching any of the criteria. Use the **Add**, **Edit**, **Remove** and **Remove All** buttons to create the list of criteria.

The criteria are *not* case-sensitive in Windows and Linux. For example, if you choose to exclude all .tmp files and the C:\Temp folder, also excluded will be all .Tmp files, all .TMP files, and the C:\TEMP folder.

Criteria: full path

Specify the full path to the file or folder, starting with the drive letter (when backing up Windows) or the root directory (when backing up Linux).

Both in Windows and Linux, you can use a forward slash in the file or folder path (as in **C:/Temp** and **C:/Temp/File.tmp**). In Windows, you can also use the traditional backslash (as in **C:\Temp** and **C:\Temp\File.tmp**).

Under a Windows-style bootable media, a volume might have a different drive letter than in Windows. For more information, see "Working under bootable media" (p. 266).

 Copyright © Acronis International GmbH, 2002-2013.

Criteria: name

Specify the name of the file or folder, such as Document.txt. All files and folders with that name will be excluded.

Wildcard characters

You can use one or more wildcard characters * and ? in the criterion. These characters can be used both within the full path and in the file or folder name.

The asterisk (*) substitutes for zero or more characters in a file name. For example, the criterion Doc*.txt covers files such as Doc.txt and Document.txt

The question mark (?) substitutes for exactly one character in a file name. For example, the criterion Doc?.txt covers files such as Doc1.txt and Docs.txt, but not the files Doc.txt or Doc11.txt

Exclusion examples

Criterion	Example	Description
Windows and Linux		
By name	F.log F	Excludes all files named "F.log" Excludes all folders named "F"
By mask (*)	*.log F*	Excludes all files with the .log extension Excludes all files and folders with names starting with "F" (such as folders F, F1 and files F.log, F1.log)
By mask (?)	F???.log	Excludes all .log files with names consisting of four symbols and starting with "F"
Windows		
By file path	C:\Finance\F.log	Excludes the file named "F.log" located in the folder C:\Finance
By folder path	C:\Finance\F *or* C:\Finance\F\	Excludes the folder C:\Finance\F (be sure to specify the full path starting from the drive letter)
Linux		
By file path	/home/user/Finance/F.log	Excludes the file named "F.log" located in the folder (directory) /home/user/Finance
By folder path	/home/user/Finance *or* /home/user/Finance/	Excludes the folder (directory) /home/user/Finance

4.2.4 Backup location selection

Specify where the archive will be stored.

1. Selecting the destination

In the **Path** field, enter the full path to the destination, or select the desired destination in the location tree as described in "Selecting backup destinations" (p. 62).

Copyright © Acronis International GmbH, 2002-2013.

2. Using the archives table

To assist you with choosing the right destination, the table displays the names of the archives contained in each location you select. While you are reviewing the location content, archives can be added, deleted or modified by another user or by the program itself according to scheduled operations. Use the **Refresh** button to refresh the list of archives.

3. Naming the new archive

Once you select the archive destination, the program generates a name for the new archive and displays it in the **Name** field. The name commonly looks like *Archive(N)*, where *N* is a sequence number. The generated name is unique within the selected location. If you are satisfied with the automatically generated name, click **OK**. Otherwise enter another unique name.

If the automatically generated name looks like *[Machine Name]_Archive(N)*, this means that the name contain variables. Such might be the case when you have selected virtual machines to back up. The *[Machine Name]* stands for the virtual machine name. You can add suffixes to the name but never delete the variables, since each virtual machine has to back up to a separate archive with the unique name.

Backing up to an existing archive

You can configure the backup plan to back up to an existing archive. To do so, select the archive in the archives table or type the archive name in the **Name** field. If the archive is protected with a password, the program will ask for it in the pop-up window.

By selecting the existing archive, you are meddling in the area of another backup plan that uses the archive. This is not an issue if the other plan is discontinued. However, you should generally follow the rule: "one backup plan - one archive". Doing the opposite will not prevent the program from functioning but is not practical or efficient, except for some specific cases.

Why two or more plans should not back up to the same archive

1. Backing up different sources to the same archive makes it difficult to use archive. When it comes to recovery, every second counts, and you might be "lost" in the archive content.

   Backup plans that operate with the same archive should back up the same data items (say, both plans back up volume C.)
2. Applying multiple retention rules to an archive makes the archive content unpredictable. Since each of the rules will be applied to the entire archive, the backups belonging to one backup plan can be easily deleted along with the backups belonging to the other. You should not expect the classic behavior of the GFS and Tower of Hanoi backup schemes.

   Normally, each complex backup plan should back up to its own archive.

4.2.4.1 Selecting backup destinations

Acronis Backup & Recovery 11.5 lets you back up data to various physical storages.

Destination	Details

Copyright © Acronis International GmbH, 2002-2013.

Destination	Details
Online backup storage	To back up data to Acronis Online Backup Storage, click **Log in** and specify the credentials to log in to the online storage. Then, expand the **Online backup storage** group and select the account. Prior to backing up to the online storage, you need to buy a subscription (p. 434) to the online backup service and activate (p. 435) the subscription on the machine(s) you want to back up. Online backup is not available in Linux and under bootable media. Online backup of Microsoft Exchange Server data by using Agent for Exchange is not possible. ***Note:*** *Acronis Backup & Recovery Online might be unavailable in your region. To find more information, click here: http://www.acronis.eu/my/backup-recovery-online/*
Personal	To back up data to a personal vault, expand the **Vaults** group and click the vault. Acronis Secure Zone is considered as a personal vault available to all users that can log on the system.
Centralized	To back up data to a centralized vault, expand the **Vaults** group and click the vault.
Machine	Local machine
Local folders	To back up data to a local folder of the machine, expand the **<Machine name>** group and select the required folder.
CD, DVD, BD	To back up data to optical media such as CD, DVD, or Blu-ray Discs (BD), expand the **<Machine name>** group, then select the required drive.
RDX, USB	To back up data to an RDX drive or USB flash drive, expand the **<Machine name>** group, then select the required drive. For information about using these drives, see the "Removable devices" (p. 200) section.
Tape device	To back up data to a locally attached tape device, expand the **<Machine name>** group, then click the required device. In stand-alone editions of Acronis Backup & Recovery 11.5, tape devices are available only if you have upgraded from Acronis Backup & Recovery 10. For information about using tapes, see the "Tape devices" (p. 201) section.
Network folders	To back up data to a network folder, expand the **Network folders** group, select the required networked machine, and then click the shared folder. If the network share requires access credentials, the program will ask for them. ***Note for Linux users:*** *To specify a Common Internet File System (CIFS) network share which is mounted on a mount point such as* ***/mnt/share****, select this mount point instead of the network share itself.*

Copyright © Acronis International GmbH, 2002-2013.

Destination	Details
FTP, SFTP	To back up data to FTP or SFTP, type the server name or address in the **Path** field as follows: **ftp://ftp_server:port _number** or **sftp://sftp_server:port number** To establish an active mode FTP connection, use the following notation: **aftp://ftp_server:port _number** If the port number is not specified, port 21 is used for FTP and port 22 is used for SFTP. After entering access credentials, the folders on the server become available. Click the appropriate folder on the server. You can access the server as an anonymous user if the server enables such access. To do so, click **Use anonymous access** instead of entering credentials. ***Note**: According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.*
Storage nodes	When you need to back up data to a storage node that is not registered on the management server, or when operating on a machine booted with bootable media: ▪ To access a managed vault, type the following string in the **Path** field: **bsp://node_address/vault_name/** ▪ To access an unmanaged centralized vault, type the full path to the vault's folder.
NFS drives	To back up data to an NFS share, expand the **NFS drives** group and click the folder. Available only in Linux and under Linux-based bootable media.

4.2.5 Access credentials for archive location

Specify credentials required for access to the location where the backup archive will be stored. The user whose name is specified will be considered as the archive owner.

To specify credentials

1. Select one of the following:
   - **Use the plan's credentials**

     The program will access the source data using the credentials of the backup plan account specified in the **Plan parameters** section.
   - **Use the following credentials**

     The program will access the source data using the credentials you specify.

     Use this option if the plan account does not have access permissions to the location. You might need to provide special credentials for a network share or a storage node vault.

     Specify:
     - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
     - **Password**. The password for the account.
     - **Confirm password**. Re-enter the password.
2. Click **OK**.

Copyright © Acronis International GmbH, 2002-2013.

Warning: *According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.*

4.2.6 Backup schemes

Choose one of the available backup schemes:

- **Simple** – to schedule when and how often to backup data and specify retention rules.
- **Grandfather-Father-Son** – to use the Grandfather-Father-Son backup scheme. The scheme does not allow data to be backed up more than once a day. You set the days of week when the daily backup will be performed and select from these days the day of weekly/monthly backup. Then you set the retention periods for the daily (referred to as "sons"), weekly (referred to as "fathers") and monthly (referred to as "grandfathers") backups. The expired backups will be deleted automatically.
- **Tower of Hanoi** – to use the Tower of Hanoi backup scheme. This scheme allows you to schedule when and how often to back up (sessions) and select the number of backup levels (up to 16). The data can be backed up more than once a day. By setting up the backup schedule and selecting backup levels, you automatically obtain the rollback period – the guaranteed number of sessions that you can go back at any time. The automatic cleanup mechanism maintains the required rollback period by deleting the expired backups and keeping the most recent backups of each level.
- **Custom** – to create a custom scheme, where you are free to set up a backup strategy in the way your enterprise needs it most: specify multiple schedules for different backup types, add conditions and specify the retention rules.
- **Manual start** – to create a backup task for manual start.
- **Initial seeding** – to save locally a full backup whose final destination is Acronis Online Backup Storage.

Note for Microsoft Exchange users: *For information about backup schemes used when backing up Exchange databases, storage groups or mailboxes, refer to the "Backup schemes" section of the "Backing up Microsoft Exchange Server data" documentation.*

4.2.6.1 Simple scheme

With the simple backup scheme, you just schedule when and how often to back up data. Other steps are optional.

To set up the simple backup scheme, specify the appropriate settings as follows.

Schedule

Set up when and how often to back up the data. To learn more about setting up the schedule, see the Scheduling (p. 83) section.

Retention rules

Specify how long to store backups in the location and whether to move or delete them afterward. The retention rules are applied after creating a backup. The **Keep backups indefinitely** is set by default, which means that no backups will be deleted automatically. For more information about retention rules, see Setting up retention of backups (p. 100).

Backup type

 Copyright © Acronis International GmbH, 2002-2013.

To access this setting, click **Show backup type, validation, convert to virtual machine**.

Select the backup type.

- **Full** - selected by default for all backup locations (except for Acronis Online Backup Storage).
- **Incremental**. At the first time a full backup will be created. The next backups will be incremental. Selected as the one and only backup type for Acronis Online Backup Storage.

***Note**: When the **Incremental** backup type is selected along with retention rules, the archive will be cleaned up using consolidation (p. 447), which is a more time-consuming and resource-intensive operation.*

4.2.6.2 Grandfather-Father-Son scheme

At a glance

- Daily ("Son"), weekly ("Father"), and monthly ("Grandfather") backups
- Custom day for weekly and monthly backups
- Custom retention periods for backups of each type

Description

Let us suppose that we want to set up a backup plan that will regularly produce a series of daily (D), weekly (W), and monthly (M) backups. Here is a natural way to do this: the following table shows a sample two-month period for such a plan.

	Mo	Tu	We	Th	Fr	Sa	Su
Jan 1—Jan 7	D	D	D	D	W	-	-
Jan 8—Jan 14	D	D	D	D	W	-	-
Jan 15—Jan 21	D	D	D	D	W	-	-
Jan 22—Jan 28	D	D	D	D	M	-	-
Jan 29—Feb 4	D	D	D	D	W	-	-
Feb 5—Feb 11	D	D	D	D	W	-	-
Feb 12—Feb 18	D	D	D	D	W	-	-
Feb 19—Feb 25	D	D	D	D	M	-	-
Feb 26—Mar 4	D	D	D	D	W	-	-

Daily backups run every workday except Friday, which is left for weekly and monthly backups. Monthly backups run on the last Friday of each month, and weekly backups run on all other Fridays. As a result, you will normally obtain 12 monthly backups over a full year.

Parameters

You can set up the following parameters of a Grandfather-Father-Son (GFS) scheme.

Start backup at	Specifies when to start a backup. The default value is 12:00 PM.
Back up on	Specifies the days of the week when a backup will be performed. The default value is **Workdays**.

Copyright © Acronis International GmbH, 2002-2013.

Weekly/Monthly	Specifies which day of the week (out of the days selected in the **Back up on** field) you want to reserve for weekly and monthly backups. The default value is **Friday**. With this value, a monthly backup will run on the last Friday of each month. Weekly backups will run on all other Fridays. If you choose a different day of week, these rules will apply to the day chosen.
Keep backups	Specifies how long you want the backups to be stored in the archive. A term can be set in hours, days, weeks, months, or years. For monthly backups, you can also select **Keep indefinitely** if you want them to be saved forever. The default values for each backup type are as follows. Daily: 5 days (recommended minimum) Weekly: 7 weeks Monthly: indefinitely The retention period for weekly backups must exceed that for daily backups; the monthly backups' retention period must be greater than the weekly backups' retention period. We recommend setting a retention period of at least one week for daily backups.
Backup type	Specifies the types of daily, weekly and monthly backups ▪ **Always full** - all the daily, weekly and monthly backups will always be full. This is the default selection for cases when a tape drive is selected as a backup location. ▪ **Full/Differential/Incremental** - daily backups are incremental, weekly backups are differential, and monthly backups are full. The first backup is always full. However, this does not mean that it is a monthly backup. It will be kept as a daily, weekly or monthly backup, depending on the day of week it is created.
Advanced settings	Available only for advanced editions of Acronis Backup & Recovery 11.5 when creating a centralized backup plan. See the "Advanced scheduling settings" (p. 92) section for details.

A backup is not deleted until all backups that directly depend on it become subject to deletion as well. This is why you might see a backup, marked with the icon, for a few days past its expected expiration date.

Examples

Each day of the past week, each week of the past month

Let us consider a GFS backup scheme that many may find useful.

- Back up files every day, including weekends
- Be able to recover files as of any date over the past seven days
- Have access to weekly backups of the past month
- Keep monthly backups indefinitely.

Backup scheme parameters can then be set up as follows.

- Start backup at: **11:00 PM**
- Back up on: **All days**
- Weekly/monthly: **Saturday** (for example)
- Keep backups:

 Copyright © Acronis International GmbH, 2002-2013.

- Daily: **1 week**
- Weekly: **1 month**
- Monthly: **indefinitely**

As a result, an archive of daily, weekly, and monthly backups will be created. Daily backups will be available for seven days since creation. For instance, a daily backup of Sunday, January 1, will be available through next Sunday, January 8; the first weekly backup, the one of Saturday, January 7, will be stored on the system until February 7. Monthly backups will never be deleted.

Limited storage

If you do not want to arrange a vast amount of space to store a huge archive, you may set up a GFS scheme so as to make your backups more short-lived, at the same time ensuring that your information can be recovered in case of an accidental data loss.

Suppose that you need to:

- Perform backups at the end of each working day
- Be able to recover an accidentally deleted or inadvertently modified file if this has been discovered relatively quickly
- Have access to a weekly backup for 10 days after it was created
- Keep monthly backups for half a year.

Backup scheme parameters can then be set up as follows.

- Start backup at: **6:00 PM**
- Back up on: **Workdays**
- Weekly/monthly: **Friday**
- Keep backups:
  - Daily: **1 week**
  - Weekly: **10 days**
  - Monthly: **6 months**

With this scheme, you will have a week to recover a previous version of a damaged file from a daily backup; as well as 10-day access to weekly backups. Each monthly full backup will be available for six months since the creation date.

Work schedule

Suppose you are a part-time financial consultant and work in a company on Tuesdays and Thursdays. On these days, you often make changes to your financial documents, statements, and update the spreadsheets etc. on your laptop. To back up this data, you may want to:

- Track changes to the financial statements, spreadsheets, etc. performed on Tuesdays and Thursdays (daily incremental backup).
- Have a weekly summary of file changes since last month (Friday weekly differential backup).
- Have a monthly full backup of your files.

Moreover, assume that you want to retain access to all backups, including the daily ones, for at least six months.

The following GFS scheme suits such purposes:

- Start backup at: **11:30 PM**

 Copyright © Acronis International GmbH, 2002-2013.

- Back up on: **Tuesday, Thursday, Friday**
- Weekly/monthly: **Friday**
- Keep backups:
  - Daily: **6 months**
  - Weekly: **6 months**
  - Monthly: **5 years**

Here, daily incremental backups will be created on Tuesdays and Thursdays, with weekly and monthly backups performed on Fridays. Note that, in order to choose **Friday** in the **Weekly/monthly** field, you need to first select it in the **Back up on** field.

Such an archive would allow you to compare your financial documents as of the first and the last day of work, and have a five-year history of all documents, etc.

No daily backups

Consider a more exotic GFS scheme:

- Start backup at: **12:00 PM**
- Back up on: **Friday**
- Weekly/monthly: **Friday**
- Keep backups:
  - Daily: **1 week**
  - Weekly: **1 month**
  - Monthly: **indefinitely**

Backup is thus performed only on Fridays. This makes Friday the only choice for weekly and monthly backups, leaving no other date for daily backups. The resulting “Grandfather-Father” archive will hence consist only of weekly differential and monthly full backups.

Even though it is possible to use GFS to create such an archive, the Custom scheme is more flexible in this situation.

4.2.6.3 Custom backup scheme

At a glance

- Custom schedule and conditions for backups of each type
- Custom schedule and retention rules

Parameters

Parameter	Meaning
Full backup schedule	Specifies on what schedule and under which conditions to perform a full backup. For example, the full backup can be set up to run every Sunday at 1:00 AM as soon as all users are logged off.
Incremental backup schedule	Specifies on what schedule and under which conditions to perform an incremental backup. If the archive contains no backups at the time of the task run, a full backup is created instead of the incremental backup.

Copyright © Acronis International GmbH, 2002-2013.

Differential backup schedule	Specifies on what schedule and under which conditions to perform a differential backup. If the archive contains no full backups at the time of the task run, a full backup is created instead of the differential backup.
Clean up archive	Specifies how to get rid of old backups: either to apply retention rules (p. 101) regularly or clean up the archive during a backup when the destination location runs out of space. By default, the retention rules are not specified, which means older backups will not be deleted automatically. **Using retention rules** Specify the retention rules and when to apply them. This setting is recommended for backup destinations such as shared folders or centralized vaults. **When there is insufficient space while backing up** The archive will be cleaned up only during backup and only if there is not enough space to create a new backup. In this case, the software will act as follows: ▪ Delete the oldest full backup with all dependent incremental/differential backups ▪ If there is only one full backup left and a full backup is in progress, then delete the last full backup with all dependent incremental/differential backups ▪ If there is only one full backup left, and an incremental or differential backup is in progress, an error occurs saying there is a lack of available space This setting is recommended when backing up to a USB drive or Acronis Secure Zone. This setting is not applicable to managed vaults, FTP and SFTP servers. This setting enables deletion of the last backup in the archive, in case your storage device cannot accommodate more than one backup. However, you might end up with no backups if the program is not able to create the new backup for some reason.
Apply retention rules (only if the retention rules are set)	Specifies when to apply the retention rules (p. 101). For example, the cleanup procedure can be set up to run after each backup, and also on schedule. This option is available only if you have set at least one retention rule in **Retention rules**.
Cleanup schedule (only if **On schedule** is selected)	Specifies a schedule for archive cleanup. For example, the cleanup can be scheduled to start on the last day of each month. This option is available only if you selected **On schedule** in **Apply retention rules**.
2nd location, **3rd location**, and so on	Specifies where to copy or move (p. 97) the backups from the current location. This option is available only if you selected either the **Replicate newly created backup to another location** check box under **How to back up**, or **Move the oldest backups to another location** in the **Retention rules** window.

Copyright © Acronis International GmbH, 2002-2013.

Examples

Weekly full backup

The following scheme yields a full backup performed every Friday night.

Full backup: **Schedule: Weekly**, every **Friday**, at **10:00 PM**

Here, all parameters except **Schedule** in **Full backup** are left empty. All backups in the archive are kept indefinitely (no archive cleanup is performed).

Full and incremental backup plus cleanup

With the following scheme, the archive will consist of weekly full backups and daily incremental backups. We further require that a full backup begin only after all users have logged off.

Full backup: Schedule: Weekly, every **Friday**, at **10:00 PM**

Full backup: Conditions: User is logged off

Incremental: Schedule: Weekly, every workday, at **9:00 PM**

Also, let all backups older than one year be deleted from the archive, and let the cleanup be performed upon creating a new backup.

Retention rules: Delete backups older than **12 months**

Apply the rules: After backing up

By default, a one-year-old full backup will not be deleted until all incremental backups that depend on it become subject to deletion too. For more information, see Retention rules (p. 101).

Monthly full, weekly differential, and daily incremental backups plus cleanup

This example demonstrates the use of all options available in the Custom scheme.

Suppose that we need a scheme that will produce monthly full backups, weekly differential backups, and daily incremental backups. Then the backup schedule can look as follows.

Full backup: Schedule: Monthly, every **Last Sunday** of the month, at **9:00 PM**

Incremental: Schedule: Weekly, every **workday**, at **7:00 PM**

Differential: Schedule: Weekly, every **Saturday**, at **8:00 PM**

Further, we want to add conditions that have to be satisfied for a backup task to start. This is set up in the **Conditions** fields for each backup type.

Full backup: **Conditions**: **Location available**

Incremental: **Conditions**: **User is logged off**

Differential: **Conditions**: **User is idle**

As a result, a full backup—originally scheduled at 9:00 PM—may actually start later: as soon as the backup location becomes available. Likewise, backup tasks for incremental and differential backups will wait until all users are logged off and users are idle, respectively.

 Copyright © Acronis International GmbH, 2002-2013.

Finally, we create retention rules for the archive: let us retain only backups that are no older than six months, and let the cleanup be performed after each backup task and also on the last day of every month.

Retention rules: Delete backups older than **6 months**

Apply the rules: **After backing up**, **On schedule**

Cleanup schedule: **Monthly**, on the **Last day** of **All months**, at **10:00 PM**

By default, a backup is not deleted as long as it has dependent backups that must be kept. For example, if a full backup has become subject to deletion, but there are incremental or differential backups that depend on it, the deletion is postponed until all the dependent backups can be deleted as well.

For more information, see Retention rules (p. 101).

4.2.6.4 Tower of Hanoi scheme

At a glance

- Up to 16 levels of full, differential, and incremental backups
- Next-level backups are twice as rare as previous-level backups
- One backup of each level is stored at a time
- Higher density of more recent backups

Parameters

You can set up the following parameters of a Tower of Hanoi scheme.

Schedule	Set up a daily (p. 84), weekly (p. 86), or monthly (p. 88) schedule. Setting up schedule parameters allows for the creation of simple schedules (example of a simple daily schedule: a backup task will be run every 1 day at 10 AM) as well as more complex schedules (example of a complex daily schedule: a task will be run every 3 days, starting from January 15. During the specified days the task will be repeated every 2 hours from 10 AM to 10 PM). Thus, complex schedules specify the sessions on which the scheme should run. In the discussion below, "days" can be replaced with "scheduled sessions".
Number of levels	Select from 2 to 16 backup levels. See the example stated below for details.
Roll-back period	The guaranteed number of sessions that one can go back in the archive at any time. Calculated automatically, depending on the schedule parameters and the numbers of levels you select. See the example below for details.
Backup type	Specifies what backup types the backup levels will have ▪ **Always full** - all levels of backups will be full. This is the default selection for cases when a tape drive is selected as a backup location. ▪ **Full/Differential/Incremental** - backups of different levels will have different types: - Last-level backups are full - Backups of intermediate levels are differential - First-level backups are incremental

Example

Schedule parameters are set as follows

 Copyright © Acronis International GmbH, 2002-2013.

- Recur: Every 1 day
- Frequency: Once at 6 PM

Number of levels: 4

Backup type: Full/Differential/Incremental

This is how the first 14 days (or 14 sessions) of this scheme's schedule look. Shaded numbers denote backup levels.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
4	1	2	1	3	1	2	1	4	1	2	1	3	1

Backups of different levels have different types:

- *Last-level* (in this case, level 4) backups are full;
- Backups of *intermediate levels* (2, 3) are differential;
- *First-level* (1) backups are incremental.

A cleanup mechanism ensures that only the most recent backups of each level are kept. Here is how the archive looks on day 8, a day before creating a new full backup.

1	2	3	4	5	6	7	8
4	1	2	1	3	1	2	1

The scheme allows for efficient data storage: more backups accumulate toward the current time. Having four backups, we could recover data as of today, yesterday, half a week, or a week ago.

Roll-back period

The number of days we can go back in the archive is different on different days. The minimum number of days we are guaranteed to have is called the roll-back period.

The following table shows full backup and roll-back periods for schemes of various levels.

Number of levels	**Full backup every**	**On different days, can go back**	**Roll-back period**
2	2 days	1 to 2 days	1 day
3	4 days	2 to 5 days	2 days
4	8 days	4 to 11 days	4 days
5	16 days	8 to 23 days	8 days
6	32 days	16 to 47 days	16 days

Adding a level doubles the full backup and roll-back periods.

To see why the number of recovery days varies, let us return to the previous example.

Here are the backups we have on day 12 (numbers in gray denote deleted backups).

1	2	3	4	5	6	7	8	9	10	11	12
4	1	2	1	3	1	2	1	4	1	2	1

Copyright © Acronis International GmbH, 2002-2013.

A new level 3 differential backup has not yet been created, so the backup of day five is still stored. Since it depends on the full backup of day one, that backup is available as well. This enables us to go as far back as 11 days, which is the best-case scenario.

The following day, however, a new third-level differential backup is created, and the old full backup is deleted.

1	2	3	4	5	6	7	8	9	10	11	12	13
4	1	2	1	3	1	2	1	4	1	2	1	3

This gives us only a four day recovery interval, which turns out to be the worst-case scenario.

On day 14, the interval is five days. It increases on subsequent days before decreasing again, and so on.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
4	1	2	1	3	1	2	1	4	1	2	1	3	1

The roll-back period shows how many days we are guaranteed to have even in the worst case. For a four-level scheme, it is four days.

4.2.6.5 Manual start

With the **Manual start** scheme, you do not have to specify the backup schedule. You can run the backup plan from the **Plans and Tasks** view manually at any time afterwards.

Specify the appropriate settings as follows.

Backup type

Select the type of backup

- **Full -** selected by default for all backup locations (except for Acronis Online Backup Storage).
- **Incremental.** At the first time a full backup will be created. The next backups will be incremental. Selected as the one and only backup type for Acronis Online Backup Storage.
- **Differential.** At the first time a full backup will be created. The next backups will be differential.

4.2.6.6 Initial seeding

This backup scheme is available when Acronis Online Backup Storage is selected as the backup destination. A backup is only successful if you have an Initial Seeding license.

The Initial Seeding service might be unavailable in your region. To find more information, click here: http://kb.acronis.com/content/15118.

Initial seeding enables you to transfer the first backup, which is full and usually the largest, to the online storage on a hard drive instead of over the Internet. Subsequent backups, which are all incremental and thus usually much smaller, can be transferred over the Internet after the full backup has arrived in the online storage.

If you back up 100 GB of data or more, initial seeding ensures faster delivery of the backed-up data and lower traffic costs.

Please refer to the "Initial Seeding FAQ (p. 424)" section for more details.

 Copyright © Acronis International GmbH, 2002-2013.

4.2.7 Archive validation

Set up the validation task to check if the backed-up data is recoverable. If the backup could not pass the validation successfully, the validation task fails and the backup plan gets the **Error** status.

Validation of a file backup imitates recovery of all files from the backup to a dummy destination. Validation of a volume backup calculates a checksum for every data block saved in the backup.

To set up validation, specify the following parameters

1. **When to validate** – select when to perform the validation. As the validation is a resource-intensive operation, it makes sense to **schedule** the validation to the managed machine's off-peak period. On the other hand, if the validation is a major part of your data protection strategy and you prefer to be immediately informed whether the backed-up data is not corrupted and can be successfully recovered, think of starting the validation right after backup creation.
2. **What to validate** – select either to validate the entire archive or the latest backup in the archive.

   Validation of the archive will validate all the archive's backups and may take a long time and a lot of system resources.

   Validation of the latest backup may also take time, even if this backup is incremental or differential, and small in size. This is because the operation validates not only the data physically contained in the backup, but all of the data recoverable by selecting the backup. This requires access to previously created backups.
3. **Validation schedule** (appears only if you have selected **On schedule** in step 1) - set the schedule of validation. For more information see the Scheduling (p. 83) section.

4.2.8 Backup plan's credentials

Provide the credentials for the account under which the plan will run.

To specify credentials

1. Select one of the following:
   - **Use Acronis service credentials** or **Run under the current user**

     The plan will run under one of the following user accounts:
     - The agent service account if you have administrative privileges on the machine.
     - Your account, if you are logged on as a regular user such as a member of the Users group.
   - **Use the following credentials**

     The tasks will always run under the credentials you specify, whether started manually or executed on schedule.

     Specify:
     - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
     - **Password**. The password for the account.
     - **Confirm password**. Re-enter the password.
2. Click **OK**.

To learn more about operations available depending on the user privileges, see the Users' privileges on a managed machine (p. 36) section.

 Copyright © Acronis International GmbH, 2002-2013.

4.2.9 Label (Preserving machine properties in a backup)

Any time data on a machine is backed up, information about the machine name, operating system, Windows service pack and security identifier (SID) is added to the backup, along with the user-defined text label. The label may include the department or machine owner's name or similar information that can be used as a tag or a key.

If you recover (p. 134) the machine to a VMware ESX(i) using Agent for ESX(i), or convert (p. 174) the backup to a ESX(i) virtual machine, these properties will be transferred to the virtual machine's configuration. You can view them in the virtual machine settings: **Edit settings** > **Options** > **Advanced** > **General** > **Configuration parameters**. You can select, sort and group the virtual machines with the help of these custom parameters. This can be useful in various scenarios.

Example:

Let's assume you migrate your office or datacenter to a virtual environment. By using third-party software that can access configuration parameters through VMware API, you can automatically apply security policies to each machine even before powering it on.

To add a text label to a backup:

1. On the **Create backup plan** (p. 55) page, click **Show plan's credentials, comments, label**.
2. In **Label**, enter the text label or select it from the drop-down menu.

Parameters specification

Parameter	Value	Description
acronisTag.label	<string>	A user-defined label. The label can be set by a user when creating a backup plan.
acronisTag.hostname	<string>	Host name (FQDN)
acronisTag.os.type	<string>	Operating system
acronisTag.os.servicepack	0, 1, 2...	The version of the Service Pack installed in the system. For Windows OS only.
acronisTag.os.sid	<string>	Machine's SID. For example: S-1-5-21-874133492-782267321-3928949834. For Windows OS only.

Values of the "acronisTag.os.type" parameter

Windows NT 4	winNTGuest
Windows 2000 Professional	win2000ProGuest
Windows 2000 Server	win2000ServGuest
Windows 2000 Advanced Server	win2000ServGuest
Windows XP All Editions	winXPProGuest
Windows XP All Editions (64 bit)	winXPPro64Guest
Windows Server 2003, All Editions	winNetStandardGuest
Windows Server 2003, All Editions (64 bit)	winNetStandard64Guest

Copyright © Acronis International GmbH, 2002-2013.

Windows 2008	winLonghornGuest
Windows 2008 (64 bit)	winLonghorn64Guest
Windows Vista	winVistaGuest
Windows Vista (64 bit)	winVista64Guest
Windows 7	windows7Guest
Windows 7 (64 bit)	windows7_64Guest
Windows Server 2008 R2 (64 bit)	windows7Server64Guest
Linux	otherLinuxGuest
Linux (64 bit)	otherLinux64Guest
Other Operating System	otherGuest
Other Operating System (64 bit)	otherGuest64

Example

acronisTag.label = “DEPT:BUCH; COMP:SUPERSERVER; OWNER:EJONSON”

acronisTag.hostname = “superserver.corp.local”

acronisTag.os.type = “windows7Server64Guest”

acronisTag.os.servicepack = “1”

acronisTag.os.sid = “S-1-5-21-874133492-782267321-3928949834”

4.2.10 Sequence of operations in a backup plan

If a backup plan contains multiple operations, Acronis Backup & Recovery 11.5 performs them in the following order:

1. Cleanup (if configured **Before backup**) and validation (if cleanup has been performed and validation is configured to run **After the retention rules are applied**).

   If a backup was moved to a different location during the cleanup, all the operations configured for the subsequent locations are performed before continuing to the following steps in the primary location.
2. Pre-backup command execution.
3. Backup:
   a. Pre-data capture command execution
   b. Snapshot creation
   c. Post-data capture command execution
   d. Backup process
4. Start of backup cataloging.

   Backup cataloging can be a time-consuming process. It is performed in parallel with the following steps.
5. Post-backup command execution.
6. Disaster Recovery Plan (DRP) creation.
7. Conversion to a virtual machine.
8. Backup replication.
9. Cleanup.

Copyright © Acronis International GmbH, 2002-2013.

If the replication took place, or a backup was moved to a different location during the cleanup, all the operations configured for the subsequent locations are performed before continuing to the following steps in the primary location.

10. Validation.
11. Tape media ejection.
12. Sending e-mail notification.

4.2.11 Why is the program asking for the password?

A scheduled or postponed task has to run regardless of users being logged on. In case you have not explicitly specified the credentials, under which the task(s) will run, the program proposes using your account. Enter your password, specify another account or change the scheduled start to manual.

4.3 Simplified naming of backup files

To use simplified naming of backup files, do either of the following:

- In the welcome screen, click **Create backup plan** (p. 55), expand **Show backup file naming, archive comments**, and then select the **Name backup files using the archive name…** check box.

  When you back up to a locally attached RDX drive or USB flash drive, the **Name backup files using the archive name...** check box does not appear. Instead, the removable device mode (p. 200) determines whether the standard or simplified naming scheme will be used. In Linux, the check box appears after you manually mount the device.
- In the welcome screen, click **Back up now** (p. 55). Simplified naming will be used whenever the backup destination supports it (see “Restrictions” below).

When you use simplified file naming

- The file name of the first (full) backup in the archive will consist of the archive name; for example: **MyData.tib.** The file names of subsequent (incremental or differential) backups will have an index. For example: **MyData2.tib**, **MyData3.tib**, and so on.

  This simple naming scheme enables you to create a portable image of a machine on a detachable media or move the backups to a different location by using a script.
- Before creating a new full backup, the software will delete the entire archive and start a new one.

  This behavior is useful when you rotate USB hard drives and want each drive to keep a single full backup (p. 81) or all backups created during a week (p. 81). But you might end up with no backups if a full backup to your only drive fails.

  This behavior can be suppressed by adding the [Date] variable (p. 79) to the archive name.

When you use standard file naming

- Each backup will have a unique file name with the exact time stamp and the backup type. For example: **MyData_2010_03_26_17_01_38_960D.tib**. This standard file naming allows for a wider range of backup destinations and backup schemes.

Restrictions

When using simplified file naming, the following functionality is not available:

- Setting up full, incremental and differential backups within a single backup plan. You need to create separate backup plans for each type of backup.

 Copyright © Acronis International GmbH, 2002-2013.

- Backing up to a managed vault, tape, Acronis Secure Zone or Acronis Online Backup Storage.
- Backing up virtual machines by using Agent for ESX(i) or Agent for Hyper-V.
- Setting up replication of backups.
- Setting up retention rules.
- Setting up regular conversion of backups to a virtual machine.
- Converting an incremental or differential backup into a full one.

Restrictions on archive names

- The archive name cannot end with a number.
- The FAT16, FAT32, and NTFS file systems do not allow the following characters in the file name: backslash (\), slash (/), colon (:), asterisk (*), question mark (?), quotation mark ("), less than sign (<), greater than sign (>), and pipe (|).

4.3.1 The [DATE] variable

If you specify the **[DATE]** variable in the archive name, the file name of each backup will include that backup's creation date.

When using this variable, the first backup of a new day will be a full backup. Before creating the next full backup, the software deletes all backups taken earlier that day. Backups taken before that day are kept. This means you can store multiple full backups with or without incremental ones, but no more than one full backup per day. You can sort the backups by date. You can also use a script to copy, move, or delete the older backups.

The value of this variable is the current date surrounded by brackets ([]). The date format depends on the regional options on the machine. For example, if the date format is *year-month-day*, the value for January 31, 2012, is **[2012-01-31]**. Characters that are not supported in a file name, such as slashes (/), are replaced with underscores (_).

You can place this variable anywhere in the archive name. You can use both lowercase and uppercase letters in this variable.

Examples

Example 1. Suppose that you perform incremental backups twice a day (at midnight and noon) for two days, starting on January 31, 2012. The archive name is **MyArchive-[DATE]**, the date format is *year-month-day.* Here is the list of backup files after day two:

MyArchive-[2012-01-31].tib (full, created on January 31 at midnight)
MyArchive-[2012-01-31]2.tib (incremental, created on January 31 at noon)
MyArchive-[2012-02-01].tib (full, created on February 1 at midnight)
MyArchive-[2012-02-01]2.tib (incremental, created on February 1 at noon)

Example 2. Suppose that you perform full backups, with the same schedule, archive name, and date format as in the previous example. Then, the list of backup files after day two is the following:

MyArchive-[2012-01-31].tib (full, created on January 31 at noon)
MyArchive-[2012-02-01].tib (full, created on February 1 at noon)

This is because the full backups created at midnight were replaced by new full backups of the same day.

Copyright © Acronis International GmbH, 2002-2013.

4.3.2 Backup splitting and simplified file naming

When a backup is split according to backup splitting (p. 113) settings, the same indexing is used to also name parts of the backup. The file name for the next backup will have the next available index.

For example, suppose that the first backup of the archive **MyData** has been split in two parts. Then, the file names for this backup are **MyData1.tib** and **MyData2.tib**. The second backup (supposing that it is not split) will be named **MyData3.tib**.

4.3.3 Usage examples

This section provides examples of how you can use simplified file naming.

4.3.3.1 Example 1. Daily backup replacing the old one

Consider the following scenario:

- You want to perform a daily full backup of your machine.
- You want to store the backup on a locally attached USB hard drive in the file **MyMachine.tib**.
- You want each new backup to replace the old one.

In this scenario, create a backup plan with a daily schedule. When creating the backup plan, specify the USB hard drive as the archive location, specify **MyMachine** as the archive name, select the **Name backup files using the archive name...** check box, and select **Full** as the backup type.

Result. The archive consists of a single file: MyMachine.tib. This file is deleted before creating a new backup.

If you choose to back up to a locally attached RDX drive or USB flash drive, you will not see the **Name backup files using the archive name...** check box. Instead, make sure that the removable device mode (p. 200) is set to **Removable media**.

4.3.3.2 Example 2. Daily full backups with a date stamp

Consider the following scenario:

- You want to perform a daily full backup of your machine.
- You want to move older backups to a remote location by using a script.

In this scenario, create a backup plan with a daily schedule. When creating the backup plan, specify **MyMachine-[DATE]** as the archive name, select the **Name backup files using the archive name...** check box, and select **Full** as the backup type.

Result:

- The backups of January 1, 2012, January 2, 2012, and so on, are stored respectively as MyMachine-[2012-01-01].tib, MyMachine-[2012-01-02].tib, and so on.
- Your script can move older backups based on the date stamp.

See also “The [Date] variable” (p. 79).

4.3.3.3 Example 3. Hourly backups within a day

Consider the following scenario:

 Copyright © Acronis International GmbH, 2002-2013.

- You want to perform hourly backups of your server's critical files every day.
- You want the first backup of each day to be full and to run at midnight; and the subsequent backups of the day to be differential and to run at 01:00, 02:00, and so on.
- You want to keep older backups in the archive.

In this scenario, create a backup plan with a daily schedule. When creating the backup plan, specify **ServerFiles[Date]** as the archive name, select the **Name backup files using the archive name…** check box, specify **Differential** as the backup type, and schedule the backups to run every hour from midnight.

Result:

- The 24 backups of January 1, 2012, will be stored as ServerFiles[2012-01-01].tib, ServerFiles[2012-01-01]2.tib, and so on up to ServerFiles[2012-01-01]24.tib.
- The following day, the backups will start with the full backup ServerFiles[2012-01-02].tib.

See also "The [Date] variable" (p. 79).

4.3.3.4 Example 4. Daily full backups with daily drive swaps

Consider the following scenario:

- You want to perform a daily full backup of your machine.
- You want to store the backup on a locally attached USB hard drive in the file **MyMachine.tib**.
- You have two such drives. You want to swap them before each backup so that one drive contains today's backup and the other drive yesterday's backup.
- You want each new backup to replace the backup on the currently attached drive.

In this scenario, create a backup plan with a daily schedule. When creating the backup plan:

- Specify **MyMachine** as the archive name.
- In Windows, specify **D:** as the archive location, where **D** is the letter each of the drives has in the operating system when attached to the machine.

  In Linux, create a directory such as **/mnt/backup** and specify it as the archive location. Each time you attach a drive, make sure to mount it to the mount point **/mnt/backup**.
- Select the **Name backup files using the archive name...** check box.
- Select **Full** as the backup type.

Result. Each hard disk drive will contain one full backup. While one drive is attached to the machine, you can keep the other drive off-site for extra data protection.

In Windows, if you choose to back up to locally attached RDX drives or USB flash drives, the **Name backup files using the archive name...** check box does not appear. Instead, make sure that the removable device mode (p. 200) is set to **Removable media**.

4.3.3.5 Example 5. Daily backups with weekly drive swaps

Consider the following scenario:

- You want to perform daily backups of your machine: a full backup each Monday and incremental backups on Tuesday through Sunday.
- You want to store the backups on a locally attached USB hard drive in the archive **MyMachine**.

 Copyright © Acronis International GmbH, 2002-2013.

- You have two such drives. You want to swap them each Monday so that one drive contains backups of the current week (Monday through Sunday), and the other drive those of the previous week.

In this scenario, you need to create two backup plans as follows:

a) When creating the first backup plan:
   - Specify **MyMachine** as the archive name.
   - In Windows, specify **D:** as the archive location, where **D** is the letter either of the drives has in the operating system when attached to the machine.

     In Linux, create a directory such as **/mnt/backup** and specify it as the archive location. Each time you attach a drive, make sure to mount it to the mount point **/mnt/backup**.
   - Select the **Name backup files using the archive name...** check box.
   - Select **Full** as the backup type.
   - Schedule the backups to run every week on Monday.

b) When creating the second backup plan, specify the same settings as in the first backup plan, but select **Incremental** as the backup type and schedule the backups to run every week on Tuesday through Sunday.

Result:

- Before creating a Monday backup (by the first backup plan), all backups will be deleted from the currently attached drive.
- While one drive is attached to the machine, you can keep the other drive off-site for extra data protection.

In Windows, if you choose to back up to locally attached RDX drives or USB flash drives, the **Name backup files using the archive name...** check box does not appear. Instead, make sure that the removable device mode (p. 200) is set to **Removable media**.

4.3.3.6 Example 6. Backups within working hours

Consider the following scenario:

- You want to back up your server's critical files every day.
- You want the first backup of each day to be full and to run at 01:00 AM.
- You want the backups during working hours to be differential and to run every hour from 8:00 AM through 5:00 PM.
- You want to include a creation date in the name of each backup file.

In this scenario, you need to create two backup plans as follows:

a) When creating the first backup plan, specify **ServerFiles[DATE]** as the archive name, select the **Name backup files using the archive name…** check box, select **Full** as the backup type, and schedule the backups to run every day at 01:00:00 AM.

b) When creating the second backup plan, specify the same settings as in the first backup plan, but select **Differential** as the backup type and schedule the backups as follows:
   - **Run the task**: **Daily**
   - **Every**: **1 Hour(s)**
   - **From**: **08:00:00 AM**
   - **Until**: **05:01:00 PM**

 Copyright © Acronis International GmbH, 2002-2013.

Result:

- The full backup of January 31, 2012, will be stored as ServerFiles[2012-01-31].tib.
- The 10 differential backups of January 31, 2012, will be stored as ServerFiles[2012-01-31]2.tib, ServerFiles[2012-01-31]3.tib, and so on up to ServerFiles[2012-01-31]11.tib.
- The following day, February 1, the backups will start with the full backup ServerFiles[2012-02-01].tib. The differential backups will start with ServerFiles[2012-02-01]2.tib.

See also “The [Date] variable” (p. 79).

4.4 Scheduling

Acronis scheduler helps the administrator adapt backup plans to the company’s daily routine and each employee’s work style. The plans’ tasks will be launched systematically keeping the critical data safely protected.

The scheduling is available when creating a backup plan (p. 55) with any of the following backup schemes: Simple, Custom or Tower of Hanoi. The schedule also can be set for validation tasks (p. 241).

The scheduler uses local time of the machine the backup plan exists on. Before creating a schedule, be sure the machine’s date and time settings are correct.

Schedule

To define when a task has to be executed, you need to specify an event or multiple events. The task will be launched as soon as any of the events occurs. The table below lists the events available under Windows and Linux operating systems.

Event	Windows	Linux
Time: Daily, Weekly, Monthly	+	+
Time passed since the last successful backup has completed (specify the length of time)	+	+
User logon (any user, current user, specify the user’s account)	+	-
User logoff* (any user, current user, specify the user’s account) *Shutting down is not the same as logging off. The task will not run at a system shutdown.	+	-
System startup	+	+
System shutdown	+	-
An event in Windows Event Log (specify the parameters of the event)	+	-

Condition

For backup operations only, you can specify a condition or multiple conditions in addition to the events. Once any of the events occurs, the scheduler checks the condition and runs the task if the condition is met. With multiple conditions, all of them must be met simultaneously to enable task

 Copyright © Acronis International GmbH, 2002-2013.

execution. The table below lists the conditions available under Windows and Linux operating systems.

Condition: run the task only if	Windows	Linux
User is idle (a screen saver is running or the machine is locked)	+	-
Location's host is available	+	+
The task run time is within the specified time interval	+	+
All users are logged off	+	-
The specified period of time has passed since the last successful backup completed	+	+

The scheduler behavior, in case the event occurs but the condition (or any of multiple conditions) is not met is defined by the Task start conditions (p. 130) backup option.

What-ifs

- **What if an event occurs (and a condition, if any, is met) while the previous task run has not completed?**

  The event will be ignored.
- **What if an event occurs while the scheduler is waiting for the condition required by the previous event?**

  The event will be ignored.
- **What if the condition is not met for a very long time?**

  If delaying a backup is getting risky, you can force the condition (tell the users to log off) or run the task manually. To automatically handle this situation, you can set the time interval after which the task will run regardless of the condition.

4.4.1 Daily schedule

Daily schedule is effective in Windows and Linux operating systems.

To specify a daily schedule

In the **Schedule** area, select the appropriate parameter as follows:

Every: <...> day(s)	Set up the certain number of days you want the task to be run. For example, if you set Every 2 day(s), the task will be started on every other day.

In the **During the day execute the task...** area, select one of the following:

Once at: <...>	Set up the time at which the task will be run once.
Every: <...> **From: <...> Until: <...>**	Set up how many times the task will be restarted during the specified time interval. For example, setting the task frequency to Every 1 hour From 10:00:00 AM until 10:00:00 PM allows the task to run 12 times: from 10 AM to 10 PM during one day.

In the **Effective...** area, set the following settings:

From: <...>	Set up a date when this schedule will be enabled (an effective date). If this check box is cleared, the task will be started on the nearest day and time you have specified above.
To: <...>	Set up a date when this schedule will be disabled. If this check box is cleared, the task will be run for an indefinite number of days.

 Copyright © Acronis International GmbH, 2002-2013.

Advanced scheduling settings (p. 92) are available only for machines registered on Acronis Backup & Recovery 11.5 Management Server. To specify these settings, click **Change** in the **Advanced settings** area.

All the settings you made are displayed in the **Result** field at the bottom of the window.

Examples

"Simple" daily schedule

Run the task every day at 6PM.

The schedule's parameters are thus set up as follows.

1. Every: **1** day(s).
2. Once at: **06:00:00 PM**.
3. Effective:

   From: **not set**. The task will be started on the current day, if it has been created before 6PM. If you have created the task after 6 PM, the task will be started for the first time on the next day at 6 PM.

   To: **not set**. The task will be performed for an indefinite number of days.

"Three-hour time interval lasting for three months" schedule

Run the task every three hours. The task starts on a certain date (say, September 15, 2009), and ends after three months.

The schedule's parameters are thus set up as follows.

1. Every: **1** day(s).
2. Every: **3** hours

   From: **12:00:00 AM** (midnight) Until: **09:00:00 PM** - thus, the task will be performed 8 times a day with a 3 hour time interval. After the last daily recurrence at 9 PM, the next day comes and the task starts over again from midnight.
3. Effective:

   From: **09/15/2009**. If September 15, 2009 is the current date of the task's creation and, say, 01:15 PM is the task's creation time, the task will be started when the nearest time interval comes: at 03:00 PM in our example.

   To: **12/15/2009**. On this date the task will be performed for the last time, but the task itself is still available in the **Tasks** view.

Several daily schedules for one task

There are some cases when you might need the task to be run several times a day, or even several times a day with different time intervals. For such cases, consider adding several schedules to a single task.

For example, suppose that the task has to be run every 3rd day, starting from 09/20/2009, five times a day:

- first at 8 AM
- second at 12 PM (noon)
- third at 3 PM
- fourth at 5 PM

 Copyright © Acronis International GmbH, 2002-2013.

- fifth at 7 PM

The obvious way is to add five simple schedules. If you spend one minute for examination, you can think out a more optimal way. As you can see, the time interval between the first and the second task's recurrences is 4 hours, and between the third, fourth and fifth is 2 hours. In this case, the optimal way is to add two schedules to the task.

First daily schedule

1. Every: **3** day(s).
2. Every: **4** hours.
   From: **08:00:00 AM** Until: **12:00:00 PM**.
3. Effective:
   From: **09/20/2009**.
   To: **not set**.

Second daily schedule

1. Every: **3** day(s).
2. Every: **2** hour(s).
   From: **03:00:00 PM** Until: **07:00:00 PM**.
3. Effective:
   From: **09/20/2009**.
   To: **not set**.

4.4.2 Weekly schedule

Weekly schedule is effective in Windows and Linux operating systems.

To specify a weekly schedule

In the **Schedule** area, select the appropriate parameter as follows:

Every: <...> week(s) on: <...>	Specify a certain number of weeks and the days of the week you want the task to be run. For example, with the Every **2** week(s) on **Mon** setting, the task will be performed on Monday of every other week.

In the **During the day execute the task...** area, select one of the following:

Once at: <...>	Set up the time at which the task will be run once.
Every: <...> **From: <...> Until: <...>**	Set up how many times the task will be run during the specified time interval. For example, setting the task frequency to Every **1** hour From **10:00:00 AM** until **10:00:00 PM** allows the task to be run 12 times from 10 AM to 10 PM during one day.

In the **Effective...** area, set the following settings:

From: <...>	Set up a date when this schedule will be enabled (an effective date). If this check box is cleared, the task will be started on the nearest day and time you have specified above.
To: <...>	Set up a date when this schedule will be disabled. If this check box is cleared, the task will be run for an indefinite number of weeks.

Copyright © Acronis International GmbH, 2002-2013.

Advanced scheduling settings (p. 92) are available only for machines registered on Acronis Backup & Recovery 11.5 Management Server. To specify these settings, click **Change** in the **Advanced settings** area.

All the settings you made are displayed in the **Result** field at the bottom of the window.

Examples

"One day in the week" schedule

Run the task every Friday at 10PM, starting from a certain date (say 05/14/2009) and ending after six months.

The schedule's parameters are thus set up as follows.

1. Every: **1** week(s) on: **Fri**.
2. Once at: **10:00:00 PM**.
3. Effective:

   From: **05/13/2009**. The task will be started on the nearest Friday at 10 PM.

   To: **11/13/2009**. The task will be performed for the last time on this date, but the task itself will still be available in the Tasks view after this date. (If this date were not a Friday, the task would be last performed on the last Friday preceding this date.)

This schedule is widely used when creating a custom backup scheme. The "One day in the week"-like schedule is added to the full backups, while the incremental backups are scheduled to be performed on workdays. For more details, see the Full and incremental backups plus cleanup example in the Custom backup scheme (p. 69) section.

"Workdays" schedule

Run the task every week on workdays: from Monday through Friday. During a workday, the task starts only once at 9 PM.

The schedule's parameters are thus set up as follows.

1. Every: **1** week(s) on: **<Workdays>** - selecting the <Workdays> check box automatically selects the corresponding check boxes (**Mon**, **Tue**, **Wed**, **Thu**, and **Fri**), and leaves the remaining ones unchanged.
2. Once at: **09:00:00 PM**.
3. Effective:

   From: **empty**. If you have created the task, say on Monday at 11:30 AM, the task will be started on the same day at 9 PM. If the task was created, say on Friday after 9 PM, then it will be started for the first time on the nearest workday (Monday in our example) at 9 PM.

   End date: **empty**. The task will be restarted for an indefinite number of weeks.

This schedule is widely used when creating a custom backup scheme. The "Workdays"-like schedule is added to the incremental backups, while the full backup is scheduled to be performed one day in the week. For more details, see the Full and incremental backups plus cleanup example in the Custom backup scheme (p. 69) section.

Several weekly schedules for one task

In the case when the task needs to be run on different days of the weeks with different time intervals, consider adding a dedicated schedule to every desired day of the week, or to several days.

 Copyright © Acronis International GmbH, 2002-2013.

For example, you need the task to be run with the following schedule:

- Monday: twice at 12 PM (noon) and 9 PM
- Tuesday: every 3 hours from 9 AM until 9 PM
- Wednesday: every 3 hours from 9 AM until 9 PM
- Thursday: every 3 hours from 9 AM until 9 PM
- Friday: twice at 12 PM and 9 PM (i.e. same as on Monday)
- Saturday: once at 9 PM
- Sunday: once at 9 PM

Combining the identical times, the following three schedules can be added to the task:

First schedule

1. Every: **1** week(s) on: **Mon**, **Fri**.
2. Every: **9** hours
   From: **12:00:00 PM** Until: **09:00:00 PM**.
3. Effective:
   From: **not set**.
   To: **not set**.

Second schedule

1. Every **1** week(s) on: **Tue**, **Wed**, **Thu**.
2. Every **3** hours
   From **09:00:00 AM** until **09:00:00 PM**.
3. Effective:
   From: **not set**.
   To: **not set**.

Third schedule

1. Every: **1** week(s) on: **Sat, Sun**.
2. Once at: **09:00:00 PM**.
3. Effective:
   From: **not set**.
   To: **not set**.

4.4.3 Monthly schedule

Monthly schedule is effective in Windows and Linux operating systems.

To specify a monthly schedule

In the **Schedule** area, select the appropriate parameter as follows:

Months: <...>	Select a certain month(s) you want to run the task in.
Days: <...>	Select specific days of the month to run the task on. You can also select the last day of the month, irrespective of its actual date.
On: <...> <...>	Select specific days of the weeks to run the task on.

Copyright © Acronis International GmbH, 2002-2013.

In the **During the day execute the task...** area, select one of the following:

Once at: <...>	Set up the time at which the task will be run once.
Every: <...> **From: <...> Until: <...>**	Set up how many times the task will be run during the specified time interval. For example, setting the task frequency to Every **1** hour From **10:00:00 AM** until **10:00:00 PM** allows the task to be run 12 times from 10 AM to 10 PM during one day.

In the **Effective...** area, set the following settings:

From: <...>	Set up a date when this schedule will be enabled (an effective date). If this check box is cleared, the task will be started on the nearest day and time you have specified above.
To: <...>	Set up a date when this schedule will be disabled. If this check box is cleared, the task will be run for an indefinite number of months.

Advanced scheduling settings (p. 92) are available only for machines registered on Acronis Backup & Recovery 11.5 Management Server. To specify these settings, click **Change** in the **Advanced settings** area.

All the settings you made are displayed in the **Result** field at the bottom of the window.

Examples

"Last day of every month" schedule

Run the task once at 10 PM on the last day of every month.

The schedule's parameters are set up as follows.

1. Months: **<All months>**.
2. Days: **Last**. The task will run on the last day of every month despite its actual date.
3. Once at: **10:00:00 PM**.
4. Effective:
   From: **empty**.
   To: **empty**.

This schedule is widely used when creating a custom backup scheme. The "Last day of every month" schedule is added to the full backups, while the differential backups are scheduled to be performed once a week and incremental on workdays. For more details, see the Monthly full, weekly differential, and daily incremental backups plus cleanup example in the Custom backup scheme (p. 69) section.

"Season" schedule

Run the task on all workdays during the northern autumn seasons of 2009 and 2010. During a workday, the task is performed every 6 hours from 12 AM (midnight) until 6 PM.

The schedule's parameters are set up as follows.

1. Months: **September, October, November**.
2. On: **<all> <workdays>**.
3. Every: **6** hours.
   From: **12:00:00 AM** Until: **06:00:00 PM**.

 Copyright © Acronis International GmbH, 2002-2013.

4. Effective:

   From: **08/30/2009**. Actually the task will be started on the first workday of September. By setting up this date we just define that the task must be started in 2009.

   To: **12/01/2010**. Actually the task will end on the last workday of November. By setting up this date we just define that the task must be discontinued in 2010, after autumn ends in the northern hemisphere.

Several monthly schedules for one task

In the case when the task needs to be run on different days or weeks with different time intervals depending on the month, consider adding a dedicated schedule to every desired month or several months.

Suppose that the task goes into effect on 11/01/2009.

- During northern winter, the task runs once at 10PM on every workday.
- During northern spring and autumn, the task runs every 12 hours on all workdays.
- During northern summer, the task runs every first and fifteenth of every month at 10 PM.

Thus, the following three schedules are added to the task.

First schedule

1. Months: **December**, **January**, **February**.
2. On: **<All> <All workdays>**
3. Once at: **10:00:00 PM**.
4. Effective:

   From: **11/01/2009**.

   To: **not set**.

Second schedule

1. Months: **March**, **April**, **May**, **September**, **October**, **November**.
2. On: **<All> <All workdays>**.
3. Every: **12 hours**

   From: **12:00:00 AM** Until: **12:00:00 PM**.
4. Effective:

   From: **11/01/2009**.

   To: **not set**.

Third schedule

1. Months: **June**, **July**, **August**.
2. Days: **1**, **15**.
3. Once at: **10:00:00 PM**.
4. Effective:

   From: **11/01/2009**.

   To: **not set**.

4.4.4 On Windows Event Log event

This type of schedule is effective only in Windows operating systems.

 Copyright © Acronis International GmbH, 2002-2013.

You can schedule a backup task to start when a certain Windows event has been recorded in one of the event logs such as the Application, Security, or System log.

For example, you may want to set up a backup plan that will automatically perform an emergency full backup of your data as soon as Windows discovers that your hard disk drive is about to fail.

Parameters

Log name

Specifies the name of the log. Select the name of a standard log (**Application**, **Security**, or **System**) from the list, or type a log name—for example: **Microsoft Office Sessions**

Event source

Specifies the event source, which typically indicates the program or the system component that caused the event—for example: **disk**

Event type

Specifies the event type: **Error**, **Warning**, **Information**, **Audit success**, or **Audit failure**.

Event ID

Specifies the event number, which typically identifies the particular kind of events among events from the same source.

For example, an **Error** event with Event source **disk** and Event ID **7** occurs when Windows discovers a bad block on a disk, whereas an **Error** event with Event source **disk** and Event ID **15** occurs when a disk is not ready for access yet.

Examples

"Bad block" emergency backup

One or more bad blocks that have suddenly appeared on a hard disk usually indicate that the hard disk drive will soon fail. Suppose that you want to create a backup plan that will back up hard disk data as soon as such a situation occurs.

When Windows detects a bad block on a hard disk, it records an event with the event source **disk** and the event number **7** into the **System** log; the type of this event is **Error**.

When creating the plan, type or select the following in the **Schedule** area:

- **Log name**: **System**
- **Event source**: **disk**
- **Event type**: **Error**
- **Event ID**: **7**

Important: *To ensure that such a task will complete despite the presence of bad blocks, you must make the task ignore bad blocks. To do this, in* ***Backup options****, go to* ***Error handling****, and then select the* ***Ignore bad sectors*** *check box.*

Pre-update backup in Vista

Suppose that you want to create a backup plan that will automatically perform a backup of the system—for example, by backing up the volume where Windows is installed—every time that Windows is about to install updates.

 Copyright © Acronis International GmbH, 2002-2013.

Having downloaded one or more updates and scheduled their installation, the Microsoft Windows Vista operating system records an event with the event source **Microsoft-Windows-WindowsUpdateClient** and event number **18** into the **System** log; the type of this event is **Information**.

When creating the plan, type or select the following in the **Schedule** area:

- **Log name**: **System**
- **Event source**: **Microsoft-Windows-WindowsUpdateClient**
- **Event type**: **Information**
- **Event ID**: **18**

Tip: *To set up a similar backup plan for machines running Microsoft Windows XP, replace the text in* ***Event source*** *with* ***Windows Update Agent*** *and leave the remaining fields the same.*

How to view events in Event Viewer

To open a log in Event Viewer

1. On the Desktop or in the **Start** menu, right-click **My Computer**, and then click **Manage**.
2. In the **Computer Management** console, expand **System Tools**, and then expand **Event Viewer**.
3. In **Event Viewer**, click the name of a log that you want to view—for example, **Application**.

   Note: *To be able to open the security log (****Security****), you must be a member of the Administrators group.*

To view properties of an event, including the event source and event number

1. In **Event Viewer**, click the name of a log that you want to view—for example, **Application**.

   Note: *To be able to open the security log (****Security****), you must be a member of the Administrators group.*

2. In the list of events in the right pane, double-click the name of an event whose properties you want to view.
3. In the **Event Properties** dialog box, view the event's properties such as the event source, shown in the **Source** field; and the event number, shown in the **Event ID** field.

When you are finished, click **OK** to close the **Event Properties** dialog box.

4.4.5 Advanced scheduling settings

The following advanced settings are available when setting up a daily, weekly, or monthly schedule in a centralized backup plan.

Use Wake-on-LAN

When this setting is enabled, Acronis Backup & Recovery 11.5 Management Server will use the Wake-on-LAN functionality to wake up turned-off registered machines when a backup, cleanup or validation is scheduled to start. If the backup task on each machine starts with a delay (see the next setting), the management server will wake up the machines according to those delays.

Before using this setting, make sure that you have enabled Wake-on-LAN on the registered machines. The machine's basic input/output system (BIOS) configuration, network adapter configuration, and the operating system configuration must allow waking up the machine from the powered-off state, also known as the S5 or G2 power state.

Copyright © Acronis International GmbH, 2002-2013.

Distribute start time within the time window

When this setting is enabled, the backup task on each registered machine will start with a specific delay from the start time set in the backup plan. This distributes the tasks' actual start times within a time interval.

You may want to use this setting when creating a centralized backup plan for backing up multiple machines to a network location, to avoid excessive network load.

The delay values range from zero to the specified maximum delay value, and are determined according to the chosen distribution method. The delay value for each machine is determined when the backup plan is deployed to the machine, and remains the same until you edit the backup plan and change the maximum delay value.

The conditions, if any, will be checked at the task's actual start time on each machine.

Regardless of the maximum delay value, all start times stay within the same date. For example, if your backup plan starts at 23:00 and the maximum delay value is two hours, the start times of all tasks will lie between 23:00 and 23:59 only. The tasks may finish after midnight, as usual.

The following examples illustrate this setting.

Example 1

Suppose that you are deploying a centralized backup plan with the following schedule to three machines:

Run the task: **Daily**
Once at: **09:00:00 AM**

Distribute start time within the time window
Maximum delay: **1 Hour(s)**
Distribution method: **Random**

In this case, the task's start time on each machine may be any time between 09:00:00 AM and 09:59:59 AM. For instance:

First machine: Every day at 09:30:03 AM

Second machine: Every day at 09:00:00 AM

Third machine: Every day at 09:59:59 AM

Example 2

Suppose that you are deploying a centralized backup plan with the following schedule to three machines:

Run the task: **Daily**
Every: **2 Hour(s)** From: **09:00:00 AM** Until: **11:00:00 AM**

Distribute start time within the time window
Maximum delay: **1 Hour(s)**
Distribution method: **Random**

In this case, the time of the task's first run on each machine may be any time between 09:00:00 AM and 09:59:59 AM; the interval between the first and the second run is exactly two hours. For instance:

First machine: Every day at 09:30:03 AM and at 11:30:03 AM

Second machine: Every day at 09:00:00 AM and at 11:00:00 AM

Third machine: Every day at 09:59:59 AM and at 11:59:59 AM

 Copyright © Acronis International GmbH, 2002-2013.

To specify advanced settings

1. Connect to the management server and then start creating a backup plan.
2. In **How to back up**, select the **Simple**, **GFS (Grandfather-Father-Son)**, **Tower of Hanoi**, or **Custom** backup scheme.
3. Depending on the backup scheme, do one of the following:
   - For the **GFS (Grandfather-Father-Son)** backup scheme, click **Advanced settings**.
   - For the **Simple**, **Tower of Hanoi**, or **Custom** backup scheme:
   a. Click **Schedule** to specify a schedule for the scheme.
   b. Under **Run the task**, select **Daily**, **Weekly**, or **Monthly**.
   c. In the **Advanced settings** area, click **Change**.
4. To enable the use of the Wake-on-LAN functionality, select the **Use Wake-on-LAN** check box.
5. To distribute the centralized backup tasks' start times, select the **Distribute start time within the time window** check box and then specify the maximum delay value and the distribution method.

4.4.6 Conditions

Conditions add more flexibility to the scheduler, enabling to execute backup tasks with respect to certain conditions. Once a specified event occurs (see the "Scheduling (p. 83)" section for the list of available events), the scheduler checks the specified condition and executes the task if the condition is met.

Conditions are available only when the custom backup scheme (p. 69) is used. You can set conditions for full, incremental and differential backup separately.

The scheduler behavior in case the event occurs but the condition (or any of multiple conditions) is not met, is defined by the **Task start conditions** (p. 130) backup option. There, you can specify how important the conditions are for the backup strategy:

- conditions are obligatory - put the backup task run on hold until all the conditions are met.
- conditions are preferable, but a backup task run has higher priority - put the task on hold for the specified time interval. If the time interval lapses and the conditions are still not met, run the task anyway. With this setting, the program will automatically handle the situation when the conditions are not met for too long and further delaying the backup is undesirable.
- backup task start time matters - skip the backup task if the conditions are not met at the time when the task should be started. Skipping the task run makes sense when you need to back up data strictly at the specified time, especially if the events are relatively often.

Adding multiple conditions

If two or more conditions are specified, the backup will start only when all of them are met.

4.4.6.1 User is idle

Applies to: Windows

"User is idle" means that a screen saver is running on the managed machine or the machine is locked.

Example:

Run the backup task on the managed machine every day at 9PM, preferably when the user is idle. If the user is still active by 11PM, run the task anyway.

 Copyright © Acronis International GmbH, 2002-2013.

- Event: **Daily**, every **1** day(s); Once at: **09:00:00 PM**.
- Condition: **User is idle**.
- Task start conditions: **Wait until the conditions are met**, Run the task anyway after **2** hour(s).

As a result,

(1) If the user becomes idle before 9PM, the backup task will start at 9PM.

(2) If the user becomes idle between 9PM and 11PM, the backup task will start immediately after the user becomes idle.

(3) If the user is still active at 11PM, the backup task starts anyway.

4.4.6.2 Location's host is available

Applies to: Windows, Linux

"Location's host is available" means that the machine hosting the destination for storing archives on a networked drive is available.

Example:

Backing up data to the networked location is performed on workdays at 9:00 PM. If the location's host is not available at that moment (for instance, due to maintenance work), skip the backup and wait for the next workday to start the task. It is assumed that the backup task should not be started at all rather than failed.

- Event: **Weekly**, Every **1** week(s) on **<workdays>**; Once at **09:00:00 PM**.
- Condition: **Location's host is available**
- Task start conditions: **Skip the task execution**.

As a result,

(1) If 9:00 PM comes and the location's host is available, the backup task starts right on time.

(2) If 9:00 PM comes but the host is unavailable at the moment, the backup task will start on the next workday if the location's host is available.

(3) If the location's host will never be available on workdays at 9:00 PM, the task never starts.

4.4.6.3 Fits the time interval

Applies to: Windows, Linux

Restricts a backup task's start time to a specified interval.

Example

A company uses different locations on the same network-attached storage for backing up users data and servers. The workday starts at 8AM and ends at 5 PM. Users' data should be backed up as soon as the users log off, but not earlier than 4:30 PM and not later than 10 PM. Every day at 11 PM the company's servers are backed up. So, all the users' data should be preferably backed up before this time, in order to free network bandwidth. By specifying the upper limit as 10 PM, it is supposed that the backing up of users' data does not take more than one hour. If a user is still logged on within the

 Copyright © Acronis International GmbH, 2002-2013.

specified time interval, or logs off at any other time – do not back up the users' data, i.e. skip task execution.

- Event: **When logging off**, The following user: **Any user**.
- Condition: **Fits the time interval**, from **04:30:00 PM** until **10:00:00 PM**.
- Task start conditions: **Skip the task execution**.

As a result,

(1) if the user logs off between 04:30:00 PM and 10:00:00 PM, the backup task will start immediately following the logging off.

(2) if the user logs off at any other time, the task will be skipped.

What if...

What if a task is scheduled to be executed at a certain time and this time is outside the specified time interval?

For example:

- Event: **Daily**, Every **1** day(s); Once at **03:00:00 PM**.
- Condition: **Fits the time interval**, from **06:00:00 PM** until **11:59:59 PM**.

In this case, whether and when the task will run depends on the task start conditions:

- If the task start conditions are **Skip the task execution**, the task will never run.
- If the task start conditions are **Wait until the conditions are met** and the **Run the task anyway after** check box is *cleared*, the task (scheduled to run at 3:00 PM) will start at 6:00 PM—the time when the condition is met.
- If the task start conditions are **Wait until the conditions are met** and the **Run the task anyway after** check box is *selected* with, say, the **1 Hour** waiting time, the task (scheduled to run at 3:00 PM) will start at 4:00 PM—the time when the waiting period ends.

4.4.6.4 Users logged off

Applies to: Windows

Enables to put a backup task run on hold until all users log off from Windows on the managed machine.

Example

Run the backup task at 8 PM on the first and third Friday of every month, preferably when all users are logged off. If one of the users is still logged on at 11 PM, run the task anyway.

- Event: **Monthly**, Months: **<All>**; On: **<First>**, **<Third> <Friday>**; Once at **08:00:00 PM**.
- Condition: **Users logged off**.
- Task start conditions: **Wait until the conditions are met**, **Run the task anyway after 3** hour(s).

As a result,

(1) If all users are logged off at 8PM, the backup task will start at 8PM.

(2) If the last user logs off between 8PM and 11PM, the backup task will start immediately after the user has logged off.

 Copyright © Acronis International GmbH, 2002-2013.

(3) If any of the users is still logged on at 11PM, the backup task starts anyway.

4.4.6.5 Time since last backup

Applies to: Windows, Linux

Enables to put a backup task run on hold until the specified time interval since the last successful backup completion passes.

Example:

Run the backup task at system startup, but only if more than 12 hours have passed since the last successful backup.

- Event: **At startup**, Start the task on machine startup.
- Condition: **Time since last backup**, Time since the last backup: **12** hour(s).
- Task start conditions: **Wait until the conditions are met**.

As a result,

(1) if the machine is restarted before 12 hours pass since the completion of the latest successful backup, the scheduler will wait until 12 hours pass, and then will start the task.

(2) if the machine is restarted after 12 hours have passed since the completion of the latest successful backup, the backup task will start immediately.

(3) if the machine is never restarted, the task will never start. You can start the backup manually, if need be, in the **Backup plans and tasks** view.

4.5 Replication and retention of backups

When creating a backup plan (p. 55), you specify the primary location for the backups. In addition, you can do the following:

- Replicate (copy) each backup to a second location immediately after creation.
- Retain the backups according to the retention rules you specify, and then either move them to a second location or delete them.

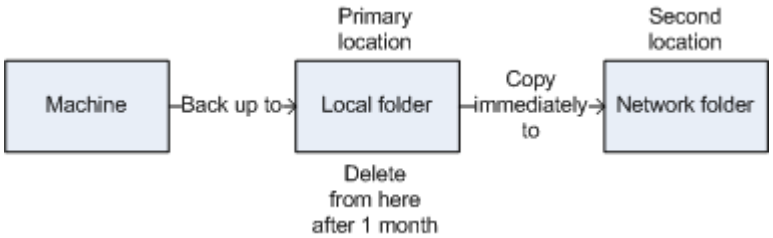
Similarly, you can copy or move backups from a second location to a third location and so on. Up to five consecutive locations are supported (including the primary one).

Note: *The replication feature replaces and enhances the* ***Dual destination*** *option, which was available in Acronis Backup & Recovery 10.*

Example. You back up your machine to a local folder. The backup is immediately copied to a network folder. In the original local folder, the backup is stored for just one month.

Copyright © Acronis International GmbH, 2002-2013.

The following picture illustrates this example.



Usage scenarios

- **Reliable disaster recovery** (p. 103)

  Store your backups both on-site (for immediate recovery) and off-site (to secure the backups from local storage failure or a natural disaster).
- **Keeping only the latest recovery points** (p. 103)

  Delete older backups from a fast storage according to retention rules, in order to not overuse expensive storage space.
- **Using Acronis cloud to protect data from a natural disaster** (p. 104)

  Replicate the archive to the online storage by transferring only the data changes outside working hours.
- **Reduced costs of storing the backed-up data** (p. 105)

  Store your backups on a fast storage for as long as a need to access them is likely. Then, move them to a lower-cost storage to keep them there for a longer term. This enables you to meet legal requirements on data retention.
- **Backup to a slow device within a narrow backup window** (p. 105)

  Back up overnight to a managed vault on a fast storage, and then let Acronis Backup & Recovery 11.5 Storage Node move the backups to tapes during the day.

Replication and retention in backup schemes

The following table shows availability of replication and retention rules in various backup schemes.

Backup scheme	Can copy backups	Can move backups	Can delete backups
Manual start (p. 74)	Yes	No	No
Simple (p. 65)	Yes	Yes	Yes
Grandfather-Father-Son (GFS) (p. 66)	Yes	No	Yes
Tower of Hanoi (p. 72)	Yes	No	Yes
Custom (p. 69)	Yes	Yes	Yes
Initial seeding (p. 74)	No	No	No

Notes:

- Setting up both copying and moving backups from the same location is not possible.
- With simplified naming of backup files (p. 78), neither replication nor use of retention rules is available.

Copyright © Acronis International GmbH, 2002-2013.

4.5.1 Supported locations

You can copy or move a backup *from* any of these locations:

- A local folder on a fixed drive
- A network folder
- An FTP or SFTP server
- Acronis Backup & Recovery 11.5 Storage Node
- Acronis Secure Zone

You can copy or move a backup *to* any of these locations:

- A local folder on a fixed drive
- A network folder
- An FTP or SFTP server
- Acronis Backup & Recovery 11.5 Storage Node
- A tape device
- Acronis Online Backup Storage
- A removable device (p. 200) used in the **Fixed drive** mode. (You select the removable device mode when creating a backup plan.)

Backups that were copied or moved to the next location do not depend on the backups remaining in the original location and vice versa. You can recover data from any backup without access to other locations.

Restrictions

- Copying or moving backups *to and from* optical discs (CD, DVD, Blu-ray discs) is not supported.
- Copying or moving backups *to and from* removable devices used in the **Removable media** mode is not supported.
- Copying or moving backups *from* Acronis Backup & Recovery 11.5 Storage Node *to* a local folder is not supported. A local folder means a folder on the machine with the agent that created the backup.
- A tape device and Acronis Online Backup Storage can only be the final locations. Further copying or moving backups *from* them is not possible.
- You cannot specify the same location more than once. For example, you cannot move a backup from one folder to another and then back to the original folder.

Which machine performs the operation?

Copying, moving or deleting a backup *from* any location is initiated by the agent that created the backup, and is performed:

- By that agent, if the location *is not* a managed vault.
- By the corresponding storage node, if the location *is* a managed vault. However, copying or moving the backup *from* the managed vault *to* the online storage is performed by the agent that created the backup.

As follows from the above description, the operation will be performed only if the machine with the agent is powered on. If the operation is scheduled, the schedule will use that machine's date and time.

Copyright © Acronis International GmbH, 2002-2013.

Copying and moving backups between managed vaults

Copying or moving a backup from one managed vault to another managed vault is performed by the storage node.

If the target vault is a deduplicating vault (p. 447) (possibly on a different storage node), the source storage node sends only those blocks of data that are not present in the target vault. In other words, like an agent, the storage node performs deduplication at source (p. 235). This saves network traffic when you replicate data between geographically separated storage nodes.

4.5.2 Setting up replication of backups

Setting up replication of backups is available when creating a backup plan (p. 55).

- To set up replication from the primary location, select the **Replicate newly created backup to another location** check box.
- To set up replication from the second or a further location, select the **Replicate backups to another location as soon as they appear in this location** check box.

Next, select the location where to replicate the backups.

If allowed by the backup scheme, you can also specify when to automatically delete the backups from each of the locations.

A backup is replicated to the next location as soon as it appears in the previous location. If earlier backups were not replicated (for example, the network connection was lost), the software also replicates all of the backups that appeared after the last successful replication.

4.5.3 Setting up retention of backups

You can set retention rules for backups when creating a backup plan (p. 55). The available retention rules depend on the chosen backup scheme.

Applying retention rules can be restricted by the **Replication/cleanup inactivity time** (p. 103) option.

Simple scheme

Each backup is retained until its age exceeds a limit you specify. Then, it is either deleted or moved.

To set up deleting the backups:

- In **Retention rules**, select **Delete backups older than…**, and then specify the retention period.

To set up moving the backups:

- In **Retention rules**, select **Move backups older than…**, specify the retention period. Under **Where to replicate/move backups**, specify the location.

The retention rules are applied after creating a backup. For the second and next locations, creating a backup means copying or moving a backup there from the previous location.

Grandfather-Father-Son (GFS) scheme

Backups of each type (daily, weekly, and monthly) are retained for the periods you specify in **Keep backups**, and then deleted.

 Copyright © Acronis International GmbH, 2002-2013.

The retention rules are applied after creating a backup. They are applied sequentially in the primary, the second and all next locations.

Tower of Hanoi scheme

Each backup is retained based on its level (p. 72), and then deleted. You specify the number of levels in **Number of levels**.

The retention rules are applied after creating a backup. They are applied sequentially in the primary, the second and all next locations.

Custom scheme

Each backup is retained until the rules you specify are met. Then, it is either deleted or moved.

To set up deleting the backups:

- In **Clean up archive**, select **Using retention rules**. In the **Retention Rules** window (p. 101), specify the rules and select **If the specified conditions are met: Delete the oldest backups**.
- In **Apply retention rules**, specify when to apply the rules.

To set up moving the backups:

- In **Clean up archive**, select **Using retention rules**. In the **Retention Rules** window (p. 101), specify the rules and select **If the specified conditions are met: Move the oldest backups to another location**. Click **OK** and then specify the location under **Where to replicate/move backups**.
- In **Apply retention rules**, specify when to apply the rules.

You can choose to apply the retention rules before creating a backup, after creating a backup, on a schedule, or combine these options. For the second and next locations, creating a backup means copying or moving a backup there from the previous location.

4.5.4 Retention rules for the Custom scheme

In the **Retention Rules** window, you can select how long to store backups in the location and whether to move or delete them afterward.

The rules will be applied to all the backups taken on the *specific machine* and put in this *specific location* by this *specific backup plan*. In Acronis Backup & Recovery 11.5, such set of backups is called *an archive*.

To set up retention rules for backups:

1. Specify one of the following (options (a) and (b) are mutually exclusive):
   a. **Backups older than...** and/or **Archive size greater than...**.

      A backup will be stored until the specified condition (or both of the conditions) are met.

      Note: In a deduplicating vault (p. 447), the **Archive size greater than** condition has little effect on storage space consumption. This is because almost all backed-up data is stored in a data store outside the archive.

      Example:

      Backups older than 5 days

      Archive size greater than 100 GB

      With these settings, a backup will be stored until it is older than five days *and* the size of the archive containing it exceeds 100 GB.

 Copyright © Acronis International GmbH, 2002-2013.

b. **Number of backups in the archive exceeds...**

If the number of backups exceeds the specified value, one or more of the oldest backups will be moved or deleted. The minimal setting is 1.

2. Select whether to delete the backups or to move them to another location if the specified conditions are met.

   You will be able to specify the location where to move the backups and set up retention rules for that location after you click **OK**.

Deleting the last backup in the archive

The retention rules are effective if the archive contains more than one backup. This means that the last backup in the archive will be kept, even if a retention rule violation is detected. Please do not try to delete the only backup you have by applying the retention rules *before* backup. This will not work. Use the alternative setting **Clean up archive** > **When there is insufficient space while backing up** (p. 69) if you accept the risk of losing the last backup.

Deleting or moving backups with dependencies

To access this setting, click **Show advanced settings** in the **Retention Rules** window.

Retention rules presume deleting or moving some backups while retaining the others. What if the archive contains incremental and differential backups that depend on each other and on the full backups they are based on? You cannot, say, delete an outdated full backup and keep its incremental "children".

When deletion or movement of a backup affects other backups, one of the following rules is applied:

- **Retain the backup until all dependent backups become subject to deletion (movement)**

  The outdated backup (marked with the icon) will be kept until all backups that depend on it also become outdated. Then, all the chain will be deleted at once during the regular cleanup. If you chose moving outdated backups to the next location, the backup will be copied there without delay. Only its deletion from the current location is postponed.

  This mode helps to avoid the potentially time-consuming consolidation but requires extra space for storing backups whose deletion is postponed. The archive size and/or the backup age or number can exceed the values you specify.

  This mode is not available for Acronis Online Backup Storage when you copy or move backups there. In the online storage, all backups are incremental except the first backup of an archive which is always full. This chain cannot be entirely deleted because the most recent backup must always be kept.

- **Consolidate these backups**

  The software will consolidate the backup that is subject to deletion or movement, with the next dependent backup. For example, the retention rules require to delete a full backup but to retain the next incremental one. The backups will be combined into a single full backup which will be dated with the incremental backup date. When an incremental or differential backup from the middle of the chain is deleted, the resulting backup type will be incremental.

  This mode ensures that after each cleanup the archive size and the age or number of backups are within the bounds you specify. The consolidation, however, may take a lot of time and system resources. You still need some extra space in the vault for temporary files created during consolidation.

  This mode is not available if you selected the **Archive size greater than** rule for any archive location except for Acronis Online Backup Storage.

 Copyright © Acronis International GmbH, 2002-2013.

What you need to know about consolidation

Please be aware that consolidation is just a method of deletion but not an alternative to deletion. The resulting backup will not contain data that was present in the deleted backup and was absent from the retained incremental or differential backup.

4.5.5 Replication/cleanup inactivity time

This option is effective only if you set up replication or retention rules (p. 97) for the backups.

This option defines a time period when starting replication or applying retention rules is not allowed. The operations will be performed when the inactivity time ends, if the machine is powered on at that moment. The operations that had started before the inactivity time began continue without interruption.

The inactivity time affects all locations, including the primary one.

The preset is: **Disabled.**

To specify the inactivity time, select the **Do not start replication/cleanup within the following time** check box, and then select the days and the time period during the day.

Usage example

You may want to use this option to separate the backup process from replication or cleanup. For example, suppose that you back up machines locally during the day and replicate the backups to a network folder. Make the inactivity time contain the working hours. Replication will be performed after the working hours, when network load is lower.

4.5.6 Usage examples

This section provides examples of how you can replicate backups and set up retention rules for them.

4.5.6.1 Example 1. Replicating backups to a network folder

Consider the following scenario:

- You want to perform a full backup of your machine manually.
- You want to store the backups in Acronis Secure Zone (p. 196) on the machine.
- You want to store a copy of the backups in a network folder.

In this scenario, create a backup plan with the **Manual start** scheme. When creating the backup plan, specify Acronis Secure Zone in the **Location** field, select **Full** in the **Backup type** field, select the **Replicate newly created backup to another location** check box, and then specify the network folder in the **2nd location** field.

Result:

- You can recover the machine's volumes or files from a readily available local backup, which is stored in a dedicated area of the hard disk.
- You can recover the machine from the network folder if the machine's hard disk drive fails.

4.5.6.2 Example 2. Limiting the age and total size of stored backups

Consider the following scenario:

 Copyright © Acronis International GmbH, 2002-2013.

- You want to perform a weekly full backup of your machine.
- You want to keep all backups that are younger than a month.
- You want to keep even older backups, as long as the total size of all backups stays below 200 GB.

In this scenario, create a backup plan with the **Custom** scheme. When creating the backup plan, specify a weekly schedule for the full backup. In **Clean up archive**, select **Using retention rules**.

Click **Retention rules**, select the **Backups older than** and the **Archive size greater than** check boxes, and specify respectively **1 month** and **200 GB**. In **If the specified conditions are met**, select **Delete the oldest backups**.

Click **OK**. In **Apply retention rules**, select the **After backup** check box.

Result:

- Backups that are younger than one month are kept, regardless of their total size.
- Backups that are older than one month are kept only if the total size of all backups (older plus younger) does not exceed 200 GB. Otherwise, the software deletes some or all of the older backups, starting from the oldest one.

4.5.6.3 Example 3. Replicating backups to the online storage

This example assumes that you have activated (p. 435) an online backup subscription (p. 420) for the machine that you are backing up.

The following scenario assumes that the amount of data you want to back up is relatively small. For larger backups, see “Replicating large amounts of data to the online storage” later in this section.

Consider the following scenario:

- You want to occasionally back up your machine to a local folder.
- You want to keep a copy of the resulting archive off-site in Acronis Online Backup Storage.
- No matter when you start the backup, you want the replication to take place outside working hours, when demand on the Internet connection is lower.

In this scenario, create a backup plan with the desired backup scheme. When creating the backup plan, specify a local folder in the **Location** field. Select the **Replicate newly created backup to another location** check box, and then specify the online storage in the **2nd location** field.

In **Backup options**, go to **Replication/cleanup inactivity time** (p. 103), and specify the working hours (for example, Monday through Friday from 8:00 until 17:00).

Result:

- After the backup plan starts, the data is backed up to the local folder.
- If the backup finishes outside the working hours, replication starts immediately. Otherwise, replication is postponed until the end of the working hours.

Note: *In the online storage, the second and further backups of an archive will always be incremental, no matter what type they are in the original location. This leads to efficient use of storage space for your online backup subscription.*

 Copyright © Acronis International GmbH, 2002-2013.

Replicating large amounts of data to the online storage

If you are planning to back up 100 GB of data or more, you may want to send the first backup to the online storage on a physical hard drive. This option is provided by the Initial Seeding service (p. 424) which you can buy in addition to your online backup subscription.

The Initial Seeding service might be unavailable in your region. To find more information, click here: http://kb.acronis.com/content/15118.

During the subsequent backups, only changes to the original data will be sent to the online storage and will not affect network traffic as much.

In this scenario, create a backup plan with the **Initial seeding** scheme. When creating the backup plan, specify a local folder in the **Location** field. This can be a folder on the hard drive that you are going to send. For more details, see “How to perform initial seeding?” (p. 425).

After you have sent the hard drive and the order status becomes **The data upload has been completed**, edit the backup plan. Change the backup scheme, destination, and replication settings to those previously described in this section.

The updated backup plan will produce backups that will be replicated to the online storage outside working hours.

4.5.6.4 Example 4. Moving older backups to tapes

Consider the following scenario:

- You want to perform a daily backup of your machine.
- You want to store the backups locally for one week.
- You want to move the backups that are older than one week to a tape device.

Such scenario is sometimes called disk staging, or D2D2T (disk-to-disk-to-tape).

In this scenario, create a backup plan with the **Simple** scheme and a daily schedule. (All backups will be full by default.) When creating the backup plan, specify a local folder or Acronis Secure Zone in the **Location** field. Under **Retention rules**, select **Move backups older than 1 week**. Then, specify the tape device in the **2nd location** field.

Make sure that the tape device is ready to work. The preparation steps are described in the "Backing up a machine to a directly attached tape device" (p. 206) section.

Result:

- After a backup is completed, the agent checks for backups that need to be moved.
- The agent moves the backups that are older than one week, by copying them to the tape device and then deleting them from the original location.
- You can eject tapes with backups and securely store them off-site. Once you select data for recovery, Acronis Backup & Recovery 11.5 will prompt you which tapes to insert.

4.5.6.5 Example 5. Backing up to tapes within a narrow backup window

This example assumes that you are using an advanced edition of Acronis Backup & Recovery 11.5.

Consider the following scenario:

- You want to back up servers every workday after working hours.

 Copyright © Acronis International GmbH, 2002-2013.

- You want to do a monthly full backup on one of the workdays, and partial (incremental or differential) backups on the other workdays.
- You want to store the backups on a tape library.
- The backup window for the servers is narrow, so they cannot be backed up to the tapes directly.

In this scenario, install Acronis Backup & Recovery 11.5 Storage Node and create two managed vaults: one on a hard disk local to the storage node, and another on the tape library locally attached to it.

Create a centralized backup plan for all of the machines with the **Grandfather-Father-Son (GFS)** scheme. When creating the backup plan, specify the vault on the hard disk in the **Location** field. Under **Backup type**, select **Full/Incremental/Differential**.

For the primary location, in **Keep backups**, choose to keep monthly backups for one month (you need to clear the **Keep indefinitely** check box). This way, the vault will serve as an intermediate, short-term storage for the backups.

Select the **Replicate newly created backup to another location** check box, and then specify the vault on the tape library in the **2nd location** field. For the second location, select to keep monthly backups indefinitely.

Result:

- Agents back up their machines to the vault on the hard disk.
- The storage node copies the backups to the tape device. No CPU resource from the machines is taken.
- The lifetime of backups on the hard disk does not exceed one month. On the tape library, the monthly backups are kept indefinitely.

4.6 How to disable backup cataloging

Cataloging a backup adds the contents of the backup to the data catalog as soon as the backup is created. This process can be time-consuming, especially in environments with a large amount of machines. Therefore, you may want to disable cataloging in the entire environment.

To disable backup cataloging

These steps can be performed in any order.

1. Modify the Windows registry on the management server.
2. Modify the Windows registry on storage nodes.
3. [On managed machines in an Active Directory domain] Load Acronis Administrative Template (p. 404) on the domain controller and configure the **Cataloging** setting in the **Acronis Backup & Recovery 11.5 Agent for Windows** (p. 409) category of the template.
4. [On managed machines not included in an Active Directory domain] Connect the console to each machine, go to **Options** > **Machine options**, and configure the **Backup cataloging** option.

4.7 Default backup options

Each Acronis agent has its own default backup options. Once an agent is installed, the default options have pre-defined values, which are referred to as **presets** in the documentation. When creating a backup plan, you can either use a default option, or override the default option with the custom value that will be specific for this plan only.

 Copyright © Acronis International GmbH, 2002-2013.

You can also customize a default option itself by changing its value against the pre-defined one. The new value will be used by default in all backup plans you will create later on this machine.

To view and change the default backup options, connect the console to the managed machine and then select **Options** > **Default backup and recovery options** > **Default backup options** from the top menu.

Availability of the backup options

The set of available backup options depends on:

- The environment the agent operates in (Windows, Linux, bootable media).
- The type of the data being backed up (disk, file).
- The backup destination (networked location or local disk).
- The backup scheme (manual start or using the scheduler).

The following table summarizes the availability of the backup options.

	Agent for Windows		**Agent for Linux**		**Bootable media (Linux-based or PE-based)**	
	Disk backup	**File backup**	**Disk backup**	**File backup**	**Disk backup**	**File backup**
Additional settings (p. 109):						
Ask for the first media while backing up to removable media	Dest: removable media	Dest: removable media	Dest: removable media	Dest: removable media	Dest: removable media	Dest: removable media
Deduplicate backup only after transferring it to the vault	Dest: dedup. vault	Dest: dedup. vault	Dest: dedup. vault	Dest: dedup. vault	Dest: dedup. vault	Dest: dedup. vault
Reset archive bit	-	+	-	-	-	+
Restart the machine automatically after backup is finished	-	-	-	-	+	+
Archive protection (p. 110) (password + encryption)	+	+	+	+	+	+
Backup cataloging (p. 111)	+	+	+	+	-	-
Backup performance:						
Backup priority (p. 112)	+	+	+	+	-	-
HDD writing speed (p. 112)	Dest: HDD	Dest: HDD	Dest: HDD	Dest: HDD	Dest: HDD	Dest: HDD
Network connection speed (p. 113)	Dest: network share	Dest: network share	Dest: network share	Dest: network share	Dest: network share	Dest: network share
Backup splitting (p. 113)	+	+	+	+	+	+
Compression level (p. 114)	+	+	+	+	+	+

Copyright © Acronis International GmbH, 2002-2013.

	Agent for Windows		Agent for Linux		Bootable media (Linux-based or PE-based)	
	Disk backup	**File backup**	**Disk backup**	**File backup**	**Disk backup**	**File backup**
Disaster recovery plan (p. 114)	+	+	+	+	-	-
Error handling (p. 115):						
Do not show messages and dialogs while processing (silent mode)	+	+	+	+	+	+
Re-attempt if an error occurs	+	+	+	+	+	+
Ignore bad sectors	+	+	+	+	+	+
Event tracing:						
Windows events log (p. 117)	+	+	-	-	-	-
SNMP (p. 116)	+	+	+	+	-	-
Fast incremental/differential backup (p. 117)	+	-	+	-	+	-
File-level backup snapshot (p. 118)	-	+	-	+	-	-
File-level security (p. 118):						
Preserve files' security settings in archives	-	+	-	-	-	-
In archives, store encrypted files in decrypted state	-	+	-	-	-	-
LVM snapshotting (p. 119)	-	-	+	-	-	-
Media components (p. 120)	Dest: removable media	Dest: removable media	Dest: removable media	Dest: removable media	-	-
Mount points (p. 121)	-	+	-	-	-	-
Multi-volume snapshot (p. 122)	+	+	-	-	-	-
Notifications:						
E-mail (p. 122)	+	+	+	+	-	-
Win Pop-up (p. 123)	+	+	+	+	-	-
Pre/Post backup commands (p. 124)	+	+	+	+	PE only	PE only
Pre/Post data capture commands (p. 125)	+	+	+	+	-	-
Replication/cleanup inactivity time (p. 103)	+	+	+	+	-	-

Copyright © Acronis International GmbH, 2002-2013.

	Agent for Windows		Agent for Linux		Bootable media (Linux-based or PE-based)	
	Disk backup	**File backup**	**Disk backup**	**File backup**	**Disk backup**	**File backup**
Sector-by-sector backup (p. 128)	+	-	+	-	+	-
Tape management (p. 128)	Dest: tape	Dest: tape	Dest: tape	Dest: tape	Dest: tape	Dest: tape
Task failure handling (p. 130)	+	+	+	+	-	-
Task start conditions (p. 130)	+	+	+	+	-	-
Volume Shadow Copy Service (p. 131)	+	+	-	-	-	-

4.7.1 Additional settings

Specify the additional settings for the backup operation by selecting or clearing the following check boxes.

Ask for the first media while backing up to removable media

This option is effective only when backing up to removable media.

The option defines whether to display the **Insert First Media** prompt when backing up to removable media.

The preset is: **Disabled**.

When the option is enabled, backing up to removable media may be not possible if the user is away, because the program will wait for someone to press OK in the prompt box. Hence, you should disable the prompt when scheduling a backup to removable media. Then, if the removable media is available (for example, a DVD is inserted), the task can run unattended.

Reset archive bit

The option is effective only for file-level backup in Windows operating systems and in bootable media.

The preset is: **Disabled**.

In Windows operating systems, each file has the **File is ready for archiving** attribute, available by selecting **File** -> **Properties** -> **General** -> **Advanced** -> **Archive and Index attributes**. This attribute, also known as the archive bit, is set by the operating system each time the file is changed and can be reset by backup applications each time they include the file in a backup. The archive bit value is used by various applications such as databases.

When the **Reset archive bit** check box is selected, Acronis Backup & Recovery 11.5 will reset the archive bits of all files being backed up. Acronis Backup & Recovery 11.5 itself does not use the archive bit value. When performing incremental or differential backup, it determines whether a file has changed by the file size and the date/time when the file was last saved.

Copyright © Acronis International GmbH, 2002-2013.

Restart the machine automatically after backup is finished

This option is available only when operating under bootable media.

The preset is: **Disabled**.

When the option is enabled, Acronis Backup & Recovery 11.5 will restart the machine after the backup process is completed.

For example, if the machine boots from a hard disk drive by default and you select this check box, the machine will be restarted and the operating system will start as soon as the bootable agent has finished creating the backup.

Deduplicate backup only after transferring it to the vault (do not deduplicate at source)

This option is available only in advanced editions of Acronis Backup & Recovery 11.5.

This option is effective for Windows and Linux operating systems and bootable media, when the backup destination is a deduplicating vault.

The preset is: **Disabled**.

Enabling this option turns off deduplicating backups at source, meaning that deduplication will be performed by Acronis Backup & Recovery 11.5 Storage Node after the backup is saved to the vault (this is called deduplication at target).

Turning off deduplication at source may lead to faster backup processes but greater network traffic and heavier load of the storage node. The eventual size of the backup in the vault is independent of whether deduplication at source is turned on.

Deduplication at source and deduplication at target are described in Deduplication overview (p. 234).

4.7.2 Archive protection

This option is effective for Windows and Linux operating systems and bootable media.

This option is effective for both disk-level and file-level backup.

This option defines whether the archive will be protected with a password and whether the archive's content will be encrypted.

This option is not available when the archive already contains backups. For example, this option may not be available:

- When you specify an already existing archive as the destination of the backup plan.
- When you edit a backup plan that has already resulted in a backup.

The preset is: **Disabled.**

To protect the archive from unauthorized access

1. Select the **Set password for the archive** check box.
2. In the **Enter the password** field, type a password.
3. In the **Confirm the password** field, re-type the password.
4. Select one of the following:

 Copyright © Acronis International GmbH, 2002-2013.

- **Do not encrypt** – the archive will be protected with the password only
- **AES 128** – the archive will be encrypted using the Advanced Encryption Standard (AES) algorithm with a 128-bit key
- **AES 192** – the archive will be encrypted using the AES algorithm with a 192-bit key
- **AES 256** – the archive will be encrypted using the AES algorithm with a 256-bit key.

5. Click **OK**.

The AES cryptographic algorithm operates in the Cipher-block chaining (CBC) mode and uses a randomly generated key with a user-defined size of 128, 192 or 256 bits. The larger the key size, the longer it will take for the program to encrypt the archive and the more secure your data will be.

The encryption key is then encrypted with AES-256 using a SHA-256 hash of the password as a key. The password itself is not stored anywhere on the disk or in the backup file; the password hash is used for verification purposes. With this two-level security, the backup data is protected from any unauthorized access, but recovering a lost password is not possible.

4.7.3 Backup cataloging

Cataloging a backup adds the contents of the backup to the data catalog. Using the data catalog, you can easily find the required version of data and select it for recovery.

The **Backup cataloging** option specifies whether full or fast cataloging will be performed on a backup as soon as the backup is created.

This option is effective only if backup cataloging is enabled on the backed-up machine or on the storage node.

The preset is: **Full cataloging.**

If you select **Full cataloging**, the backup contents are cataloged to the highest possible level of detail. This means that the following data will be displayed in the catalog:

- For a disk-level backup - disks, volumes, files, and folders.
- For a file-level backup - files and folders.
- For an Exchange database-level backup - databases or storage groups and mailboxes (always); folders and e-mails (depends on the **Microsoft Exchange metadata collection** option).
- For an Exchange mailbox-level backup - mailboxes, folders, and e-mails.

You may want to select **Fast cataloging** if the full cataloging tends to affect the performance of the managed machine or if your backup window is too narrow. The following data will be displayed in the catalog:

- For a disk-level backup - only disks and volumes.
- For a file-level backup - nothing.
- For an Exchange database-level backup - only databases or storage groups and mailboxes.
- For an Exchange mailbox-level backup - only mailboxes.

To add the full contents of already existing backups to the catalog, you can start the full cataloging manually when appropriate.

Note for Virtual Edition users: *When backing up to an unmanaged vault (except for a locally-attached storage), Agent for ESX(i) (Virtual Appliance) always performs* ***fast cataloging****. You can start the full cataloging of the vault manually from the management server.*

 Copyright © Acronis International GmbH, 2002-2013.

For more information about using the data catalog, see the "Data catalog" (p. 138) section.

4.7.4 Backup performance

Use this group of options to specify the amount of network and system resources to allocate to the backup process.

Backup performance options might have a more or less noticeable effect on the speed of the backup process. This depends on the overall system configuration and the physical characteristics of devices the backup is being performed from or to.

4.7.4.1 Backup priority

This option is effective for both Windows and Linux operating systems.

The priority of a process running in a system determines the amount of CPU and system resources allocated to that process. Decreasing the backup priority will free more resources for other applications. Increasing the backup priority might speed up the backup process by requesting the operating system to allocate more resources like the CPU to the backup application. However, the resulting effect will depend on the overall CPU usage and other factors like disk in/out speed or network traffic.

The preset is: **Low.**

To specify the backup process priority

Select one of the following:

- **Low** – to minimize resources taken by the backup process, leaving more resources to other processes running on the machine
- **Normal** – to run the backup process with normal speed, allocating resources on a par with other processes
- **High** – to maximize the backup process speed by taking resources from other processes.

4.7.4.2 HDD writing speed

This option is effective for Windows and Linux operating systems and bootable media.

This option is available when an internal (fixed) hard disk of the machine being backed up is selected as the backup destination

Backing up to a fixed hard disk (for example, to Acronis Secure Zone) may slow performance of the operating system and applications because of the large amounts of data that needs to be written to the disk. You can limit the hard disk usage by the backup process to the desired level.

The preset is: **Maximum.**

To set the desired HDD writing speed for backup

Do any of the following:

- Click **Writing speed stated as a percentage of the maximum speed of the destination hard disk**, and then drag the slider or select a percentage in the box
- Click **Writing speed stated in kilobytes per second**, and then enter the writing speed in kilobytes per second.

 Copyright © Acronis International GmbH, 2002-2013.

4.7.4.3 Network connection speed

This option is effective for Windows and Linux operating systems and bootable media.

This option is available when a location on the network (network share, managed vault or an FTP/SFTP server) is selected as the backup destination.

The option defines the amount of network connection bandwidth allocated for transferring the backup data.

By default the speed is set to maximum, i.e. the software uses all the network bandwidth it can get when transferring the backup data. Use this option to reserve a part of the network bandwidth for other network activities.

The preset is: **Maximum.**

To set the network connection speed for backup

Do any of the following:

- Click **Transferring speed stated as a percentage of the estimated maximum speed of the network connection**, and then drag the slider or type a percentage in the box
- Click **Transferring speed stated in kilobytes per second**, and then enter the bandwidth limit for transferring backup data in kilobytes per second.

4.7.5 Backup splitting

This option is effective for Windows and Linux operating systems and bootable media.

This option is not effective when the backup destination is a managed vault or Acronis Online Backup Storage.

The option defines how a backup can be split.

The preset is: **Automatic**

The following settings are available.

Automatic

With this setting, Acronis Backup & Recovery 11.5 will act as follows.

- **When backing up to a hard disk or a network share:**

  A single backup file will be created if the destination disk's file system allows the estimated file size.

  The backup will automatically be split into several files if the destination disk's file system does not allow the estimated file size. This might be the case when the backup is placed on FAT16 and FAT32 file systems that have a 4-GB file size limit.

  If the destination disk runs out of free space while creating the backup, the task enters the **Need interaction** state. You have the ability to free additional space and retry the operation. If you do so, the resulting backup will be split into the parts created before and after the retry.
- **When backing up to removable media** (CD, DVD, Blu-Ray Discs, a stand-alone tape drive, an RDX or USB drive used in the removable device (p. 200) mode):

  The task will enter the **Need interaction** state and ask for a new media when the previous one is full.

 Copyright © Acronis International GmbH, 2002-2013.

- **When backing up to an FTP server:**

  The backup will automatically be split into files no more than 2 GB in size. Splitting is needed to allow data recovery directly from the FTP server.
- **When backing up to an SFTP server:**

  A single backup file will be created. If the destination storage runs out of free space while creating the backup, the task will fail.

When you replicate or move a backup (p. 97) to other locations, these rules apply to each location independently.

Example.
Suppose that the primary location for a 3-GB backup is a hard disk, the second location is an FTP server, and the third location is a network share. In this case, the backup will be stored as a single file in the primary location, as two files in the second location, and as a single file again in the third location.

Fixed size

Enter the desired file size or select it from the drop-down list. The backup will then be split into multiple files of the specified size. This comes in handy when creating a backup that you plan to burn to multiple CDs or DVDs later on. You might also want to split a backup into 2-GB files if you are backing up to a hard disk, but you plan to manually copy the backup to an FTP server later.

4.7.6 Compression level

This option is effective for Windows and Linux operating systems and bootable media.

The option defines the level of compression applied to the data being backed up.

The preset is: **Normal.**

The optimal data compression level depends on the type of data being backed up. For example, even maximum compression will not significantly reduce the archive size if the archive contains essentially compressed files, such as .jpg, .pdf or .mp3. However, formats such as .doc or .xls will be compressed well.

To specify the compression level

Select one of the following:

- **None** – the data will be copied as is, without any compression. The resulting backup size will be maximal.
- **Normal** – recommended in most cases.
- **High** – the resulting backup size will typically be less than for the **Normal** level.
- **Maximum** – the data will be compressed as much as possible. The backup duration will be maximal. You may want to select maximum compression when backing up to removable media to reduce the number of blank disks required.

4.7.7 Disaster recovery plan (DRP)

This option is effective for Windows and Linux but is not applicable to bootable media.

This option is not effective for file-level backups.

 Copyright © Acronis International GmbH, 2002-2013.

Disaster recovery plan (DRP) contains a list of backed up data items and detailed instructions that guide a user through a process of recovering these items from a backup.

A DRP is created after the first successful backup is performed by the backup plan. If the **Send disaster recovery plans** option is enabled, the DRP is sent by e-mail to the specified list of users. If the **Save DRP as file** option is enabled, the DRP is saved as a file to the specified location. The DRP will be created again in the following cases:

- The backup plan has been edited so that the DRP parameters changed.
- The backup contains new data items or does not contain items previously backed up. (This does not apply to such data items as files or folders.)

If multiple machines are protected by a backup plan, then a separate DRP is created for each machine. You can specify a local folder (when connected directly to a managed machine), a network folder, an FTP or SFTP server as a location to save the DRPs.

DRP and post-backup commands

Note that the DRP will not automatically change if post-backup commands in your backup plan copy or move the backups from the original location. The DRP points only to the locations specified in the backup plan.

Adding information to a DRP template

You can append additional information to a DRP template if you are well familiar with XML and HTML. The default paths to the DRP template are:

- **%ProgramFiles%\Acronis\BackupAndRecovery\drp.xsl** - in 32-bit Windows
- **%ProgramFiles(x86)%\Acronis\BackupAndRecovery\drp.xsl -** in 64-bit Windows
- **/usr/lib/Acronis/BackupAndRecovery/drp.xsl -** in Linux

To set up sending DRPs:

1. Select the **Send disaster recovery plans** check box.
2. Enter the e-mail address in the **E-mail Address** field. You can enter several e-mail addresses in a semicolon-delimited format.
3. [Optional] Change the default value of the **Subject** field, if necessary.

   If you back up multiple machines with one centralized backup plan and want each machine user to receive a separate DRP e-mail about his/her machine only:

   a. Use the *%MachineName%* variable to show the name of the certain machine in the e-mail subject.

   b. Set up your mail server or client to filter or forward e-mails using the **Subject** field.
4. Enter the parameters of access to the SMTP server. For more detailed information, see E-mail notifications (p. 168).
5. [Optional] Click **Send test e-mail message** to check if the settings are correct.

To set up saving DRPs as files:

1. Select the **Save DRP as file** check box.
2. Click **Browse** to specify a location for the DRP files.

4.7.8 Error handling

These options are effective for Windows and Linux operating systems and bootable media.

 Copyright © Acronis International GmbH, 2002-2013.

These options enable you to specify how to handle errors that might occur during backup.

Do not show messages and dialogs while processing (silent mode)

The preset is: **Disabled**.

With the silent mode enabled, the program will automatically handle situations requiring user interaction (except for handling bad sectors, which is defined as a separate option). If an operation cannot continue without user interaction, it will fail. Details of the operation, including errors, if any, can be found in the operation log.

Re-attempt, if an error occurs

The preset is: **Enabled. Number of attempts: 30. Interval between attempts: 30 seconds.**

When a recoverable error occurs, the program re-attempts to perform the unsuccessful operation. You can set the time interval and the number of attempts. The attempts will be stopped as soon as the operation succeeds OR the specified number of attempts are performed, depending on which comes first.

For example, if the backup destination on the network becomes unavailable or not reachable, the program will attempt to reach the destination every 30 seconds, but no more than 5 times. The attempts will be stopped as soon as the connection is resumed OR the specified number of attempts is performed, depending on which comes first.

*If Acronis Online Backup Storage is selected as the primary, the second, or a further backup location, the option value is automatically set to **Enabled. Number of attempts: 300**, regardless of the default value.*

Ignore bad sectors

The preset is: **Disabled**.

When the option is disabled, the program will display a pop-up window each time it comes across a bad sector and ask for a user decision as to whether to continue or stop the backup procedure. In order to back up the valid information on a rapidly dying disk, enable ignoring bad sectors. The rest of the data will be backed up and you will be able to mount the resulting disk backup and extract valid files to another disk.

4.7.9 Event tracing

It is possible to duplicate log events of the backup operations, performed on the managed machine, in the Application Event Log of Windows; or send the events to the specified SNMP managers.

4.7.9.1 SNMP notifications

This option is effective for both Windows and Linux operating systems.

This option is not available when operating under the bootable media.

The option defines whether the agent(s) operating on the managed machine have to send the log events of the backup operations to the specified Simple Network Management Protocol (SNMP) managers. You can choose the types of events to be sent.

For detailed information about using SNMP with Acronis Backup & Recovery 11.5, please see "Support for SNMP (p. 53)".

 Copyright © Acronis International GmbH, 2002-2013.

The preset is: **Use the setting set in the Machine options.**

To select whether to send the backup operations events to the SNMP managers:

Choose one of the following:

- **Use the setting set in the Machine options** – to use the setting specified for the machine. For more information refer to Machine options.
- **Send SNMP notifications individually for backup operation events** – to send the events of the backup operations to the specified SNMP managers.
  - **Types of events to send** – choose the types of events to be sent: **All events**, **Errors and warnings**, or **Errors only**.
  - **Server name/IP** – type the name or IP address of the host running the SNMP management application, the messages will be sent to.
  - **Community** – type the name of the SNMP community to which both the host running the SNMP management application and the sending machine belong. The typical community is "public".

  Click **Send test message** to check if the settings are correct.
- **Do not send SNMP notifications** – to disable sending the log events of the backup operations to SNMP managers.

4.7.9.2 Windows event log

This option is effective only in Windows operating systems.

This option is not available when operating under the bootable media.

This option defines whether the agent(s) operating on the managed machine have to log events of the backup operations in the Application Event Log of Windows (to see this log, run **eventvwr.exe** or select **Control Panel > Administrative tools > Event Viewer**). You can filter the events to be logged.

The preset is: **Use the setting set in the Machine options.**

To select whether to log the backup operations events in the Application Event Log of Windows:

Choose one of the following:

- **Use the setting set in the Machine options** – to use the setting specified for the machine. For more information refer to Machine options.
- **Log the following event types** – to log events of the backup operations in the Application Event Log. Specify the types of events to be logged:
  - **All events** – log all events (information, warnings and errors)
  - **Errors and warnings**
  - **Errors only**
- **Do not log** - to disable logging events of the backup operations in the Application Event Log.

4.7.10 Fast incremental/differential backup

The option is effective in Windows and Linux operating systems and bootable media.

This option is effective for incremental and differential disk-level backup.

 Copyright © Acronis International GmbH, 2002-2013.

This option defines whether a file change is detected using the file size and time stamp or by comparing the file contents to those stored in the archive.

The preset is: **Enabled.**

Incremental or differential backup captures only data changes. To speed up the backup process, the program determines whether a file has changed or not by the file size and the date/time when the file was last modified. Disabling this feature will make the program compare the entire file contents to those stored in the archive.

4.7.11 File-level backup snapshot

This option is effective only for file-level backup in Windows and Linux operating systems.

This option defines whether to back up files one by one or by taking an instant data snapshot.

Note: *Files that are stored on network shares are always backed up one by one.*

The preset is: **Create snapshot if it is possible.**

Select one of the following:

- **Always create a snapshot**

  The snapshot enables backing up of all files including files opened for exclusive access. The files will be backed up at the same point in time. Choose this setting only if these factors are critical, that is, backing up files without a snapshot does not make sense. To use a snapshot, the backup plan has to run under the account with the Administrator or Backup Operator privileges. If a snapshot cannot be taken, the backup will fail.
- **Create a snapshot if it is possible**

  Back up files directly if taking a snapshot is not possible.
- **Do not create a snapshot**

  Always back up files directly. Administrator or Backup Operator privileges are not required. Trying to back up files that are opened for exclusive access will result in a read error. Files in the backup may be not time-consistent.

4.7.12 File-level security

These options are effective only for file-level backup in Windows operating systems.

In archives, store encrypted files in a decrypted state

This option defines whether to decrypt files before saving them to a backup archive.

The preset is: **Disabled**.

Simply ignore this option if you do not use the encryption. Enable the option if encrypted files are included in the backup and you want them to be accessed by any user after recovery. Otherwise, only the user who encrypted the files/folders will be able to read them. Decryption may also be useful if you are going to recover encrypted files on a different machine.

File encryption is available in Windows using the NTFS file system with the Encrypting File System (EFS). To access a file or folder encryption setting, select ***Properties > General > Advanced Attributes > Encrypt contents to secure data.***

 Copyright © Acronis International GmbH, 2002-2013.

Preserve file security settings in archives

This option defines whether to back up NTFS permissions for files along with the files.

The preset is: **Enabled.**

When the option is enabled, files and folders are saved in the archive with the original permissions to read, write or execute the files for each user or user group. If you recover a secured file/folder on a machine without the user account specified in the permissions, you may not be able to read or modify this file.

To completely eliminate this kind of problem, disable preserving file security settings in archives. The recovered files and folders will always inherit the permissions from the folder to which they are recovered or from the disk, if recovered to the root.

Alternatively, you can disable recovery (p. 167) of the security settings, even if they are available in the archive. The result will be the same - the files will inherit the permissions from the parent folder.

*To access file or folder NTFS permissions, select **Properties** > **Security**.*

4.7.13 LVM snapshotting

This option is effective only for Linux operating systems. This option is effective for both disk-level and file-level backup of volumes managed by Linux Logical Volume Manager (LVM). Such volumes are also called logical volumes.

This option defines how a snapshot of a logical volume is taken. Acronis Backup & Recovery 11.5 can do this on its own or rely on Linux Logical Volume Manager (LVM). Use of a snapshot ensures a time-consistent backup of a volume whose data may change during the backup process.

The preset is: **Acronis Backup & Recovery 11.5**

Select one of the following:

- **Acronis Backup & Recovery 11.5**

Acronis Backup & Recovery 11.5 will take the snapshot on its own. With this setting, a backup normally proceeds faster and unallocated space on the volume group is not required. Therefore, we recommend changing the preset only if you are experiencing problems with backing up logical volumes.

- **Logical volume manager**

Acronis Backup & Recovery 11.5 will use the snapshot taken by LVM. This snapshot is stored on unallocated space of the volume group. If the unallocated space is missing, Acronis Backup & Recovery 11.5 will take the snapshot on its own.

A detailed explanation of LVM snapshotting

Once a volume snapshot is taken, and the data starts changing, the old data has to be kept somewhere until it is saved to the backup.

- Acronis keeps the old data mostly in the RAM. (During a file-level backup, the software may create a temporary file in **/tmp** if the old data size significantly grows.)
- LVM needs a temporary logical volume (a snapshot logical volume) for keeping the old data (see http://tldp.org/HOWTO/LVM-HOWTO/snapshots_backup.html). Writing this data onto the

 Copyright © Acronis International GmbH, 2002-2013.

volume causes a large number of disk I/O operations. This is why the backup is usually slower when a snapshot is taken by LVM.

If you choose to use LVM, Acronis Backup & Recovery 11.5 creates a snapshot logical volume on its own. The software proceeds as follows:

1. Checks the backed-up volume size (not data size, but volume size).
2. Calculates 10 percent of that size—say, 10 GB.
3. Checks if there is at least 10 GB of unallocated space on the corresponding volume group.
4. If there is, creates a 10-GB snapshot logical volume (using the `lvcreate -s` command) and starts backing up. Otherwise, the software backs up using the Acronis snapshot.
5. Deletes the snapshot volume as soon as it is no longer needed.

Multiple logical volumes are backed up one by one. For each of them, the software creates a separate snapshot volume of the corresponding size. Only one snapshot volume is stored at a time.

If the data changes extremely fast while the software is keeping the snapshot, the snapshot logical volume will run out of space and the backup will fail. That is why you can change the 10 percent default value to any value up to 100 percent (which guarantees success) in **/etc/Acronis/BackupAndRecovery.config**.

To change the default size of a snapshot logical volume:

1. Decide how much unallocated space you want to use. If you are backing up two or more logical volumes, base your choice on the size of the biggest of them.

   Tip: *To view the amount of unallocated space on a volume group, run the* `vgdisplay` *command and then examine the* `Free PE / Size` *line. To view the sizes of logical volumes, run the* `lvdisplay` *command and then examine the* `LV Size` *lines.*

2. Open the file **/etc/Acronis/BackupAndRecovery.config** in a text editor.
3. Locate the line `<value name="MMSDirPath" type="TString">`.
4. Add the following fragment directly before that line:

```
<key name="LVMSnapshots">
      <value name="MinimalVGFreeRelative" type="TString">
            20
      </value>
</key>
```

   In this example, the new value is 20 percent. The number must be integer.

5. Save the file. The new setting will take effect at the next backup. No service restart is needed.

4.7.14 Media components

This option is effective for both Windows and Linux operating systems, when the backup destination is CD, DVD, or Blue-ray Disc (BD).

When backing up to this media, you can make this media work as regular Linux-based bootable media (p. 445) by writing additional components to it. As a result, you will not need a separate rescue disc.

The preset is: **No bootable components.**

Choose one of the following components you want to put on the bootable media:

 Copyright © Acronis International GmbH, 2002-2013.

- **Acronis Bootable Agent** is a bootable rescue utility (based on Linux kernel) that includes most of the functionality of the Acronis Backup & Recovery 11.5 agent. Put this component on the media if you want more functionality during recovery. You will be able to configure the recovery operation in the same way as under regular bootable media; use Active Restore or Universal Restore. If the media is being created in Windows, the disk management functionality will also be available.
- **Acronis Bootable Agent and One-Click Restore**. The One-Click Restore is the minimal addition to a disk backup stored on removable media, allowing for easy recovery from this backup. If you boot a machine from the media and click **Run Acronis One-click Restore,** the disk will be immediately recovered from the backup contained on the same media.

Caution: *Because the one-click approach does not presume user selections, such as selecting volumes to recover, Acronis One-Click Restore always recovers the entire disk. If your disk contains several volumes and you are planning to use Acronis One-Click Restore, include all the volumes in the backup. Any volumes missing from the backup will be lost.*

4.7.15 Mount points

This option is effective only in Windows for a file-level backup of a data source that includes mounted volumes or cluster shared volumes.

This option is effective only when you select for backup a folder that is higher in the folder hierarchy than the mount point. (A mount point is a folder on which an additional volume is logically attached.)

- If such folder (a parent folder) is selected for backup, and the **Mount points** option is enabled, all files located on the mounted volume will be included in the backup. If the **Mount points** option is disabled, the mount point in the backup will be empty.

  During recovery of a parent folder, the mount point content will or will not be recovered, depending on whether the **Mount points** option for recovery (p. 168) is enabled or disabled.
- If you select the mount point directly, or select any folder within the mounted volume, the selected folders will be considered as ordinary folders. They will be backed up regardless of the state of the **Mount points** option and recovered regardless of the state of the **Mount points** option for recovery (p. 168).

The preset is: **Disabled**.

Tip. *You can back up Hyper-V virtual machines residing on a cluster shared volume by backing up the required files or the entire volume with file-level backup. Just power off the virtual machines to be sure that they are backed up in a consistent state.*

Example

Let's assume that the **C:\Data1** folder is a mount point for the mounted volume. The volume contains folders **Folder1** and **Folder2**. You create a backup plan for file-level backup of your data.

If you select the check box for volume C and enable the **Mount points** option, the **C:\Data1** folder in your backup will contain **Folder1** and **Folder2**. When recovering the backed-up data, be aware of proper using the **Mount points** option for recovery (p. 168).

If you select the check box for volume C, and disable the **Mount points** option, the **C:\Data1** folder in your backup will be empty.

If you select the check box for the **Data1**, **Folder1** or **Folder2** folder, the checked folders will be included in the backup as ordinary folders, regardless of the state of the **Mount points** option.

 Copyright © Acronis International GmbH, 2002-2013.

4.7.16 Multi-volume snapshot

This option is effective only for Windows operating systems.

This option applies to disk-level backup. This option also applies to file-level backup when the file-level backup is performed by taking a snapshot. (The File-level backup snapshot (p. 118) option determines whether a snapshot will be taken during file-level backup).

The option determines whether to take snapshots of multiple volumes at the same time or one by one.

The preset is: **Enable.**

When this option is set to **Enable**, snapshots of all volumes being backed up will be created simultaneously. Use this option to create a time-consistent backup of data spanned across multiple volumes, for instance for an Oracle database.

When this option is set to **Disable**, the volumes' snapshots will be taken one after the other. As a result, if the data spans across several volumes, the resulting backup may be not consistent.

4.7.17 Notifications

Acronis Backup & Recovery 11.5 provides the ability of notifying users about backup completion through e-mail or the messaging service.

4.7.17.1 E-mail

This option is effective for Windows and Linux operating systems.

This option is not available when operating under the bootable media.

The option enables you to receive e-mail notifications about the backup task's successful completion, failure or when user interaction is required.

The preset is: **Disabled**.

To configure e-mail notification

1. Select the **Send e-mail notifications** check box to activate notifications.
2. Under **Send e-mail notifications**, select the appropriate check boxes as follows:
   - **When backup completes successfully**.
   - **When backup fails**.
   - **When user interaction is required**.
3. Select the **Add full log to notification** check box if you want the e-mail notification to include log entries for the operation.
4. In the **E-mail addresses** field, type the destination e-mail address. You can enter several addresses separated by semicolons.
5. In the **Subject** field, type the notification subject.

   The subject can include ordinary text and one or more variables. In the received e-mail messages, each variable will be replaced by its value at the time of task execution. The following variables are supported:
   - **%description%**

 Copyright © Acronis International GmbH, 2002-2013.

For a machine running Windows, the **%description%** variable will be replaced by the text that is given in the **Computer description** field of the machine. To specify this text, either go to **Control panel > System** or run the following command as an administrator:

```
net config server /srvcomment:<text>
```

For a machine running Linux, the **%description%** variable will be replaced by an empty string ("").

- **%subject%**

  The **%subject%** variable will be replaced by the following phrase: *Task <task name> <task result> on machine <machine name>.*

6. In the **SMTP server** field, enter the name of the outgoing mail server (SMTP).
7. In the **Port** field, set the port of the outgoing mail server. By default, the port is set to **25**.
8. If the outgoing mail server requires authentication, enter **User name** and **Password** of the sender's e-mail account.

   If the SMTP server does not require authentication, leave the **User name** and **Password** fields blank. If you are not sure whether the SMTP server requires authentication, contact your network administrator or your e-mail service provider for assistance.
9. Click **Additional e-mail parameters...** to configure additional e-mail parameters as follows:
   a. **From** – type the name of the sender. If you leave this field empty, the messages will contain the sender's e-mail account in the **From** field.
   b. **Use encryption** – you can opt for encrypted connection to the mail server. SSL and TLS encryption types are available for selection.
   c. Some Internet service providers require authentication on the incoming mail server before being allowed to send something. If this is your case, select the **Log on to incoming mail server** check box to enable a POP server and to set up its settings:
      - **Incoming mail server (POP)** – enter the name of the POP server.
      - **Port** – set the port of the POP server. By default, the port is set to **110**.
      - **User name** and **Password** of the incoming mail server.
   d. Click **OK**.
10. Click **Send test e-mail message** to check whether e-mail notifications work correctly with the specified settings.

4.7.17.2 Messenger service (WinPopup)

This option is effective for the Windows XP, Windows Server 2003 and Linux operating systems on the sending machine and for Windows XP or Windows Server 2003 on the receiving machine. Windows Vista and later versions of Windows do not support the Messenger service.

This option is not available when operating under bootable media.

The option enables you to receive WinPopup notifications about the backup task's successful completion, failure or need for interaction.

The preset is: **Disabled.**
Before configuring WinPopup notifications, make sure the Messenger service is started on both the machine executing the task and the machine that will receive messages.

In Windows XP SP2+ and Windows Server 2003/2003 R2, the Messenger service is disabled by default. Change the service **Startup type** to **Automatic** and start the service.

 Copyright © Acronis International GmbH, 2002-2013.

To configure WinPopup notifications:

1. Select the **Send WinPopup notifications** check box.
2. In the **Machine name** field, enter the name of the machine to which notifications will be sent. Multiple names are not supported.

Under **Send notifications**, select the appropriate check boxes as follows:

- **When backup completes successfully** – to send notification when the backup operation is completed successfully
- **When backup fails** – to send notification when the backup operation is failed
- **When user interaction is required** – to send notification during the operation when user interaction is required.

Click **Send test WinPopup message** to check if the settings are correct.

4.7.18 Pre/Post commands

This option is effective for Windows and Linux operating systems and PE-based bootable media.

The option enables you to define the commands to be automatically executed before and after the backup procedure.

The following scheme illustrates when pre/post commands are executed.

Pre-backup command	Backup	Post-backup command

Examples of how you can use the pre/post commands:

- Delete some temporary files from the disk before starting backup.
- Configure a third-party antivirus product to be started each time before the backup starts.
- Selectively copy backups from an archive to another location. This option may be useful because the replication configured in a backup plan copies *every* backup of an archive to subsequent locations.

Acronis Backup & Recovery 11.5 performs the replication *after* executing the post-backup command. For more information see "Sequence of operations in a backup plan" (p. 77).

The program does not support interactive commands, i.e. commands that require user input (for example, "pause").

To specify pre/post commands

1. Enable pre/post commands execution by checking the following options:
   - **Execute before the backup**
   - **Execute after the backup**
2. Do any of the following:
   - Click **Edit** to specify a new command or a batch file
   - Select the existing command or the batch file from the drop-down list
3. Click **OK**.

 Copyright © Acronis International GmbH, 2002-2013.

4.7.18.1 Pre-backup command

To specify a command/batch file to be executed before the backup process starts

1. In the **Command** field, type a command or browse to a batch file. The program does not support interactive commands, i.e. commands that require user input (for example, "pause".)
2. In the **Working directory** field, specify a path to a directory where the command/batch file will be executed.
3. In the **Arguments** field specify the command's execution arguments, if required.
4. Depending on the result you want to obtain, select the appropriate options as described in the table below.
5. Click **Test command** to check if the command is correct.

Check box	**Selection**			
Fail the task if the command execution fails*	Selected	Cleared	Selected	Cleared
Do not back up until the command execution is complete	Selected	Selected	Cleared	Cleared
Result				
	Preset Perform the backup only after the command is successfully executed. Fail the task if the command execution fails.	Perform the backup after the command is executed despite execution failure or success.	N/A	Perform the backup concurrently with the command execution and irrespective of the command execution result.

* A command is considered failed if its exit code is not equal to zero.

4.7.18.2 Post-backup command

To specify a command/executable file to be executed after the backup is completed

1. In the **Command** field, type a command or browse to a batch file.
2. In the **Working directory** field, specify a path to a directory where the command/batch file will be executed.
3. In the **Arguments** field, specify the command execution arguments, if required.
4. Select the **Fail the task if the command execution fails** check box if successful execution of the command is critical for you. The command is considered failed if its exit code is not equal to zero. If the command execution fails, the program will remove the resulting TIB file and temporary files if possible, and the task run result will be set to Failed.

   When the check box is not selected, the command execution result does not affect the task execution failure or success. You can track the command execution result by exploring the log or the errors and warnings displayed in the **Log** view.
5. Click **Test Command** to check if the command is correct.

4.7.19 Pre/Post data capture commands

This option is effective for both Windows and Linux operating systems.

 Copyright © Acronis International GmbH, 2002-2013.

The option enables you to define the commands to be automatically executed before and after data capture (that is, taking the data snapshot). Data capture is performed by Acronis Backup & Recovery 11.5 at the beginning of the backup procedure.

The following scheme illustrates when the pre/post data capture commands are executed.

	<---------- Backup ---------->				
Pre-backup command	Pre-data capture command	Data capture	Post-data capture command		Post-backup command

If the Volume Shadow Copy Service (p. 131) option is enabled, the commands' execution and the Microsoft VSS actions will be sequenced as follows:

"Before data capture" commands -> VSS Suspend -> Data capture -> VSS Resume -> "After data capture" commands.

Using the pre/post data capture commands, you can suspend and resume a database or application that is not compatible with VSS. As opposed to the Pre/Post commands (p. 124), the pre/post data capture commands will be executed before and after the data capture process. This takes seconds. The entire backup procedure may take much longer, depending on the amount of data to be backed up. Therefore, the database or application idle time will be minimal.

To specify pre/post data capture commands

1. Enable pre/post data capture commands execution by checking the following options:
   - **Execute before the data capture**
   - **Execute after the data capture**
2. Do any of the following:
   - Click **Edit** to specify a new command or a batch file
   - Select the existing command or the batch file from the drop-down list
3. Click **OK**.

4.7.19.1 Pre-data capture command

To specify a command/batch file to be executed before data capture

1. In the **Command** field, type a command or browse to a batch file. The program does not support interactive commands, i.e. commands that require user input (for example, "pause".)
2. In the **Working directory** field, specify a path to a directory where the command/batch file will be executed.
3. In the **Arguments** field specify the command's execution arguments, if required.
4. Depending on the result you want to obtain, select the appropriate options as described in the table below.
5. Click **Test command** to check if the command is correct.

Check box	**Selection**			
Fail the backup task if the command execution fails*	Selected	Cleared	Selected	Cleared
Do not perform the data capture until the command execution is complete	Selected	Selected	Cleared	Cleared

Copyright © Acronis International GmbH, 2002-2013.

Result				
	Preset Perform the data capture only after the command is successfully executed. Fail the task if the command execution fails.	Perform the data capture after the command is executed despite execution failure or success.	N/A	Perform the data capture concurrently with the command and irrespective of the command execution result.

* A command is considered failed if its exit code is not equal to zero.

4.7.19.2 Post-data capture command

To specify a command/batch file to be executed after data capture

1. In the **Command** field, type a command or browse to a batch file. The program does not support interactive commands, i.e. commands that require user input (for example, "pause".)
2. In the **Working directory** field, specify a path to a directory where the command/batch file will be executed.
3. In the **Arguments** field specify the command's execution arguments, if required.
4. Depending on the result you want to obtain, select the appropriate options as described in the table below.
5. Click **Test command** to check if the command is correct.

Check box	**Selection**			
Fail the task if the command execution fails*	Selected	Cleared	Selected	Cleared
Do not back up until the command execution is complete	Selected	Selected	Cleared	Cleared
Result				
	Preset Continue the backup only after the command is successfully executed. Delete the TIB file and temporary files and fail the task if the command execution fails.	Continue the backup after the command is executed despite command execution failure or success.	N/A	Continue the backup concurrently with the command execution and irrespective of the command execution result.

* A command is considered failed if its exit code is not equal to zero.

4.7.20 Replication/cleanup inactivity time

This option is effective only if you set up replication or retention rules (p. 97) for the backups.

 Copyright © Acronis International GmbH, 2002-2013.

This option defines a time period when starting replication or applying retention rules is not allowed. The operations will be performed when the inactivity time ends, if the machine is powered on at that moment. The operations that had started before the inactivity time began continue without interruption.

The inactivity time affects all locations, including the primary one.

The preset is: **Disabled.**

To specify the inactivity time, select the **Do not start replication/cleanup within the following time** check box, and then select the days and the time period during the day.

Usage example

You may want to use this option to separate the backup process from replication or cleanup. For example, suppose that you back up machines locally during the day and replicate the backups to a network folder. Make the inactivity time contain the working hours. Replication will be performed after the working hours, when network load is lower.

4.7.21 Sector-by-sector backup

The option is effective only for disk-level backup.

To create an exact copy of a disk or volume on a physical level, select the **Back up sector-by-sector** check box. The resulting backup will be equal in size to the disk being backed up (if the **Compression level** (p. 114) option is set to **None**). Use the sector-by-sector backup for backing up drives with unrecognized or unsupported file systems and other proprietary data formats.

4.7.22 Tape management

These options are effective when the backup destination is a tape device.

Use a separate tape set for each single machine

The preset is: **Disabled**.

Tapes within one pool can be grouped into so-called **tape sets**.

If you leave this option disabled, data from different machines will be backed up on all tapes belonging to a pool. If the option is enabled, backups of each machine will be stored on a separate tape set.

The option applies to backing up to a storage node.

Enable file recovery from disk backups stored on tapes

The preset is: **Disabled**.

If this check box is selected, at each backup, the software creates supplementary files on a hard disk of the machine where the tape device is attached. File recovery from disk backups is possible as long as these supplementary files are intact. The files are deleted automatically when the tape storing the respective backups is erased (p. 214), removed (p. 217) or overwritten.

The supplementary files' locations are as follows:

 Copyright © Acronis International GmbH, 2002-2013.

- In Windows XP and Server 2003: **%ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\TapeLocation**.
- In Windows Vista and later versions of Windows: **%PROGRAMDATA%\Acronis\BackupAndRecovery\TapeLocation**.
- In Linux: **/var/lib/Acronis/BackupAndRecovery/TapeLocation**.

The space occupied by these supplementary files depends on the number of files in the respective backup. For a full backup of a disk containing approximately 20,000 files (the typical workstation disk backup), the supplementary files occupy around 150 MB. A full backup of a server containing 250,000 files may produce around 700 MB of supplementary files. So if you are certain that you will not need to recover individual files, you can leave the check box cleared to save the disk space.

When you configure a single-pass disk and application backup (p. 316), the **Enable file recovery from disk backups stored on tapes** check box is automatically selected. You can clear it only if you change the backup destination or disable single-pass backup.

If the supplementary files were not created during backup, or have been deleted, you still can create them by rescanning (p. 215) the tapes where the backup is stored. This does not apply to backups created by Acronis Backup & Recovery 11 Update 0 (build 17318) and earlier.

Eject tapes after successful backups

The preset is: **Disabled**.

When this check box is selected, the software will eject tapes after any successful backup. If, according to the backup plan, other operations follow the backup (such as the backup validation or replication to another location), the tape will be ejected after completion of these operations.

Move a tape back to the slot after using

The preset is: **Enabled**.

If you disable this option, a tape will remain in the drive after an operation with the tape is completed.

If both this option and the **Eject tapes after successful backups** option are enabled, the tape will be ejected.

Always use a free tape

By default, the software tries to write a backup onto a tape containing backups of the same backup chain or archive. If not found, the software searches for a tape of the same tape set. (Tape sets can be determined by tape pools, by the **Use a separate tape set for each single machine** option or by the Grandfather-Father-Son (p. 66) or Tower of Hanoi (p. 72) backup schemes.) If a tape of the same tape set is not found, the software will try to use a free tape.

You can force using a free tape by changing the following settings.

- **For each full backup**

The preset is: **Disabled**.

When this option is enabled, each full backup will be written onto a free tape.

- **For each differential backup** (not applicable when backing up Exchange data)

The preset is: **Disabled**.

 Copyright © Acronis International GmbH, 2002-2013.

When this option is enabled, each differential backup will be written onto a free tape. In addition, each full backup will be written onto a free tape. The **For each full backup** check box becomes selected and disabled.

- **For each incremental backup** (or transaction log backup when backing up Exchange data)

The preset is: **Disabled**.

When this option is enabled, each incremental backup will be written onto a free tape. In addition, each full backup and each differential backup will be written onto a free tape. The **For each full backup** and **For each differential backup** check boxes become selected and disabled.

Overwrite a tape in the drive when creating a full backup

The preset is: **Disabled**.

The option applies only to stand-alone tape drives. When this option is enabled, a tape inserted into a drive will be overwritten every time a full backup is created.

4.7.23 Task failure handling

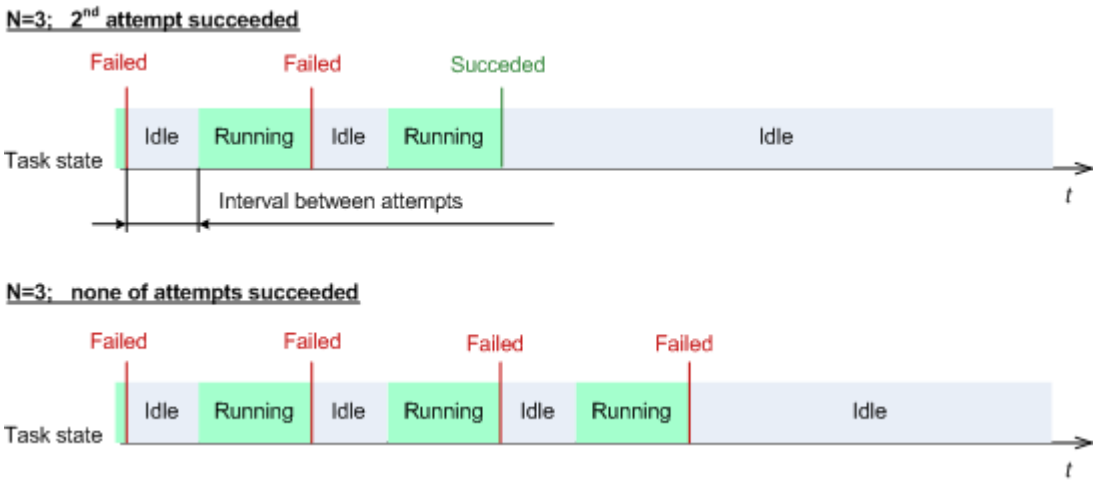
This option is effective for Windows and Linux operating systems.

This option is not available when operating under the bootable media.

This option determines the program behavior when any of the backup plan's tasks fails.

The preset is **not to restart a failed task.**

The program will try to execute the failed task again if you select the **Restart a failed task** check box and specify the number of attempts and the time interval between the attempts. The program stops trying as soon as an attempt completes successfully OR the specified number of attempts is performed, depending on which comes first.



If the task fails because of a mistake in the backup plan, you can edit the plan while the task is in the Idle state. While the task is running, you have to stop it prior to editing the backup plan.

4.7.24 Task start conditions

This option is effective in Windows and Linux operating systems.

 Copyright © Acronis International GmbH, 2002-2013.

This option is not available when operating under bootable media.

This option determines the program behavior in case a backup task is about to start (the scheduled time comes or the event specified in the schedule occurs), but the condition (or any of multiple conditions) is not met. For more information on conditions please see Scheduling (p. 83) and Conditions (p. 94).

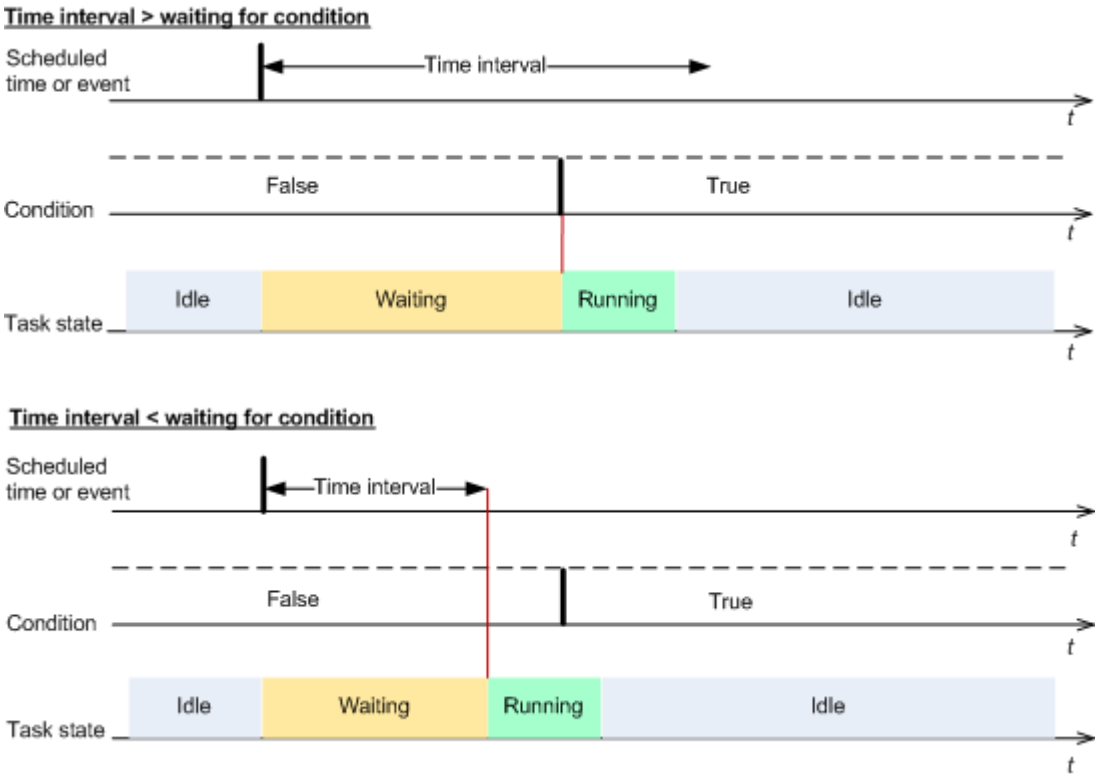
The preset is: **Wait until the conditions are met.**

Wait until the conditions are met

With this setting, the scheduler starts monitoring the conditions and launches the task as soon as the conditions are met. If the conditions are never met, the task will never start.

To handle the situation when the conditions are not met for too long and further delaying the backup is becoming risky, you can set the time interval after which the task will run irrespective of the condition. Select the **Run the task anyway after** check box and specify the time interval. The task will start as soon as the conditions are met OR the maximum time delay lapses, depending on which comes first.

Time diagram: Wait until conditions are met



Skip the task execution

Delaying a backup might be unacceptable, for example, when you need to back up data strictly at the specified time. Then it makes sense to skip the backup rather than wait for the conditions, especially if the events occur relatively often.

4.7.25 Volume Shadow Copy Service

These options are effective only for Windows operating systems.

 Copyright © Acronis International GmbH, 2002-2013.

Using Volume Shadow Copy Service

The option defines whether a Volume Shadow Copy Service (VSS) provider has to notify VSS-aware applications that the backup is about to start. This ensures the consistent state of all data used by the applications; in particular, completion of all database transactions at the moment of taking the data snapshot by Acronis Backup & Recovery 11.5. Data consistency, in turn, ensures that the application will be recovered in the correct state and become operational immediately after recovery.

The preset is: **Use Volume Shadow Copy Service**.

Use VSS

When **Use Volume Shadow Copy Service** is selected, choose a snapshot provider from the following list:

- **Hardware/software - Select automatically**

  VSS will use the hardware-based provider that supports the source volume. If none is found, VSS will use Acronis VSS Provider.
- **Software - Select automatically**

  In most cases, VSS will use Acronis VSS Provider.
- **Software - Acronis VSS Provider**

  VSS will use Acronis VSS Provider for taking snapshots.
- **Software - System provider** (selected by default)

  VSS will use the system provider (Microsoft Software Shadow Copy provider) for taking snapshots. We recommend choosing the system provider when backing up application servers (Microsoft Exchange Server, Microsoft SQL Server, Microsoft SharePoint, or Active Directory).
- **Software - A software provider**

  In most cases, VSS will use the Microsoft Software Shadow Copy provider.
- **Hardware - Select automatically**

  VSS will use the hardware-based provider that supports the source volume. If no hardware-based provider is found, backups will be created by means of Acronis Backup & Recovery 11.5 without taking snapshots.

Note: *Using a hardware snapshot provider may require administrative privileges.*

Do not use VSS

If you select **Do not use VSS**, the data snapshot will be taken by Acronis Backup & Recovery 11.5.

Choose **Do not use VSS** if your database is incompatible with VSS. Backup process is fastest, but data consistency of the applications whose transactions are not completed at the time of taking a snapshot cannot be guaranteed. You may use Pre/Post data capture commands (p. 125) to indicate which commands should be performed before and after taking the snapshot. This ensures that the data is being backed up in a consistent state. For instance, specify pre-data capture commands that will suspend the database and flush all caches to ensure that all transactions are completed; and specify post-data capture commands that will resume the database operations after the snapshot is taken.

 Copyright © Acronis International GmbH, 2002-2013.

About volume shadow copy writers

Before backing up the data of VSS-aware applications, make sure that the volume shadow copy writers for those applications are turned on by examining the list of writers that are present in the operating system. To view this list, run the following command:

```
vssadmin list writers
```

Note: *In Microsoft Windows Small Business Server 2003, the writer for Microsoft Exchange Server 2003 is turned off by default. For instructions on how to turn it on, see the following Microsoft knowledge base article http://support.microsoft.com/kb/838183/.*

Enabling VSS Full backup

The preset is: **Disabled**.

This option can be useful when you protect Microsoft Exchange Server with a disk-level backup (p. 288).

If enabled, logs of Microsoft Exchange Server and of other VSS-aware applications (except for Microsoft SQL Server) will be truncated after each successful full, incremental or differential backup.

Leave this option disabled in the following cases:

- If you use Acronis Backup & Recovery 11.5 Agent for Microsoft Exchange Server or third-party software for backing up the Exchange Server data. This is because the log truncation will interfere with the consecutive transaction log backups.
- If you use third-party software for backing up the SQL Server data. The reason for this is that the third-party software will take the resulting disk-level backup for its "own" full backup. As a result, the next differential backup of the SQL Server data will fail. The backups will continue failing until the third-party software creates the next "own" full backup.
- If other VSS-aware applications are running on the machine and you need to keep their logs for any reason.

Enabling this option does not result in the truncation of Microsoft SQL Server logs. To truncate the SQL Server log after a single-pass backup (p. 312), enable the **Log truncation** setting in the **Single-pass disk and application backup** (p. 316) section of the **Create backup plan** or **Back up now** page.

Enable this option when using VSS on a machine that has Windows XP and runs Microsoft SQL Server. If you leave the option disabled, the backup may fail.

Copyright © Acronis International GmbH, 2002-2013.

5 Recovery

When it comes to data recovery, first consider the most functional method: connect the console to the managed **machine running the operating system** and create the recovery task.

If the machine's **operating system fails to start** or you need to **recover data to bare metal**, boot the machine from the bootable media (p. 445) or using Acronis Startup Recovery Manager and configure recovery.

Acronis Universal Restore lets you recover and boot up operating systems on **dissimilar hardware** or a virtual machine.

Acronis Backup & Recovery 11.5 enables you to transfer Windows operating systems between BIOS-based hardware and hardware that supports Unified Extensible Firmware Interface (UEFI). See the "Recovering BIOS-based systems to UEFI-based and back" (p. 154) section for more details.

A **Windows system can be brought online in seconds** while it is still being recovered. Using the proprietary Acronis Active Restore (p. 158) technology, Acronis Backup & Recovery 11.5 will boot the machine into the operating system found in the backup as if the system were on the physical disk. The system becomes operational and ready to provide necessary services. Thus, the system downtime will be minimal.

A dynamic volume can be recovered over an existing volume, to unallocated space of a disk group, or to unallocated space of a basic disk. To learn more about recovering dynamic volumes, please turn to the "Backup and recovery of dynamic volumes (Windows)" (p. 41) section.

For detailed information about recovering Linux Software RAID devices and volumes created by Logical Volume Manager (LVM), see "Recovering MD devices and logical volumes" (p. 45).

Acronis Backup & Recovery 11.5 Agent for Windows and Agent for Linux have the ability to recover a disk (volume) backup to a new virtual machine. With Acronis Backup & Recovery 11.5 Agent for Hyper-V or Agent for ESX(i), you can create the new virtual machine on the respective virtualization server. See the "Recovery to the "New virtual machine" destination" (p. 177) section for more details.

You might need to prepare target disks before recovery. Acronis Backup & Recovery 11.5 includes a handy disk management utility which enables you to create or delete volumes, change a disk partitioning style, create a disk group and perform other disk management operations on the target hardware, both under the operating system and on bare metal. To find out more about Acronis Disk Director LV, see "Disk management" (p. 272).

5.1 Creating a recovery task

To create a recovery task, perform the following steps

What to recover

Select data (p. 136)

Select data to recover.

Access credentials (p. 140)

[Optional] Provide credentials for the archive location if the task account does not have the right to access it. To access this option, click **Show access credentials**.

 Copyright © Acronis International GmbH, 2002-2013.

Where to recover

This section appears after the required backup is selected and the type of data to recover is defined. The parameters you specify here depend on the type of data being recovered.

Disks (p. 141)

Volumes (p. 145)

Files (p. 148)

Microsoft Exchange databases or storage groups

Microsoft Exchange mailboxes or public folders

Microsoft SQL databases (p. 317)

Microsoft Active Directory (p. 325)

[On the management server only] Choose the registered machine to recover the data to. In most cases, the machine that the data comes from is chosen automatically. If you need to recover data to a network share or to a virtual machine, choose the registered machine with the agent that will perform the recovery.

Acronis Active Restore

[Optional] Enable Acronis Active Restore if you need to bring a system or a database online immediately after the recovery is started. Available when recovering Windows (p. 158), Microsoft Exchange databases, or Microsoft SQL databases (p. 319).

Access credentials (p. 141)

[Optional] Provide credentials for the destination if the task credentials do not enable recovery of the selected data. To access this setting, click **Show access credentials**.

When to recover

Recover (p. 150)

Select when to start recovery. The task can start immediately after its creation, be scheduled for a specified date and time in the future or simply saved for manual execution.

Task parameters

Task name

[Optional] Enter a unique name for the recovery task. A conscious name lets you quickly identify the task among the others.

Recovery options

[Optional] Customize the recovery operation by configuring the recovery options, such as pre/post recovery commands, recovery priority, error handling or notification options. If you do nothing in this section, the default values (p. 163) will be used.

After any of the settings are changed against the default value, a new line that displays the newly set value appears. The setting status changes from **Default** to **Custom**. Should you modify the setting again, the line will display the new value unless the new value is the default one. When the default value is set, the line disappears. Therefore, in this section you always see only the settings that differ from the default values.

Clicking **Reset to default** resets all the settings to default values.

Task credentials

[Optional] The task will run on behalf of the user who is creating the task. You can change the task account credentials if necessary. To access this setting, click **Show task credentials**.

 Copyright © Acronis International GmbH, 2002-2013.

[Optional] Universal Restore for Windows/Linux

Applies to: system disk or volume recovery. Using Acronis Universal Restore requires a separate license.

Universal Restore for Windows/Linux (p. 151)

Use Acronis Universal Restore when you need to recover and boot up an operating system on dissimilar hardware.

After you complete all the required steps, click **OK** to create the recovery task.

5.1.1 What to recover

1. Specifying the archive location

In the **Data path** field, specify the archive location path or click **Browse** and select the required location as described in "Selecting archive location" (p. 137).

In the advanced editions of Acronis Backup & Recovery 11.5, you can select either to specify the archive location path as described above, or use the centralized data catalog.

2. Selecting data

The backed-up data can be selected using the **Data view** tab, or the **Archive view** tab. The **Data view** tab displays all the backed-up data by versions (the date and time of backup creation) within the selected archive location. The **Archive view** tab displays the backed-up data by the archives.

Selecting data using the Data view

Since the **Data view** tab shares the same functionality with the data catalog, selecting data on the **Data view** tab is performed in the same way as in the catalog. For more information about selecting data, see "Data catalog" (p. 138).

Selecting data using the Archive view

1. Expand the required archive and select one of the successive backups by its creation date and time. Thus, you can revert the disk data to a certain moment in time.

   If the list of archives is not displayed (for example, if the archive metadata has been lost), click **Refresh**.

   If the list of archives is too long, you can filter the archives by selecting only the required type of archives to display. To do this, select the required archive type in the **Show** list.

   Note for Microsoft Exchange users: *For information about selecting Microsoft Exchange data, refer to the "Selecting the Exchange data by using the Archive view" section of the "Backing up Microsoft Exchange Server data" documentation.*

2. For disk or volume backups only: in the **Backup contents**, select the type of data to display from the drop-down box:
   - **Disks** - to recover disks as a whole (with all their volumes).
   - **Volumes** - to recover individual basic and/or dynamic volumes.
   - **Files** - to recover individual files and folders.
   - **Microsoft SQL databases** - to recover Microsoft SQL databases from single-pass disk and application backups.
   - **Microsoft Active Directory** - to extract Microsoft Active Directory data from single-pass disk and application backups.

 Copyright © Acronis International GmbH, 2002-2013.

3. In the **Backup contents**, select the check boxes for the items you need to recover.
4. Click **OK**.

Selecting MBR
When recovering a system volume, you will usually select the disk's MBR if:

- The operating system cannot boot.
- The disk is new and does not have MBR.
- You are recovering custom or non-Windows boot loaders (such as LILO and GRUB).
- The disk geometry is different to that stored in the backup.

There are probably other times when you may need to recover the MBR, but the above are the most common.

When recovering the MBR of one disk to another Acronis Backup & Recovery 11.5 recovers Track 0, which does not affect the target disk's partition table and partition layout. Acronis Backup & Recovery 11.5 automatically updates Windows loaders after recovery, so there is no need to recover the MBR and Track 0 for Windows systems, unless the MBR is damaged.

5.1.1.1 Selecting archive location

Location	Details
Online backup storage	If the archive is stored in Acronis Online Backup Storage, click **Log in** and specify the credentials to log in to the online storage. Then, expand the **Online backup storage** group and select the account. *Exporting and mounting are not supported for backups stored in Acronis Online Backup Storage.*
Personal	If the archive is stored in a personal vault, expand the **Personal** group and click the required vault.
Centralized	If the archive is stored in a centralized vault, expand the **Centralized** group and click the appropriate vault.
Machine name	Local machine
Local folders	If the archive is stored in a local folder on the machine, expand the **<Machine name>** group and select the required folder.
CD, DVD, BD	If the archive is stored on optical media such as CD, DVD, or Blu-ray Discs (BD), expand the **<Machine name>** group, then select the required drive. First insert the last disc. Then insert the discs in order starting from the first one when the program prompts.
RDX, USB	If the archive is stored on an RDX drive or USB flash drive, expand the **<Machine name>** group, then select the required drive. For information about using these drives, see the "Removable devices (p. 200)" section.
Tape device	If the archive is stored on a locally attached tape device, expand the **Tape devices** group, then click the required device. In stand-alone editions of Acronis Backup & Recovery 11.5, tape devices are available only if you have upgraded from Acronis Backup & Recovery 10. For information about using tapes, see the "Tape devices" (p. 201) section.

Copyright © Acronis International GmbH, 2002-2013.

Location	Details
Network folders	If the archive is stored on a network share, expand the **Network folders** group, then select the required networked machine and then click the shared folder. If the network share requires access credentials, the program will ask for them. ***Note for Linux users:*** *To specify a Common Internet File System (CIFS) network share which is mounted on a mount point such as /mnt/share, select this mount point instead of the network share itself.*
FTP, SFTP	If the archive is stored on an FTP or SFTP server, type the server name or address in the **Path** field as follows: **ftp://ftp_server:port _number or sftp://sftp_server:port number** To establish an active mode FTP connection, use the following notation: **aftp://ftp_server:port _number** If the port number is not specified, port 21 is used for FTP and port 22 is used for SFTP. After entering access credentials, the folders on the server become available. Click the appropriate folder on the server. You can access the server as an anonymous user if the server enables such access. To do so, click **Use anonymous access** instead of entering credentials. *According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.*
Storage nodes	When working in the operating system, access a storage node by selecting the respective centralized vault. When operating on a machine booted with bootable media: ▪ To access a managed vault, type the following string in the **Path** field: **bsp://node_address/vault_name/** ▪ To access an unmanaged centralized vault, type the full path to the vault's folder.
NFS drives	If the archive is stored on an NFS share, expand the **NFS drives** group and click the folder. Available only in Linux and under Linux-based bootable media.

5.1.1.2 Data catalog

Data catalog lets you easily find the required version of data and select it for recovery. On a managed machine, the data catalog functionality is available through the **Data view** tab for any vault accessible from this machine. On the management server, the catalog functionality is available through both **Data view** and the centralized **Data catalog**. The centralized data catalog displays in a single place all the data stored in the centralized managed vaults.

Acronis Backup & Recovery 11.5 may upload data catalog files from a vault to a local cache folder. By default, this folder is located on the disk where the operating system is installed. For information about changing the default cache folder, refer to the "Changing the default cache folder for catalog files" (p. 195) section.

Selecting the backed-up data for recovery

1. Do any of the following:
   - To access the **Data view** tab, connect the console to a machine or to the management server, navigate to **Vaults** view, and click the required vault.

 Copyright © Acronis International GmbH, 2002-2013.

- To access the **Data catalog**, connect the console to the management server and select **Data catalog** in the **Navigation** tree.

2. In the **Show** field, select the type of data to display:
   - Select **Machines/disks/volumes** to browse and search for entire disks and volumes in disk-level backups.
   - Select **Folders/files** to browse and search for files and folders in both file-level and disk-level backups.
   - Select **Microsoft Exchange Information Store** to browse and search for information stores, individual storage groups or databases in the database-level backups.

     Select **Microsoft Exchange Mailboxes** to browse and search for entire mailboxes, public folders, individual folders, e-mails, calendar events, tasks, contacts, notes both in the database-level and mailbox-level backups.

     For information about selecting Microsoft Exchange data, refer to the "Selecting the Exchange data by using the Data view or Data catalog" section of the "Backing up Microsoft Exchange Server data" documentation.
   - Select **Microsoft SQL databases** to browse and search for Microsoft SQL databases in single-pass disk and application backups.
   - Select **Microsoft Active Directory** to find Microsoft Active Directory data in single-pass disk and application backups.
3. In the **Display data backed up for** field, specify the time period for which the backed-up data will be displayed.
4. Do any of the following:
   - Select the data to recover in the catalog tree, or in the table to the right of the catalog tree.
   - In the search string, type the information that helps to identify the required data items (this can be a machine name, a file or folder name, or a disk label) and then click **Search**. You can use the asterisks (*) and question marks (?) wildcards.

     As a result, in the **Search** window, you will see the list of backed up data items whose names fully or partially coincide with the entered value. If the list of matches is too long, you can refine the search criteria by specifying the date or time range of backup creation, and the size range of backed up items. When the required data is found, select it, and click **OK** to return to the **Data catalog/Data view**.
5. Use the **Versions** list to select the point of time to revert the data to. By default, the data will be reverted to latest point of time available for the time period selected in step 3.

   [Optionally, applicable to the **Data catalog** only] If the backed-up data has multiple replicas stored on more than one location, you can select the location to recover the data from. To access information about locations of the selected data, right-click its version and then click **Change the vault to recover from**. By default, the location that provides the fastest access to the data is selected. Local hard disk drives are the fastest, tapes - the slowest.
6. Having selected the required data, click **Recover** and configure the parameters of the recovery operation.

What if the data does not appear in the catalog or the data view

The probable reasons of the issue are as follows.

Wrong time period is set

The required data was not backed up during the time period set by the **Display data backed up for** control.

 Copyright © Acronis International GmbH, 2002-2013.

Solution: Try to increase the time period.

Cataloging is disabled or fast cataloging is turned on

If the data is displayed partially or is not displayed at all, most likely cataloging was disabled or the fast cataloging (p. 111) was turned on during backup.

Solutions:

- If cataloging is disabled
  - On a managed machine: Enable cataloging in the **Backup cataloging** option (**Options** > **Machine options**).
  - On the management server: Enable cataloging by modifying the Windows registry.
  - On the storage node(s): Enable cataloging by modifying the Windows registry.
- Run the full cataloging manually by clicking **Catalog now**. For the **Data catalog**, all backups stored in the managed vaults will be cataloged. For the **Data view** tab, only the backups stored on the selected vault will be cataloged. The backups that have already been cataloged, will not be cataloged again.
- Since cataloging a large number of backed up data may take a long time, you may prefer to use the **Archive view** of the respective vault. For more information about using the **Archive view**, see "Browsing the vault contents and data selection" in the "Working with vaults" (p. 183) section.

The data is not supported by the catalog

The following data cannot be displayed in the catalog or data view:

- Data from the encrypted and password-protected archives.
- Data from encrypted managed vaults.
- Data backed up to removable media, such as CD, DVD, BD, Iomega REV, RDX or USB devices.
- Data backed up to Acronis Online Backup Storage.
- Data backed up using Acronis True Image Echo or earlier product versions.
- Data backed up using the simplified backup naming.

Solution: To be able to browse such data, use the **Archive view** tab of the respective vault.

The data is not included in the centralized catalog

The centralized catalog does not display data from centralized unmanaged vaults or from personal vaults (p. 193).

Solution for centralized unmanaged vaults: Select the vault in the **Navigation tree**, and then select **Data view**.

Solution for personal vaults: Connect directly to the machine, select the vault and then select **Data view**.

5.1.2 Access credentials for location

Specify the credentials required for access to the location where the backup is stored.

To specify credentials

1. Select one of the following:
   - **Use the task credentials**

 Copyright © Acronis International GmbH, 2002-2013.

The software will access the location using the credentials of the task account specified in the **Task parameters** section.

- **Use the following credentials**

  The software will access the location using the credentials you specify. Use this option if the task account does not have access permissions to the location. You might need to provide special credentials for a network share or a storage node vault.

  Specify:

  - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
  - **Password**. The password for the account.

2. Click **OK**.

According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

5.1.3 Access credentials for destination

To specify credentials

1. Select one of the following:

   - **Use the task credentials**

     The program will access the destination using the credentials of the task account specified in the **Task parameters** section.

   - **Use the following credentials**

     The program will access the destination using the credentials you specify. Use this option if the task account does not have access permissions to the destination.

     Specify:

     - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
     - **Password**. The password for the account.

2. Click **OK**.

5.1.4 Where to recover

Specify the destination the selected data will be recovered to.

5.1.4.1 Selecting target disks

Available disk or volume destinations depend on the agents operating on the machine.

Recover to:

Physical machine

Available when the Acronis Backup & Recovery 11.5 Agent for Windows or Agent for Linux is installed.

The selected disks will be recovered to the physical disks of the machine the console is connected to. On selecting this, you proceed to the regular disk mapping procedure described below.

New virtual machine

Copyright © Acronis International GmbH, 2002-2013.

- *If Acronis Backup & Recovery 11.5 Agent for Windows or Agent for Linux is installed.*

  The selected disks will be recovered to a new virtual machine of any of the following types: VMware Workstation, Microsoft Virtual PC, Red Hat Kernel-based Virtual Machine (KVM), Red Hat Enterprise Virtualization (RHEV), or Citrix XenServer Open Virtual Appliance (OVA).

  The virtual machine files will be saved to the destination you specify in the **Storage** section. By default, the new virtual machine will be created in the current user's documents folder.
- *If Acronis Backup & Recovery 11.5 Agent for Hyper-V or Agent for ESX(i) is installed.*

  These agents enable creating a new virtual machine on the virtualization server you specify.

  By default, the new virtual machine will be created in the default storage of the virtualization server. Whether you can change the storage on the virtualization server or not, depends on the virtualization product brand and settings. VMware ESX(i) may have multiple storages. A Microsoft Hyper-V server enables creating a new virtual machine in any local folder.

The new virtual machine will be configured automatically, the source machine configuration being copied where possible. The configuration is displayed in the **Virtual Machine Settings** (p. 179) section. Check the settings and make changes if necessary.

Then you proceed to the regular disk mapping procedure described below.

Existing virtual machine

Available when the Acronis Backup & Recovery 11.5 Agent for Hyper-V or Agent for ESX(i) is installed.

On selecting this, you specify the virtualization server and the target virtual machine. Then you proceed to the regular disk mapping procedure described below.

Please be aware that the target machine will be powered off automatically before the recovery. If you prefer to power it off manually, modify the VM power management option.

Disks/volumes

Map automatically

Acronis Backup & Recovery 11.5 attempts to map the selected disks to the target disks as described in the "How the automatic mapping works" (p. 143) section. If you are unsatisfied with the mapping result, you can re-map disks manually. To do this, you have to unmap the disks in a reverse order; that is, the last mapped disk should be unmapped first. Then, map the disks manually as described below.

Disk #:

Disk # (MODEL) (p. 142)

Select the destination disk for each of the source disks.

NT signature (p. 143)

Select the way the recovered disk's signature will be handled. The disk signature is used by Windows and the Linux kernel version 2.6 and later.

Disk destination

To specify a destination disk:

1. Select a disk where you want the selected disk to recover to. The destination disk's space should be at least the same size as the uncompressed image data.
2. Click **OK**.

 Copyright © Acronis International GmbH, 2002-2013.

All the data stored on the target disk will be replaced by the backed-up data, so be careful and watch out for non-backed-up data that you might need.

NT signature

The NT signature is a record that is kept in the MBR. It uniquely identifies the disk for the operating system.

When recovering a disk containing a system volume, you can choose what to do with the NT signature of the target disk. Specify any of the following parameters:

- **Select automatically**

  The software will keep the NT signature of the target disk if it is the same as the NT signature stored in the backup. (In other words, if you recover the disk to the same disk that was backed up.) Otherwise, the software will generate a new NT signature for the target disk.

  This is the default selection recommended in most cases. Use the following settings only if you absolutely need to.
- **Create new**

  Acronis Backup & Recovery 11.5 will generate a new NT signature for the target hard disk.
- **Recover from backup**

  Acronis Backup & Recovery 11.5 will replace the NT signature of the target hard disk with one from the disk backup.

  ***Note**: You should be absolutely sure that none of the existing disks on this machine has the same NT signature. Otherwise, the operating system runs from the first disk at the startup; discovers the same signature on the second one, automatically generates a new unique NT signature and assigns it to the second disk. As a result, all the volumes on the second disk will lose their letters, all paths will be invalid on the disk, and programs won't find their files. The operating system on that disk will be unbootable.*

  Recovering the disk signature may be desirable due to the following reasons:

  - Acronis Backup & Recovery 11.5 schedules tasks using the signature of the source hard disk. If you recover the same disk signature, you don't need to re-create or edit the tasks created previously.
  - Some installed applications use disk signature for licensing and other purposes.
  - This enables you to keep all the Windows Restore Points on the recovered disk.
  - To recover VSS snapshots used by Windows Vista's "Previous Versions" feature.
- **Keep existing**

  The program will leave the NT signature of the target hard disk untouched.

How the automatic mapping works

Acronis Backup & Recovery 11.5 automatically maps the disks or volumes to the target disks only if the system bootability can be preserved. Otherwise, the automatic mapping is canceled and you have to map the disks or volumes manually.

Also, you have to map the volumes manually if they are Linux logical volumes, or Linux software RAID (MD devices). For more information on recovering logical volumes and MD devices, see Recovering MD devices and logical volumes (p. 45).

The automatic mapping is performed as follows.

 Copyright © Acronis International GmbH, 2002-2013.

1. If the disk or volume is recovered to its original location, the mapping process reproduces the original disk/volume layout.

   The original location for a disk or volume means exactly the same disk or volume that has been backed up. A volume will not be considered original if its size, location or other physical parameters have been changed after backup. Changing the volume letter or label does not prevent the software from recognizing the volume.

2. If the disk or volume is recovered to a different location:
   - **When recovering disks**: The software checks the target disks for size and volumes. A target disk must contain no volumes and its size must be large enough to place the disk being recovered. Not initialized target disks will be initialized automatically.

     If the required disks cannot be found, you have to map the disks manually.
   - **When recovering volumes**: The software checks the target disks for unallocated space.

     If there is enough unallocated space, the volumes will be recovered "as is".

     If unallocated space on the target disks is less than the size of the volumes being recovered, the volumes will be proportionally shrunk (by decreasing their free space) in order to fit the unallocated space. If the shrunk volumes still cannot fit the unallocated space, you have to map the volumes manually.

Support for Advanced Format (4K-sector) hard disks

Acronis Backup & Recovery 11.5 can back up hard disks with a sector size of 4 KB (known as Advanced Format disks), as well as traditional hard disks that have 512-byte sectors.

Acronis Backup & Recovery 11.5 can recover data from one disk to another as long as *both disks have the same logical sector size*. (This is the sector size presented to the operating system.) Acronis Backup & Recovery 11.5 automatically aligns the disk's volumes (p. 148) if necessary. This way, the start of a cluster in the file system always matches the start of a physical sector on the disk.

The disk management (p. 272) functionality of Acronis Backup & Recovery 11.5 is not available for disks with a 4-KB logical sector size.

Determining the logical sector size

By disk specification

Development of the Advanced Format technology is coordinated by the International Disk Drive Equipment and Materials Association (IDEMA). For more details, see http://www.idema.org/?page_id=2.

In terms of the logical sector size, IDEMA specifies two types of Advanced Format disks:

- **512 Byte emulation (512e)** disks have a 512-byte logical sector size. These disks are supported in Windows starting with Windows Vista, and in modern Linux distributions. Microsoft and Western Digital use the term "Advanced Format" exclusively for this type of disk.
- **4K native (4Kn)** disks have a 4-KB logical sector size. Modern operating systems can store data on these disks, but they generally cannot boot from these disks. These disks are commonly external drives with USB connection.

By running the appropriate command

To find out the logical sector size of a disk, do the following.

In Windows:

 Copyright © Acronis International GmbH, 2002-2013.

1. Make sure that the disk contains an NTFS volume.
2. Run the following command as an administrator, specifying the drive letter of the NTFS volume:

   ```
   fsutil fsinfo ntfsinfo D:
   ```

3. Examine the value in the **Bytes Per Sector** line. For example, the output may be the following:

   ```
   Bytes Per Sector : 512
   ```

In Linux:

1. Determine the device name of the disk, such as /dev/sdb.
2. Run the following command as the root user, specifying the device name:

   ```
   parted /dev/sdb print
   ```

3. Examine the first value in the **Sector size (logical/physical)** line. For example, the output may be the following:

   ```
   Sector size (logical/physical): 512B/4096B
   ```

5.1.4.2 Selecting target volumes

Available volume destinations depend on the agents operating on the machine.

Recover to:

Physical machine

Available when the Acronis Backup & Recovery 11.5 Agent for Windows or Agent for Linux is installed.

The selected volumes will be recovered to the physical disks of the machine the console is connected to. On selecting this, you proceed to the regular volume mapping procedure described below.

New virtual machine

- *If Acronis Backup & Recovery 11.5 Agent for Windows or Agent for Linux is installed.*

  The selected volumes will be recovered to a new virtual machine of any of the following types: VMware Workstation, Microsoft Virtual PC, Red Hat Kernel-based Virtual Machine (KVM), Red Hat Enterprise Virtualization (RHEV), or Citrix XenServer Open Virtual Appliance (OVA).

  The virtual machine files will be saved to the destination you specify in the **Storage** section. By default, the new virtual machine will be created in the current user's documents folder.

- *If Acronis Backup & Recovery 11.5 Agent for Hyper-V or Agent for ESX(i) is installed.*

  These agents enable creating a new virtual machine on the virtualization server you specify.

  By default, the new virtual machine will be created in the default storage of the virtualization server. Whether you can change the storage on the virtualization server or not, depends on the virtualization product brand and settings. VMware ESX(i) may have multiple storages. A Microsoft Hyper-V server enables creating a new virtual machine in any local folder.

The new virtual machine will be configured automatically, the source machine configuration being copied where possible. The configuration is displayed in the **Virtual Machine Settings** (p. 179) section. Check the settings and make changes if necessary.

Then you proceed to the regular volume mapping procedure described below.

 Copyright © Acronis International GmbH, 2002-2013.

Existing virtual machine

Available when the Acronis Backup & Recovery 11.5 Agent for Hyper-V or Agent for ESX(i) is installed.

On selecting this, you specify the virtualization server and the target virtual machine. Then you proceed to the regular volume mapping procedure described below.

Please be aware that the target machine will be powered off automatically before recovery. If you prefer to power it off manually, modify the VM power management option.

Disks/volumes

Map automatically

Acronis Backup & Recovery 11.5 attempts to map the selected volumes to the target disks as described in the "How the automatic mapping works" (p. 143) section. If you are unsatisfied with the mapping result, you can re-map volumes manually. To do this, you have to unmap the volumes in a reverse order; that is, the last mapped volume should be unmapped first. Then, map the volumes manually as described below.

Recover [Disk #] MBR to: [If the Master Boot Record is selected for recovery]

Disk # (p. 146)

Choose the disk to recover the Master Boot Record to.

NT signature: (p. 143)

Select the way the disk's signature contained in the MBR will be handled. The disk signature is used by Windows and the Linux kernel version 2.6 and later.

Recover [Volume] [Letter] to:

Disk # /Volume

Sequentially map each of the source volumes to a volume or an unallocated space on the destination disk.

Size: (p. 147)

[Optional] Change the recovered volume size, location and other properties.

MBR destination

To specify a destination disk:

1. Select the disk to recover the MBR to.
2. Click **OK**.

Volume destination

To specify a target volume or unallocated space

1. Select a volume or unallocated space where you want the selected volume to be recovered to. The destination volume/unallocated space should be at least the same size as the uncompressed image data.
2. Click **OK**.

All the data stored on the target volume will be replaced by the backed-up data, so be careful and watch out for non-backed-up data that you might need.

Copyright © Acronis International GmbH, 2002-2013.

When using bootable media

Disk letters seen under Windows-style bootable media might differ from the way Windows identifies drives. For example, the D: drive in the rescue utility might correspond to the E: drive in Windows.

Be careful! To be on the safe side, it is advisable to assign unique names to the volumes.

The Linux-style bootable media shows local disks and volumes as unmounted (sda1, sda2...).

Changing volume properties

Size and location

When recovering a volume to a basic MBR disk, you can resize and relocate the volume by dragging it or its borders with a mouse or by entering corresponding values in the appropriate fields. Using this feature, you can redistribute the disk space between the volumes being recovered. In this case, you will have to recover the volume to be reduced first.

Note: *Volumes backed up using the sector-by-sector option cannot be resized.*

Tip: *A volume cannot be resized when being recovered from a backup split into multiple removable media. To be able to resize the volume, copy all parts of the backup to a single location on a hard disk.*

Type

A basic MBR disk can contain up to four primary volumes or up to three primary volumes and multiple logical drives. By default, the program selects the original volume's type. You can change this setting, if required.

- **Primary**. Information about primary volumes is contained in the MBR partition table. Most operating systems can boot only from the primary volume of the first hard disk, but the number of primary volumes is limited.

  If you are going to recover a system volume to a basic MBR disk, select the Active check box. Active volume is used for loading an operating system. Choosing active for a volume without an installed operating system could prevent the machine from booting. You cannot set a logical drive or dynamic volume active.
- **Logical**. Information about logical volumes is located not in the MBR, but in the extended partition table. The number of logical volumes on a disk is unlimited. A logical volume cannot be set as active. If you recover a system volume to another hard disk with its own volumes and operating system, you will most likely need only the data. In this case, you can recover the volume as logical to access the data only.

File system

By default, the recovered volume will have the same file system as the original volume has. You can change the volume's file system during recovery, if required.

Acronis Backup & Recovery 11.5 can make the following file system conversions: FAT 16 -> FAT 32 and Ext2 -> Ext3. For volumes with other native file systems, this option is not available.

Assume you are going to recover a volume from an old, low-capacity FAT16 disk to a newer disk. FAT16 would not be effective and might even be impossible to set on the high-capacity hard disk. That's because FAT16 supports volumes up to 4 GB, so you will not be able to recover a 4 GB FAT16 volume to a volume that exceeds that limit, without changing the file system. It would make sense here to change the file system from FAT16 to FAT32.

 Copyright © Acronis International GmbH, 2002-2013.

Older operating systems (MS-DOS, Windows 95 and Windows NT 3.x, 4.x) do not support FAT32 and will not be operable after you recover a volume and change its file system. These can be normally recovered on a FAT16 volume only.

Volume (partition) alignment

Acronis Backup & Recovery 11.5 automatically eliminates volume misalignment – a situation, when volume clusters are not aligned with disk sectors. The misalignment occurs when recovering volumes created with the Cylinder/Head/Sector (CHS) addressing scheme to a hard disk drive (HDD) or solid-state drive (SSD) drive that has a 4-KB sector size. The CHS addressing scheme is used, for example, in all Windows operating systems earlier than Windows Vista.

If volumes are misaligned, the cluster overlaps more physical sectors than it would have occupied if aligned. As a result, more physical sectors need to be erased and rewritten each time the data changes. The redundant read/write operations noticeably slow down the disk speed and overall system performance. SSD drive misalignment decreases not only system performance, but drive lifetime. Since SSD memory cells are designed for a certain amount of read/write operations, redundant read/write operations lead to early degradation of the SSD drive.

When recovering dynamic volumes and logical volumes created in Linux with Logical Volume Manager (LVM), the appropriate alignment is set up automatically.

When recovering basic MBR and GPT volumes, you can select the alignment method manually if the automatic alignment does not satisfy you for some reason. The following options are available:

- **Select automatically** - (Default) recommended. The software will automatically set the appropriate alignment based on the source and target disk/volume properties.

  Use the following options only if you absolutely need to.

  - **CHS (63 sectors)** - select this option if the recovered volume will be used under Microsoft Windows XP and Windows Server 2003 (or earlier) on disks having 512 bytes per physical sector.
  - **VMware VMFS (64 KB)** - select this option when recovering the volume as a VMware Virtual Machine File System partition.
  - **Vista alignment (1 MB)** - select this option if the recovered volume will be used under Windows operating systems starting with Windows Vista, or when recovering volumes to an HDD or SSD drive that has a 4-KB sector size.
  - **Custom** - Specify the volume alignment manually. It is recommended that the value be a multiple of the physical sector size.

Logical drive letter (for Windows only)

By default, the first unused letter will be assigned to the volume. To assign other letter, select the desired letter from a drop-down list.

If you select the empty value, no letter will be assigned to the recovered volume, hiding it from the OS. You should not assign letters to volumes that are inaccessible to Windows, such as to those other than FAT and NTFS.

5.1.4.3 Selecting target location for files and folders

Where to recover

Destination

 Copyright © Acronis International GmbH, 2002-2013.

Select a location to recover the backed-up files to:

- **Original location**

  Files and folders will be recovered to the same path(s) as they are in the backup. For example, if you have backed up all files and folders in *C:\Documents\Finance\Reports*, the files will be recovered to the same path. If the folder does not exist, it will be created automatically.

- **New location**

  Files will be recovered to the location that you specify in the tree. The files and folders will be recovered without recreating a full path, unless you clear the **Recover without full path** check box.

Overwriting

Choose what to do if the program finds in the target folder a file with the same name as in the archive:

- **Overwrite existing files** – this will give the file in the backup priority over the file on the hard disk.
- **Overwrite an existing file if it is older** – this will give priority to the most recent file modification, whether it be in the backup or on the disk.
- **Do not overwrite existing files** – this will give the file on the hard disk priority over the file in the backup.

If you allow files to be overwritten, you still have an option to prevent overwriting of specific files by excluding them from the recovery operation.

Recovery exclusions (p. 149)

Specify files and folders you do not wish to be recovered.

Recovery exclusions

Set up exclusions for the specific files and folders you do not wish to recover.

Note: *Exclusions override selection of data items to recover. For example, if you select to recover file MyFile.tmp and to exclude all .tmp files, file MyFile.tmp will not be recovered.*

Use the **Add**, **Edit**, **Remove** and **Remove All** buttons to create the list of files and folders to exclude. Specify the name of the file or folder, such as Document.txt.

The names are *not* case-sensitive in Windows and Linux. For example, if you choose to exclude all .tmp files and the Temp folders, also excluded will be all .Tmp files, all .TMP files, and the TEMP folders.

You can use one or more wildcard characters * and ?:

- The asterisk (*) substitutes for zero or more characters. For example, Doc*.txt covers files such as Doc.txt and Document.txt.
- The question mark (?) substitutes for exactly one character. For example, Doc?.txt covers files such as Doc1.txt and Docs.txt, but not the files Doc.txt or Doc11.txt.

Exclusion examples

Criterion	Example	Description

 Copyright © Acronis International GmbH, 2002-2013.

By name	F.log F	Excludes all files named "F.log" Excludes all folders named "F"
By mask (*)	*.log F*	Excludes all files with the .log extension Excludes all files and folders with names starting with "F" (such as folders F, F1 and files F.log, F1.log)
By mask (?)	F???.log	Excludes all .log files with names consisting of four symbols and starting with "F"

5.1.5 When to recover

Select when to start the recovery task:

- **Now** - the recovery task will be started immediately after you click **OK** on the **Recover data** page.
- **Later** - the recovery task will be started manually afterwards. If you need to schedule the task, clear the **Task will be started manually** check box, and specify the required date and time.

5.1.6 Task credentials

Provide credentials for the account under which the task will run.

To specify credentials

1. Select one of the following:
   - **Run under the current user**

     The task will run under the credentials with which the user who starts the tasks is logged on. If the task has to run on schedule, you will be asked for the current user's password on completing the task creation.
   - **Use the following credentials**

     The task will always run under the credentials you specify, whether started manually or executed on schedule.

     Specify:
     - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
     - **Password**. The password for the account.
2. Click OK.

To learn more about using credentials in Acronis Backup & Recovery 11.5, see the "Credentials used in backup plans and tasks" (p. 34) section.

To learn more about operations available depending on the user privileges, see the "User privileges on a managed machine" (p. 36) section.

5.2 Acronis Universal Restore

Acronis Universal Restore is the Acronis proprietary technology that helps recover and boot up an operating system on dissimilar hardware or a virtual machine. Universal Restore handles differences in devices that are critical for the operating system start-up, such as storage controllers, motherboard or chipset.

 Copyright © Acronis International GmbH, 2002-2013.

Universal Restore is extremely useful in the following scenarios:

1. Instant recovery of a failed system on different hardware.
2. Hardware-independent cloning and deployment of operating systems.
3. Physical-to-physical, physical-to-virtual and virtual-to-physical machine migration.

5.2.1 Getting Universal Restore

Universal Restore is always available when recovering a system from the online storage.

Universal Restore comes free with the Acronis Backup & Recovery 11.5 Advanced Server SBS Edition and Virtual Edition.

Universal Restore for the other product editions is purchased separately. It has its own license.

To enable Universal Restore on a managed machine, do any of the following:

- Install Universal Restore from the product installation package (in addition to Agent for Windows, Agent for Linux or Bootable Media Builder).
- If the agent is already installed, you can connect the management console to the machine, click **Help > Change license** and specify the license key or the license server from where to take the Universal Restore license.

You need to re-create bootable media to make the newly installed add-on operational in the bootable environment.

5.2.2 Using Universal Restore

During recovery

Universal Restore is available when configuring a disk or volume recovery, if a Windows or Linux operating system is present in your selection of disks or volumes. If there are more than one operating systems in your selection, you can apply Universal Restore to all Windows systems, all Linux systems or to both Windows and Linux systems.

If the software cannot detect whether an operating system is present in the backup, it suggests using Universal Restore on the off-chance of the system presence. These cases are as follows:

- the backup is split into several files
- the backup is located in a deduplicating vault, in Acronis Online Backup Storage, on an FTP/SFTP server, tape, CD or DVD.

Sometimes Universal Restore is applied in the background because the software knows what drivers or modules are required for the supported virtual machines. These cases are as follows:

- recovering a system to a new virtual machine
- recovering a system to any virtual machine by means of Agent for ESX(i) or Agent for Hyper-V.

Universal Restore is not available when:

- the backup is located in Acronis Secure Zone
- you have chosen to use Acronis Active Restore (p. 442)

This is because these features are primarily meant for instant data recovery on the same machine.

 Copyright © Acronis International GmbH, 2002-2013.

Without recovery

Under bootable media, you can also use Universal Restore without recovery by clicking **Apply Universal Restore** in the media welcome screen. Universal Restore will be applied to the operating system that already exists on the machine. If there are multiple operating systems, you are prompted to choose the one to apply Universal Restore to.

5.2.2.1 Universal Restore in Windows

Preparation

Prepare drivers

Before applying Universal Restore to a Windows operating system, make sure that you have the drivers for the new HDD controller and the chipset. These drivers are critical to start the operating system. Use the CD or DVD supplied by the hardware vendor or download the drivers from the vendor's Web site. The driver files should have the *.inf, *.sys or *.oem extensions. If you download the drivers in the *.exe, *.cab or *.zip format, extract them using a third-party application.

The best practice is to store drivers for all the hardware used in your organization in a single repository sorted by device type or by the hardware configurations. You can keep a copy of the repository on a DVD or a flash drive; pick some drivers and add them to the bootable media; create the custom bootable media with the necessary drivers (and the necessary network configuration) for each of your servers. Or, you can simply specify the path to the repository every time Universal Restore is used.

Check access to the drivers in bootable environment

Make sure you have access to the device with drivers when working under bootable media. Even if you configure system disk recovery in a Windows environment, the machine will reboot and recovery will proceed in the Linux-based environment. Use WinPE-based media if the device is available in Windows but Linux-based media does not detect it.

What if you do not have drivers

Windows 7 includes more drivers than the older Windows operating systems. There is a great chance that Universal Restore finds all necessary drivers in the Windows 7 driver folder. So, you may not necessarily have to specify the external path to the drivers. Nevertheless, performing Universal Restore is critical so the system uses the correct drivers.

*The Windows default driver storage folder is determined in the registry value **DevicePath**, which can be found in the registry key **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion**. This storage folder is usually WINDOWS/inf.*

Universal Restore settings

Automatic driver search

Specify where the program will search for the Hardware Abstraction Layer (HAL), HDD controller driver and network adapter driver(s):

- If the drivers are on a vendor's disc or other removable media, turn on the **Search removable media**.
- If the drivers are located in a networked folder or on the bootable media, specify the path to the folder by clicking **Add folder**.

 Copyright © Acronis International GmbH, 2002-2013.

During recovery, Universal Restore will perform the recursive search in all the sub-folders of the specified folder, find the most suitable HAL and HDD controller drivers of all those available, and install them into the recovered system. Universal Restore also searches for the network adapter driver; the path to the found driver is then transmitted by Universal Restore to the operating system. If the hardware has multiple network interface cards, Universal Restore will try to configure all the cards' drivers.

Mass storage drivers to install anyway

To access this setting, expand **Show mass storage drivers to install anyway**.

You need this setting if:

- The target hardware has a specific mass storage controller such as RAID (especially NVIDIA RAID) or a fibre channel adapter.
- You recover a system to a virtual machine that uses a SCSI hard drive controller and is booted into bootable media. Use SCSI drivers bundled with your virtualization software or download the latest drivers versions from the software manufacturer Web site.
- If the automatic drivers search does not help to boot the system.

Specify the appropriate drivers by clicking **Add driver**. The drivers defined here will be installed, with appropriate warnings, even if the program finds a better driver.

The recovery process

If Universal Restore cannot find a compatible driver in the specified locations, it will display a prompt with the problem device. Do any of the following:

- Add the driver to any of the previously specified locations and click **Retry**.
- If you do not remember the location, continue the recovery. If the result is not satisfactory, start Universal Restore without recovery by clicking **Apply Universal Restore** in the media welcome screen. When configuring the operation, specify the necessary driver.

Once Windows boots, it will initialize the standard procedure for installing new hardware. The network adapter driver will be installed silently if the driver has the Microsoft Windows signature. Otherwise, Windows will ask for confirmation on whether to install the unsigned driver.

After that, you will be able to configure the network connection and specify drivers for the video adapter, USB and other devices.

5.2.2.2 Universal Restore in Linux

Universal Restore can be applied to Linux operating systems with a kernel version of 2.6.8 or later.

When Universal Restore is applied to a Linux operating system, it updates a temporary file system known as the initial RAM disk (initrd). This ensures that the operating system can boot on the new hardware.

Universal Restore adds modules for the new hardware (including device drivers) to the initial RAM disk. As a rule, it finds the necessary modules in the **/lib/modules** directory of the operating system you are recovering. If Universal Restore cannot find a module it needs, it records the module's file name into the log (p. 338).

 Copyright © Acronis International GmbH, 2002-2013.

Universal Restore may modify the configuration of the GRUB boot loader. This may be required, for example, to ensure the system bootability when the new machine has a different volume layout than the original machine.

Universal Restore never modifies the Linux kernel.

Reverting to the original initial RAM disk

You can revert to the original initial RAM disk if necessary.

The initial RAM disk is stored on the machine in a file. Before updating the initial RAM disk for the first time, Universal Restore saves a copy of it to the same directory. The name of the copy is the name of the file, followed by the **_acronis_backup.img** suffix. This copy will not be overwritten if you run Universal Restore more than once (for example, after you have added missing drivers).

To revert to the original initial RAM disk, do any of the following:

- Rename the copy accordingly. For example, run a command similar to the following:

```
mv initrd-2.6.16.60-0.21-default_acronis_backup.img
initrd-2.6.16.60-0.21-default
```

- Specify the copy in the **initrd** line of the GRUB boot loader configuration (p. 161).

5.2.2.3 Applying Universal Restore to multiple operating systems

During recovery, you can use Universal Restore for operating systems of a certain type: all Windows systems, all Linux systems, or both.

If your selection of volumes to recover contains multiple Windows systems, you can specify all drivers for them in a single list. Each driver will be installed in the operating system for which it is intended.

5.3 Recovering BIOS-based systems to UEFI-based and vice versa

Acronis Backup & Recovery 11.5 supports transferring 64-bit Windows operating systems between BIOS-based hardware and hardware that supports Unified Extensible Firmware Interface (UEFI).

How it works

Depending on whether the machine uses BIOS or UEFI firmware for booting, the disk with the system volume must have a specific *partition style*. The partition style is master boot record (MBR) for BIOS, and GUID partition table (GPT) for UEFI.

In addition, the operating system itself is sensitive to the type of firmware.

When performing a recovery to a machine that has a type of firmware that is different from the firmware of the original machine, Acronis Backup & Recovery 11.5:

- Initializes the disk to which you are recovering the system volume either as an MBR disk or as a GPT disk, depending on the new firmware.
- Adjusts the Windows operating system so that it can start on the new firmware.

For details, including the list of Windows operating systems that can be adjusted this way, see “Recovering volumes” (p. 155) and “Recovering disks” (p. 156) in this section.

 Copyright © Acronis International GmbH, 2002-2013.

Recommendations

- Recover the entire system onto uninitialized disks.
- When migrating to UEFI-based hardware, use Linux-based bootable media or WinPE-based bootable media of versions later than 4.0. Earlier versions of WinPE and Acronis PXE Server do not support UEFI.
- Remember that BIOS does not allow using more than 2 TB of disk space.

Limitations

Transferring a Linux system between UEFI and BIOS is not supported.

Transferring a Windows system between UEFI and BIOS is not supported if a backup is stored in any of these locations:

- Acronis Online Backup Storage
- Tape device
- Optical discs (CDs, DVDs, or Blu-ray discs)

When transferring a system between UEFI and BIOS is not supported, Acronis Backup & Recovery 11.5 initializes the target disk with the same partitioning scheme as the original disk. No adjustment of the operating system is performed. If the target machine supports both UEFI and BIOS, you need to enable the boot mode corresponding to the original machine. Otherwise, the system will not boot.

5.3.1 Recovering volumes

Let's assume you backed up the system and boot volumes (or the entire machine) and want to recover these volumes to a different platform. The ability of the recovered system to boot up depends on the following factors:

- **Source operating system:** is the OS convertible or non-convertible? Convertible operating systems allow changing the boot mode from BIOS to UEFI and back.
  - 64-bit versions of all Windows operating systems starting with Windows Vista x64 SP1 are convertible.
  - 64-bit versions of all Windows Server operating systems starting with Windows Server 2008 x64 SP1 are convertible.

  All other operating systems are non-convertible.
- **Source and target disk partition style**: MBR or GPT. System and boot volumes of BIOS platforms use MBR disks. System and boot volumes of UEFI platforms use GPT disks.

  When selecting not initialized target disk for recovery, this disk will be automatically initialized either to GPT or to MBR depending on the original disk partitioning style, the current boot mode (UEFI or BIOS) and the type of operating systems (convertible or non-convertible) that are located on this volume.

  If the initialization may result in bootability loss, the software takes the partitioning style from the source volume ignoring the target disk size. In such cases, the software can select the MBR partitioning style for disks whose size is more than 2 TB; however, the disk space beyond 2 TB will not be available for use.

  If required, you can initialize the target disk manually by using the Disk management (p. 272) functionality.

The following table summarizes whether it is possible to retain the system bootability when recovering boot and system volumes of a BIOS-based system to UEFI-based and back.

 Copyright © Acronis International GmbH, 2002-2013.

- A green background means that the system will be bootable. No user action is required.
- A yellow background means that you need to perform additional steps to make the system bootable. These steps are not possible on some machines.
- A red background means that the system will not be able to boot due to BIOS and UEFI platform limitations.

<table>
<tr><th rowspan="2">Original system</th><th colspan="4">Target hardware</th></tr>
<tr><th>BIOS
Disk: MBR</th><th>BIOS
Disk: GPT</th><th>UEFI
Disk: MBR</th><th>UEFI
Disk: GPT</th></tr>
<tr><td>BIOS
OS: convertible</td><td rowspan="2"></td><td rowspan="2">Solution
Recover the operating system to an MBR disk or to an uninitialized disk.</td><td rowspan="2">The target machine must support BIOS.
Additional steps
1. Before recovery, turn off the UEFI mode in BIOS
2. Perform the recovery under the bootable media.
or
After recovery, turn off the UEFI mode in BIOS.</td><td>The convertible OS will be automatically converted to support UEFI booting.</td></tr>
<tr><td>BIOS
OS: non-convertible</td><td>Solution
Recover the operating system to an MBR disk or to an uninitialized disk.</td></tr>
<tr><td>UEFI
OS: convertible</td><td>The convertible OS will be automatically converted to support BIOS booting.</td><td rowspan="2">The target machine must support UEFI.
Additional steps
1. Before recovery, turn on the UEFI mode in BIOS.
2. Perform the recovery under the bootable media.
or
After recovery, turn on the UEFI mode in BIOS.</td><td rowspan="2">Solution
Recover the operating system to a GPT disk or to an uninitialized disk.</td><td rowspan="2"></td></tr>
<tr><td>UEFI
OS: non-convertible</td><td>Solution
Recover the operating system to a GPT disk or to an uninitialized disk.</td></tr>
</table>

5.3.2 Recovering disks

Let's assume you backed up a whole disk (with all its volumes) and want to recover this disk to a different target platform.

The ability of the recovered system to boot up in different modes depends on the operating systems installed on the source disk. Operating systems can be **convertible** i.e. allow changing the boot mode from BIOS to UEFI and back, or **non-convertible**. For the list of convertible operating systems, see Recovering volumes (p. 155).

- When a source disk contains one or more operating systems and *all* of them are convertible, the boot mode can be automatically changed. Depending on the current boot mode, the target disk may be initialized either to GPT or to MBR partitioning style.

 Copyright © Acronis International GmbH, 2002-2013.

- If *at least one* operating system on a source disk is non-convertible (or the source disk contains any boot volumes of the non-convertible OSes), the boot mode cannot be changed automatically and the software will initialize the target disk as the source one. To boot up the target machine, you have to turn on/off the UEFI mode in BIOS manually. Otherwise, the system will not boot after recovery.

The following table summarizes all cases of recovering disks of a BIOS-based system to UEFI-based and vice versa.

- Green background means that the system will be bootable. No user action is required.
- Yellow background means that you need to perform additional steps to make the system bootable. These steps are not possible on some machines.

Original system	**Target hardware**	
	BIOS	UEFI
BIOS OS: convertible		The target disk will be initialized as GPT. The OS will be automatically converted to support UEFI booting. If you want to recover the source disk “as is”: 1. Turn off the UEFI mode in BIOS. 2. Boot from a bootable media, and perform the recovery.
BIOS OS: non-convertible		The target disk will be initialized as the source one (MBR). *The target machine must support BIOS.* **Additional steps** 1. Turn off the UEFI mode in BIOS. 2. Boot from a bootable media, and perform the recovery.
UEFI OS: convertible	The target disk will be initialized as MBR. The OS will be automatically converted to support BIOS booting. If you want to recover the source disk “as is”: 1. Turn on the UEFI mode in BIOS. 2. Boot from a bootable media, and perform the recovery.	
UEFI OS: non-convertible	The target disk will be initialized as the source one (GPT). *The target machine must support UEFI.* **Additional steps** 1. Turn on the UEFI mode in BIOS. 2. Boot from a bootable media, and perform the recovery.	

 Copyright © Acronis International GmbH, 2002-2013.

Recovery to large disks in BIOS

After a recovery to a BIOS-based system, the target system disk is initialized as MBR. Because of disk size limitations in BIOS, if the disk is larger than 2 TB, only the first 2 TB of disk space will be available for use. If the machine supports UEFI, you can overcome this limitation by turning on the UEFI mode and then performing the recovery. The disk is initialized as GPT. The 2-TB limitation for GPT disks does not exist.

5.4 Acronis Active Restore

Active Restore is the Acronis proprietary technology that brings a system or a database online immediately after its recovery is started.

This section describes the use of Active Restore during an operating system recovery. While based on the same technology, recovery of Microsoft Exchange databases or Microsoft SQL databases proceeds in a different way. For more information, refer to following sections:

- When recovering Microsoft Exchange databases, see the "Using Acronis Active Restore for database recovery" section of the "Backing up Microsoft Exchange Server data" document.
- When recovering Microsoft SQL databases, see "Using Acronis Active Restore for SQL database recovery" (p. 319).

Limitations

- Active Restore is not available when recovering Windows 8/8.1 or Windows Server 2012/2012 R2.
- Active Restore is meant for instant data recovery on the same machine. It is not available when recovering to dissimilar hardware.
- The only supported archive location is a local drive, or more precisely, any device available through the machine's BIOS. This may be Acronis Secure Zone, a USB hard drive, a flash drive or any internal hard drive.
- Active Restore does not support disks with the GPT partitioning style as a source being recovered, as a recovery destination, or as an archive location. This also means that Unified Extensible Firmware Interface (UEFI) is not supported. The only supported boot mode is BIOS.

How it works

When configuring a recovery operation, you select disks or volumes to recover from a backup. Acronis Backup & Recovery 11.5 scans the selected disks or volumes in the backup. If this scan finds a supported operating system, use of Acronis Active Restore becomes available.

If you do not enable Active Restore, the system recovery will proceed in the usual way and the machine will become operational after the recovery is completed.

If you enable Active Restore, the sequence of actions will be set as follows.

Once the system recovery is started, the operating system boots from the backup. The machine becomes operational and ready to provide necessary services. The data required to serve incoming requests is recovered with the highest priority; everything else is recovered in the background.

Because serving requests is performed simultaneously with recovery, the system operation can slow down even if recovery priority (p. 171) in the recovery options is set to **Low**. Although the system downtime is minimal, there may be reduced performance during recovery.

 Copyright © Acronis International GmbH, 2002-2013.

Usage scenarios

1. The system uptime is one of the efficiency criteria.

   Examples: Client-oriented online services, Web-retailers, polling stations.

2. The system/storage space ratio is heavily biased toward storage.

   Some machines are being used as storage facilities, where the operating system claims a small space segment and all other disk space is committed to storage, such as movies, sounds or other multimedia files. Some of these storage volumes can be extremely large as compared to the system and so practically all the recovery time will be dedicated to recovering the files, which might be used much later on, if in any near future at all.

   If you opt for Acronis Active Restore, the system will be operational in a short time. Users will be able to open the necessary files from the storage and use them while the rest of the files, which are not immediately necessary, are being recovered in the background.

   Examples: movie collection storage, music collection storage, multimedia storage.

How to use

1. Back up the system disk or volume to a location accessible through the system's BIOS. This may be Acronis Secure Zone, a USB hard drive, a flash drive or any internal hard drive.

   If your operating system and its loader reside on different volumes, always include both volumes in the backup. The volumes must also be recovered together; otherwise, there is a high risk that the operating system will not start.

2. Create bootable media.
3. If a system failure occurs, boot the machine using the bootable media. Start the console and connect to the bootable agent.
4. Create a recovery task (p. 134). In **What to recover**, make sure that the system disk or volume is selected for recovery.

   Acronis Active Restore will choose for the boot-up and subsequent recovery the first operating system found during the backup scan. Do not try to recover more than one operating system using Active Restore if you want the result to be predictable. When recovering a multi-boot system, choose only one system volume and boot volume at a time.

5. In **Where to recover**, make sure that the system disk or volume is mapped to the first disk. If it is not, map it manually as described in "Selecting target disks" (p. 141).
6. In **Acronis Active Restore**, select **Use**.
7. Once the system recovery is started, the operating system boots from the backup. The Acronis Active Restore icon appears in the system tray. The machine becomes operational and ready to provide necessary services. The immediate user sees the drive tree and icons and can open files or launch applications even though they were not yet recovered.

   The drivers of Acronis Active Restore intercept system queries and set the immediate priority for recovery of the files that are necessary to serve the incoming requests. While this on-the-fly recovery proceeds, the continuing recovery process is transferred to the background.

   Please do not shut down or reboot the machine until the recovery is completed. If you switch off the machine, all the changes made to the system since the last boot up will be lost. The system will not be recovered, not even partially. The only possible solution in this case will be to restart the recovery process from a bootable media.

8. The background recovery continues until all the selected volumes are recovered, the log entry is made and the Acronis Active Restore icon disappears from the system tray.

 Copyright © Acronis International GmbH, 2002-2013.

5.5 Bootability troubleshooting

If a system was bootable at the time of backup, you expect that it will boot after recovery. However, the information the operating system stores and uses for booting up may become outdated during recovery, especially if you change volume sizes, locations or destination drives. Acronis Backup & Recovery 11.5 automatically updates Windows loaders after recovery. Other loaders might also be fixed, but there are cases when you have to re-activate the loaders. Specifically when you recover Linux volumes, it is sometimes necessary to apply fixes or make booting changes so that Linux can boot and load correctly.

Below is a summary of typical situations that require additional user actions.

Why a recovered operating system may be unbootable

- **The machine BIOS is configured to boot from another HDD.**

  Solution: Configure the BIOS to boot from the HDD where the operating system resides.

- **The system was recovered on dissimilar hardware and the new hardware is incompatible with the most critical drivers included in the backup**

  Solution: Boot the machine using bootable media and apply Acronis Universal Restore (p. 151) to install the appropriate drivers and modules.

- **Windows was recovered to a dynamic volume that cannot be bootable**

  Solution: Recover Windows to a basic, simple or mirrored volume.

- **A system volume was recovered to a disk that does not have an MBR**

  When you configure recovery of a system volume to a disk that does not have an MBR, the program prompts whether you want to recover the MBR along with the system volume. Opt for not recovering, only if you do not want the system to be bootable.

  Solution: Recover the volume once again along with the MBR of the corresponding disk.

- **The system uses Acronis OS Selector**

  Because the Master Boot Record (MBR) can be changed during the system recovery, Acronis OS Selector, which uses the MBR, might become inoperable. If this happens, reactivate Acronis OS Selector as follows.

  Solution: Boot the machine from the Acronis Disk Director's bootable media and select in the menu **Tools -> Activate OS Selector**.

- **The system uses GRand Unified Bootloader (GRUB) and was recovered from a normal (not from a raw, that is, sector-by-sector) backup**

  One part of the GRUB loader resides either in the first several sectors of the disk or in the first several sectors of the volume. The rest is on the file system of one of the volumes. System bootability can be recovered automatically only when the GRUB resides in the first several sectors of the disk and on the file system to which direct access is possible. In other cases, the user has to manually reactivate the boot loader.

  Solution: Reactivate the boot loader. You might also need to fix the configuration file.

- **The system uses Linux Loader (LILO) and was recovered from a normal (not from a raw, that is, sector-by-sector) backup**

  LILO contains numerous references to absolute sector numbers and so cannot be repaired automatically except for the case when all data is recovered to the sectors that have the same absolute numbers as on the source disk.

  Solution: Reactivate the boot loader. You might also need to fix the loader configuration file for the reason described in the previous item.

 Copyright © Acronis International GmbH, 2002-2013.

- **The system loader points to the wrong volume**

  This may happen when system or boot volumes are not recovered to their original location.

  Solution: Modification of the boot.ini or the boot\bcd files fixes this for Windows loaders. Acronis Backup & Recovery 11.5 does this automatically and so you are not likely to experience the problem.

  For the GRUB and LILO loaders, you will need to correct the GRUB configuration files. If the number of the Linux root partition has changed, it is also recommended that you change /etc/fstab so that the SWAP volume can be accessed correctly.

- **Linux was recovered from an LVM volume backup to a basic MBR disk**

  Such system cannot boot because its kernel tries to mount the root file system at the LVM volume.

  Solution: Change the loader configuration and /etc/fstab so that the LVM is not used and reactivate the boot loader.

5.5.1 How to reactivate GRUB and change its configuration

Generally, you should refer to the boot loader manual pages for the appropriate procedure. There is also the corresponding Knowledge Base article on the Acronis Web site.

The following is an example of how to reactivate GRUB in case the system disk (volume) is recovered to identical hardware.

1. Start Linux or boot from the bootable media, and then press CTRL+ALT+F2.
2. Mount the system you are recovering:

   ```
   mkdir /mnt/system/
   mount -t ext3 /dev/sda2 /mnt/system/ # root partition
   mount -t ext3 /dev/sda1 /mnt/system/boot/ # boot partition
   ```

3. Mount the **proc** and **dev** file systems to the system you are recovering:

   ```
   mount -t proc none /mnt/system/proc/
   mount -o bind /dev/ /mnt/system/dev/
   ```

4. Save a copy of the GRUB menu file, by running one of the following commands:

   ```
   cp /mnt/system/boot/grub/menu.lst /mnt/system/boot/grub/menu.lst.backup
   ```

   or

   ```
   cp /mnt/system/boot/grub/grub.conf /mnt/system/boot/grub/grub.conf.backup
   ```

5. Edit the **/mnt/system/boot/grub/menu.lst** file (for Debian, Ubuntu, and SUSE Linux distributions) or the **/mnt/system/boot/grub/grub.conf** file (for Fedora and Red Hat Enterprise Linux distributions)—for example, as follows:

   ```
   vi /mnt/system/boot/grub/menu.lst
   ```

6. In the **menu.lst** file (respectively **grub.conf**), find the menu item that corresponds to the system you are recovering. This menu items have the following form:

   ```
   title Red Hat Enterprise Linux Server (2.6.24.4)
         root (hd0,0)
         kernel /vmlinuz-2.6.24.4 ro root=/dev/sda2 rhgb quiet
         initrd /initrd-2.6.24.4.img
   ```

   The lines starting with **title**, **root**, **kernel**, and **initrd** respectively determine:

   - The title of the menu item.

Copyright © Acronis International GmbH, 2002-2013.

- The device on which the Linux kernel is located—typically, this is the boot partition or the root partition, such as **root (hd0,0)** in this example.
- The path to the kernel on that device and the root partition—in this example, the path is **/vmlinuz-2.6.24.4** and the root partition is **/dev/sda2**. You can specify the root partition by label (such as **root=LABEL=/**), identifier (in the form **root=UUID=***some_uuid*), or device name (such as **root=/dev/sda2**).
- The path to the **initrd** service on that device.

7. Edit the file **/mnt/system/etc/fstab** to correct the names of any devices that have changed as a result of the recovery.
8. Start the GRUB shell by running one of the following commands:

   ```
   chroot /mnt/system/ /sbin/grub
   ```

   or

   ```
   chroot /mnt/system/ /usr/sbin/grub
   ```

9. Specify the disk on which GRUB is located—typically, the boot or root partition:

   ```
   root (hd0,0)
   ```

10. Install GRUB. For example, to install GRUB in the master boot record (MBR) of the first disk, run the following command:

    ```
    setup (hd0)
    ```

11. Exit the GRUB shell:

    ```
    quit
    ```

12. Unmount the mounted file systems and then reboot:

    ```
    umount /mnt/system/dev/
    umount /mnt/system/proc/
    umount /mnt/system/boot/
    umount /mnt/system/
    reboot
    ```

13. Reconfigure the bootloader by using tools and documentation from the Linux distribution that you use. For example, in Debian and Ubuntu, you may need to edit some commented lines in the **/boot/grub/menu.lst** file and then run the **update-grub** script; otherwise, the changes might not take effect.

5.5.2 About Windows loaders

Windows NT/2000/XP/2003

A part of the loader resides in the partition boot sector, the rest is in the files ntldr, boot.ini, ntdetect.com, ntbootdd.sys. boot.ini is a text file that contains the loader configuration. Example:

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Microsoft Windows XP Professional"
/noexecute=optin /fastdetect
```

Windows Vista and later

A part of the loader resides in the partition boot sector, the rest is in the files bootmgr, boot\bcd. At starting Windows, boot\bcd is mounted to the registry key HKLM \BCD00000000.

 Copyright © Acronis International GmbH, 2002-2013.

5.6 Reverting a Windows system to its factory settings

If your Windows operating system was deployed by using Acronis Backup & Recovery 11.5 for System Builders, you can revert the system to its factory settings.

Reverting the system to the factory settings can be started from the management console or at boot time. The second method is useful if the operating system became unbootable for some reason.

- To start the operation from the management console, click **Revert to factory settings** in the **Welcome** screen.
- To start the operation at boot time, press a hot key (usually, F11) and then click **Revert to factory settings** in the appeared screen. Alternatively, you can continue booting the operating system.

Once you confirm the operation, Acronis Backup & Recovery 11.5 will re-deploy the factory image located in Acronis Secure Zone. This will recover the original volume layout, the pre-installed Windows operating system, and any original third-party applications. In addition, the software will remove all user archives from Acronis Secure Zone and resize Acronis Secure Zone to its original size.

Caution: *All user data stored on the original disks of the machine will be lost.*

Sometimes, a system cannot be reverted to the factory settings even at boot time. This may be the case if a drive failure occurred, if the factory image became corrupted in Acronis Secure Zone, or if the original drive was replaced with a new one. In these cases, you can revert the system to the factory settings by using the factory bootable media if it was shipped with the machine.

To start the operation, boot the machine into the factory bootable media and click **Revert to factory settings** in the appeared screen. Once you confirm the operation, Acronis Backup & Recovery 11.5 will create Acronis Secure Zone and copy the factory image to it. Then, it will re-deploy the factory image as described above.

For additional information, refer to "Acronis Secure Zone" (p. 196) and "Acronis Startup Recovery Manager" (p. 269).

5.7 Default recovery options

Each Acronis agent has its own default recovery options. Once an agent is installed, the default options have pre-defined values, which are referred to as **presets** in the documentation. When creating a recovery task, you can either use a default option, or override the default option with the custom value that will be specific for this task only.

You can also customize a default option itself by changing its value against the pre-defined one. The new value will be used by default in all recovery tasks you will create later on this machine.

To view and change the default recovery options, connect the console to the managed machine and then select **Options > Default backup and recovery options > Default recovery options** from the top menu.

Availability of the recovery options

The set of available recovery options depends on:

- The environment the agent operates in (Windows, Linux, bootable media).
- The type of data being recovered (disk, file).
- The operating system being recovered from the disk backup (Windows, Linux).

 Copyright © Acronis International GmbH, 2002-2013.

The following table summarizes the availability of the recovery options.

	Agent for Windows		Agent for Linux		Bootable media (Linux-based or PE-based)	
	Disk recovery	File recovery (also from a disk backup)	Disk recovery	File recovery (also from a disk backup)	Disk recovery	File recovery (also from a disk backup)
Additional settings (p. 165):						
Validate backup archive before recovery	+	+	+	+	+	+
Restart the machine automatically if it is required for recovery	+	+	+	+	-	-
Restart the machine automatically after recovery is finished	-	-	-	-	+	+
Check file system after recovery	+	-	+	-	+	-
Change SID after recovery	Windows recovery	-	Windows recovery	-	Windows recovery	-
Set current date and time for recovered files	-	+	-	+	-	+
Error handling (p. 166):						
Do not show messages and dialogs while processing (silent mode)	+	+	+	+	+	+
Re-attempt if an error occurs	+	+	+	+	+	+
Event tracing:						
Windows events log (p. 167)	+	+	-	-	-	-
SNMP (p. 166)	+	+	+	+	-	-
File-level security (p. 167):						
Recover files with their security settings	-	+	-	+	-	+
Mount points (p. 168)	-	+	-	-	-	-
Notifications:						
E-mail (p. 168)	+	+	+	+	-	-
Win Pop-up (p. 169)	+	+	+	+	-	-
Pre/Post recovery commands (p. 170)	+	+	+	+	PE only	PE only
Recovery priority (p. 171)	+	+	+	+	-	-

Copyright © Acronis International GmbH, 2002-2013.

5.7.1 Additional settings

Specify the additional settings for the recovery operation by selecting or clearing the following check boxes.

Set current date and time for recovered files

This option is effective only when recovering files.

The preset is **Enabled**.

This option defines whether to recover the files' date and time from the archive or assign the files the current date and time.

Validate backups before recovery

The preset is **Disabled**.

This option defines whether to validate a backup to ensure that the backup is not corrupted, before data is recovered from it.

Check file system after recovery

This option is effective only when recovering disks or volumes.

The preset is **Disabled**.

This option defines whether to check the integrity of the file system after a disk or volume recovery. The check takes place either immediately after recovery or after the machine boots into the recovered operating system.

Restart the machine automatically if it is required for recovery

This option is effective when recovery takes place on a machine running an operating system.

The preset is **Disabled**.

The option defines whether to reboot the machine automatically if it is required for recovery. Such might be the case when a volume locked by the operating system has to be recovered.

Restart the machine automatically after recovery is finished

This option is effective when operating under bootable media.

The preset is **Disabled**.

This option enables booting the machine into the recovered operating system without user interaction.

Change SID after recovery

This option is not effective when recovery to a virtual machine is performed by Acronis Backup & Recovery 11.5 Agent for ESX/ESXi or Acronis Backup & Recovery 11.5 Agent for Hyper-V.

The preset is **Disabled**.

Acronis Backup & Recovery 11.5 can generate an unique security identifier (SID) for the recovered system. You do not need a new SID when recovering a system over itself or when creating a system

 Copyright © Acronis International GmbH, 2002-2013.

replica that will replace the original system. Generate a new SID if the original and the recovered systems will work concurrently in the same workgroup or domain.

5.7.2 Error handling

These options are effective for Windows and Linux operating systems and bootable media.

These options enable you to specify how to handle errors that might occur during recovery.

Do not show messages and dialogs while processing (silent mode)

The preset is: **Disabled**.

With the silent mode enabled, the program will automatically handle situations requiring user interaction where possible. If an operation cannot continue without user interaction, it will fail. Details of the operation, including errors, if any, can be found in the operation log.

Re-attempt, if an error occurs

The preset is: **Enabled**. **Number of attempts: 30. Interval between attempts: 30 seconds.**

When a recoverable error occurs, the program re-attempts to perform the unsuccessful operation. You can set the time interval and the number of attempts. The attempts will be stopped as soon as the operation succeeds OR the specified number of attempts are performed, depending on which comes first.

For example, if the network location becomes unavailable or not reachable, the program will attempt to reach the location every 30 seconds, but no more than 5 times. The attempts will be stopped as soon as the connection is resumed OR the specified number of attempts is performed, depending on which comes first.

5.7.3 Event tracing

It is possible to duplicate log events of the recovery operations, performed on the managed machine, in the Application Event Log of Windows; or send the events to the specified SNMP managers.

5.7.3.1 SNMP notifications

This option is effective for both Windows and Linux operating systems.

This option is not available when operating under the bootable media.

The option defines whether the agent(s) operating on the managed machine have to send the log events of the recovery operations to the specified Simple Network Management Protocol (SNMP) managers. You can choose the types of events to be sent.

For detailed information about using SNMP with Acronis Backup & Recovery 11.5, please see "Support for SNMP (p. 53)".

The preset is: **Use the setting set in the Machine options.**

To select whether to send the recovery operations events to the SNMP managers:

Choose one of the following:

 Copyright © Acronis International GmbH, 2002-2013.

- **Use the setting set in the Machine options** – to use the setting specified for the machine. For more information refer to Machine options.
- **Send SNMP notifications individually for recovery operation events** – to send the events of the recovery operations to the specified SNMP managers.
  - **Types of events to send** – choose the types of events to be sent: **All events**, **Errors and warnings**, or **Errors only**.
  - **Server name/IP** – type the name or IP address of the host running the SNMP management application, the messages will be sent to.
  - **Community** – type the name of SNMP community to which both the host running SNMP management application and the sending machine belong. The typical community is "public".

  Click **Send test message** to check if the settings are correct.
- **Do not send SNMP notifications** – to disable sending the log events of the recovery operations to SNMP managers.

5.7.3.2 Windows event log

This option is effective only in Windows operating systems.

This option is not available when operating under the bootable media.

This option defines whether the agent(s) operating on the managed machine have to log events of the recovery operations in the Application Event Log of Windows (to see this log, run **eventvwr.exe** or select **Control Panel > Administrative tools > Event Viewer**). You can filter the events to be logged.

The preset is: **Use the setting set in the Machine options.**

To select whether to log the recovery operations events in the Application Event Log of Windows:

Select one of the following:

- **Use the setting set in the Machine options** – to use the setting specified for the machine. For more information refer to Machine options.
- **Log the following event types** – to log events of the recovery operations in the Application Event Log. Specify the types of events to be logged:
  - **All events** – log all events (information, warnings and errors)
  - **Errors and warnings**
  - **Errors only**
- **Do not log** - to disable logging events of the recovery operations in the Application Event Log.

5.7.4 File-level security

This option is effective only for recovery from file-level backup of Windows files.

This option defines whether to recover NTFS permissions for files along with the files.

The preset is: **Recover files with their security settings**.

If the file NTFS permissions were preserved during backup (p. 118), you can choose whether to recover the permissions or let the files inherit the NTFS permissions from the folder to which they are recovered.

 Copyright © Acronis International GmbH, 2002-2013.

5.7.5 Mount points

This option is effective only in Windows for recovering data from a file-level backup.

Enable the **Mount points** option to recover files and folders that were stored on the mounted volumes and were backed up with the enabled **Mount points** option. For details of backing up mounted volumes or cluster shared volumes, see Mount points (p. 121).

The preset is: **Disabled**.

This option is effective only when you select for backup a folder that is higher in the folder hierarchy than the mount point. If you select for recovery folders within the mount point or the mount point itself, the selected items will be recovered regardless of the **Mount points** option value.

Please be aware that if the volume is not mounted at the moment of recovery, the data will be recovered directly to the folder that has been the mount point at the time of backing up.

5.7.6 Notifications

Acronis Backup & Recovery 11.5 provides the ability of notifying users about recovery completion through e-mail or the messaging service.

5.7.6.1 E-mail

This option is effective for Windows and Linux operating systems.

This option is not available when operating under the bootable media.

The option enables you to receive e-mail notifications about the recovery task's successful completion, failure or when user interaction is required.

The preset is: **Disabled**.

To configure e-mail notification

1. Select the **Send e-mail notifications** check box to activate notifications.
2. Under **Send e-mail notifications**, select the appropriate check boxes as follows:
   - **When recovery completes successfully**.
   - **When recovery fails**.
   - **When user interaction is required**.
3. In the **E-mail addresses** field, type the destination e-mail address. You can enter several addresses separated by semicolons.
4. In the **Subject** field, type the notification subject.

   The subject can include ordinary text and one or more variables. In the received e-mail messages, each variable will be replaced by its value at the time of task execution. The following variables are supported:

   - **%description%**

     For a machine running Windows, the **%description%** variable will be replaced by the text that is given in the **Computer description** field of the machine. To specify this text, either go to **Control panel > System** or run the following command as an administrator:

     ```
     net config server /srvcomment:<text>
     ```

 Copyright © Acronis International GmbH, 2002-2013.

For a machine running Linux, the **%description%** variable will be replaced by an empty string ("").

- **%subject%**

  The **%subject%** variable will be replaced by the following phrase: *Task <task name> <task result> on machine <machine name>.*

5. In the **SMTP server** field, enter the name of the outgoing mail server (SMTP).
6. In the **Port** field, set the port of the outgoing mail server. By default, the port is set to **25**.
7. If the outgoing mail server requires authentication, enter **User name** and **Password** of the sender's e-mail account.

   If the SMTP server does not require authentication, leave the **User name** and **Password** fields blank. If you are not sure whether the SMTP server requires authentication, contact your network administrator or your e-mail service provider for assistance.
8. Click **Additional e-mail parameters...** to configure additional e-mail parameters as follows:
   a. **From** – type the name of the sender. If you leave this field empty, the messages will contain the sender's e-mail account in the **From** field.
   b. **Use encryption** – you can opt for encrypted connection to the mail server. SSL and TLS encryption types are available for selection.
   c. Some Internet service providers require authentication on the incoming mail server before being allowed to send something. If this is your case, select the **Log on to incoming mail server** check box to enable a POP server and to set up its settings:
      - **Incoming mail server (POP)** – enter the name of the POP server.
      - **Port** – set the port of the POP server. By default, the port is set to **110**.
      - **User name** and **Password** of the incoming mail server.
   d. Click **OK**.
9. Click **Send test e-mail message** to check whether e-mail notifications work correctly with the specified settings.

5.7.6.2 Messenger service (WinPopup)

This option is effective for Windows XP, Windows Server 2003 and Linux operating systems. Windows Vista and later versions of Windows do not support the Messenger service.

This option is not available when operating under bootable media.

The option enables you to receive WinPopup notifications about the recovery task's successful completion, failure or need for interaction.

The preset is: **Disabled.**

Before configuring WinPopup notifications, make sure the Messenger service is started on both the machine executing the task and the machine that will receive messages.

In Windows XP SP2+ and Windows Server 2003/2003 R2, the Messenger service is disabled by default. Change the service **Startup type** to **Automatic** and start the service.

To configure WinPopup notifications:

1. Select the **Send WinPopup notifications** check box.
2. In the **Machine name** field, enter the name of the machine to which notifications will be sent. Multiple names are not supported.

 Copyright © Acronis International GmbH, 2002-2013.

3. Under **Send notifications**, select the appropriate check boxes as follows:
   - **When recovery completes successfully** – to send notification when the recovery task has completed successfully
   - **When recovery fails** – to send notification when the recovery task has failed.
   - **When user interaction is required** check box – to send notification during the operation when user interaction is required.
4. Click **Send Test WinPopup Message** to check if the settings are correct.

5.7.7 Pre/Post commands

This option is effective for Windows and Linux operating systems and PE-based bootable media.

The option enables you to define the commands to be automatically executed before and after the data recovery.

Example of how you can use the pre/post commands:

- Launch the `Checkdisk` command in order to find and fix logical file system errors, physical errors or bad sectors to be started before the recovery starts or after the recovery ends.

The program does not support interactive commands, i.e. commands that require user input (for example, "pause".)

A post-recovery command will not be executed if the recovery proceeds with reboot.

To specify pre/post commands

1. Enable pre/post commands execution by checking the following options:
   - **Execute before the recovery**
   - **Execute after the recovery**
2. Do any of the following:
   - Click **Edit** to specify a new command or a batch file
   - Select the existing command or the batch file from the drop-down list
3. Click **OK**.

5.7.7.1 Pre-recovery command

To specify a command/batch file to be executed before the recovery process starts

1. In the **Command** field, type a command or browse to a batch file. The program does not support interactive commands, i.e. commands that require user input (for example, "pause".)
2. In the **Working directory** field, specify a path to a directory where the command/batch file will be executed.
3. In the **Arguments** field specify the command's execution arguments, if required.
4. Depending on the result you want to obtain, select the appropriate options as described in the table below.
5. Click **Test command** to check if the command is correct.

Check box	**Selection**			
Fail the task if the command execution fails*	Selected	Cleared	Selected	Cleared
Do not recover until the	Selected	Selected	Cleared	Cleared

 Copyright © Acronis International GmbH, 2002-2013.

command execution is complete				
Result				
	Preset Perform the recovery only after the command is successfully executed. Fail the task if the command execution failed.	Perform the recovery after the command is executed despite execution failure or success.	N/A	Perform the recovery concurrently with the command execution and irrespective of the command execution result.

* A command is considered failed if its exit code is not equal to zero.

5.7.7.2 Post-recovery command

To specify a command/executable file to be executed after the recovery is completed

1. In the **Command** field, type a command or browse to a batch file.
2. In the **Working** directory field, specify a path to a directory where the command/batch file will be executed.
3. In the **Arguments** field, specify the command execution arguments, if required.
4. Select the **Fail the task if the command execution fails** check box if successful execution of the command is critical for you. The command is considered failed if its exit code is not equal to zero. If the command execution fails, the task run result will be set to Failed.

   When the check box is not selected, the command execution result does not affect the task execution failure or success. You can track the command execution result by exploring the **Log** view.
5. Click **Test command** to check if the command is correct.

A post-recovery command will not be executed if the recovery proceeds with reboot.

5.7.8 Recovery priority

This option is effective for both Windows and Linux operating systems.

This option is not available when operating under the bootable media.

The priority of a process running in a system determines the amount of CPU and system resources allocated to that process. Decreasing the recovery priority will free more resources for other applications. Increasing the recovery priority might speed up the recovery process by requesting the operating system to allocate more resources to the application that will perform the recovery. However, the resulting effect will depend on the overall CPU usage and other factors like disk I/O speed or network traffic.

The preset is: **Normal.**

To specify the recovery process priority

Select one of the following:

- **Low** – to minimize resources taken by the recovery process, leaving more resources to other processes running on the machine

 Copyright © Acronis International GmbH, 2002-2013.

- **Normal** – to run the recovery process with normal speed, allocating resources on a par with other processes
- **High** – to maximize the recovery process speed by taking resources from the other processes.

6 Conversion to a virtual machine

Acronis Backup & Recovery 11.5 offers a number of ways of converting a disk backup into a virtual machine. This section helps you choose the method that best fits your needs and provides step-by-step instructions for conversion.

6.1 Conversion methods

Depending on your needs, you can choose among the following conversion methods:

a) **Make the conversion a part of a backup plan**

When to use.

- If you want the backup and the conversion to be executed on a schedule. This helps you maintain a standby virtual server ready to power on in case your physical server fails.
- If you do not need to adjust the resulting virtual machine settings.

How to perform. When creating a backup plan (p. 55), enable conversion of a backup to a virtual machine (p. 174).

b) **Recover the backed-up disks or volumes to the "New virtual machine" destination**

When to use.

- If you want to do the conversion once or occasionally, as required.
- If you want to do a lossless physical to virtual migration. In this case, you boot the original machine from bootable media, back up the machine in the off-line state and immediately recover the machine from the resulting backup.
- If you need to adjust the resulting virtual machine settings. You may want to add or remove disks, choose the disk provisioning mode, change the volume sizes and their location on the disks, and more.

How to perform. Follow the steps described in "Recovery to the 'New virtual machine' destination" (p. 177).

c) **Recover the backed-up disks or volumes to a manually created virtual machine by using bootable media**

When to use.

- If you want to create a machine directly on a virtualization server, rather than import it.

  Tip. With Agent for ESX(i) or Agent for Hyper-V, a virtual machine can be created directly on a respective virtualization server by using methods (a) and (b).
- If you need to recreate dynamic volumes on a Windows machine.
- If you need to recreate logical volumes or software RAID on a Linux machine.

How to perform. Follow the steps described in “Recovery to a manually created virtual machine” (p. 180).

Copyright © Acronis International GmbH, 2002-2013.

6.2 Conversion to an automatically created virtual machine

This section describes the conversion methods (p. 172) in which Acronis Backup & Recovery 11.5 automatically creates a new virtual machine:

- During conversion which is part of a backup plan (p. 174), the software creates the virtual machine in addition to creating the backup. The virtual machine has the same configuration as the original machine.
- During recovery to the "New virtual machine" destination (p. 177), the software creates the virtual machine from a backup you already have. You can change the configuration of the virtual machine.

Depending on the agent that performs the conversion, Acronis Backup & Recovery 11.5 can create a virtual machine of any of these formats:

Agent for Windows, Agent for Linux

- VMware Workstation
- Microsoft Virtual PC (includes Windows Virtual PC)
- Citrix XenServer OVA (only during recovery to the "New virtual machine" destination)
- Kernel-based Virtual Machine
- Red Hat Enterprise Virtualization (RAW format)

Agent for ESX(i)

- VMware ESX(i)

Agent for Hyper-V

- Microsoft Hyper-V

6.2.1 Considerations before conversion

Converting a UEFI-based machine

Virtual machines that use Unified Extensible Hardware Interface (UEFI) are currently supported in VMware ESXi 5 only. If the target virtualization platform is ESXi 5, Acronis Backup & Recovery 11.5 creates a UEFI-based machine. Otherwise, the resulting machine will use the BIOS boot firmware.

Acronis Backup & Recovery 11.5 adjusts the Windows boot mode to the BIOS boot firmware and ensures that Windows remains bootable.

For Linux operating systems, changing the boot mode from UEFI to BIOS is not supported. When converting a UEFI-based machine running Linux, make sure that it uses GRUB version 1 and that the target virtualization platform is ESXi 5. For more details, see "Support for UEFI-based machines" (p. 50).

Logical and dynamic volumes

The resulting machine will have basic volumes, even if Linux logical volume structure is present in the backup. The same applies to dynamic volumes used in Windows systems. If you want to recreate logical or dynamic volumes on the machine, perform the conversion as described in “Recovery to a manually created virtual machine” (p. 180).

 Copyright © Acronis International GmbH, 2002-2013.

Custom loader reactivation

- During conversion, the disk interfaces may be changed as a result of migration to a different platform or just manually. The software sets the system-disk interface to be the same as the default interface for the new platform. The default interface is SCSI for VMware and IDE for other supported platforms. If the system disk interface changes, the name of the boot device also changes, while the boot loader still uses the old name.
- Conversion of logical volumes to basic ones may also prevent the system from booting up.

For these reasons, if the machine uses a custom boot loader, you might need to configure the loader to point to the new devices and reactivate it. Configuring GRUB is normally not needed because Acronis Backup & Recovery 11.5 does this automatically. Should the need arise, use the procedure described in "How to reactivate GRUB and change its configuration" (p. 161).

For more considerations about physical to virtual machine conversion, see the "Backing up virtual machines" document.

6.2.2 Setting up regular conversion to a virtual machine

When creating a backup plan (p. 55), you can set up regular conversion of a disk or volume backup to a virtual machine. By setting up regular conversion, you obtain a copy of your server or workstation on a virtual machine which can be readily powered on in case the original machine fails.

Restrictions

- Conversion of a backup from the following locations is not available: CD, DVD, Blu-Ray Discs, tape devices and Acronis Online Backup Storage.
- Conversion to a Citrix XenServer virtual machine is not available as a part of the backup plan. As an alternative, use methods (b) and (c) as described in "Conversion methods" (p. 172).
- Microsoft Virtual PC does not support virtual disks larger than 127 GB. During a conversion to a Virtual PC machine, the size of every disk that exceeds 127 GB will be reduced to this value. If the disk resize is not possible, the conversion will fail. If you need larger virtual disks in order to connect them to a Hyper-V machine, use methods (b) and (c) as described in "Conversion methods" (p. 172).

6.2.2.1 Conversion settings

This section provides information that helps you make the appropriate conversion settings.

The settings are specified in the **Convert to virtual machine** section of the **Create backup plan** page.

Convert to virtual machine

Convert from

If you are copying or moving backups to other locations (p. 97), select the location where the backup will be taken from. Conversion locations which are not available (p. 174), such as Acronis Online Backup Storage, are not listed.

By default, conversion will be performed from the primary location.

When to convert

Depending on the selected backup scheme, specify whether to convert every full, every incremental or every differential backup or convert the last created backup on schedule. Specify the **conversion schedule (p. 175)** if required.

Target host... (p. 175)

 Copyright © Acronis International GmbH, 2002-2013.

Select the resulting virtual machine type and location. Available options depend on the agent that will perform conversion. This may be the agent that performs the backup (by default) or an agent installed on another machine. If the latter is the case, the archive must be stored in a shared location such as a network folder or a managed vault, so that the other machine can access the archive.

To specify another agent, click **Change** and select a machine where Agent for ESX(i), Agent for Hyper-V, Agent for Windows or Agent for Linux is installed.

Storage

Choose the storage on the virtualization server or the folder to place the virtual machine files in.

Resultant VMs

Specify the name of the virtual machine. The default name is **Backup_of_[Machine Name]**. You can add more variables to the name. The following templates are supported:

[Plan Name]
[Machine Name]
[Virtual Host Name]
[Virtual Machine Name]
[Virtualization Server Type]

Folder on VMware vCenter

If the management server is integrated with vCenter Server, the resultant virtual machines will appear in the **Acronis Backups** folder on the vCenter. You can specify a subfolder for the machines resulting from execution of the plan.

6.2.2.2 Setting up a conversion schedule

A disk backup (p. 448) created while executing a backup plan can be converted to a virtual machine immediately, on schedule, or combining both methods.

The conversion task will be created on the machine being backed up, and will use this machine's date and time. If the agent that backs up the machine is installed outside it (such is the case when a ESX(i) or Hyper-V virtual machine is backed up at a hypervisor level), the task will be created on the machine where the agent is.

The target virtual machine must be powered off by the time of conversion, otherwise the conversion task will fail. If this happens, you can restart the conversion task manually after powering off the machine. Any changes made to the machine while it was powered on, will be overwritten.

6.2.2.3 Selecting a machine that will perform conversion

Take into account the following considerations.

Which agent is installed on the machine?

The resulting virtual machine type and location depend on the agent that resides on the selected machine.

- **Agent for ESX(i)** is installed on the machine

  If the agent manages more than one ESX(i) host, you can choose the host where the virtual machine will be created.

  In the **Storage** step, you can select the storage where the virtual machine will be created.

 Copyright © Acronis International GmbH, 2002-2013.

Virtual machines created as a result of backup cannot be added to a backup plan. On the management server they appear as unmanageable or do not appear at all (if integration with vCenter Server is not enabled).

- **Agent for Hyper-V** is installed on the machine

  You can only create a virtual machine on the Hyper-V server.

  In the **Storage** step, you can select the virtual machine path.

  Virtual machines created on the server as a result of backup do not appear on the management server, because such machines are not intended to be backed up.

- **Agent for Windows** or **Agent for Linux** is installed on the machine

  You can choose the virtual machine type: VMware Workstation, Microsoft Virtual PC, Red Hat Kernel-based Virtual Machine (KVM) or Red Hat Enterprise Virtualization (RHEV).

  In the **Storage** step, you can select the virtual machine path.

What is the machine's processing power?

Conversion will take the selected machine's CPU resource. Multiple conversion tasks will be queued on that machine and it may take considerable time to complete them all. Consider this when creating a centralized backup plan with conversion for multiple machines or multiple local backup plans using the same machine for conversion.

What storage will be used for the virtual machines?

Network usage

As opposed to ordinary backups (TIB files), virtual machine files are transferred uncompressed through the network. Therefore, using a SAN or a storage local to the machine that performs conversion is the best choice from the network usage standpoint. A local disk is not an option though, if the conversion is performed by the same machine that is backed up. Using a NAS also makes good sense.

Storage space

For VMware, Hyper-V and Virtual PC, disks of the resulting virtual machine will use as much storage space as the original data occupies. Assuming that the original disk size is 100 GB and the disk stores 10 GB of data, the corresponding virtual disk will occupy about 10 GB. VMware calls this format "thin provisioning", Microsoft uses the "dynamically expanding disk" term. Since the space is not pre-allocated, the physical storage is expected to have sufficient free space for the virtual disks to increase in size.

For KVM or RHEV, disks of the resulting virtual machine will have the raw format. This means that virtual disk size is always equal to the original disk capacity. Assuming that the original disk size is 100 GB, the corresponding virtual disk will occupy 100 GB even if the disk stores 10 GB of data.

6.2.2.4 How regular conversion to VM works

The way the repeated conversions work depends on where you choose to create the virtual machine.

- **If you choose to save the virtual machine as a set of files:** each conversion re-creates the virtual machine from scratch.
- **If you choose to create the virtual machine on a virtualization server:** when converting an incremental or differential backup, the software updates the existing virtual machine instead of re-creating it. Such conversion is normally faster. It saves network traffic and CPU resource of the

 Copyright © Acronis International GmbH, 2002-2013.

host that performs the conversion. If updating the virtual machine is not possible, the software re-creates it from scratch.

The following is a detailed description of both cases.

If you choose to save the virtual machine as a set of files

As a result of the first conversion, a new virtual machine will be created. Every subsequent conversion will re-create this machine from scratch. First, the old machine is temporarily renamed. Then, a new virtual machine is created that has the previous name of the old machine. If this operation succeeds, the old machine is deleted. If this operation fails, the new machine is deleted and the old machine is given its previous name. This way, the conversion always ends up with a single machine. However, extra storage space is required during conversion to store the old machine.

If you choose to create the virtual machine on a virtualization server

The first conversion creates a new virtual machine. Any subsequent conversion works as follows:

- If there has been a *full backup* since the last conversion, the virtual machine is re-created from scratch, as described earlier in this section.
- Otherwise, the existing virtual machine is updated to reflect changes since the last conversion. If updating is not possible (for example, if you deleted the intermediate snapshots, see below), the virtual machine is re-created from scratch.

Intermediate snapshots

To be able to update the virtual machine, the software stores a few intermediate snapshots of it. They are named **Backup…** and **Replica…** and should be kept. Unneeded snapshots are deleted automatically.

The latest **Replica…** snapshot corresponds to the result of the latest conversion. You can go to this snapshot if you want to return the machine to that state; for example, if you worked with the machine and now want to discard the changes made to it.

Other snapshots are for internal use by the software.

6.2.3 Recovery to the "New virtual machine" destination

Rather than converting a TIB file to a virtual disk file, which requires additional operations to bring the virtual disk into use, Acronis Backup & Recovery 11.5 performs the conversion by recovery of a disk backup to a fully configured and operational new virtual machine. You have the ability to adapt the virtual machine configuration to your needs when configuring the recovery operation.

With **Acronis Backup & Recovery 11.5 Agent for Windows** or **Agent for Linux,** you can create a new virtual machine in a local or network folder. You can start the machine using the respective virtualization software or prepare the machine files for further usage. The following table summarizes the available virtual machine formats and the actions you can take to add the machine to a virtualization server.

VM format	Further action and tool to use	Target virtualization platform
VMware Workstation	Export using VMware Workstation; or Convert to OVF using VMware OVF tool > Deploy OVF template using vSphere Client	ESX(i)

 Copyright © Acronis International GmbH, 2002-2013.

Microsoft Virtual PC*	Add the VHD file to a Hyper-V machine	Hyper-V
Citrix XenServer OVA	Import using Citrix XenCenter	XenServer
Kernel-based Virtual Machine (Raw format)	Move the virtual machine files to a machine running Linux and run the virtual machine by using Virtual Machine Manager	-
Red Hat Enterprise Virtualization (RHEV) (Raw format)	Import using RHEV Manager	RHEV

*Microsoft Virtual PC does not support disks that are larger than 127 GB. Acronis enables you to create a Virtual PC machine with larger disks so that you can attach the disks to a Microsoft Hyper-V virtual machine.

With **Acronis Backup & Recovery 11.5 Agent for Hyper-V** or **Agent for ESX(i)**, you can create a new virtual machine directly on the respective virtualization server.

6.2.3.1 Steps to perform

To perform a recovery to a new virtual machine

1. Connect the console to the management server, to a machine where an agent is installed, or to a machine booted from a bootable media.
2. Click **Recover** to open the **Recover data** (p. 134) page.
3. Click **Select data** (p. 136). Use the **Data view** tab or the **Archive view** tab to select the disks or volumes to convert.
4. In **Recover to**, select **New virtual machine**.
5. Click **Browse**. In the **VM/VS Selection** (p. 179) window, select the resulting virtual machine type or the virtualization server where to create the machine.
6. [Optional] In **Storage**, you can view or select the storage where the virtual machine will be created.
7. [Optional] In **Virtual machine settings** (p. 179), you can change the name of the virtual machine, the disk provisioning mode, the allocated memory, and other settings.

   Machines of the same type and with the same name cannot be created in the same folder. If you get an error message caused by identical names, change either the VM name or the path.

8. The destination disk for each of the source disks or source volumes and the MBRs will be selected automatically. If required, you can change the destination disks.

   On a Microsoft Virtual PC, be sure to recover the disk or volume where the operating system's loader resides to the Hard disk 1. Otherwise, the operating system will not boot. This cannot be fixed by changing the boot device order in BIOS, because a Virtual PC ignores these settings.

9. In **When to recover**, specify when to start the recovery task.
10. [Optional] In **Task**, review **Recovery options** and change the settings from the default ones, if need be. You can specify in **Recovery options > VM power management** whether to start the new virtual machine automatically after the recovery is completed. This option is available only when the new machine is created on a virtualization server.
11. Click **OK**. If the recovery task is scheduled for the future, specify the credentials under which the task will run.

In the **Backup plans and tasks** view, you can examine the state and progress of the recovery task.

 Copyright © Acronis International GmbH, 2002-2013.

6.2.3.2 Virtual machine type / virtualization server selection

Select the resulting virtual machine type or the virtualization server where the machine will be created.

The available options depend on the agent(s) installed on the machine the console is connected to. If the console is connected to the management server, you can choose any registered machine that is able to perform the required operation.

To select the virtualization server where the new virtual machine will be created

1. Choose the **Create a new virtual machine on the server** option.
2. In the left part of the window, select the virtualization server. Use the right part of the window to review details on the selected server.

   [Only if the console is connected to the management server] If multiple agents manage the selected ESX(i) host, you can choose the agent that will perform recovery. For better performance, choose an Agent for ESX(i) (Virtual Appliance) located on that ESX(i). If no agent manages the ESX(i) and automatic deployment is turned on, Agent for ESX(i) (Virtual Appliance) will be deployed immediately after you click **OK**. Recovery will be performed by that agent. It will take a license.
3. Click **OK** to return to the **Recover data** page.

To select the virtual machine type

1. Choose the **Save the virtual machine as a set of files** option.
2. In the left part of the window, select the virtual machine type. Use the right part of the window to review details on the selected virtual machine type.

   [Only if the console is connected to the management server] You can select the machine that will perform recovery. This can be any registered machine where Agent for Windows or Agent for Linux is installed.
3. Click **OK** to return to the **Recover data** page.

6.2.3.3 Virtual machine settings

The following virtual machine settings can be configured.

Disks

Initial setting: the number and size of the source machine's disks.

The number of disks is generally equal to that of the source machine. It might be different if the software has to add more disks to accommodate the source machine volumes because of limitations set by the virtualization product. You can add virtual disks to the machine configuration or, in some cases, delete the proposed disks.

When adding a new virtual disk, along with interface and capacity, you can specify its format.

- **Thin format.** The disk occupies as much storage space as the data it stores. This saves the storage space. To enable thin format, select the **Thin provisioning** (for ESX), or **Dynamically expanding disk** (for Hyper-V) check box.
- **Thick format.** The disk occupies all the provisioned storage space. This improves the virtual machine performance. To use thick format, clear the **Thin provisioning** (for ESX), or **Dynamically expanding disk** (for Hyper-V) check box.

 Copyright © Acronis International GmbH, 2002-2013.

The default setting is thick format if a physical machine was backed up. When recovering from a virtual machine backup, the software tries to reproduce the format of the original machine's disks. If this is not possible, thick format is used.

Implementation of Xen machines is based on Microsoft Virtual PC and inherits its limitations: up to 3 IDE disks and 1 processor. SCSI disks are not supported.

Memory

Initial setting: if not contained in the backup, it is the default setting of the virtualization server.

This is the amount of memory allocated to the new virtual machine. The memory adjustment range depends on the host hardware, the host operating system and the virtualization product settings. For example, virtual machines may be allowed to use no more than 30% of memory.

Name

Initial setting: if not contained in the backup, **New virtual machine**.

Enter the name for the new virtual machine. If the backup was created by Agent for ESX(i) or Agent for Hyper-V, the software takes the name from the virtual machine configuration contained in the backup.

Processors

Initial setting: if not contained in the backup or if the backed-up setting is not supported by the virtualization server, it is the default server's setting.

This is the number of processors of the new virtual machine. In most cases, it is set to one. The result of assignment of more than one processor to the machine is not guaranteed. The number of virtual processors may be limited by the host CPU configuration, the virtualization product and the guest operating system. Multiple virtual processors are generally available on multi-processor hosts. A multicore host CPU or hyperthreading may enable multiple virtual processors on a single-processor host.

6.3 Recovery to a manually created virtual machine

This section describes the conversion method (p. 172) in which you create a virtual machine yourself and perform a recovery to it as if it were a physical machine.

To use this method, you need a license for the Acronis Universal Restore (p. 150) functionality.

6.3.1 Considerations before conversion

Converting a UEFI-based machine

If the original machine uses Unified Extensible Firmware Interface (UEFI) for booting, consider creating a virtual machine that is also UEFI-based.

If your virtualization product does not support UEFI, you can create a BIOS-based machine, provided that the original machine is running Windows. Acronis Backup & Recovery 11.5 adjusts the Windows boot mode to the BIOS boot firmware and ensures that Windows remains bootable.

For Linux operating systems, changing the boot mode from UEFI to BIOS is not supported. Acronis Backup & Recovery 11.5 can convert a UEFI-based machine running Linux only when the machine

 Copyright © Acronis International GmbH, 2002-2013.

uses GRUB version 1 and the target machine is also UEFI-based. For more details, see "Support for UEFI-based machines" (p. 50).

Choosing the disk interface

When creating the virtual machine, you may want its disks to have a different interface than those of the original machine.

- You may want to change all disk interfaces from IDE to SCSI when migrating a machine to ESX(i), because SCSI is a default disk interface for ESX(i) and it provides better performance.
- You need to change the system disk interface from SCSI to IDE when migrating a machine to Hyper-V, because Hyper-V does not support booting from SCSI disks.

If the original machine uses a custom boot loader, either recover the system disk to a disk with the same interface, or manually configure the boot loader. The reason is that when the interface of the system disk changes, the name of the boot device also changes; however, the boot loader still uses the old name. Configuring GRUB is normally not needed because Acronis Backup & Recovery 11.5 does this automatically.

6.3.2 Steps to perform

To perform a recovery to a manually created virtual machine

1. [When recovering Windows] Prepare Windows drivers (p. 152) that correspond to the target virtualization platform.

   For machines running Linux, the necessary drivers are normally already present in the operating system.
2. Create a bootable media (p. 258) with the Universal Restore functionality by using Acronis Bootable Media Builder.
3. Create a virtual machine by using your virtualization product's native tools.
4. Boot the virtual machine from the media.
5. [When recovering Windows] If you need dynamic volumes, create a volume group by using the disk management functionality (p. 282).
6. Select **Actions** > **Recover**. When configuring a recovery:
   - Enable Universal Restore for Linux or Universal Restore for Windows. In the latter case, provide the drivers that you prepared.
   - [When recovering Linux] If you need logical volumes, click **Apply RAID/LVM** when setting up the recovery. The LVM structure will be automatically recreated (p. 46) during the recovery.
7. Configure other recovery settings and perform a recovery in the same way as onto a physical machine.

Copyright © Acronis International GmbH, 2002-2013.

7 Storing the backed up data

7.1 Vaults

A vault is a location for storing backup archives. For ease of use and administration, a vault is associated with the archives' metadata. Referring to this metadata makes for fast and convenient operations with archives and backups stored in the vault.

A vault can be organized on a local or networked drive, detachable media or a tape device.

There are no settings for limiting a vault size or number of backups in a vault. You can limit the size of each archive using cleanup. However, the total size of archives stored in the vault is limited by the storage size only.

Why create vaults?

We recommend that you create a vault in each destination where you are going to store backup archives. This will ease your work as follows.

Quick access to the vault

You will not have to remember paths to the folders where the archives are stored. When creating a backup plan or a task that requires selection of an archive or an archive destination place, the list of vaults will be available for quick access without drilling down through the folders tree.

Easy archive management

A vault is available for access from the **Navigation** pane. Having selected the vault, you can browse the archives stored there and perform the following archive management operations:

- Get a list of backups included in each archive
- Recover data from a backup
- Examine backup content
- Validate all archives in the vault or individual archives or backups
- Mount a volume backup to copy files from the backup to a physical disk
- Safely delete archives and backups from the archives.

Creating vaults is highly recommended but is not obligatory. You may choose not to use the shortcuts and always specify the location path.

Creating a vault results in adding the vault name to the **Vaults** section of the **Navigation** pane.

Centralized and personal vaults

A centralized vault is a networked location allotted by the management server administrator to serve as storage for the backup archives. A centralized vault can be managed by a storage node (managed vault) or be unmanaged. For more information, see the Centralized vaults (p. 184) section.

A vault is called personal if it was created using direct connection of the console to a managed machine. Personal vaults are specific for each managed machine.

 Copyright © Acronis International GmbH, 2002-2013.

'Vaults' view

Vaults (on the navigation pane) - top item of the vaults tree. Click this item to display centralized and personal vaults. To perform actions on any vault, use the toolbar that is located at the top of the **Vaults** view. For centralized vaults, see the Actions on centralized vaults (p. 185) section. For personal vaults, see the Actions on personal vaults (p. 193) section.

- **Centralized vaults.** These vaults are available when the console is connected to a managed machine or to a management server.
- **Personal vaults.** These vaults are available when the console is connected to a managed machine.

Click any vault in the vaults tree to open the detailed view of this vault (p. 183) and to take actions on archives (p. 253) and backups (p. 254) stored in there.

7.1.1 Working with vaults

This section briefly describes the main GUI elements of the selected vault, and suggests ways to work with them.

Examining information on a vault

Information about the selected vault is located at the top pane of the selected vault. Using the stacked bar, you can estimate the vault's load. The vault's load is the proportion of the vault's free space and occupied space (not available if the vault is located on a tape library). Free space is a space on the storage device where the vault is located. For example, if the vault is located on a hard disk, the vault free space is the free space of the respective volume. Occupied space is the total size of backup archives and their metadata, if it is located in the vault.

You can obtain the total number of archives and backups stored in the vault and full path to the vault.

For managed vaults only, you can examine the name of the storage node that manages the vault, encryption and deduplication (p. 234) states.

Browsing the vault contents and data selection

You can browse the vault content and select data to recover by using the **Data view** tab or the **Archive view** tab.

Data view

The **Data view** tab lets you browse and select the backed-up data by versions (backup date and time). The **Data view** tab shares the same searching and cataloging functionality with the data catalog (p. 138).

Archive view

The **Archive view** tab displays the backed-up data by archives. Use the **Archive view** to perform operations with archives and backups stored in the vault. For more information about these operations, see the following sections:

- Operations with archives stored in a vault (p. 253).
- Operations with backups (p. 254).
- Sorting, filtering and configuring table items (p. 29).

 Copyright © Acronis International GmbH, 2002-2013.

What does the icon mean?

When browsing archives on the **Archive view** tab, you may encounter a backup with the icon. This icon means that the backup is marked for deletion but cannot be deleted immediately for any of the following reasons:

- Other backups depend on it, but consolidation is either not possible or disabled by retention rules.
- The backup is stored on a tape.

You cannot perform any operation on backups marked for deletion. They disappear from the **Archive view** after they are physically deleted. This happens when all of the dependent backups are also deleted, or when the tape is overwritten, or at next cleanup after you enable consolidation in the retention rules.

7.1.2 Centralized vaults

A centralized vault is a networked location allotted by the management server administrator to serve as storage for the backup archives. A centralized vault can be **managed** by a storage node or be **unmanaged**. The total number and size of archives stored in a centralized vault is limited by the storage size only.

As soon as the management server administrator creates a centralized vault, the vault path and name are distributed to all machines registered on the server. The shortcut to the vault appears on the machines in the **Vaults** group. Any backup plan existing on the machines, including local plans, can use the centralized vault.

The following table explains in details the difference between managed and unmanaged vaults.

Functionality	Managed vaults	Unmanaged vaults
Requires installation of Acronis Backup & Recovery 11.5 Storage Node	Yes	No
Data stored in the vault is included in the centralized data catalog (p. 138)	Yes	No
Dedicated user accounts for accessing a vault (vault administrators (p. 189) and vault users (p. 190))	Yes	No
Data deduplication (p. 234)	Yes	No
Vault encryption (p. 189)	Yes	No
Archive cleanup, replication and validation set in the backup plan is performed by...	...the storage node (p. 222) (except replication to Online Backup Storage, performed by the agent).	...the agent.
Supported types of storage:		
Acronis Online Backup Storage	No	Yes
Tape device	Yes (no deduplication or vault encryption)	No
Network share	Yes	Yes

 Copyright © Acronis International GmbH, 2002-2013.

SAN, NAS	Yes	Yes
FTP/SFTP server	No	Yes

7.1.2.1 Actions on centralized vaults

To access actions

1. Connect the console to the management server.
2. In the **Navigation** pane, click **Vaults** > **Centralized**.

All the operations described here are performed by clicking the corresponding buttons on the vaults toolbar. These operations can be also accessed from the **[Vault name] actions** item of the main menu.

The following is a guideline for you to perform operations with centralized vaults.

To	Do
Create a managed or an unmanaged vault	1. Click **Create**. 2. In the **Type** field, select the vault type: **Managed** or **Unmanaged** The procedure of creating centralized vaults is described in-depth in the following sections: ▪ Create a managed centralized vault (p. 186) ▪ Create an unmanaged centralized vault (p. 190)
Edit a managed or an unmanaged vault	1. Select the vault. 2. Click **Edit**. Depending on the vault you select (managed or unmanaged), the respective Edit page will be opened: ▪ The **Edit managed vault** page lets you change the vault's name, user accounts and information in the **Comments** field. ▪ The **Edit unmanaged vault** page lets you edit the vault's name and information in the **Comments** field.
Detach a managed vault	1. Select the vault. 2. Click **Detach**. Detaching a vault removes association between the vault and the storage node and deletes this vault from the GUI. Nevertheless, all archives stored in the vault will remain untouched. The plans and tasks that use this vault will fail. Later on, you'll be able to attach this detached vault to the same or to another storage node. **Notes.** ▪ Tape-based vaults cannot be detached. ▪ To detach a vault from an unavailable storage node, remove the storage node (p. 226) from the management server.
Attach the previously detached managed vault	Click **Attach**. The procedure of attaching a managed vault to a storage node is described in-depth

Copyright © Acronis International GmbH, 2002-2013.

To	Do
	in the Attaching a managed vault (p. 191) section. **Note**. Tape-based vaults cannot be attached.
Validate a vault	1. Select the vault. 2. Click **Validate**. You will be taken to the Validation (p. 241) page with an already pre-selected vault as a source. The vault validation checks all the archives in this vault.
Open an unmanaged vault folder	1. Select the unmanaged vault. 2. Click **Explore**. The vault will be available for examination with the standard file manager program.
Delete a vault	1. Select the vault. 2. Click **Delete**. The vault will be deleted along with all the archives stored in there. The plans and tasks that use this vault will fail.
Change user credentials for accessing a vault	Click **Change user**. Changing user credentials is available for vaults that reside on shared storages only.
Refresh a vault's information	Click **Refresh**. While you are reviewing the vault content, archives can be added to the vault, deleted or modified. Click **Refresh** to update the vault information with the most recent changes.

Creating a managed centralized vault

To create a managed centralized vault, perform the following steps

Vault

Name

Specify a unique name for the vault. Creation of two centralized vaults with the same name is prohibited.

Comments

[Optional] Enter the distinctive description of the vault being created.

Type

Select the **Managed** type.

Storage node

Select the Acronis Backup & Recovery 11.5 Storage Node that will manage the vault.

Deduplication

[Optional] Select whether to enable archive deduplication in the vault. Deduplication minimizes storage space taken by the archives and backup traffic. It reduces the size of archives in the vault by eliminating redundant data such as duplicate files or disk blocks.

Deduplication is not possible on tape devices.

Deduplication is not possible if the storage node is installed in a 32-bit operating system.

To learn more about how deduplication works, see the Deduplication (p. 234) section.

 Copyright © Acronis International GmbH, 2002-2013.

Encryption (p. 189)

[Optional] Select whether to protect the vault with encryption. Anything written to the vault will be encrypted and anything read from it will be decrypted transparently by the storage node, using a vault-specific encryption key stored on the storage node.

A vault located on a tape device cannot be protected with encryption.

Path (p. 188)

Specify where the vault will be created. Managed vaults can reside on a network share, SAN, NAS, tape device, or on a hard drive local to the storage node.

Place deduplication database along with backups (available only if the **Deduplication** is enabled)

The deduplication database stores the hash values of all items stored in the vault—except for those that cannot be deduplicated, such as encrypted files.

If the vault is created on the disk local to the storage node, the deduplication database is placed to the same vault (the **Place deduplication database along with backups** check box is selected).

If the vault is created on the network share, the **Place deduplication database along with backups** check box is disabled, and you have to specify a path to the deduplication database manually.

Placing the deduplication database along with backups may result in system performance slowdown. To improve the system performance, we recommend you to create the deduplication database and the managed vault on different disks.

Deduplication database (p. 188) (available only if the **Deduplication** is enabled)

Specify a folder on the storage node local disks or SAN to create the deduplication database.

Drives

[Optional] If the vault is created on a tape device, specify the tape drive(s) to be used when backing up to the vault. By default, all available drives will be used. Click the down arrow and select or clear required check boxes.

Tape pool

[Optional] If the vault is created on a tape device, specify the pool whose tapes will be used by the vault. By default, the **Acronis** pool is selected.

Catalog database

[Optional] Specify where the data catalog database will be placed.

Backward compatibility

To access this option, click **Show backward compatibility**.

[Optional] Select whether to make the vault backward compatible for working with Acronis Backup & Recovery 10 agents.

What you need to know about backward compatible vaults:

- A vault located on a tape device cannot be backward compatible.

- Agents of Acronis Backup & Recovery 11 and Acronis Backup & Recovery 11.5 can back up to a vault regardless of its backward compatibility property.

- You cannot specify vault administrators and vault users for a backward compatible vault.

- When the console is connected to an Acronis Backup & Recovery 10 agent, the **Data view** tab for a vault is not displayed.

- Backups created by Acronis Backup & Recovery 11 and Acronis Backup & Recovery 11.5 are cataloged automatically. To include backups created by Acronis Backup & Recovery 10 in the

 Copyright © Acronis International GmbH, 2002-2013.

data catalog, click the **update the catalog now** link on the **Data view** tab of the vault. Please be aware that the cataloging procedure may be time and resource consuming.

Compression

[Optional] Select whether to compress the deduplication data stores. This setting is available only if the backward compatibility is turned on and deduplication is enabled.

User accounts

Vault administrators (p. 189)

Add groups or user accounts that will have administrator rights on this vault. Vault administrators can view and manage all the archives stored in the vault. Acronis Centralized Admins and members of the Administrators group on the storage node are considered as vault administrators by default.

Vault users (p. 190)

Add groups or user accounts that will have user rights on this vault. Vault users can view and manage only their own archives in the vault. By default, the Everyone group of the storage node is added to the vault users.

After you have performed all the required steps, click **OK** to commit creating the managed vault.

Vault path

To specify the path where the managed vault will be created

1. Enter the full path to the folder in the **Path** field or select the desired folder in the folders tree. Managed vaults can be organized:
   - On the hard drives local to the storage node.
   - On a network share.
   - On a Storage Area Network (SAN).
   - On a Network Attached Storage (NAS).
   - On a tape library locally attached to the storage node.

   To create a new folder for the vault in the selected location, click **Create folder**.
2. Click **OK**.

A vault can be created in an empty folder only.

We do not recommend creating a deduplicating *managed vault on a FAT32 volume. The reason is that such vault stores all deduplicated items in two potentially large files. Because the maximum file size in the FAT file systems is limited to 4 GB, the storage node may stop working when this limit is reached.*

Deduplication database path

To specify the path where the deduplication database will be created

1. In the **Local folders** of the storage node, select the desired folder or enter the full path to the folder in the **Path** field.

   To create a new folder for the database, click **Create folder**.

   We strongly advise that you follow the recommendations given in the "Selecting a disk for the deduplication database" section of "Deduplication best practices" (p. 237).
2. Click **OK**.

 Copyright © Acronis International GmbH, 2002-2013.

Vault encryption

If you protect a vault with encryption, anything written to the vault will be encrypted and anything read from it will be decrypted transparently by the storage node using a vault-specific encryption key stored on the node. If the storage medium is stolen or accessed by an unauthorized person, the malefactor will not be able to decrypt the vault contents without access to the storage node.

This encryption has nothing to do with the archive encryption specified by the backup plan and performed by an agent. If the archive is already encrypted, the storage node-side encryption is applied over the encryption performed by the agent.

To protect the vault with encryption

1. Select one of the following encryption algorithms from the drop-down list:
   - **AES 128** – the vault contents will be encrypted using the Advanced Encryption Standard (AES) algorithm with a 128-bit key
   - **AES 192** – the vault contents will be encrypted using the AES algorithm with a 192-bit key
   - **AES 256** – the vault contents will be encrypted using the AES algorithm with a 256-bit key.
2. In the **Enter the word** field, specify a word to be used for generating the encryption key.

   Details. The word is case-sensitive. You will be asked for this word only when attaching the vault to another storage node.
3. In the **Confirm** field, re-type the word you just entered.
4. Click **OK**.

The AES cryptographic algorithm operates in the Cipher-block chaining (CBC) mode and uses a randomly generated key with a user-defined size of 128, 192 or 256 bits. The larger the key size, the longer it will take for the program to encrypt the archives stored in the vault and the more secure the archives will be.

The encryption key is then encrypted with AES-256 using a SHA-256 hash of the selected word as a key. The word itself is not stored anywhere on the disk; the word hash is used for verification purposes. With this two-level security, the archives are protected from any unauthorized access, but recovering a lost word is not possible.

Vault administrators

Vault administrators can back up to the vault, view and manage any archive stored in the vault. By default, the Administrators group on the storage node is added to the vault administrators.

To add a group or user accounts

1. Enter names of groups or users in the separate fields in accordance with the following patterns:
   - *DisplayName* (example: **FirstName LastName**).
   - *UserName* (example: **User1**).
   - *ObjectName@DomainName* (example: **User1@Domain1**).
   - *DomainName\ObjectName* (example: **Domain1\User1**).
2. Once the names are entered, click **Check names**. If the entered name is found, click **OK** (the **OK** button is disabled until the name is found).

   If no objects were found, delete the name and enter another one. If several objects for the entered name were found, select one of them and click **OK**, or click **Cancel** and specify another name.

 Copyright © Acronis International GmbH, 2002-2013.

At first, the software tries to find the entered names in the list of local users and groups on the machine where the storage node is installed. If not found, the software checks the domain users and groups.

You will be prompted to specify the domain account credentials, when you enter a user or group name that cannot be checked using your domain account; for example, if you are logged on using a domain account other than the domain name you have entered to check.

Vault users

Vault users can view and manage only their own archives in the vault. A vault user who is a member of the Administrators group on a machine can additionally view and manage any archives created from that machine in a managed vault. By default, the Everyone group on the storage node is added to the vault users.

To add a group or user accounts

1. Enter names of groups or users in the separate fields in accordance with the following patterns:
   - *DisplayName* (example: **FirstName LastName**).
   - *UserName* (example: **User1**).
   - *ObjectName@DomainName* (example: **User1@Domain1**).
   - *DomainName\ObjectName* (example: **Domain1\User1**).
2. Once the names are entered, click **Check names**. If the entered name is found, click **OK** (the **OK** button is disabled until the name is found).

   If no objects were found, delete the name and enter another one. If several objects for the entered name were found, select one of them and click **OK**, or click **Cancel** and specify another name.

   At first, the software tries to find the entered names in the list of local users and groups on the machine where the storage node is installed. If not found, the software checks the domain users and groups.

   You will be prompted to specify the domain account credentials, when you enter a user or group name that cannot be checked using your domain account; for example, if you are logged on using a domain account other than the domain name you have entered to check.

Creating an unmanaged centralized vault

In contrast to centralized managed vaults, the data from unmanaged vaults is not included in the centralized data catalog (p. 138). Nevertheless, you can use the **Data view** tab of each vault to browse its data.

To create an unmanaged centralized vault, perform the following steps.

Vault

Name

Specify a unique name for the vault. The creation of two centralized vaults with the same name is prohibited.

Comments

Enter the distinctive description of the vault.

Type

Select the **Unmanaged** type.

Path (p. 191)

 Copyright © Acronis International GmbH, 2002-2013.

Specify where the vault will be created.

After you have performed all the required steps, click **OK** to commit creating the unmanaged centralized vault.

Vault path

To specify the path where the unmanaged vault will be created

1. Enter the full path to the folder in the **Path** field or select the desired folder in the folders tree. Unmanaged vaults can be organized:
   - Acronis Online Backup Storage
   - on a network share
   - on a Storage Area Network (SAN)
   - on a Network Attached Storage (NAS)
   - on FTP and SFTP servers.

   According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

   To create a new folder for the vault, click **Create folder**.

   A vault can be created in an empty folder only.

2. Click **OK**.

Attaching a managed vault

A vault managed by a storage node can be detached (p. 185) from this storage node and attached to another one. As a result, the old storage node stops managing the vault, and the new one starts managing the vault. You might need to do this when retiring the storage node hardware, when the storage node is lost, or when reinstalling a storage node.

If the old storage node is unavailable, remove it (p. 226) from the management server prior to attaching its vaults to a new storage node.

Note: *Personal, centralized unmanaged and tape-based vaults cannot be attached.*

Before attaching

Catalog database

We recommend that you move the vault catalog database from the old storage node to the new one. Otherwise, you will have to re-catalog the vault, which may take a long time to perform.

The vault catalog database is a set of files located in the folder whose name is the same as the GUID of the vault. Do not change the folder name when moving it. To learn the GUID of a properly detached vault, find the file named `<vault GUID>_L.FDB` in the vault folder.

The default location of catalog databases on a storage node is as follows:

- In Windows XP and Server 2003: **%ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\ASN\Catalog**.
- In Windows Vista and later versions of Windows: **%PROGRAMDATA%\Acronis\BackupAndRecovery\ASN\Catalog**.

 Copyright © Acronis International GmbH, 2002-2013.

Deduplication database

If the vault is deduplicating, we recommend that you move the deduplication database from the old storage node to the new one. Otherwise, the software will automatically re-create the deduplication database, which may take a long time to perform.

For the information about the recommended location of the deduplication database, see "Deduplication best practices" (p. 237).

The deduplication database consists of several files that are named `<vault GUID>_u.*`. To learn the GUID of a properly detached vault, find the file named `<vault GUID>_L.FDB` in the vault folder.

Vault database

The vault database contains the metadata of all archives stored in the vault. Normally, when detaching a vault from the storage node, the vault database is moved from its default location to the vault being detached. While attaching the vault, the software searches for the database in the vault. If the vault database is found, it is moved to the default location on the storage node the vault is being attached to. If the database is not found in the vault, you will be asked to manually specify the path to this database.

The default location of a vault database on a storage node is as follows:

- In Windows XP and Server 2003: **%ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\ASN\VaultMetadataDatabases**.
- In Windows Vista and later versions of Windows: **%PROGRAMDATA%\Acronis\BackupAndRecovery\ASN\VaultMetadataDatabases**.

To attach a managed vault to a storage node, perform the following steps.

Vault

Storage node

Select the storage node that will manage the vault.

Path

Specify the path to the detached vault.

Vault database

Specify where the vault database is located. This section appears only if the storage node cannot find the database inside the vault.

If the database is found in the folder you specify, it will be moved to the default location on the storage node where the vault is being attached to. Otherwise, the new storage node will retrieve the metadata and re-create the database in the default location mentioned above.

Deduplication database

Specify the folder where the deduplication database of the vault is located. If the database is not found in the folder you specify, it will be re-created there.

The database path is auto-filled if the database is stored in the vault folder.

Catalog database

Specify the folder where the vault catalog database is located. (For example, if the vault catalog database path is **E:\catalog_db\AAAAAAAA-BBBB-CCCC-DDDD-EEEEEEEEEEEE**, specify **E:\catalog_db**.) If the catalog database is not found in the folder you specify, the attached vault will be considered as not cataloged.

 Copyright © Acronis International GmbH, 2002-2013.

Password

For the encrypted vault, provide the encryption password.

After you have performed all the required steps, click **OK** to commit to attaching the vault.

7.1.3 Personal vaults

A vault is called personal if it was created using direct connection of the console to a managed machine. Personal vaults are specific for each managed machine. Personal vaults are visible to any user that can log on to the system. A user's right to back up to a personal vault is defined by the user's permission for the folder or device where the vault is located.

A personal vault can be organized on a network share, FTP server, detachable media or removable, Acronis Online Backup Storage, tape device, or on a hard drive local to the machine. Acronis Secure Zone is considered as a personal vault available to all users that can log on the system. Personal vaults are created automatically when backing up any of the above locations.

Personal vaults can be used by local backup plans or local tasks. Centralized backup plans cannot use personal vaults except for Acronis Secure Zone.

Sharing a personal vault

Multiple machines can refer to the same physical location; for example, to the same shared folder. However, each of the machines has its own shortcut in the **Vaults** tree. Users that back up to a shared folder can see and manage each other's archives according to their access permissions for that folder. To ease archive identification, the **Personal vault** view has the **Owner** column that displays the owner of each archive. To find out more about the owner concept see Owners and credentials (p. 34).

Metadata

The **.meta** folder is created during backup in every personal vault. This folder contains additional information about archives and backups stored in the vault, such as archive owners or the machine name. If you accidentally delete the .meta folder, it will be automatically recreated next time you access the vault. But some information, like owner names and machine names, may be lost.

7.1.3.1 Actions on personal vaults

To access actions

1. Connect the console to the management server.
2. In the **Navigation** pane, click **Vaults** > **Personal**.

All the operations described here are performed by clicking the corresponding buttons on the vaults toolbar. These operations can be also accessed from the **[Vault name] actions** item of the main menu.

The following is a guideline for you to perform operations with personal vaults.

To	Do
Create a personal vault	Click **Create**. The procedure of creating personal vaults is described in-depth in the Creating a personal vault (p. 194) section.
Edit a vault	1. Select the vault.

 Copyright © Acronis International GmbH, 2002-2013.

	2. Click **Edit**. The **Edit personal vault** page lets you edit the vault's name and information in the **Comments** field.
Change user account for accessing a vault	Click **Change user**. In the appearing dialog box, provide the credentials required for accessing the vault.
Create Acronis Secure Zone	Click **Create Acronis Secure Zone**. The procedure of creating the Acronis Secure Zone is described in-depth in the Creating Acronis Secure Zone (p. 197) section.
Explore a vault's content	Click **Explore**. In the appearing Explorer window, examine the selected vault's content.
Validate a vault	Click **Validate**. You will be taken to the Validation (p. 241) page, where this vault is already pre-selected as a source. The vault validation checks all the archives stored in the vault.
Delete a vault	Click **Delete**. The deleting operation actually removes only a shortcut to the folder from the **Vaults** view. The folder itself remains untouched. You have the option to keep or delete archives contained in the folder.
Refresh vault table information	Click **Refresh**. While you are reviewing the vault content, archives can be added to the vault, deleted or modified. Click **Refresh** to update the vault information with the most recent changes.

Creating a personal vault

To create a personal vault

1. In the **Name** field, type a name for the vault being created.
2. [Optional] In the **Comments** field, add a description of the vault.
3. Click **Path** and specify a path to the folder that will be used as the vault. A personal vault can be organized on a network share, FTP server, detachable media, Acronis Online Backup Storage, tape device, or on a hard drive local to the machine.
4. [Optional] If the vault is created on a tape device:
   a. Click **Drives** to specify the tape drive(s) to be used when backing up to the vault. By default, all available drives will be used. Click **Use the following drives only** and select or clear required check boxes;
   b. Click **Tape pool** and specify the pool whose tapes will be used by the vault. By default, the **Acronis** pool is selected.
5. Click **OK**. As a result, the created vault appears in the **Personal** group of the vaults tree.

Merging and moving personal vaults

What if I need to move the existing vault from one place to another?

Proceed as follows

 Copyright © Acronis International GmbH, 2002-2013.

1. Make sure that none of the backup plans uses the existing vault while moving files, or disable the given plans. See Actions on backup plans and tasks (p. 327).
2. Move the vault folder with all its content to a new place manually by means of a third-party file manager.
3. Create a new vault.
4. Edit the backup plans and tasks: redirect their destination to the new vault.
5. Delete the old vault.

How can I merge two vaults?

Suppose you have two vaults *A* and *B* in use. Both vaults are used by backup plans. You decide to leave only vault *B*, moving all the archives from vault *A* there.

To do this, proceed as follows

1. Make sure that none of the backup plans uses vault *A* while merging, or disable the given plans. See Actions on backup plans and tasks (p. 327).
2. Move the content of vault *A* folder to vault *B* manually by means of a third-party file manager.
3. Edit the backup plans that use vault *A*: redirect their destination to vault *B*.
4. In the vaults tree, select vault *B* to check whether the archives are displayed. If not, click **Refresh**.
5. Delete vault *A*.

7.1.4 Changing the default cache folder for catalog files

Catalog files are normally stored in vaults. When working with catalog files, Acronis Backup & Recovery 11.5 may save them to a local folder on a managed machine or on a management server. This happens in the following cases:

- When an agent catalogues the data backed up to an unmanaged vault. The agent creates or updates the catalog locally and then copies it to the vault.
- When storing backups on a tape device. Because tape has a long latency for random accesses, the catalog of a tape-based vault is always stored on the machine where the tape device is attached.
- When browsing the data backed up to an FTP server in the **Data view** tab. During the browsing session, Acronis Backup & Recovery 11.5 maintains a full copy of the data catalog from an FTP server on a managed machine or on a management server. This is done for the purpose of fast access to the data catalog.

By default, a cache folder is located on the disk where the operating system is installed. Storing multiple catalog files in this location may result in the lack of free disk space. Therefore, you may want to change the folder path.

Changing the default cache folder

To do this, add a special parameter to the system registry in Windows or modify the **MMS.config** configuration file in Linux.

If the specified folder does not exist, Acronis Backup & Recovery 11.5 will automatically create it when creating or copying catalog files next time. If you are storing backups on a tape device, create the folder in advance so as not to catalog the data over again.

 Copyright © Acronis International GmbH, 2002-2013.

To specify a new cache folder in Windows:

1. Add the **Catalog** key to the following registry key:
   HKEY_LOCAL_MACHINE\SOFTWARE\Acronis\AMS\Configuration (on a management server) or **HKEY_LOCAL_MACHINE\SOFTWARE\Acronis\MMS\Configuration** (on a managed machine).
2. Add the **CatalogDir** string value.
3. Specify a new folder path in the **CatalogDir** string value. The path must end with a backslash (\) and can be 32765 characters long.

To specify a new cache folder in Linux:

Add the following element inside the `Configuration` tag in **/etc/Acronis/MMS.config**:

```
<key name="Catalog">
  <value name="CatalogDir" type="TString">"/home/Catalog/"</value>
</key>
```

So, the configuration file will look like:

```
<?xml version="1.0" encoding="UTF-8" ?>
<registry name="MMS">
  <key name="Configuration">
    ...
    <key name="Catalog">
      <value name="CatalogDir" type="TString">"/home/Catalog/"</value>
    </key>
  </key>
</registry>
```

Where `/home/Catalog/` is a new folder path. The path must end with a slash mark (/) and can be 32765 characters long.

Moving the catalog files

After changing a cache folder, Acronis Backup & Recovery 11.5 neither moves the catalog files to the new folder nor removes the old folder.

If your backups are stored on a tape device, move the catalog files to the new location so as not to catalog the data over again. Otherwise, you may let Acronis Backup & Recovery 11.5 create or copy the catalog files anew.

You may also want to delete the old folder. The default cache folder path is as follows:

- In Windows XP and Server 2003: **%ALLUSERSPROFILE%\Application Data\Acronis\AMS\AMS\Catalog** (on a management server) or **%ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\MMS\Catalog** (on a managed machine).
- In Windows Vista and later versions of Windows: **%PROGRAMDATA%\Acronis\AMS\AMS\Catalog** (on a management server) or **%PROGRAMDATA%\Acronis\BackupAndRecovery\MMS\Catalog** (on a managed machine).
- In Linux: **/var/lib/Acronis/BackupAndRecovery/MMS/Catalog/**

7.2 Acronis Secure Zone

Acronis Secure Zone is a secure partition that enables keeping backup archives on a managed machine disk space and therefore recovery of a disk to the same disk where the backup resides.

 Copyright © Acronis International GmbH, 2002-2013.

Should the disk experience a physical failure, the zone and the archives located there will be lost. That's why Acronis Secure Zone should not be the only location where a backup is stored. In enterprise environments, Acronis Secure Zone can be thought of as an intermediate location used for backup when an ordinary location is temporarily unavailable or connected through a slow or busy channel.

Advantages

Acronis Secure Zone:

- Enables recovery of a disk to the same disk where the disk's backup resides.
- Offers a cost-effective and handy method for protecting data from software malfunction, virus attack, operator error.
- Since it is internal archive storage, it eliminates the need for a separate media or network connection to back up or recover the data. This is especially useful for mobile users.
- Can serve as a primary destination when using replication of backups (p. 100).

Limitations

- Acronis Secure Zone cannot be organized on a dynamic disk.

7.2.1 Creating Acronis Secure Zone

You can create Acronis Secure Zone while the operating system is running or using bootable media.

To create Acronis Secure Zone, perform the following steps.

Location and size

Disk (p. 197)

Choose a hard disk (if several) on which to create the zone. Acronis Secure Zone is created using unallocated space, if available, or at the expense of the volume's free space.

Size (p. 198)

Specify the exact size of the zone. Moving or resizing of locked volumes, such as the volume containing the currently active operating system, requires a reboot.

Security

Password (p. 198)

[Optional] Protect the Acronis Secure Zone from unauthorized access with a password. The prompt for the password appear at any operation relating to the zone.

After you configure the required settings, click OK. In the Result confirmation (p. 198) window, review the expected layout and click OK to start creating the zone.

7.2.1.1 Acronis Secure Zone Disk

The Acronis Secure Zone can be located on any fixed hard drive. Acronis Secure Zone is always created at the end of the hard disk. A machine can have only one Acronis Secure Zone. Acronis Secure Zone is created using unallocated space, if available, or at the expense of the volumes' free space.

The Acronis Secure Zone cannot be organized on a dynamic disk.

Copyright © Acronis International GmbH, 2002-2013.

To allocate space for Acronis Secure Zone

1. Choose a hard disk (if several) on which to create the zone. The unallocated space and free space from all volumes of the first enumerated disk are selected by default. The program displays the total space available for the Acronis Secure Zone.
2. If you need to allocate more space for the zone, you can select volumes from which free space can be taken. Again, the program displays the total space available for the Acronis Secure Zone depending on your selection. You will be able to set the exact zone size in the **Acronis Secure Zone Size** (p. 198) window.
3. Click **OK**.

7.2.1.2 Acronis Secure Zone Size

Enter the Acronis Secure Zone size or drag the slider to select any size between the minimum and the maximum ones. The minimum size is approximately 50MB, depending on the geometry of the hard disk. The maximum size is equal to the disk's unallocated space plus the total free space on all the volumes you have selected in the previous step.

If you have to take space from the boot or the system volume, please bear the following in mind:

- Moving or resizing of the volume from which the system is currently booted will require a reboot.
- Taking all free space from a system volume may cause the operating system to work unstably and even fail to start. Do not set the maximum zone size if the boot or the system volume is selected.

7.2.1.3 Password for Acronis Secure Zone

Setting up a password protects the Acronis Secure Zone from unauthorized access. The program will ask for the password at any operation relating to the zone and the archives located there, such as data backup and recovery, validating archives, resizing and deleting the zone.

To set up a password

1. Choose **Use password**.
2. In the **Enter the password** field, type a new password.
3. In the **Confirm the password** field, re-type the password.
4. Click **OK**.

To disable password

1. Choose **Do not use**.
2. Click **OK**.

7.2.1.4 Result confirmation

The **Result confirmation** window displays the expected partition layout according to the settings you have chosen. Click **OK**, if you are satisfied with the layout and the Acronis Secure Zone creation will start.

How the settings you make will be processed

This helps you to understand how creating the Acronis Secure Zone will transform a disk containing multiple volumes.

- Acronis Secure Zone is always created at the end of the hard disk. When calculating the final layout of the volumes, the program will first use unallocated space at the end.

 Copyright © Acronis International GmbH, 2002-2013.

- If there is no or not enough unallocated space at the end of the disk, but there is unallocated space between volumes, the volumes will be moved to add more unallocated space to the end.
- When all unallocated space is collected but it is still not enough, the program will take free space from the volumes you select, proportionally reducing the volumes' size. Resizing of locked volumes requires a reboot.
- However, there should be free space on a volume, so that the operating system and applications can operate; for example, for creating temporary files. The program will not decrease a volume where free space is or becomes less than 25% of the total volume size. Only when all volumes on the disk have 25% or less free space, will the program continue decreasing the volumes proportionally.

As is apparent from the above, setting the maximum possible zone size is not advisable. You will end up with no free space on any volume which might cause the operating system or applications to work unstably and even fail to start.

7.2.2 Managing Acronis Secure Zone

Acronis Secure Zone is considered as a personal vault (p. 455). Once created on a managed machine, the zone is always present in the list of **Personal vaults**. Centralized backup plans can use Acronis Secure Zone as well as local plans.

All the archive management operations available in vaults are also applicable to Acronis Secure Zone. To learn more about archive management operations, see Operations with archives and backups (p. 253).

7.2.2.1 Increasing Acronis Secure Zone

To increase Acronis Secure Zone

1. On the **Manage Acronis Secure Zone** page, click **Increase**.
2. Select volumes from which free space will be used to increase the Acronis Secure Zone.
3. Specify the new size of the zone by:
   - dragging the slider and selecting any size between the current and maximum values. The maximum size is equal to the disk's unallocated space plus the total free space of all selected partitions;
   - typing an exact value in the Acronis Secure Zone Size field.

   When increasing the size of the zone, the program will act as follows:
   - first, it will use the unallocated space. Volumes will be moved, if necessary, but not resized. Moving of locked volumes requires a reboot.
   - If there is not enough unallocated space, the program will take free space from the selected volumes, proportionally reducing the volumes' size. Resizing of locked partitions requires a reboot.

   Reducing a system volume to the minimum size might prevent the machine's operating system from booting.

4. Click **OK**.

7.2.2.2 Decreasing Acronis Secure Zone

To decrease Acronis Secure Zone

1. On the **Manage Acronis Secure Zone** page, click **Decrease**.

Copyright © Acronis International GmbH, 2002-2013.

2. Select volumes that will receive the free space after the zone is decreased.

   If you select several volumes, the space will be distributed to each partition equally. If you do not select any volumes, the freed space becomes unallocated.
3. Specify the new size of the zone by:
   - dragging the slider and selecting any size between the current and minimum values. The minimum size is approximately 50MB, depending on the geometry of the hard disk;
   - typing an exact value in the **Acronis Secure Zone Size** field.
4. Click **OK**.

7.2.2.3 Deleting Acronis Secure Zone

To delete Acronis Secure Zone:

1. On the **Manage Acronis Secure Zone** page, click **Delete**.
2. In the **Delete Acronis Secure Zone** window, select volumes to which you want to add the space freed from the zone and then click **OK**.

   If you select several volumes, the space will be distributed to each partition equally. If you do not select any volumes, the freed space becomes unallocated.

After you click **OK**, Acronis Backup & Recovery 11.5 will start deleting the zone.

7.3 Removable devices

This section describes peculiarities of backing up to removable devices.

By a removable device, we mean an RDX drive or USB flash drive. A USB hard disk drive is not considered to be a removable device unless it is recognized as such by the operating system.

In Linux, an RDX drive or USB flash drive is considered to be a removable device if it is specified by its name (for example, **sdf:/**). If a device is specified by its mount point (for example, **/mnt/backup**), it behaves as a fixed drive.

The method of working with removable disk libraries (multi-cartridge devices) depends on the device type, brand, and configuration. Therefore, each case should be considered individually.

Vaults on removable devices

Before backing up a machine to a removable device, you can create a personal vault (p. 194). If you do not want to, the software will automatically create a personal vault in the drive folder selected for backing up.

Limitations

- Centralized vaults cannot be created on removable devices.
- Vaults created on removable devices do not have the **Data view** (p. 138) tab.

Usage modes of removable devices

When creating a backup plan, you can choose whether to use your removable device as a fixed drive or as removable media. The **Fixed drive** mode presumes that the removable device will always be attached to the machine. The **Removable media** mode is selected by default.

When you back up using the **Back up now** feature or under bootable media, the removable device is always used in the **Removable media** mode.

 Copyright © Acronis International GmbH, 2002-2013.

When you back up using Agent for Exchange, Agent for ESX(i) (Windows) or Agent for Hyper-V, the removable device is always used in the **Fixed drive** mode.

The difference between the two modes is mostly related to retention and replication of backups.

Functionality	Fixed drive	Removable media
If there is insufficient space to continue backing up, the software will prompt you to...	...manually free up disk space.	...insert new media.
You can set retention rules (p. 100) for backups stored on the device.	Yes	No
You can set the option to clean up the archive "**When there is insufficient space while backing up**" within the **Custom** (p. 69) backup scheme.	Yes	No
Simplified naming (p. 78) of backup files...	...is unavailable.	...is always used.
You can replicate backups (p. 100) *to* the removable device.	Yes	No
You can replicate backups *from* the removable device.	No	No
An archive with several full backups can be created.	Yes	No. Before creating a new full backup, the software will delete the entire archive and start a new one.
You can delete any backup of any archive.	Yes	No. You can delete only a backup that does not have dependent backups.

Since the removable device mode determines the naming scheme for backup files, the **Name backup files using the archive name...** check box does not appear when the backup destination is a removable device.

7.4 Tape devices

The following sections describe in detail how to use tape devices for storing backup archives.

You can work with tape devices if you have an advanced edition of Acronis Backup & Recovery 11.5 or if you have upgraded from Acronis Backup & Recovery 10 to Acronis Backup & Recovery 11.5.

7.4.1 What is a tape device?

A **tape device** is a generic term that means a tape library or a stand-alone tape drive.

A **tape library** (robotic library) is a high-capacity storage device that contains:

- one or more tape drives
- multiple (up to several thousand) slots to hold tapes
- one or more changers (robotic mechanisms) intended to move the tapes between the slots and the tape drives.

It may also contain other components such as barcode readers or barcode printers.

 Copyright © Acronis International GmbH, 2002-2013.

An **autoloader** is a particular case of tape libraries. It contains one drive, several slots, a changer and a barcode reader (optional).

A **stand-alone tape drive** (also called **streamer**) contains one slot and can hold only one tape at a time.

7.4.2 Overview of tape support

Acronis Backup & Recovery 11.5 agents can back up data to a tape device directly or through Acronis Backup & Recovery 11.5 Storage Node (p. 18). In either case, fully automatic operation of the tape device is ensured. When a tape device with several drives is attached to a storage node, multiple machines can simultaneously back up to tapes.

7.4.2.1 Compatibility with RSM and third-party software

Coexistence with third-party software

Acronis Backup & Recovery 11.5 cannot work with tapes on a machine where third-party software with proprietary tape management tools is installed. For Acronis Backup & Recovery 11.5 to use tapes on such machine, you need to uninstall or deactivate the third-party tape management software.

Interaction with RSM

Unlike Acronis Backup & Recovery 10, Acronis Backup & Recovery 11.5 does not use Windows Removable Storage Manager. During an upgrade from Acronis Backup & Recovery 10, Acronis Backup & Recovery 11.5 writes the necessary information from RSM to its own database in the new format.

When detecting a tape device (p. 210), Acronis Backup & Recovery 11.5 disables the device from RSM (unless it is being used by other software). As long as you want Acronis Backup & Recovery 11.5 to work with the tape device, make sure that neither a user nor third-party software enables the device in RSM. If the tape device was enabled in RSM, repeat the tape device detection.

7.4.2.2 Supported hardware

Acronis Backup & Recovery 11.5 supports external SCSI devices. These are devices connected to Fibre Channel or using the SCSI, iSCSI, Serial Attached SCSI (SAS) interfaces. Also, Acronis Backup & Recovery 11.5 supports USB-connected tape devices.

In Windows, Acronis Backup & Recovery 11.5 can back up to a tape device even if the drivers for the device's changer are not installed. Such a tape device is shown in **Device Manager** as **Unknown Medium Changer**. However, drivers for the device's drives must be installed. In Linux and under bootable media, backing up to a tape device without drivers is not possible.

Recognition of IDE or SATA connected devices is not guaranteed. It depends on whether proper drivers have been installed in the operating system.

7.4.2.3 Tape management database

Acronis Backup & Recovery 11.5 stores information about all tape devices attached to a machine in the tape management database. The default database path is as follows:

- In Windows XP/Server 2003: **%ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\ARSM\Database**.

 Copyright © Acronis International GmbH, 2002-2013.

- In Windows Vista and later versions of Windows: **%PROGRAMDATA%\Acronis\BackupAndRecovery\ARSM\Database**.
- In Linux: **/var/lib/Acronis/BackupAndRecovery/ARSM/Database**.

The database size depends on the number of archives stored on tapes and equals approximately 10 MB per hundred archives. The database may be large if the tape library contains thousands of archives. In this case, you may want to store the tape database on a different volume.

To relocate the database in Windows:

1. Stop the Acronis Removable Storage Management service.
2. Move all files from the default location to the new location.
3. Add the registry key described below. Specify the new location path in the registry value **ArsmDmlDbProtocol**.

   Registry key: HKEY_LOCAL_MACHINE\SOFTWARE\Acronis\ARSM\Settings

   Registry value: **ArsmDmlDbProtocol**

   Possible data values: Any string 0 to 32765 characters long.

   Description: Specifies the folder where the tape management database is stored.
4. Start the Acronis Removable Storage Management service.

To relocate the database in Linux:

1. Stop the `acronis_rsm` service.
2. Move all files from the default location to the new location.
3. Open the configuration file **/etc/Acronis/ARSM.config** in a text editor.
4. Locate the line `<value name="ArsmDmlDbProtocol" type="TString">`.
5. Change the path under this line.
6. Save the file.
7. Start the `acronis_rsm` service.

7.4.2.4 Peculiarities of backing up to tapes

Backup options

You can configure the **Tape management** (p. 128) backup options to determine:

- When to eject a tape.
- Whether to use a free tape for each full, incremental or differential backup.
- Whether to overwrite a tape when creating a full backup (for stand-alone tape drives only).
- Whether to use a separate tape set for backing up each machine.
- Whether to enable file recovery from disk-level backups stored on tapes.

Backup schemes

Simple scheme

When you use the Simple backup scheme (p. 65), only full backups can be created on tapes. This is because backups located on tapes cannot be consolidated (p. 447). If you had the option of creating incremental backups, you would not be able to delete any of the backups.

Grandfather-Father-Son and Tower of Hanoi schemes

 Copyright © Acronis International GmbH, 2002-2013.

By default, the Grandfather-Father-Son (p. 66) and Tower of Hanoi (p. 72) backup schemes create only full backups on tapes. This helps the software to delete each backup on time as defined by the backup scheme.

You may want to change the default setting to creating full, incremental and differential backups. For example, if you have a few tapes but your full backups are quite large, you may want to save space on tapes.

Each level of the above schemes uses a separate tape set within the same tape pool. This means that the software can only take a tape belonging to a certain tape set or a free tape (when space is running out on the currently used tape). This helps minimize the quantity of used tapes, because tapes with incremental and differential backups are filled and rewritten more often than tapes with full backups.

Custom scheme

Set up the custom scheme so that it creates full backups with a reasonable frequency. Otherwise, if you specify retention rules, the software will not be able to overwrite tapes as appropriate.

In the retention rules of the Custom backup scheme (p. 69), the **If a backup to be moved or deleted has dependencies: Consolidate these backups** option is disabled. Only the **Retain the backup until all dependent backups become subject to deletion** option is available. This is because backups located on tapes cannot be consolidated (p. 447).

7.4.2.5 Parallel operations

Acronis Backup & Recovery 11.5 can simultaneously perform operations with various components of a tape device. During an operation that uses a drive (backing up, recovering, rescanning (p. 215), or erasing (p. 214)), you can launch an operation that uses a changer (moving (p. 213) a tape to another slot or ejecting (p. 214) a tape) and vice versa. If your tape library has more than one drive, you can also launch an operation that uses one of the drives during an operation with another drive. For example, several machines can back up or recover simultaneously using different drives of the same tape library.

The operation of detecting the new tape devices (p. 210) can be performed simultaneously with any other operation. During inventorying (p. 216), no other operation is available except for detecting the new tape devices.

Operations that cannot be performed in parallel are queued.

7.4.2.6 Limitations

The limitations of tape device usage are the following:

1. The consolidation (p. 447) of backups located on tapes is not possible. As a result, usage of backup schemes has certain peculiarities (p. 203).
2. The deduplication (p. 447) of backups located on tapes is not possible.
3. Simplified naming of backup files (p. 78) is not possible for backups stored on tapes.
4. You cannot recover under an operating system from a backup stored on tapes if the recovery requires the operating system reboot. Use bootable media to perform such recovery.
5. Files cannot be recovered from disk-level backups created by Acronis Backup & Recovery 11 Update 0 (build 17318) and earlier.

 Copyright © Acronis International GmbH, 2002-2013.

Files can be recovered from a disk-level backup created by Acronis Backup & Recovery 11 Update 0.5 (build 17437) only after you rescan (p. 215) the tapes where the backup is located.

The **Enable file recovery from disk backups stored on tapes** (p. 128) option value determines whether files and folders can be recovered from disk-level backups created by Acronis Backup & Recovery 11.5.

6. You can validate (p. 241) any backup or archive stored on tapes, but you cannot select for validation an entire tape-based vault or tape device.
7. You cannot attach (p. 191) or detach a tape-based vault.
8. A managed tape-based vault cannot be protected with encryption. Encrypt your archives instead.
9. You cannot create a managed tape-based vault (p. 186) with the backward compatibility property. This means that Acronis Backup & Recovery 10 agents cannot back up to Acronis Backup & Recovery 11.5 managed tape-based vaults.
10. The software cannot simultaneously write one backup to multiple tapes or multiple backups through the same drive to the same tape.
11. Devices that use the Network Data Management Protocol (NDMP) are not supported.
12. Barcode printers are not supported.

7.4.2.7 Readability of tapes written by the older Acronis products

The following table summarizes the readability of tapes written by Acronis True Image Echo, Acronis True Image 9.1, Acronis Backup & Recovery 10 and Acronis Backup & Recovery 11 product families in Acronis Backup & Recovery 11.5. The table also illustrates the compatibility of tapes written by various components of Acronis Backup & Recovery 11.5.

			...is readable on a tape device attached to a machine with...			
			ABR11.5 Bootable Media	ABR11.5 Agent for Windows	ABR11.5 Agent for Linux	ABR11.5 Storage Node
Tape written on a locally attached tape device (tape drive or tape library) by...	Bootable Media	9.1	+	+	+	+
		Echo	+	+	+	+
		ABR10	+	+	+	+
		ABR11/11.5	+	+	+	+
	Agent for Windows	9.1	+	+	+	+
		Echo	+	+	+	+
		ABR10	+	+	+	+
		ABR11/11.5	+	+	+	+
	Agent for Linux	9.1	+	+	+	+
		Echo	+	+	+	+
		ABR10	+	+	+	+
		ABR11/11.5	+	+	+	+
Tape written on a tape device through...	Backup Server	9.1	-	-	-	-
		Echo	-	-	-	-
	Storage Node	ABR10	+	+	+	+
		ABR11/11.5	+	+	+	+

Copyright © Acronis International GmbH, 2002-2013.

7.4.3 Getting started with a tape device

7.4.3.1 Backing up a machine to a directly attached tape device

Prerequisites

- The tape device is attached to the machine in accordance with the manufacturer's instructions.
- Acronis Backup & Recovery 11.5 agent is installed on the machine.

Before backing up

1. Load tapes to the tape device.
2. Connect the console to the machine.
3. In the **Navigation** tree, click **Tape management**.
4. Click **Detect tape devices**.
5. If your tape device is a stand-alone drive, skip this step. Otherwise, do the following:
   a. Click **Inventory** to detect the loaded tapes. Select the **Full** inventorying method. Do not select the **Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool** check box.

      Result. The loaded tapes have been moved to proper pools as specified in the "Inventorying" (p. 216) section.

      Full inventorying of an entire tape device may take a long time.

   b. If the loaded tapes were sent to the **Unrecognized tapes** or **Imported tapes** pool and you want to use them for backing up, move (p. 213) such tapes to the **Free tapes** pool manually.

      *Tapes sent to the **Imported tapes** pool contain backups written by Acronis software. Before moving such tapes to the **Free tapes** pool, make sure you do not need these backups.*

Backing up

On the **Actions** menu, click **Back up now** or **Create backup plan**. Configure (p. 55) the backup settings. When specifying the backup destination, select the tape device.

Results

- The resulting backups will be located in an automatically created personal vault (p. 218). To access the vault, click **Vaults** in the **Navigation** tree. Each time you select the tape device as the backup destination, the backups will be saved to the same vault.
- Tapes with the backups will be moved to the **Acronis** pool.

7.4.3.2 Backing up to a tape device attached to a storage node

Prerequisites

- Acronis Backup & Recovery 11.5 Storage Node is added to the management server (p. 226).
- The tape device is attached to the storage node in accordance with the manufacturer's instructions.

Before backing up

1. Load tapes to the tape device.
2. Connect the console to the management server.

 Copyright © Acronis International GmbH, 2002-2013.

3. In the **Navigation** tree, click **Tape management**. Select the storage node to which your tape device is attached.
4. Click **Detect tape devices**.
5. If your tape device is a stand-alone drive, skip this step. Otherwise, do the following:
   a. Click **Inventory** to detect the loaded tapes. Select the **Full** inventorying method. Do not select the **Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool** check box.

      Result. The loaded tapes have been moved to proper pools as specified in the "Inventorying" (p. 216) section.

      Full inventorying of an entire tape device may take a long time.

   b. If the loaded tapes were sent to the **Unrecognized tapes** or **Imported tapes** pool and you want to use them for backing up, move (p. 213) such tapes to the **Free tapes** pool manually.

      *Tapes sent to the **Imported tapes** pool contain backups written by Acronis software. Before moving such tapes to the **Free tapes** pool, make sure you do not need these backups.*

   c. Decide whether you want to back up to the default **Acronis** pool (p. 210) or to create a new pool (p. 211).

      Details. Having several pools enables you to use a separate tape set for each machine or each department of your company. By using multiple pools, you can prevent backups created via different backup plans from mixing up on one tape.

   d. If you chose the **Acronis** pool, or enabled the new pool to take tapes from the **Free tapes** pool when required, skip this step.

      Otherwise, move tapes from the **Free tapes** pool to the new pool.

      Tip. To learn whether a pool can take tapes from the **Free tapes** pool, click the pool and then click **Details**.
6. In the **Navigation** tree, click **Storage nodes**. Select the storage node to which your tape device is attached, and then click **Create vault**. Proceed as described in the "Creating a managed centralized vault" (p. 186) section. In the **Tape pool** list, select the pool you decided to use on step 5c.

   Creating a centralized vault is mandatory when the tape device is attached to the storage node.

Backing up

On the **Actions** menu, click **Back up now** or **Create backup plan**. Configure (p. 360) the backup settings for one or more machines. When specifying the backup destination, select the created vault.

Results

- The resulting backups will be located in the vault you created.

Tips for further usage of the tape library

- You do not need to perform full inventorying each time you load a new tape. To save time, follow the procedure described in the "Inventorying" (p. 216) section under "Combination of fast and full inventorying".
- You can create other vaults (p. 218) on the same tape library and select any of them as a destination for backups.

Copyright © Acronis International GmbH, 2002-2013.

7.4.3.3 Recovering under an operating system from a tape device

To recover under an operating system from a tape device:

1. Connect the console to the machine you want to recover.
2. On the **Actions** menu, click **Recover**.
3. Click **Select data**, click **Data path**, and then click **Browse**.
4. Select the vault that contains the backup whose data is to be recovered, click **OK**, and then click **Archive view**.
5. Select the backup, and then select the data you want to recover. After you click **OK**, the **Recover** page will show you the list of tapes required for the recovery. The missing tapes are grayed out. If your tape device has empty slots, load these tapes into the device.
6. Configure (p. 134) other recovery settings.
7. Click **OK** to start the recovery operation.
8. If any of the required tapes are not loaded for some reason, the software will show you a message with the identifier of the needed tape. Load the tape, and click **Retry** to continue the recovery.

What if I do not see backups stored on tapes?

It may mean that the database with the contents of tapes is lost or corrupted for some reason.

To restore the database, do the following:

If the backup is located on the machine

1. After you click **Recover**, click **Select data**, and then click **Browse**.
2. Double-click **Tape devices**. The system prompts to confirm the tape devices detection. Click **Yes**.
3. After the detected tape devices appear in the tree, select the necessary device and click **OK**. The system prompts to confirm the rescanning operation. Click **Yes**.
4. Rescan (p. 215) the **Unrecognized tapes** pool. As a result, you will get the contents of the loaded tape(s).
5. If any of the detected backups continue on other tapes that have not been rescanned yet, load these tapes as prompted and rescan them.
6. After that, you can select the required backup.

If the backup is located on a storage node

1. Connect the console to the management server.
2. Detect the tape devices (p. 210).
3. Perform the fast inventorying (p. 216).

   During the inventorying, do not *select the* ***Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool*** *check box. If the check box is selected, you may lose all your backups.*

4. Create a managed vault (p. 218) on the tape device.
5. Rescan (p. 215) the **Unrecognized tapes** pool. As a result, you will get the contents of the loaded tape(s).
6. If any of the detected backups continue on other tapes that have not been rescanned yet, load these tapes as prompted and rescan them.

 Copyright © Acronis International GmbH, 2002-2013.

7.4.3.4 Recovering under bootable media from a locally attached tape device

To recover under bootable media from a locally attached tape device:

1. Load the tape(s) required for the recovery into the tape device.
2. Boot the machine from the bootable media.
3. Click **Acronis Backup & Recovery 11.5**, and then click **Manage this machine locally**. Skip this step if you use WinPE-based media.
4. If the tape device is connected by using the iSCSI interface, configure the device as described in "Configuring iSCSI and NDAS devices" (p. 267).
5. Click **Recover**.
6. Click **Select data**, and then click **Browse**.
7. Double-click **Tape devices**. The system prompts to confirm the tape devices detection. Click **Yes**.
8. After the detected tape devices appear in the tree, select the necessary device. The system prompts to confirm the rescanning. Click **Yes**.
9. Select the **Unrecognized tapes** pool.
10. Select the tapes to be rescanned. To select all the tapes of the pool, select the check box next to the **Tape name** column header.
11. If the tapes contain a password-protected archive, select the corresponding check box, and then specify the password for the archive in the **Password** box. If you do not specify a password, or the password is incorrect, the archive will not be detected. Please keep this in mind in case you see no archives after the rescanning.

    Tip. If the tapes contain several archives protected by various passwords, you need to repeat the rescanning several times specifying each password in turn.
12. Click **Start** to start the rescanning. As a result, you will get the contents of the loaded tape(s).
13. If any of the detected backups continue on other tapes that have not been rescanned yet, load these tapes as prompted and rescan them.
14. After the rescanning completes, click **OK**.
15. In the **Archive view**, select the backup whose data is to be recovered, and then select the data you want to recover. After you click **OK**, the **Recover** page will show you the list of tapes required for the recovery. The missing tapes are grayed out. If your tape device has empty slots, load these tapes into the device.
16. Configure (p. 134) other recovery settings.
17. Click **OK** to start the recovery.
18. If any of the required tapes are not loaded for some reason, the software will show you a message with the identifier of the needed tape. Load the tape, and click **Retry** to continue the recovery.

7.4.3.5 Recovering under bootable media from a tape device attached to a storage node

To recover under bootable media from a tape device attached to a storage node:

1. Load the tape(s) required for the recovery into the tape device.
2. Boot the machine from the bootable media.
3. Click **Acronis Backup & Recovery 11.5**, and then click **Manage this machine locally**. Skip this step if you use WinPE-based media.

 Copyright © Acronis International GmbH, 2002-2013.

4. Click **Recover**.
5. Click **Select data**, and then click **Browse**.
6. In the **Path** box, type `bsp://<storage node address>/<vault name>/`, where `<storage node address>` is the IP address of the storage node that contains the required backup, and `<vault name>` is the name of the vault. Click **OK** and specify credentials for the vault.
7. Select the backup, and then select the data you want to recover. After you click **OK**, the **Recover** page will show you the list of tapes required for the recovery. The missing tapes are grayed out. If your tape device has empty slots, load these tapes into the device.
8. Configure (p. 134) other recovery settings.
9. Click **OK** to start the recovery.
10. If any of the required tapes are not loaded for some reason, the software will show you a message with the identifier of the needed tape. Load the tape, and click **Retry** to continue the recovery.

7.4.4 Tape management

7.4.4.1 Detecting tape devices

When detecting tape devices, Acronis Backup & Recovery 11.5 finds tape devices attached to the machine and places information about them in the tape management database. Detecting tape devices is required:

- After you have attached or re-attached a tape device.
- After you have installed or reinstalled Acronis Backup & Recovery 11.5 on the machine to which a tape device is attached.

When detecting tape devices, Acronis Backup & Recovery 11.5 disables them from RSM.

To detect the tape devices

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click **Detect tape devices**. You will see the quantity of connected tape devices, their drives and slots.

7.4.4.2 Tape pools

Acronis Backup & Recovery 11.5 uses tape pools that are logical groups of tapes. The software contains the following predefined tape pools: **Unrecognized tapes**, **Imported tapes**, **Free tapes**, and **Acronis**. Also, you can create your own custom pools.

Predefined pools

Unrecognized tapes

The pool contains tapes that were written by third-party applications. To write to such tapes, you need to move (p. 213) them to the **Free tapes** pool explicitly. You cannot move tapes from this pool to any other pool, except for the **Free tapes** pool.

Imported tapes

 Copyright © Acronis International GmbH, 2002-2013.

The pool contains tapes that were written by Acronis Backup & Recovery 11.5 in a tape device attached to another storage node or agent. To write to such tapes, you need to move them to the **Free tapes** pool explicitly. You cannot move tapes from this pool to any other pool, except for the **Free tapes** pool.

Free tapes

The pool contains free (empty) tapes. You can manually move tapes to this pool from other pools.

When you move a tape to the **Free tapes** pool, the software marks it as empty. If the tape contains backups, they are marked with the icon. When the software starts overwriting the tape, the data related to the backups will be removed from the database.

Acronis

The pool is used for backing up by default, when you do not want to create your own pools. Usually it applies to one tape drive with a small number of tapes.

Custom pools

You need to create several pools if you want to separate backups of different data. For example, you may want to create custom pools in order to separate:

- backups from different departments of your company
- backups from different machines
- backups of system volumes and users' data
- filled tapes from tapes being written to (p. 211).

Separating filled tapes

You may want to separate filled tapes from incomplete ones. Let's assume you want the tapes filled over a month to be taken to an off-site location. To do this:

1. Create a custom tape pool (p. 211) (for example, **Filled tapes**).
2. Create another custom tape pool (for example, **Current tapes**). In the pool settings, select the **When tape is full, move to pool** check box and select the **Filled tapes** pool in the list.
3. Create a vault (p. 218), and associate it with the **Current tapes** pool.
4. When creating a backup plan, choose the created vault as the backup destination.
5. Once a month, eject tapes stored in the **Filled tapes** pool and take them to an off-site storage.

7.4.4.3 Operations with pools

Creating a pool

To create a pool:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click **Create pool**.
3. Specify the pool name.
4. [Optional] Select tapes to be moved to the pool from the **Free tapes** pool.
5. [Optional] Clear the **Take tapes from the Free tapes pool automatically...** check box. If cleared, only tapes that are included into the new pool at a certain moment will be used for backing up.

 Copyright © Acronis International GmbH, 2002-2013.

6. [Optional] Select the **After ... rewritings, move tape to pool** check box, specify the number of information writing cycles, and then select the pool to which a tape will be moved after that.

   Tip. Tapes have relatively short durability. So, you can create a special pool and move old tapes to it. Then, you regularly eject tapes stored in this pool, get rid of them and load new tapes into your tape device.
7. [Optional] Select the **After ... backups, move tape to pool** check box, specify the number of backups, and then select the pool to which a tape will be moved after that.

   Tip. For example, this option can be useful in the following case. You back up your machine once a day from Monday until Friday and move the tape(s) after five backups to a custom pool. Once a week special employees eject the tapes from this pool and take them to a secure off-site location.
8. [Optional] Select the **When tape is full, move to pool** check box, and then select the pool to which a tape will be moved when it is full.

   Tip. For example, this option can be useful for separating filled tapes from tapes being written to (p. 211).
9. Click **OK**.

Editing a pool

You can edit parameters of the **Acronis** pool or your own custom pool.

To edit a pool:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Select the required pool, and then click **Settings**.
3. You can change the pool name (except the name of the **Acronis** pool) or settings. For more information about pool settings, see the "Creating a pool" (p. 211) section.
4. Click **OK** to save the changes.

Deleting a pool

You can delete only custom pools. Predefined tape pools (**Unrecognized tapes**, **Imported tapes**, **Free tapes**, and the **Acronis** pool) cannot be deleted.

To delete a pool:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Select the required pool and click **Remove**.
3. If the pool is associated with one or several vaults, the system will notify you that it cannot delete the pool. You need to click **Close**, change the pool in the settings of each of the vaults mentioned in the notification message, and then repeat the pool deletion operation.

   Otherwise, select the pool to which the tapes of the pool being deleted will be moved after the deletion.
4. Click **OK** to delete the pool.

 Copyright © Acronis International GmbH, 2002-2013.

7.4.4.4 Operations with tapes

Renaming

When a new tape is detected by the software, it is automatically assigned a name in the following format: **Tape XXX**, where **XXX** is a unique number. Tapes are numbered sequentially. The renaming operation allows you to manually change the name of one or several tapes.

To rename tapes:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click the pool that contains the necessary tape(s), and then select the required tape(s).
3. Click **Rename**.
4. Type new name(s) of the selected tape(s).
5. Click **OK** to save the changes.

Changing pool

The operation allows you to move one or several tapes from one pool to another.

When you move a tape to the **Free tapes** pool, the software marks it as empty. If the tape contains backups, they are marked with the icon. When the software starts overwriting the tape, the data related to the backups will be removed from the database.

Notes about specific types of tape

- You cannot move write-protected and once-recorded WORM (Write-Once-Read-Many) tapes to the **Free tapes** pool.
- Cleaning tapes are always displayed in the **Unrecognized tapes** pool; you cannot move them to any other pool.

To move tapes to another pool:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click the pool that contains the necessary tapes, and then select the required tapes.
3. Click **Change pool**.
4. [Optional] Click **Create pool** if you want to create another pool for the selected tapes. Perform actions described in the "Creating a pool" (p. 211) section.
5. Select the pool to move the tapes to.
6. Click **OK** to save the changes.

Moving to another slot

Use this operation in the following situations:

- You need to take several tapes out of a tape device simultaneously.
- Your tape device does not have a mail slot and the tapes to be taken out are located in slots of non-detachable magazine(s).

You need to move tapes to slots of one slot magazine and then take the magazine out manually.

 Copyright © Acronis International GmbH, 2002-2013.

To move tapes to other slots:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click the pool that contains the necessary tapes, and then select the required tapes.
3. Click **Move**.
4. Select a new slot to move each of the selected tapes to.
5. Click **OK** to start the operation.

Ejecting

For successful ejecting of a tape from a tape library, the tape library must have the mail slot and the slot must not be locked by a user or by other software.

To eject a tape:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click the pool that contains the necessary tape, and then select the required tape.
3. Click **Eject**. The software will prompt you to provide the tape description. We recommend that you describe the physical location where the tape will be kept. During recovery, the software will display this description so you could easily find the tape.

   Details. You can disable the tape description prompt by clicking **Do not show this message again**. To re-enable the prompt: click **Options** on the menu, then click **Console options**, click **Pop-up messages**, and then select the **Request description when ejecting a tape** check box.
4. Click **OK** to start the operation.

After a tape is ejected either manually or automatically (p. 128), it is recommended to write its name on the tape.

Erasing

Erasing a tape physically deletes all backups stored on the tape and removes the information about these backups from the database. However the information about the tape itself remains in the database.

After erasing, a tape located in the **Unrecognized tapes** or **Imported tapes** pool is moved to the **Free tapes** pool. A tape located in any other pool is not moved.

You can apply the operation to one tape at a time.

To erase a tape:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click the pool that contains the necessary tape, and then select the required tape.
3. Click **Erase**. The system prompts to confirm the operation.
4. Click **OK** to start the operation.

   Details. You cannot cancel the erasing operation.

 Copyright © Acronis International GmbH, 2002-2013.

Rescanning

The information about the contents of tapes is stored in a dedicated database. The rescanning operation reads the contents of tapes and updates the database if the information in it mismatches the data stored on tapes. The archives detected as a result of the operation are placed in the specified vault.

Within one operation, you can rescan tapes of one pool. Only online tapes can be selected for the operation.

Run the rescanning:

- If the database of a storage node or managed machine is lost or damaged.
- If information about a tape in the database is out of date (for example, a tape contents were modified by another storage node or agent).
- To obtain access to backups stored on tapes when working under bootable media.
- If you have mistakenly removed (p. 217) the information about a tape from the database. When you rescan a removed tape, the backups stored on it reappear in the database and become available for data recovery.
- If backups were deleted from a tape either manually or through retention rules (p. 453) but you want them to become accessible for data recovery. Before rescanning such a tape, eject (p. 214) it, remove (p. 217) the information about it from the database, and then insert the tape into the tape device again.

To rescan tapes:

1. If you have no tape-based vault (p. 218) associated with the device you loaded the tapes to, create one.
2. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
3. Perform the fast inventorying (p. 216).

   Note *During the inventorying, do* not *select the* ***Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool*** *check box.*

4. Click **Rescan**.
5. Select the vault where the newly detected archives will be placed.
6. Select the **Unrecognized tapes** pool. This is the pool to which most of the tapes are sent as a result of the fast inventorying. Rescanning the pool associated with the selected vault or the **Imported tapes** pool is also possible.
7. Select the tapes to be rescanned. To select all the tapes of the pool, select the check box next to the **Tape name** column header.
8. If necessary, select the **Enable file recovery from disk backups stored on tapes** check box.

   Details. If the check box is selected, the software will create special supplementary files on a hard disk of the machine where the tape device is attached. File recovery from disk backups is possible as long as these supplementary files are intact. Be sure to select the check box if the tapes contain single-pass backups (p. 453). Otherwise, you will not be able to recover the application data from these backups.
9. If the tapes contain a password-protected archive, select the corresponding check box, and then specify the password for the archive in the **Password** box. If you do not specify a password, or the password is incorrect, the archive will not be detected. Please keep this in mind in case you see no archives after the rescanning.

 Copyright © Acronis International GmbH, 2002-2013.

Tip. If the tapes contain several archives protected by various passwords, you need to repeat the rescanning several times specifying each password in turn.

10. Click **Start** to start the rescanning.

Result. The selected tapes are moved to the pool associated with the selected vault. The backups stored on the tapes can be found in this vault. A backup spread over several tapes will not appear in the vault until all of these tapes are rescanned.

Inventorying

The inventorying operation detects tapes loaded into a tape device and assigns names to those that have none. Perform the operation every time you load tapes into the tape device slots.

Inventorying methods

Acronis Backup & Recovery 11.5 provides the following two methods of inventorying.

Fast inventorying

Acronis Backup & Recovery 11.5 scans tapes for barcodes. Using barcodes, the software can quickly return a tape to the pool where it was before.

Select this method to recognize tapes used by the same tape device attached to the same machine. Other tapes will be sent to the **Unrecognized tapes** pool.

If your tape library contains no barcode reader, all tapes will be sent to the **Unrecognized tapes** pool. To recognize your tapes, perform full inventorying or combine fast and full inventorying as described later in this section.

Full inventorying

Acronis Backup & Recovery 11.5 reads tags written by Acronis software and analyzes other information about the contents of the loaded tapes. Select this method to recognize empty tapes and tapes written by Acronis software on any tape device and any machine.

The following table shows pools to which tapes are sent as a result of the full inventorying.

Tape was used by...	**Tape is read by...**	**Tape is sent to pool...**
Agent	the same Agent	where the tape was before
	another Agent	**Imported tapes**
	Storage Node	**Imported tapes**
Storage Node	the same Storage Node	where the tape was before
	another Storage Node	**Imported tapes**
	Agent	**Imported tapes**
third-party backup application	Agent or Storage Node	**Unrecognized tapes**

Tapes of certain types are sent to specific pools:

Tape type	**Tape is sent to pool...**
Empty tape	**Free tapes**
Empty write-protected tape	**Unrecognized tapes**

 Copyright © Acronis International GmbH, 2002-2013.

Cleaning tape	**Unrecognized tapes**

The fast inventorying can be applied to entire tape devices. The full inventorying can be applied to entire tape devices, individual drives or slots.

Combination of fast and full inventorying

Full inventorying of an entire tape device may take a long time. If you need to inventory only a few tapes, proceed as follows:

1. Perform the fast inventorying of the tape device.
2. Click the **Unrecognized tapes** pool. Find the tapes you want to inventory and note which slots they occupy.
3. Perform the full inventorying of these slots.

What to do after inventorying

If you want to back up to tapes that were placed in the **Unrecognized tapes** or **Imported tapes** pool, move (p. 213) them to the **Free tapes** pool, and then to the **Acronis** pool or a custom pool. If the pool to which you want to back up is replenishable (p. 453), you may leave the tapes in the **Free tapes** pool.

If you want to recover from a tape that was placed in the **Unrecognized tapes** or **Imported tapes** pool, you need to rescan (p. 215) it. The tape will be moved to the pool associated with the vault you have selected during the rescanning, and the backups stored on the tape will appear in the vault.

Sequence of actions

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click **Inventory**.
3. Select the inventorying method: **Fast** or **Full**.
4. [Optional] Select the **Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool** check box.

   Warning. *Only select this check box if you are absolutely sure that the data stored on your tapes can be overwritten.*

5. [Optional] Select tape libraries and stand-alone drives to be inventoried. By default, all the tape libraries and stand-alone drives are selected.
6. [Optional] If you chose the **Full** inventorying method, you can select tape library slots and drives to be inventoried. By default, all the slots and drives are selected.

Removing

The removal operation deletes the information about the backups stored on the selected tape and about the tape itself from the database.

You can only remove an offline (ejected (p. 214)) tape.

To remove a tape:

1. In the **Navigation** tree, click **Tape management**. If connected to the management server, select the storage node to which your tape device is attached.
2. Click the pool that contains the necessary tape, and then select the required tape.
3. Click **Remove**. The system prompts to confirm the operation.

Copyright © Acronis International GmbH, 2002-2013.

4. Click **OK** to remove the tape.

What to do if I removed a tape by mistake?

Unlike an erased (p. 214) tape, the data from a removed tape is not physically deleted. Hence, you can make backups stored on such tape available again. To do so:

1. Load the tape into your tape device.
2. Perform the fast inventorying (p. 216) to detect the tape.

   During the inventorying, do not *select the* ***Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool*** *check box.*

3. Perform the rescanning (p. 215) to match the data stored on tapes with the database.

7.4.5 Vaults on tapes

Each tape-based vault is associated with one or several drives of a tape device and with a tape pool (p. 210).

Why do I need several vaults?

Two of the most common scenarios that require you to create several vaults are as follows:

- You want to back up the data of several machines so that backups from each machine are located on a separate tape set.
- You want to back up different data of the same machine onto separate tape sets. For example, you want to back up the system volume weekly and the frequently changing data daily.

In either case, create a separate custom pool for each tape set and associate a separate vault with it.

Personal tape-based vaults

Before backing up a machine to a directly attached tape device, you can create a personal vault. If you do not want to, the software will automatically create a personal vault associated with the **Acronis** pool.

If you create more than one personal vault, tapes with backups will be placed in the respective pools specified in the vaults' settings. However, each vault will show all the backups located in all of the vaults.

To create a personal vault:

1. In the **Navigation** tree, click **Vaults**.
2. Click **Create**.
3. Proceed as described in the "Creating a personal vault" (p. 194) section.

Managed centralized tape-based vaults

To back up a machine to a tape device attached to a storage node, you need to create a managed centralized vault on the tape device.

To create a managed centralized vault:

1. In the **Navigation** tree, click **Storage nodes**.
2. Select the required storage node, and then click **Create vault**.
3. Proceed as described in the "Creating a managed centralized vault" (p. 186) section.

 Copyright © Acronis International GmbH, 2002-2013.

Tip. If you back up multiple machines to a tape library with multiple drives, associate the vault with the whole library. This will allow you to back up the machines simultaneously via different drives. If you associate a vault or several vaults with one drive, backups will be queued.

7.4.6 Usage examples

Apart from the examples described in this section, you can consider the following two examples:

- Moving older backups to tapes for long-term retention (p. 105) (disk-to-disk-to-tape)
- Backing up to tapes within a narrow backup window (p. 105)

7.4.6.1 Example 1. A tape autoloader and 12 tapes

Consider the following scenario:

- You have 12 tapes and a tape autoloader attached to the machine whose data you want to back up.
- You want to back up the machine data so that if there is insufficient space on a tape, the backup continues onto another one.
- When all of the tapes are filled, you want them to be overwritten sequentially without any user interaction.

You need a separate pool for the backup plan that will perform this scenario. If you have or are planning to create other backup plans that write to the same tape device, use other pools for those plans.

Sequence of actions

1. Load your tapes into the autoloader slots.
2. Perform the fast inventorying (p. 216) with the **Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool** check box selected.

   Result. The loaded tapes are in the **Free tapes** pool. If some of them are sent to the **Acronis** pool or a custom pool, this means the tapes contain backups you did earlier on this machine. Move (p. 213) such tapes to the **Free tapes** pool manually if you don't need these backups.
3. Decide whether you want to back up to the default **Acronis** pool (p. 210) or to create a new pool (p. 211). In either case, clear the **Take tapes from the Free tapes pool automatically...** check box in the settings of the chosen pool.
4. Move all of the loaded tapes from the **Free tapes** pool to the chosen pool.
5. Create a personal vault (p. 218) and associate your pool with it.
6. When creating a backup plan (p. 55):
   - Select your vault as the backup location.
   - Select the **Custom** backup scheme. Set the backup schedules in such a way that the whole set of 12 tapes contains at least two full backups. This will allow the software to overwrite tapes as appropriate.
   - In **Clean up archive**, select **When there is insufficient space while backing up**.

Result

The backup plan will use only the tapes located in the selected pool. When all of the tapes are full, the oldest tape will be overwritten, and so on.

 Copyright © Acronis International GmbH, 2002-2013.

7.4.6.2 Example 2. Backing up to tapes on a weekly rotational basis

Consider the following scenario:

- You want to back up several machines to a tape device attached to Acronis Backup & Recovery 11.5 Storage Node.
- You want to create full backups on Fridays and incremental ones on Mondays, Tuesdays, Wednesdays and Thursdays.
- You want to use two tape sets, each one to be written over a week. A set of tapes from a week that has just passed should be ejected and replaced with the other set which will be later overwritten in turn. This way of working can be useful if the number of slots of your tape device is only enough for backing up during a week.

Sequence of actions

1. Load one of your tape sets into the tape device slots.
2. Perform the fast inventorying (p. 216) with the **Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool** check box selected.

   Result. The loaded tapes are in the **Free tapes** pool. If some of them are sent to the **Acronis** pool or a custom pool, this means the tapes contain backups you did earlier on this machine. Move (p. 213) such tapes to the **Free tapes** pool manually if you don't need these backups.
3. Decide whether you want to back up to the default **Acronis** pool (p. 210) or to create a new pool (p. 211).
4. If the chosen pool is not replenishable (p. 453), move all of the loaded tapes from the **Free tapes** pool to it.
5. Eject the loaded tape set. Repeat steps 1, 2 and 4 for the other tape set.
6. Create a managed vault (p. 186). When creating the vault:
   - In **Drives**, select the entire tape device. This will enable simultaneous backup of the machines via different drives, if your tape device has more than one drive.
   - In **Tape pool**, select the pool where you will back up to (the **Acronis** pool or the newly created one).
7. When creating a centralized backup plan (p. 360):
   - In **Items to back up**, select the machines you want to back up.
   - Choose the created vault as the backup destination.
   - Select the **Custom** backup scheme.
   - Specify the schedules for full and incremental backups.
   - In **Clean up archive**, select **Using retention rules**, and then click **Retention rules**. Specify the retention rule to delete backups older than 1 week.
8. Each Friday, before a new full backup runs, eject the loaded tape set and insert the other one. If your tape device contains a barcode reader, perform the fast inventorying. Otherwise, perform the full inventorying.

Result

The tape sets will be used in turns. After a tape set is inserted, its tapes will be sequentially overwritten.

 Copyright © Acronis International GmbH, 2002-2013.

7.4.6.3 Example 3. Disk-to-disk-to tape with sending tapes to an off-site storage

Consider the following scenario:

- You want to back up a machine to a hard disk and replicate each backup to the locally attached tape device.
- You want to eject tapes with each backup and send them to an off-site storage.

Sequence of actions

1. Load tapes into the tape device slots.
2. Perform the fast inventorying (p. 216) with the **Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool** check box selected.

   Result. The loaded tapes are in the **Free tapes** pool. If some of them are sent to the **Acronis** pool or a custom pool, this means the tapes contain backups you did earlier on this machine. Move (p. 213) such tapes to the **Free tapes** pool manually if you don't need these backups.
3. Decide whether you want to back up to the default **Acronis** pool (p. 210) or to create a new pool (p. 211).
4. If the chosen pool is not replenishable (p. 453), move all of the loaded tapes from the **Free tapes** pool to it.
5. Create a personal vault (p. 218) and associate your pool with it.
6. When creating a backup plan (p. 55):
   - Specify a local folder as the backup destination.
   - Set up the required backup scheme.
   - Select the **Replicate newly created backup to another location** check box, click **2nd location**, and select the created vault in the tree.
   - Click **Backup options**, click **Tape management** (p. 128) in the tree, and select the **Eject tapes after successful backups** check box.
7. After each backup is created and the tapes with it are ejected, send them to a secure off-site storage. If you do not have enough free tapes to continue backups, load new tapes and perform steps 2 and 4.

Result

The machine will be backed up to the local folder and to tapes. Tapes with each backups will be sent to the off-site storage.

7.4.6.4 Example 4. GFS. Sending full backups to an off-site storage

Consider the following scenario:

- You want to back up a machine to a tape device attached to a storage node.
- You want to use the Grandfather-Father-Son backup scheme (p. 66).
- You want to create full, incremental and differential backups. Each full backup should be written to a separate tape in order to send tapes with full backups to a secure off-site storage.

Sequence of actions

1. Load tapes into the tape device slots.

Copyright © Acronis International GmbH, 2002-2013.

2. Perform the fast inventorying (p. 216) with the **Move newly detected tapes from the 'Unrecognized tapes' or 'Imported tapes' pools to the 'Free tapes' pool** check box selected.

   Result. The loaded tapes are in the **Free tapes** pool. If some of them are sent to the **Acronis** pool or a custom pool, this means the tapes contain backups you did earlier on this machine. Move (p. 213) such tapes to the **Free tapes** pool manually if you don't need these backups.
3. Decide whether you want to back up to the default **Acronis** pool (p. 210) or to create a new pool (p. 211).
4. If the chosen pool is not replenishable (p. 453), move all of the loaded tapes from the **Free tapes** pool to it.
5. Create a managed vault (p. 186). When creating the vault:
   - In **Drives**, select the entire tape device. This will enable simultaneous backup of the machines via different drives, if your tape device has more than one drive.
   - In **Tape pool**, select the pool where you will back up to (the **Acronis** pool or the newly created one).
6. When creating a backup plan (p. 55):
   - Choose the created vault as the backup destination.
   - Select the **Grandfather-Father-Son (GFS)** backup scheme.
   - Specify the rules to keep daily backups for 7 days, weekly ones for 4 weeks and monthly ones indefinitely.
   - Click **Show backup type, validation...**, and then select **Full/incremental/differential** in **Backup type**.
   - Click **Backup options**, click **Tape management** (p. 128) in the tree, and select **For each full backup** under **Always use a free tape**.
7. After a full backup is created, you can eject the tapes with it and send them to a secure off-site storage. If you do not have enough free tapes to continue backups, load new tapes and perform steps 2 and 4.

Result

The machine will be backed up to tapes according to the specified backup scheme. Tapes with full backups will be sent to a secure off-site storage.

7.5 Storage nodes

The following sections describe how to use Acronis Backup & Recovery 11.5 Storage Nodes.

Storage nodes are available only in advanced editions of Acronis Backup & Recovery 11.5.

7.5.1 What is a storage node?

Acronis Backup & Recovery 11.5 Storage Node is a server designed to optimize the usage of various resources (such as the corporate storage capacity, the network bandwidth, or the managed machines' CPU load) which are required to protect enterprise data. This goal is achieved by organizing and managing the locations that serve as dedicated storages of the enterprise backup archives (managed vaults).

The most important function of a storage node is deduplication of backups stored in its vaults. This means that identical data will be backed up to this vault only once. This minimizes the network usage during backup and storage space taken by the archives.

 Copyright © Acronis International GmbH, 2002-2013.

Up to 50 storage nodes can be set up.

7.5.2 Supported types of storage

A managed vault can be organized:

- On the hard drives local to the storage node
- On a network share
- On a Storage Area Network (SAN)
- On a Network Attached Storage (NAS)
- On a tape library (p. 201) locally attached to the storage node.

7.5.3 Operations performed by storage nodes

Storage nodes can perform the following operations on archives stored in managed vaults.

Cleanup and validation

Archives stored in unmanaged vaults are maintained by the agents (p. 443) that create the archives. This means that each agent not only backs up data to the archive, but also executes service tasks that apply to the archive the retention rules and validation rules specified by the backup plan (p. 444). To relieve the managed machines of unnecessary CPU load, execution of the service tasks can be delegated to the storage node. Since the task schedules exist on the machine the agent resides on, and therefore uses that machine's time and events, the agent has to initiate the cleanup and the validation according to the schedule. To do so, the agent must be online. Further processing is performed by the storage node.

This functionality cannot be disabled in a managed vault. The next two operations are optional.

Deduplication

A managed vault can be configured as a deduplicating vault. This means that identical data will be backed up to this vault only once to minimize network usage during backup and to minimize storage space taken by the archives. For more information, see the "Deduplication" (p. 234) section.

Encryption

A managed vault can be configured so that anything written to it is encrypted and anything read from it is decrypted transparently by the storage node. This is done by using a vault-specific encryption key stored on the node server. In case the storage medium is stolen or accessed by an unauthorized person, the malefactor will not be able to decrypt the vault contents without access to this specific storage node.

If the archive is already encrypted by the agent, the storage node applies its own encryption over the encryption performed by the agent.

7.5.4 Getting started with a storage node

Prerequisites

Make sure that:

- The management server, the console and the agents are already installed.

 Copyright © Acronis International GmbH, 2002-2013.

- The machine where the storage node is planned to be installed meets the system requirements described in the installation documentation.
- You downloaded the setup program of Acronis Backup & Recovery 11.5.

Setting up the storage node

1. Install Acronis Backup & Recovery 11.5 Storage Node.
   a. Log on as an administrator and start the Acronis Backup & Recovery 11.5 setup program.
   b. Click **Install Acronis Backup & Recovery 11.5**.
   c. Accept the terms of the license agreement.
   d. Select the **Store the backups of other machines on this machine** check box.
   e. Click **Register now**. Specify the name or IP address of the machine where you installed the management server. Provide the user name and password of a user who is a member of the Acronis Centralized Admins group on the management server's machine.

      Details. Alternatively, you can add the storage node at a later time as described in step 2.
   f. Proceed with the installation.
2. Add the storage node to the management server. Skip this step, if you registered the storage node during the installation.
   a. Connect the console to the management server, and click **Storage nodes** in the **Navigation** pane.
   b. Click **Add**, and then proceed as described in "Adding a storage node to a management server" (p. 227).
3. Create a managed centralized vault.
   a. If not connected, connect the console to the management server, and then click **Storage nodes** in the **Navigation** pane.
   b. Select the storage node, then click **Create vault**. The **Create centralized vault** page will be opened with the pre-selected storage node. Perform the remaining steps to create the vault as described in "Creating a managed centralized vault" (p. 186).

      Note. If you enable deduplication in the vault, remember that the Deduplication add-on must be present on any machine backed up to the vault. Without this add-on backup to a deduplicating vault is not possible.

      Details. When specifying the paths to the vault and to the deduplication database, follow the recommendations described in "Deduplication best practices" (p. 237).

Backup to the storage node

Create a local (p. 55) or centralized (p. 360) backup plan. When creating the backup plan, specify the managed vault as a destination for storing backups.

Recovery from the storage node

Follow the regular steps described in "Creating a recovery task" (p. 134).

Managing storage nodes

1. Connect the console to the management server.
2. In the **Navigation** pane, click **Storage nodes**.
3. Select the storage node; then, perform the required operations as described in "Actions on storage nodes" (p. 226).

 Copyright © Acronis International GmbH, 2002-2013.

7.5.5 User privileges on a storage node

User accounts can have the different scope of user's privileges on Acronis Backup & Recovery 11.5 Storage Node.

1. **Acronis Centralized Admins** - management server administrators, members of the Acronis Centralized Admins group. Acronis Centralized Admins can:
   - Create centralized vaults to be managed by the storage node.
   - Add, edit, or remove Vault administrators and Vault users accounts.
   - View and manage any archive in any centralized vault managed by the storage node.
   - Manage indexing and compacting as described in "Actions on storage nodes" (p. 226).
2. **Vault administrators** - group or user accounts on the storage node, selected by the management server administrator when creating or editing a vault. Vault administrators can view and manage any archive in the specified managed vault. By default, the Administrators group on the storage node is added to the Vault administrators.
3. **Vault users** - group or user accounts on the storage node, selected by the management server administrator when creating or editing a vault. Vault users can view and manage only their own archives in the vault. By default, the Everyone group on the storage node is added to the Vault users.

Recommendations on user accounts

To allow users to access the centralized vaults managed by a storage node, you must ensure that those users have a right to access the storage node from the network.

If both the users' machines and the machine with the storage node are in one Active Directory domain, you probably do not need to perform any further steps: all users are typically members of the Domain Users group and so can access the storage node.

Otherwise, you need to create user accounts on the machine where the storage node is installed. We recommend creating a separate user account for each user who will access the storage node, so that the users are able to access only the archives they own.

Additional right of machine administrators

A vault user who is a member of the Administrators group on a machine can view and manage any archives created *from that machine* in a managed vault—regardless of the type of that user's account on the storage node.

Example

Suppose that two users on a machine, UserA and UserB, perform backups from this machine to a centralized vault managed by a storage node. On the storage node, let these users to be added as regular (non-administrative accounts) UserA_SN and UserB_SN, respectively. While creating a managed vault, both accounts were added as vault users.

Normally, UserA can access only the archives created by UserA (and owned by UserA_SN), and UserB can access only the archives created by UserB (and owned by UserB_SN).

However, if UserA is a member of the Administrators group on the machine, this user can additionally access the archives created from this machine by UserB—even though UserA's account on the storage node is a regular one.

 Copyright © Acronis International GmbH, 2002-2013.

7.5.6 Operations with storage nodes

7.5.6.1 Actions on storage nodes

To access actions

1. Connect the console to the management server.
2. In the **Navigation** pane, click **Storage nodes**.
3. The actions are performed by clicking the corresponding buttons on the toolbar.

To	Do
Add a storage node to the management server	1. Click **Add**. 2. In the **Add storage node** (p. 227) window, specify the machine the storage node is installed on. Adding a storage node establishes a trusted relationship between the management server and the storage node, in the same way as when you add machines to the server. Once the storage node is added to the management server, you will be able to create managed vaults on the node.
Remove a storage node from the management server	1. Select the storage node you need to remove. 2. Click **Remove**. Once the storage node is removed from the management server, the vaults being managed by the storage node disappear from the vault list (p. 182) and become unavailable for performing operations. All the plans and tasks that use these vaults will fail. All the databases and vaults of this storage node remain untouched. It is possible to add the previously removed storage node to the management server again. As a result, all the vaults managed by the storage node will appear in the vault list and become available once again for all the plans and tasks that used these vaults.
Create a centralized managed vault on the selected storage node	1. Select the storage node that will manage the vault. 2. Click **Create vault**. The **Create centralized vault** (p. 186) page will be opened with the pre-selected storage node. Perform the remaining steps to create the vault.
View details of the storage node	1. Select the storage node. 2. Click **View details**. In the **Storage node properties** (p. 227) window (its content is duplicated on the **Information** panel at the bottom of the **Storage nodes** view), examine information about the storage node and the vaults managed by this node.
Run, stop or reschedule compacting	1. Select the storage node. 2. Click **View details**. In the **Storage node properties (p. 227)** window, click the **Run compacting**, **Stop**, or **Compacting schedule** links respectively.
Run or stop indexing	1. Select the storage node. 2. Click **View details**. In the **Storage node properties (p. 227)** window, click the **Run indexing** or **Stop** links respectively.

Copyright © Acronis International GmbH, 2002-2013.

Refresh the list of storage nodes	Click **Refresh**. The management console will update the list of storage nodes from the management server with the most recent information. The list of storage nodes is refreshed automatically based on events. However, the data may not be retrieved immediately from the management server due to some latency. Manual refresh guarantees that the most recent data is displayed.

7.5.6.2 Adding a storage node to a management server

To add a storage node

1. In the **IP/Name** field, enter the name or the IP address of the machine the storage node resides on, or click **Browse...** and browse the network for the machine.

   Use the fully-qualified domain name (FQDN) of the storage node, that is, a completely specified domain name ending in a top-level domain. Do not enter “127.0.0.1” or “localhost” as the storage node IP/name. These settings are no good even if the management server and the storage node are on the same machine; because, after the centralized backup plan using the storage node is deployed, each agent will try to access the storage node as if it were installed on the agent's host.
2. To provide a valid user account for the machine, click **Options>>**, and specify:
   - **User name**. When entering a name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain). The user account has to be a member of the Administrators group on the machine.
   - **Password**. The password for the account.

   Select the **Save password** check box to store the password for the account.
3. Click **OK**.

Because registration requires the storage node's participation, it cannot take place when the machine is offline.

7.5.6.3 Storage node properties

The **Storage node properties** window accumulates in four tabs all information on the selected Acronis Backup & Recovery 11.5 Storage Node. This information is also duplicated on the **Information** panel.

Storage node properties

This tab displays the following information about the selected storage node:

- **Name** - the name of the machine where the storage node is installed
- **Availability**:
  - **Unknown** - this status is displayed until the first connection between the management server and the storage node is established after adding the storage node or starting the management server's service.
  - **Online** - the storage node is available for the management server. This means that the last management server's connection to the node was successful. Connection is established every 2 minutes.
  - **Offline** - the storage node is unavailable.

Copyright © Acronis International GmbH, 2002-2013.

    - **Withdrawn** - the storage node was registered on another management server. As a result, it is not possible to control the node from the current management server.
- **IP** - the IP address of the machine where the storage node is installed.
- **Archives** - the total number of archives stored in all the vaults managed by the storage node.
- **Backups** - the total number of backups stored within the archives in all the vaults managed by the storage node.
- **Indexing** - the indexing activity deduplicates the data saved to the deduplicating vault during a backup. Indexing always runs after a backup is completed. To learn more about indexing, see "How deduplication works" (p. 235).
    - **Idle** - indexing is not running. You can start the indexing by clicking the **Run indexing** link.
    - **Running** - indexing is running. You can stop the indexing by clicking the **Stop** link. Since indexing is a resource-consuming operation, you may want to stop it in order to allocate more resources to other processes which are more important at the moment. We recommend you to stop the indexing only if you absolutely need to, and to re-run the indexing as soon as possible. The longer you delay the indexing, the more data will not be deduplicated in the vault and the more disk space will be occupied.
- **Compacting** - the compacting task deletes from the deduplication data store the blocks which are no longer referred to. To learn more about compacting, see the "How deduplication works" (p. 235) section.
    - **Idle** - compacting is not running. You can start the compacting by clicking the **Run compacting** link.
    - **Running** - compacting is running. You can stop the compacting by clicking the **Stop** link.
- **Compacting schedule** - the compacting task scheduling parameters. Click the **Compacting schedule** link to re-schedule the compacting task. Only the time events (daily (p. 84), weekly (p. 86), and monthly (p. 88) schedules) are available for setting up. The preset is: Start the task every **1 week** on **Sunday** at **03:00:00 AM**.

Statistics

This tab provides you with information about the original and backed data sizes on all the managed vaults of the selected storage node.

Vaults

This tab displays a list of vaults managed by the selected storage node. To update the list of vaults with the most recent information from the management server, click **Refresh**.

Indexing

This tab lets you examine the current status of indexing for the deduplicating vaults of the storage node and review the date and time of the last run.

7.5.6.4 Configuring a storage node with Acronis Administrative Template

The following are the parameters of Acronis Backup & Recovery 11.5 Storage Node that can be set by using Acronis Administrative Template. For information on how to apply the administrative template, see How to load Acronis Administrative Template (p. 404).

 Copyright © Acronis International GmbH, 2002-2013.

Parameters related to compacting

As backups are deleted from a deduplicating vault, its deduplication data store (p. 235) may contain unused data blocks (items) that are no longer referred to from any backup. The storage node processes the data store to delete the unused items. This operation is called compacting. Compacting is performed by the compacting task.

Every time the compacting task starts, the storage node determines whether to perform compacting. To do this, the storage node:

1. Checks the size of the backed-up data that has been deleted from the vault since the last compacting.
2. Uses the **Compacting Trigger Rough Estimation Threshold** parameter to determine whether this size, relative to the size of the remaining backed up data, is significant.
3. If so, uses the **Compacting Trigger Threshold** parameter to determine whether the deduplication data store contains a significant number of unused items. If so, the storage node performs compacting.

The parameters are the following.

Compacting Trigger Rough Estimation Threshold

Description: Specifies the relative size of the backed-up data that remains in a deduplicating vault, below which checking for unused items is performed (see the **Compacting Trigger Threshold** parameter).

Possible values: Any integer number between **0** and **100**

Default value: **90**

The **Compacting Trigger Rough Estimation Threshold** parameter enables you to skip the check for unused items (and hence skip compacting) when the content of the vault did not change significantly.

The larger the value of this parameter, the more often the check for unused items will be performed. The value **100** means that the check will be performed each time the compacting task starts.

How it works. Assume that the parameter value is **90** and the vault has 100 GB of backed up data. It does not matter whether this data has duplicates. Then, you delete a few backups and the backed-up data size becomes equal to 80 GB. In this case:

The size of the deleted data is 20 GB, and the size of the remaining data is 80 GB. The ratio of the deleted to remaining data is thus 20 GB / 80 GB = 0.25, or 25 percent.

The storage node calculates the relative size of the remaining data as 100 percent – 25 percent = **75** percent.

Because this relative size is less than **90** percent, the storage node starts checking for unused items.

Compacting Trigger Threshold

Description: Specifies the percentage of used items in the deduplication data store below which compacting occurs.

Possible values: Any integer number between **0** and **100**

Default value: **90**

Since compacting is a resource-consuming operation, it should occur only when the number of unused items is significant.

 Copyright © Acronis International GmbH, 2002-2013.

The **Compacting Trigger Threshold** parameter enables you to set up a balance between the extra space required to store unused items and the compacting frequency. The larger the value of this parameter, the fewer unused items are allowed in the data store, but compacting will likely be more frequent.

The check is performed only after checking the percentage of the remaining backed up data in the vault (see the **Compacting Trigger Rough Estimation Threshold**).

Other parameters

Log Cleanup Rules

Specifies how to clean up the storage node log.

This parameter has the following settings:

Max Size

Description: Specifies the maximum size of the storage node log folder, in kilobytes.

Possible values: Any integer number between **0** and **2147483647**

Default value: **1048576** (that is, 1 GB)

Percentage To Keep

Description: Specifies the percentage of the maximum log size to keep on cleanup.

Possible values: Any integer number between **0** and **100**

Default value: **95**

Client Connection Limit

Description: Specifies the maximum number of simultaneous connections to the storage node by the agents that perform backup, recovery, or operations with archives (such as validation, replication, or cleanup).

Possible values: Any integer number between **1** and **2147483647**

Default value: **10**

Acronis Backup & Recovery 11.5 agents connect to the storage node to access its managed vaults during backup, recovery, or to perform an operation with an archive. The **Client Connection Limit** parameter determines the maximum number of such connections that the storage node can handle simultaneously.

When this limit is reached, the storage node will use the backup queue (see the next parameter) for the agents that are awaiting connection.

See also the **Fast Operation Connection Limit** parameter.

Backup Queue Limit

Description: Specifies the maximum number of agents in the storage node's backup queue.

Possible values: Any integer number between **1** and **2147483647**

Default value: **50**

The backup queue is a list of agents that are awaiting connection to the storage node for backup, recovery, or an operation with an archive (see the previous parameter). This list also includes the agents that are currently connected to the storage node for these purposes.

If an agent tries to establish such connection when the number of agents in the backup queue is equal to the value in **Backup Queue Limit**, the storage node does not put the agent in the queue.

In this case, the connection of the agent to the storage node fails. The corresponding task stops with the **Error** status.

See also the **Fast Operation Queue Limit** parameter.

 Copyright © Acronis International GmbH, 2002-2013.

Fast Operation Connection Limit

Description: Specifies the maximum number of simultaneous connections to the storage node for purposes other than backup, recovery, and operations with archives.

Possible values: Any integer number between **1** and **2147483647**

Default value: **10**

Components of Acronis Backup & Recovery 11.5 may connect to the storage node for viewing the contents of a vault and for other fast operations. The **Fast Operation Connection Limit** parameter determines the maximum number of such connections that the storage node can handle simultaneously.

When this limit is reached, the storage node will use the queue called the fast operations queue (see the next parameter) for the components that are awaiting connection.

See also the **Client Connection Limit** parameter.

Fast Operation Queue Limit

Description: Specifies the maximum number of components of Acronis Backup & Recovery 11.5 in the fast operations queue (see the previous parameter).

Possible values: Any integer number between **1** and **2147483647**

Default value: **50**

The fast operations queue is a list of components that are awaiting connection for fast operations such as viewing the contents of a vault.

When the number of components in this queue is equal to the value in **Fast Operation Queue Limit** and another component tries to establish a connection, the storage node does not put the component in the queue. In this case, the corresponding operation fails.

See also the **Backup Queue Limit** parameter.

Vault Metadata Databases Path

Description: Specifies the path to the folder where vault databases, also called metadata databases, are stored.

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

An empty string means the folder %ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\ASN\VaultMetadataDatabases (in Windows XP and Server 2003) or %PROGRAMDATA%\Acronis\BackupAndRecovery\ASN\VaultMetadataDatabases (in Windows Vista and later versions of Windows).

A vault database contains information about archives and backups stored in the vault. When you create or attach a vault, the storage node places the database for that vault to the folder determined by this parameter.

Changing this parameter does not affect the currently existing vault databases. If you want these databases to be moved to the new folder, detach (p. 185) the corresponding vaults and then attach (p. 191) them to the same storage node.

Deduplication Databases path

Description: Specifies the path where deduplication databases are stored.

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

An empty string means that the path must be entered manually.

 Copyright © Acronis International GmbH, 2002-2013.

A deduplication database contains the hash values of all data items stored in a vault—except for those that cannot be deduplicated. When you create a deduplicating vault, the storage node places the deduplication database for that vault to the folder determined by this parameter. For better performance, place the database on a disk drive other than the disk drive used for storing backups.

Changing this parameter does not affect the currently existing deduplication databases.

Check Hash Value On Server Side

Description: Specifies whether to check the hash values of data blocks that are sent to a deduplicating vault

Possible values: **Enabled** or **Disabled**

Default value: **Disabled**

When sending a data block to a deduplicating vault, the agent also sends that block's fingerprint known as the hash value.

The **Check Hash Value On Server Side** parameter determines whether the storage node must ensure that the hash value matches the data block. Such check puts an additional load on the storage node.

Normally, such check is not necessary. You can set this parameter to **Enabled** to make the deduplication process more secure.

If the check reveals a mismatch between the data block and its hash value, the backup operation fails.

Vault Warnings and Limits

Specifies the amount of free space in a vault (both as an absolute value and as a percentage) below which a warning or error is recorded in the log.

This parameter contains the following settings:

Vault Free Space Warning Limit

Description: Specifies the amount of free space in a managed vault, in megabytes, below which a warning is recorded in the storage node's log.

Possible values: Any integer number between **0** and **2147483647**

Default value: **200**

A vault's free space is the amount of free space on the medium—such as a disk volume—that stores the vault.

When the amount of free space in a vault is equal to the value in **Vault Free Space Warning Limit** or less, a warning is recorded in the storage node's log, indicating the vault in question. You can view storage node warnings in the Dashboard.

Vault Free Space Warning Percentage

Description: Specifies the amount of free space in a managed vault, as a percentage of its total size, below which a warning is recorded in the storage node's log.

Possible values: Any integer number between **0** and **100**

Default value: **10**

The total size of a vault is the vault's free space plus the size of all archives that are contained in the vault.

 Copyright © Acronis International GmbH, 2002-2013.

For example, suppose that two vaults, Vault A and Vault B, are both stored on a disk volume. Suppose further that the size of the archives in Vault A is 20 GB and the size of the archives in Vault B is 45 GB.

If the volume has 5 GB of free space, then the total size of Vault A is 20 GB + 5 GB = 25 GB, and that of Vault B is 45 GB + 5 GB = 50 GB, regardless of the size of the volume.

The percentage of free space in a vault is the vault's free space divided by the vault's total size. In the previous example, Vault A has 5 GB / 25 GB = 20% of free space, and Vault B has 5 GB / 50 GB = 10% of free space.

When the percentage of free space in a vault is equal to the value in **Vault Free Space Warning Percentage** or less, a warning is recorded in the storage node's log, indicating the vault in question. You can view storage node warnings in the Dashboard.

Note: *The parameters* ***Vault Free Space Warning Limit*** *and* ***Vault Free Space Warning Percentage*** *are independent of each other: a warning will be recorded every time that either of the thresholds is reached.*

Vault Free Space Error Limit

Description: Specifies the amount of free space in a managed vault, in megabytes, below which an error is recorded in the storage node's log and any backup to the vault becomes prohibited.

Possible values: Any integer number between **0** and **2147483647**

Default value: **50**

When the amount of free space in a vault is equal to the value in **Vault Free Space Error Limit** or less, an error is recorded in the storage node's log. Backups performed to the vault will keep failing until the vault's free space is above the limit.

Vault Database Free Space Warning Limit

Description: Specifies the amount of free space, in megabytes, on the volume containing a managed vault's database, below which a warning is recorded in the storage node's log.

Possible values: Any integer number between **0** and **2147483647**

Default value: **20**

If the amount of free space on the volume containing a managed vault's database is less than the value in **Vault Database Free Space Warning Limit**, a warning is recorded in the storage node's log, indicating the vault in question. You can view storage node warnings in the Dashboard.

The database is stored on the storage node in a local folder whose name is specified by the by the **Vault Metadata Database Path** parameter.

Vault Database Free Space Error Limit

Description: Specifies the amount of free space on the volume containing a managed vault's database, in megabytes, below which an error is recorded in the storage node's log and any backup to the vault becomes prohibited.

Possible values: Any integer number between **0** and **2147483647**

Default value: **10**

If the amount of free space on the disk containing a managed vault's database is less than the value of **Vault Database Free Space Error Limit**, an error is recorded in the storage node's log. Backups performed to the vault will keep failing until the amount of free space is above the limit.

You can view storage node errors in the Dashboard.

 Copyright © Acronis International GmbH, 2002-2013.

The database is stored on the storage node in a local folder whose name is specified by the **Vault Metadata Database Path** parameter.

7.5.7 Deduplication

This section describes deduplication, a mechanism designed to eliminate data repetition by storing identical data in archives only once.

7.5.7.1 Overview

Deduplication is the process of minimizing storage space taken by the data by detecting data repetition and storing the identical data only once.

Deduplication may also reduce network load: if, during a backup, a data is found to be a duplicate of an already stored one, its content is not transferred over the network.

Acronis Backup & Recovery 11.5 will deduplicate backups saved to a managed vault if you enable deduplication during the vault creation. A vault where deduplication is enabled is called a **deduplicating vault**. The Deduplication add-on to the agent must be installed on any machine that backs up to such vault. Without the add-on backing up to the vault is not possible.

The deduplication is performed on data blocks. The block size is **4 KB for disk-level backups** and **1 B to 256 KB for file-level backups**. Each file that is less than 256 KB is considered a data block. Files larger than 256 KB are split into 256-KB blocks.

Acronis Backup & Recovery 11.5 performs deduplication in two steps:

Deduplication at source

Performed on a managed machine during backup. The agent uses the storage node to determine what data can be deduplicated and does not transfer the data blocks whose duplicates are already present in the vault.

Deduplication at target

Performed in the vault after a backup is completed. The storage node analyses the vault's contents and deduplicates data in the vault.

When creating a backup plan, you have the option to turn off deduplication at source for that plan. This may lead to faster backups but a greater load on the network and storage node.

Deduplication database

Acronis Backup & Recovery 11.5 Storage Node managing a deduplicating vault, maintains the deduplication database, which contains the hash values of all data blocks stored in the vault—except for those that cannot be deduplicated, such as encrypted files.

The deduplication database is stored in the storage node local folder. You can specify the database path when creating the vault.

The size of the deduplication database is about 1.5 percent of the total size of unique data stored in the vault. In other words, each terabyte of new (non-duplicate) data adds about 15 GB to the database.

 Copyright © Acronis International GmbH, 2002-2013.

If the database is corrupted or the storage node is lost, while the vault retains its contents, the new storage node rescans the vault and re-creates the vault database and then the deduplication database.

7.5.7.2 How deduplication works

Deduplication at source

When performing a backup to a deduplicating vault, Acronis Backup & Recovery 11.5 Agent calculates a fingerprint of each data block. Such a fingerprint is often called a *hash value*.

Before sending the data block to the vault, the agent queries the deduplication database to determine whether the block's hash value is the same as that of an already stored block. If so, the agent sends only the hash value; otherwise, it sends the block itself. The storage node saves the received data blocks in a temporary file.

Some data, such as encrypted files or disk blocks of a non-standard size, cannot be deduplicated. The agent always transfers such data to the vault without calculating the hash values. For more information about restrictions of deduplication, see Deduplication restrictions (p. 239).

Once the backup process is completed, the vault contains the resulting backup and the temporary file with the unique data blocks. The temporary file will be processed on the next stage. The backup (TIB file) contains hash values and the data that cannot be deduplicated. Further processing of this backup is not needed. You can readily recover data from it.

Deduplication at target

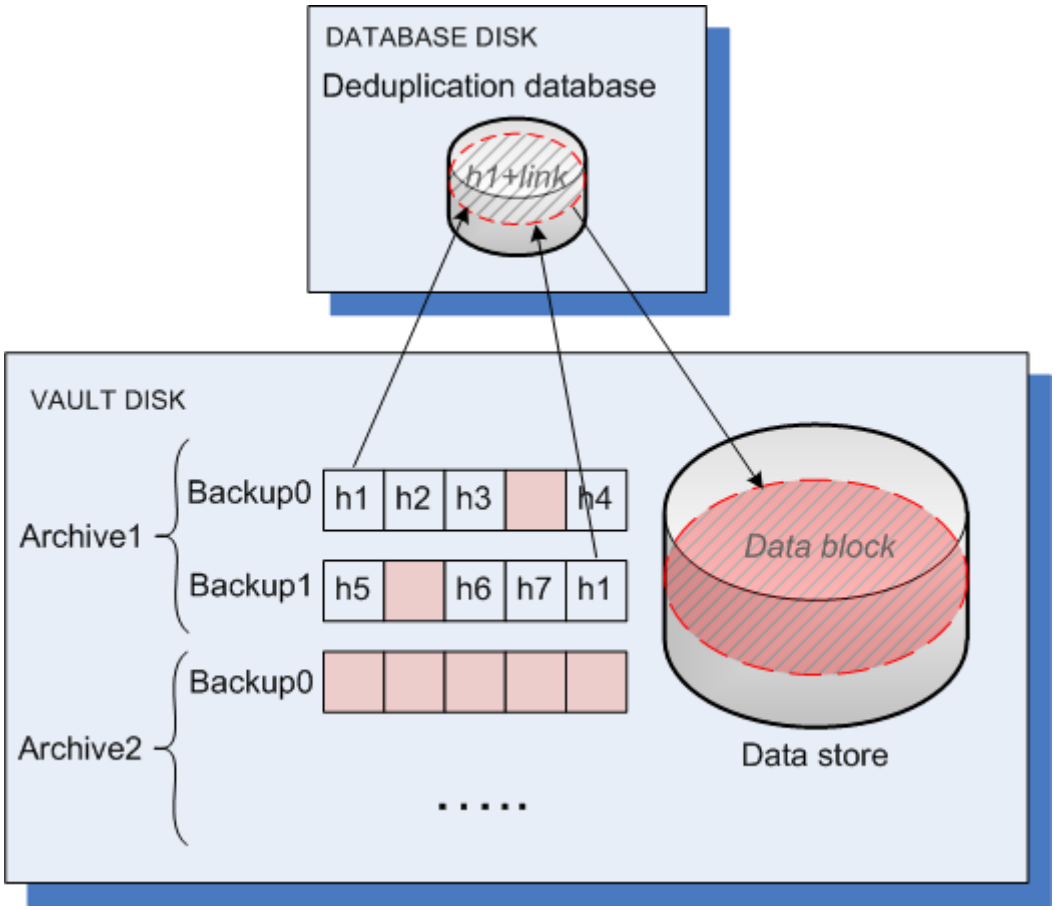
After a backup to a deduplicating vault is completed, the storage node runs the **indexing** activity. This activity deduplicates the data in the vault as follows:

1. It moves the data blocks from the temporary file to a special file within the vault, storing duplicate items there only once. This file is called the **deduplication data store**.
2. It saves the hash values and the links that are necessary to "assemble" the deduplicated data to the deduplication database.
3. After all the data blocks have been moved, it deletes the temporary file.

As a result, the data store contains a number of unique data blocks. Each block has one or more references from the backups. The references are contained in the deduplication database. The backups remained untouched. They contain hash values and the data that cannot be deduplicated.

 Copyright © Acronis International GmbH, 2002-2013.

The following diagram illustrates the result of deduplication at target.



The indexing activity may take considerable time to complete. You can view this activity's state on the management server, by selecting the corresponding storage node and clicking **View details** (p. 227). You can also manually start or stop this activity in that window.

Compacting

After one or more backups or archives have been deleted from the vault—either manually or during cleanup—the data store may contain blocks which are no longer referred to from any archive. Such blocks are deleted by the **compacting task,** which is a scheduled task performed by the storage node.

By default, the compacting task runs every Sunday night at 03:00. You can re-schedule the task by selecting the corresponding storage node, clicking **View details** (p. 227), and then clicking **Compacting schedule**. You can also manually start or stop the task on that tab.

Because deletion of unused blocks is resource-consuming, the compacting task performs it only when a sufficient amount of data to delete has accumulated. The threshold is determined by the **Compacting Trigger Threshold** (p. 228) configuration parameter.

7.5.7.3 When deduplication is most effective

The following are cases when deduplication produces the maximum effect:

- When backing up in the **full backup mode** similar data from different sources. Such is the case when you back up operating systems and applications deployed from a single source over the network.

 Copyright © Acronis International GmbH, 2002-2013.

- When performing **incremental backups** of similar data from different sources, provided that the **changes to the data are also similar**. Such is the case when you deploy updates to these systems and apply the incremental backup.
- When performing **incremental backups** of data that does not change itself, but **changes its location**. Such is the case when multiple pieces of data circulate over the network or within one system. Each time a piece of data moves, it is included in the incremental backup which becomes sizeable while it does not contain new data. Deduplication helps to solve the problem: each time an item appears in a new place, a reference to the item is saved instead of the item itself.

Deduplication and incremental backups

In case of random changes to the data, de-duplication at incremental backup will not produce much effect because:

- The deduplicated items that have not changed are not included in the incremental backup.
- The deduplicated items that have changed are not identical anymore and therefore will not be deduplicated.

Deduplication and database backups

Deduplication is not very effective for backing up a database on a regular basis. This is because changes to the database are usually unique and, therefore, cannot be deduplicated. We recommend backing up databases to a non-deduplicating vault.

7.5.7.4 Deduplication best practices

Deduplication is a complex process that depends on many factors.

The most important factors that influence deduplication speed are:

- The speed of access to the deduplication database
- The RAM capacity of the storage node
- The number of deduplicating vaults created on the storage node.

To increase deduplication performance, follow the recommendations below.

Place the deduplication database and deduplicating vault on separate physical devices

To increase the speed of access to a deduplication database, the database and the vault must be located on separate physical devices.

It is best to allocate dedicated devices for the vault and the database. If this is not possible, at least do not place a vault or database on the same disk with the operating system. The reason is that the operating system performs a large number of hard disk read/write operations, which significantly slows down the deduplication.

Selecting a disk for a deduplication database

- The database must reside on a fixed drive. Please do not try to place the deduplication database on external detachable drives.
- Minimal disk access time is important. It is recommended that you use a fast IDE drive (7200rpm or higher), SCSI drive, or an enterprise-grade Solid-State Drive (SSD).
- The volume to store the deduplication database should have at least 10 GB of free space. When backing up a large number of machines, the required free space may exceed 10 GB.

 Copyright © Acronis International GmbH, 2002-2013.

- The disk space required for a deduplication database can be estimated by using the following formula:

  $$S = U / 32 + 10$$

  where

  S – disk size, in GB

  U – planned amount of unique data in the deduplication data store, in GB.

  For example, if the planned amount of unique data in the deduplication data store is U=5 TB, the deduplication database will require the free disk space not less than

  $$S = 5*1024 / 32 + 10 = 170 \text{ GB}$$

Selecting a disk for a deduplicating vault

For the purpose of data loss prevention, we recommend using RAID 10, 5 or 6. RAID 0 is not recommended since it not fault tolerant. RAID 1 is not recommended because of relatively low speed. There is no preference to local disks or SAN, both are good.

8 GB of RAM per 1 TB of unique data

This is a recommendation for a worst case scenario. It is not necessary to follow it if you do not experience a deduplication performance problem. However, if the deduplication runs too slowly, check the **Occupied space** parameter of the deduplicating vault. By adding more RAM to the storage node you can significantly raise the deduplication speed.

In general, the more RAM you have, the greater the deduplication database size can be, provided that the deduplication speed is the same.

Only one deduplicating vault on each storage node

It is highly recommended that you create only one deduplicating vault on a storage node. Otherwise, the whole available RAM volume will be distributed in proportion to the number of the vaults.

64-bit operating system

The storage node must be installed in a 64-bit operating system. The machine with the storage node should not run applications that require much system resources; for example, Database Management Systems (DBMS) or Enterprise Resource Planning (ERP) systems.

Multi-core processor with at least 2.5 GHz clock rate

We recommend that you use a processor with the number of cores not less than 4 and the clock rate not less than 2.5 GHz.

Sufficient free space in the vault

Indexing of a backup requires as much free space as the backed-up data occupies immediately after saving it to the vault. Without a compression or deduplication at source, this value is equal to the size of the original data backed up during the given backup operation.

High-speed LAN

1-Gbit LAN is recommended. It will allow the software to perform 5-6 backups with deduplication in parallel, and the speed will not reduce considerably.

 Copyright © Acronis International GmbH, 2002-2013.

Back up a typical machine before backing up several machines with similar contents

When backing up several machines with similar contents, it is recommended that you back up one machine first and wait until the end of the backed-up data indexing. After that, the other machines will be backed up faster owing to the efficient deduplication. Because the first machine's backup has been indexed, most of the data is already in the deduplication data store.

Back up different machines at different times

If you back up a large number of machines, spread out the backup operations over time. To do this, create several backup plans with various schedules.

Use fast cataloging

Indexing of a backup starts after its cataloging has been completed. To reduce the overall time required for backup processing, switch automatic cataloging (p. 111) to the fast mode. You can start full cataloging manually outside of the backup window.

Configure alert notifications

It is recommended that you configure the "Vaults" alert notification (p. 401) in the management server options. This can help you to promptly react in out-of-order situations. For example, a timely reaction to a "There is a vault with low free space" alert can prevent an error when next backing up to the vault.

7.5.7.5 Deduplication restrictions

Common restrictions

Deduplication cannot be performed if you protected the archive with a password. Data blocks of password-protected archives are stored in the backups as they would be in a non-deduplicating vault.

If you want to protect an archive while still allowing it to be deduplicated, leave the archive non-password-protected and encrypt the deduplicating vault itself with a password. You can do this when creating the vault.

Disk-level backup

Deduplication of disk blocks is not performed if the volume's allocation unit size—also known as cluster size or block size—is not divisible by 4 KB.

Tip: *The allocation unit size on most NTFS and ext3 volumes is 4 KB. This allows for block-level deduplication. Other examples of allocation unit sizes allowing for block-level deduplication include 8 KB, 16 KB, and 64 KB.*

File-level backup

Deduplication of a file is not performed if the file is encrypted and the **In archives, store encrypted files in decrypted state** check box in the backup options is cleared (it is cleared by default).

Deduplication and NTFS data streams

In the NTFS file system, a file may have one or more additional sets of data associated with it—often called *alternate data streams*.

When such file is backed up, so are all its alternate data streams. However, these streams are never deduplicated—even when the file itself is.

 Copyright © Acronis International GmbH, 2002-2013.

Copyright © Acronis International GmbH, 2002-2013.

8 Operations with archives and backups

8.1 Validating archives and backups

Validation is an operation that checks the possibility of data recovery from a backup.

Validation of a file backup imitates recovery of all files from the backup to a dummy destination. Validation of a disk or volume backup calculates a checksum for every data block saved in the backup. Both procedures are resource-intensive.

Validation of an archive will validate all the archive's backups. A vault (or a location) validation will validate all the archives stored in this vault (location).

While successful validation means high probability of successful recovery, it does not check all factors that influence the recovery process. If you back up the operating system, only a test recovery in a bootable environment to a spare hard drive can guarantee success of the recovery. At least ensure that the backup can be successfully validated using the bootable media.

Limitation
You cannot validate archives and backups in Acronis Online Backup Storage (p. 420). However, an initial seeding backup (p. 424) is automatically validated immediately after its creation.

Different ways to create a validation task

Using the **Validation** page is the most general way to create a validation task. Here you can validate immediately or set up a validation schedule for any backup, archive, or vault you have permission to access.

Validation of an archive or of the latest backup in the archive can be scheduled as part of the backup plan. For more information, see Creating a backup plan (p. 55).

To access the **Validation** page, first select a validation object: a vault, an archive, or a backup.

- To select a vault, click the **Vaults** icon in the **Navigation** pane and select the vault by expanding the vaults tree in the **Vaults** view or directly in the **Navigation** pane.
- To select an archive, select a vault, and then in the **Vault** view select the **Archive view** tab and click the archive name.
- To select a backup, select an archive in the **Archive view**, expand the archive by clicking the expand button to the left of the archive name, and then click the backup.

After selecting the validation object, select **Validate** from the context menu. The **Validation** page will be opened with the pre-selected object as a source. All you need to do is to select when to validate and (optionally) provide a name for the task.

To create a validation task, perform the following steps.

What to validate

Validate

Choose an object to validate:

Archive (p. 247) - in this case, you need to specify the archive.

Backup (p. 242) - specify the archive first. Then, select the desired backup in this archive.

 Copyright © Acronis International GmbH, 2002-2013.

Vault (p. 243) - select a vault (or other location), to validate archives from.

Credentials (p. 243)

[Optional] Provide credentials for accessing the source if the task account does not have enough privileges to access it.

When to validate

Start validation (p. 244)

Specify when and how often to perform validation.

Task parameters

Task name

[Optional] Enter a unique name for the validation task. A conscious name lets you quickly identify the task among the others.

Task's credentials (p. 244)

[Optional] The validation task will run on behalf of the user who is creating the task. You can change the task credentials if necessary.

Comments

[Optional] Enter comments on the task.

After you configure all the required settings, click **OK** to create the validation task.

8.1.1 Archive selection

To specify an archive to validate

1. Enter the full path to the archive location in the **Path** field, or select the required location in the tree (p. 137).

   When operating on a machine booted with bootable media:

   - To access a managed vault, type the following string in the **Path** field:

     bsp://node_address/vault_name/

   - To access an unmanaged centralized vault, type the full path to the vault's folder.
2. In the table to the right of the tree, select the archive. The table displays the names of the archives contained in each location you select.

   While you are reviewing the location content, archives can be added, deleted or modified by another user or by the program itself according to scheduled operations. Use the **Refresh** button to refresh the list of archives.
3. Click **OK**.

8.1.2 Backup selection

To specify a backup to validate

1. In the upper pane, select a backup by its creation date/time.

   The bottom part of the window displays the selected backup content, assisting you to find the right backup.
2. Click **OK**.

Copyright © Acronis International GmbH, 2002-2013.

8.1.3 Vault selection

To select a vault or a location

1. Enter the full path to the vault (location) in the **Path** field or select the desired location in the tree.

- To select a centralized vault, expand the **Centralized** group and click the appropriate vault.
- To select a personal vault, expand the **Personal** group and click the appropriate vault.
- To select a local folder (CD/DVD drive, or locally attached tape device), expand the **Local folders** group and click the required folder.
- To select a network share, expand the **Network folders** group, select the required networked machine and then click the shared folder. If the network share requires access credentials, the program will ask for them.
- To select a folder stored on NFS share, expand the **NFS drives** group and click the folder.
- To select **FTP** or **SFTP** server, expand the corresponding group and click the appropriate folder on the server.

  According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

  To assist you with choosing the right vault, the table displays the names of the archives contained in each vault you select. While you are reviewing the location content, archives can be added, deleted or modified by another user or by the program itself according to scheduled operations. Use the **Refresh** button to refresh the list of archives.

1. Click **OK**.

8.1.4 Access credentials for source

Specify the credentials required for access to the location where the backup archive is stored.

To specify credentials

1. Select one of the following:
   - **Use the task credentials**

     The software will access the location using the credentials of the task account specified in the **Task parameters** section.
   - **Use the following credentials**

     The software will access the location using the credentials you specify. Use this option if the task account does not have access permissions to the location. You might need to provide special credentials for a network share or a storage node vault.

     Specify:
     - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
     - **Password**. The password for the account.
2. Click **OK**.

According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

Copyright © Acronis International GmbH, 2002-2013.

8.1.5 When to validate

As validation is a resource-intensive operation, it makes sense to schedule validation to the managed machine's off-peak period. On the other hand, if you prefer to be immediately informed whether the data is not corrupted and can be successfully recovered, consider starting validation right after the task creation.

Choose one of the following:

- **Now** - to start the validation task right after its creation, that is, after clicking OK on the Validation page.
- **Later** - to start the one-time validation task, at the date and time you specify.

  Specify the appropriate parameters as follows:
  - **Date and time** - the date and time when to start the task.
  - **The task will be started manually (do not schedule the task)** - select this check box, if you wish to start the task manually later.
- **On schedule** - to schedule the task. To learn more about how to configure the scheduling parameters, please see the Scheduling (p. 83) section.

8.1.6 Task credentials

Provide credentials for the account under which the task will run.

To specify credentials

1. Select one of the following:
   - **Run under the current user**

     The task will run under the credentials with which the user who starts the tasks is logged on. If the task has to run on schedule, you will be asked for the current user's password on completing the task creation.
   - **Use the following credentials**

     The task will always run under the credentials you specify, whether started manually or executed on schedule.

     Specify:
     - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
     - **Password**. The password for the account.
2. Click **OK**.

To learn more about using credentials in Acronis Backup & Recovery 11.5, see the Owners and credentials (p. 34) section.

To learn more about operations available depending on the user privileges, see the User privileges on a managed machine (p. 36) section.

8.2 Exporting archives and backups

The export operation creates a copy of an archive or a self-sufficient part copy of an archive in the location you specify. The original archive remains untouched.

The export operation can be applied to:

 Copyright © Acronis International GmbH, 2002-2013.

- **A single archive** - an exact archive copy will be created.
- **A single backup** - an archive consisting of a single full backup will be created. The export of an incremental or a differential backup is performed using consolidation of the preceding backups up to the nearest full backup.
- **Your choice of backups** belonging to the same archive - the resulting archive will contain only the specified backups. Consolidation is performed as required, so the resulting archive may contain full, incremental and differential backups.
- **An entire vault** that can be exported by using the command line interface. For more information, please refer to Acronis Backup & Recovery 11.5 Command Line Reference.

Usage scenarios

Export enables you to separate a specific backup from a chain of incremental backups for fast recovery, writing onto removable or detachable media or other purposes.

Example. When backing up data to a remote location through an unstable or low-bandwidth network connection (such as backing up through WAN using VPN access), you may want to save the initial full backup to a detachable media. Then, send the media to the remote location. There, the backup will be exported from the media to the target storage. Subsequent incremental backups, which are usually much smaller, can be transferred over the network.

By exporting a managed vault to a detachable media, you obtain a portable unmanaged vault that can be used in the following scenarios:

- Keeping an off-site copy of your vault or of the most important archives.
- Physical transportation of a vault to a distant branch office.
- Recovery without access to the storage node in case of networking problems or failure of the storage node.
- Recovery of the storage node itself.

Export from an HDD-based vault to a tape device can be considered as simple on-demand archive staging.

The resulting archive's name

By default, the exported archive inherits the name of the original archive. Because having multiple archives of the same names in the same location is not advisable, the following actions are disabled with the default archive name:

- Exporting part of an archive to the same location.
- Exporting an archive or part of an archive to a location where an archive of the same name exists.
- Exporting an archive or part of an archive to the same location twice.

In any of the above cases, provide an archive name that is unique to the destination folder or vault. If you need to redo the export using the same archive name, first delete the archive that resulted from the previous export operation.

The resulting archive's options

The exported archive inherits the options of the original archive, including encryption and the password. When exporting a password-protected archive, you are prompted for the password. If the original archive is encrypted, the password is used to encrypt the resulting archive.

 Copyright © Acronis International GmbH, 2002-2013.

Source and destination locations

When the console is connected to a **managed machine**, you can export an archive or part of an archive to and from any location accessible to the agent residing on the machine. These include personal vaults, locally attached tape devices, removable media and, in the advanced product versions, managed and unmanaged centralized vaults.

When the console is connected to a **management server**, two export methods are available:

- Export from a **managed vault**. The export is performed by the storage node that manages the vault. The destination can be a network share or a local folder of the storage node.
- Export from an **unmanaged centralized vault**. The export is performed by the agent installed on the managed machine you specify. The destination can be any location accessible to the agent, including a managed vault.

Tip. *When configuring export to a deduplicating managed vault, choose a machine where the deduplication add-on to the agent is installed. Otherwise the export task will fail.*

Operations with an export task

An export task starts immediately after you complete its configuration. An export task can be stopped or deleted in the same way as any other task.

Once the export task is completed, you can run it again at any time. Before doing so, delete the archive that resulted from the previous task run if the archive still exists in the destination vault. Otherwise the task will fail. You cannot edit an export task to specify another name for the destination archive (this is a limitation).

Tip. *You can implement the staging scenario manually, by regularly running the archive deletion task followed by the export task.*

Different ways to create an export task

Using the **Export** page is the most general way to create an export task. Here, you can export any backup, or archive you have permission to access.

You can access the **Export** page from the **Vaults** view. Right-click the object to export (archive or backup) and select **Export** from the context menu.

To access the **Export** page first select a validation object: an archive or a backup.

1. Select a vault. For this click the **Vaults** icon in the **Navigation** pane and select the vault expanding the vaults tree in the **Vaults** view or directly in the **Navigation** pane.
2. To select an archive, select a vault, and then in the **Vault** view select the **Archive view** tab and click the archive name.
3. To select a backup, select an archive in the **Archive view**, expand the archive by clicking the expand button to the left of archive name, and then click the backup.

After selecting the validation object, select **Export** from the context menu. The **Export** page will be opened with the pre-selected object as a source. All you need to do is to select a destination and (optionally) provide a name for the task.

To export an archive or a backup perform the following steps.

What to export

Export

 Copyright © Acronis International GmbH, 2002-2013.

Select the type of objects to export:

Archive - in this case, you need to specify the archive only.

Backups - you need to specify the archive first, and then select the desired backup(s) in this archive.

Browse

Select the **Archive** (p. 247) or the **Backups** (p. 247).

Show access credentials (p. 248)

[Optional] Provide credentials for accessing the source if the task account does not have enough privileges to access it.

Where to export

Browse (p. 248)

Specify the path to the location where the new archive will be created.

Be sure to provide a distinct name and comment for the new archive.

Full cataloging/Fast cataloging

Not available under bootable media or for locations that do not support cataloging

Select whether full or fast cataloging will be performed on the exported backups. For more information about the cataloging, see "Backup cataloging" (p. 111).

Show access credentials (p. 249)

[Optional] Provide credentials for the destination if the task credentials do not have enough privileges to access it.

After you have performed all the required steps, click **OK** to start the export task.

As a result, the program shows the **Execution state** of the task in the **Backup plans and tasks** view. When the task ends the **Task Information** window shows the final state of the task execution.

8.2.1 Archive selection

To specify an archive to export

1. Enter the full path to the archive location in the **Path** field, or select the required location in the tree (p. 137).

   For the management server: in the folders tree, select the managed vault.

2. In the table to the right of the tree, select the archive. The table displays the names of the archives contained in each location you select.

   While you are reviewing the location content, archives can be added, deleted or modified by another user or by the program itself according to scheduled operations. Use the **Refresh** button to refresh the list of archives.

3. Click **OK**.

8.2.2 Backup selection

To specify a backup(s) to export

1. At the top of the window, select the respective check box(es).

   To ensure that you choose the right backup, click on the backup and look at the bottom table that displays the volumes contained in the selected backup.

   To obtain information on a volume, right-click it and then select **Information**.

 Copyright © Acronis International GmbH, 2002-2013.

2. Click **OK**.

8.2.3 Access credentials for source

Specify credentials required for access to the location where the source archive, or the backup is stored.

To specify credentials

1. Select one of the following:
   - **Use the current user credentials**

     The software will access the location using the credentials of the current user.
   - **Use the following credentials**

     The program will access the location using the credentials you specify. Use this option if the task account does not have access permissions to the location. You might need to provide special credentials for a network share or a storage node vault.

     Specify:
     - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
     - **Password**. The password for the account.
2. Click **OK**.

According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

8.2.4 Destination selection

Specify a destination where the exported object will be stored. Exporting backups to the same archive is not allowed.

1. Selecting the export destination

Enter the full path to the destination in the **Path** field, or select the required destination in the tree.

- To export data to a centralized unmanaged vault, expand the **Centralized vaults** group and click the vault.
- To export data to a personal vault, expand the **Personal vaults** group and click the vault.
- To export data to a local folder on the machine, expand the **Local folders** group and click the required folder.
- To export data to a network share, expand the **Network folders** group, select the required networked machine and then click the shared folder. If the network share requires access credentials, the program will ask for them.

  ***Note for Linux users**: To specify a Common Internet File System (CIFS) network share which is mounted on a mount point such as /mnt/share, select this mount point instead of the network share itself.*

- To export data to an **FTP** or **SFTP** server, type the server name or address in the **Path** field as follows:

  ftp://ftp_server:port _number or **sftp://sftp_server:port number**

  If the port number is not specified, port 21 is used for FTP and port 22 is used for SFTP.

 Copyright © Acronis International GmbH, 2002-2013.

After entering access credentials, the folders on the server become available. Click the appropriate folder on the server.

You can access the server as an anonymous user if the server enables such access. To do so, click **Use anonymous access** instead of entering credentials.

According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

- To export data to a locally attached tape device, expand the **Tape drives** group, then click the required device. In stand-alone editions of Acronis Backup & Recovery 11.5, tape devices are available only if you have upgraded from Acronis Backup & Recovery 10. For information about using tapes, see the "Tape devices" (p. 201) section.

For the management server the folders tree contains:

- Local folders group to export data onto the hard drives that are local to the storage node.
- Network folders group to export data to a network share. If the network share requires access credentials, the program will ask for them.

Note for Linux users: To specify a Common Internet File System (CIFS) network share which is mounted on a mount point such as /mnt/share, select this mount point instead of the network share itself.

2. Using the archives table

To assist you with choosing the right destination, the table on the right displays the names of the archives contained in each location you select in the tree.

While you are reviewing the location content, archives can be added, deleted or modified by another user or by the program itself according to scheduled operations. Use the **Refresh** button to refresh the list of archives.

3. Naming the new archive

By default, the exported archive inherits the name of the original archive. Because having multiple archives of the same names in the same location is not advisable, the following actions are disabled with the default archive name:

- Exporting part of an archive to the same location.
- Exporting an archive or part of an archive to a location where an archive of the same name exists.
- Exporting an archive or part of an archive to the same location twice.

In any of the above cases, provide an archive name that is unique to the destination folder or vault. If you need to redo the export using the same archive name, first delete the archive that resulted from the previous export operation.

8.2.5 Access credentials for destination

Specify credentials required for access to the location where the resulting archive will be stored. The user whose name is specified will be considered as the archive owner.

To specify credentials

1. Select one of the following:
   - **Use the current user credentials**

 Copyright © Acronis International GmbH, 2002-2013.

The software will access the destination using the credentials of the current user.

- **Use the following credentials**

  The software will access the destination using the credentials you specify. Use this option if the task account does not have access permissions to the destination.

  Specify:

  - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
  - **Password**. The password for the account.

2. Click **OK**.

According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

8.3 Mounting an image

Mounting volumes from a disk backup (image) lets you access the volumes as though they were physical disks. Multiple volumes contained in the same backup can be mounted within a single mount operation. The mount operation is available when the console is connected to a managed machine running either Windows or Linux.

Mounting volumes in the read/write mode enables you to modify the backup content, that is, save, move, create, delete files or folders, and run executables consisting of one file. In this mode, the software creates an incremental backup containing the changes you make to the backup content. Please be aware that none of the subsequent backups will contain these changes.

You can mount volumes if the disk backup is stored in a local folder (except optical disks), Acronis Secure Zone, or on a network share.

Usage scenarios

- **Sharing**: mounted images can be easily shared to networked users.
- **"Band aid" database recovery solution**: mount up an image that contains an SQL database from a recently failed machine. This will provide access to the database until the failed machine is recovered.
- **Offline virus clean**: if a machine is attacked, the administrator shuts it down, boots with bootable media and creates an image. Then, the administrator mounts this image in read/write mode, scans and cleans it with an antivirus program, and finally recovers the machine.
- **Error check**: if recovery failed due to a disk error, mount the image in the read/write mode. Then, check the mounted disk for errors with the **chkdsk /r** command.

To mount an image, perform the following steps.

Source

Archive (p. 251)

Specify the path to the archive location and select the archive containing disk backups.

Backup (p. 251)

Select the backup.

Access credentials (p. 251)

[Optional] Provide credentials for the archive location.

 Copyright © Acronis International GmbH, 2002-2013.

Mount settings

Volumes (p. 252)

Select volumes to mount and configure the mount settings for every volume: assign a letter or enter the mount point, choose the read/write or read only access mode.

When you complete all the required steps, click **OK** to mount the volumes.

8.3.1 Archive selection

To select an archive

1. Enter the full path to the location in the **Path** field, or select the desired folder in the folders tree:
   - If the archive is stored in a personal vault located in a local folder, Acronis Secure Zone, or on a network share, expand the **Personal** group and click the required vault.
   - If the archive is stored in a local folder on the machine, expand the **Local folders** group and click the required folder.

     Mounting is not available if the archive is stored on optical media such as CD, DVD, or Blu-ray Discs (BD).
   - If the archive is stored on a network share, expand the **Network folders** group, select the required networked machine, and then click the shared folder. If the network share requires access credentials, the program will ask for them.

     Note for Linux users: *To specify a Common Internet File System (CIFS) network share which is mounted on a mount point such as /mnt/share, select this mount point instead of the network share itself.*
   - If the archive is stored on an NFS share, expand the **NFS drives** group and click the folder.

     Access to NFS drives is available only in Linux and under Linux-based bootable media.
2. In the table to the right of the tree, select the archive. The table displays the names of the archives contained in each vault/folder you select.

   While you are reviewing the location content, archives can be added, deleted or modified by another user or by the program itself according to scheduled operations. Use the **Refresh** button to refresh the list of archives.
3. Click **OK**.

8.3.2 Backup selection

To select a backup:

1. Select one of the backups by its creation date/time.
2. To assist you with choosing the right backup, the bottom table displays the volumes contained in the selected backup.

   To obtain information on a volume, right-click it and then click **Information**.
3. Click **OK**.

8.3.3 Access credentials

To specify credentials

1. Select one of the following:
   - **Use the current user credentials**

     The program will access the location using the credentials of the current user.

 Copyright © Acronis International GmbH, 2002-2013.

- **Use the following credentials**

  The program will access the location using the credentials you specify. Use this option if the current user account does not have access permissions to the location. You might need to provide special credentials for a network share or a storage node vault.

  Specify:

  - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
  - **Password**. The password for the account.

2. Click **OK**.

According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

8.3.4 Volume selection

Select the volumes to mount and configure the mounting parameters for each of the selected volumes as follows:

1. Select the check box for each volume you need to mount.
2. Click on the selected volume to set its mounting parameters.
   - **Access mode** - choose the mode you want the volume to be mounted in:
     - **Read only** - enables exploring and opening files within the backup without committing any changes.
     - **Read/write** - with this mode, the program assumes that the backup content will be modified, and creates an incremental backup to capture the changes.
   - **Assign letter** (in Windows) - Acronis Backup & Recovery 11.5 will assign an unused letter to the mounted volume. If required, select another letter to assign from the drop-down list.
   - **Mount point** (in Linux) - specify the directory where you want the volume to be mounted.
3. If several volumes are selected for mounting, click on every volume to set its mounting parameters, described in the previous step.
4. Click **OK**.

8.3.5 Managing mounted images

Once a volume is mounted, you can browse files and folders contained in the backup using a file manager and copy the desired files to any destination. Thus, if you need to take out only a few files and folders from a volume backup, you do not have to perform the recovery procedure.

Exploring images

Exploring mounted volumes lets you view and modify (if mounted in the read/write mode) the volume's content.

To explore a mounted volume select it in the table and click **Explore**. The default file manager window opens, allowing the user to examine the mounted volume contents.

 Copyright © Acronis International GmbH, 2002-2013.

Unmounting images

Maintaining the mounted volumes takes considerable system resources. It is recommended that you unmount the volumes after the necessary operations are completed. If not unmounted manually, a volume will remain mounted until the operating system restarts.

To unmount an image, select it in the table and click **Unmount**.

To unmount all the mounted volumes, click **Unmount all**.

8.4 Operations available in vaults

By using vaults, you can easily access archives and backups and perform archive management operations.

To perform operations with archives and backups

1. In the **Navigation** pane, select the vault whose archives you need to manage.
2. In the vault view, select the **Archive view** tab. This tab displays all archives stored in the selected vault.
3. Proceed as described in:
   - Operations with archives (p. 253)
   - Operations with backups (p. 254)

8.4.1 Operations with archives

To perform any operation with an archive

1. In the **Navigation** pane, select the vault that contains archives.
2. On the **Archive view** tab of the vault, select the archive. If the archive is protected with a password, you will be asked to provide it.
3. Perform operations by clicking the corresponding buttons on the toolbar. These operations can also be accessed from the **'[Archive name]' actions** item of the main menu.

The following is a guideline for you to perform operations with archives stored in a vault.

To	Do
Validate an archive	Click **Validate**. The **Validation** (p. 241) page will be opened with the pre-selected archive as a source. Validation of an archive will check all the archive's backups.
Export an archive	Click **Export**. The **Export** (p. 244) page will be opened with the pre-selected archive as a source. The export of an archive creates a duplicate of the archive with all its backups in the location you specify.
Delete a single archive or multiple archives	1. Select one or more archives you want to delete. 2. Click **Delete**. The program duplicates your selection in the **Backups deletion** (p. 256) window that has check boxes for each archive and each backup. Review the selection and make corrections if need be (select the check boxes for the desired archives), then

Copyright © Acronis International GmbH, 2002-2013.

	confirm the deletion.
Delete all archives in the vault	Please be aware that if filters have been applied to the vaults list, you see only a part of the vault content. Be sure that the vault does not contain archives you need to retain before starting the operation. Click **Delete all**. The program duplicates your selection in the new window that has check boxes for each archive and each backup. Review the selection and correct if need be, then confirm the deletion.

8.4.2 Operations with backups

To perform any operation with a backup

1. In the **Navigation** pane, select the vault that contains archives.
2. On the **Archive view** tab of the vault, select the archive. Then, expand the archive and click the backup to select it. If the archive is protected with a password, you will be asked to provide it.
3. Perform operations by clicking the corresponding buttons on the toolbar. These operations can also be accessed from the **'[Backup name]' actions** item of the main menu.

The following is a guideline for you to perform operations with backups.

To	Do
View backup content in a separate window	Click **View content**. In the **Backup Content** window, examine the backup content.
Recover	Click **Recover**. The **Recover data** (p. 134) page will be opened with the pre-selected backup as a source.
Convert a disk/volume backup to a virtual machine	Right-click the disk backup, then select **Convert to VM**. The **Recover data** (p. 134) page will be opened with the pre-selected backup as a source. Select the location and the type of new virtual machine and then proceed as with regular disk or volume recovery.
Validate a backup	Click **Validate**. The **Validation** (p. 241) page will be opened with the pre-selected backup as a source. Validation of a file backup imitates recovering of all files from the backup to a dummy destination. Validation of a disk backup calculates a checksum for every data block saved in the backup.
Export a backup	Click **Export**. The **Export** (p. 244) page will be opened with the pre-selected backup as a source. The export of a backup creates a new archive with a self-sufficient copy of the backup in the location you specify.
Convert a backup to full	Click **Convert to full backup** to replace the incremental or differential backup with a full backup for the same point in time. See "Converting a backup to full" (p. 255) for more information.

Copyright © Acronis International GmbH, 2002-2013.

Delete a single or multiple backups	Select one of the backups you want to delete, then click **Delete**. The program duplicates your selection in the **Backups deletion** (p. 256) window that has check boxes for each archive and each backup. Review the selection and correct if need be (select the check boxes for the desired backups), then confirm the deletion.
Delete all archives and backups in the vault	Please be aware that if filters have been applied to the vaults list, you see only a part of the vault content. Be sure that the vault does not contain archives you need to retain before starting the operation. Click **Delete all**. The program duplicates your selection in the **Backups deletion** (p. 256) window that has check boxes for each archive and each backup. Review the selection and correct if need be, then confirm the deletion.

8.4.3 Converting a backup to full

When the chain of incremental backups in an archive becomes long, conversion of an incremental backup to a full one increases the reliability of your archive. You may also want to convert a differential backup if there are incremental backups that depend on it.

During the conversion, the selected incremental or differential backup is replaced with a full backup for the same point in time. The previous backups in the chain are not changed. All subsequent incremental and differential backups up to the nearest full backup are also updated. The new backup versions are created first and only after that are the old ones deleted. Therefore, the location must have enough space to temporarily store both the old and the new versions.

Example

You have the following backup chain in your archive:

```
F1 I2 I3 I4 D5 I6 I7 I8 F9 I10 I11 D12 F13
```

Here **F** means full backup, **I** -incremental, **D** - differential.

You convert to full the **I4** backup. The **I4, D5, I6, I7, I8** backups will be updated, while **I10 I11 D12** will remain unchanged, because they depend on **F9**.

Tips on usage

Conversion does not create a copy of a backup. To obtain a self-sufficient copy of the backup on a flash drive or removable media, use the export (p. 244) operation.

When you mount an image (p. 250) in the read/write mode, the software creates an incremental backup containing the changes you make to the backup content. The subsequent backups do not contain these changes. Naturally, if you convert any of the subsequent backups to full, none of these changes will appear in the resulting full backup.

Limitations

Conversion is not allowed for the following backups:

- Backups stored on tapes, CD/DVD, or in Acronis Online Backup Storage.
- Backups that have simplified names (p. 78).
- Backups of Microsoft Exchange Server data.

 Copyright © Acronis International GmbH, 2002-2013.

8.4.4 Deleting archives and backups

The **Backups deletion** window displays the same tab as for the vaults view, but with check boxes for each archive and backup. The archive or backup you have chosen to delete has the check mark. Review the archive or backup that you have selected to delete. If you need to delete other archives and backups select the respective check boxes, then click **Delete selected** and confirm the deletion.

What happens if I delete a backup that is a base of an incremental or differential backup?

To preserve archive consistency, the program will consolidate the two backups. For example, you delete a full backup but retain the next incremental one. The backups will be combined into a single full backup which will be dated the incremental backup date. When you delete an incremental or differential backup from the middle of the chain, the resulting backup type will be incremental.

Please be aware that consolidation is just a method of deletion but not an alternative to deletion. The resulting backup will not contain data that was present in the deleted backup and was absent from the retained incremental or differential backup.

There should be enough space in the vault for temporary files created during consolidation. Backups resulting from consolidation always have maximum compression.

Copyright © Acronis International GmbH, 2002-2013.

9 Bootable media

Bootable media

Bootable media is physical media (CD, DVD, USB flash drive or other removable media supported by a machine BIOS as a boot device) that boots on any PC-compatible machine and enables you to run Acronis Backup & Recovery 11.5 Agent either in a Linux-based environment or Windows Preinstallation Environment (WinPE), without the help of an operating system. Bootable media is most often used to:

- recover an operating system that cannot start
- access and back up the data that has survived in a corrupted system
- deploy an operating system on bare metal
- create basic or dynamic volumes on bare metal
- back up sector-by-sector a disk with an unsupported file system
- back up offline any data that cannot be backed up online because of restricted access, being permanently locked by the running applications or for any other reason.

A machine can be booted into the above environments either with physical media, or using the network boot from Acronis PXE Server, Windows Deployment Services (WDS) or Remote Installation Services (RIS). These servers with uploaded bootable components can be thought of as a kind of bootable media too. You can create bootable media or configure the PXE server or WDS/RIS using the same wizard.

Linux-based bootable media

Linux-based media contains Acronis Backup & Recovery 11.5 Bootable Agent based on Linux kernel. The agent can boot and perform operations on any PC-compatible hardware, including bare metal and machines with corrupted or non-supported file systems. The operations can be configured and controlled either locally or remotely using the management console.

PE-based bootable media

PE-based bootable media contains a minimal Windows system called Windows Preinstallation Environment (WinPE) and Acronis Plug-in for WinPE, that is, a modification of Acronis Backup & Recovery 11.5 Agent that can run in the preinstallation environment.

WinPE proved to be the most convenient bootable solution in large environments with heterogeneous hardware.

Advantages:

- Using Acronis Backup & Recovery 11.5 in Windows Preinstallation Environment provides more functionality than using Linux-based bootable media. Having booted PC-compatible hardware into WinPE, you can use not only Acronis Backup & Recovery 11.5 Agent, but also PE commands and scripts and other plug-ins you've added to the PE.
- PE-based bootable media helps overcome some Linux-related bootable media issues such as support for certain RAID controllers or certain levels of RAID arrays only. Media based on WinPE 2.x and later enable dynamic loading of the necessary device drivers.

Limitation:

 Copyright © Acronis International GmbH, 2002-2013.

- Bootable media based on WinPE versions earlier than 4.0 cannot boot on machines that use Unified Extensible Firmware Interface (UEFI).

9.1 How to create bootable media

Acronis offers a dedicated tool for creating bootable media, Acronis Bootable Media Builder.

Bootable Media Builder does not require a license if installed together with an agent. All add-ons to the agent, if installed, will be available in a rescue environment. To use a media builder on a machine without an agent, you need to enter the license key or have at least one license on the license server. The license may be either available or assigned.

To enable creating physical media, the machine must have a CD/DVD recording drive or allow a flash drive to be attached. To enable PXE or WDS/RIS configuration, the machine must have a network connection. Bootable Media Builder can also create an ISO image of a bootable disk to burn it later on a blank disk.

The following are instructions for creating bootable media.

9.1.1 Linux-based bootable media

To create a Linux-based bootable media

1. Start the Bootable Media Builder either from the management console, by selecting **Tools > Create Bootable Media**, or as a separate component.
2. If Agent for Windows or Agent for Linux is *not* installed on the machine, specify the license key or the license server with licenses. The licenses will not get assigned or reassigned. They determine which functionality to enable for the created media. Without a license, you can create media only for recovery from the online backup storage.

   If Agent for Windows or Agent for Linux *is* installed on the machine, the media inherits its functionality, including Universal Restore and deduplication.
3. Select **Bootable media type: Default (Linux-based media)**.

   Select the way volumes and network resources will be handled—called the media style:
   - A media with Linux-style volume handling displays the volumes as, for example, hda1 and sdb2. It tries to reconstruct MD devices and logical (LVM) volumes before starting a recovery.
   - A media with Windows-style volume handling displays the volumes as, for example, C: and D:. It provides access to dynamic (LDM) volumes.
4. Follow the wizard steps to specify the following:
   a. [Optional] The parameters of the Linux kernel. Separate multiple parameters with spaces.

      For example, to be able to select a display mode for the bootable agent each time the media starts, type: **vga=ask**

      For a list of parameters, see Kernel parameters (p. 259).

   b. The Acronis bootable components to be placed on the media.

      You can select 32-bit and/or 64-bit components. The 32-bit components can work on 64-bit hardware. However, you need 64-bit components to boot a machine that uses Unified Extensible Firmware Interface (UEFI).

      To use the media on different types of hardware, select both types of components. When booting a machine from the resulting media, you will be able to select 32-bit or 64-bit components on the boot menu.

 Copyright © Acronis International GmbH, 2002-2013.

c. [Optional] The timeout interval for the boot menu plus the component that will automatically start on timeout.
   - If not configured, the Acronis loader waits for someone to select whether to boot the operating system (if present) or the Acronis component.
   - If you set, say, **10 sec.** for the bootable agent, the agent will launch 10 seconds after the menu is displayed. This enables unattended onsite operation when booting from a PXE server or WDS/RIS.
d. [Optional] Remote logon settings:
   - User name and password to be entered on the console side at the connection to the agent. If you leave these boxes empty, the connection will be enabled without specifying credentials.
e. [Optional] Network settings (p. 261):
   - TCP/IP settings to be assigned to the machine network adapters.
f. [Optional] Network port (p. 262):
   - The TCP port that the bootable agent listens for incoming connection.
g. The type of media to create. You can:
   - Create CD, DVD or other bootable media such as removable USB flash drives if the hardware BIOS allows for boot from such media
   - Build an ISO image of a bootable disc to burn it later on a blank disc
   - Upload the selected components to Acronis PXE Server
   - Upload the selected components to a WDS/RIS.
h. [Optional] Windows system drivers to be used by Acronis Universal Restore (p. 262). This window appears only if the Acronis Universal Restore add-on is installed and a media other than PXE or WDS/RIS is selected.
i. Path to the media ISO file or the name or IP and credentials for PXE or WDS/RIS.

9.1.1.1 Kernel parameters

This window lets you specify one or more parameters of the Linux kernel. They will be automatically applied when the bootable media starts.

These parameters are typically used when experiencing problems while working with the bootable media. Normally, you can leave this field empty.

You can also specify any of these parameters by pressing F11 while in the boot menu.

Parameters

When specifying multiple parameters, separate them with spaces.

acpi=off

Disables Advanced Configuration and Power Interface (ACPI). You may want to use this parameter when experiencing problems with a particular hardware configuration.

noapic

Disables Advanced Programmable Interrupt Controller (APIC). You may want to use this parameter when experiencing problems with a particular hardware configuration.

vga=ask

 Copyright © Acronis International GmbH, 2002-2013.

Prompts for the video mode to be used by the bootable media's graphical user interface. Without the **vga** parameter, the video mode is detected automatically.

vga=*mode_number*

Specifies the video mode to be used by the bootable media's graphical user interface. The mode number is given by *mode_number* in the hexadecimal format—for example: **vga=0x318**

Screen resolution and the number of colors corresponding to a mode number may be different on different machines. We recommend using the **vga=ask** parameter first to choose a value for *mode_number*.

quiet

Disables displaying of startup messages when the Linux kernel is loading, and starts the management console after the kernel is loaded.

This parameter is implicitly specified when creating the bootable media, but you can remove this parameter while in the boot menu.

Without this parameter, all startup messages will be displayed, followed by a command prompt. To start the management console from the command prompt, run the command: **/bin/product**

nousb

Disables loading of the USB (Universal Serial Bus) subsystem.

nousb2

Disables USB 2.0 support. USB 1.1 devices still work with this parameter. This parameter allows you to use some USB drives in the USB 1.1 mode if they do not work in the USB 2.0 mode.

nodma

Disables direct memory access (DMA) for all IDE hard disk drives. Prevents the kernel from freezing on some hardware.

nofw

Disables the FireWire (IEEE1394) interface support.

nopcmcia

Disables detection of PCMCIA hardware.

nomouse

Disables mouse support.

*module_name***=off**

Disables the module whose name is given by *module_name*. For example, to disable the use of the SATA module, specify: **sata_sis=off**

pci=bios

Forces the use of PCI BIOS instead of accessing the hardware device directly. You may want to use this parameter if the machine has a non-standard PCI host bridge.

pci=nobios

Disables the use of PCI BIOS; only direct hardware access methods will be allowed. You may want to use this parameter when the bootable media fails to start, which may be caused by the BIOS.

pci=biosirq

 Copyright © Acronis International GmbH, 2002-2013.

Uses PCI BIOS calls to get the interrupt routing table. You may want to use this parameter if the kernel is unable to allocate interrupt requests (IRQs) or discover secondary PCI buses on the motherboard.

These calls might not work properly on some machines. But this may be the only way to get the interrupt routing table.

9.1.1.2 Network settings

While creating Acronis bootable media, you have an option to pre-configure network connections that will be used by the bootable agent. The following parameters can be pre-configured:

- IP address
- Subnet mask
- Gateway
- DNS server
- WINS server.

Once the bootable agent starts on a machine, the configuration is applied to the machine's network interface card (NIC). If the settings have not been pre-configured, the agent uses DHCP auto configuration. You also have the ability to configure the network settings manually when the bootable agent is running on the machine.

Pre-configuring multiple network connections

You can pre-configure TCP/IP settings for up to ten network interface cards. To ensure that each NIC will be assigned the appropriate settings, create the media on the server for which the media is customized. When you select an existing NIC in the wizard window, its settings are selected for saving on the media. The MAC address of each existing NIC is also saved on the media.

You can change the settings, except for the MAC address; or configure the settings for a non-existent NIC, if need be.

Once the bootable agent starts on the server, it retrieves the list of available NICs. This list is sorted by the slots the NICs occupy: the closest to the processor on top.

The bootable agent assigns each known NIC the appropriate settings, identifying the NICs by their MAC addresses. After the NICs with known MAC addresses are configured, the remaining NICs are assigned the settings that you have made for non-existent NICs, starting from the upper non-assigned NIC.

You can customize bootable media for any machine, and not only for the machine where the media is created. To do so, configure the NICs according to their slot order on that machine: NIC1 occupies the slot closest to the processor, NIC2 is in the next slot and so on. When the bootable agent starts on that machine, it will find no NICs with known MAC addresses and will configure the NICs in the same order as you did.

Example

The bootable agent could use one of the network adapters for communication with the management console through the production network. Automatic configuration could be done for this connection. Sizeable data for recovery could be transferred through the second NIC, included in the dedicated backup network by means of static TCP/IP settings.

 Copyright © Acronis International GmbH, 2002-2013.

9.1.1.3 Network port

While creating bootable media, you have an option to pre-configure the network port that the bootable agent listens for incoming connection. The choice is available between:

- the default port
- the currently used port
- the new port (enter the port number).

If the port has not been pre-configured, the agent uses the default port number (9876.) This port is also used as default by the Acronis Backup & Recovery 11.5 Management Console.

9.1.1.4 Drivers for Universal Restore

While creating bootable media, you have an option to add Windows drivers to the media. The drivers will be used by Universal Restore when recovering Windows on a machine with a dissimilar processor, different motherboard or different mass storage device than in the backed-up system.

You will be able to configure the Universal Restore:

- to search the media for the drivers that best fit the target hardware
- to get the mass-storage drivers that you explicitly specify from the media. This is necessary when the target hardware has a specific mass storage controller (such as a SCSI, RAID, or Fiber Channel adapter) for the hard disk.

For more information please refer to Universal Restore.

The drivers will be placed in the visible Drivers folder on the bootable media. The drivers are not loaded into the target machine RAM, therefore, the media must stay inserted or connected throughout the Universal Restore operation.

Adding drivers to bootable media is available on the condition that:

1. The Acronis Backup & Recovery 11.5 Universal Restore add-on is installed on the machine where the bootable media is created AND
2. You are creating a removable media or its ISO or detachable media, such as a flash drive. Drivers cannot be uploaded on a PXE server or WDS/RIS.

The drivers can be added to the list only in groups, by adding the INF files or folders containing such files. Selecting individual drivers from the INF files is not possible, but the media builder shows the file content for your information.

To add drivers:

1. Click **Add** and browse to the INF file or a folder that contains INF files.
2. Select the INF file or the folder.
3. Click **OK**.

The drivers can be removed from the list only in groups, by removing INF files.

To remove drivers:

1. Select the INF file.
2. Click **Remove**.

 Copyright © Acronis International GmbH, 2002-2013.

9.1.2 WinPE-based bootable media

Bootable Media Builder provides three methods of integrating Acronis Backup & Recovery 11.5 with WinPE:

- Adding the Acronis Plug-in to the existing PE ISO. This comes in handy when you have to add the plug-in to the previously configured PE ISO that is already in use.
- Creating the PE ISO with the plug-in from scratch.
- Adding the Acronis Plug-in to a WIM file for any future purpose (manual ISO building, adding other tools to the image and so on).

Bootable Media Builder supports WinPE distributions that are based on any the following kernels:

- Windows Vista (PE 2.0)
- Windows Vista SP1 and Windows Server 2008 (PE 2.1)
- Windows 7 (PE 3.0) with or without the supplement for Windows 7 SP1 (PE 3.1)
- Windows 8 (PE 4.0)
- Windows 8.1 (PE 5.0)

Bootable Media Builder supports both 32-bit and 64-bit WinPE distributions. The 32-bit WinPE distributions can also work on 64-bit hardware. However, you need a 64-bit distribution to boot a machine that uses Unified Extensible Firmware Interface (UEFI).

PE images based on WinPE 4 and later require approximately 1 GB of RAM to work.

9.1.2.1 Preparation: WinPE 2.x and 3.x

To be able to create or modify PE 2.x or 3.x images, install Bootable Media Builder on a machine where Windows Automated Installation Kit (AIK) is installed. If you do not have a machine with AIK, prepare it as follows.

To prepare a machine with AIK

1. Download and install Windows Automated Installation Kit.

   Automated Installation Kit (AIK) for Windows Vista (PE 2.0):

   http://www.microsoft.com/Downloads/details.aspx?familyid=C7D4BC6D-15F3-4284-9123-679830D629F2&displaylang=en

   Automated Installation Kit (AIK) for Windows Vista SP1 and Windows Server 2008 (PE 2.1):

   http://www.microsoft.com/downloads/details.aspx?FamilyID=94bb6e34-d890-4932-81a5-5b50c657de08&DisplayLang=en

   Automated Installation Kit (AIK) for Windows 7 (PE 3.0):

   http://www.microsoft.com/downloads/details.aspx?familyid=696DD665-9F76-4177-A811-39C26D3B3B34&displaylang=en

   Automated Installation Kit (AIK) Supplement for Windows 7 SP1 (PE 3.1):

   http://www.microsoft.com/download/en/details.aspx?id=5188

   You can find system requirements for installation by following the above links.
2. [Optional] Burn the WAIK to DVD or copy to a flash drive.
3. Install the Microsoft .NET Framework from this kit (NETFXx86 or NETFXx64, depending on your hardware).
4. Install Microsoft Core XML (MSXML) 5.0 or 6.0 Parser from this kit.

 Copyright © Acronis International GmbH, 2002-2013.

5. Install Windows AIK from this kit.
6. Install Bootable Media Builder on the same machine.

It is recommended that you familiarize yourself with the help documentation supplied with Windows AIK. To access the documentation, select **Microsoft Windows AIK -> Documentation** from the start menu.

9.1.2.2 Preparation: WinPE 4.0 and WinPE 5.0

To be able to create or modify PE 4 or 5 images, install Bootable Media Builder on a machine where Windows Assessment and Deployment Kit (ADK) is installed. If you do not have a machine with ADK, prepare it as follows.

To prepare a machine with ADK

1. Download the setup program of Assessment and Deployment Kit.

   Assessment and Deployment Kit (ADK) for Windows 8 (PE 4.0):
   http://www.microsoft.com/en-us/download/details.aspx?id=30652.

   Assessment and Deployment Kit (ADK) for Windows 8.1 (PE 5.0):
   http://www.microsoft.com/en-US/download/details.aspx?id=39982.

   You can find system requirements for installation by following the above links.
2. Install Assessment and Deployment Kit on the machine.
3. Install Bootable Media Builder on the same machine.

9.1.2.3 Adding Acronis Plug-in to WinPE

To add Acronis Plug-in to WinPE ISO:

1. When adding the plug-in to the existing WinPE ISO, unpack all files of your WinPE ISO to a separate folder on the hard disk.
2. Start the Bootable Media Builder either from the management console, by selecting **Tools > Create Bootable Media**, or as a separate component.
3. If Agent for Windows is *not* installed on the machine, specify the license key or the license server with licenses. The licenses will not get assigned or reassigned. They determine which functionality to enable for the created media. Without a license, you can create media only for recovery from the online backup storage.

   If Agent for Windows *is* installed on the machine, the media inherits its functionality, including Universal Restore and deduplication.
4. Select **Bootable media type: Windows PE**.

   When creating a new PE ISO:

   - Select **Create WinPE automatically**.
   - [Optional] To create a 64-bit bootable media, select the **Create x64 media** check box, if available. A 64-bit media is required to boot a machine that uses Unified Extensible Firmware Interface (UEFI).
   - The software runs the appropriate script and proceeds to the next window.

   When adding the plug-in to the existing PE ISO:

   - Select **Use WinPE files located in the folder I specify**.
   - Specify path to the folder where the WinPE files are located.

 Copyright © Acronis International GmbH, 2002-2013.

5. [Optional] Select whether to enable or disable remote connections to a machine booted from the media. If enabled, specify the user name and password to be entered on the console side at the connection to the agent. If you leave these boxes empty, the connection will be disabled.
6. Specify network settings (p. 261) for the machine network adapters or choose DHCP auto configuration.
7. [Optional] Specify the Windows drivers to be added to Windows PE.

   Once you boot a machine into Windows PE, the drivers can help you access the device where the backup archive is located. Add 32-bit drivers if you use a 32-bit WinPE distribution or 64-bit drivers if you use a 64-bit WinPE distribution.

   Also, you will be able to point to the added drivers when configuring Universal Restore. For using Universal Restore, add 32-bit or 64-bit drivers depending on whether you are planning to recover a 32-bit or a 64-bit Windows operating system.

   To add the drivers:

   - Click **Add** and specify the path to the necessary *.inf file for a corresponding SCSI, RAID, SATA controller, network adapter, tape drive or other device.
   - Repeat this procedure for each driver you want to be included in the resulting WinPE boot media.
8. Choose whether you want to create ISO or WIM image or upload the media on a server (Acronis PXE Server, WDS or RIS).
9. Specify the full path to the resulting image file including the file name, or specify the server and provide the user name and password to access it.
10. Check your settings in the summary screen and click **Proceed**.
11. Burn the .ISO to CD or DVD using a third-party tool or copy to a flash drive.

Once a machine boots into WinPE, Acronis Backup & Recovery 11.5 starts automatically.

To create a PE image (ISO file) from the resulting WIM file:

- replace the default boot.wim file in your Windows PE folder with the newly created WIM file. For the above example, type:

  ```
  copy c:\AcronisMedia.wim c:\winpe_x86\ISO\sources\boot.wim
  ```

- use the **Oscdimg** tool. For the above example, type:

  ```
  oscdimg -n –bc:\winpe_x86\etfsboot.com c:\winpe_x86\ISO
  c:\winpe_x86\winpe_x86.iso
  ```

For more information on customizing Windows PE, see the Windows Preinstallation Environment User's Guide (Winpe.chm).

9.2 Connecting to a machine booted from media

Once a machine boots from bootable media, the machine terminal displays a startup window with the IP address(es) obtained from DHCP or set according to the pre-configured values.

Configuring network settings

To change the network settings for a current session, click **Configure network** in the startup window. The **Network Settings** window that appears will allow you to configure network settings for each network interface card (NIC) of the machine.

Changes made during a session will be lost after the machine reboots.

 Copyright © Acronis International GmbH, 2002-2013.

Adding VLANs

In the **Network Settings** window, you can add virtual local area networks (VLANs). Use this functionality if you need access to a backup location that is included in a specific VLAN.

VLANs are mainly used to divide a local area network into segments. A NIC that is connected to an *access* port of the switch always has access to the VLAN specified in the port configuration. A NIC connected to a *trunk* port of the switch can access the VLANs allowed in the port configuration only if you specify the VLANs in the network settings.

To enable access to a VLAN via a trunk port

1. Click **Add VLAN**.
2. Select the NIC that provides access to the local area network that includes the required VLAN.
3. Specify the VLAN identifier.

After you click **OK**, a new entry appears in the list of network adapters.

If you need to remove a VLAN, click the required VLAN entry, and then click **Remove VLAN**.

Local connection

To operate directly on the machine booted from bootable media, click **Manage this machine locally** in the startup window.

Remote connection

To connect a management console to a remote machine booted from bootable media, select **Connect > Manage a remote machine** in the console menu, and then specify one of the machine's IP addresses. Provide the user name and password if these were configured when creating the bootable media.

9.3 Working under bootable media

Operations on a machine booted with bootable media are very similar to backup and recovery under the operating system. The difference is as follows:

1. Under a Windows-style bootable media, a volume has the same drive letter as in Windows. Volumes that do not have drive letters in Windows (such as the **System Reserved** volume) are assigned free letters in order of their sequence on the disk.

   If the bootable media cannot detect Windows on the machine or detects more than one of them, all volumes, including those without drive letters, are assigned letters in order of their sequence on the disk. This way, the volume letters may differ from those seen in Windows. For example, the D: drive under the bootable media might correspond to the E: drive in Windows.

   Be careful! To be on the safe side, it is advisable to assign unique names to the volumes.

2. The Linux-style bootable media shows local disks and volumes as unmounted (sda1, sda2...).
3. Backups created using bootable media have simplified file names (p. 78). Standard names are assigned to the backups only if these are added to an existing archive with standard file naming, or if the destination does not support simplified file names.
4. The Linux-style bootable media cannot write a backup to an NTFS-formatted volume. Switch to the Windows style if you need to do so.
5. You can switch the bootable media between the Windows style and the Linux style by selecting **Tools** > **Change volume representation**.

 Copyright © Acronis International GmbH, 2002-2013.

6. There is no **Navigation** tree in the media GUI. Use the **Navigation** menu item to navigate between views.
7. Tasks cannot be scheduled; in fact, tasks are not created at all. If you need to repeat the operation, configure it from scratch.
8. The log lifetime is limited to the current session. You can save the entire log or the filtered log entries to a file.
9. Centralized vaults are not displayed in the folder tree of the **Archive** window.

   To access a managed vault, type the following string in the **Path** field:

   bsp://node_address/vault_name/

   To access an unmanaged centralized vault, type the full path to the vault's folder.

   After entering access credentials, you will see a list of archives located in the vault.

9.3.1 Setting up a display mode

For a machine booted from media, a display video mode is detected automatically based on the hardware configuration (monitor and graphics card specifications). If, for some reason, the video mode is detected incorrectly, do the following:

1. In the boot menu, press F11.
2. Add to the command prompt the following command: **vga=ask**, and then proceed with booting.
3. From the list of supported video modes, choose the appropriate one by typing its number (for example, **318**), and then press ENTER.

If you do not wish to follow this procedure every time you boot from media on a given hardware configuration, re-create the bootable media with the appropriate mode number (in our example, **vga=0x318**) typed in the **Kernel parameters** window (see the Bootable Media Builder (p. 258) section for details).

9.3.2 Configuring iSCSI and NDAS devices

This section describes how to configure Internet Small Computer System Interface (iSCSI) devices and Network Direct Attached Storage (NDAS) devices when working under bootable media.

These devices are connected to the machine through a network interface and appear as if they were locally-attached devices. On the network, an iSCSI device is identified by its IP address, and an NDAS device is identified by its device ID.

An iSCSI device is sometimes called an iSCSI target. A hardware or software component that provides interaction between the machine and the iSCSI target is called the iSCSI initiator. The name of the iSCSI initiator is usually defined by an administrator of the server that hosts the device.

To add an iSCSI device

1. In a bootable media (Linux-based or PE-based), run the management console.
2. Click **Configure iSCSI/NDAS devices** (in a Linux-based media) or **Run the iSCSI Setup** (in a PE-based media).
3. Specify the IP address and port of the iSCSI device's host, and the name of the iSCSI initiator.
4. If the host requires authentication, specify the user name and password for it.
5. Click **OK**.
6. Select the iSCSI device from the list, and then click **Connect**.

 Copyright © Acronis International GmbH, 2002-2013.

7. If prompted, specify the user name and password to access the iSCSI device.

To add an NDAS device

1. In a Linux-based bootable media, run the management console.
2. Click **Configure iSCSI/NDAS devices**.
3. In **NDAS devices**, click **Add device**.
4. Specify the 20-character device ID.
5. If you want to allow writing data onto the device, specify the five-character write key. Without this key, the device will be available in the read-only mode.
6. Click **OK**.

9.4 List of commands and utilities available in Linux-based bootable media

Linux-based bootable media contains the following commands and command line utilities, which you can use when running a command shell. To start the command shell, press CTRL+ALT+F2 while in the bootable media's management console.

Acronis command-line utilities

- `acrocmd`
- `acronis`
- `asamba`
- `lash`

Linux commands and utilities

`busybox`	`ifconfig`	`rm`
`cat`	`init`	`rmmod`
`cdrecord`	`insmod`	`route`
`chmod`	`iscsiadm`	`scp`
`chown`	`kill`	`scsi_id`
`chroot`	`kpartx`	`sed`
`cp`	`ln`	`sg_map26`
`dd`	`ls`	`sh`
`df`	`lspci`	`sleep`
`dmesg`	`lvm`	`ssh`
`dmraid`	`mdadm`	`sshd`
`e2fsck`	`mkdir`	`strace`
`e2label`	`mke2fs`	`swapoff`
`echo`	`mknod`	`swapon`
`egrep`	`mkswap`	`sysinfo`

Copyright © Acronis International GmbH, 2002-2013.

fdisk	more	tar
fsck	mount	tune2fs
fxload	mtx	udev
gawk	mv	udevinfo
gpm	pccardctl	udevstart
grep	ping	umount
growisofs	pktsetup	uuidgen
grub	poweroff	vconfig
gunzip	ps	vi
halt	raidautorun	zcat
hexdump	readcd	
hotplug	reboot	

9.5 Acronis Startup Recovery Manager

Acronis Startup Recovery Manager is a modification of the bootable agent (p. 444), residing on the system disk in Windows, or on the /boot partition in Linux and configured to start at boot time on pressing F11. It eliminates the need for a separate media or network connection to start the bootable rescue utility.

Acronis Startup Recovery Manager is especially useful for mobile users. If a failure occurs, reboot the machine, wait for the prompt "Press F11 for Acronis Startup Recovery Manager…" to appear, and hit F11. The program will start and you can perform recovery.

You can also back up using Acronis Startup Recovery Manager, while on the move.

On machines with the GRUB boot loader installed, you select the Acronis Startup Recovery Manager from the boot menu instead of pressing F11.

Activate

Activation enables the boot time prompt "Press F11 for Acronis Startup Recovery Manager…" (if you do not have the GRUB boot loader) or adds the "Acronis Startup Recovery Manager" item to GRUB's menu (if you have GRUB).

The system disk (or, the /boot partition in Linux) should have at least 100 MB of free space to activate Acronis Startup Recovery Manager.

Unless you use the GRUB boot loader and it is installed in the Master Boot Record (MBR), Acronis Startup Recovery Manager activation overwrites the MBR with its own boot code. Thus, you may need to reactivate third-party boot loaders if they are installed.

Under Linux, when using a boot loader other than GRUB (such as LILO), consider installing it to a Linux root (or boot) partition boot record instead of the MBR before activating Acronis Startup Recovery Manager. Otherwise, reconfigure the boot loader manually after the activation.

 Copyright © Acronis International GmbH, 2002-2013.

Do not activate

Disables boot time prompt "Press F11 for Acronis Startup Recovery Manager…" (or, the menu item in GRUB). If Acronis Startup Recovery Manager is not activated, you will need one of the following to recover the system when it fails to boot:

- boot the machine from a separate bootable rescue media
- use network boot from Acronis PXE Server or Microsoft Remote Installation Services (RIS).

9.6 Acronis PXE Server

Acronis PXE Server allows for booting machines to Acronis bootable components through the network.

Network booting:

- eliminates the need to have a technician onsite to install the bootable media into the system that must be booted
- during group operations, reduces the time required for booting multiple machines as compared to using physical bootable media.

Bootable components are uploaded to Acronis PXE Server using Acronis Bootable Media Builder. To upload bootable components, start the Bootable Media Builder (either from the management console, by selecting **Tools > Create bootable media** or as a separate component) and follow the step-by-step instructions described in the "Bootable Media Builder (p. 258)" section.

Booting multiple machines from the Acronis PXE Server makes sense if there is a Dynamic Host Control Protocol (DHCP) server on your network. Then the network interfaces of the booted machines will automatically obtain IP addresses.

Limitation:

Acronis PXE Server does not support UEFI boot loader.

9.6.1 Acronis PXE Server Installation

To install Acronis PXE Server:

1. Run the Acronis Backup & Recovery 11.5 setup file.
2. Select Acronis PXE Server from the list of **Centralized management components**.
3. Follow the onscreen instructions.

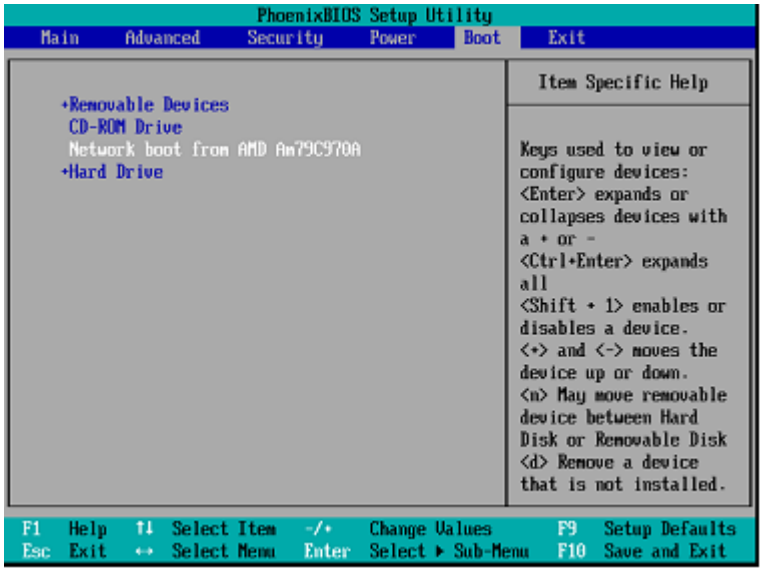
Acronis PXE Server runs as a service immediately after installation. Later on it will automatically launch at each system restart. You can stop and start Acronis PXE Server in the same way as other Windows services.

9.6.2 Setting up a machine to boot from PXE

For bare metal, it is enough that the machine's BIOS supports network booting.

 Copyright © Acronis International GmbH, 2002-2013.

On a machine that has an operating system on the hard disk, the BIOS must be configured so that the network interface card is either the first boot device, or at least prior to the Hard Drive device. The example below shows one of reasonable BIOS configurations. If you don't insert bootable media, the machine will boot from the network.



In some BIOS versions, you have to save changes to BIOS after enabling the network interface card so that the card appears in the list of boot devices.

If the hardware has multiple network interface cards, make sure that the card supported by the BIOS has the network cable plugged in.

9.6.3 Work across subnets

To enable the Acronis PXE Server to work in another subnet (across the switch), configure the switch to relay the PXE traffic. The PXE server IP addresses are configured on a per-interface basis using IP helper functionality in the same way as DHCP server addresses. For more information please refer to: http://support.microsoft.com/default.aspx/kb/257579.

Copyright © Acronis International GmbH, 2002-2013.

10 Disk management

Acronis Disk Director Lite is a tool for preparing a machine disk/volume configuration for recovering the volume images saved by the Acronis Backup & Recovery 11.5 software.

Sometimes after the volume has been backed up and its image placed into a safe storage, the machine disk configuration might change due to a HDD replacement or hardware loss. In such case with the help of Acronis Disk Director Lite, the user has the possibility to recreate the necessary disk configuration so that the volume image can be recovered exactly “as it was” or with any alteration of the disk or volume structure the user might consider necessary.

All operations on disks and volumes involve a certain risk of data damage. Operations on system, bootable or data volumes must be carried out very carefully to avoid potential problems with the booting process or hard disk data storage.

Operations with hard disks and volumes take a certain amount of time, and any power loss, unintentional turning off of the machine or accidental pressing of the Reset button during the procedure could result in volume damage and data loss.

All operations on volumes of dynamic disks in Windows XP and Windows 2000 require Acronis Managed Machine Service to be run under an account with administrator's rights.

Please take all necessary precautions (p. 272) to avoid possible data loss.

10.1 Supported file systems

Acronis Disk Director Lite supports the following file systems:

- FAT 16/32
- NTFS

If it is necessary to perform an operation on a volume with a different file system, use the full version of Acronis Disk Director. It provides more tools and utilities to manage disks and volumes with the following file systems:

- FAT 16/32
- NTFS
- Ext2
- Ext3
- HFS+
- HFSX
- ReiserFS
- JFS
- Linux SWAP

10.2 Basic precautions

To avoid any possible disk and volume structure damage or data loss, please take all necessary precautions and follow these simple rules:

 Copyright © Acronis International GmbH, 2002-2013.

1. Back up the disk on which volumes will be created or managed. Having your most important data backed up to another hard disk, network share or removable media will allow you to work on disk volumes being reassured that your data is safe.
2. Test your disk to make sure it is fully functional and does not contain bad sectors or file system errors.
3. Do not perform any disk/volume operations while running other software that has low-level disk access. Close these programs before running Acronis Disk Director Lite.

With these simple precautions, you will protect yourself against accidental data loss.

10.3 Running Acronis Disk Director Lite

You can run Acronis Disk Director Lite in Windows or under bootable media.

Limitations.

- Acronis Disk Director Lite is not available under Windows 8/8.1, Windows Server 2012/2012 R2.
- Disk management operations under bootable media may work incorrectly if storage spaces are configured on the machine.

Running Acronis Disk Director Lite under Windows

If you run Acronis Backup & Recovery 11.5 Management Console, and connect it to a managed machine, the **Disk management** view will be available in the **Navigation** tree of the console, with which you can start Acronis Disk Director Lite.

Running Acronis Disk Director Lite from a bootable media

You can run Acronis Disk Director Lite on a bare metal, on a machine that cannot boot or on a non-Windows machine. To do so, boot the machine from a bootable media (p. 445) created with the Acronis Bootable Media Builder; run the management console and then click **Disk management**.

10.4 Choosing the operating system for disk management

On a machine with two or more operating systems, representation of disks and volumes depends on which operating system is currently running.

A volume may have a different letter in different Windows operating systems. For example, volume E: might appear as D: or L: when you boot another Windows operating system installed on the same machine. (It is also possible that this volume will have the same letter E: under any Windows OS installed on the machine.)

A dynamic disk created in one Windows operating system is considered as a **Foreign Disk** in another Windows operating system or might be unsupported by this operating system.

When you need to perform a disk management operation on such machine, it is necessary to specify for which operating system the disk layout will be displayed and the disk management operation will be performed.

The name of the currently selected operating system is shown on the console toolbar after "**The current disk layout is for:**". Click the OS name to select another operating system in the **Operating System Selection** window. Under bootable media, this window appears after clicking **Disk management**. The disk layout will be displayed according to the operating system you select.

 Copyright © Acronis International GmbH, 2002-2013.

10.5 "Disk management" view

Acronis Disk Director Lite is controlled through the **Disk management** view of the console.

The top part of the view contains a disks and volumes table enabling data sorting and columns customization and toolbar. The table presents the numbers of the disks, as well as assigned letter, label, type, capacity, free space size, used space size, file system, and status for each volume. The toolbar comprises of icons to launch the **Undo**, **Redo** and **Commit** actions intended for pending operations (p. 287).

The graphic panel at the bottom of the view also graphically depicts all the disks and their volumes as rectangles with basic data on them (label, letter, size, status, type and file system).

Both parts of the view also depict all unallocated disk space that can be used in volume creation.

Starting the operations

Any operation can be launched:

- From the volume or disk context menu (both in the table and the graphic panel)
- From the **Disk management** menu of the console
- From the **Operations** bar on the **Actions and Tools** pane

*Note that the list of available operations in the context menu, the **Disk management** menu, and the **Operations** bar depends on the selected volume or disk type. The same is true for unallocated space as well.*

Displaying operation results

The results of any disk or volume operation, you have just planned, are immediately displayed in the **Disk management** view of the console. For example, if you create a volume, it will be immediately shown in the table, as well as in graphical form at the bottom of the view. Any volume changes, including changing the volume letter or label, are also immediately displayed in the view.

10.6 Disk operations

Acronis Disk Director Lite includes the following operations that can be performed on disks:

- Disk Initialization (p. 275) - initializes the new hardware added to the system
- Basic disk cloning (p. 275) - transfers complete data from the source basic MBR disk to the target
- Disk conversion: MBR to GPT (p. 277) - converts an MBR partition table to GPT
- Disk conversion: GPT to MBR (p. 278) - converts a GPT partition table to MBR
- Disk conversion: Basic to Dynamic (p. 278) - converts a basic disk to dynamic
- Disk conversion: Dynamic to Basic (p. 279) - converts a dynamic disk to basic

The full version of Acronis Disk Director will provide more tools and utilities for working with disks.

Acronis Disk Director Lite must obtain exclusive access to the target disk. This means no other disk management utilities (like Windows Disk Management utility) can access it at that time. If you receive a message stating that the disk cannot be blocked, close the disk management applications that use this disk and start again. If you cannot determine which applications use the disk, close them all.

 Copyright © Acronis International GmbH, 2002-2013.

10.6.1 Disk initialization

If you add any new disk to your machine, Acronis Disk Director Lite will notice the configuration change and scan the added disk to include it to the disk and volume list. If the disk is still not initialized or, possibly, has a file structure unknown to the machine system, that means that no programs can be installed on it and you will not be able to store any files there.

Acronis Disk Director Lite will detect that the disk is unusable by the system and needs to be initialized. The **Disk management** view will show the newly detected hardware as a gray block with a grayed icon, thus indicating that the disk is unusable by the system.

If you need to initialize a disk:

1. Select a disk to initialize.
2. Right-click on the selected volume, and then click **Initialize** in the context menu. You will be forwarded to the **Disk Initialization** window, that will provide the basic hardware details such as the disk's number, capacity and state to aid you in the choice of your possible action.
3. In the window, you will be able to set the disk partitioning scheme (MBR or GPT) and the disk type (basic or dynamic). The new disk state will be graphically represented in the **Disk Management** view of the console immediately.
4. By clicking **OK**, you'll add a pending operation of the disk initialization.

(To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

After the initialization, all the disk space remains unallocated and so still impossible to be used for program installation or file storage. To be able to use it, proceed normally to the **Create volume** operation.

If you decide to change the disk settings it can be done later using the standard Acronis Disk Director Lite disk tools.

10.6.2 Basic disk cloning

Sometimes it is necessary to transfer all the disk data onto a new disk. It can be a case of expanding the system volume, starting a new system layout or disk evacuation due to a hardware fault. In any case, the reason for the **Clone basic disk** operation can be summed up as the necessity to transfer all the source disk data to a target disk exactly as it is.

Acronis Disk Director Lite allows the operation to be carried out to basic MBR disks only.

To plan the **Clone basic disk** operation:

1. Select a disk you want to clone.
2. Select a disk as target for the cloning operation.
3. Select a cloning method and specify advanced options.

The new volume structure will be graphically represented in the **Disk management** view immediately.

*It is advisable that you deactivate Acronis Startup Recovery Manager (p. 442) (ASRM), if it is active, before cloning a system disk. Otherwise the cloned operating system might not boot. You can activate the ASRM again after the cloning is completed. If deactivation is not possible, choose the **As is** method to clone the disk.*

 Copyright © Acronis International GmbH, 2002-2013.

10.6.2.1 Selecting source and target disks

The program displays a list of partitioned disks and asks the user to select the source disk, from which data will be transferred to another disk.

The next step is selection of a disk as target for the cloning operation. The program enables the user to select a disk if its size will be sufficient to hold all the data from the source disk without any loss.

If there is some data on the disk that was chosen as the target, the user will receive a warning: "**The selected target disk is not empty. The data on its volumes will be overwritten.**", meaning that all the data currently located on the chosen target disk will be lost irrevocably.

10.6.2.2 Cloning method and advanced options

The **Clone basic disk** operation usually means that the information from the source disk is transferred to the target "**As is**". So, if the destination disk is the same size and even if it is larger, it is possible to transfer all the information there exactly as it is stored at the source.

But with the wide range of available hardware it is normal that the target disk would differ in size from the source. If the destination is larger, then it would be advisable to resize the source disk volumes to avoid leaving unallocated space on the target disk by selecting the **Proportionally resize volumes** option. The option to **Clone basic disk** "as is" remains, but the default method of cloning will be carried out with proportional enlargement of all the **source** disk volumes so that no unallocated space remains on the **target** disk.

If the destination is smaller, then the **As is** option of cloning will be unavailable and proportional resizing of the **source** disk volumes will be mandatory. The program analyzes the **target** disk to establish whether its size will be sufficient to hold all the data from the **source** disk without any loss. If such transfer with proportional resizing of the **source** disk volumes is possible, but without any data loss , then the user will be allowed to proceed. If due to the size limitations safe transfer of all the **source** disk data to the **target** disk is impossible even with the proportional resizing of the volumes, then the **Clone basic disk** operation will be impossible and the user will not be able to continue.

If you are about to clone a disk comprising of a **system volume**, pay attention to the **Advanced options**.

By clicking **Finish**, you'll add the pending operation of the disk cloning.

(To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

Using advanced options

When cloning a disk comprising of a **system volume**, you need to retain an operating system bootability on the target disk volume. It means that the operating system must have the system volume information (e.g. volume letter) matched with the disk NT signature, which is kept in the MBR disk record. But two disks with the same NT signature cannot work properly under one operating system.

If there are two disks having the same NT signature and comprising of a system volume on a machine, at the startup the operating system runs from the first disk, discovers the same signature on the second one, automatically generates a new unique NT signature and assigns it to the second disk. As a result, all the volumes on the second disk will lose their letters, all paths will be invalid on the disk, and programs won't find their files. The operating system on that disk will be unbootable.

 Copyright © Acronis International GmbH, 2002-2013.

You have the following two alternatives to retain system bootability on the target disk volume:

1. Copy NT signature – to provide the target disk with the source disk NT signature matched with the Registry keys also copied on the target disk.
2. Leave NT signature – to keep the old target disk signature and update the operating system according to the signature.

If you need to copy the NT signature:

1. Select the **Copy NT signature** check box. You receive the warning: "If there is an operating system on the hard disk, uninstall either the source or the target hard disk drive from your machine prior to starting the machine again. Otherwise, the OS will start from the first of the two, and the OS on the second disk will become unbootable." The **Turn off the machine after the cloning operation** check box is selected and disabled automatically.
2. Click **Finish** to add the pending operation.
3. Click **Commit** on the toolbar and then click **Proceed** in the **Pending Operations** window.
4. Wait until the operation is finished.
5. Wait until the machine is turned off.
6. Disconnect either the source or the target hard disk drive from the machine.
7. Start up the machine.

If you need to leave an NT signature:

1. Click to clear the **Copy NT signature** check box, if necessary.
2. Click to clear the **Turn off the machine after the cloning operation** check box, if necessary.
3. Click **Finish** to add the pending operation.
4. Click **Commit** on the toolbar and then click **Proceed** in the **Pending Operations** window.
5. Wait until the operation is finished.

10.6.3 Disk conversion: MBR to GPT

You would want to convert an MBR basic disk to a GPT basic disk in the following cases:

- If you need more than 4 primary volumes on one disk.
- If you need additional disk reliability against any possible data damage.

If you need to convert a basic MBR disk to basic GPT:

1. Select a basic MBR disk to convert to GPT.
2. Right-click on the selected volume, and then click **Convert to GPT** in the context menu.

   You will receive a warning window, stating that you are about to convert MBR into GPT.
3. By clicking **OK**, you'll add a pending operation of MBR to GPT disk conversion.

(To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

Please note: A GPT-partitioned disk reserves the space in the end of the partitioned area necessary for the backup area, which stores copies of the GPT header and the partition table. If the disk is full and the volume size cannot be automatically decreased, the conversion operation of the MBR disk to GPT will fail.

The operation is irreversible. If you have a primary volume, belonging to an MBR disk, and convert the disk first to GPT and then back to MBR, the volume will be logical and will not be able to be used as a system volume.

 Copyright © Acronis International GmbH, 2002-2013.

If you plan to install an OS that does not support GPT disks, the reverse conversion of the disk to MBR is also possible through the same menu items the name of the operation will be listed as **Convert to MBR**.

Dynamic disk conversion: MBR to GPT

Acronis Disk Director Lite does not support direct MBR to GPT conversion for dynamic disks. However you can perform the following conversions to reach the goal using the program:

1. MBR disk conversion: dynamic to basic (p. 279) using the **Convert to basic** operation.
2. Basic disk conversion: MBR to GPT using the **Convert to GPT** operation.
3. GPT disk conversion: basic to dynamic (p. 278) using the **Convert to dynamic** operation.

10.6.4 Disk conversion: GPT to MBR

If you plan to install an OS that does not support GPT disks, conversion of the GPT disk to MBR is possible the name of the operation will be listed as **Convert to MBR**.

If you need to convert a GPT disk to MBR:

1. Select a GPT disk to convert to MBR.
2. Right-click on the selected volume, and then click **Convert to MBR** in the context menu.

   You will receive a warning window, stating that you are about to convert GPT into MBR.

   You will be explained the changes that will happen to the system after the chosen disk is converted from GPT to MBR. E.g. if such conversion will stop a disk from being accessed by the system, the operating system will stop loading after such conversion or some volumes on the selected GPT disk will not be accessible with MBR (e.g. volumes located more than 2 TB from the beginning of the disk) you will be warned here about such damage.

   Please note, a volume, belonging to a GPT disk to convert, will be a logical one after the operation and is irreversible.

3. By clicking **OK**, you'll add a pending operation of GPT to MBR disk conversion.

(To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

10.6.5 Disk conversion: basic to dynamic

You would want to convert a basic disk to dynamic in the following cases:

- If you plan to use the disk as part of a dynamic disk group.
- If you want to achieve additional disk reliability for data storage.

If you need to convert a basic disk to dynamic:

1. Select the basic disk to convert to dynamic.
2. Right-click on the selected volume, and then click **Convert to dynamic** in the context menu. You will receive a final warning about the basic disk being converted to dynamic.
3. If you click **OK** in this warning window, the conversion will be performed immediately and if necessary, your machine will be restarted.

   Please note: A dynamic disk occupies the last megabyte of the physical disk to store the database, including the four-level description (Volume-Component-Partition-Disk) for each dynamic volume. If during the

 Copyright © Acronis International GmbH, 2002-2013.

conversion to dynamic it turns out that the basic disk is full and the size of its volumes cannot be decreased automatically, the basic disk to dynamic conversion operation will fail.

Should you decide to revert your dynamic disks back to basic ones, e.g. if you want to start using an OS on your machine that does not support dynamic disks, you can convert your disks using the same menu items, though the operation now will be named **Convert to basic**.

System disk conversion

Acronis Disk Director Lite does not require an operating system reboot after basic to dynamic conversion of the disk, if:

1. There is a single Windows 2008/Vista operating system installed on the disk.
2. The machine runs this operating system.

Basic to dynamic conversion of the disk, comprising of system volumes, takes a certain amount of time, and any power loss, unintentional turning off of the machine or accidental pressing of the Reset button during the procedure could result in bootability loss.

In contrast to Windows Disk Manager the program ensures bootability of an **offline operating system** on the disk after the operation.

10.6.6 Disk conversion: dynamic to basic

You would want to convert dynamic disks back to basic ones, e.g. if you want to start using an OS on your machine that does not support dynamic disks.

If you need to convert a dynamic disk to basic:

1. Select the dynamic disk to convert to basic.
2. Right-click on the selected volume, and then click **Convert to basic** in the context menu. You will receive a final warning about the dynamic disk being converted to basic.

   You will be advised about the changes that will happen to the system if the chosen disk is converted from dynamic into basic. E.g. if such a conversion will stop the disk from being accessed by the system, the operating system will stop loading after such conversion, or if the disk you want to convert to basic contains any volumes of the types that are only supported by dynamic disks (all volume types except Simple volumes), then you will be warned here about the possible damage to the data involved in the conversion.

   Please note, the operation is unavailable for a dynamic disk containing Spanned, Striped, or RAID-5 volumes.

3. If you click **OK** in this warning window, the conversion will be performed immediately.

After the conversion the last 8Mb of disk space is reserved for the future conversion of the disk from basic to dynamic.

In some cases the possible unallocated space and the proposed maximum volume size might differ (e.g. when the size of one mirror establishes the size of the other mirror, or the last 8Mb of disk space are reserved for the future conversion of the disk from basic to dynamic).

System disk conversion

Acronis Disk Director Lite does not require an operating system reboot after dynamic to basic conversion of the disk, if:

1. There is a single Windows 2008/Vista operating system installed on the disk.

 Copyright © Acronis International GmbH, 2002-2013.

2. The machine runs this operating system.

Dynamic to basic conversion of the disk, comprising of system volumes, takes a certain amount of time, and any power loss, unintentional turning off of the machine or accidental pressing of the Reset button during the procedure could result in bootability loss.

In contrast to Windows Disk Manager the program ensures:

- safe conversion of a dynamic disk to basic when it contains volumes **with data** for simple and mirrored volumes
- in multiboot systems, bootability of a system that was **offline** during the operation

10.6.7 Changing disk status

Changing disk status is effective for Windows Vista SP1, Windows Server 2008, Windows 7 operating systems and applies to the current disk layout (p. 273).

One of the following disk statuses always appears in the graphical view of the disk next to the disk's name:

- **Online**

  The online status means that a disk is accessible in the read-write mode. This is the normal disk status. If you need a disk to be accessible in the read-only mode, select the disk and then change its status to offline by selecting **Change disk status to offline** from the **Operations** menu.
- **Offline**

  The offline status means that a disk is accessible in the read-only mode. To bring the selected offline disk back to online, select **Change disk status to online** from the **Operations** menu.
  If the disk has the offline status and the disk's name is **Missing**, this means that the disk cannot be located or identified by the operating system. It may be corrupted, disconnected, or powered off. For information on how to bring a disk that is offline and missing back online, please refer to the following Microsoft knowledge base article:
  http://technet.microsoft.com/en-us/library/cc732026.aspx.

10.7 Volume operations

Acronis Disk Director Lite includes the following operations that can be performed on volumes:

- Create Volume (p. 281) - Creates a new volume with the help of the Create Volume Wizard.
- Delete Volume (p. 284) - Deletes the selected volume.
- Set Active (p. 285) - Sets the selected volume Active so that the machine will be able to boot with the OS installed there.
- Change Letter (p. 285) - Changes the selected volume letter
- Change Label (p. 286) - Changes the selected volume label
- Format Volume (p. 286) - Formats a volume giving it the necessary file system

The full version of Acronis Disk Director will provide more tools and utilities for working with volumes.

Acronis Disk Director Lite must obtain exclusive access to the target volume. This means no other disk management utilities (like Windows Disk Management utility) can access it at that time. If you receive a message stating that the volume cannot be blocked, close the disk management applications that use this volume and start again. If you can not determine which applications use the volume, close them all.

 Copyright © Acronis International GmbH, 2002-2013.

10.7.1 Creating a volume

You might need a new volume to:

- Recover a previously saved backup copy in the “exactly as was” configuration;
- Store collections of similar files separately — for example, an MP3 collection or video files on a separate volume;
- Store backups (images) of other volumes/disks on a special volume;
- Install a new operating system (or swap file) on a new volume;
- Add new hardware to a machine.

In Acronis Disk Director Lite the tool for creating volumes is the **Create volume Wizard**.

10.7.1.1 Types of dynamic volumes

Simple Volume

A volume created from free space on a single physical disk. It can consist of one region on the disk or several regions, virtually united by the Logical Disk Manager (LDM). It provides no additional reliability, no speed improvement, nor extra size.

Spanned Volume

A volume created from free disk space virtually linked together by the LDM from several physical disks. Up to 32 disks can be included into one volume, thus overcoming the hardware size limitations, but if at least one disk fails, all data will be lost, and no part of a spanned volume may be removed without destroying the entire volume. So, a spanned volume provides no additional reliability, nor a better I/O rate.

Striped Volume

A volume, also sometimes called RAID 0, consisting of equal sized stripes of data, written across each disk in the volume; it means that to create a striped volume, a user will need two or more dynamic disks. The disks in a striped volume don’t have to be identical, but there must be unused space available on each disk that you want to include in the volume and the size of the volume will depend on the size of the smallest space. Access to the data on a striped volume is usually faster than access to the same data on a single physical disk, because the I/O is spread across more than one disk.

Striped volumes are created for improved performance, not for their better reliability - they do not contain redundant information.

Mirrored Volume

A fault-tolerant volume, also sometimes called RAID 1, whose data is duplicated on two identical physical disks. All of the data on one disk is copied to another disk to provide data redundancy. Almost any volume can be mirrored, including the system and boot volumes, and if one of the disks fails, the data can still be accessed from the remaining disks. Unfortunately, the hardware limitations on size and performance are even more severe with the use of mirrored volumes.

Mirrored-Striped Volume

A fault-tolerant volume, also sometimes called RAID 1+0, combining the advantage of the high I/O speed of the striped layout and redundancy of the mirror type. The evident disadvantage remains inherent with the mirror architecture - a low disk-to-volume size ratio.

RAID-5

Copyright © Acronis International GmbH, 2002-2013.

A fault-tolerant volume whose data is striped across an array of three or more disks. The disks do not need to be identical, but there must be equally sized blocks of unallocated space available on each disk in the volume. Parity (a calculated value that can be used to reconstruct data in case of failure) is also striped across the disk array. And it is always stored on a different disk than the data itself. If a physical disk fails, the portion of the RAID-5 volume that was on that failed disk can be re-created from the remaining data and the parity. A RAID-5 volume provides reliability and is able to overcome the physical disk size limitations with a higher than mirrored disk-to-volume size ratio.

10.7.1.2 Create volume wizard

The **Create volume** wizard lets you create any type of volume (including system and active), select a file system, label, assign a letter, and also provides other disk management functions.

Its pages will enable you to enter operation parameters, proceeding step-by-step further on and return to any previous step if necessary to change any previously selected options. To help you with your choices, each parameter is supplemented with detailed instructions.

If you want to create a volume:

Run the **Create volume** wizard by selecting **Create volume** on the **Wizards** bar, or right-click any unallocated space and select **Create volume** in the appearing context menu.

Select the type of volume being created

At the first step you have to specify the type of volume you want to create. The following types of volume are available:

- Basic
- Simple/Spanned
- Striped
- Mirrored
- RAID-5

You will obtain a brief description of every type of volume for better understanding of the advantages and limitations of each possible volume architecture.

*If the current operating system, installed on this machine, does not support the selected type of volume , you will receive the appropriate warning. In this case the **Next** button will be disabled and you will have to select another type of volume to proceed with the new volume creation.*

After you click the **Next** button, you will proceed forward to the next wizard page: Select destination disks (p. 282).

Select destination disks

The next wizard page will prompt you to choose the disks, whose space will be used for the volume creation.

To create a basic volume:

- Select a destination disk and specify the unallocated space to create the basic volume on.

To create a Simple/Spanned volume:

 Copyright © Acronis International GmbH, 2002-2013.

- Select one or more destination disks to create the volume on.

To create a Mirrored volume:

- Select two destination disks to create the volume on.

To create a Striped volume:

- Select two or more destination disks to create the volume on.

To create a RAID-5 volume:

- Select three destination disks to create the volume on.

After you choose the disks, the wizard will calculate the maximum size of the resulting volume, depending on the size of the unallocated space on the disks you chose and the requirements of the volume type you have previously decided upon.

If you are creating a **dynamic** volume and select one or several **basic** disks, as its destination, you will receive a warning that the selected disk will be converted to dynamic automatically.

If need be, you will be prompted to add the necessary number of disks to your selection, according to the chosen type of the future volume.

If you click the **Back** button, you will be returned to the previous page: Select the type of volume being created (p. 282).

If you click the **Next** button, you will proceed to the next page: Set the volume size (p. 283).

Set the volume size

On the third wizard page, you will be able to define the size of the future volume, according to the previously made selections. In order to choose the necessary size between the minimum and the maximum values, use the slider or enter the necessary values into the special windows between the minimum and the maximum values or click on the special handle, and hold and drag the borders of the disk's picture with the cursor.

The maximum value normally includes the most possible unallocated space. But in some cases the possible unallocated space and the proposed maximum volume size might differ (e.g. when the size of one mirror establishes the size of the other mirror, or the last 8Mb of the disk space is reserved for the future conversion of the disk from basic to dynamic).

For basic volumes if some unallocated space is left on the disk, you also will be able to choose the position of the new volume on the disk.

If you click the **Back** button, you will be returned to the previous page: Select destination disks (p. 282).

If you click the **Next** button, you will proceed to the next page: Set the volume options (p. 283).

Set the volume options

On the next wizard page you can assign the volume **Letter** (by default - the first free letter of the alphabet) and, optionally, a **Label** (by default – none). Here you will also specify the **File system** and the **Cluster size**.

 Copyright © Acronis International GmbH, 2002-2013.

The wizard will prompt you to choose one of the Windows file systems: FAT16 (disabled, if the volume size has been set at more than 2 GB), FAT32 (disabled, if the volume size has been set at more than 2 TB), NTFS or to leave the volume **Unformatted**.

In setting the cluster size you can choose between any number in the preset amount for each file system. Note, the program suggests the cluster size best suited to the volume with the chosen file system.

If you are creating a basic volume, which can be made into a system volume, this page will be different, giving you the opportunity to select the volume **Type** — **Primary** (**Active Primary**) or **Logical**.

Typically **Primary** is selected to install an operating system to a volume. Select the **Active** (default) value if you want to install an operating system on this volume to boot at machine startup. If the **Primary** button is not selected, the **Active** option will be inactive. If the volume is intended for data storage, select **Logical**.

*A Basic disk can contain up to four primary volumes. If they already exist, the disk will have to be converted into dynamic, otherwise or **Active** and **Primary** options will be disabled and you will only be able to select the **Logical** volume type. The warning message will advise you that an OS installed on this volume will not be bootable.*

*If you use characters when setting a new volume label that are unsupported by the currently installed operation system, you will get the appropriate warning and the **Next** button will be disabled. You will have to change the label to proceed with the creation of the new volume.*

If you click the **Back** button, you will be returned to the previous page: Set the volume size (p. 283).

If you click the **Finish** button, you will complete the operation planning.

To perform the planned operation click **Commit** in the toolbar, and then click **Proceed** in the **Pending Operations** window**.**

If you set a 64K cluster size for FAT16/FAT32 or on 8KB-64KB cluster size for NTFS, Windows can mount the volume, but some programs (e.g. Setup programs) might calculate its disk space incorrectly.

10.7.2 Delete volume

This version of Acronis Disk Director Lite has reduced functionality because it is mainly a tool for preparing bare-metal systems for recovering previously saved volume images. The features of resizing the existing volumes and creating the new volumes, using free space from the existing ones, exist on the full version of the software, so with this version deleting an existing volume sometimes might be the only way to free the necessary disk space without changing the existing disk configuration.

After a volume is deleted, its space is added to unallocated disk space. It can be used for creation of a new volume or to change another volume's type.

If you need to delete a volume:

1. Select a hard disk and a volume to be deleted.
2. Select **Delete volume** or a similar item in the **Operations** sidebar list, or click the **Delete the selected volume** icon on the toolbar.

   If the volume contains any data, you will receive the warning, that all the information on this volume will be lost irrevocably.

3. By clicking **OK** in the **Delete volume** window, you'll add the pending operation of volume deletion.

 Copyright © Acronis International GmbH, 2002-2013.

(To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

10.7.3 Set active volume

If you have several primary volumes, you must specify one to be the boot volume. For this, you can set a volume to become active. A disk can have only one active volume, so if you set a volume as active, the volume, which was active before, will be automatically unset.

If you need to set a volume active:

1. Select a primary volume on a basic MBR disk to set as active.
2. Right-click on the selected volume, and then click **Mark as active** in the context menu.

   If there is no other active volume in the system, the pending operation of setting active volume will be added.

   Please note, that due to setting the new active volume, the former active volume letter might be changed and some of the installed programs might stop running.

3. If another active volume is present in the system, you will receive the warning that the previous active volume will have to be set passive first. By clicking **OK** in the **Warning** window, you'll add the pending operation of setting active volume.

   Please note: even if you have the Operating System on the new active volume, in some cases the machine will not be able to boot from it. You will have to confirm your decision to set the new volume as active.

(To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

The new volume structure will be graphically represented in the **Disk management** view immediately.

10.7.4 Change volume letter

Windows operating systems assign letters (C:, D:, etc) to hard disk volumes at startup. These letters are used by applications and operating systems to locate files and folders in the volumes.

Connecting an additional disk, as well as creating or deleting a volume on existing disks, might change your system configuration. As a result, some applications might stop working normally or user files might not be automatically found and opened. To prevent this, you can manually change the letters that are automatically assigned to the volumes by the operating system.

If you need to change a letter assigned to a volume by the operating system:

1. Select a volume to change a letter.
2. Right-click on the selected volume, and then click **Change letter** in the context menu.
3. Select a new letter in the **Change Letter** window.
4. By clicking **OK** in the **Change Letter** window, you'll add a pending operation to volume letter assignment.

   (To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

The new volume structure will be graphically represented in the **Disk management** view immediately.

Copyright © Acronis International GmbH, 2002-2013.

10.7.5 Change volume label

The volume label is an optional attribute. It is a name assigned to a volume for easier recognition. For example, one volume could be called SYSTEM — a volume with an operating system, or PROGRAM — an application volume, DATA — a data volume, etc., but it does not imply that only the type of data stated with the label could be stored on such a volume.

In Windows, volume labels are shown in the Explorer disk and folder tree: LABEL1(C:), LABEL2(D:), LABEL3(E:), etc. LABEL1, LABEL2 and LABEL3 are volume labels. A volume label is shown in all application dialog boxes for opening and saving files.

If you need to change a volume label:

1. Right-click on the selected volume, and then click **Change label**.
2. Enter a new label in the **Change label** window text field.
3. By clicking **OK** in the **Change label** window, you'll add the pending operation of changing the volume label .

   *If when setting a new volume label you use characters that are unsupported by the currently installed operating system, you will get the appropriate warning and the **OK** button will be disabled. You will have to use only supported characters to proceed with changing the volume label.*

   (To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

The new label will be graphically represented in the **Disk Management** view of the console immediately.

10.7.6 Format volume

You might want to format a volume if you want to change its file system:

- to save additional space which is being lost due to the cluster size on the FAT16 or FAT32 file systems
- as a quick and more or less reliable way of destroying data, residing in this volume

If you want to format a volume:

1. Select a volume to format.
2. Right-click on the selected volume, and then click **Format** in the context menu.

   You will be forwarded to the **Format Volume** window, where you will be able to set the new file system options. You can choose one of the Windows file systems: FAT16 (disabled, if the Volume Size is more than 2 GB), FAT32 (disabled, if the Volume Size is more than 2 TB) or NTFS.

   In the text window you will be able to enter the volume label, if necessary: by default this window is empty.

   In setting the cluster size you can choose between any number in the preset amount for each file system. Note, the program suggests the cluster size best suited to the volume with the chosen file system.
3. If you click **OK** to proceed with the **Format Volume** operation, you'll add a pending operation of formatting a volume.

   (To finish the added operation you will have to commit (p. 287) it. Exiting the program without committing the pending operations will effectively cancel them.)

The new volume structure will be graphically represented in the **Disk management** view.

 Copyright © Acronis International GmbH, 2002-2013.

If you set a 64K cluster size for FAT16/FAT32 or an 8KB-64KB cluster size for NTFS, Windows can mount the volume, but some programs (e.g. Setup programs) might calculate its disk space incorrectly.

10.8 Pending operations

All operations, which were prepared by the user in manual mode or with the aid of a wizard, are considered pending until the user issues the specific command for the changes to be made permanent. Until then, Acronis Disk Director Lite will only demonstrate the new volume structure that will result from the operations that have been planned to be performed on disks and volumes. This approach enables you to control all planned operations, double-check the intended changes, and, if necessary, cancel operations before they are executed.

To prevent you from performing any unintentional change on your disk, the program will first display the list of all pending operations.

The **Disk management** view contains the toolbar with icons to launch the **Undo**, **Redo** and **Commit** actions intended for pending operations. These actions might also be launched from the **Disk management** menu of the console.

All planned operations are added to the pending operation list.

The **Undo** action lets you undo the latest operation in the list. While the list is not empty, this action is available.

The **Redo** action lets you reinstate the last pending operation that was undone.

The **Commit** action forwards you to the **Pending Operations** window, where you will be able to view the pending operation list. Clicking **Proceed** will launch their execution. You will not be able to undo any actions or operations after you choose the **Proceed** operation. You can also cancel the commitment by clicking **Cancel**. Then no changes will be done to the pending operation list.

Quitting Acronis Disk Director Lite without committing the pending operations effectively cancels them, so if you try to exit **Disk management** without committing the pending operations, you will receive the appropriate warning.

Copyright © Acronis International GmbH, 2002-2013.

11 Protecting applications with disk-level backup

This section describes how to use a disk-level backup to protect applications running on Windows servers.

This information is valid for both physical and virtual machines, no matter if the virtual machines are backed up at a hypervisor level or from inside a guest OS.

Disk-level backup can potentially protect any VSS-aware application; however, Acronis has tested the protection for the following applications:

- Microsoft Exchange Server
- Microsoft SQL Server
- Active Directory (Active Directory Domain Services)
- Microsoft SharePoint

Using a disk backup of an application server

A disk or volume backup stores a disk or a volume file system as a whole. Therefore, it stores all of the information necessary for the operating system to boot. It also stores all application files, including database files. You can use this backup in various ways depending on the situation.

- In case of disaster, you can recover the entire disk to ensure that both the operating system and applications are up and running.
- If the operating system is intact, you may need to revert an application database to a previous state. To do this, recover the database files and then use the native tools of the application to make the application acknowledge the database.
- You may need to extract only a certain data item, for example a PDF document from a Microsoft SharePoint server backup. In this case, you can temporarily mount a backed-up volume to the application server file system and use the native tools of the application to extract the item.

11.1 Backing up an application server

To protect an application server, create a backup plan or use the **Backup now** feature as described in the "Backup" (p. 55) section.

Applications that use databases require a few simple measures to ensure the application data consistency within a disk backup.

Back up entire machines

Databases may be stored on more than one disk or volume. To ensure that all necessary files are included in a backup, back up the entire machine. This also ensures that the application will remain protected if you add more databases or relocate the log files in the future.

If you are sure that the databases and their associated files are always on the same volumes, you may want to back up only these volumes. Or you may want to create separate backup plans for the system volume and for the volumes that store the data. In both cases, make sure that all of the volumes containing the necessary files are included in the backup. For instructions on how to find out the database paths, refer to "Locating database files" (p. 290).

 Copyright © Acronis International GmbH, 2002-2013.

If the application databases are located on a number of machines, back up all of the machines on the same schedule. For example, include all of the SQL servers belonging to a SharePoint farm in a centralized backup plan running on a fixed schedule.

Use Volume Shadow Copy (VSS)

Microsoft Volume Shadow Copy Service (VSS) should be used to ensure consistency of the database files in the backup. Without VSS, the files would be in a crash-consistent state; that is, after the recovery, the system would be in the same state as if the power were disconnected at the moment when backup began. While such backups are good enough for most applications, applications that use databases may not be able to start from a crash-consistent state.

A VSS provider notifies VSS-aware applications that the backup is about to start. This ensures that all database transactions are completed by the time Acronis Backup & Recovery 11.5 takes the data snapshot. This, in turn, ensures the consistent state of the databases in the resulting backup.

Acronis Backup & Recovery 11.5 can use various VSS providers. For Microsoft products, Microsoft Software Shadow Copy Provider is the best choice.

Using VSS on a physical machine

On a physical machine, using VSS is configurable. This also applies to a virtual machine that is backed up from inside the guest OS. You may need to enable using VSS manually if the factory preset was changed from the default value.

You also need to make sure that VSS writers for the respective application are turned on. In Windows Small Business Server 2003, the Exchange writer is turned off by default. For instructions on how to turn it on, see the following Microsoft Knowledge Base article http://support.microsoft.com/kb/838183/.

To enable using VSS by default in any backup plan created on a machine:

1. Connect the console to the machine.
2. On the top menu, select **Options** > **Default backup and recovery options** > **Default backup options** > **Volume Shadow Copy Service**.
3. Click **Use Volume Shadow Copy Service**.
4. In the **Snapshot provider** list, click **Software - System provider**.

When the console is connected to the management server, you can set the same default setting for all of the registered machines.

Using VSS on a virtual machine

When backing up a virtual machine at a hypervisor level, using VSS is not configurable. VSS is always used if VMware Tools or Hyper-V Integration Services are installed in a respective guest system.

Installing these tools/services is a common requirement for backing up at a hypervisor level. If you encounter errors mentioning "quiesced snapshot" when backing up ESX(i) virtual machines, then reinstalling or updating VMware Tools and rebooting the virtual machine will usually help. For more information, see http://kb.acronis.com/content/4559.

Truncating transaction logs

Active Directory normally uses circular logging. Logs of other VSS-aware applications (except for Microsoft SQL Server) can be truncated by using the **Enable VSS Full backup** option (p. 131). This

 Copyright © Acronis International GmbH, 2002-2013.

option is effective on a physical machine and on a virtual machine where Agent for Windows is installed.

Other available solutions include:

1. Truncating the logs manually or by using a script. For more information, see "Truncating transaction logs" (p. 293)
2. For Microsoft Exchange Server, using the dedicated Agent for Microsoft Exchange Server.
3. For Microsoft SQL Server, using Agent for Microsoft SQL Server (single-pass).

Application-specific recommendations

See "Best practices when backing up application servers" (p. 297).

11.1.1 Locating database files

This section describes how to find application database files.

We recommend that you find out the database file paths and store them in a safe place. This will save you time and effort when you will recover the application data.

11.1.1.1 SQL Server database files

SQL Server databases have three types of files:

- Primary data files - have the **.mdf** extension by default. Every database has one primary data file.
- Secondary data files - have the **.ndf** extension by default. Secondary data files are optional. Some databases may not have them at all, while other databases may have several secondary data files.
- Log files - have the **.ldf** extension by default. Every database has a least one log file.

Make sure that all of the volumes containing the above files are included in the backup. For example, if your databases are located in C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Data\ and log files are located in F:\TLs\, you need to back up both volumes C:\ and F:\.

Determining paths to all database files of an instance by using Transact-SQL

The following Transact-SQL script can be used "as is" to determine paths to all database files of an instance.

 Copyright © Acronis International GmbH, 2002-2013.

```
Create Table ##temp
(
    DatabaseName sysname,
    Name sysname,
    physical_name nvarchar(500),
    size decimal (18,2),
    FreeSpace decimal (18,2)
)
Exec sp_msforeachdb '
Use [?];
Insert Into ##temp (DatabaseName, Name, physical_name, Size, FreeSpace)
    Select DB_NAME() AS [DatabaseName], Name,  physical_name,
    Cast(Cast(Round(cast(size as decimal) * 8.0/1024.0,2) as decimal(18,2)) as
nvarchar) Size,
    Cast(Cast(Round(cast(size as decimal) * 8.0/1024.0,2) as decimal(18,2)) -
        Cast(FILEPROPERTY(name, ''SpaceUsed'') * 8.0/1024.0 as decimal(18,2)) as
nvarchar) As FreeSpace
    From sys.database_files'
Select * From ##temp
drop table ##temp
```

Determining locations of database files by using SQL Server Management Studio

Default locations

SQL Server database files are in their default locations unless you have customized the paths manually. To find out the default locations of database files:

1. Run Microsoft SQL Server Management Studio and connect to the necessary instance.
2. Right-click the instance name and select **Properties**.
3. Open the **Database Settings** page and view the paths specified in the **Database default locations** section.

Custom locations

If SQL Server database file locations were customized, proceed as follows.

1. In Microsoft SQL Server Management Studio, expand the necessary instance.
2. Right-click the database, and then click **Properties**. This will open the **Database Properties** dialog box.
3. In the **Select a page** pane, click **Files** and view the paths specified in the **Database files** section.

11.1.1.2 Exchange Server database files

Exchange databases have three types of files:

- **Database file (.edb)**

  Contains message headers, message text, and standard attachments.

  An Exchange 2003/2007 database uses two files: .edb for text data and .stm for MIME data.

- **Transaction log files (.log)**

  Contains the history of changes made to the database. Only after a change has been securely logged, it is then written to the database file. This approach guarantees a reliable recovery of the database in a consistent state in case of a sudden database interruption.

  Each log file is 1024 KB in size (or 5120 KB in Exchange 2003). When an active log file is full, Exchange closes it and creates a new log file.

 Copyright © Acronis International GmbH, 2002-2013.

- **Checkpoint file (.chk)**

  Tracks how far Exchange has progressed in writing logged information to the database file.

To find out the database file and log file paths, proceed as follows.

Exchange 2010

Execute the following commands by using Exchange Management Shell:

```
Get-MailboxDatabase | Format-List -Property Name, EdbFilePath, LogFolderPath
```

Exchange 2007

Execute the following commands by using Exchange Management Shell:

- To obtain database file paths:

  ```
  Get-MailboxDatabase | Format-List -Property Name, EdbFilePath, StorageGroup
  ```

- To obtain log file paths:

  ```
  Get-MailboxDatabase | ForEach { Get-StorageGroup $_.StorageGroupName | Format-List
  -Property Name, LogFolderPath }
  ```

Exchange 2003

1. Start Exchange System Manager.
2. Click **Administrative Groups**.

   ***Note**: If Administrative Groups does not appear, it may not be turned on. To turn on Administrative Groups, right-click **Exchange Organization**, and then click **Properties**. Click to select the Display Administrative Groups check box.*

3. To find out transaction log location, do the following:
   a. Right-click the storage group, and then click **Properties**.
   b. On the **General** tab you will see transaction log location.
4. To find out database file location (*.edb) do the following:
   a. Expand the required storage group.
   b. Right-click the database, and then click **Properties**.
   c. On the **Database** tab you will see database file location and database streaming file location.

11.1.1.3 Active Directory database files

An Active Directory database consists of the following files:

1. **NTDS.dit** (database file)
2. **Edb.chk** (checkpoint file)
3. **Edb*.log** (transaction logs)
4. **Res1.log** and **Res2.log** (two reserve log files)

The files are typically located in the **%systemroot%\NTDS** folder (such as C:\Windows\NTDS) of a domain controller. However, their location is configurable. The database files and the transaction logs may be stored on different volumes. Make sure that both volumes are included in the backup.

To determine the current location of the database files and transaction logs, examine the **DSA Database file** and **Database log files path** values in the following registry key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Netlogon\Parameters
```

 Copyright © Acronis International GmbH, 2002-2013.

11.1.1.4 SharePoint database files

SharePoint stores content, auxiliary SharePoint services' data and farm configuration in Microsoft SQL Server databases.

To find database files in SharePoint 2010 or later

1. Open **Central Administration** site.
2. Select **Upgrade and Migration** > **Review database status**. You will see the SQL instance and database name for all of the databases.
3. Use Microsoft SQL Server Management Studio to identify the files of the necessary database. For detailed instructions, refer to "SQL Server database files" (p. 290).

To find the content database files in SharePoint 2007

1. Open **Central Administration** site.
2. Select **Application Management** > **Content Databases**.
3. Select a web application.
4. Selecta database. In the opened page you will see the database server and database name. Write them down or copy to a text file.
5. Repeat step 4 for other databases of the web application.
6. Repeat steps 3-5 for other web applications.
7. Use Microsoft SQL Server Management Studio to identify the database files. For detailed instructions, refer to "SQL Server database files" (p. 290).

To find the configuration or service database files in SharePoint 2007

1. Open **Central Administration** site.
2. Select **Application Management** > **Create or configure this farm's shared services**.
3. Right-click a shared services provider and select **Edit properties**. In the opened page you will see the database server and database name. Write them down or copy to a text file.
4. Repeat step 3 for other shared services providers.
5. Use Microsoft SQL Server Management Studio to identify the database files. For detailed instructions, refer to "SQL Server database files" (p. 290).

11.1.2 Truncating transaction logs

This section describes how to truncate transaction logs when protecting Microsoft Exchange and Microsoft SQL servers by using disk backups.

The recommendations for SQL servers also apply to SQL servers included in a Microsoft SharePoint farm. Active Directory databases normally use circular logging, so they do not need log truncation.

11.1.2.1 Transaction log truncation and log file shrinking for SQL Server

Acronis Backup & Recovery 11.5 does not truncate transaction logs after creating a disk backup. If you do not use the native backup engine of Microsoft SQL Server or any other third-party backup solution that automatically manages transaction logs, you can manage logs by using the following methods.

- **Transaction log truncation**. Log truncation frees inactive virtual log files (that contain only inactive log records) for reuse by new log records. Truncation may prevent a physical log file from growing but does not reduce its size.

 Copyright © Acronis International GmbH, 2002-2013.

For more information about truncation refer to the following article:
http://technet.microsoft.com/en-us/library/ms189085(v=sql.105)

- **Log file shrinking**. Log file shrinking reduces the physical size of a log file by removing the inactive virtual log files. Shrinking is most effective after log truncation.

  For more information about shrinking refer to the following article:
  http://technet.microsoft.com/en-us/library/ms178037(v=sql.105)

Log truncation by using SQL Server Management Studio

When you switch a database to the Simple Recovery Model, transaction logs are truncated automatically.

1. To switch the database to the Simple Recovery Model:
   a. Run Microsoft SQL Server Management Studio and connect to the instance.
   b. Right-click the database, and then click **Properties**. This will open the **Database Properties** dialog box.
   c. In the **Select a page** pane, click **Options**.
   d. In the **Recovery Model** list box, select the **Simple** model list.
2. The transaction log files will automatically be truncated.
3. Switch the database back to the Full or Bulk-logged recovery model in the same manner as in step 1.

Automating log truncation and shrinking

You can automate the above truncation procedure by using a script and (optionally) add log file shrinking. If you add the script to the Post-backup command (p. 125), the logs will be truncated and shrunk immediately after a backup. This method assumes that you have Transact-SQL scripting skills and are familiar the `sqlcmd` utility.

For more information about Transact-SQL and `sqlcmd` refer to the following articles:

- Using Transact-SQL: http://technet.microsoft.com/en-us/library/ms189826(v=sql.90)
- Using the `sqlcmd` utility: http://technet.microsoft.com/en-us/library/ms170572(SQL.90).aspx

To automate transaction log truncation and shrinking for an SQL instance

1. Using the following template, create a script that will truncate and shrink the log files for the databases of the instance:

```
USE database_name
ALTER DATABASE database_name SET RECOVERY SIMPLE;
DBCC SHRINKFILE(logfile_name);
ALTER DATABASE database_name SET RECOVERY FULL;
```

   In the last string, the `SET RECOVERY` value depends on the original recovery model of the particular database and could be `FULL` or `BULK_LOGGED`.

   Example for an instance having two databases (TestDB1 and TestDB2):

 Copyright © Acronis International GmbH, 2002-2013.

```
USE TestDB1;
ALTER DATABASE TestDB1 SET RECOVERY SIMPLE;
DBCC SHRINKFILE(TestDB1_log);
ALTER DATABASE TestDB1 SET RECOVERY FULL;

USE TestDB2;
ALTER DATABASE TestDB2 SET RECOVERY SIMPLE;
DBCC SHRINKFILE(TestDB2_log);
ALTER DATABASE TestDB2 SET RECOVERY BULK_LOGGED;
```

2. Add the following `sqlcmd` command to the Post-backup command (p. 125):

   ```
   sqlcmd -S myServer\instanceName -i C:\myScript.sql
   ```

   Where:

   - `myServer` - name of the server
   - `instanceName` - name of the instance
   - `C:\myScript.sql` - path to the script file created in the step 1.

To automate transaction log truncation and shrinking for multiple SQL instances

If you have more than one instance on the machine and want to apply the above procedure to these instances, proceed as follows.

1. Create a separate script file for each instance (e.g. C:\script1.sql and C:\script2.sql).
2. Create a batch file (e.g. C:\truncate.bat) that will contain the commands for the corresponding instance:

   ```
   sqlcmd -S myServer\instance1 -i C:\script1.sql
   sqlcmd -S myServer\instance2 -i C:\script2.sql
   ```

3. In the Post-backup command, specify the path to the batch file.

11.1.2.2 Transaction log truncation for Exchange Server

About Microsoft Exchange Server log

Before committing a transaction to a database file, Exchange logs it to a transaction log file. To track which of the logged transactions have been committed to the database, Exchange uses checkpoint files. Once the transactions are committed to the database and tracked by the checkpoint files, the log files are no longer needed by the database.

If log files are not deleted, they will eventually consume all the available disk space and the Exchange databases will be taken offline until the log files are purged from the disk. Using circular logging is not a best practice for a production environment. When circular logging is enabled, Exchange overwrites the first log file after its data has been committed to the database, and you can recover data only up until the last backup.

We recommend that you delete the log files after backing up an Exchange server, because log files are backed up along with other files. Therefore, after a recovery you will be able to roll the database back or forward.

For more information about transaction logging see
http://technet.microsoft.com/en-us/library/bb331958.aspx.

 Copyright © Acronis International GmbH, 2002-2013.

Log truncation by using the Enable VSS Full backup option

The easiest method of log truncation is to use the **Enable VSS Full backup** (p. 131) backup option (**Options** > **Default backup and recovery options** > **Default backup options** > **Volume Shadow Copy Service** > **Enable VSS Full backup**). It is recommended in most cases.

If enabling this option is undesirable (for example, you need to keep logs of another VSS-aware application running on the machine), follow the recommendations below.

Log truncation of offline databases

After normal shutdown the database state is considered consistent and the database files are self-contained. This means that you can delete all the log files of the database or the storage group.

To delete transaction log files:

1. Dismount the database (in Exchange 2010) or all databases of the storage group (in Exchange 2003/2007). For more information, see:
   - Exchange 2010: http://technet.microsoft.com/en-us/library/bb123903
   - Exchange 2007: http://technet.microsoft.com/en-us/library/bb124936(v=exchg.80)
   - Exchange 2003: http://technet.microsoft.com/en-us/library/aa996179(v=exchg.65)
2. Delete all the log files of the database or the storage group.
3. Mount the dismounted database or databases.

   For more information, see:
   - Exchange 2010: http://technet.microsoft.com/en-us/library/bb123587.aspx
   - Exchange 2007: http://technet.microsoft.com/en-us/library/aa998871(v=exchg.80).aspx
   - Exchange 2003: http://technet.microsoft.com/en-us/library/aa995829(v=exchg.65)

Log truncation of online databases

This method is good for the databases that are in constant use and cannot be dismounted. If a database is in use, you can safely delete only those transaction log files whose data has been committed to the database. Do not delete log files whose data has not been committed to the database, they are essential to recover the database consistency from unexpected shutdown.

To delete the committed transaction logs

1. Determine which logs have been committed to the database by using the `Eseutil` tool:
   a. Execute the `eseutil /mk <path to checkpoint file>` command, where the `<path to checkpoint file>` is a path to the checkpoint file of the required database or the storage group.
   b. Look at the `Checkpoint` field in the output. For example, you should see something like this:

   ```
   CheckPoint: (0x60B, 7DF, 1C9)
   ```

   The first number 0x60B is the hexadecimal log generation number of the current log file. This means that all the log files with lesser numbers have been committed to the database.
2. Delete all the log files whose numbers are less than the number of the current log file. For example, you can safely delete Enn0000060A.log, Enn00000609.log and the lesser files.

Log truncation after a backup

You can automate the above truncation procedure by using a script. If you add the script to the Post-backup command (p. 125), the logs will be truncated immediately after a backup.

 Copyright © Acronis International GmbH, 2002-2013.

This method assumes that you have scripting skills and are familiar with Acronis Backup & Recovery 11.5 command-line utility (`acrocmd`). For detailed information about `acrocmd` see the Command-Line Reference.

The script should contain the following steps:

1. Mount the volumes containing the necessary database files by using the `mount` command.

   Template:

   ```
   acrocmd mount --loc=<path> --credentials=<user name>,<password> --arc=<archive name> --volume=<volume numbers> --letter=<letters>
   ```

   Example:

   ```
   acrocmd mount --loc=\\bkpsrv\backups --credentials=user1,pass1 --arc=my_arc --volume=1-1 --letter=Z
   ```

2. In the mounted volumes, determine which logs have been committed to the database by using the `Eseutil` tool. The procedure is described in step 1 of "Log truncation of online databases" above.
3. In the respective online database or storage group, delete all the log files whose numbers are less than the number of the current log file in the backup.
4. Unmount the mounted volumes by using the `umount` command.

11.1.3 Best practices when backing up application servers

11.1.3.1 Exchange Server backup

If you are not using Microsoft Exchange Server 2010 SP2, it is recommended that you periodically check the consistency of the Exchange database files.

In Exchange, consistency check is performed by running `Eseutil /K`. It verifies the page-level integrity of all Exchange databases and checksums of all database pages and log files. The process of verification can be time consuming. For information about using `Eseutil /K`, see: http://technet.microsoft.com/en-us/library/bb123956(v=exchg.80).

You can perform the consistency check before or after a backup.

- **Before a backup**. This ensures that you do not back up the damaged Exchange database files.
  a. Dismount the databases.
  b. Run `Eseutil /K` and review the verification results.
  c. If the databases are consistent, mount them again and run the backup. Otherwise, repair the damaged databases.

  Refer to the "Transaction log truncation for Exchange Server" (p. 295) section for more information about mounting and dismounting databases.
- **After a backup**. The advantage of this method is that you do not have to dismount the databases that are in constant use. However, the consistency check in the backup is much slower than the consistency check of the on-disk databases.

  Mount (p. 250) volumes (containing the required database files) from the disk backup in the "Read only" mode and run `Eseutil /K`.

  If a checksum mismatch or file header damage is detected, repair the damaged databases and then perform the backup again.

Copyright © Acronis International GmbH, 2002-2013.

Tip. *Acronis offers a dedicated product for backing up Microsoft Exchange – Acronis Backup & Recovery 11.5 for Microsoft Exchange Server. When you use this product, Agent for Exchange automatically checks consistency of the databases being backed up and skips the databases with a checksum mismatch or file header damage. As opposed to this agent,* `Eseutil /K` *verifies the pages of all Exchange databases that are present on the server.*

11.1.3.2 Active Directory backup

Active Directory services use a database located on the file system of a domain controller. If the domain has two or more domain controllers, the information stored in the database is constantly replicated between them.

Volumes to back up

To back up Active Directory, back up the following volumes of a domain controller:

- The system volume and the boot volume
- The volumes where the Active Directory database and the transaction logs (p. 292) are located
- The volume with the SYSVOL folder. The default location of this folder is **%SystemRoot%\SYSVOL**. To determine the current location of this folder, examine the **Sysvol** value in the following registry key:
  `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Netlogon\Parameters`

Considerations for backup

When setting up and performing Active Directory backup, make sure that:

- You perform a backup **at least monthly.** If your domain has only one domain controller, we recommend creating a backup at least daily.
- Your most up-to-date backup is **no older than half the tombstone lifetime.** Depending on the operating system where your domain has been created, the default tombstone lifetime is 60 days or 180 days. It does not matter whether the latest backup is full or incremental; you can perform a successful recovery from either one.
- You create an **additional backup upon any of the following events:**
  - The Active Directory database and/or transaction logs were moved to a different location.
  - An operating system on the domain controller was upgraded, or a service pack was installed.
  - A hotfix that changes the Active Directory database was installed.
  - The tombstone lifetime was changed administratively.

  The reason for this additional backup is that a successful recovery of Active Directory from the previous backups might not be possible.

11.1.3.3 SharePoint data backup

A Microsoft SharePoint farm consists of front-end Web servers and Microsoft SQL servers.

A front-end Web server is a host where SharePoint services are running. Some front-end Web servers may be identical to each other (for example, the front-end Web servers that run a Web server). You do not have to back up all identical front-end Web servers but only unique ones.

To protect SharePoint databases, you need to back up all of the Microsoft SQL servers and all of the unique Web Front End servers belonging to the farm. The backups should be done with *the same schedule*. This is needed because the configuration database must be synchronized with other

 Copyright © Acronis International GmbH, 2002-2013.

databases. For example, if the content database contains the data about a site while the latest backup of the configuration database does not, the site will be orphaned after the configuration database is recovered.

If you have an advanced edition of Acronis Backup & Recovery 11.5, the easiest way to back up a SharePoint farm is to create a centralized backup plan as described in the "Creating a centralized backup plan" (p. 360) section, or use the **Backup now** feature as described in the "Back up now" (p. 360) section. In stand-alone editions of Acronis Backup & Recovery 11.5, you must specify the identical schedule when creating a backup plan (p. 55) for every server belonging to the farm.

11.2 Recovering SQL Server data

In case of a disaster, you can recover an entire SQL Server by restoring all its disks from a disk backup. If you followed the recommendations outlined in the "Backing up an application server" (p. 288) section, all of the SQL Server services will be up and running without additional actions. The server data will be reverted to the state that it was at the time of backup.

To bring a backed-up database back to production, recover the database files from a disk backup. For details, see "Recovering SQL Server databases from a disk backup" (p. 299).

If you only need temporary access to the backed-up databases for data mining or data extraction, mount a disk backup and access the required data. For details, see "Accessing SQL Server databases from a disk backup" (p. 300).

11.2.1 Recovering SQL Server databases from a disk backup

This section describes how to recover SQL Server databases from a disk backup.

For the instructions how to find out the database paths, refer to "SQL Server database files" (p. 290).

To recover SQL Server databases

1. Connect the console to the machine on which you are going to perform the operation.
2. Navigate to the vault containing the disk backup with the SQL Server database files.
3. Click the **Data view** tab. In the **Show** list, click **Folders/files**.
4. Select the required SQL Server database files and click **Recover**. By default, the data will be reverted to the state of the latest backup. If you need to select another point in time to revert the data to, use the **Versions** list.
5. On the recovery page under **What to recover** section:
   a. In **Data paths**, select **Custom**.
   b. In **Browse**, specify a folder where the files will be recovered to.

      ***Note**: We recommend that you recover the SQL server database files to a folder local to the SQL Server, since all of the SQL Server versions earlier than SQL Server 2012 do not support databases located on network shares.*

   c. Leave the rest of the settings "as is" and click **OK** to proceed with recovery.
6. After the recovery is complete, attach the databases according to the instructions described in the "Attaching SQL Server databases" (p. 300) section.

   Details. If for any reason you did not recover all of the SQL Server database files, you will not be able to attach the database. However, the Microsoft SQL Server Management Studio will inform

 Copyright © Acronis International GmbH, 2002-2013.

you about all the paths and names of the missing files and it will help you to identify what particular files the database consists of.

11.2.2 Accessing SQL Server databases from a disk backup

If you want to access the SQL Server databases for data mining or other short-term purposes, you can use the **Mount image** operation instead of recovery. Just mount volumes (containing the required database files) from a disk backup (image) in the "Read/write" mode and you are free to attach databases, modify database files and work with them as if they were on a physical disk.

You can mount volumes if the disk backup is stored in a local folder (except optical media such as CD, DVD, or Blu-ray Discs), Acronis Secure Zone, or on a network share.

To attach databases contained in a disk backup to SQL Server

1. Connect the console to the SQL Server where Agent for Windows is installed.
2. In the main menu, select **Actions** > **Mount image**.
3. In the **What to mount** section, select the source archive and specify the backup.
4. In the **Mount settings** section:
   a. In **Mount for**, select **All users that share this machine**.
   b. Select the volume(s) containing the SQL Server database files. For the instructions on how to find out the database paths, refer to "SQL Server database files" (p. 290).
   c. Choose the **Read/write** access mode.
   d. Specify drive letters that will be assigned to the mounted volumes.
5. After the volumes are mounted, use instructions from the "Attaching SQL Server databases" (p. 300) section to attach the databases directly from the mounted volumes.
6. Perform the required operations with the newly attached databases.
7. After the necessary operations are completed, detach the database from the instance by using Microsoft SQL Server Management Studio. To do this, right-click the database and select **Tasks** > **Detach**.
8. Unmount the mounted volumes:
   a. In the main menu, select **Navigation** > **Mounted images**.
   b. Select the image and click **Unmount**.

   Details. When mounting an image in the "Read/write" mode, Acronis Backup & Recovery 11.5 creates a new incremental backup. We strongly recommend deleting this incremental backup.

11.2.3 Attaching SQL Server databases

This section describes how to attach a database in SQL Server by using SQL Server Management Studio. Only one database can be attached at a time.

Attaching a database requires any of the following permissions: **CREATE DATABASE**, **CREATE ANY DATABASE**, or **ALTER ANY DATABASE**. Normally, these permissions are granted to the **sysadmin** role of the instance.

To attach a database

1. Run Microsoft SQL Server Management Studio.
2. Connect to the required SQL Server instance, and then expand the instance.
3. Right click **Databases** and click **Attach**.

 Copyright © Acronis International GmbH, 2002-2013.

4. Click **Add**.
5. In the **Locate Database Files** dialog box, find and select the .mdf file of the database.
6. In the **Database Details** section, make sure that the rest of database files (.ndf and .ldf files) are found.

   Details. SQL Server database files may not be found automatically, if:

   - They are not in the default location, or they are not in the same folder as the primary database file (.mdf). Solution: Specify the path to the required files manually in the **Current File Path** column.
   - You have recovered an incomplete set of files that make up the database. Solution: Recover the missing SQL Server database files from the backup.
7. When all of the files are found, click **OK**.

11.3 Recovering Exchange Server data

In case of disaster, you can recover an entire Exchange Server by restoring all its disks from a disk backup. All of the Exchange Server services will be up and running without any additional actions, if you follow the recommendations outlined in the "Backing up an application server" (p. 288) section. The server data will be reverted to the state that it was at the time of backup.

By using Acronis Backup & Recovery 11.5, you can recover Exchange database files from a disk backup. To bring a database online, mount it. For details, see "Mounting Exchange Server databases" (p. 302).

If you need to perform granular recovery of individual mailboxes or their items, mount the restored database either as a recovery database (RDB) in Exchange 2010, or to a recovery storage group (RSG) in Exchange 2003/2007. For details, see "Granular recovery of mailboxes" (p. 302).

11.3.1 Recovering Exchange Server database files from a disk backup

This section describes how to use Acronis Backup & Recovery 11.5 to recover Exchange Server database files from a disk backup.

For instructions on how to find out the database paths, refer to "Exchange Server database files" (p. 291).

To recover Exchange Server databases

1. Connect the console to the machine on which you are going to perform the operation.
2. Navigate to the vault containing the disk backup with the Exchange data files.
3. Click the **Data view** tab. In the **Show** list, click **Folders/files**.
4. Select the required Exchange database files and click **Recover**. By default, the data will be reverted to the state of the latest backup. If you need to select another point in time to revert the data to, use the **Versions** list.
5. On the recovery page under **What to recover** section:
   a. In **Data paths**, select **Custom**.
   b. In **Browse**, specify a folder where the database files will be recovered to.
6. Leave the rest of the settings "as is" and click **OK** to proceed with recovery.

 Copyright © Acronis International GmbH, 2002-2013.

11.3.2 Mounting Exchange Server databases

After recovering the database files, you can bring the databases online by mounting them. Mounting is performed by using Exchange Management Console, Exchange System Manager, or Exchange Management Shell.

The recovered databases will be in a Dirty Shutdown state. A database that is in a Dirty Shutdown state can be mounted by the system if it is recovered to its original location (that is, information about the original database is present in Active Directory). When recovering a database to an alternate location (such as a new database or as the recovery database), the database cannot be mounted until you bring it to a Clean Shutdown state by using the `Eseutil /r <Enn>` command. `<Enn>` specifies the log file prefix for the database (or storage group that contains the database) into which you need to apply the transaction log files.

The account you use to attach a database must be delegated an Exchange Server Administrator role and a local Administrators group for the target server.

For details about how to mount databases, see the following articles:

- Exchange 2010: http://technet.microsoft.com/en-us/library/aa998871.aspx
- Exchange 2007: http://technet.microsoft.com/en-us/library/aa998871(v=EXCHG.80).aspx
- Exchange 2003: http://technet.microsoft.com/en-us/library/bb124040.aspx

11.3.3 Granular recovery of mailboxes

RDB (RSG) is a special administrative database (storage group) in Exchange Server. It lets you extract data from the mounted mailbox database. The extracted data can be copied or merged to the existing mailboxes without disturbing user access to the current data.

For more information about RDB and RSG, refer to the following articles:

- Exchange 2010: http://technet.microsoft.com/en-us/library/dd876954
- Exchange 2007: http://technet.microsoft.com/en-us/library/bb124039(v=exchg.80)
- Exchange 2003: http://technet.microsoft.com/en-us/library/bb123631(v=exchg.65)

To recover a mailbox

1. If a RDB/RSG does not exist, create it as described in the following articles:
   - Exchange 2010: http://technet.microsoft.com/en-us/library/ee332321
   - Exchange 2007: http://technet.microsoft.com/en-us/library/aa997694(v=exchg.80)
   - Exchange 2003: http://technet.microsoft.com/en-us/library/bb124427(v=exchg.65)
2. Recover the database files to the RDB/RSG folder structure. For information about recovering database files, see "Recovering Exchange Server database files from a disk backup" (p. 301).
3. Mount the recovery database. For information about mounting databases, see "Mounting Exchange Server databases" (p. 302).
4. Proceed as described in the following articles:
   - Exchange 2010: http://technet.microsoft.com/en-us/library/ee332351
   - Exchange 2007: http://technet.microsoft.com/en-us/library/aa997694(v=exchg.80)
   - Exchange 2003: http://technet.microsoft.com/en-us/library/aa998109(v=exchg.65)

 Copyright © Acronis International GmbH, 2002-2013.

11.4 Recovering Active Directory data

Active Directory recovery differs depending on the type of recovery required.

This section considers the following disaster scenarios:

- A domain controller is lost but other domain controllers are still available. See “Recovering a domain controller (other DCs are available)”.
- All domain controllers are lost (or there was only one). See “Recovering a domain controller (no other DCs are available)”.
- The Active Directory database is corrupted and the Active Directory service does not start. See “Restoring the Active Directory database”.
- Certain information is accidentally deleted from Active Directory. See “Restoring accidentally deleted information”.

11.4.1 Recovering a domain controller (other DCs are available)

When one of the several domain controllers (DCs) is lost, the Active Directory service is still available. Therefore, other domain controllers will contain data that is newer than the data in the backup.

In these cases, a type of recovery known as *nonauthoritative restore* is usually performed. Nonauthoritative restore means that the recovery will not affect the current state of Active Directory.

Steps to perform

If the domain has other domain controllers, you can perform nonauthoritative restore of a lost domain controller in either of these ways:

- **Recover a domain controller** from a backup by using a bootable media. Ensure that there is no USN rollback problem (p. 306).
- **Recreate a domain controller** by installing the operating system and making the machine a new domain controller (by using the `dcpromo.exe` tool).

Both operations are followed by automatic *replication*. Replication makes the domain controller database up-to-date. Just ensure that the Active Directory service has started successfully. Once replication completes, the domain controller will be up and running again.

Recovery vs. re-creation

Re-creation does not require having a backup. Recovery is normally faster than re-creation. However, recovery is not possible in the following cases:

- All available backups are older than the tombstone lifetime. Tombstones are used during replication to ensure that an object deleted on one domain controller becomes deleted on other domain controllers. Thus, proper replication is not possible after the tombstones have been deleted.
- The domain controller held a Flexible Single Master Operations (FSMO) role, and you have assigned that role to a different domain controller (seized the role). In this case, restoring the domain controller would lead to two domain controllers holding the same FSMO role within the domain and cause a conflict.

 Copyright © Acronis International GmbH, 2002-2013.

Recovering a domain controller that holds a FSMO role

Some domain controllers hold unique roles known as Flexible Single Master Operations (FSMO) roles or operations manager roles. For the description of FSMO roles and their scopes (domain-wide or forest-wide), see Microsoft Help and Support article http://support.microsoft.com/kb/324801.

Before recreating a domain controller that held the PDC Emulator role, you must seize that role. Otherwise, you will not be able to add the recreated domain controller to the domain. After recreating the domain controller, you can transfer this role back. For information about how to seize and transfer FSMO roles, see Microsoft Help and Support article http://support.microsoft.com/kb/255504.

To view which FSMO roles are assigned to which domain controller, you can connect to any live domain controller by using the `Ntdsutil` tool as described in Microsoft Help and Support article http://support.microsoft.com/kb/234790. Follow the steps in the "Using the NTDSUTIL Tool" section of that article:

- For the Windows 2000 Server and Windows Server 2003 operating systems, follow all steps as they are given.
- For the Windows Server 2008 operating systems, in the step asking you to type **domain management**, type **roles** instead. Follow other steps as they are given.

11.4.2 Recovering a domain controller (no other DCs are available)

If all domain controllers are lost, nonauthoritative restore in fact becomes authoritative: the objects restored from the backup are the newest available. Replication of Active Directory data cannot take place because there are no live domain controllers. This means that:

- Changes to Active Directory that occurred after the backup had been made will be lost.
- Re-creation of the domain controller is not an option.
- Even a backup with an expired tombstone lifetime can be used.

You need to recover the volumes that store Active Directory database files (p. 292). If these volumes store other valuable data except Active Directory, copy this data to a different location before the recovery.

To recover a domain controller when no other domain controllers are available

1. Ensure that the newest available backup is used for recovery. This is important because all changes made to Active Directory objects after the backup will be lost.
2. Recover the domain controller from the backup by using a bootable media.
3. Restart the domain controller. Ensure that the Active Directory service has started successfully.

11.4.3 Restoring the Active Directory database

If the Active Directory database files are corrupted but the domain controller is able to start in normal mode, you can restore the database in one of the following ways.

Re-promoting the domain controller

This method of restoring the database is available only if the domain has other domain controllers. It does not require having a backup.

To restore the database, use the `Dcpromo` tool to demote the domain controller with the corrupted database, and then to promote that domain controller again.

 Copyright © Acronis International GmbH, 2002-2013.

To re-promote the domain controller, run the following commands:

```
dcpromo /forceremoval

dcpromo /adv
```

Recovering the database from a backup

This method of restoring the database can be used regardless of whether the domain has other domain controllers.

To restore the database, recover the Active Directory database files (p. 292). In addition, if you have made any changes to Group Policy Objects (GPOs) since backup, you also need to recover the SYSVOL folder (p. 298).

To recover the Active Directory database from a backup

1. Restart the domain controller and press F8 during startup.
2. On the **Advanced Boot Options** screen, select **Directory Services Restore Mode**.
3. [Optional] Create a copy of the current Active Directory database files in case the changes need to be undone.
4. Change the original account of the Acronis agent service to the Directory Services Restore Mode (DSRM) Administrator account:
   a. Open the **Services** snap-in.
   b. In the list of services, double-click **Acronis Managed Machine Service**.
   c. On the **Log On** tab, in **This account**, specify the user name and password that you use to log on to Directory Services Restore Mode, and then click **Apply**.
   d. On the **General** tab, click **Start**. After the service starts, click **OK**.

   Details. This change is needed because the Acronis agent service on a domain controller runs under a domain user account, but domain user accounts are unavailable in Directory Services Restore Mode.
5. Start Acronis Backup & Recovery 11.5 and recover the database files from the backup. If necessary, also recover the SYSVOL folder.

   Details. For paths to these files and folders, see "Active Directory backup" (p. 298). The recovery procedure is similar to the one described in "Recovering Exchange Server database files (p. 301).
6. If the domain has other domain controllers, ensure that a USN rollback problem will not occur (p. 306).
7. Restart the domain controller in normal mode. Ensure that the Active Directory service has started successfully.
8. Change the account for the Acronis agent service back to the original one, as described in step 4.

11.4.4 Restoring accidentally deleted information

If the domain has other domain controllers, you can use the `Ntdsutil` tool to perform an authoritative restore of certain entries only. For example, you can restore an unintentionally deleted user account or computer account.

To restore accidentally deleted information

1. Perform steps 1–5 from "Restoring the Active Directory database" (p. 304) to restart the domain controller into Directory Services Restore Mode (DSRM) and to restore the Active Directory database.

 Copyright © Acronis International GmbH, 2002-2013.

2. Without exiting DSRM, run the following command:

```
Ntdsutil
```

3. At the tool's command prompt, run the following commands:

```
activate instance ntds
authoritative restore
```

4. At the tool's command prompt, run the `restore subtree` or `restore object` command with the necessary parameters.

   For example, the following command restores the `Manager` user account in the `Finance` organizational unit of the `example.com` domain:

```
restore object cn=Manager,ou=Finance,dc=example,dc=com
```

   For more information about using the `Ntdsutil` tool, refer to its documentation.

   Details. Other objects will be replicated from other domain controllers when you restart the domain controller. This way, you will restore the unintentionally deleted objects and keep the other objects up-to-date.

5. Restart the domain controller in normal mode. Ensure that the Active Directory service has started successfully and that the restored objects have become available.
6. Change the account for the Acronis agent service back to the original one, as described in step 4 from "Restoring the Active Directory database" (p. 304).

11.4.5 Avoiding a USN rollback

If the domain has two or more domain controllers and you need to recover one of the controllers or its database, consider taking action against a USN rollback.

A USN rollback is unlikely to occur when you recover an entire domain controller from a VSS-based disk-level backup.

A USN rollback is highly probable if any of the following is true:

- A domain controller was recovered partially: not all disks or volumes were recovered or only the Active Directory database was recovered.
- A domain controller was recovered from a backup created without VSS. For example, the backup was created by using bootable media or the **Use VSS** option (p. 131) was disabled or the VSS provider malfunctioned.

The following information will help you avoid a USN rollback by taking a few simple steps.

Replication and USNs

Active Directory data is constantly replicated between the domain controllers. At any given moment, the same Active Directory object may have a newer version on one domain controller and an older version on another. To prevent conflicts and loss of information, Active Directory tracks object versions on each domain controller and replaces the outdated versions with the up-to-date version.

To track object versions, Active Directory uses numbers called Update Sequence Numbers (USNs). Newer versions of Active Directory objects correspond to higher USNs. Each domain controller keeps the USNs of all other domain controllers.

 Copyright © Acronis International GmbH, 2002-2013.

USN rollback

After you perform a nonauthoritative restore of a domain controller or of its database, the current USN of that domain controller is replaced by the old (lower) USN from the backup. But the other domain controllers are not aware of this change. They still keep the latest known (higher) USN of that domain controller.

As a result, the following issues occur:

- The recovered domain controller reuses older USNs for new objects; it starts with the old USN from the backup.
- The other domain controllers do not replicate the new objects from the recovered domain controller as long as its USN remains lower than the one they are aware of.
- Active Directory starts having different objects that correspond to the same USN, i.e. becomes inconsistent. This situation is called a USN rollback.

To avoid a USN rollback, you need to notify the domain controller about the fact that it has been recovered.

To avoid a USN rollback

1. Immediately after recovering a domain controller or its database, boot the recovered domain controller and press F8 during startup.
2. On the **Advanced Boot Options** screen, select **Directory Services Restore Mode**, and log on to Directory Services Restore Mode (DSRM).
3. Open Registry Editor, and then expand the following registry key:
   `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\NTDS\Parameters`
4. In that registry key, examine the **DSA Previous Restore Count** value. If this value is present, write down its setting. Do not add the value if it is absent.
5. Add the following value to that registry key:
   - Value type: **DWORD (32-bit) Value**
   - Value name: **Database restored from backup**
   - Value data: **1**
6. Restart the domain controller in normal mode.
7. [Optional] After the domain controller restarts, open Event Viewer, expand **Application and Services Logs**, and then select the **Directory Services** log. In the **Directory Services** log, look for a recent entry for Event ID 1109. If you find this entry, double-click it to ensure that the **InvocationID** attribute has changed. This means that the Active Directory database has been updated.
8. Open Registry Editor and verify that the setting in the **DSA Previous Restore Count** value has increased by one as compared with step 4. If the **DSA Previous Restore Count** value was absent in step 4, verify that it is now present and that its setting is **1**.

   If you see a different setting (and you cannot find the entry for Event ID 1109), ensure that the recovered domain controller has current service packs, and then repeat the entire procedure.

For more details about USNs and USN rollback, see the following Microsoft Technet article: http://technet.microsoft.com/en-us/library/virtual_active_directory_domain_controller_virtualization_hyperv.aspx.

 Copyright © Acronis International GmbH, 2002-2013.

11.5 Recovering SharePoint data

Different SharePoint servers and databases are recovered in different way.

- To recover separate disks or volumes of a front-end Web server, you can either create a recovery task (p. 134) in Acronis Backup & Recovery 11.5 graphical user interface or boot the server from the bootable media (p. 257) and configure recovery.

  In the same way, you can recover an SQL server.
- Content databases can be recovered by using Agent for SQL (single-pass) or Agent for Windows. For details, see "Recovering a content database" (p. 308).
- Configuration and service databases are recovered as files. For details, see "Recovering configuration and service databases" (p. 309).
- You can also recover individual SharePoint items (such as sites, lists, document libraries and others). For details, see "Recovering individual items" (p. 311).

11.5.1 Recovering a content database

This topic describes the recovery of a content database to the original SharePoint farm by using Acronis Backup & Recovery 11.5.

The recovery to a non-original farm is a more complicated procedure. Its steps vary depending on the farm configuration and other parameters of the production environment.

Recovering a content database by using Agent for SQL (single-pass)

This method allows you to recover a database from a single-pass backup of a machine running SQL Server.

To recover a content database

1. Connect the console to the machine where you need to recover the database to. Agent for SQL (single-pass) must be installed on the machine.
2. Recover the database to an instance, as described in the "Recovering SQL databases to instances" (p. 317) section.
3. If you have recovered the database to a non-original SQL server of the original SharePoint farm, attach the recovered database to the farm. To do this, run the following command on a front-end Web server:

   In SharePoint 2010 or later:

   ```
   Mount-SPContentDatabase <database> -DatabaseServer <database server>
   -WebApplication <site url>
   ```

   In SharePoint 2007:

   ```
   stsadm.exe -o addcontentdb -url <site url> -databasename <database>
   -databaseserver <database server>
   ```

Recovering a content database by using Agent for Windows

This method allows you to recover a database from a disk-level backup of a machine running SQL Server.

Copyright © Acronis International GmbH, 2002-2013.

To recover a content database to the original SQL server

1. If the Windows SharePoint Services Timer service is running, stop the service and wait for a few minutes for any running stored procedures to complete. Do not restart the service until you have recovered all the databases that you need to recover.
2. If you are recovering the database to the original location on the disk, do the following:
   a. Bring the destination database offline.
   b. Recover the database files as described in "Recovering SQL Server databases from a disk backup" (p. 299), except for the database attachment step (the database is already attached).
   c. Bring the recovered database online.

   If you are recovering the database to another location on the disk, recover the database files as described in "Recovering SQL Server databases from a disk backup" (p. 299), including the database attachment step.
3. Start the Windows SharePoint Services Timer service.

To recover a content database to another SQL server of the original farm

1. Remove from the SharePoint farm the database that you will later recover. To do this, run the following command on a front-end Web server:

   In SharePoint 2010 or later:

   ```
   Dismount-SPContentDatabase <database>
   ```

   If you have multiple content databases that have the same name, you must use the content database GUID in this command instead of using the content database name. To retrieve the GUID of the content database, run the `Get-SPContentDatabase` cmdlet with no arguments.

   In SharePoint 2007:

   ```
   stsadm -url <web application url> –o deletecontentdb –databasename <database>
   ```

2. Recover the database files as described in "Recovering SQL Server databases from a disk backup" (p. 299), including the database attachment step.
3. Attach the recovered database to the SharePoint farm. To do this, run the following command on a front-end Web server:

   In SharePoint 2010 or later:

   ```
   Mount-SPContentDatabase <database> -DatabaseServer <database server>
   -WebApplication <site url>
   ```

   In SharePoint 2007:

   ```
   stsadm.exe -o addcontentdb -url <site url> -databasename <database>
   -databaseserver <database server>
   ```

11.5.2 Recovering configuration and service databases

Configuration and service databases must be synchronized with other databases. Hence, it is recommended to recover configuration and service databases either along with content databases or to the latest point in time (if content databases do not need recovery).

The configuration database contains hostnames of the farm's servers. Therefore, you can recover the configuration database only to the original SharePoint farm. Service databases can be recovered to a non-original farm.

Copyright © Acronis International GmbH, 2002-2013.

To recover the configuration database

1. On the server that is running the **Central Administration** site, in the **Services** snap-in, stop the services listed in the table below.
2. On the server that is running the **Central Administration** site, run the following command:

```
iisreset /stop
```

3. Recover the database files as described in "Recovering SQL Server databases from a disk backup" (p. 299).
4. Start the SharePoint services that were stopped earlier.

SharePoint 2007 services	SharePoint 2010 serivces	SharePoint 2013 services
▪ **Microsoft Single Sign-On Service** ▪ **Office Document Conversions Launcher Service** ▪ **Office Document Conversions Load Balancer Service** ▪ **Office SharePoint Server Search** ▪ **Windows SharePoint Services Administration** ▪ **Windows SharePoint Services Search** ▪ **Windows SharePoint Services Timer** ▪ **Windows SharePoint Services Tracing** ▪ **Windows SharePoint Services VSS Writer**	▪ **SharePoint 2010 Administration** ▪ **SharePoint 2010 Timer** ▪ **SharePoint 2010 Tracing** ▪ **SharePoint 2010 User Code Host** ▪ **SharePoint 2010 VSS Writer** ▪ **World Wide Web Publishing Service** ▪ **SharePoint Server Search 14** ▪ **SharePoint Foundation Search V4** ▪ **Web Analytics Data Processing Service** ▪ **Web Analytics Web Service**	▪ **SharePoint Administration** ▪ **SharePoint Timer** ▪ **SharePoint Tracing** ▪ **SharePoint User Code Host** ▪ **SharePoint VSS Writer** ▪ **World Wide Web Publishing Service** ▪ **SharePoint Server Search**

To recover a service database

1. Stop the services associated with the database you want to recover. To do so:
   a. Open **Central Administration** site.
   b. Do one of the following:
      In SharePoint 2010 or later, select **System Settings** > **Manage services on server**.
      In SharePoint 2007, select **Operations** > **Services on server**.
   c. To change the server on which you want to stop the service, in the **Server** list, click **Change Server**, and then click the required server name.
   d. By default, only configurable services are displayed. To view all services, in the **View** list, click **All**.
   e. To stop a service, click **Stop** in the **Action** column of the relevant service.
   f. Click **OK** to stop the service.
2. Recover the database files as described in "Recovering SQL Server databases from a disk backup" (p. 299).
3. Start the services associated with the database, similarly to step 1.

 Copyright © Acronis International GmbH, 2002-2013.

11.5.3 Recovering individual items

Use one of the following three methods of recovering individual SharePoint items:

- Using Acronis SharePoint Explorer. This tool allows you to recover SharePoint items from single-pass disk and application backups (p. 312), from an attached database, or from database files.

  To use the tool, you need a working SharePoint farm. You must also purchase an Acronis Backup & Recovery 11.5 Microsoft SharePoint Add-on license.

  To access Acronis SharePoint Explorer, click **Extract SharePoint Data** on the **Tools** menu of Acronis Backup & Recovery 11.5 Management Console. For information about the tool, see its documentation: http://www.acronis.eu/support/documentation/ASPE/.
- Attaching the content database to a non-original SharePoint farm (for example, to a SharePoint recovery farm).

  It is necessary to attach the content database to a non-original SharePoint farm because each object in a farm must have a unique ID. So, you will not be able to attach the database to the original farm.
- Recovering from an unattached database. The method is not available for SharePoint 2007.

  This method allows you to recover only the following types of items: sites, lists, or document libraries.

To recover SharePoint items via attaching the content database to a farm

1. Attach the content database to an SQL Server instance as described in steps 1-5 of "Accessing SQL Server databases from a disk backup" (p. 300).
2. Attach the content database to a non-original SharePoint farm. To do this:
   a. Make sure that you are performing this procedure under a farm administrator account that is a member of the **db_owner** role of the database. If not, add the account to this role by using Microsoft SQL Server Management Studio.
   b. Run the following command on a front-end Web server:

      In SharePoint 2010 or later:

      ```
      Mount-SPContentDatabase <database> -DatabaseServer <database server>
      -WebApplication <site url>
      ```

      In SharePoint 2007:

      ```
      stsadm.exe -o addcontentdb -url <site url> -databasename <database>
      -databaseserver <database server>
      ```
3. Open the SharePoint site and select the document to download.
4. After the downloading is complete, detach the content database from the SharePoint farm.
5. Detach the database and unmount the previously mounted volume as described in steps 7-8 of "Accessing SQL Server databases from a disk backup" (p. 300).

To recover SharePoint items from an unattached database

1. Attach the content database to an SQL Server instance as described in steps 1-5 of "Accessing SQL Server databases from a disk backup" (p. 300).
2. Recover the data as described in http://technet.microsoft.com/en-us/library/hh269602.
3. Detach the database and unmount the previously mounted volume as described in steps 7-8 of "Accessing SQL Server databases from a disk backup" (p. 300).

Copyright © Acronis International GmbH, 2002-2013.

12 Protecting Microsoft SQL Server with single-pass backup

This section describes how to use single-pass disk and application backups to protect Microsoft SQL Server data.

A single-pass backup operation creates an application-aware disk backup which enables browsing and recovery of the backed-up application data without recovering the entire disk or volume. The disk or volume can also be recovered as a whole. This means that a single solution and a single backup plan can be used for both the disaster recovery and data protection purposes. The application logs can be truncated after the backup, if necessary.

The single-pass backup functionality becomes available by installing Acronis Backup & Recovery 11.5 Agent for Microsoft SQL Server (single-pass).

Without this agent, you can protect your SQL Server data by using disk-level backup. For a detailed description of this method, see the "Protecting applications with disk-level backup" (p. 288) section.

Protecting Microsoft SharePoint

A Microsoft SharePoint farm consists of front-end Web servers and machines with Microsoft SQL Server. This means that the information presented in this section also applies to protecting Microsoft SharePoint data.

For the recommendations specific to backing up the machines with SharePoint data, see the "SharePoint data backup" (p. 298) section.

For information about recovering SharePoint data, see the "Recovering SharePoint data" (p. 308) section.

12.1 General information

12.1.1 Agent for SQL (single-pass)

Single-pass backup of Microsoft SQL Server data becomes available by using Acronis Backup & Recovery 11.5 Agent for Microsoft SQL Server (single-pass). The agent is referred to as Agent for SQL (single-pass) in this document.

Backup

During a disk backup, Agent for SQL (single-pass) adds Microsoft SQL Server metadata to the resulting backup file. By using this metadata, Acronis Backup & Recovery 11.5 detects and catalogues SQL Server databases. After the backup is successfully completed, the agent truncates the SQL Server transaction log if the corresponding option in the backup plan has been set.

Recovery

The agent enables you to recover SQL databases directly to a running SQL Server instance. You can make a database available to users immediately, or perform additional operations before making it available.

 Copyright © Acronis International GmbH, 2002-2013.

The agent can also extract database files from a single-pass backup to a folder on a file system. These files can be used for data mining or auditing. In case of emergency, you can attach these database files to a SQL Server instance that is not managed by the agent.

Mounting databases

By using the agent, you can temporarily attach a backed-up database to a running SQL Server instance and use third-party tools to get various objects from this database.

12.1.2 Supported operating systems

Agent for SQL (single-pass) can be installed in the following operating systems:

Windows Server 2003/2003 R2 – Standard and Enterprise editions (x86, x64)

Windows Small Business Server 2003/2003 R2

Windows Server 2008 – Standard, Enterprise, and Datacenter editions (x86, x64)

Windows Small Business Server 2008

Windows 7 – all editions except for the Starter and Home editions (x86, x64)

Windows Server 2008 R2 – Standard, Enterprise, Datacenter, and Foundation editions

Windows MultiPoint Server 2010/2011

Windows Small Business Server 2011 – all editions

Windows 8/8.1 – all editions except for the Windows RT editions (x86, x64)

Windows Server 2012/2012 R2 – all editions

Windows Storage Server 2003/2008/2008 R2/2012

12.1.3 Supported Microsoft SQL Server versions

Agent for SQL (single-pass) supports the following versions of Microsoft SQL Server:

- Microsoft SQL Server 2005
- Microsoft SQL Server 2008
- Microsoft SQL Server 2008 R2
- Microsoft SQL Server 2012

12.1.4 Permissions for SQL Server backup and recovery

Permissions required for a single-pass backup

To successfully perform a single-pass backup of a machine that is running Microsoft SQL Server, the account under which the backup plan runs must be a member of the **Backup Operators** or **Administrators** group on the machine.

Also, this account must be granted the **sysadmin** role on each of the instances installed on the machine.

If you create a backup plan while you are logged on as a regular user, such as a member of the **Users** group, you need to specify the credentials for the account that has the above privileges. To access this setting, click **Plan's credentials** on the **Create backup plan** (p. 55) page.

 Copyright © Acronis International GmbH, 2002-2013.

A backup plan created by a member of the **Administrators** group runs under the agent service account by default. The same applies to a centralized backup plan deployed from the management server. That's why it is advisable to assign the agent the permissions required for single-pass backup.

Granting the permissions to the agent

During installation, the setup program includes the agent service account in the **Backup Operators** group. If you choose to create a new account for the agent, this account is also included in the **Administrators** group. Therefore, the agent always has the required privileges in Windows.

To grant the agent the **sysadmin** role in SQL Server, you are asked to specify the **sysadmin** credentials for each Microsoft SQL instance installed on the machine. If you do not specify the credentials during installation, you can grant the agent the **sysadmin** role later in any of the following ways:

- By clicking **Tools** > **Provide SQL Server credentials** when Acronis Backup & Recovery 11.5 Management Console is connected to the machine.
- By using SQL Server Management Studio.
- By running a T-SQL script.

You must also grant explicitly the agent the **sysadmin** role after a new Microsoft SQL Server instance is installed on the machine.

To grant the agent service account the** sysadmin **role on an instance by means of a T-SQL script

1. Create a text file with the following contents:

   ```
   Create Login [<machine name>\Acronis Agent User] From Windows
   Exec master..sp_addsrvrolemember @loginame = '<machine name>\Acronis Agent User',@rolename = 'sysadmin'
   ```

   `Acronis Agent User` is the account created for the agent by default. If you specified an existing account during the agent installation, replace `Acronis Agent User` with the user name of the existing account.

   The file can have any extension.

2. At the command prompt, run the following command:

   ```
   sqlcmd -S <machine name>\<instance name> -i <full path to T-SQL script file>
   ```

If you do not want to grant the **sysadmin** role to the agent, you must specify credentials in every backup plan as described at the beginning of this section.

Permissions required for recovering a Microsoft SQL Server database

When recovering a database to an instance, you need to specify credentials for this instance. The prompt for the credentials appears after you select the destination instance on the **Recover data** (p. 134) page.

12.1.5 What else you need to know about single-pass backup

Single-pass backup is performed at a disk level. This results in the following peculiarities for this backup type:

- Databases located on network shares cannot be backed up.
- Filegroups are backed up and recovered as a whole database. An individual file cannot be recovered so that the database is operational.

 Copyright © Acronis International GmbH, 2002-2013.

- Databases cannot be recovered to any point in time, but only to a point in time when the data snapshot was taken. If you back up transaction logs by using the SQL Server backup and restore component, you can further apply these logs to reach the desired recovery point.

12.2 Installation of Agent for SQL (single-pass)

Agent for SQL (single-pass) can only be installed on a machine running Microsoft SQL Server. Remote installation of the agent is not possible.

The agent is included in the setup programs of both the stand-alone and advanced editions of Acronis Backup & Recovery 11.5. The functionality provided by the agent is the same in both setup programs.

Agent for SQL (single-pass) is installed as an add-on to Agent for Windows.

Licenses required

To install Agent for Windows, use any license that enables installation of this agent.

If Agent for Windows is installed by using the Advanced Server SBS Edition license, you can install Agent for SQL (single-pass) without an additional license. Otherwise, use one of the following licenses:

- Acronis Backup & Recovery 11.5 Microsoft SQL Server Add-On
- Acronis Backup & Recovery 11.5 Microsoft SharePoint Add-On

Each of these licenses enables you to install Agent for SQL (single-pass) onto a physical host and onto four virtual machines running on the same host. Please remember that Agent for Windows must be installed on each virtual machine along with Agent for SQL (single-pass).

To use the product in the trial mode, you do not need licenses.

Installation

Install the agent in the same way as Agent for Windows. For detailed step-by-step instructions, refer to the following sections of the installation documentation:

- "Interactive installation in stand-alone editions".
- "Interactive installation in advanced editions".

Credentials for Microsoft SQL instances

During the installation, you are asked to specify the **sysadmin** credentials for each Microsoft SQL instance installed on the machine. These credentials are required to grant the **sysadmin** role to the agent service account.

You can skip entering the credentials and grant the agent the **sysadmin** role later in any of the following ways:

- By clicking **Tools** > **Provide SQL Server credentials** when Acronis Backup & Recovery 11.5 Management Console is connected to the machine.
- By using SQL Server Management Studio.
- By running a T-SQL script.

For more information, see "Permissions for SQL Server backup and recovery" (p. 313) in the product Help or the User Guide.

 Copyright © Acronis International GmbH, 2002-2013.

12.3 Backing up Microsoft SQL server

To protect a Microsoft SQL server, create a backup plan or use the **Backup now** feature as described in the "Backup" (p. 55) section.

Follow these recommendations to ensure that a single-pass backup is successful.

- **Back up entire machines. This will allow you to recover both the operating system and any SQL database present on a machine.**

  Databases may be stored on more than one disk or volume. To ensure that all necessary files are included in a backup, back up the entire machine. This also ensures that the SQL Server will remain protected if you add more databases or relocate the log files in the future.

- **If you do not want to back up an entire machine, select the volumes carefully.**

  If you are sure that the databases and their associated files are always on the same volumes, you may want to back up only these volumes. Or, you may want to create separate backup plans for the system volume and for the volumes that store the data.

  You can also exclude files and folders (p. 60) if you are sure they do not belong to Microsoft SQL Server.

  In any case, make sure that all of the volumes containing the necessary files are included in the backup. If, for example, the log file of a database is not included in the backup, you will not be able to recover this database. Recovery of the operating system may not be possible if you did not back up boot and system volumes or excluded critical system files.

  For instructions on how to find out the database paths, refer to "SQL Server database files" (p. 290).

- **Use Volume Shadow Copy (VSS).**

  Make sure that the Volume Shadow Copy Service (p. 131) backup option is set to **Use Volume Shadow Copy Service** and that the selected snapshot provider is not **Software - Acronis VSS Provider**. The best choice is **Software - System provider**.

12.3.1 Single-pass backup settings

The settings described in this section relate to single-pass backup. These settings are grouped in the **Single-pass disk and application backup** section of the **Create backup plan** (p. 55) or **Back up now** page.

Single-pass backup

This setting enables single-pass disk and application backup.

To access the following settings, click **Show task failure handling, log truncation**.

Error handling

The **Ignore application backup errors and continue the task** check box determines the software behavior when it fails to collect application metadata during a backup. For example, this happens if a database is corrupted, or the application service is stopped, or using VSS is disabled in the backup options, or the account under which the backup runs does not have permissions to access a database.

By default, Acronis Backup & Recovery 11.5 fails the backup.

If you select the check box, the backup will continue. The event log will contain an entry about each of the databases for which the metadata is not collected. If no metadata is collected at all, you will obtain an ordinary disk-level backup.

The following setting is available only if Agent for SQL (single-pass) is installed on the machine.

 Copyright © Acronis International GmbH, 2002-2013.

Log truncation

If the setting is enabled, the Microsoft SQL Server log will be truncated after each full, incremental or differential backup. The truncation occurs only if the single-pass backup was successful.

Leave the setting disabled if you use a third-party application, such as the SQL Server backup and restore component, for backing up the SQL Server data.

Log truncation and ignoring application errors are mutually exclusive. This prevents truncating the Microsoft SQL log if the application metadata is not collected.

12.4 Recovering Microsoft SQL Server data

This section describes only the steps and settings that are specific for recovering SQL databases from a single-pass backup. The common settings of a recovery task are described in the "Creating a recovery task" (p. 134) section.

You have two options for SQL database recovery:

- **Recover the databases to instances (p. 317).**
- **Extract the database files to folders (p. 319).**

12.4.1 Recovering SQL databases to instances

Within a single recovery task, you can recover multiple databases. The databases are automatically mapped to their original instances. You can select a target instance for each database, if necessary.

System databases are recovered in the same way as user databases. When recovering the **master** database, the software automatically restarts the destination instance in the single-user mode. After the recovery completes, the software restarts the instance and recovers other databases (if any). Other things to consider when recovering a system database:

- A system database can only be recovered to an instance of the same version as the original instance.
- A system database is always recovered in the "ready to use" state.
- Because the **master** database records information about all databases of the instance, you may need to perform additional actions after the database is recovered. For details, see "Actions after a master database recovery" (p. 318).

To recover databases to instances

On the **Recover data** page:

1. Under **What to recover**, click **Select data** and select the databases.
2. If the console is connected to the management server, select the registered machine where you want to recover the databases. Otherwise, skip this step.
3. Select **Recover the databases to instances**.
4. Acronis Backup & Recovery 11.5 tries to specify the target instances for the selected databases by taking the original paths from the backup. If the target instance is not selected for some database or if you want to recover the database to another instance, specify the target instance manually.

   If your current account does not have enough privileges to access the target SQL Server instance, you will be asked to provide the credentials.

 Copyright © Acronis International GmbH, 2002-2013.

5. If the target instance contains a database that has the same name as the one being recovered, the software displays a warning: **The target database already exists**. You have the following options:
   - **Overwrite existing database**

     This is the default setting that fits most situations. The database in the target instance will be overwritten with the database from the backup.
   - **Rename the recovered database**

     This setting lets you retain the existing database. A recovered database will have the following name: `<original database name>-Recovered`. If a database with this name already exists, the recovered database will be named as follows: `<original database name>-Recovered (<sequence number>)`.

     Examples: `MyDatabase-Recovered`, `MyDatabase-Recovered (2)`.
6. For each database being recovered, you can select its state after recovery. To do so, click the ▷ icon to the left of the database name, and then select one of the following values:
   - **Ready to use (RESTORE WITH RECOVERY)** (by default)

     After the recovery competes, the database will be ready for use. Users will have full access to it. The software will roll back all uncommitted transactions of the recovered database that are stored in the transaction logs. You will not be able to recover additional transaction logs from the native Microsoft SQL backups.
   - **Non-operational (RESTORE WITH NORECOVERY)**

     After the recovery competes, the database will be non-operational. Users will have no access to it. The software will keep all uncommitted transactions of the recovered database. You will be able to recover additional transaction logs from the native Microsoft SQL backups and thus reach the necessary recovery point.
   - **Read-only (RESTORE WITH STANDBY)**

     After the recovery completes, users will have read-only access to the database. The software will undo any uncommitted transactions. However, it will save the undo actions in a temporary standby file so that the recovery effects can be reverted.

     This value is primarily used to detect the point in time when a SQL Server error occurred.
7. You can change the paths to where the database files will be saved. To access these settings, click the ▷ icon to the left of the database name.
8. Under **How to recover**, select whether to use Acronis Active Restore (p. 319) during recovery.
9. Specify other settings of the recovery task as appropriate.

12.4.1.1 Actions after a master database recovery

The **master** database records information about all databases of the instance. Hence, the **master** database in a backup contains information about databases which existed in the instance at the time of the backup.

After recovering the **master** database, you may need to do the following:

- Databases that have appeared in the instance after the backup was done are not visible by the instance. To bring these databases back to production, attach them to the instance manually. For instructions on how to do this by using SQL Server Management Studio, see the "Attaching SQL Server databases" (p. 300) section.
- Databases that have been deleted after the backup was done are displayed as offline in the instance. Delete these databases by using SQL Server Management Studio.

 Copyright © Acronis International GmbH, 2002-2013.

12.4.1.2 Using Acronis Active Restore for SQL database recovery

Active Restore is an Acronis proprietary technology. It brings a Microsoft SQL database online minutes after the database recovery is started. This allows users to access their data while the databases are still being recovered. Therefore, using Active Restore makes sense when you recover the databases to the **Ready to use** or **Read-only** state.

Active Restore supports the following backup locations:

- A local folder on the machine where the recovery is performed (except optical disks).
- Acronis Secure Zone.
- A network share.

To use Active Restore, enable it on the **Recover data** page (p. 134) under **How to recover**.

The recovery process

1. If the recovery task includes the **master** database, it is recovered first. During this process, the instance is in the single-user mode and, therefore, users cannot connect to it. After the database is recovered, the software restarts the instance.
2. The agent starts the recovery of other databases. Multiple databases are recovered in parallel.

   First, the databases are in the **Restoring** state and users have no access to them. After a short time, users obtain the read-write or read-only access to the databases, depending on the state specified in the recovery task settings.

   Details. The Acronis Active Restore drivers intercept user queries. The data required to service the queries is recovered with the highest priority; everything else is recovered in the background. As a result, users can access their data even though the databases are not yet recovered.
3. After the recovery is completed, the databases are reattached. This takes less than a minute.

Because the servicing of requests is performed simultaneously with recovery, the database operation can slow down even if recovery priority (p. 171) in the recovery options is set to **Low**. Although the database downtime is minimal, there may be reduced performance during recovery.

12.4.2 Extracting the database files to folders

SQL database files and transaction logs can be extracted from a single-pass backup to a folder you specify. This can be useful if you need to recover databases to a machine where Agent for SQL (single-pass) is not installed, or you need to extract data for data mining, audit or further processing by third party tools.

To extract database files

On the **Recover data** page:

1. Under **What to recover**, click **Select data** and select the databases.
2. If the console is connected to the management server, select a registered machine where Agent for SQL (single-pass) is installed. Otherwise, skip this step.
3. Select **Extract the database files to folders**.
4. In **Target folder**, specify the destination folder where the database files will be saved.

   Details. If you select more than one database, files of each database will be extracted to a separate folder within the folder you specify. If the destination folder already contains a file of a database with the same name as the selected database, the database files will be extracted to subfolder `<instance name>\<database name>`.

 Copyright © Acronis International GmbH, 2002-2013.

5. Specify other settings of the recovery task as appropriate.

Once the extraction is completed, you can attach the database to a SQL Server instance. For instructions on how to do this by using SQL Server Management Studio, see the "Attaching SQL Server databases" (p. 300) section.

12.5 Mounting SQL Server databases from a single-pass backup

When you mount a backed-up SQL database, it is temporarily attached to your SQL Server in the read-only mode. You can access the database like any other database of the instance.

Mounting databases comes in handy when you need any of the following:

- To granularly restore individual database objects, such as tables, records, stored procedures. Mount the database and use third-party tools to get the necessary information from it.
- To quickly access historical information. Recovery of a large database may take a long time. If you mount the database, you do not have to wait until the database is recovered.
- To view the state of a database as of a certain point in time (for example, for data mining or audit).

The mount operation is available when the console is connected to a machine where Agent for SQL (single-pass) is installed. The single-pass backup must be stored in a local folder on that machine (except optical disks), in Acronis Secure Zone, or on a network share. Other locations are not supported by the mount operation.

System databases are mounted as user databases.

To mount a SQL Server database

1. Connect the console to a machine where Agent for SQL (single-pass) is installed.
2. On the **Actions** menu, click **Mount SQL databases from image**.
3. Click **Select data**, and then select the backup and the databases you need to mount.
4. Acronis Backup & Recovery 11.5 tries to specify the target instances for the selected databases by taking the original paths from the backup. If the target instance is not selected for some database or if you want to mount the database to another instance, specify the target instance manually.

   If your current account does not have enough privileges to access the target SQL Server instance, you will be asked to provide the credentials.
5. Click **OK**.

A mounted database has the following name: `<original database name>-Mounted`. If a database with this name already exists, the mounted database is named as follows: `<original database name>-Mounted (<sequence number>)`.

Examples: `MyDatabase-Mounted`, `MyDatabase-Mounted (2)`.

12.5.1 Unmounting mounted SQL Server databases

Maintaining the mounted databases takes considerable system resources. It is recommended that you unmount a database after the necessary operations are completed. If a database is not

 Copyright © Acronis International GmbH, 2002-2013.

unmounted manually, it will remain mounted until the operating system restarts or until the agent service restarts.

To unmount a SQL database

1. Connect the console to a machine where Agent for SQL (single-pass) is installed.
2. In the **Navigation** pane, click **Manage mounted SQL databases**.
3. To unmount one database, select it and click **Unmount**. To unmount all of the mounted databases at once, click **Unmount all**.

   If the selected database is in use, Acronis Backup & Recovery 11.5 forcibly disconnects all users from the database and then unmounts it.

12.6 Protecting clustered SQL Server instances and AAG

SQL Server high-availability solutions

The Windows Server Failover Clustering (WSFC) functionality enables you to configure a highly available SQL Server through redundance at the instance level (Failover Cluster Instance, FCI) or at the database level (AlwaysOn Availability Group, AAG). You can also combine both methods.

In a Failover Cluster Instance, SQL databases are located on a shared storage. Because this storage can only be accessed from the active node, SQL Server data is backed up only when the active node is backed up. For the same reason, SQL databases can only be recovered onto an active node. If the active node fails, a failover occurs and a different node becomes active.

In an availability group, each database replica resides on a different node. If the primary replica becomes not available, a secondary replica residing on a different node is assigned the primary role.

Other solutions include database mirroring and log shipping. For more information about SQL Server high-availability solutions refer to the Microsoft documentation: http://msdn.microsoft.com/en-us/library/ms190202.aspx.

Backing up SQL Server configured for high availability

In both the FCI and AAG cases, backing up only one node is not sufficient. If this node fails, the SQL Server will continue functioning, but its databases will not be backed up. If you want the SQL Server data to be backed up uninterruptedly, regardless of how many nodes are up and operational, consider the following approach.

1. Install Agent for SQL (single-pass) on all of the WSFC nodes.
2. On each of the nodes, create a backup plan with identical settings. If you have an advanced edition of Acronis Backup & Recovery 11.5, create a single centralized backup plan for all of the nodes.

   The settings are as follows:

   In **What to back up**, click **Items to back up** and select the check box next to the machine (not next to individual disks). This ensures that the shared storages will be included in the backup when the node becomes active.

   In **Where to back up**, specify a single location for all of the nodes. This may be a centralized vault or just a network share. This ensures that all the backed-up data will be stored in one place.

   Single-pass disk and application backup - Enabled.
3. Specify other settings of the backup plan as appropriate.

 Copyright © Acronis International GmbH, 2002-2013.

With these settings, if a failover occurs, the SQL databases will continue to be backed up on a different node. When it comes to recovery, you will find the databases in the vault **Data view** or **Archive view**, under the node they were backed up from.

Recovery of databases configured for high availability

A database configured for mirroring or included in an AlwaysOn Availability Group cannot be overwritten during a recovery because Microsoft SQL Server prohibits this. You need to remove the target database mirroring or exclude the target database from the AAG before the recovery. Or, just recover the database as a new non-AAG one. When the recovery is completed, you can reconstruct the original mirroring/AAG configuration.

Copyright © Acronis International GmbH, 2002-2013.

13 Protecting Microsoft Active Directory with single-pass backup

This section describes how to use single-pass disk and application backups to protect the Active Directory Domain Services role of Microsoft Active Directory.

The single-pass backup functionality becomes available by installing Acronis Backup & Recovery 11.5 Agent for Microsoft Active Directory (single-pass). The agent is referred to as Agent for Active Directory (single-pass) in this document.

Without this agent, you can protect your Active Directory data by using disk-level backup. For a detailed description of this method, see the "Protecting applications with disk-level backup" (p. 288) section.

13.1 Agent for Active Directory (single-pass)

Agent for Active Directory (single-pass) creates an application-aware disk backup also known as a single-pass backup. While doing a backup, Agent for Active Directory (single-pass) adds Microsoft Active Directory metadata to the resulting backup file.

The agent enables you to extract Active Directory files from a single-pass backup without recovering the entire disk or volume. After that, you can replace the corrupted files with the extracted ones.

The domain controller can also be recovered as a whole.

13.2 Supported operating systems

Agent for Active Directory (single-pass) can be installed in the following operating systems:

- Windows Server 2003/2003 R2 – Standard and Enterprise editions (x86, x64)
- Windows Small Business Server 2003/2003 R2
- Windows Server 2008 – Standard, Enterprise, and Datacenter editions (x86, x64)
- Windows Small Business Server 2008
- Windows Server 2008 R2 – Standard, Enterprise, Datacenter, and Foundation editions
- Windows Small Business Server 2011 – all editions
- Windows Server 2012/2012 R2 – all editions

13.3 Installation of Agent for Active Directory (single-pass)

Agent for Active Directory (single-pass) can only be installed on a domain controller. Remote installation of the agent is not possible.

The agent is included in the setup programs of both the stand-alone and advanced editions of Acronis Backup & Recovery 11.5. The functionality provided by the agent is the same in both setup programs.

Agent for Active Directory (single-pass) is installed as an add-on to Agent for Windows.

 Copyright © Acronis International GmbH, 2002-2013.

Licenses required

To install Agent for Windows, use any license that enables installation of this agent.

If Agent for Windows is installed by using the Advanced Server SBS Edition license, you can install Agent for Active Directory (single-pass) without an additional license. Otherwise, use the following license: Acronis Backup & Recovery 11.5 Microsoft Active Directory Add-On.

This license enables you to install Agent for Active Directory (single-pass) onto a physical host and onto four virtual machines running on the same host. Please remember that Agent for Windows must be installed on each virtual machine along with Agent for Active Directory (single-pass).

To use the product in the trial mode, you do not need licenses.

Installation

Install the agent in the same way as Agent for Windows. For detailed step-by-step instructions, refer to the following sections of the installation documentation:

- "Interactive installation in stand-alone editions".
- "Interactive installation in advanced editions".

13.4 Backing up Microsoft Active Directory

To protect Active Directory, create a backup plan or use the **Backup now** feature as described in the "Backup" (p. 55) section.

Follow the best practices described in the "Active Directory backup" (p. 298) section.

Ensure that the Volume Shadow Copy Service (p. 131) backup option is set to **Use Volume Shadow Copy Service** and that the selected snapshot provider is not **Software - Acronis VSS Provider**. The best choice is **Software - System provider**.

13.5 Recovering Microsoft Active Directory

Recovering a domain controller

If the domain controller is not able to boot, refer to one of the following sections, depending on the number and availability of domain controllers in your environment:

- "Recovering a domain controller (other DCs are available)" (p. 303).
- "Recovering a domain controller (no other DCs are available)" (p. 304).

Recovering Active Directory data

If the Active Directory database files or the SYSVOL folder are corrupted but the domain controller is able to start in normal mode, you can recover only the Active Directory data.

Use one of the following methods:

- "Re-promoting the domain controller" (p. 325)

  This is just a replication of all the Active Directory data from other DCs.
- "Recovering the Active Directory data from a single-pass backup" (p. 325)

  This method enables you to recover all the Active Directory data regardless of availability of other DCs. If other DCs are available, you can also perform an authoritative restore of individual

 Copyright © Acronis International GmbH, 2002-2013.

Active Directory objects. For example, you can restore an unintentionally deleted user account or computer account. Other objects will be replicated from other DCs.

13.5.1 Re-promoting the domain controller

This method of recovering the data is available only if the domain has other domain controllers. It does not require having a backup.

To recover Microsoft Active Directory, use the `Dcpromo` tool to demote the domain controller with the corrupted data, and then to promote that domain controller again.

To re-promote the domain controller, run the following commands:

```
dcpromo /forceremoval
dcpromo /adv
```

13.5.2 Recovering the Active Directory data from a single-pass backup

This method of recovering the data can be used regardless of whether the domain has other domain controllers.

This section describes only the steps and settings that are specific for recovering Active Directory data from a single-pass backup. The common settings of a recovery task are described in the "Creating a recovery task" (p. 134) section.

Extracting the Active Directory data

On the **Recover data** page:

1. Under **What to recover**, click **Select data**. Select the data and the recovery point.

   Warning *If the domain has two or more domain controllers, select a recovery point that is not older than the tombstone lifetime. Otherwise, replication issues may occur.*

2. If the console is connected to the management server, select a registered machine where Agent for Active Directory (single-pass) is installed. Otherwise, skip this step.
3. Click **Destination** and select a local or network folder to extract the Microsoft Active Directory data as files to. The database files and the SYSVOL folder will be recovered with recreating a full path.
4. In **Overwriting**, choose whether to overwrite an existing file with the same name as in the archive.
5. Specify other settings of the recovery task (p. 134) as appropriate.
6. Run the recovery task and wait until it is completed.

Replacing the Active Directory data with the extracted files

1. Restart the domain controller and press F8 during startup.
2. On the **Advanced Boot Options** screen, select **Directory Services Restore Mode**.
3. [Optional] Create a copy of the current Active Directory database files in case the changes need to be undone.
4. Move the extracted Active Directory data to its original location:

Copyright © Acronis International GmbH, 2002-2013.

a. Navigate to the folder with the extracted data. This folder contains one or more folders. The names of these folders contain drive letters of the disks that contained the backed-up Active Directory data. For example, **Drive(C).**

b. Copy all of the contents from each of these folders to the root of the corresponding disk drive. For example, copy the contents from the **Drive(C)** folder to **C:/** and from the **Drive(E)** folder to **E:/**. Choose to overwrite the files, if prompted.

Completing the recovery

1. If the domain has only one domain controller, skip this step. Otherwise, do one of the following:
   - If you want to recover the entire Active Directory database, perform steps 3–8 described under "USN rollback" in the "Avoiding a USN rollback" (p. 306) section.
   - If you want to recover individual objects, such as an unintentionally deleted user account or computer account, perform steps 2–4 described in the "Restoring accidentally deleted information" (p. 305) section.
2. Restart the domain controller in normal mode.
3. Ensure that the Active Directory service has started successfully.

 Copyright © Acronis International GmbH, 2002-2013.

14 Administering a managed machine

This section describes the views that are available through the navigation tree of the console connected to a managed machine and explains how to work with each view. This section also covers supplementary operations that can be performed on a managed machine, such as changing a license, adjusting **Machine options**, and collecting system information.

14.1 Backup plans and tasks

The **Backup plans and tasks** view keeps you informed of data protection on a given machine. It lets you monitor and manage backup plans and tasks.

To find out what a backup plan is currently doing on the machine, check the backup plan execution state (p. 329). A backup plan execution state is a cumulative state of the plan's most recent activities. The status of a backup plan (p. 330) helps you to estimate whether the data is successfully protected.

To keep track of a task's current progress, examine its state (p. 331). Check a task status (p. 331) to ascertain the result of a task.

Typical workflow

- Use filters to display the desired backup plans (tasks) in the backup plans table. By default, the table displays all the plans of the managed machine sorted by name. You can also hide the unneeded columns and show the hidden ones. For details, see "Sorting, filtering and configuring table items" (p. 29).
- In the backup table, select the backup plan (task).
- Use the toolbar's buttons to take an action on the selected plan (task). For details, see "Actions on backup plans and tasks" (p. 327).
- To review detailed information on the selected plan (task), use the information panel at the bottom of the window. The panel is collapsed by default. To expand the panel, click the arrow mark ( ). The content of the panel is also duplicated in the **Plan details** (p. 336) and **Task details** (p. 337) windows respectively.

14.1.1 Actions on backup plans and tasks

The following is a guideline for you to perform operations with backup plans and tasks.

Restrictions

- Without the Administrator privileges on the machine, a user cannot run or modify plans or tasks owned by other users.
- It is not possible to modify or delete a currently running backup plan or task.
- A centralized backup plan or task can be modified or deleted only on the management server side.

To	Do
Create a new backup plan or task	Click **New**, then select one of the following: ▪ Backup plan (p. 55) ▪ Recovery task (p. 134)

Copyright © Acronis International GmbH, 2002-2013.

To	Do
	▪ Validation task (p. 241)
View details of a plan/task	Click **Details**. In the respective **Plan Details** (p. 336) or **Task Details** (p. 337) window, review the plan or task details.
View plan's/task's log	Click **Log**. You will be taken to the **Log** (p. 338) view containing the list of the log entries grouped by the plan/task-related activities.
Run a plan/task	**Backup plan** 1. Click **Run**. 2. In the drop-down list, select the plan's task you need run. Running the backup plan starts the selected task of that plan immediately in spite of its schedule and conditions. **Task** Click **Run**. The task will be executed immediately in spite of its schedule and conditions.
Stop a plan/task	Click **Stop**. **Backup plan** Stopping the running backup plan stops all its tasks. Thus, all the task operations will be aborted. **Task** Stopping a task aborts its operation (recovery, validation, exporting, conversion, etc.). The task enters the **Idle** state. The task schedule, if created, remains valid. To complete the operation you will have to run the task over again. **What will happen if I stop the recovery task?** ▪ Recovering disks: the aborted operation may cause changes in the target disk. Depending on the time that has passed since the task run, the target disk may not be initialized, or the disk space may be unallocated, or some volumes may be recovered and others not. To recover the entire disk, run the task once again. ▪ Recovering volumes: the target volume will be deleted and its space unallocated – the same result you will get if the recovery is unsuccessful. To recover the “lost” volume, run the task once again. ▪ Recovering files or folders: the aborted operation may cause changes in the destination folder. Depending on the time that has passed since the task run, some files may be recovered, but some not. To recover all the files, run the task once again.

Copyright © Acronis International GmbH, 2002-2013.

To	Do
Edit a plan/task	Click **Edit**. Backup plan editing is performed in the same way as creation (p. 55), except for the following **limitations**: It is not always possible to use all scheme options, when editing a backup plan if the created archive is not empty (i.e. contains backups). 1. It is not possible to change the scheme to Grandfather-Father-Son or Tower of Hanoi. 2. If the Tower of Hanoi scheme is used, it is not possible to change the number of levels. In all other cases the scheme can be changed, and should continue to operate as if existing archives were created by a new scheme. For empty archives all changes are possible.
Clone a backup plan	Click **Clone**. The clone of the original backup plan will be created with default name "*Clone of <original_plan_name>*". The cloned plan will be disabled immediately after cloning, so that it does not run concurrently with the original plan. You can edit the cloned plan settings before enabling it.
Enable a plan	Click **Enable**. The previously disabled backup plan will run again as scheduled.
Disable a plan	Click **Disable**. The backup plan will not run as scheduled. However, it can be started manually. After a manual run, the plan will stay disabled. The plan will run as usual if you enable it again.
Export a plan	Click **Export**. Specify the path and name of the resulting file. See Export and import of backup plans (p. 332) for more information.
Import a plan	Click **Import**. Specify the path and name of the file that contains a previously exported plan. See Export and import of backup plans (p. 332) for more information.
Delete a plan/task	Click **Delete**.

14.1.2 States and statuses of backup plans and tasks

14.1.2.1 Backup plan execution states

A backup plan state is a cumulative state of the plan's tasks/activities.

	State	How it is determined	How to handle

Copyright © Acronis International GmbH, 2002-2013.

1	**Need interaction**	At least one task needs user interaction. Otherwise, see 2.	Identify the tasks that need interaction (the program will display what action is needed) -> Stop the tasks or enable the tasks to run (change media; provide additional space on the vault; ignore the read error; create the missing Acronis Secure Zone).
2	**Running**	At least one task is running. Otherwise, see 3.	No action is required.
3	**Waiting**	At least one task is waiting. Otherwise, see 4.	Waiting for condition. This situation is quite normal, but delaying a backup for too long is risky. The solution may be to set the maximum delay (p. 130) after which the task will start anyway or force the condition (tell the user to log off, enable the required network connection.) Waiting while another task locks the necessary resources. A one-time waiting case may occur when a task start is delayed or a task run lasts much longer than usual for some particular reason and prevents another task from starting. This situation is resolved automatically when the obstructing task comes to an end. Consider stopping a task if it hangs for too long to enable the next task to start. Persistent task overlapping may result from an incorrectly scheduled plan or plans. It makes sense to edit the plan in this case.
4	**Idle**	All the tasks are idle.	No action is required.

14.1.2.2 Backup plan statuses

A backup plan can have one of the following statuses: **Error; Warning; OK**.

A backup plan status is derived from the results of the last run of the plans' tasks/activities.

	Status	How it is determined	How to handle
1	**Error**	At least one task has failed. Otherwise, see 2	Identify the failed tasks -> Check the tasks log to find out the reason of the failure, then do one or more of the following: ▪ Remove the reason of the failure -> [optionally] Start the failed task manually ▪ Edit the local plan to prevent its future failure if a local plan has failed ▪ Edit the centralized backup plan on the management server if a centralized plan has failed
2	**Warning**	At least one task has succeeded with warnings. Otherwise, see 3.	View the log to read the warnings -> [optionally] Perform actions to prevent the future warnings or failure.
3	**OK**	All the tasks are completed successfully.	No action is required. Note that a backup plan can be OK if none of the tasks has been started yet.

Copyright © Acronis International GmbH, 2002-2013.

14.1.2.3 Task states

A task can be in one of the following states: **Idle**; **Waiting**; **Running**; **Need interaction**. The initial task state is **Idle**.

Once the task is started manually or the event specified by the schedule occurs, the task enters either the **Running** state or the **Waiting** state.

Running

A task changes to the **Running** state when the event specified by the schedule occurs AND all the conditions set in the backup plan are met AND no other task that locks the necessary resources is running. In this case, nothing prevents the task from running.

Waiting

A task changes to the **Waiting** state when the task is about to start, but another task using the same resources is already running. In particular, more than one backup tasks cannot run simultaneously on a machine. A backup task and a recovery task also cannot run simultaneously, if they use the same resources. Once the other task unlocks the resource, the waiting task enters the **Running** state.

A task may also change to the **Waiting** state when the event specified by the schedule occurs but the condition set in the backup plan is not met. See Task start conditions (p. 130) for details.

Need interaction

Any running task can put itself into the **Need interaction** state when it needs human interaction such as changing media or ignoring a read error. The next state may be **Idle** (if the user chooses to stop the task) or **Running** (on selecting Ignore/Retry or another action, such as Reboot, that can put the task to the **Running** state.)

14.1.2.4 Task statuses

A task can have one of the following statuses: **Error**; **Warning**; **OK**.

A task status is derived from the result of the last run of the task.

	Status	How it is determined	How to handle
1	**Error**	Last result is "Failed"	Identify the failed task -> Check the task log to find out the reason of the failure, then do one or more of the following: ▪ Remove the reason of the failure -> [optionally] Start the failed task manually ▪ Edit the failed task to prevent its future failure
2	**Warning**	Last result is "Succeeded with warning" or the task has been stopped	View the log to read the warnings -> [optionally] Perform actions to prevent the future warnings or failure.
3	**OK**	Last result is "Succeeded" or "Not run yet"	"Not run yet" means that the task has never been started or has been started, but has not finished yet and, therefore its result is not available. You may want to find out why the task has not started so far.

Copyright © Acronis International GmbH, 2002-2013.

14.1.3 Export and import of backup plans

The export operation creates a file with complete configuration of the backup plan. You can import the file to reuse the exported backup plan on another machine.

Centralized backup plans can be exported from a management server and imported to a management server only.

You can edit plans in the Acronis Backup & Recovery 11.5 graphical user interface when importing them or after. Backup plans are exported to .xml files, so you can edit the export files of backup plans (p. 333) with text editors. Passwords are encrypted in the export files.

Usage examples

- **Agent reinstallation**

  Export the backup plans before reinstalling the agent and import them after reinstalling.
- **Deploying a backup plan to multiple machines**

  You have an environment where it is not possible to use Acronis Backup & Recovery 11.5 Management Server; for example, because of security restrictions. Nevertheless, you want to use the same backup plan on multiple machines. Export this plan from one of the machines and deploy it as a file (p. 335) to the other machines.

Adjusting credentials

Before exporting a backup plan that will further be imported to a different machine, check the user account under which the plan runs (**Edit** > **Plan parameters** > **Show task credentials, comments, label** > **Plan's credentials**).

The plan will successfully run on a different machine if the **Plan's credentials** value is either **Acronis service credentials** or **Run as: ... (current user)**. If the **Plan's credentials** parameter contains a specific user account, the plan will start only if there is an identical account on that machine. Therefore, you may need to do one of the following:

- Create an account with identical credentials on the machine where the plan will be imported.
- Edit credentials in the export file before importing. For details, see Editing the export file (p. 333).
- Edit credentials after importing the plan.

Steps to perform

To export a backup plan

1. Select a backup plan in the **Backup plans and tasks** view.
2. Click **Export**.
3. Specify the path and name of the export file.
4. Confirm your choice.

To import a backup plan

1. Click **Import** in the **Backup plans and tasks** view.
2. Specify the path and name of the export file.
3. Confirm your choice.
4. If you need to edit the newly imported backup plan, select it in the **Backup plans and tasks** view, then click **Edit**. Make the necessary changes and click **Save**.

 Copyright © Acronis International GmbH, 2002-2013.

14.1.3.1 Editing the export file

The export file is an .xml file and can be edited with a text editor.

Here is how to make some useful changes.

How to modify credentials

In the export file, the `<login>` tags include the user name and the `<password>` tags include the user password.

To modify credentials, change the `<login>` and `<password>` tags in the corresponding sections:

- plan's credentials – the `<plan><options><common_parameters>` section
- access credentials for the backed-up data – the `<plan><targets><inclusions>` section
- access credentials for the backup destination – the `<plan><locations>` section.

Pay special attention to modifying the `<password>` tag. The tag that contains an encrypted password looks like `<password encrypted="true">...</password>`.

To change the encrypted password

1. In the command line, run the `acronis_encrypt` utility:
   `acronis_encrypt UserPassword#1`
   (here `UserPassword#1` is the password you want to encrypt).
2. The utility outputs a string, for example "`XXXYYYZZZ888`".
3. Copy this string and paste it into the tag as follows:
   `<password encrypted="true">XXXYYYZZZ888</password>`

The `acronis_encrypt` utility is available on any machine where Acronis Backup & Recovery 11.5 Management Console or Acronis Backup & Recovery 11.5 command-line utility (`acrocmd`) is installed. The path to the utility is as follows:

- In a 32-bit version of Windows: **%CommonProgramFiles%\Acronis\Utils**
- In a 64-bit version of Windows: **%CommonProgramFiles(x86)%\Acronis\Utils**
- In Linux: **/usr/sbin**

How to make a backup plan use the agent's credentials

Before importing or deploying the export file, delete the value of the required `<login>` tag. Then the imported or deployed plan will use credentials of the agent service.

Example

To make the backup plan run under the agent's credentials, find the `<login>` tag in the `<plan><options><common_parameters>` section. The tag looks like follows:

```
<login>
   Administrator
</login>
<password encrypted="true">
   XXXYYYZZZ888
</password>
```

Delete the value of the `<login>` tag, so that the tag looks like follows:

 Copyright © Acronis International GmbH, 2002-2013.

```
<login>
</login>
<password encrypted="true">
   XXXYYYZZZ888
</password>
```

How to change items to back up

Replacing a directly specified item with another directly specified item

Inside the `<plan><targets><inclusions>` section:

1. Delete the `<ID>` tag.
2. Edit the value of the `<Path>` tag , which contains information about data to back up; for example, replace "`C:`" with "`D:`".

Replacing a directly specified item with a selection template

Inside the `<plan><options><specific><inclusion_rules>` section:

1. Add the `<rules_type>` tag with "`disks`" or "`files`" value, depending on the type of the template you need.
2. Add the `<rules>` tag.
3. Inside the `<rules>` tag, add the `<rule>` with the required template. The template must correspond to the directly specified item. For example, if the specified item has the "`disks`" value, you can use the `[SYSTEM]`, `[BOOT]` and `[Fixed Volumes]` templates; but you cannot use the `[All Files]` or `[All Profiles Folder]` templates. For more information about templates, see "Selection rules for volumes" (p. 364) and "Selection rules for files and folders" (p. 363).
4. To add another template, repeat the step 3.

Example

The following example illustrates how to replace a directly specified item with selection templates.

The original section:

```
<specific>
   <backup_type>
      disks
   </backup_type>
   <disk_level_options />
   <file_level_options />
   <inclusion_rules />
<specific>
```

The section after applying the selection templates:

 Copyright © Acronis International GmbH, 2002-2013.

```
<specific>
   <backup_type>
      disks
   </backup_type>
   <disk_level_options />
   <file_level_options />
   <inclusion_rules>
      <rules_type>
         disks
      </rules_type>
      <rules>
         <rule>
            [BOOT]
         </rule>
         <rule>
            [SYSTEM]
         </rule>
      </rules>
   </inclusion_rules>
<specific>
```

14.1.4 Deploying backup plans as files

Assume that for some reason you cannot run Acronis Backup & Recovery 11.5 Management Server in your environment, but you need to apply one and the same backup plan to multiple machines. A good decision is to export the backup plan from one machine and deploy it to all the other machines.

How it works

A dedicated folder for storing deployed plans exists on every machine where an agent is installed. The agent tracks changes in the dedicated folder. As soon as a new .xml file appears in the dedicated folder, the agent imports the backup plan from that file. If you change (or delete) an .xml file in the dedicated folder, the agent automatically changes (or deletes) the appropriate backup plan.

Editing the export file

A backup plan imported in such way cannot be edited through the graphical user interface. You can edit the export file (p. 333) with a text editor either before or after the deployment.

If you edit the file before the deployment, the changes will take effect on all the machines where the plan will be deployed. You may want to change the direct specification of the item to backup (such as C: or C:\Users) with a template (such as [SYSTEM] or [All Profiles Folder]). For more information about templates see Selection rules for volumes (p. 364) and Selection rules for files and folders (p. 363).

You may also want to change credentials used by the plan.

To deploy a backup plan as file

1. Create a backup plan on one of the machines.
2. Export it to an .xml file (p. 332).
3. [Optional] Edit the export file. See Editing the export file (p. 333) for more information.
4. Deploy this .xml file to the dedicated folder.

   The dedicated folder path

In Windows

 Copyright © Acronis International GmbH, 2002-2013.

The default path to the dedicated folder is **%ALLUSERSPROFILE%\Acronis\BackupAndRecovery\import** (in Windows Vista and later versions of Windows) or **%ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\import** (in versions of Windows earlier than Windows Vista).

The path is stored in the registry key **HKEY_LOCAL_MACHINE\SOFTWARE\Acronis\MMS\Configuration\Import\FolderPath**.

The absence of the key means that the agent does not monitor the dedicated folder.

To change the path, edit the key. The change will be applied after a restart of **Acronis Managed Machine Service**.

In Linux

The default path to the dedicated folder is **/usr/lib/Acronis/BackupAndRecovery/import**.

The path is stored in the file **/etc/Acronis/MMS.config**.

To change the path, edit the `/usr/lib/Acronis/BackupAndRecovery/import` value in the following tag:

```
<key name="Import">
        <value name="FolderPath" type="TString">
                "/usr/lib/Acronis/BackupAndRecovery/import"
        </value>
</key>
```

The change will be applied after a restart of the agent. To restart the agent, run the following command as the root user:

```
/etc/init.d/acronis_mms restart
```

The absence of the tag means that the agent does not monitor the dedicated folder.

14.1.5 Backup plan details

The **Backup plan details** window (also duplicated on the **Information** panel) aggregates all information on the selected backup plan.

The respective message will appear at the top of the tabs, if execution of the plan requires user interaction. The message contains a brief description of the problem and action buttons that let you select the appropriate action or stop the plan.

Details

The **Backup plans and tasks** tab provides the following general information on the selected plan:

- **Name** - name of the backup plan
- **Origin** - whether the plan was created directly on the machine (local origin), or deployed to the machine from the management server (centralized origin).
- **Execution state** - execution state (p. 329) of the backup plan.
- **Status** - status (p. 330) of the backup plan.
- **Machine** - name of the machine on which the backup plan exists (only for centralized backup plans).
- **Schedule** - whether the task is scheduled, or set to start manually.

 Copyright © Acronis International GmbH, 2002-2013.

- **Last start time** - how much time has passed since the last plan or task start.
- **Deployment state** - the deployment states of the backup plan (only for centralized backup plans).
- **Last finish time** - how much time has passed since the last plan or task end.
- **Last result** - the result of the last plan or task run.
- **Type** - backup plan or task type.
- **Owner** - the name of the user who created or last modified the plan
- **Next start time** - when the plan or task will start the next time.
- **Comments** - description of the plan (if provided).

Tasks

The **Tasks** tab displays a list of all tasks of the selected backup plan. To view the selected task details, click **Details**.

Progress

The **Progress** tab lists all the selected backup plan's activities that are currently running or waiting for their turn to run.

History

The **History** tab lets you examine the history of all the backup plan's accomplished activities.

What to back up

The **Source** tab provides the following information on the data selected for backup:

- **Source type** - the type of data selected for backing up.
- **Items to back up** - items selected to back up and their size.

Where to back up

The **Destination** tab provides the following information:

- **Name** - name of the archive.
- **Location** - name of the vault or path to the folder, where the archive is stored.
- **Archive comments** - comments on the archive (if provided).
- **2nd**, **3rd**, **4th**, **5th location** - names of the locations to which the archive was copied or moved (if specified in the backup plan).

Settings

The **Settings** tab displays the following information:

- **Backup scheme** - the selected backup scheme and all its settings with schedules.
- **Validation** - if specified, events before or after which the validation is performed, and validation schedule. If the validation is not set, the **Never** value is displayed.
- **Backup options** - backup options changed against the default values.

14.1.6 Task/activity details

The **Task/activity details** window (also duplicated on the **Information** panel) aggregates on several tabs all information about the selected task or activity.

 Copyright © Acronis International GmbH, 2002-2013.

When a task or activity requires user interaction, a message and action buttons appear above the tabs. The message contains a brief description of the problem. The buttons allow you to retry or stop the task or the activity.

14.2 Log

The local event log stores the history of operations performed by Acronis Backup & Recovery 11.5 on the machine.

To view a plain list of log entries, select **Events** in the **Display** drop-down list; to view log entries grouped by activities, select **Activities**. The details of the selected log entry or activity are shown in the **Information** panel at the bottom of the **Log** view.

Use filters to display the desired activities and log entries in the table. You can also hide the unneeded columns and show the hidden ones. For details, see "Sorting, filtering and configuring table items" (p. 29).

Select the activity or log entry to take an action on log entries. For details, see "Actions on log entries" (p. 338) and "Log entry details" (p. 339).

14.2.1 Actions on log entries

All the operations described below are performed by clicking the corresponding items on the log **toolbar**. These operations can also be performed with the context menu (by right-clicking the log entry or the activity).

The following is a guideline for you to perform actions on log entries.

To	Do
Select a single activity	Select **Activities** in the **Display** drop-down list and click an activity. The **Information** pane will show log entries for the selected activity.
Select a single log entry	Click on it.
Select multiple log entries	▪ *non-contiguous*: hold down **CTRL** and click the log entries one by one ▪ *contiguous*: select a single log entry, then hold down **SHIFT** and click another log entry. All the log entries between the first and last selections will be selected too.
View a log entry's details	1. Select a log entry. 2. Do one of the following: ▪ Double click the selection. ▪ Click **Details**. The log entry's details will be displayed. See Log entry details (p. 398) for details of the log entry's operations.
Save the selected log entries to a file	1. Display **Activities** and select activities or display **Events** and select log entries. 2. Click **Save selected to file**. 3. In the opened window, specify a path and a name for the file. All log entries of the selected activities or selected log entries will be saved to the specified file.

 Copyright © Acronis International GmbH, 2002-2013.

Save all the log entries to a file	1. Make sure, that the filters are not set. 2. Click **Save all to file**. 3. In the opened window, specify a path and a name for the file. All log entries will be saved to the specified file.
Save all the filtered log entries to a file	1. Set filters to get a list of the log entries that satisfy the filtering criteria. 2. Click **Save all to file**. 3. In the opened window, specify a path and a name for the file. All log entries in the list will be saved to the specified file.
Delete all the log entries	Click **Delete all**. All the log entries will be deleted from the log, and a new log entry will be created. It will contain information about who deleted the log entries and when.

14.2.2 Log entry details

Displays detailed information on the log entry you have selected and lets you copy the details to the clipboard.

To view details of the next or the previous log entry, click the down arrow button or correspondingly the up arrow button.

To copy the details, click the **Copy to clipboard** button.

Log entry data fields

A log entry contains the following data fields:

- **Type** - Type of event (Error; Warning; Information).
- **Date and time** - Date and time when the event took place.
- **Backup plan** - The backup plan the event relates to (if any).
- **Task** - The task the event relates to (if any).
- **Code** - It can be blank or the program error code if the event type is error. Error code is an integer number that may be used by Acronis support service to solve the problem.
- **Module** - It can be blank or the number of the program module where the event has occurred. It is an integer number that may be used by Acronis support service to solve the problem.
- **Owner** - The user name of the backup plan owner (p. 34).
- **Message** - The event text description.

Date and time presentation varies depending on your locale settings.

14.3 Alerts

An alert is a message that warns about actual or potential problems. The **Alerts** view lets you rapidly identify and solve the problems by monitoring the current alerts and view the alerts history.

Copyright © Acronis International GmbH, 2002-2013.

Active and inactive alerts

An alert can be either in an active, or inactive state. The active state indicates that the issue that caused the alert still exists. An active alert becomes inactive when the problem that caused the alert is resolved either manually or on its own.

***Note**: There is one alert type that is always active: "Backup not created". This is because even if the cause of this alert was resolved and the following backups successfully created, the fact that the backup was not created remains.*

Fixing issues that caused alerts

To find and fix the issue that caused the alert, click **Fix the issue**. You will be taken to the corresponding view,where you can examine the issue and take the necessary steps to resolve it.

Optionally, you can click **View details** to get more information about the alert you select.

Accepting alerts

By default, the **Current alerts** table lists both active and inactive alerts until they are not accepted. To accept an alert, select it and then click **Accept**. By accepting an alert you acknowledge the alert and agree to takeresponsibility for it. The accepted alerts are then moved to the **Accepted alerts** table, with the alert state unchanged.

The **Accepted alerts** table stores the history of the accepted alerts. Here, you can find out who accepted the alert and when it happen. The accepted alerts of both states can be removed from the table either manually, by using **Delete** and **Delete all** buttons, or automatically (see "Configuring alerts" later in this section).

To export entire table contents to a *.txt or *.csv file, click **Save all to file**.

Configuring alerts

Use the following options at the top of the **Alerts** view to configure alerts:

- **Show/hide alerts** (p. 31) - specify the alert types to display in the **Alerts** view.
- **Notifications** (p. 345) - set up e-mail notifications about alerts.
- **Settings** (p. 343) - specify whether to move inactive alerts to the **Accepted alerts** table automatically; set how long to keep the accepted alerts in the **Accepted alerts** table.

14.4 Changing a license

By changing the license, you switch to a different version or edition of the product. The following table summarizes the available options.

Switching a license	Why you may need it
Trial > Full	After trying the product, you purchased a license.

Copyright © Acronis International GmbH, 2002-2013.

Full > Full different edition	▪ You want to upgrade Acronis Backup & Recovery 11.5 from a stand-alone product to the advanced platform in order to use the centralized management capability. For more information, refer to the "Upgrading from a stand-alone product to the advanced platform" section of the installation documentation. ▪ You used a server edition license for a workstation. Now you want to assign the workstation a workstation license. After that, you can revoke the server one and use it for a server. ▪ A machine has an Advanced Server license that allows you to back up 4 virtual machines. To back up more virtual machines, you need to assign the machine a Virtual Edition license.
Full > Full + add-on	You purchased an add-on license such as Universal Restore or Deduplication.
Backing up to the online storage* > Full	After backing up to the online storage only, you decided to buy an edition with greater functionality.
Trial > Backing up to the online storage*	After trying the product, you decided to back up to the online storage only.

*Online backup is not available for machines running Linux. Some types of data (such as Exchange databases) cannot be backed up to the online storage. Prior to backing up to the online storage, you need to activate a subscription for the online backup service on the machine(s) you want to back up. For more information refer to the "Online backup" (p. 420) section.

Before switching from trial mode to full mode

If you are planning to change licenses on a large number of machines, you may want to add (import) the license keys to Acronis License Server.

Acronis Deduplication is always enabled in the trial mode. If you want to continue using this functionality, please do not forget to:

1. Purchase Acronis Deduplication licenses.
2. Import the Acronis Deduplication license keys to the license server (recommended).
3. Use one Acronis Deduplication license for every machine where Acronis Backup & Recovery 11.5 will be switched to the full mode.

You can do this later at any time; however, until that time, backups to deduplicating vaults will fail.

Accessing the Licenses window

Do any of the following:

- To change a license for a managed machine, connect the console to the machine and click **Help** > **Change license**.
- To change a license for a managed machine, connect the console to the management server, navigate to **Machines with agents** > **All machines with agents** or to another group that displays the machine whose license you want to change, right-click the machine, and then click **Change license**.
- To change a license for a virtualization host (except for a clustered host), connect the console to the management server, navigate to **Virtual machines** > **Hosts and clusters**, right-click the host, and then click **Change license**.

 Copyright © Acronis International GmbH, 2002-2013.

- To change licenses for all of the hosts of a virtualization cluster, connect the console to the management server, navigate to **Virtual machines** > **Hosts and clusters**, right-click the cluster, and then click **Change license**.

Changing a license

In the **Licenses** window, you can add license keys and select which licenses to use for the selected machine. Each license enables a certain set of features. If you choose not to use a license, you will be able to back up the machine to the online storage only.

In this window, you can also change a license server used by a machine. This operation is possible only if the machine is not registered on the management server. For registered machines, the management server determines which license server they use. See "Changing the license server used by the management server" (p. 388) for details.

Managing an online backup subscription

The **Acronis Cloud** block of the **Licenses** window requires that you sign in to your Acronis account. After that, it shows the online backup subscription activated on the machine. If no subscription is activated, this block allows you to request for a subscription, to enter the registration code that you received after the subscription purchase, and to activate the subscription.

14.5 Collecting system information

The system information collection tool gathers information about the machine to which the management console is connected, and saves it to a file. You may want to provide this file when contacting Acronis technical support.

This option is available under bootable media and for machines where Agent for Windows, Agent for Linux or Acronis Backup & Recovery 11.5 Management Server is installed.

To collect system information

1. In the management console, select from the top menu **Help** > **Collect system information from** 'machine name'.
2. Specify where to save the file with system information.

14.6 Adjusting machine options

The machine options define the general behavior of all Acronis Backup & Recovery 11.5 agents operating on the managed machine, and so the options are considered machine-specific.

To access the machine options, connect the console to the managed machine and then select **Options > Machine options** from the top menu.

14.6.1 Additional settings

Specify what to do if the machine is about to be shut down while a task is running

This option is effective only for Windows operating systems.

It determines Acronis Backup & Recovery 11.5 behavior when the system is shutting down. The system shutdown occurs when the machine is turned off or restarted.

The preset is: **Stop running tasks and shut down.**

 Copyright © Acronis International GmbH, 2002-2013.

If you select **Stop running tasks and shut down**, all of the running Acronis Backup & Recovery 11.5 tasks will be aborted.

If you select **Wait for task completion**, all of the running Acronis Backup & Recovery 11.5 tasks will be completed.

14.6.2 Acronis Customer Experience Program

This option is effective only for Windows operating systems.

This option defines whether the machine will participate in the Acronis Customer Experience Program (CEP).

If you choose **Yes, I want to participate in the CEP**, information about the hardware configuration, the most and least used features and about any problems will be automatically collected from the machine and sent to Acronis on a regular basis. The end results are intended to provide software improvements and enhanced functionality to better meet the needs of Acronis customers.

Acronis does not collect any personal data. To learn more about the CEP, read the terms of participation on the Acronis Web site or in the product GUI.

Initially the option is configured during the Acronis Backup & Recovery 11.5 agent installation. This setting can be changed at any time using the product GUI (**Options** > **Machine options** > **Customer Experience Program**). The option can also be configured using the Group Policy infrastructure (p. 405). A setting defined by a Group Policy cannot be changed using the product GUI unless the Group Policy is disabled on the machine.

14.6.3 Alerts

14.6.3.1 Alert management

Remove from "Accepted alerts" items older than

This option defines whether to delete the accepted alerts from the **Accepted alerts** table.

The preset is: **Disabled**.

When enabled, you can specify the keeping period for the accepted alerts. The accepted alerts older than this period will be deleted from the table automatically.

Automatically move inactive alerts to "Accepted alerts"

This option defines whether to accept all the alerts that become inactive and move them to the **Accepted alerts** table automatically.

The preset is: **Disabled**.

When enabled, you can specify the alert types to apply this option to.

14.6.3.2 Time-based alerts

Last backup

This option is effective when the console is connected to a managed machine (p. 452) or to the management server (p. 452).

 Copyright © Acronis International GmbH, 2002-2013.

The option defines whether to alert if no backup was performed on a given machine for a period of time. You can configure the time period that is considered critical for your business.

The preset is: alert if the last successful backup on a machine was completed more than **5 days** ago.

The alert is displayed in the **Alerts** view of the **Navigation** pane. When the console is connected to the management server, this setting will also control the color scheme of the **Last backup** column's value for each machine.

Last connection

This option is effective when the console is connected to the management server or to a registered machine (p. 453).

The option defines whether to alert if no connection was established between a registered machine and the management server for a period of time so indicating that the machine might not be centrally managed (for instance in the case of network connection failure to that machine). You can configure the length of time that is considered critical.

The preset is: alert if the machine's last connection to the management server was more than **5 days** ago.

The alert is displayed in the **Alerts** view of the **Navigation** pane. When the console is connected to the management server, this setting will also control the color scheme of the **Last connect** column's value for each machine.

14.6.4 E-mail settings

The option enables you to configure e-mail settings to send notifications about alerts which occurred on the managed machine.

The notification schedule and the types of alerts to send are configured in **Machine options** > **E-mail settings** > **Alert notifications** (p. 345).

The preset is: **Disabled**.

Note: *Alerts warn only about problems. Therefore, e-mail notifications about successful backup or recovery operations will not be sent. These e-mail notifications are configured in Backup options > Notifications > E-mail (p. 122) and in Recovery options > Notifications > E-mail (p. 168) respectively.*

To configure e-mail notification

1. In the **E-mail addresses** field, type the destination e-mail address. You can enter several addresses separated by semicolons.
2. In the **Subject** field, type the notification subject or leave the default value. Variables are not supported in this field.
3. In the **SMTP server** field, enter the name of the outgoing mail server (SMTP).
4. In the **Port** field, set the port of the outgoing mail server. By default, the port is set to **25**.
5. If the outgoing mail server requires authentication, enter **User name** and **Password** of the sender's e-mail account.

   If the SMTP server does not require authentication, leave the **User name** and **Password** fields blank. If you are not sure whether the SMTP server requires authentication, contact your network administrator or your e-mail service provider for assistance.
6. Click **Additional e-mail parameters...** to configure additional e-mail parameters as follows:

 Copyright © Acronis International GmbH, 2002-2013.

a. **From** – type the name of the sender. If you leave this field empty, the messages will contain the sender's e-mail account in the **From** field.

b. **Use encryption** – you can opt for encrypted connection to the mail server. SSL and TLS encryption types are available for selection.

c. Some Internet service providers require authentication on the incoming mail server before being allowed to send something. If this is your case, select the **Log on to incoming mail server** check box to enable a POP server and to set up its settings:

- **Incoming mail server (POP)** – enter the name of the POP server.
- **Port** – set the port of the POP server. By default, the port is set to **110**.
- **User name** and **Password** of the incoming mail server.

d. Click **OK**.

7. Click **Send test e-mail message** to check whether e-mail notifications work correctly with the specified settings.

14.6.4.1 Alert notifications

This option enables you to specify when to send e-mail notifications about alerts which occurred on the managed machine and to select the types of alerts to send.

When using this option, make sure that the e-mail settings are properly configured in **Machine options** > **E-mail settings** (p. 344).

The preset is: **Disabled**.

To configure alert notifications

1. Select when to send alert notifications:
   - **As soon as an alert appears** – to send a notification every time a new alert occurs.

     Click **Select the types of alerts...** to specify the types of alerts to send notifications about.
   - **On schedule send notification about all current alerts** – to send a cumulative alert notification including all alerts which occurred over a time interval you specify.

     Click **Select the types of alerts...** to specify the types of alerts to send notifications about.

     Set up the notification **Frequency** and **Time**.
2. Click **OK**.

14.6.5 Event tracing

It is possible to duplicate log events generated by the agent(s), operating on the managed machine, in the Application Event Log of Windows; or send the events to the specified SNMP managers. If you do not modify the event tracing options anywhere except for here, your settings will be effective for each local backup plan and each task created on the machine.

You can override the settings set here, exclusively for the events that occur during backup or during recovery, in the Default backup and recovery options. In this case, the settings set here will be effective for operations other than backup and recovery, such as archive validation or cleanup.

You can further override the settings set in the default backup and recovery options, when creating a backup plan or a recovery task. The settings you obtain in this case will be plan-specific or task-specific.

 Copyright © Acronis International GmbH, 2002-2013.

14.6.5.1 SNMP notifications

This option is effective for both Windows and Linux operating systems.

This option is not available when operating under the bootable media.

The option defines whether the agent(s) operating on the managed machine have to send the log events to the specified Simple Network Management Protocol (SNMP) managers. You can choose the types of events to be sent.

You can override the settings set here, exclusively for the events that occur during backup or during recovery, in the Default backup and recovery options. In this case, the settings set here will be effective for operations other than backup and recovery, such as archive validation or cleanup.

You can further override the settings set in the default backup and recovery options, when creating a backup plan or a recovery task. The settings you obtain in this case will be plan-specific or task-specific.

For detailed information about using SNMP with Acronis Backup & Recovery 11.5, please see "Support for SNMP (p. 53)".

The preset is: **Disabled**.

To set up sending SNMP messages

1. Select the **Send messages to SNMP server** check box.
2. Specify the appropriate options as follows:
   - **Types of events to send** – choose the types of events: **All events**, **Errors and warnings**, or **Errors only**.
   - **Server name/IP** – type the name or IP address of the host running the SNMP management application, the messages will be sent to.
   - **Community** – type the name of the SNMP community to which both the host running SNMP management application and the sending machine belong. The typical community is "public".

   Click **Send test message** to check if the settings are correct.

To disable sending SNMP messages, clear the **Send messages to SNMP server** check box.

The messages are sent over UDP.

The next section contains additional information about Setting up SNMP services on the receiving machine (p. 346).

14.6.5.2 Setting up SNMP services on the receiving machine

Windows

To install the SNMP service on a machine running Windows:

1. **Start > Control Panel > Add or Remove Programs > Add/Remove Windows Components.**
2. Select **Management and Monitoring Tools.**
3. Click **Details.**
4. Select the **Simple Network Management Protocol** check box.
5. Click **OK.**

 Copyright © Acronis International GmbH, 2002-2013.

You might be asked for lmmib2.dll that can be found on the installation disc of your operating system.

Linux

To receive SNMP messages on a machine running Linux, the net-snmp (for RHEL and SUSE) or the snmpd (for Debian) package has to be installed.

SNMP can be configured using the **snmpconf** command. The default configuration files are located in the /etc/snmp directory:

- /etc/snmp/snmpd.conf - configuration file for the Net-SNMP SNMP agent
- /etc/snmp/snmptrapd.conf - configuration file for the Net-SNMP trap daemon.

14.6.5.3 Windows event log

This option is effective only in Windows operating systems.

This option is not available when operating under the bootable media.

This option defines whether the agent(s) operating on the managed machine have to log events in the Application Event Log of Windows (to see this log, run **eventvwr.exe** or select **Control Panel > Administrative tools > Event Viewer**). You can filter the events to be logged.

You can override the settings set here, exclusively for the events that occur during backup or during recovery, in the Default backup and recovery options. In this case, the settings set here will be effective for operations other than backup and recovery, such as archive validation or cleanup.

You can further override the settings set in the default backup and recovery options, when creating a backup plan or a recovery task. The settings you obtain in this case will be plan-specific or task-specific.

The preset is: **Disabled**.

To enable this option, select the **Log events** check box.

Use the **Types of events to log** check box to filter the events to be logged in the Application Event Log of Windows:

- **All events** - all events (information, warnings and errors)
- **Errors and warnings**
- **Errors only**.

To disable this option, clear the **Log events** check box.

14.6.6 Log cleanup rules

This option specifies how to clean up the Acronis Backup & Recovery 11.5 agent log.

This option defines the maximum size of the agent log file. The file paths are as follows:

- In Windows XP and Server 2003: **%ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\MMS\events.db3**.
- In Windows Vista and later versions of Windows: **%PROGRAMDATA%\Acronis\BackupAndRecovery\MMS\events.db3**.
- In Linux: **/var/lib/Acronis/BackupAndRecovery/MMS/events.db3**.

 Copyright © Acronis International GmbH, 2002-2013.

The preset is: **Maximum log size: 50 MB**. **On cleanup, keep 95% of the maximum log size**.

When the option is enabled, the program compares the actual log size with the maximum size after every 100 log entries. Once the maximum log size is exceeded, the program deletes the oldest log entries. You can select the amount of log entries to retain. The default 95% setting will keep most of the log. With the minimum 1% setting, the log will be nearly cleared.

This parameter can also be set by using Acronis Administrative Template (p. 409).

14.6.7 Machine management

This option defines whether the machine has to be managed centrally by the Acronis Backup & Recovery 11.5 Management Server.

To be able to use this option, you must be logged on as a member of the **Administrators** group on the machine.

You have the opportunity to register the machine on the management server when installing an Acronis Backup & Recovery 11.5 agent. If the machine is not registered, selecting **Centralized management** here will initiate the registration (p. 453). Or, you can add the machine to the management server on the server side. Any of the three registration methods require the server administrator privileges.

Selecting **Stand-alone management** on a registered machine will result in the machine stopping communication with the server. On the management server, the machine appears as **Withdrawn**. The management server administrator can delete the machine from the server or register the machine once again.

The preset is: **Stand-alone management**.

To set up centralized management on the machine:

1. Select **Centralized management**.
2. Specify the **Management Server IP/Name**.
3. Specify the user name and password of the management server administrator on prompt.
4. In the **Machine's registration address**, select how the machine will be registered on the management server: by its name (recommended) or by its IP address.
5. Click **OK** and the machine will be registered on the management server.

To disable centralized management, select **Stand-alone management**.

14.6.8 Online backup proxy

This option is effective only for backup to and recovery from Acronis Online Backup Storage over the Internet.

This option defines whether the Acronis agent will connect to the Internet through a proxy server.

Note: *Acronis Backup & Recovery Online supports only HTTP and HTTPS proxy servers.*

To set up proxy server settings

1. Select the **Use a proxy server** check box.
2. In **Address**, specify the network name or IP address of the proxy server—for example: **proxy.example.com** or **192.168.0.1**

 Copyright © Acronis International GmbH, 2002-2013.

3. In **Port**, specify the port number of the proxy server—for example: **80**
4. If the proxy server requires authentication, specify the credentials in **User name** and **Password**.
5. To test the proxy server settings, click **Test connection**.

If you do not know the proxy server settings, contact your network administrator or Internet service provider for assistance.

Alternatively, you can try to take these settings from your Web browser's configuration. This is how to find them in three popular browsers.

- **Microsoft Internet Explorer.** On the **Tools** menu, click **Internet Options**. On the **Connections** tab, click **LAN settings**.
- **Mozilla Firefox.** On the **Tools** menu, click **Options** and then click **Advanced**. On the **Network** tab, under **Connection**, click **Settings**.
- **Google Chrome.** In **Options**, click **Under the Hood**. Under **Network**, click **Change proxy settings**.

Copyright © Acronis International GmbH, 2002-2013.

15 Centralized management

This section covers operations that can be performed centrally by using the components for centralized management. The content of this section is only applicable to advanced editions of Acronis Backup & Recovery 11.5.

15.1 Understanding centralized management

This section contains an overview of centralized data protection with Acronis Backup & Recovery 11.5. Please be sure you have an understanding of how data is protected on a single machine before reading this section.

15.1.1 Basic concepts

Creating centralized backup plans and tracking their execution

To protect data on a single machine, you install on the machine an agent (p. 443) or multiple agents for various data types you want to protect. You connect the console to the machine and create a backup plan (p. 444) or multiple backup plans.

What if you have to manage hundreds of machines? It takes time to create a backup plan on each machine, while the plans may be quite similar – you need to back up, say, the system drive and the users' documents. Tracking the plans' execution on each machine separately is also time-consuming.

To be able to propagate the management operations to multiple machines, you install Acronis Backup & Recovery 11.5 Management Server (p. 452) and register (p. 453) the machines on the server. After that you can create groups of machines and thus manage multiple machines as a whole. You can protect all of them or your selection by setting up a centralized backup plan (p. 360).

Once you complete setting up a centralized backup plan on the management server, the server deploys it to each of the machines included in the plan. The agents on the machines start executing the plan. You are able to monitor the plan's status on a single screen and navigate, if required, to each machine or activity to see their status and log entries. The management server also enables you to monitor and manage the agent's locally originated activities.

Since you connect the console to the management server rather than to each machine and perform all management operations through the central management unit, this way of management is called centralized management (p. 445).

Centralized management does not rule out the direct management (p. 447) of each machine. You can connect the console to each machine and perform any direct management operation. However, centralized backup plans can be managed through the management server only, since a well-thought out plan functions automatically and rarely requires human intervention.

Using the management server, you can create one or more centralized archive storages (centralized vaults (p. 446)), which will be shared by the registered machines. A centralized vault can be used by any backup plan, either centralized or created on the registered machines using direct management.

 Copyright © Acronis International GmbH, 2002-2013.

Organizing a managed archive storage

What should the capacity of your centralized vault be? What if transferring sizeable backups to the vault will cause network congestion? Does backup of an online production server affect the server performance? To ensure that the centralized backup will not slow down business processes in your company and to minimize the resources required for the data protection, you install Acronis Backup & Recovery 11.5 Storage Node (p. 454) and configure it to manage a centralized vault or multiple centralized vaults. Such vaults are called managed vaults (p. 452).

The storage node helps the agent deduplicate (p. 447) backups before transferring them to managed vaults and deduplicates the backups already saved in the vaults. Deduplication results in reducing backup traffic and saving storage space. The storage node also undertakes operations with archives (such as validation and cleanup), which otherwise are performed by the agent, and thus relieves the managed machines from unnecessary computing load. Last but not least, Acronis Backup & Recovery 11.5 Storage Node enables using a tape library as a centralized vault for storing backup archives.

More than one storage node, each managing a number of vaults, can be set up and controlled centrally from the Acronis Backup & Recovery 11.5 Management Server.

For more detailed information about storage nodes please refer to the "Storage nodes" (p. 222) section.

15.1.2 Privileges for centralized management

This section describes the users' privileges that are required to manage a machine locally and remotely, to manage a machine registered on Acronis Backup & Recovery 11.5 Management Server, and to access and manage Acronis Backup & Recovery 11.5 Storage Node.

15.1.2.1 Types of connection to a managed machine

There are two types of connection to a managed machine: local connection and remote connection.

Local connection

The local connection is established between Acronis Backup & Recovery 11.5 Management Console on a machine and Acronis Backup & Recovery 11.5 Agent on the same machine.

To establish a local connection

- On the toolbar, click **Connect**, then point to **New connection**, and then click **Manage this machine**.

Remote connection

A remote connection is established between Acronis Backup & Recovery 11.5 Management Console on one machine and Acronis Backup & Recovery 11.5 Agent on another machine.

You might need to specify logon credentials to establish a remote connection.

To establish a remote connection

1. On the toolbar, click **Connect**, then point to **New connection**, and then click **Manage a remote machine**.
2. In **Machine**, type or select the name or IP address of the remote machine to which you want to connect; or click **Browse** to select the machine from the list.

 Copyright © Acronis International GmbH, 2002-2013.

3. To specify credentials for connection, click **Options** and then type the user name and password in the **User name** and **Password** boxes respectively. In Windows, if you leave the **User name** box empty, the credentials under which the console is running will be used.
4. To save the password for the specified user name, select the **Save password** check box; the password will be saved in a secure storage on the machine where the console is running.

15.1.2.2 Privileges for local connection

Windows

Local connection on a machine running Windows can be established by any user who has the "Log on locally" user right on the machine.

Linux

Establishing a local connection on a machine running Linux, and managing such machine, requires the root privileges on it.

To establish a local connection as the root user

1. If you are logged on as the root user, run the following command:

   ```
   /usr/sbin/acronis_console
   ```

   Otherwise, run the following command:

   ```
   su -c /usr/sbin/acronis_console
   ```

2. Click **Manage this machine**.

To allow a non-root user to start the console

- As a root user, add the name of the non-root user whom you want to allow to start the console, to the file **/etc/sudoers**—for example, by using the **visudo** command.

Caution: *As a result of this procedure, the non-root user will not only be allowed to start the console with the root privileges, but also may be able to perform other actions as the root user.*

To establish a local connection as a non-root user

1. Make sure that the root user has allowed you to start the console, as described in the previous procedure.
2. Run the following command:

   ```
   sudo /usr/sbin/acronis_console
   ```

3. Click **Manage this machine**.

15.1.2.3 Privileges for remote connection in Windows

To establish a remote connection to a machine running Windows, the user must be a member of the Acronis Remote Users security group on that machine.

After remote connection is established, the user has management rights on the remote machine as described in "User privileges on a managed machine" (p. 36).

Note: *On a remote machine running Windows Vista and later with enabled User Account Control (UAC)—and which is not part of a domain—only the built-in Administrator user can back up data and perform disk management operations. To overcome the restriction, include the machine into a domain or disable UAC (p. 353) on the machine (by default, UAC is enabled).*

 Copyright © Acronis International GmbH, 2002-2013.

For information about Acronis security groups and their default members, see "Acronis security groups" (p. 354).

15.1.2.4 Requirements on User Account Control (UAC)

On a machine that is running Windows Vista or later and is not a member of an Active Directory domain, centralized management operations (including remote installation) require that UAC be disabled.

To disable UAC

Do one of the following depending on the operating system:

- **In a Windows operating system prior to Windows 8:**

  Go to **Control panel > View by: Small icons > User Accounts > Change User Account Control Settings**, and then move the slider to **Never notify**. Then, restart the machine.
- **In any Windows operating system,** including Windows 8/8.1 and Windows Server 2012/2012 R2:
  1. Open Registry Editor.
  2. Locate the following registry key:
     HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Policies\System
  3. For the **EnableLUA** value, change the setting to **0**.
  4. Restart the machine.

15.1.2.5 Privileges for remote connection in Linux

Remote connections to a machine running Linux—including those performed by the root user—are established according to authentication policies, which are set up by using Pluggable Authentication Modules for Linux, known as Linux-PAM.

For the authentication policies to work, we recommend installing the latest version of Linux-PAM for your Linux distribution. The latest stable source code of Linux-PAM is available at Linux-PAM source code Web page.

Remote connection as the root user

Remote connections by the root user are established according to the Acronisagent authentication policy, which is automatically set up during the installation of Acronis Backup & Recovery 11.5 Agent for Linux, by creating the file **/etc/pam.d/acronisagent** with the following content:

```
#%PAM-1.0
auth     required     pam_unix.so
auth     required     pam_succeed_if.so uid eq 0
account  required     pam_unix.so
```

Remote connection as a non-root user

Since accessing the system as the root user should be restricted, the root user can create an authentication policy to enable remote management under non-root credentials.

The following are two examples of such policies.

Note: *As a result, the specified non-root users will be able to perform any operation on the machine under the root privileges. A security best practice is to make sure that the user accounts are hard to compromise—for example, by requiring that they have strong passwords.*

 Copyright © Acronis International GmbH, 2002-2013.

Example 1

This authentication policy uses the pam_succeed_if module and works with Linux distributions with kernel version 2.6 or later. For an authentication policy which works with kernel version 2.4, see the next example.

Perform the following steps as the root user:

1. Create the **Acronis_Trusted** group account, by running the following command:

   ```
   groupadd Acronis_Trusted
   ```

2. Add the names of the non-root users, whom you want to allow to connect to the machine remotely, to the **Acronis_Trusted** group. For example, to add the existing user user_a to the group, run the following command:

   ```
   usermod -G Acronis_Trusted user_a
   ```

3. Edit the file **/etc/pam.d/acronisagent-trusted** as follows:

   ```
   #%PAM-1.0
   auth      required   pam_unix.so
   auth      required   pam_succeed_if.so user ingroup Acronis_Trusted
   account   required   pam_unix.so
   ```

Example 2

The above authentication policy might not work on Linux distributions with kernel version 2.4—including Red Hat Linux—because the pam_succeed_if.so module is not supported there.

In this case, you can use the following authentication policy.

1. As the root user, create the file **/etc/pam.d/Acronis_trusted_users**
2. Add the names of the non-root users whom you want to allow to manage the machine, to this file, one user name per line. For example, if you want to add the users user_a, user_b, and user_c, add the following three lines to the file:

   ```
   user_a
   user_b
   user_c
   ```

   If necessary, also add the root user to the file.

3. Edit the file **/etc/pam.d/acronisagent-trusted** as follows:

   ```
   #%PAM-1.0
   auth     required     pam_unix.so
   auth     required     pam_listfile.so item=user sense=allow
   file=/etc/pam.d/Acronis_trusted_users onerr=fail
   account  required     pam_unix.so
   ```

15.1.2.6 Acronis security groups

On a machine running Windows, Acronis security groups determine who can manage the machine remotely and act as Acronis Backup & Recovery 11.5 Management Server administrator.

These groups are created when Acronis Backup & Recovery 11.5 Agents or Acronis Backup & Recovery 11.5 Management Server are being installed. During installation, you can specify what users to include in each group.

Copyright © Acronis International GmbH, 2002-2013.

Acronis Backup & Recovery 11.5 Agents

When Acronis Backup & Recovery 11.5 Agent for Windows is being installed on a machine, the **Acronis Remote Users** group is created (or updated).

A user who is a member of this group can manage the machine remotely by using Acronis Backup & Recovery 11.5 Management Console, according to the management rights described in Users' privileges on a managed machine (p. 36).

By default, this group includes all members of the Administrators group.

Acronis Backup & Recovery 11.5 Management Server

When Acronis Backup & Recovery 11.5 Management Server is being installed on a machine, two groups are created (or updated):

Acronis Centralized Admins

A user who is a member of this group is a management server administrator. Management server administrators can connect to the management server by using Acronis Backup & Recovery 11.5 Management Console; they have the same management rights on the registered machines as users with administrative privileges on those machines—regardless of the contents of Acronis security groups there.

To be able to connect to the management server *remotely*, an administrator of the management server must also be a member of the Acronis Remote Users group.

No user—even a member of the Administrators group—can be an administrator of the management server without being a member of the Acronis Centralized Admins group.

By default, this group includes all members of the Administrators group.

Acronis Remote Users

A user who is a member of this group can connect to the management server remotely by using Acronis Backup & Recovery 11.5 Management Console—provided that the user is also a member of the Acronis Centralized Admins group.

By default, this group includes all members of the Administrators group.

On a domain controller

If a machine is a domain controller in an Active Directory domain, the names and default contents of Acronis security groups are different:

- Instead of **Acronis Remote Users** and **Acronis Centralized Admins**, the groups are named *DCNAME* **$ Acronis Remote Users** and *DCNAME* **$ Acronis Centralized Admins** respectively; here, *DCNAME* stands for the NetBIOS name of the domain controller. Each dollar sign is surrounded by a single space on either side.
- Instead of explicitly including the names of all members of the Administrators group, the Administrators group itself is included.

Tip: *To ensure proper group names, you should install Acronis components in a domain controller after you have set up the domain controller itself. If the components were installed before you set up the domain controller, create the groups* DCNAME ***$ Acronis Remote Users*** *and* DCNAME ***$ Acronis Centralized Admins*** *manually, and then include the members of Acronis Remote Users and Acronis Centralized Admins in the newly created groups.*

 Copyright © Acronis International GmbH, 2002-2013.

15.1.2.7 Management server administrator rights

Normally, the Acronis Backup & Recovery 11.5 Management Server administrator operates on a registered machine on behalf of the Acronis Managed Machine Service (also known as the Acronis service) on that machine and has the same privileges as the service has.

Alternatively, when creating a centralized backup plan, the management server administrator has the option to explicitly specify a user account under which the centralized backup plan will run on the registered machines. In this case, the user account must exist on all the machines to which the centralized backup plan will be deployed. This is not always efficient.

To be a management server administrator, the user must be a member of the Acronis Centralized Admins group on the machine where the management server is installed.

15.1.3 Communication between Acronis Backup & Recovery 11.5 components

This section describes how Acronis Backup & Recovery 11.5 components communicate with each other using secure authentication and encryption.

This section also provides information on configuring communication settings, selecting a network port for communication, and managing security certificates.

15.1.3.1 Secure communication

Acronis Backup & Recovery 11.5 provides the capability to secure the data transferred between its components within a local area network and through a perimeter network (also known as demilitarized zone, DMZ).

There are two mechanisms which ensure secure communication between Acronis Backup & Recovery 11.5 components:

- **Secure authentication** provides secure transfer of certificates needed to establish a connection, by using the Secure Sockets Layer (SSL) protocol.
- **Encrypted communication** provides secure transfer of information between any two components—for example, between Acronis Backup & Recovery 11.5 Agent and Acronis Backup & Recovery 11.5 Storage Node—by encrypting the data being transferred.

For instructions on how to set up secure authentication and data encryption settings, see Configuring communication options (p. 357).

For instructions on how to manage SSL certificates used for secure authentication, see SSL certificates (p. 358).

Note: *The components of earlier Acronis products, including those of the Acronis True Image Echo family, cannot connect to the Acronis Backup & Recovery 11.5 components, regardless of the secure authentication and data encryption settings.*

15.1.3.2 Client and server applications

There are two stakeholders of the secure communication process:

- **Client application**, or client, is an application that tries to establish connection.
- **Server application**, or server, is an application to which the client tries to connect.

 Copyright © Acronis International GmbH, 2002-2013.

For example, if Acronis Backup & Recovery 11.5 Management Console is connecting to Acronis Backup & Recovery 11.5 Agent on a remote machine, the former is the client and the latter is the server.

An Acronis component can act as a client application, a server application, or both, as shown in the following table.

Component name	Can be client	Can be server
Acronis Backup & Recovery 11.5 Management Console	Yes	No
Acronis Backup & Recovery 11.5 Agent	Yes	Yes
Acronis Backup & Recovery 11.5 Management Server	Yes	Yes
Acronis Backup & Recovery 11.5 Storage Node	Yes	Yes
Acronis PXE Server	No	Yes
Acronis Backup & Recovery 11.5 Bootable Agent	Yes	Yes

15.1.3.3 Configuring communication settings

You can configure communication settings, such as whether to encrypt transferred data, for Acronis Backup & Recovery 11.5 components installed on one or more machines, by using Acronis Administrative Template. For information on how to load the administrative template, see How to load Acronis Administrative Template (p. 404).

When applied to a single machine, the administrative template defines the communication settings for all the components on the machine; when applied to a domain or an organizational unit, it defines the communication settings for all the components on the machines in that domain or organizational unit.

To configure communication settings

1. Click **Start**, then click **Run**, and then type **gpedit.msc**
2. In the **Group Policy** console, expand **Computer Configuration**, then expand **Administrative Templates**, and then click Acronis.
3. In the Acronis pane to the right, double-click a communication option that you want to configure. The administrative template contains the following options (p. 405):
   - **Remote Agent ports**
   - **Client Encryption options**
   - **Server Encryption options**
4. For the new communication settings to take effect, restart all running Acronis components—preferably, by restarting Windows. If restart is not possible, make sure you do the following:
   - If Acronis Backup & Recovery 11.5 Management Console is running, close it and start it again.

 Copyright © Acronis International GmbH, 2002-2013.

- If other Acronis components, such as Acronis Backup & Recovery 11.5 Agent for Windows or Acronis Backup & Recovery 11.5 Management Server are running, restart their corresponding services from the **Services** snap-in in Windows.

15.1.3.4 Network port configuration

Acronis Backup & Recovery 11.5 components use the 9876/TCP network communication port by default. The server listens to this port for incoming connection. This port is also used as default by the Acronis client. During component installation you might be asked to confirm the port opening or to open the port manually, in case you are using a firewall other than Windows Firewall.

After installation, you can change the ports at any time to match your preferable values or for the purpose of security. This operation requires the restart of Acronis Remote Agent (in Windows) or the acronis_agent (in Linux) service.

After the port is changed on the server side, connect to the server using the <Server-IP>:<port> or the <Server-hostname>:<port> URL notation.

Note: *If you use network address translation (NAT), you can also configure the port by setting up port mapping.*

Configuring the port in the operating system

Windows

To be able to change the ports' numbers, load and configure the Administrative Template, provided by Acronis, as described in Configuring communication settings (p. 357), under "Remote Agent ports".

Linux

Specify the port in the /etc/Acronis/Policies/Agent.config file. Restart the acronis_agent daemon.

Configuring the port in a bootable environment

While creating Acronis bootable media, you have the option to pre-configure the network port that will be used by the Acronis Backup & Recovery 11.5 Bootable Agent. The choice is available between:

- The default port (9876)
- The currently used port
- New port (enter the port number)

If a port has not been pre-configured, the agent uses the default port number.

15.1.3.5 SSL certificates

Acronis Backup & Recovery 11.5 components use Secure Sockets Layer (SSL) certificates for secure authentication.

SSL certificates for the components can be one of the two types:

- **Self-signed certificates**, such as certificates automatically generated during the installation of an Acronis component.
- **Non-self-signed certificates**, such as certificates issued by a third-party Certificate Authority (CA)—for example, by a public CA such as VeriSign® or Thawte™—or by your organization's CA.

 Copyright © Acronis International GmbH, 2002-2013.

Certificate path

All Acronis components installed on a machine, when acting as a server application, use an SSL certificate called the server certificate.

In Windows, the certificate path and the server certificate's file name are specified in the registry key `HKEY_LOCAL_MACHINE\SOFTWARE\Acronis\Encryption\Server`. The default path is:

- For 32-bit versions of Windows: **%CommonProgramFiles%\Acronis\Agent**
- For 64-bit versions of Windows: **%CommonProgramFiles(x86)%\AcronisAgent**

For self-signed certificates, the certificate thumbprint (also known as fingerprint or hash) is used for future host identification: if a client has previously connected to a server by using a self-signed certificate and tries to establish connection again, the server checks whether the certificate's thumbprint is the same as the one used before.

Self-signed certificates

On machines running Windows, if the certificate location contains no server certificate, a self-signed server certificate is automatically generated and installed during the installation of any Acronis component except Acronis Backup & Recovery 11.5 Management Console.

If the machine is renamed after its self-signed certificate was generated, the certificate cannot be used and you will need to generate a new one.

To generate a new self-signed certificate

1. Log on as a member of the Administrators group.
2. In the **Start** menu, click **Run**, and then type: **cmd**
3. Run the following command (note quotation marks):
   - When using a 32-bit version of Windows:
     ```
     "%CommonProgramFiles%\Acronis\Utils\acroniscert" --reinstall
     ```
   - When using a 64-bit version of Windows:
     ```
     "%CommonProgramFiles(x86)%\Acronis\Utils\acroniscert" --reinstall
     ```
4. Restart Windows, or restart the running Acronis services.

Non-self-signed certificates

You have the option to use trusted third-party certificates or certificates created by your organization's CA as an alternative to self-signed certificates, by using Acronis Certificate Command-line Utility.

To install a third-party certificate

1. Click **Start**, then click **Run**, and then type: **certmgr.msc**
2. In the **Certificates** console, double-click the name of the certificate that you want to install.
3. In the **Details** tab, in the list of fields, click **Thumbprint**.
4. Select and copy the field's value, called a certificate thumbprint—a string such as **20 99 00 b6 3d 95 57 28 14 0c d1 36 22 d8 c6 87 a4 eb 00 85**
5. In the **Start** menu, click **Run**, and then type the following in the **Open** box (if you are using a 64-bit version of Windows, replace **%CommonProgramFiles%** with **%CommonProgramFiles(x86)%**):
   ```
   "%CommonProgramFiles%\Acronis\Utils\acroniscert.exe" --install "20 99 00 b6 3d 95 57 28 14 0c d1 36 22 d8 c6 87 a4 eb 00 85"
   ```


Copyright © Acronis International GmbH, 2002-2013.

(Note quotation marks; substitute the sample thumbprint shown here with that of your certificate.)

15.2 Back up now

You can configure a one-time backup of multiple machines in a few simple steps by using the **Back up now** feature on Acronis Backup & Recovery 11.5 Management Server. The backup process will start immediately after you perform the required steps and click **OK**.

For a long-time backup strategy that includes schedules and conditions, timely deleting of backups or moving them to different locations, consider creating a backup plan.

Configuring immediate backup is similar to creating a centralized backup plan (p. 360) except for the following:

- There are no options to schedule backups and to set up retention rules.
- Conversion of a disk-level backup to a virtual machine is not available as a part of the backup operation. You can convert the resulting backup afterwards.
- After a backup task is configured, the software has 5 minutes to deploy the task to the specified machines. If all the attempts to deploy the task on a machine during that period fail, this machine will not be backed up.
- If you run the same backup task again, it will back up only those machines that were backed up during the first run.

Unlike a **Back up now** operation that is performed directly on a managed machine (p. 55), a **Back up now** operation configured on the management server never uses the simplified naming of backup files.

15.3 Creating a centralized backup plan

A centralized backup plan can be applied to both Windows and Linux machines.

The steps required for the creating centralized backup plan are similar to creating a backup plan (p. 55) except the following:

- When selecting what data to back up, you can either select items on the registered machines directly or use the selection rules. For more information, see "Selecting data to back up" (p. 361).
- When specifying where to store machines' archives, you can select to store:
  - All machines' archives in a single location.
  - Each machine's archive in the specified folder on the machine.
  - Each machine's archive in the machine's Acronis Secure Zone.

  For more information, see "Location selection" (p. 367).
- **Single-pass disk and application backup** (p. 316) is always available for selection. However, single-pass backup will be applied only to those machines where it is possible. For virtual machines backed up by Agent for ESX(i) or Agent for Hyper-V, and for other machines that do not have licenses for single-pass backup, a regular disk-level backup will be created.
- When setting up a daily, weekly, or monthly schedule, you can use the advanced scheduling settings. For more information, see "Advanced scheduling settings" (p. 92).

 Copyright © Acronis International GmbH, 2002-2013.

15.3.1 Selecting data to back up

To select the data to back up

1. In the **Data to back up** section, select the type of data you want to be backed up. The list of available data types depends on the agents running on the machines:

   Machines/disks/volumes

   To be able to back up this data, you must have Administrator or Backup operator privileges.

   Select this option to back up:

   - Entire physical machines or their individual disks or volumes, if Acronis Backup & Recovery 11.5 Agent for Windows or Acronis Backup & Recovery 11.5 Agent for Linux is installed.

     A disk-level backup enables you to recover the entire system in case of severe data damage or hardware failure. Also, you can individually recover files and folders. The backup procedure is faster than copying files, and may significantly speed up the backup process when backing up large volumes of data.

   - Microsoft SQL databases by means of single-pass disk and application backup, if Acronis Backup & Recovery 11.5 Agent for Microsoft SQL Server (single-pass) is installed.

     Agent for SQL (single-pass) enables you to create application-aware disk backups and to recover Microsoft SQL databases from such backups. For more information, see the "Protecting Microsoft SQL Server..." (p. 312) section.

   - Microsoft Active Directory data by means of single-pass disk and application backup, if Acronis Backup & Recovery 11.5 Agent for Microsoft Active Directory (single-pass) is installed.

     Agent for Active Directory (single-pass) enables you to create application-aware disk backups and to recover Microsoft Active Directory data from such backups. For more information, see the "Protecting Microsoft Active Directory ..." (p. 323) section.

   - Entire virtual machines residing on a virtualization server or their disks or volumes, if Acronis Backup & Recovery 11.5 Agent for ESX(i) or Acronis Backup & Recovery 11.5 Hyper-V is installed.

     Backing up an entire virtual machine, its disks, or volumes yields a standard disk backup (p. 448). In addition, this backup stores the virtual machine configuration. This configuration will be suggested by default when recovering the backup content to a new virtual machine. For more information about backing up virtual machines see "Backing up virtual machines".

   Folders/files

   Available if Acronis Backup & Recovery 11.5 Agent for Windows or Acronis Backup & Recovery 11.5 Agent for Linux is installed.

   Select this option to back up specific files and folders.

   A file-level backup is not sufficient for recovery of the operating system. Choose file backup if you plan to keep safe only certain data (the current project, for example). This will reduce the archive size, thus saving storage space.

   In order to recover your operating system along with all the settings and applications, you have to perform a disk backup.

   Microsoft Exchange Information Store

   Available if Acronis Backup & Recovery 11.5 Agent for Microsoft Exchange Server is installed.

Copyright © Acronis International GmbH, 2002-2013.

Select this option to back up information store, individual storage groups or databases of Microsoft Exchange servers. In case of disaster, you will be able to recover lost or corrupted databases or storage groups. Also, you can individually recover mailboxes, public folders, single emails, contacts, calendar events, and other items.

To be able to back up Exchange data, a domain user account that has administrative privileges on the Exchange server is required. In a cluster, the account must have administrative privileges on each of the cluster's nodes.

For more information about backing up Microsoft Exchange data see "Backing up Microsoft Exchange Server data".

Microsoft Exchange Mailboxes

Available if Acronis Backup & Recovery 11.5 Agent for Microsoft Exchange Server is installed.

Select this option to back up individual mailboxes and public folders without backing up the entire Microsoft Exchange database. By using the exclusion filters, you can specify items to be skipped during mailbox backups.

To be able to back up Exchange data, a domain user account that has administrative privileges on the Exchange server is required. In a cluster, the account must have administrative privileges on each of the cluster's nodes.

For more information about backing up Microsoft Exchange data see "Backing up Microsoft Exchange Server data".

2. Choose how to select the items:

- **Select items directly** (default) – recommended in cases, when backing up different data items on multiple machines. For example, *FolderA* on *Machine1*, *FolderB* on *Machine2*, *FolderC* on *Machine3*, etc.

  Microsoft Exchange server's data items to back up are selected directly. Selection of Exchange data items by using the policy rules is not supported.

  To back up all items of the selected data type present on a machine, select the check box next to the machine. To back up individual data items, expand the machine and select check boxes next to the required items.

  Notes for physical machines, their disks and volumes

  - If your operating system and its loader reside on different volumes, always include both volumes in the backup. The volumes must also be recovered together; otherwise there is a high risk that the operating system will not start.
  - Notes for Linux users: Logical volumes and MD devices are shown under **Dynamic volumes**. For more information about backing up such volumes and devices, see "Backup and recovery of logical volumes and MD devices (Linux)" (p. 43).
  - Note for Linux users: We recommend that you unmount any volumes that contain non-journaling file systems—such as the ext2 file system—before backing them up. Otherwise, these volumes might contain corrupted files upon recovery; recovery of these volumes with resize might fail.

  Notes for virtual machines, their disks and volumes

  - Backing up entire virtual machines comes in handy when having small (in terms of virtual disks size) but numerous legacy servers such as those resulting from workload consolidation. A separate archive will be created for each machine.
  - Backing up individual disks or volumes within a virtual machine comes in handy when the operating system and applications, such as a database server, run on a virtual disk, but the data, such as a database, is stored on a large capacity physical disk added to the

 Copyright © Acronis International GmbH, 2002-2013.

same machine. You will be able to use different backup strategies for the virtual disk and the physical storage.

For more information about backing up virtual machines see "Backing up virtual machines".

- **Use policy rules for selection** – most suitable in cases, when backing up the same data items on multiple machines. For example, backing up the system volume on every selected machine.

  For more information, see the following sections:

  Selection rules for files and folders (p. 363)

  Selection rules for volumes (p. 364)

3. Having specified the data to backup, click **OK**.

15.3.2 Selection rules for files and folders

Define file selection rules, according to which the files and (or) folders will be backed up on the machines included in the centralized backup plan.

To define file selection rules

1. Select the rule from the drop-down list (or type it manually) and click **Add rule**. The program remembers the rules typed manually, and the next time you open the window, these rules will be available for selection in the list along with the default ones.
2. In the right part of the window, select the check boxes next to the machines or groups you want to apply the rules to.

Windows

Full path

Point to the folders and files to be backed up. If you specified a path to a file or folder explicitly, the plan will back up this item on each machine where this exact path will be found.

To include	In the Files and folders column, type or select:
File Text.doc in folder D:\Work	**D:\Work\Text.doc**
Folder C:\Windows	**C:\Windows**

Environment variables

Some environment variables point to Windows folders. Using such variables instead of full folder and file paths ensures that proper Windows folders are backed up regardless of where Windows is located on a particular machine.

To include	In the Files and folders column, type or select	Comments
Program Files folder	**%PROGRAMFILES%**	Points to the Program Files folder (for example, **C:\Program Files**)
Windows folder	**%WINDIR%**	Points to the folder where Windows is located (for example, **C:\Windows**)
Common data for all user profiles	**%ALLUSERSPROFILE%**	Points to the folder where the common data of all user profiles is located (typically, **C:\Documents and Settings\All Users** in Windows XP and

 Copyright © Acronis International GmbH, 2002-2013.

		C:\ProgramData in Windows Vista)

You can use other environment variables or a combination of environment variables and text. For example, to refer to the Acronis folder in the machines' Program Files folder, type: **%PROGRAMFILES%\Acronis**

Templates

Templates are similar to environment variables, but are already pre-customized.

To include	In the Files and folders column, type or select:	Comments
All files on all volumes on a machine	**[All Files]**	Points to all files on all volumes of the machine.
All user profiles existing on a machine	**[All Profiles Folder]**	Points to the folder where all user profiles are located (typically, **C:\Documents and Settings** in Windows XP, and **C:\Users** in Windows Vista).

Linux

To include	In the Files and folders column, type or select:
Text file file.txt on the volume /dev/hda3 mounted on /home/usr/docs	**/dev/hda3/file.txt** or **/home/usr/docs/file.txt**
Home directory of the common users	**/home**
The root user's home directory	**/root**
Directory for all user-related programs	**/usr**
Directory for system configuration files	**/etc**

15.3.3 Selection rules for volumes

Define volume selection rules, according to which the volumes on the machines included in the centralized backup plan will be backed up.

To define volume selection rules

1. Select the rule from the drop-down list (or type it manually) and click **Add rule**. The program remembers the rules typed manually, and the next time you open the window, these rules will be available for selection in the list along with the default ones.
2. In the right part of the window, select the check boxes next to the machines or groups you want to apply the rules to.

The following table explains the pre-defined rules that can be selected from the list. The names of templates are case-sensitive.

To include	In the selection rules box:	Comments
Windows and Linux volumes		

 Copyright © Acronis International GmbH, 2002-2013.

All volumes	Type or select: **[All Volumes]**	Refers to all volumes on machines running Windows, and all mounted volumes on machines running Linux.
Windows volumes		
Volume C:	Type **C:** or select it from the list	
System volume	Type or select: **[SYSTEM]**	The system volume contains the hardware-specific files that are needed to start Windows, such as Ntldr, Boot.ini, and Ntdetect.com. There is only one system volume even if multiple Windows operating systems are installed on the computer. For more details, see "Note on Windows machines" below.
Boot volume	Type or select: **[BOOT]**	Refers to the registered machine's boot volume. The boot volume contains the Windows folder and the supporting files for the Windows operating system (typically located in the Windows\System32 folder). It may or may not be the same as the system volume. If multiple operating systems are installed on the computer, this is the boot volume of the operating system in which the agent is working. For more details, see "Note on Windows machines" below.
All fixed volumes	Type or select: **[Fixed Volumes]**	Refers to all volumes other than removable media. Fixed volumes include volumes on SCSI, ATAPI, ATA, SSA, SAS and SATA devices, and on RAID arrays.
First disk	Type or select: **[Disk 1]**	Refers to the first disk of the registered machine, including all volumes on that disk.
Linux volumes		
First partition on the first IDE hard disk of a Linux machine	Type or select: **/dev/hda1**	hda1 is the standard device name for the first partition of the first IDE hard disk drive. For more details, see "Note on Linux machines" below.
First partition on the first SCSI hard disk of a Linux machine	Type or select: **/dev/sda1**	sda1 is the standard device name for the first partition of the first SCSI hard disk drive. For more details, see "Note on Linux machines" below.
First partition on the first software RAID hard disk of a Linux machine	Type or select: **/dev/md1**	md1 is the standard device name for the first partition of the first software RAID drive. For more details, see "Note on Linux machines" below.

Copyright © Acronis International GmbH, 2002-2013.

Note on Windows machines

Windows operating systems prior to Windows 7 and Windows Server 2008 R2 keep system files and the loader on the same volume, unless a different volume has been specified during the system installation. If Windows files and the loader are on the same volume, selecting either **[SYSTEM]** or **[BOOT]** is enough to back up the entire operating system. Otherwise, select both **[SYSTEM]** and **[BOOT]**.

Operating systems starting with Windows 7 and Windows Server 2008 R2 create a dedicated system volume called **System Reserved**. If you select **[SYSTEM]**, only this dedicated volume will be backed up. Always select both **[SYSTEM]** and **[BOOT]** when backing up machines running these operating systems.

Because centralized backup plans usually include multiple machines with various operating systems, Acronis recommends that you always select both the system and the boot volumes for backup. This ensures the integrity of every operating system.

Note on Linux machines

You can include both Windows and Linux volumes (partitions) in one centralized backup plan.

For example, it is possible to set up a centralized backup plan to back up volume **C:** on Windows machines and partition **/dev/hda1** on Linux machines.

Unlike Windows, there is no clear distinction between a volume (partition) and a folder (directory) in Linux. Linux has the root partition (denoted as /) to which elements of various types—including hard disks, directories, and system devices—are attached (mounted). This forms a tree similar to the file and folder structure in Windows.

For example, let a Linux machine contain a hard disk which is split into three volumes, or partitions: the first, second, and third partitions. These partitions are available in the tree as /dev/hda1, /dev/hda2, and /dev/hda3, respectively. To perform a disk backup of the, say, third partition, you can specify the rule **/dev/hda3** in the **Data to Back Up** dialog box.

Furthermore, a Linux partition can be mounted anywhere inside the tree. For example, /dev/hda3, can be mounted as a “subdirectory” inside the tree. Such a tree might be /home/usr/docs. In this case, you can type either /dev/hda3 or /home/usr/docs in the Volume field to perform a disk backup of the third partition.

In general, when setting up a centralized backup plan to perform volume backups of Linux machines, make sure that the paths entered in the selection rules for volumes correspond to partitions (such as /dev/hda2 or /home/usr/docs in the previous example), and not to directories.

Standard names for Linux partitions

Names such as **/dev/hda1** reflect the standard way of naming IDE hard disk partitions in Linux. The prefix **hd** signifies the disk type (IDE); **a** means that this is the first IDE hard disk on the system, and **1** denotes the first partition on the disk.

In general, the standard name for a Linux partition consists of three components:

- **Disk type:** hd for IDE drives, sd for SCSI drives, md for software RAID drives (for example, dynamic volumes)
- **Disk number:** a for the first disk, b for the second disk, and so on
- **Partition number on the disk:** 1 for the first partition, 2 for the second partition, and so on

 Copyright © Acronis International GmbH, 2002-2013.

To guarantee backing up selected disks regardless of their type, consider including three entries in the **Data to Back Up** dialog box, one for each possible type. For example, to back up the first hard disk of each Linux machine under a centralized backup plan, you may want to add the following rules:

/dev/hda1

/dev/sda1

/dev/mda1

Names for logical volumes

To back up logical volumes, also known as LVM volumes, specify their full names in the selection rules. The full name of a logical volume includes the volume group to which the volume belongs.

For example, to back up two logical volumes, **lv_root** and **lv_bin**, both of which belong to the volume group **vg_mymachine**, specify the following selection rules:

```
/dev/vg_mymachine/lv_root
/dev/vg_mymachine/lv_bin
```

To see the list of logical volumes on a machine, run the **lvdisplay** utility. In our example, the output would be similar to the following:

```
--- Logical volume ---
LV Name          /dev/vg_mymachine/lv_root
VG Name          vg_mymachine
…

--- Logical volume ---
LV Name          /dev/vg_mymachine/lv_bin
VG Name          vg_mymachine
…
```

15.3.4 Backup location selection

Specify where to store the archives and define names for the new backup archives.

1. Selecting the archives destination

Choose where to store machines' archives:

- **Store all machines' archives in a single location**
  - To back up data to Acronis Online Backup Storage, click **Log in** and specify the credentials to log in to the online storage. Then, expand the **Online backup storage** group and select the account.

    Prior to backing up to the online storage, you need to buy a subscription (p. 434) to the online backup service and activate (p. 435) the subscription on the machine(s) you want to back up. Online backup is not available in Linux.

    Acronis Backup & Recovery Online might be unavailable in your region. To find more information, click here: http://www.acronis.eu/my/backup-recovery-online/

  - To store archives in a centralized vault, expand the **Vaults** group and click the vault.
  - To store archives on a network share, expand the **Network folders** group, then select the required networked machine and then click the shared folder. If the network share requires access credentials, the program will ask for them.

 Copyright © Acronis International GmbH, 2002-2013.

- To store archives on an **FTP** or **SFTP** server, expand the corresponding group and reach the appropriate server, then select the folder that will be used for storing archives.

  According to the original FTP specification, credentials required for access to FTP servers are transferred through a network as plaintext. This means that the user name and password can be intercepted by an eavesdropper using a packet sniffer.

- **Store each machine's archive in the specified folder on the machine with agent**

  Enter the full path to the folder in the **Path** field. You need to create this folder in advance on each machine the centralized plan is created for.

- **Store each machine's archive in the machine's Acronis Secure Zone**

  You need to create Acronis Secure Zone in advance on each machine the centralized plan is created for. For information on how to create Acronis Secure Zone, see the Creating Acronis Secure Zone (p. 197) section.

2. Naming the archives

Data from each machine will be backed up to a separate archive.

The software generates a common name for the new archives and displays it in the **Name** field. The name looks like *[Machine Name]_Archive(N)*, where the *[Machine Name]* stands for the machine's name (physical or virtual), and *N* is a sequence number. If you are not satisfied with the automatically generated name, construct another name.

When selecting data to back up from multiple machines, the following variables can be used:

- [Machine Name] - substitution for the machine's name. Use of this variable is mandatory.
- [Plan name] - substitution for the centralized backup plan's name. Use this variable for additional distinguishing of the archives by the backup plan names.
- [Virtual Host Name] - substitution for the name of the virtual machine host. Use this variable in cases, when two or more virtual machines from different hosts have the same names.

Example: You create the centralized backup plan, named for example, *SYSTEMBACKUP*, that will be deployed to three machines (say, *FINDEPT1*, *FINDEPT2*, *FINDEPT3*). In the **Name** field you specify *[Machine Name]_[Plan name]_Archive(N)*. Thus, the following three archives will be created in the location:

- FINDEPT1_SYSTEMBACKUP_Archive(1)
- FINDEPT2_SYSTEMBACKUP_Archive(1)
- FINDEPT3_SYSTEMBACKUP_Archive(1)

15.3.5 Centralized backup plan's credentials

Provide the credentials under which the centralized tasks will run on the machines.

To specify credentials

1. Select one of the following:
   - **Use Acronis service credentials**

     The tasks will run under the Acronis service account, whether started manually or executed on schedule.
   - **Use the following credentials**

     The tasks will run under the credentials you specify, whether started manually or executed on schedule.

 Copyright © Acronis International GmbH, 2002-2013.

Specify:

- **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
- **Password**. The password for the account.
- **Confirm password**. Re-enter the password.

2. Click **OK**.

To learn more about Acronis service credentials, see the List of Acronis services (p. 36) section.

To learn more about operations available depending on the user privileges, see the User privileges on a managed machine (p. 36) section.

15.3.6 What if a machine does not have data meeting the selection rules

A centralized backup plan can be deployed to a machine that does not have data meeting the selection rules. No error or warning will be logged during the plan deployment because it is assumed that the data may appear in the future. A backup plan is created as usual and the plan state is changed to **Deployed**.

If no data to back up is found at the time when the backup task starts, the task will fail and the plan status will turn to **Error**. If at least one of the data items is found, the backup task will succeed with a warning. The plan status will change accordingly.

The backup tasks will start on schedule as specified by the plan and produce a similar result until all data items appear on the machine or the plan is edited to exclude the non-existent data items.

Examples

Assume the selection rule states that the plan has to back up volumes D: and F:. The plan is deployed to both Linux and Windows machines. Once the first backup is started, the plan gets the **Error** status on the Linux machines and on the Windows machines that do not have such volumes. The plan gets the **Warning** status on Windows machines that have either a D: or F: volume, unless an event that will result in an error occurs.

The plan that has to back up the [SYSTEM] and the /dev/sda1 volumes will get the **Warning** status on the Windows machines (since /dev/sda is not found) and on the Linux machines that have the /dev/sda1 volume. This is because the [SYSTEM] volume is not found. The plan will get the **Error** status on Linux machines that do not have a SCSI device.

15.4 Administering Acronis Backup & Recovery 11.5 Management Server

This section describes the views that are available through the navigation tree of the console connected to the management server, and explains how to work with each view.

15.4.1 Dashboard

Use the **Dashboard** view to estimate at a glance the health of data protection on the registered machines. The dashboard displays the summary of Acronis Backup & Recovery 11.5 agents' activities, lets you check for free space available in managed vaults, and rapidly identify and resolve any issues.

 Copyright © Acronis International GmbH, 2002-2013.

Recent alerts

The **Recent alerts** section draws your attention to issues that have occurred on the management server, registered machines and in centralized vaults. It offers you ways of fixing or examining the issues. By default, the section shows the five most recent alerts. Click the **View all** link to move to the **Alerts** view and see all alerts. If no alerts or warnings have been fixed, the system displays "There are no alerts".

Activity history

The stacked column chart in the **Activity history** section lets you explore the daily history of the Acronis Backup & Recovery 11.5 agents' activities. The history is based on the log entries, collected from the registered machines and from the management server. The chart shows the number of log entries of each type (**Succeeded**, **With warnings**, **Failed**) for a particular day.

Statistics for the selected date are displayed to the right of the chart. All the statistics fields are interactive; i.e. if you click any field, the **Log** view will be opened with the log entries pre-filtered by this field.

At the top of the chart, you can select the activities to display depending on the presence and severity of the errors. Click the **View all** link to display in the **Log** view all activities. They are sorted by the start date. Right-click the particular day on the column chart to show the context menu and move to the **Log** view for the selected date.

The **Current day** button focuses selection to the current date.

Machines, backup plans, and recovery tasks

The **Machines**, **Backup plans**, and **Recovery tasks** sections show summarized statistics of registered machines, backup plans, and recovery tasks. Click the items in these sections to obtain the relevant information. This will take you to the appropriate view with pre-filtered machines, backup plans, or recovery tasks respectively. For instance, if you click **Need interaction** under **Recovery tasks**, the **Backup plans and tasks** view will be opened with the recovery tasks filtered by the **Need interaction** state.

Information presented in the **Machines**, **Backup plans**, and **Recovery tasks** sections is refreshed every time the management server synchronizes with the machines. Information in other sections is refreshed every 10 minutes and every time you access the Dashboard.

Applications

The **Applications** section displays the number of protected and unprotected applications running on the registered machines.

An application on a machine is considered protected if the respective agent is installed on that machine in the trial mode or with a license key. If an agent is installed for online backup only, the application is not considered protected.

The following applications can be protected:

- Microsoft Active Directory
- Microsoft Exchange Server
- Microsoft SQL Server (multiple SQL Server instances are counted as one application)

To see a list of machines with unprotected applications, click **Unprotected applications**.

 Copyright © Acronis International GmbH, 2002-2013.

Vaults

The **Vaults** section displays information about vaults space usage. In some cases information about free space in a vault might be not available; for example, if the vault is located on a tape library. If the vault itself is not available (offline), the "Vault is not available" message will be displayed.

The "No centralized vaults were created" message is displayed, if there are no vaults. To create a new vault, select the **Create now** link and move to the **Create vault** page.

15.4.2 Machines with agents

Acronis Backup & Recovery 11.5 lets you protect data and perform management operations on multiple machines.

Add a machine (p. 375) to the management server using the machine's name or IP address, import machines from Active Directory, or from text files. Once a machine is registered on the management server, it becomes available for centralized backup (p. 360), for grouping and for monitoring the activities related to data protection.

To estimate whether the data is successfully protected on a managed machine, check its status. A machine's status is defined as the most severe status of all backup plans (p. 330) (both local and centralized) existing on the machine. It can be "OK", "Warning" or "Error".

Typical workflow

- Create a custom group and add machines to it. For more information, see "Machine groups" (p. 371).
- Select a machine (or group) to perform actions on it. See "Actions on machines" (p. 372) and "Actions on groups" (p. 379).
- To view detailed information about the selected machine or group and perform additional operations (such as run/stop tasks, import/export backup plans), use the information panel at the bottom of the window. The panel is collapsed by default. To expand the panel, click the arrow mark ( ).
- Use filtering and sorting capabilities for easy browsing and examination of the required machines. For more information, see "Sorting, filtering and configuring table items" (p. 29).

15.4.2.1 Machine groups

Machine groups are designed for convenient protection of a large number of machines registered on the management server. While creating a centralized backup plan, select a group and the plan will be deployed to all machines of this group. Once a new machine appears in a group, the centralized backup plan is deployed to the machine. If a machine is removed from a group, the centralized backup plan will be removed from the machine. A single machine can be a member of more than one group.

Built-in group

As soon as a machine is registered on the management server, the machine appears in the **All machines with agents** built-in group. This group always exists on a management server and cannot be edited or deleted. The built-in group cannot contain any nested groups.

To protect all the registered machines at once, create a centralized backup plan select the **All machines with agents** group. Protecting all machines with a single backup plan may not be

 Copyright © Acronis International GmbH, 2002-2013.

satisfactory because of the different roles of the machines. The backed-up data is specific for each department; some data has to be backed up frequently, other data is backed up twice a year. Therefore, you may want to create various backup plans applicable to different sets of machines. In this case, consider creating custom groups.

Custom groups

Custom groups are created by the management server administrator. Creating custom groups helps the administrator to organize data protection by company departments, by Active Directory organizational units, by various populations of users, by the site locations and so forth.

A custom group can contain one or more nested groups. Any custom group can be edited or deleted. The administrator can create the following custom groups:

- **Static groups**

  The static groups contain the machines manually added by the administrator. The static group content never changes unless the administrator explicitly adds or deletes a machine.

  Example: You create custom group for the accounting department and manually add the accountants' machines to this group. Once you create the centralized backup plan for the group, the accountants' machines become protected. If a new accountant is hired, you will have to add the new machine to the group manually.

- **Dynamic groups**

  The dynamic groups contain the machines added automatically according to the criteria specified by the administrator. The dynamic group content changes automatically. A machine remains in the group until it meets the specified criteria.

  Example: The accounting department forms a separate Active Directory organizational unit (OU). You simply specify the accounting OU as the group membership criterion and create the centralized backup plan for it. If a new accountant is hired, the new machine will be added to the group as soon as it is added to the OU, and thus will be protected automatically.

  Tip. To make the best use of the AD OU criterion, consider reproducing the Active Directory hierarchy in the management server.

For more information about operations with groups and machines, see the following sections:

- Actions on groups (p. 379)
- Actions on machines (p. 372)

15.4.2.2 Actions on machines

Registering machines on the management server

Once the machine is added or imported to the **All machines with agents** group, it becomes registered on the management server. Registered machines are available for deploying centralized backup plans and for performing other centralized management operations. Registration provides a trusted relationship between the agent, residing on the machine, and the management server.

Adding and importing actions are available when you select the **Machines with agents** view or the **All machines with agents** group in the navigation tree.

To	Do

 Copyright © Acronis International GmbH, 2002-2013.

To	Do
Add a new machine to the management server	Click **Add a machine to AMS**. In the **Add machine** (p. 375) window, select the machine that needs to be added to the management server.
Add multiple machines	Click **Add multiple machines**. Specify the machines to add to the management server. This way, you can add machines running Windows with no agent installed. The agent for Windows will be installed automatically, using the remote installation functionality. For details, see the "Specifying the list of machines" section of the installation documentation.
Synchronize machines with a list in the text file	Click **Synchronize with file**. Specify a text file with the list of machines. After synchronization, only the machines that are listed in the file remain registered on the management server. For details, see "Synchronizing machines with a text file" (p. 376).

The management console addresses to the agent and initiates the registration procedure. Because registration requires the agent's participation, it cannot take place when the machine is offline.

An additional agent installed on a registered machine becomes registered on the same management server automatically. Multiple agents are jointly registered and deregistered.

Deleting the selected machine from the management server

To	Do
Delete a machine from the management server	Click **Delete machine from AMS**. As a result, backup plans are removed and shortcuts to centralized vaults are deleted from the machine. If the machine is not available at the moment, these actions will be performed on the machine as soon as the machine becomes available to the management server.

Grouping actions

To	Do
Create a custom static or dynamic group	Click **Create group**. In the **Create group** (p. 381) window, specify the required parameters of the group. The new group will be created in the group in which the selected machine is a member (except for the built-in **All machines with agents** group).
Add a machine to another static group	Click **Add to another group**. In the **Add to group** (p. 377) window, specify the group to copy the selected machine to. The centralized backup plans of the groups the machine is a member of will be deployed to the machine.
For machines in custom groups	
Add machines to a static group	Click **Add machines to group**. In the **Add machines to group** (p. 377) window, select the machines that you need to add. The centralized backup plans of the group will be deployed to the

Copyright © Acronis International GmbH, 2002-2013.

To	Do
	selected machines.
Move a machine to another static group	Click **Move to another group**. In the **Move to group** (p. 377) window, select the group to move the machine to. All the centralized backup plans of the group the machine was in will be removed. The centralized backup plans of the group the machine is now a member of will be deployed to the machine.
Remove a machine from the current static group	Click **Remove from group**. The centralized backup plans of the group will be removed from the machine automatically.

Direct management

To	Do
Create a backup plan on a machine	Click **Back up**. This operation is described in depth in Creating a backup plan (p. 55).
Recover data	Click **Recover**. This operation is described in depth in Recovering data (p. 134).
Connect to a machine directly	Click **Connect directly.** Establishes a direct connection to the managed machine. Enables to administer a managed machine and perform all the direct management (p. 447) operations.

Other actions

To	Do
View detailed information on a machine	Click **Details**. In the **Machine details** (p. 377) window, examine information on the machine.
View log entries of a machine	Click **Log**. The **Log** (p. 396) view will display a list of the machine's log entries.
Update the license for a machine's agent	Click **Change license**. The reasons for changing a license (p. 340) include: ▪ Switching from trial mode to full mode. ▪ Enabling Acronis Deduplication. ▪ Enabling Acronis Universal Restore.

Copyright © Acronis International GmbH, 2002-2013.

To	Do
Update all information related to the machine	Click **Synchronize**. The management server will query the machine and update the database with the most recent information. Along with synchronizing, the refresh operation will be performed automatically in order to update the list of the machines.
Refresh a list of machines	Click **Refresh**. The management console will update the list of machines from the management server with the most recent information. Though the list of machines is refreshed automatically based on events, the data may not be retrieved immediately from the management server due to some latency. Manual refresh guarantees that the most recent data is displayed.

Adding a machine to the management server

To be able to deploy centralized backup plans from Acronis Backup & Recovery 11.5 Management Server to a managed machine and perform other centralized management operations, you need to register the machine on the management server.

Initiating registration on the management server side

To add a machine

1. In the **Navigation** tree, select **Machines with agents**.
2. Click **Add a machine to AMS** on the toolbar.
3. In the **IP/Name** field, enter the machine's name or its IP address, or click **Browse...** and browse the network for the machine.

   Note for the Virtual edition users: *When adding a VMware ESX(i) host, enter the IP of the virtual appliance or Windows machine running Acronis Backup & Recovery 11.5 Agent for ESX(i).*

4. Specify the credentials of an account with administrative privileges on the machine.

   When adding a machine that is running Windows Vista or later and is *not* a member of an Active Directory domain, you need to either specify the built-in Administrator account or disable User Account Control (UAC) (p. 353) on the machine.

   Note for the Virtual edition users: *When adding a VMware ESX(i) host, specify the user name and password for your vCenter Server or ESX(i) host.*

   - **User name**. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username).
   - **Password**. The password for the account.
5. Click **Next**, and then click **Proceed**.

Initiating registration on the machine side

The registration procedure can be initiated on the machine side.

1. Connect the console to the machine where Acronis Backup & Recovery 11.5 agent is installed. If prompted for credentials, specify credentials of a member of the **Administrators** group on the machine.
2. Select from the menu **Options** > **Machine options** > **Machine management**.

 Copyright © Acronis International GmbH, 2002-2013.

3. Select **Centralized management** and specify the management server where to register the machine. Refer to "Machine management (p. 348)" for details.

Synchronizing machines with a text file

During synchronization, the management server adjusts the **All machines with agents** group in accordance with the list of machines provided in a .txt or .csv file. The management server:

- Adds machines that are present in the list but are not registered
- Deletes registered machines not present in the list
- Deletes and then tries again to add registered machines that are present in the list, but their current availability (p. 377) is **Withdrawn**.

As a result, only those machines that are listed in the file will be present in the **All machines with agents** group.

Text file requirements

The file should contain machine names or IP addresses, one machine per line.

Example:

```
Machine_name_1
Machine_name_2
192.168.1.14
192.168.1.15
```

Specifying an empty file leads to deletion of all machines with agents from the management server.

A registered machine has to be specified by its registration address: that is, you need to provide exactly the same host name, fully qualified domain name (FQDN), or IP address as was specified when the machine was initially added to the management server. Otherwise, the machine will be deleted and added again as if it were another machine. This means all centralized backup plans, both inherited and directly deployed, will be removed from the machine and its static group membership will be lost.

The registration address of each machine can be found in the **Registration address** column in any management server view that contains the machine (the column is hidden by default).

To avoid a discrepancy, you can initially import the machines from a text file. Modify this file later as required, by adding and removing machines, but do not change the names/addresses of the machines that have to remain registered.

To synchronize machines with a text file

1. In the **Navigation** tree, select **Machines with agents**, or **All machines with agents**.
2. Click **Synchronize with file** on the toolbar.
3. In the **Path** field, enter a path to the .txt or .csv file, or click **Browse** and select the file in the **Browse** window.
4. Under **Logon settings**, specify the user name and password of a user who is a member of the Administrators group on all machines that are listed in the file.
5. Click **OK** to start import.

Synchronization command-line tool

Acronis Backup & Recovery 11.5 Management Server has a command-line tool that enables you to create a batch file and schedule the synchronization task using Windows scheduler.

 Copyright © Acronis International GmbH, 2002-2013.

To synchronize machines with a text file using command line

1. Log on as a member of the **Acronis Centralized Admins** security group.
2. In the command prompt, change the directory to the folder where Acronis Backup & Recovery 11.5 Management Server has been installed—by default: **C:\Program Files\Acronis\AMS**.
3. Run the following command:

   ```
   syncmachines [path_to_the_file] {username password}
   ```

   where:

   - [path_to_the_file] is the path to a .txt or .csv file containing the list of machines. The tool does not accept spaces in the path name.
   - {username password} belongs to a user who is a member of the Administrators group on all machines listed in the file. If not specified, the single sign-on mechanism is used to operate on all the machines.

Adding a machine to another group

To add the selected machine to another group

1. Select the group the machine will be added to.
2. Click **OK**.

The machine being added becomes a member of more than one group. As a result, the centralized backup plans for the first group will remain on the machine, and the centralized backup plans created for the second, third, etc. group will also be deployed to the machine.

Moving a machine to another group

To move the selected machine to another group

1. In the group tree, select the group the machine will be moved to.
2. Click **OK**.

The machine being moved leaves one group and becomes a member of another group. As a result, the centralized backup plans created for the first group will be removed from the machine, and the centralized backup plans created for the second group will be deployed to the machine.

Adding machines to a group

To add machines to the selected group

1. In the groups' tree, select the group whose machines you need to add.
2. In the right part of the window, select the machines.
3. To add more machines from other groups, repeat the steps 1 and 2 for each group.
4. Click **OK** to add machines.

Once the machines appear in the group, the centralized backup plans created for the group (if any) are deployed to the machines. If any of the selected machines is not available or reachable at the moment, the action will be kept in the management server as pending and will be performed as soon as the machine becomes available to the server.

Machine details

Four tabs accumulate all information on the selected machine and let the management server administrator perform operations with the backup plans and tasks on the machine.

 Copyright © Acronis International GmbH, 2002-2013.

Machine

The tab displays the following information on the registered machine:

- **Name** - name of the selected machine (taken from the **Computer name** in Windows).
- **Registration address** - computer name or IP address of the selected machine. During the registration of a machine (p. 453) the management server administrator can assign either a name or IP address to identify the machine on the management server.
- **IP address** - IP address of the selected machine.
- **Drive health status** - the state of the machine's drives health. This field is set to **Not available** if the Acronis Drive Monitor utility is not installed on the machine. Acronis Drive Monitor automatically checks for disk problems and predicts when a hard drive is about to fail. The utility is free of charge for download at http://www.acronis.eu.
- **Status** - the machine protection status. This is the result of the latest backup of the machine's data. Results of other operations, such as validation, cleanup, or replication, do not affect the status. Possible status values are **OK**, **Warning**, and **Error**.
- **Last connection** - how much time has passed since the management server last connected to the machine.
- **Last successful backup** - how much time has passed since the last successful backup.
- **Next backup** - how much time is left before the next backup.
- **Availability:**
  - **Online** - the machine is available for the management server. This means that the management server's last connection to the machine was successful. Connection is established every 2 minutes.
  - **Offline** - the machine is unavailable for the management server: it is turned off, or its network cable is unplugged.
  - **Unknown** - this state is displayed until the first connection between the management server and the machine is established after adding the machine or starting the management server's service.
  - **Withdrawn** - the machine was registered on another management server, or the **Stand-alone management** parameter was selected on the machine in **Options** > **Machine options** > **Machine management** (p. 348). As a result, it is not possible to control the machine from the current management server. To regain control over the machine, remove it from the current management server and then add the machine again.
  - **Expired** - the trial period of the machine's agent has expired. To specify a license key for the agent, right-click the machine, and then click **Change license** (p. 340).
- **Installed agents** - full name of Acronis agents, installed on the machine.
- **Operating system** - the operating system the machine's agent runs.
- **Processor** - the type of CPU used in the managed machine.
- **CPU clock** - clock rate of the CPU.
- **RAM** - memory size.
- **Comments** - the machine's description (taken from the **Computer description** in Windows).

Backup plans and tasks

Displays a list of the plans (both local and centralized) and tasks existing on the selected machine.

Operations

 Copyright © Acronis International GmbH, 2002-2013.

For the list of the operations available with machine's backup plans and tasks, see "Actions on backup plans and tasks" (p. 327).

Filtering and sorting

Filtering and sorting of the backup plans and task is performed as described in "Sorting, filtering and configuring table items" (p. 29).

Member of

This tab appears only if the selected machine is added to one or more custom groups and displays a list of the groups the machine is a member of.

Operations

To	Do
View details of a group	Click **Details**. You will be taken to the **Group details** window, where you can examine all information related to this group.
Remove a machine from a group.	Click **Remove from this group**. The centralized plans, which were deployed to the parent group, will no longer affect this machine.
Refresh a list of groups	Click **Refresh**. While you are reviewing the machine, groups can be added, deleted or modified. Click **Refresh** to update the information on groups with the most recent changes. This opens a **Log** view with pre-filtered log entries of the selected group.

Progress

The **Progress** tab lists all of the selected machine's activities and tasks that are currently running. The tab provides information about task progress, elapsed time and other parameters.

Managed virtual machines

The tab displays a list of the machines hosted on the selected virtualization server or managed by the specified virtual appliance.

You can create a dynamic group based on the list of the hosted virtual machines. To do this, click **Create a dynamic group**. The created group will be accessible in the Virtual machines view.

15.4.2.3 Actions on groups

Actions are available when you select the **Machines with agents** view in the **Navigation** tree. You select a group in the **Navigation** tree or in the **Machines with agents** view to perform an action on the group.

The following is a guideline to perform actions on selected groups.

To	Do
Add a machine to the management server	This action is enabled only for the **Machines with agents** view and for

 Copyright © Acronis International GmbH, 2002-2013.

To	Do
	the **All machines with agents** group. Click **Add machine to AMS**. In the **Add machine** (p. 375) window, select the machine that needs to be added to the management server.
Synchronize machines with a list in the text file	This action is enabled only for the **Machines with agents** view and for the **All machines with agents** group. Click **Synchronize with file**. Specify a text file with the list of machines. After synchronization, only the machines that are listed in the file remain registered on the management server. See "**Synchronizing machines with a text file** (p. 376)" for more information.
Create a custom static or a dynamic group	Click **Create group**. In the **Create group** (p. 381) window, specify the required parameters of the group. Custom groups can be created in the root folder (**Machines with agents**), or in other custom groups.
Add machines to the selected static group	Click **Add machines to group**. In the **Add machines to group** (p. 377) window, select the machines that you need to add. Not applicable to dynamic groups.
Create a new backup plan for a group	Click **Create backup plan** to create a backup plan for the selected group. This operation is described in depth in Creating a backup plan (p. 55).
View detailed information on a group	Click **Details**. In the **Group details** (p. 383) window, examine information on the selected group.
Rename a custom group/subgroup	Click **Rename**. In the **Name** column, type a new name for the selected group. Built-in groups cannot be renamed.
Edit a custom group	Click **Edit**. In the **Edit group** (p. 383) window, change the required parameters of the group.
Move one custom group to another	Click **Move to**. In the **Move to group** (p. 383) window, specify a group that will be a new parent of the selected group.
Delete a custom group	Click **Delete**. Deletion of a parent group will delete its child groups as well. Centralized backup plans created for the parent group and inherited by its child groups will be removed from all members of the deleted groups. The backup plan

Copyright © Acronis International GmbH, 2002-2013.

To	Do
	that are directly created for the members will remain.
Refresh a list of groups	Click **Refresh**. The management console will update the list of groups from the management server with the most recent information. Though the list of groups is refreshed automatically based on events, the data may not be retrieved immediately from the management server due to some latency. Manual Refresh guarantees that the most recent data is displayed.

Creating a custom static or dynamic group

To create a group

1. In the **Name** field, enter a name for the group being created.
2. Choose the type of group:
   a. **Static** - to create a group that will contain machines added manually.
   b. **Dynamic** - to create a group that will contain machines added automatically according to the specified criteria.

      Click the **Add criterion** and select the criterion pattern.

      - **Operating system**

        All the machines running the selected operating system will be members of the dynamic group.
      - **Organizational unit** (p. 382)

        All the machines belonging to the specified organizational unit (OU) will be members of the dynamic group.
      - **IP address range**

        All the machines whose IP addresses are within the specified IP range will be members of the dynamic group.
      - **Listed in txt/csv file** (p. 382)

        All the machines that are listed in the specified .txt or .csv file will be members of the dynamic group.
3. In the **Group description** field, enter a description of the created group.
4. Click **OK**.

Adding multiple criteria

Adding multiple criteria forms a condition according to the following rules:

a) All the entries of the same criteria are combined by logical addition (OR).

For example, the following set of criteria

Operating system: Windows Server 2003

Operating system: Windows Server 2008

will add to the same group all the machines whose operating system is Windows 2003 OR Windows 2008.

 Copyright © Acronis International GmbH, 2002-2013.

b) Entries of different criteria are combined by logical multiplication (AND)

For example, consider the following set of criteria:

Operating system: Windows Server 2003

Operating system: Windows Server 2008

Organizational unit: SERVERS

IP range: 192.168.17.0 - 192.168.17.55

These criteria will add to the same group all of the machines whose operating system is Windows 2003 or Windows 2008 and belong to the SERVERS organizational unit and whose IP addresses are within the range 192.168.17.0 - 192.168.17.55.

Organizational unit criterion

Organizational unit criterion is specified for the domain the management server is currently in, as follows: *OU=OU1*

Select an organizational unit from the Active Directory tree by clicking **Browse**, or typing it manually. If the domain access credentials were not specified in the management server options, the program will ask you to provide them. The credentials will be saved in the Domain access credentials (p. 400) option.

For example, suppose that the domain *us.corp.example.com* has OU1 (which is in the root), OU1 has OU2, and OU2 has OU3. And you need to add the machines of OU3. So, the criterion will be: *OU=OU3, OU=OU2, OU=OU1*

If OU3 has child containers and you also need to add the machines of those containers to the group, select the **Include child containers** check box.

Listed in txt/csv file criterion

When you use this criterion, the dynamic group will include machines from the list given in the specified .txt or .csv file.

If you later modify the file, the contents of the group will change accordingly. The file is checked every 15 minutes.

If you later delete the file or if it becomes unavailable, the contents of the group will correspond to the list that was last stored in the file.

Text file requirements

The file should contain machine names or IP addresses, one machine per line.

Example:

```
Machine_name_1
Machine_name_2
192.168.1.14
192.168.1.15
```

A registered machine has to be specified by its registration address, that is, you need to provide exactly the same host name, fully qualified domain name (FQDN), or IP address as was specified when the machine was initially added to the management server. Otherwise, the machine will not be added to the group. The registration address of each machine can be found in the **Registration address** column in any management server view that contains the machine (the column is hidden by default).

 Copyright © Acronis International GmbH, 2002-2013.

Move one group to another

To move the selected group to another group or to the root

1. In the groups tree, click the group to move the selected group to. You can move any type of custom group (either static, or dynamic) to another custom group of any type, or to the root folder.

   The root folder of the machines tree contains *groups of the first level*. Groups that include other groups are called *parent groups*. Groups that are in parent groups are called *child groups*. All the centralized backup plans created for the parent group will be deployed to the machines of its child groups as well.
2. Click **OK**.

Editing custom groups

Editing a custom group is performed in the same way as creating (p. 381) one.

Changing the type of group will result in its conversion. Any custom group can be converted to a dynamic group if it was static, and vice versa.

- When converting a static group to dynamic, provide grouping criteria. All the members that exist in the static group that do not match the provided criteria will be removed from the dynamic group.
- When converting a dynamic group to static, two options are available – either to leave the current content of the group or to empty the group.

Group details

Aggregates in two tabs all of the information on the selected group. This allows performing operations with the centralized backup plans for the group.

Group

Displays the following information on the group:

- **Name** - name of the selected group
- **Parent group** (for subgroups only) - name of the parent group
- **Machines** - number of machines in the group
- **Type** - type of the group (static or dynamic)
- **Criteria** (for dynamic groups only) - grouping criteria
- **Description** - the group description (if specified)

Backup plans

Displays a list of centralized backup plans related to the group and allows performing the following operations:

To	Do
View details of a backup plan	Click **Details**. In the Backup plans and tasks window, examine all information related to the selected backup plan.

 Copyright © Acronis International GmbH, 2002-2013.

To	Do
View log of a backup plan	Click **Log**. The **Log** view will display a list of the log entries related to the selected backup plan.
Run a backup plan	1. Click **Run**. 2. In the drop-down list, select the plan's task you need run. Running the backup plan starts the selected task of that plan immediately in spite of its schedule and conditions on the machines the plan is deployed to. The centralized backup plan cannot be run manually, if at least one of the machines included in the plan runs Acronis Backup & Recovery 10 agent.
Stop a backup plan	Click **Stop**. Stopping the running backup plan stops all its tasks on all the machines the plan is deployed to. Thus, all the task operations will be aborted. The centralized backup plan cannot be stopped manually, if at least one of the machines included in the plan runs Acronis Backup & Recovery 10 agent.
Refresh table	Click **Refresh**. The management console will update the list of backup plans existing for the machine group with the most recent information. The list is refreshed automatically based on events. However, the data may not be retrieved immediately from the managed machine group, due to some latency. Manual refresh guarantees that the most recent data is displayed.

Filtering and sorting

Filtering and sorting of the backup plans and tasks is performed in the same way as for the **Backup plans and tasks** view. For details, see Sorting, filtering and configuring table items (p. 29).

15.4.3 Virtual machines

You can centrally manage virtual machines using either of the following methods or both:

Adding a virtual machine as a physical machine

Install Acronis Backup & Recovery 11.5 Agent for Windows or Agent for Linux on the virtual machine and register (p. 375) it on the management server. The machine will be treated as a physical one. It will appear under **Machines with agents** in the **All machines with agents** group.

This approach comes in handy when:

- The machine is not hosted on a virtualization server.
- You do not have a license for Acronis Backup & Recovery 11.5 Virtual Edition.
- The Virtual Edition does not support backup at a hypervisor level for this specific virtualization product.
- You need to overcome limitations of the backup at a hypervisor level.

Adding a virtual machine as a virtual machine

Copyright © Acronis International GmbH, 2002-2013.

On Acronis Backup & Recovery 11.5 Management Server, a machine is considered virtual if it can be backed up from the virtualization host without installing an agent on the machine. This is possible when using the Acronis Backup & Recovery 11.5 Advanced Server Virtual edition.

There are several ways to add a virtual machine to the management server:

- Enable integration of the management server with vCenter Server.

  Result. The virtual machines managed by the vCenter Server appear under **Virtual machines** in the **All virtual machines** group. The machines look as unmanageable (grayed out) but can be backed up if automatic agent deployment was enabled during the integration.
- Install and configure Agent for ESX(i) VMware vSphere (Virtual Appliance) or Agent for ESX(i) VMware vSphere (Windows). Register the agent on the management server.

  Result. The machine with the agent (the virtual appliance or the Windows host) appears under **Machines with agents** in the **All machines with agents** group. The virtual machines managed by the agent appear under **Virtual machines** in the **All virtual machines** group.
- Install Agent for Hyper-V on a Hyper-V host or on all nodes of a Hyper-V cluster. Register the agent(s) on the management server.

  Result. The Hyper-V host (nodes) appears under **Machines with agents** in the **All machines with agents** group. The virtual machines managed by the agent(s) appear under **Virtual machines** in the **All virtual machines** group.

Virtual machines added to the management server as virtual machines are present under the **Virtual machines** in the **Navigation** tree. For more information about available operations with these machines see the "Backing up virtual machines" document.

15.4.4 Backup plans and tasks

The **Backup plans and tasks** view keeps you informed of data protection on the machines registered on the management server. This view displays the centralized backup plans that exist on the management server, the management server's and the storage nodes' tasks.

To check whether the data is successfully protected on the machines the centralized plan is deployed to, inspect the cumulative status of the plan.

To find out whether a centralized backup plan is currently being deployed, removed, or updated, check the deployment state of the plan. In each of the states, the backup plan can have one of the following statuses: **Error**; **Warning**; **OK**.

To keep track of a task's current progress, examine its state (p. 331). Check a task status (p. 331) to ascertain the result of a task.

Typical workflow

- Use filters to display the desired backup plans (tasks) in the backup plans table. By default, the table displays all the plans of the managed machine sorted by name. Additionally, you can hide the unneeded columns and show the hidden ones. For more information, see Sorting, filtering and configuring table items (p. 29).
- In the table, select the backup plan (task).
- Use the toolbar's buttons to take an action on the selected plan (task). See the Actions on centralized backup plans and tasks (p. 386) section for details.
- To review detailed information on the selected plan (task), use the information panel at the bottom of the window. The panel is collapsed by default. To expand the panel, click the arrow

 Copyright © Acronis International GmbH, 2002-2013.

mark ( ). The content of the panel is also duplicated in the **Plan details** (p. 336) and **Task details** (p. 337) windows respectively.

15.4.4.1 Actions on centralized backup plans and tasks

The following is a guideline for you to perform operations with tasks and centralized backup plans.

To	Do
Create a new backup plan, or a task on a registered machine	Click **New**, and select one of the following: ▪ Backup plan (centralized) (p. 360) ▪ Recovery task (p. 134) ▪ Validation task (p. 241) For the recovery or validation tasks creation, you have to specify the registered machine the selected task will run on.
View details of the selected plan/task	Click **View details**. In the **Plan details/Task details** window, examine all information related to the selected plan/task.
View a plan's/task's log	Click **View log**. The Log (p. 396) view will display a list of the log entries related to the selected plan/task.
Run a backup plan/task	**Backup plan** 1. Click **Run**. 2. In the drop-down list, select the plan's task you need run. Running the backup plan starts the selected task of that plan immediately in spite of its schedule and conditions on the machines the plan is deployed to. The centralized backup plan cannot be run manually, if at least one of the machines included in the plan runs Acronis Backup & Recovery 10 agent. **Task** The task will be executed immediately in spite of its schedule.
Stop the running backup plan/task	Click **Stop**. **Centralized backup plan** Stopping the running backup plan stops all its tasks on all the machines the plan is deployed to. Thus, all the task operations will be aborted. The centralized backup plan cannot be stopped manually, if at least one of the machines included in the plan runs Acronis Backup & Recovery 10 agent. **Task** Generally, stopping the task aborts its operation (backup, recovery, validation, exporting, conversion, etc.). The task enters the **Idle** state. The task schedule, if created, remains valid. To complete the operation you will have to run the task once again.

Copyright © Acronis International GmbH, 2002-2013.

To	Do
Edit a plan/task	Click **Edit**. **Centralized backup plan** The editing of centralized backup plans is performed in the same way as creating. Once the plan is edited, the management server updates the plan on all machines the plan was deployed to. **Task** The editing of tasks is performed in the same way as their creation.
Clone a backup plan	Click **Clone**. The clone of the original backup plan will be created with default name "*Clone of <original_plan_name>*". The cloned plan will be disabled immediately after cloning, so that it does not run concurrently with the original plan. You can edit the cloned plan settings before enabling it.
Enable a plan	Click **Enable**. The previously disabled backup plan will run again as scheduled.
Disable a plan	Click **Disable**. The backup plan will not run as scheduled. However, it can be started manually. After a manual run, the plan will stay disabled. The plan will run as usual if you enable it again.
Export a plan	Click **Export**. Specify the path and name of the resulting file. See Export and import of backup plans (p. 332) for more information.
Import a plan	Click **Import**. Specify the path and name of the file that contains a previously exported plan. See Export and import of backup plans (p. 332) for more information.
Delete a plan/task	Click **Delete**. **Centralized backup plan** As a result, the centralized backup plan will be removed from the machines it was deployed to and deleted from the management server. If the machine is currently offline, the plan will be removed when the machine comes online again. **Task** As a result, the task will be deleted from the management server. The built-in compacting tasks of storage nodes cannot be deleted.

15.4.5 Storage nodes

Acronis Backup & Recovery 11.5 Storage Node helps you to optimize the usage of various resources which are required to protect enterprise data. This goal is achieved by organizing managed vaults that serve as dedicated storages of the enterprise backup archives.

Storage nodes become available in the **Storage nodes** view after you install and register them on the management server. For more information about operations with storage nodes, see "Storage nodes" (p. 222).

Copyright © Acronis International GmbH, 2002-2013.

15.4.6 Licenses

The **Licenses** view enables you to manage licenses stored on Acronis License Server. The license server can be either integrated with Acronis Backup & Recovery 11.5 Management Server, or installed as a separate component.

Accessing the Licenses view

To access the **Licenses** view when connected to the management server, click **Licenses** in the **Navigation** pane.

To connect to the license server directly:

1. In the **Tools** menu of the console, select **Manage licenses**.
2. Specify the name or IP address of the machine with the license server.
3. Click **OK**. This opens the same **Licenses** view.

Viewing information about licenses

The **Licenses** view displays all license keys that are present on the license server. The keys are grouped by products. One license key can contain multiple licenses.

Right-click on the column headings bar to choose the details to display: License key, Expiration date, Import date, and Total number of license keys, as well as how many of them are Available (i.e. free) and Used.

To view information about each specific license key, expand the required product and then expand the key. To obtain information about machines that use the license, click **Show machines that use the license**.

15.4.6.1 Adding licenses

To be able to manage licenses, add them to the license server first.

To add licenses

1. Click **Add license.**
2. In the **Specify licenses to add** window, type the license keys or to import them from a file. To import licenses from a .txt, .eml, or .xml file, click **Import keys from file** and specify the file containing the list of license keys. You can specify multiple files one by one or enter the license keys manually.
3. Click **OK**.

15.4.6.2 Changing the license server used by the management server

By default, the management server uses the integrated license server. You can make the management server use a different license server. If you already have a separate license server, this functionality helps you to migrate the license server to new hardware.

Before changing the license server, make sure to export (p. 389) the licenses from the old license server and then add (p. 388) them to the new one.

To change the license server

1. Connect the console to the management server.
2. In the **Actions** menu, select **Change license server**.

 Copyright © Acronis International GmbH, 2002-2013.

3. Specify the name or IP address of the machine with the license server.
4. Click **OK**.

After changing the license server, the management server deploys the new license server's IP address to the registered machines and they start using the new license server.

15.4.6.3 Exporting licenses

Before changing the license server, export the licenses from the license server that you plan to change (p. 388). All licenses are saved into .xml file. Later on, you can import (p. 388) these licenses to a new license server.

To export licenses

1. Click **Export licenses to XML**.
2. Specify the file destination (and optionally, the file name).
3. Click **OK** to save the file.

15.4.6.4 Removing licenses

To completely remove a license from the Acronis License Server, select it from the list of available licenses and click **Remove license** on the toolbar. To remove a license that is in use, you need to revoke (p. 389) it first.

15.4.6.5 Revoking licenses

Revoking makes used licenses available again. You may need it in the following cases:

- A component that requires a license (such as an agent) is uninstalled from the machine.

  Revoke the license from the machine either before or after uninstalling the component.
- A managed machine is taken out of service permanently.

  Revoke the license from the machine either before or after taking out the machine.

Make sure that revoking and subsequent reusing the license does not contradict the license agreement and other legal requirements.

To revoke a license:

Expand the required product and then expand the key.

- If the license key is used by a single machine, click **Revoke license** on the toolbar.
- If the license key is used by multiple machines, click **Show machines that use the license**. In the appearing window, select the host from which you wish to revoke the license (see the **Host name** column) and click **Revoke license**.

15.4.6.6 Using the Acronis License Server Management Tool

The LicenseServerCmdLine.exe file is located in the license server installation folder, by default it is \Program Files\Acronis\LicenseServer.

LicenseServerCmdLine.exe uses the following syntax:

```
LicenseServerCmdLine <command> <parameter1> <parameter2>
```

LicenseServerCmdLine.exe supports the following parameters:

 Copyright © Acronis International GmbH, 2002-2013.

```
--status <IP-address or hostname>
```

Displays the total number of licenses and the number of available licenses for each Acronis product.

```
--import <IP-address or hostname> <license key>
```

Adds a new license key to the specified license server. You can specify multiple license keys (space separated).

```
--import-file <IP-address or hostname> <filename>
```

Imports license keys from a .txt or .eml file.

```
--help
```

Shows usage.

15.4.7 Alerts

An alert is a message that warns about actual or potential problems. The **Alerts** view lets you rapidly identify and solve the problems by monitoring the current alerts and view the alerts history.

Active and inactive alerts

An alert can be either in an active, or inactive state. The active state indicates that the issue that caused the alert still exists. An active alert becomes inactive when the problem that caused the alert is resolved either manually or on its own.

***Note**: There is one alert type that is always active: "Backup not created". This is because even if the cause of this alert was resolved and the following backups successfully created, the fact that the backup was not created remains.*

Fixing issues that caused alerts

To find and fix the issue that caused the alert, click **Fix the issue**. You will be taken to the corresponding view,where you can examine the issue and take the necessary steps to resolve it.

Optionally, you can click **View details** to get more information about the alert you select.

Accepting alerts

By default, the **Current alerts** table lists both active and inactive alerts until they are not accepted. To accept an alert, select it and then click **Accept**. By accepting an alert you acknowledge the alert and agree to takeresponsibility for it. The accepted alerts are then moved to the **Accepted alerts** table, with the alert state unchanged.

The **Accepted alerts** table stores the history of the accepted alerts. Here, you can find out who accepted the alert and when it happen. The accepted alerts of both states can be removed from the table either manually, by using **Delete** and **Delete all** buttons, or automatically (see "Configuring alerts" later in this section).

To export entire table contents to a *.txt or *.csv file, click **Save all to file**.

Alerts view on the management server

When the console is connected to the management server, the **Alerts** view displays alerts collected from both the registered machines and the management server.

Alerts collected from the registered machines:

 Copyright © Acronis International GmbH, 2002-2013.

- Appear in the **Alerts** view independently from these machines.
- Accepted separately both on the management server side and the registered machines.

Similar alerts collected from a number of machines are combined in a single group alert. The **Machine** column for group alerts looks as **Multiple (X)**, where **X** - is the number of the registered machines that have this alert. Once a single active alert in the group becomes inactive, the alert is moved to a new or to the existing inactive group. The number of associated machines (**X**) is reduced for the active group alert and increased for the inactive group alert respectively.

To obtain information about machines associated with the group alert, click **View details**.

Configuring alerts

Use the following options at the top of the **Alerts** view to configure alerts:

- **Show/hide alerts** (p. 31) - specify the alert types to display in the **Alerts** view.
- **Notifications** (p. 401) - set up e-mail notifications about alerts.
- **Settings** (p. 399) - specify whether to move inactive alerts to the **Accepted alerts** table automatically; set how long to keep the accepted alerts in the **Accepted alerts** table.

15.4.8 Reporting

Reporting provides the management server administrator with detailed and well-structured information concerning the enterprise data protection operations. Reports can be used as an instrument for profound analysis of the whole backup infrastructure within a corporate network.

The management server generates reports using statistics and logs, which are collected from registered machines and are stored in the dedicated databases.

Report templates

Reports are generated based on report templates. The templates define the information to be included in the report and the way the information is represented.

Acronis Backup & Recovery 11.5 Management Server offers report templates for:

- Registered machines.
- Local and centralized backup plans existing on the registered machines.
- Local and centralized tasks existing on the registered machines.
- Archives and backups stored in the centralized managed vaults.
- Statistics about centralized managed vaults.
- Task activities history.

Reports about machines, backup plans, tasks, archives and backups contain information as of the current time.

Reports about vault statistics and task activities are interval-based and provide historical information for the specified time interval that can last from days to years, depending on the amount of data kept in the databases.

Configuring and generating reports

There are two types of report templates: customizable and predefined.

 Copyright © Acronis International GmbH, 2002-2013.

In a customizable report template, by using filters, you can specify which entries to include in the report, how to group and sort them. To configure a report, select a report template in the **Reports** view, click **Configure** on the toolbar, and then set **Filters** and **Report view**. Click **OK** to generate the report.

A predefined report template is preset so that you can generate a report with one click. To start generating a report, select a report template in the **Reports** view, and then click **Generate** on the toolbar.

The report will contain the information selected, grouped and sorted according to the template settings. Select whether to preview the report in the default browser or to save it to the .xml file. If previewed, the report appears in a separate interactive window that enables expanding and collapsing the tables. To open the saved .xml file use Microsoft Excel or Microsoft Access.

15.4.8.1 Report about the machines

In this view, you can generate a report about the machines that are registered on the management server. This report consists of one or more tables.

Filters

Under **Filters**, choose which machines to include in the report. Only the machines that meet all filter criteria are included.

- **Machines**: The list of machines. Select either machines with agents or virtual machines. [Optional] Click **Select** to select particular machines or machines' groups.
- **Status**: The machine statuses—**OK**, **Warning**, and/or **Error**.
- **Last connection** (machines with agents only): The period within which the last connection between the machines and the management server occurred.
- **Last successful backup**: The period within which the last successful backup finished on each of the machines.
- **Next backup**: The period within which the next scheduled backup will start on each of the machines.
- **Operating system**: The operating systems that the machines run.
- **IP address** (machines with agents only): The range for the latest-known IP addresses of the machines.
- **Availability** (machines with agents only): The types of the machines' availability—**Online** or **Offline**.

With the default filter settings, the report includes all machines with agents.

Report view

Under **Report view**, choose how the report will look:

- Select whether to show all items in a single table or to group them by a particular column.
- Specify which table columns to show, and in which order.
- Specify how to sort the table.

 Copyright © Acronis International GmbH, 2002-2013.

15.4.8.2 Report about the backup plans

In this view, you can generate a report about backup plans existing on registered machines. This report consists of one or more tables.

Filters

Under **Filters**, choose which backup plans to include in the report. Only the backup plans that meet all filter criteria are included.

- **Origin**: The types of origin of the backup plans—**Local** and/or **Centralized**.
- **Machines**: The list of machines on which the backup plans exist.
- **Backed up data type**: The types of backed up data—**Machines/Disks/Volumes** and/or **Files**.
- **Deployment state**: The deployment states of the backup plans—for example, **Revoking**.
- **Execution state**: The execution states of the backup plans—for example, **Running**.
- **Status**: The statuses of the backup plans—**OK**, **Warning**, and/or **Error**.
- **Last finished time**: The moment when the last backup plan's task has finished.
- **Schedule**: The types of the backup plans' schedules—**Manual** and/or **Scheduled**. Manual schedule means that a backup plan runs only when you start it manually.
- **Owner**: The list of users who created the backup plans.

With the default filter settings, the report includes all backup plans from all machines.

Report view

Under **Report view**, choose how the report will look:

- Select whether to show all items in a single table or to group them by a particular column.
- Specify which table columns to show, and in which order.
- Specify how to sort the table.

15.4.8.3 Report about the tasks

In this view, you can generate a report about the tasks that run on registered machines. This report consists of one or more tables.

Filters

Under **Filters**, choose which tasks to include in the report. Only the tasks that meet all filter criteria are included.

- **Origin**: The types of origin of the tasks—**Centralized**, **Local**, and/or **Local without backup plan**. A centralized task belongs to a centralized backup plan. A local task might not belong to a backup plan (for example, a recovery task).
- **Backup plans** (centralized tasks only): The backup plans on which the tasks are based.
- **Machines**: The list of machines on which the tasks exist.
- **Type**: The task types—for example, disk backup tasks.
- **Execution state**: The execution states of the tasks—for example, **Running**.
- **Last result**: The last results of the tasks—**Succeeded**, **Succeeded with warnings**, **Failed**, **Stopped**, or "**-**" (not resulted yet).

Copyright © Acronis International GmbH, 2002-2013.

- **Schedule**: The types of the tasks' schedules—**Manual** or **Scheduled**. Manual schedule means that a task runs only when you start it manually.
- **Owner**: The list of users who created the tasks.
- **Duration**: The limits for the amount of time within which each of the tasks last ran.

With the default filter settings, the report includes all tasks from all machines.

Report view

Under **Report view**, choose how the report will look:

- Select whether to show all items in a single table or to group them by a particular column.
- Specify which table columns to show, and in which order.
- Specify how to sort the table.

15.4.8.4 Report about the archives and backups

In this view, you can generate a report about the archives that are stored in managed centralized vaults. This report consists of one or more tables.

Filters

Under **Filters**, choose which archives to include in the report. Only the archives that meet all filter criteria are included.

- **Vaults**: The list of centralized managed vaults that store the archives.
- **Machines**: The list of registered machines from which the archives were created.
- **Type**: The archive types—disk-level archives and/or file-level archives.
- **Owner**: The list of users who created the archives.
- **Creation time**: The period within which the newest backup was created in each of the archives.
- **Occupied space**: The limits for the space occupied by each of the archives.
- **Data backed up**: The limits for the total size of data that is currently stored in each of the archives. This size may differ from the occupied space because of compression or deduplication.
- **Number of backups**: The limits for the number of backups that each of the archives contains.

With the default filter settings, the report includes all archives that are stored in the centralized managed vaults.

Report view

Under **Report view**, choose how the report will look:

- Select whether to show all items in a single table or to group them by a particular column.
- Specify which table columns to show, and in which order.
- Specify how to sort the table.

15.4.8.5 Report about the vaults' statistics

In this view, you can generate a report about the use of the centralized managed vaults that are currently added to the management server. This report consists of one or more tables and diagrams.

 Copyright © Acronis International GmbH, 2002-2013.

Report coverage

Under **Report coverage**, choose the time interval for which you want to generate the report. The report will show the state of the selected vaults at the specified time on each day in the report period.

Filters

Under **Filters**, select which centralized managed vaults to include in the report, and whether to include information about the combined total of all the selected vaults.

A combined total is the total free and occupied space, total amount of backed up data, total number of archives and backups, and average ratios across the selected vaults.

With the default filter settings, the report includes information about all centralized managed vaults plus the combined total.

Report view

Under **Report view**, choose how the report will look:

- Specify which table columns to show, and in which order.
- Select which diagrams to include in the report. The diagrams show space usage in the vaults.

15.4.8.6 Report about the tasks' runs

In this view, you can generate a report about the tasks that existed on registered machines within a chosen period. This report consists of one or more diagrams, one diagram per machine.

The diagrams show how many times each task finished on a particular day with each of these results: “Succeeded”, “Succeeded with warnings”, and “Failed”.

Report coverage

Under **Report coverage**, choose the time interval for which you want to generate the report.

Filters

Under **Filters**, choose which tasks to include in the report. Only the tasks that meet all filter criteria are included.

- **Origin**: The types of origin of the tasks—**Centralized**, **Local**, and/or **Local without backup plan**. A centralized task belongs to a centralized backup plan. A local task might not belong to a backup plan (for example, a recovery task).
- **Backup plans** (centralized tasks only): The backup plans on which the tasks are based. The default setting means all backup plans that ever existed during the report period.
- **Machines**: The list of machines on which the tasks exist.
- **Type**: The task types—for example, disk backup tasks.
- **Owner**: The list of users who created the tasks.

With the default filter settings, the report includes all tasks that existed on the registered machines any time during the report period.

Copyright © Acronis International GmbH, 2002-2013.

15.4.8.7 Column selection

In the **Column Selection** window, you can choose which table columns to include in the report and in which order.

The tables in the report will contain columns, from left to right, as listed in **Display in report**. The topmost column in the list will be the leftmost column in the report.

When choosing the columns to display, use the left arrow and right arrow buttons to include or exclude columns, and the up arrow and down arrow buttons to change the order of columns.

Some columns—such as **Machine name** in a report about machines—cannot be excluded from the list, or moved up or down in it.

15.4.8.8 Report view

In order for your web browser to correctly display dates and other information in generated reports, enable active content (JavaScript). You can allow active content to run temporarily for the currently displayed webpage, or enable it permanently. To allow active content to run temporarily in Internet Explorer, click the Information bar that appears at the top of the webpage by default, and then click **Allow blocked content**.

To allow active content permanently

in Internet Explorer

1. On the **Tools** menu, click **Internet Options**, and then click the **Advanced** tab.
2. Select the **Allow active content to run files on My Computer** check box under **Security**.
3. Click **OK**.

in Mozilla Firefox

1. On the **Options** menu, click **Content**.
2. Make sure, that the **Enable JavaScript** check box is selected.
3. Click **OK**.

15.4.9 Log

The centralized event log stores the history of operations performed by the management server, the storage nodes, and the registered machines.

To view a plain list of log entries, select **Events** in the **Display** drop-down list; to view log entries grouped by activities, select **Activities**. The details of the selected log entry or activity are shown in the **Information** panel at the bottom of the **Log** view.

Use filters to display the desired activities and log entries in the table. You can also hide the unneeded columns and show the hidden ones. For details, see Sorting, filtering and configuring table items (p. 29). Having selected items in other administration views (**Dashboard**, **Machines with agents**, **Backup plans and tasks**), you can open the **Log** view with already filtered log entries for the item in question.

Select the activity or log entry to take an action on log entries. For details, see Actions on log entries (p. 397) and Log entry details (p. 398).

 Copyright © Acronis International GmbH, 2002-2013.

15.4.9.1 Actions on log entries (centralized)

All the operations described below are performed by clicking the corresponding items on the log **toolbar**. These operations can also be performed with the context menu (by right-clicking the log entry or the activity).

The following is a guideline for you to perform actions on log entries.

To	Do
Select a single activity	Select **Activities** in the **Display** drop-down list and click an activity. The **Information** pane will show log entries for the selected activity.
Select a single log entry	Click on it.
Select multiple log entries	▪ *non-contiguous*: hold down **CTRL** and click the log entries one by one ▪ *contiguous*: select a single log entry, then hold down **SHIFT** and click another log entry. All the log entries between the first and last selections will be selected too.
View a log entry's details	1. Select a log entry. 2. Do one of the following: ▪ Double click the selection. ▪ Click **Details**. The log entry's details will be displayed. See Log entry details (p. 398) for details of the log entry's operations.
Save the selected log entries to a file	1. Display **Activities** and select activities or display **Events** and select log entries. 2. Click **Save selected to file**. 3. In the opened window, specify a path and a name for the file. All log entries of the selected activities or selected log entries will be saved to the specified file.
Save all the log entries to a file	1. Make sure, that the filters are not set. 2. Click **Save all to file**. 3. In the opened window, specify a path and a name for the file. All log entries will be saved to the specified file.
Save all the filtered log entries to a file	1. Set filters to get a list of the log entries that satisfy the filtering criteria. 2. Click **Save all to file**. 3. In the opened window, specify a path and a name for the file. All log entries in the list will be saved to the specified file.
Delete all the log entries	Click **Delete all**. All the log entries will be deleted from the log, and a new log entry will be created. It will contain information about who deleted the log entries and when.
Set up the logging level	Click **Configure logging level**. In the **Logging level** (p. 402) window, specify event types to be collected from the registered machines to the centralized log.

Copyright © Acronis International GmbH, 2002-2013.

15.4.9.2 Centralized log entry details

Displays detailed information on the log entry you have selected and lets you copy the details to the clipboard.

To view details of the next or the previous log entry, click the down arrow button or correspondingly the up arrow button.

To copy the details, click the **Copy to clipboard** button.

Log entry data fields

A centralized log entry contains the following data fields:

- **Type** - Type of event (Error; Warning; Information).
- **Date and time** - Date and time when the event took place.
- **Backup plan** - The backup plan the event relates to (if any).
- **Task** - The task the event relates to (if any).
- **Managed entity type** - The type of the managed entity where the event has occurred (if any).
- **Managed entity** - The name of the managed entity where the event has occurred (if any).
- **Machine** - The name of the machine where the event has occurred (if any).
- **Code** - It can be blank or the program error code if the event type is error. Error code is an integer number that may be used by Acronis support service to solve the problem.
- **Module** - It can be blank or the number of the program module where an error was occurred. It is an integer number that may be used by Acronis support service to solve the problem.
- **Owner** - The user name of the backup plan owner (p. 34).
- **Message** - The event text description.

15.4.10 Management server options

The management server options enable you to adjust the behavior of the Acronis Backup & Recovery 11.5 Management Server.

To access the management server options, connect the console to the management server and then select **Options > Management server options** from the top menu.

15.4.10.1 Acronis WOL Proxy

This option works in combination with the **Use Wake-on-LAN** (p. 92) advanced scheduling setting. Use this option if the management server has to wake up for backup machines located in another subnet.

When the scheduled operation is about to start, the management server sends out magic packets to wake up the appropriate machines. (A magic packet is a packet that contains 16 contiguous copies of the receiving NIC's MAC address). The Acronis WOL Proxy, installed in the other subnet, transfers the packets to machines located in that subnet.

The preset is: **Disabled**.

 Copyright © Acronis International GmbH, 2002-2013.

To bring this option into use:

1. Install Acronis WOL Proxy on any server in the subnet where the machines to be woken are located. The server has to provide continuous services availability. With multiple subnets, install Acronis WOL Proxy in every subnet where you need to use the Wake-On-LAN functionality.
2. Enable **Acronis WOL Proxy** in the **Management server options** as follows:
   a. Select the **Use the following proxies** check box.
   b. Click **Add**, and then enter the name or IP address of the machine where the Acronis WOL Proxy is installed. Provide access credentials for the machine.
   c. Repeat this step if there are several Acronis WOL Proxies.
3. When scheduling a centralized backup plan, enable the **Use Wake-on-LAN** setting.

You also have the ability to delete proxies from the list. Please keep in mind that any change to this option affects the entire management server. If you delete a proxy from the list, the Wake-On-LAN functionality in the corresponding subnet will be disabled for all centralized backup plans including those already deployed.

15.4.10.2 Alerts

Alert management

Remove from "Accepted alerts" items older than

This option defines whether to delete the accepted alerts from the **Accepted alerts** table.

The preset is: **Disabled**.

When enabled, you can specify the keeping period for the accepted alerts. The accepted alerts older than this period will be deleted from the table automatically.

Automatically move inactive alerts to "Accepted alerts"

This option defines whether to accept all the alerts that become inactive and move them to the **Accepted alerts** table automatically.

The preset is: **Disabled**.

When enabled, you can specify the alert types to apply this option to.

Time-based alerts

Last backup

This option is effective when the console is connected to a managed machine (p. 452) or to the management server (p. 452).

The option defines whether to alert if no backup was performed on a given machine for a period of time. You can configure the time period that is considered critical for your business.

The preset is: alert if the last successful backup on a machine was completed more than **5 days** ago.

The alert is displayed in the **Alerts** section of the **Dashboard**. When the console is connected to the management server, this setting will also control the color scheme of the **Last backup** column's value for each machine.

 Copyright © Acronis International GmbH, 2002-2013.

Last connection

This option is effective when the console is connected to the management server or to a registered machine (p. 453).

The option defines whether to alert if no connection was established between a registered machine and the management server for a period of time so indicating that the machine might not be centrally managed (for instance in the case of network connection failure to that machine). You can configure the length of time that is considered critical.

The preset is: alert if the machine's last connection to the management server was more than **5 days** ago.

The alert is displayed in the **Alerts** section of the **Dashboard**. When the console is connected to the management server, this setting will also control the color scheme of the **Last connect** column's value for each machine.

15.4.10.3 Domain access credentials

This option determines the user name and password that the management server will use to access the domain.

The preset is: No credentials

The management server needs domain access credentials when working with a dynamic group that is based on the **Organizational unit** criterion (p. 382). When you are creating such group and no credentials are given by this option, the program will ask you for credentials and save them in this option.

It is sufficient to specify the credentials of a user who is a member of the **Domain Users** group on the domain.

15.4.10.4 E-mail settings

The option enables you to configure e-mail settings to send notifications about alerts which occurred on the management server.

The notification schedule and the types of alerts to send are configured in **Management server options** > **E-mail settings** > **Alert notifications** (p. 401).

The preset is: **Disabled**.

Note: *Alerts warn only about problems. Therefore, e-mail notifications about successful backup or recovery operations will not be sent. These e-mail notifications are configured in Backup options > Notifications > E-mail (p. 122) and in Recovery options > Notifications > E-mail (p. 168) respectively.*

To configure e-mail notification

1. In the **E-mail addresses** field, type the destination e-mail address. You can enter several addresses separated by semicolons.
2. In the **Subject** field, type the notification subject or leave the default value. Variables are not supported in this field.
3. In the **SMTP server** field, enter the name of the outgoing mail server (SMTP).
4. In the **Port** field, set the port of the outgoing mail server. By default, the port is set to **25**.

 Copyright © Acronis International GmbH, 2002-2013.

5. If the outgoing mail server requires authentication, enter **User name** and **Password** of the sender's e-mail account.

   If the SMTP server does not require authentication, leave the **User name** and **Password** fields blank. If you are not sure whether the SMTP server requires authentication, contact your network administrator or your e-mail service provider for assistance.
6. Click **Additional e-mail parameters...** to configure additional e-mail parameters as follows:
   a. **From** – type the name of the sender. If you leave this field empty, the messages will contain the sender's e-mail account in the **From** field.
   b. **Use encryption** – you can opt for encrypted connection to the mail server. SSL and TLS encryption types are available for selection.
   c. Some Internet service providers require authentication on the incoming mail server before being allowed to send something. If this is your case, select the **Log on to incoming mail server** check box to enable a POP server and to set up its settings:
      - **Incoming mail server (POP)** – enter the name of the POP server.
      - **Port** – set the port of the POP server. By default, the port is set to **110**.
      - **User name** and **Password** of the incoming mail server.
   d. Click **OK**.
7. Click **Send test e-mail message** to check whether e-mail notifications work correctly with the specified settings.

Alert notifications

This option enables you to specify when to send e-mail notifications about alerts which occurred on the management server and to select the types of alerts to send.

When using this option, make sure that the e-mail settings are properly configured in **Management server options** > **E-mail settings** (p. 400).

The preset is: **Disabled**.

To configure alert notifications

1. Select when to send alert notifications:
   - **As soon as an alert appears** – to send a notification every time a new alert occurs.

     Click **Select the types of alerts...** to specify the types of alerts to send notifications about.
   - **On schedule send notification about all current alerts** – to send a cumulative alert notification including all alerts which occurred over a time interval you specify.

     Click **Select the types of alerts...** to specify the types of alerts to send notifications about.

     Set up the notification **Frequency** and **Time**.
2. Click **OK**.

15.4.10.5 Event tracing

You can configure the management server to log events in the Application Event Log of Windows, besides the management server's own log.

You can configure the management server to send Simple Network Management Protocol (SNMP) objects to a specified SNMP manager.

 Copyright © Acronis International GmbH, 2002-2013.

SNMP notifications

This option defines whether the management server has to send its own log events to the specified Simple Network Management Protocol (SNMP) managers. You can choose the types of events to be sent.

For detailed information about using SNMP with Acronis Backup & Recovery 11.5, please see "Support for SNMP (p. 53)".

The preset is: **Disabled**.

To set up sending SNMP messages

1. Select the **Send messages to SNMP server** check box.
2. Specify the appropriate options as follows:
   - **Types of events to send** – choose the types of events: **All events**, **Errors and warnings**, or **Errors only**.
   - **Server name/IP** – type the name or IP address of the host running the SNMP management application, the messages will be sent to.
   - **Community** – type the name of the SNMP community to which both the host running SNMP management application and the sending machine belong. The typical community is "public".

   Click **Send test message** to check if the settings are correct.

To disable sending SNMP messages, clear the **Send messages to SNMP server** check box.

The messages are sent over UDP.

Windows event log

This option defines whether the management server has to record its own log events in the Application Event Log of Windows (to see this log, run **eventvwr.exe** or select **Control Panel > Administrative tools > Event Viewer**). You can filter the events to be recorded.

The preset is: **Disabled**.

To enable this option, select the **Log events** check box.

Use the **Types of events to log** check box to filter the events to be logged in the Application Event Log of Windows:

- **All events** - all events (information, warnings and errors)
- **Errors and warnings**
- **Errors only**.

To disable this option, clear the **Log events** check box.

15.4.10.6 Logging level

This option defines whether the management server has to collect log events from the registered machines to the centralized log that is stored in a dedicated database and is available in the **Log** view. You can set the option for all the events at once or select the event types to be collected. If you completely disable collection of the log events, the centralized log will contain only the management server's own log.

The preset is: **Collect logs** for **All events**.

 Copyright © Acronis International GmbH, 2002-2013.

Use the **Types of events to log** combo-box to specify the types of events that will be collected:

- **All events** - all events (information, warnings and errors) occurred on all the machines registered on the management server will be recorded to the centralized log
- **Errors and warnings** - warnings and errors will be recorded to the centralized log
- **Errors only** - only errors will be recorded to the centralized log.

To disable collection of the log events, clear the **Collect logs** check box.

Log cleanup rules

This option specifies how to clean up the centralized event log stored in the management server's reporting database.

This option defines the maximum size of the reporting database.

The preset is: **Maximum log size: 1 GB**. **On cleanup, keep 95% of the maximum log size**.

When the option is enabled, the program compares the actual log size with the maximum size after every 100 log entries. Once the maximum log size is exceeded, the program deletes the oldest log entries. You can select the amount of log entries to retain. The default 95% setting will keep most of the log. With the minimum 1% setting, the log will be nearly cleared.

Even if you remove the log size limit, logging events to an SQL Server Express database will stop after the log size reaches 4 GB, because SQL Express Edition has the 4 GB per database limit. Set the maximum log size to approximately 3.8 GB if you want to use the maximum capacity of the SQL Express database.

This parameter can also be set by using Acronis Administrative Template (p. 413).

15.4.10.7 Online backup proxy

This option is effective only for connection to Acronis Online Backup Storage over the Internet.

This option defines whether the management server will connect to the Internet through a proxy server.

Note: *Acronis Backup & Recovery Online supports only HTTP and HTTPS proxy servers.*

Proxy settings for the agent and the management server are configured separately, even if both are installed on the same machine.

To set up proxy server settings

1. Select the **Use a proxy server** check box.
2. In **Address**, specify the network name or IP address of the proxy server—for example: **proxy.example.com** or **192.168.0.1**
3. In **Port**, specify the port number of the proxy server—for example: **80**
4. If the proxy server requires authentication, specify the credentials in **User name** and **Password**.
5. To test the proxy server settings, click **Test connection**.

 Copyright © Acronis International GmbH, 2002-2013.

15.5 Configuring Acronis Backup & Recovery 11.5 components

There are three ways to configure various parameters of Acronis Backup & Recovery 11.5 components in Windows:

- By using Acronis Administrative Template
- By using the graphical user interface (GUI)
- By modifying the Windows registry

In Linux, instead of using the administrative template and modifying the registry, parameters are configured by editing the corresponding configuration files.

If the values of any of these parameters set through the administrative template differ from those set through the graphical user interface, the template-based parameters take precedence and are effective immediately; the parameters shown in the GUI will be changed accordingly.

The following subtopics describe each way of configuration and the parameters that can be configured through it.

15.5.1 Parameters set through administrative template

The following are the parameters of Acronis Backup & Recovery 11.5 components that can be set by using Acronis Administrative Template. For information on how to apply the administrative template, see "How to load Acronis Administrative Template" (p. 404).

The administrative template contains the configuration parameters of Acronis Backup & Recovery 11.5 Agent, Acronis Backup & Recovery 11.5 Management Server, Acronis Backup & Recovery 11.5 Storage Node, and common parameters of Acronis Backup & Recovery 11.5 components.

The Acronis Backup & Recovery 11.5 Storage Node parameters are described in the "Storage nodes" (p. 228) section. Other parameters are described in the correspondent subtopics.

15.5.1.1 How to load Acronis Administrative Template

The Administrative Template, provided by Acronis, enables the fine-tuning of some security related features, including encrypted communication settings. Through the Microsoft Group Policy mechanism, the template policy settings can be applied to a single computer as well as to a domain.

To load the Acronis Administrative Template

1. Run Windows Group Policy Objects Editor (%windir%\system32\gpedit.msc.)
2. Open the Group Policy object (GPO) you want to edit.
3. Expand **Computer Configuration**.
4. Right click **Administrative Templates**.
5. Click **Add/Remove Templates**.
6. Click **Add**.
7. Browse to Acronis Administrative Template and click **Open**. The path to the Administrative Template is as follows:

 Copyright © Acronis International GmbH, 2002-2013.

- In a 32-bit version of Windows:
  %CommonProgramFiles%\Acronis\Agent\Acronis_agent.adm or
  %ProgramFiles%\Acronis\BackupAndRecoveryConsole\Acronis_agent.adm
- In a 64-bit version of Windows:
  %CommonProgramFiles(x86)%\Acronis\Agent\Acronis_agent.adm or
  %ProgramFiles(x86)%\Acronis\BackupAndRecoveryConsole\Acronis_agent.adm

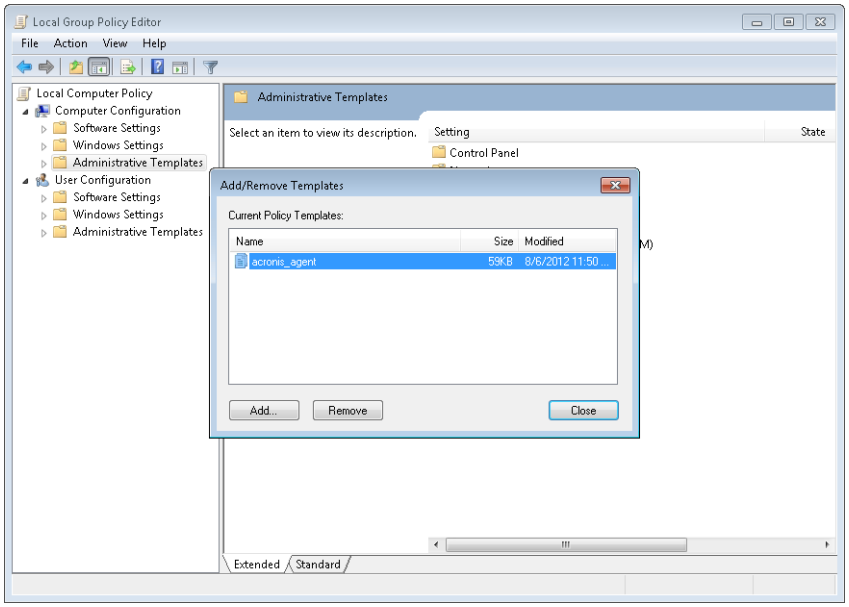
Once the template is loaded, you can open it and edit the desired settings. After loading the template or editing its settings, you should restart the configured component(s) or some of their services.

For detailed information about Windows GPO Editor please see:

http://msdn2.microsoft.com/en-us/library/aa374163.aspx

For detailed information about Group Policies please see:

http://msdn2.microsoft.com/en-us/library/aa374177.aspx



15.5.1.2 Acronis Backup & Recovery 11.5

This section of the administrative template specifies the connection parameters and event tracing parameters for the following Acronis Backup & Recovery 11.5 components:

- Acronis Backup & Recovery 11.5 Management Server
- Acronis Backup & Recovery 11.5 Agent
- Acronis Backup & Recovery 11.5 Storage Node

Connection parameters

Remote Agent ports

Specifies the port that the component will use for incoming and outgoing communication with other Acronis components.

Select one of the following:

Not Configured

 Copyright © Acronis International GmbH, 2002-2013.

The component will use the default TCP port number 9876.

Enabled

The component will use the specified port; type the port number in the **Server TCP Port** box.

Disabled

The same as **Not configured**.

Client Encryption options

Specifies whether to encrypt the transferred data when the component acts as a client application, and whether to trust self-signed SSL certificates.

Select one of the following:

Not Configured

The component will use the default settings, which is to use encryption if possible and to trust self-signed SSL certificates (see the following option).

Enabled

Encryption is enabled. In **Encryption**, select one of the following:

Enabled

Data transfer will be encrypted if encryption is enabled on the server application, otherwise it will be unencrypted.

Disabled

Encryption is disabled; any connection to a server application which requires encryption will not be established.

Required

Data transfer will be performed only if encryption is enabled on the server application (see "Server Encryption options"); it will be encrypted.

Authentication parameters

Selecting the **Trust self-signed certificates** check box allows the client to connect to the server applications that use self-signed SSL certificates such as certificates created during the installation of Acronis Backup & Recovery 11.5 components—see SSL certificates (p. 358).

You should keep this check box selected, unless you have a Public Key Infrastructure (PKI) in your environment.

In **Use Agent Certificate Authentication**, select one of the following:

Do not use

The use of SSL certificates is disabled. Any connection to a server application which requires the use of SSL certificates will not be established.

Use if possible

The use of SSL certificates is enabled. The client will use SSL certificates if their use is enabled on the server application, and will not use them otherwise.

Always use

The use of SSL certificates is enabled. The connection will be established only if the use of SSL certificates is enabled on the server application.

Disabled

The same as **Not configured**.

Server Encryption options

 Copyright © Acronis International GmbH, 2002-2013.

Specifies whether to encrypt the transferred data when the component acts as a server application.

Select one of the following:

Not Configured

The component will use the default setting, which is to use encryption if possible (see the following option).

Enabled

Encryption is enabled. In **Encryption**, select one of the following:

Enabled

Data transfer will be encrypted if encryption is enabled on the client application, otherwise it will be unencrypted.

Disabled

Encryption is disabled; any connection to a client application which requires encryption will not be established.

Required

Data transfer will be performed only if encryption is enabled on the client application (see "Client Encryption options"); it will be encrypted.

Authentication parameters

In **Use Agent Certificate Authentication**, select one of the following:

Do not use

The use of SSL certificates is disabled. Any connection to a client application which requires the use of SSL certificates will not be established.

Use if possible

The use of SSL certificates is enabled. The server will use SSL certificates if their use is enabled on the client application, and will not use them otherwise.

Always use

The use of SSL certificates is enabled. The connection will be established only if the use of SSL certificates is enabled on the client application.

Disabled

The same as **Not configured**.

Event tracing parameters

In Windows, the events occurring in Acronis Backup & Recovery 11.5 can be recorded into the event log, a file, or both.

Each event has a level from zero to five based on the event's severity, as shown in the following table:

Level	Name	Description
0	Unknown	Event whose level of severity is unknown or not applicable
1	Debug	Event used for debug purposes
2	Information	Informational event, such as one about the successful completion of an operation or startup of a service

Copyright © Acronis International GmbH, 2002-2013.

3	Warning	Event which is a possible impending problem, such as low free space in a vault
4	Error	Event that resulted in a loss of data or functionality
5	Critical	Event that resulted in the termination of a process such as the agent's process

Event tracing parameters are specified as the following settings in the administrative template:

File Trace Minimal Level

Description: Specifies the minimum severity level of events to be recorded in the file. Only events of levels greater than or equal to **File Trace Minimal Level** will be recorded.

Possible values: Any severity level from **Unknown** through **Critical**, or **Blocked** to not record any events

Default value: 2 (meaning that events with severity levels two through five will be recorded)

The log files are located inside the folder **%ALLUSERSPROFILE%\Application Data\Acronis** (in Windows XP and Server 2003) or **%PROGRAMDATA%\Acronis** (in Windows Vista and later versions of Windows), in the **Logs** subfolder for the particular component.

Win32 Trace Minimal Level

Description: Specifies the minimum severity level of events to be recorded in the System event log. Only events of levels greater than or equal to **Win32 Trace Minimal Level** will be recorded.

Possible values: Any severity level from **Unknown** through **Critical**, or **Blocked** to not record any events

Default value: 4 (meaning that events about errors and critical errors will be recorded)

Customer Experience Program

Specifies whether the machine where the Acronis Backup & Recovery 11.5 component is installed will participate in the Customer Experience Program.

Select one of the following:

Not Configured

By default, the machine does not participate in the Customer Experience Program.

Enabled

In **Enable sending reports to Acronis**, select one of the following:

Enable

Information about the hardware configuration, the most and least used features and about any problems will be automatically collected from the machine and sent to Acronis on a regular basis. The end results are intended to provide software improvements and enhanced functionality to better meet the needs of Acronis customers. Acronis does not collect any personal data. The terms of participation can be found on the Acronis Web site.

Disable

The information will not be sent.

Disabled

The same as **Not configured**.

 Copyright © Acronis International GmbH, 2002-2013.

15.5.1.3 Acronis Backup & Recovery 11.5 Agent for Windows

The following are the parameters of Acronis Backup & Recovery 11.5 Agent that can be set by using Acronis Administrative Template.

Licensing

Specifies how often the agent checks its license on the license server, and how long it can work without a license server.

License Check Interval (in days)

Description: Specifies how often, in days, to check for license availability on Acronis License Server.

Possible values: Any integer number between **0** and **5**

Default value: **1**

Acronis Backup & Recovery 11.5 Agent periodically checks whether its license key is present on the license server. The first check is performed every time that Acronis Backup & Recovery 11.5 Agent starts and subsequent checks are performed once in the number of days given by **License Check Interval**.

When the agent cannot connect to the license server, a warning is recorded into the agent's log. You can view this warning in the Dashboard.

If the value is **0**, no license check will be performed; without a license, Acronis Backup & Recovery 11.5's functionality will be disabled after the number of days given by **Maximum Time without License Server** (see the next parameter).

See also **License Server Connection Retry Interval** later in this topic.

Maximum Time without License Server (in days)

Description: Specifies how long, in days, Acronis Backup & Recovery 11.5 will work as normal until its functionality is disabled.

Possible values: Any integer number between **0** and **60**

Default value: **30**

If Acronis License Server is unavailable, Acronis Backup & Recovery 11.5 will continue working with full functionality for the number of days specified in **Maximum Time without License Server**, as counted from the moment of installation or from the last successful check.

License Server Connection Retry Interval (in hours)

Description: Specifies the interval, in hours, between connection attempts when Acronis License Server is unavailable.

Possible values: Any integer number between **0** and **24**

Default value: **1**

If, during a check for the license key (see **License Check Interval** earlier in this topic), Acronis Backup & Recovery 11.5 Agent could not connect to the license server, it will try to reconnect once in the number of hours given by **License Server Connection Retry Interval**.

If the value is **0**, no reconnection attempts will be performed; the agent will only check for the license as determined by **License Check Interval**.

License Server Address

Description: Specifies the network name or IP address of Acronis License Server.

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

Copyright © Acronis International GmbH, 2002-2013.

Log Cleanup Rules

Specifies how to clean up the agent log.

This parameter has the following settings:

Max Size

Description: Specifies the maximum size of the agent log folder, in kilobytes.

Possible values: Any integer number between **0** and **2147483647**

Default value: **1048576** (that is, 1 GB)

Percentage To Keep

Description: Specifies the percentage of the maximum log size to keep on cleanup.

Possible values: Any integer number between **0** and **100**

Default value: **95**

For details on how the agent log is cleaned up, see Log cleanup rules (p. 347).

Windows Event Log

Specifies when to record Acronis Backup & Recovery 11.5 Agent's events into the Application Event Log in Windows.

This parameter has two settings:

Trace State

Description: Specifies whether to record the agent's events into the event log.

Possible values: **Enabled** or **Disabled**

Default value: **Enabled**

Trace Level

Description: Specifies the minimum level of severity of events to be recorded into the event log. Only events of levels greater than or equal to the value in **Trace Level** will be recorded.

Possible values: **0** (Internal event), **1** (Debugging information), **2** (Information), **3** (Warning), **4** (Error), or **5** (Critical error)

Default value: **4** (only errors and critical errors will be sent—if **Trace State** is set to **Enabled**)

SNMP

Specifies the types of the agent's events to send notifications about by means of Simple Network Management Protocol (SNMP).

This parameter has the following settings:

Trace State

Description: Specifies whether to send the SNMP notifications.

Possible values: **Enabled** or **Disabled**

Default value: **Enabled**

Trace Level

Description: Specifies the minimum level of severity of events for sending SNMP notifications about them. Only notifications about events of levels greater than or equal to **Trace Level** will be sent.

Possible values: **0** (Internal event), **1** (Debugging information), **2** (Information), **3** (Warning), **4** (Error), or **5** (Critical error)

Default value: **4** (only errors and critical errors will be sent—if **Trace State** is set to **Enabled**)

SNMP Address

 Copyright © Acronis International GmbH, 2002-2013.

Description: Specifies the network name or IP address of the SNMP server.

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

SNMP Community

Description: Specifies the community name for the SNMP notifications.

Possible values: Any string 0 to 32765 characters long

Default value: **public**

Snapshot Storage

Specifies the location and initial size of the snapshot storage—a temporary file that is used when backing up data by taking a snapshot. This file is deleted as soon as the backup is complete.

With the default settings, the snapshot storage is created in the temporary files folder of the agent and initially occupies 20 percent of the space available on the volume containing that folder. This size may then grow if more space is needed for the snapshot.

You may want to increase the initial size of the snapshot storage—or to place it on a different volume—when experiencing problems with backing up data that changes extensively during backup.

This parameter is used when creating a local backup plan. Changes to this parameter do not affect already existing local backup plans.

This parameter has the following settings:

Path to the snapshot folder

Description: Specifies the folder in which to create the snapshot storage.

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

An empty string means the folder %ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\MMS\Temp (in Windows XP and Server 2003) or %PROGRAMDATA%\Acronis\BackupAndRecovery\MMS\Temp (in Windows Vista and later versions of Windows).

You can specify a local folder on any volume, including a volume you are backing up.

Pre-allocated storage size (in Megabytes)

Description: Specifies the initial size of the snapshot storage, in megabytes.

Possible values: Any integer number between **0** and **2147483647**

Default value: **0**

If this setting is **0**, the management server uses the **Pre-allocated storage size (in percent)** setting.

The initial size will not exceed the available space minus 50 MB.

Pre-allocated storage size (in percent)

This setting is effective only when the **Pre-allocated storage size (in Megabytes)** setting is **0**.

Description: Specifies the initial size of the snapshot storage as a percentage of the disk space that is available at the time of starting the backup.

Possible values: Any integer number between **0** and **100**

Default value: **50**

If this setting is **0**, the snapshot storage will not be created.

The initial size will not exceed the available space minus 50 MB.

 Copyright © Acronis International GmbH, 2002-2013.

Without the snapshot storage, taking snapshots is still possible.

The size of the snapshot storage does not affect the size of the backup.

Online Backup Proxy

Specifies proxy server settings for connection to Acronis Online Backup Storage over the Internet.

This parameter has the following settings:

Proxy

Description: Specifies whether to use a proxy server

Possible values: **Enabled** or **Disabled**

Default value: **Enabled**

If the value of this parameter is **Disabled**, all of the following parameters are ignored.

Proxy server address

Description: Specifies the name or IP address of the proxy server

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

Proxy server port

Description: Specifies the port number of the proxy server

Possible values: Any integer number between **0** and **65535**

Default value: **0**

Online Backup Proxy Credentials

Use the following two parameters if the proxy server for connection to Acronis Online Backup Storage requires authentication.

User name

Description: Specifies the user name for authentication with the proxy server

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

Password

Description: Specifies the password for authentication with the proxy server

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

Important. The password can be viewed by any user who has access to the administrative template, such as to an administrator of the machine.

Cataloging

Description: Specifies whether Acronis Backup & Recovery 11.5 Agent will catalog backups in unmanaged vaults.

Possible values: **Enabled** (catalog) or **Disabled** (do not catalog)

Default value: **Enabled**

If the value of this parameter is **Disabled**, the **Data view** for a vault will not display any data when the management console is directly connected to the machine.

Suppress machine reboot on running task

Description: Specifies what to do if the machine needs to be turned off or restarted while a task is running.

 Copyright © Acronis International GmbH, 2002-2013.

Possible values: **Enabled** (wait until the task is finished) or **Disabled** (stop the task)

Default value: **Disabled**

15.5.1.4 Acronis Backup & Recovery 11.5 Management Server

The following are the parameters of Acronis Backup & Recovery 11.5 Management Server that can be set by using Acronis Administrative Template.

Collecting Logs

Specifies when to collect log entries from machines managed by Acronis Backup & Recovery 11.5 Management Server.

This parameter contains two settings:

Trace State

Description: Specifies whether to collect the log entries about the components' events from the registered machines.

Possible values: **Enabled** or **Disabled**

Default value: **Enabled**

Trace Level

Description: Specifies the minimum level of severity of collected entries. Only entries of levels greater than or equal to the value in **Trace Level** will be collected.

Possible values: **0** (Internal event), **1** (Debugging information), **2** (Information), **3** (Warning), **4** (Error), or **5** (Critical error)

Default value: **0** (all entries will be collected)

Log Cleanup Rules

Specifies how to clean up the centralized event log stored in the management server's reporting database.

This parameter has the following settings:

Max Size

Description: Specifies the maximum size of the centralized event log, in kilobytes.

Possible values: Any integer number between **0** and **2147483647**

Default value: **1048576** (that is, 1 GB)

Percentage to Keep

Description: Specifies the percentage of the maximum log size to keep on cleanup

Possible values: Any integer number between **0** and **100**

Default value: **95**

For details on how the centralized event log is cleaned up, see Log cleanup rules (p. 403).

Windows Event Log

Specifies when to record Acronis Backup & Recovery 11.5 Management Server's events into the Application Event Log in Windows.

This parameter has two settings:

Trace State

Description: Specifies whether to record Acronis Backup & Recovery 11.5 Management Server's events into the event log.

Possible values: **Enabled** or **Disabled**

 Copyright © Acronis International GmbH, 2002-2013.

Default value: **Enabled**

Trace Level

Description: Specifies the minimum level of severity of events to be recorded into the event log. Only events of levels greater than or equal to the value in **Trace Level** will be recorded.

Possible values: **0** (Internal event), **1** (Debugging information), **2** (Information), **3** (Warning), **4** (Error), or **5** (Critical error)

Default value: **4** (only errors and critical errors will be sent—if **Trace State** is set to **Enabled**)

SNMP

Specifies the types of the management server's events to send notifications about by means of Simple Network Management Protocol (SNMP).

This parameter contains the following settings:

Trace State

Description: Specifies whether to send the SNMP notifications.

Possible values: **Enabled** or **Disabled**

Default value: **Enabled**

Trace Level

Description: Specifies the minimum level of severity of events for sending SNMP notifications about them. Only notifications about events of levels greater than or equal to **Trace Level** will be sent.

Possible values: **0** (Internal event), **1** (Debugging information), **2** (Information), **3** (Warning), **4** (Error), or **5** (Critical error)

Default value: **4** (only errors and critical errors will be sent—if **Trace State** is set to **Enabled**)

SNMP Address

Description: Specifies the network name or IP address of the SNMP server.

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

SNMP Community

Description: Specifies the community name for the SNMP notifications.

Possible values: Any string 0 to 32765 characters long

Default value: **public**

Synchronization

Specifies how Acronis Backup & Recovery 11.5 Management Server connects to registered machines for deployment of centralized backup plans, retrieval of logs and backup plan states, and similar actions—collectively called synchronization.

This parameter has the following settings:

Maximum Connections

Description: Specifies the maximum number of simultaneous synchronization connections to keep.

Possible values: Any integer number between **1** and **500**

Default value: **200**

Copyright © Acronis International GmbH, 2002-2013.

If the total number of online registered machines does not exceed the value in **Maximum Connections**, connections to those machines are always kept, and the management server periodically performs synchronization with each machine.

Otherwise, it connects to a number of registered machines depending on the allotted number of simultaneous connections. After synchronization for a machine is complete, the management server may disconnect from that machine and use the free connection for synchronization with another machine, and so on.

(Note: Connections to machines with high synchronization priority—see **Period-High Priority** later in this topic—are likely to be always kept.)

Synchronization connections are unrelated to connections such as those between Acronis Backup & Recovery 11.5 Management Server and Acronis Backup & Recovery 11.5 Management Console.

Maximum Workers

Description: Specifies the maximum number of threads to use for synchronization.

Possible values: Any integer number between **1** and **100**

Default value: **30**

The management server's process uses special threads—called worker threads or workers—to perform synchronization for a registered machine which is connected for synchronization.

Each worker performs synchronization for exactly one machine at a time.

A connected machine to be synchronized waits for an available worker. For this reason, the actual number of workers will never exceed the maximum number of connections (see **Maximum Connections** described previously).

Period (in seconds)

Description: Specifies how often, in seconds, to perform synchronization for machines that have a normal synchronization priority—typically, the machines without currently running centralized backup tasks.

Possible values: Any integer number between **120** and **2147483647**

Default value: **120**

Acronis Backup & Recovery 11.5 Management Server tries to perform synchronization for each normal-priority machine once in the number of seconds given by **Period**, by using an available worker thread (see **Maximum Workers** described previously).

If there are fewer worker threads than normal-priority machines, the actual interval between synchronizations may be longer than the value of this parameter.

Period-High Priority (in seconds)

Description: Specifies how often, in seconds, to perform synchronization for machines that have a high synchronization priority—typically, the machines with currently running centralized backup tasks.

Possible values: Any integer number between **15** and **2147483647**

Default value: **15**

This parameter is analogous to the **Period** parameter described previously.

Real-Time Monitoring

Description: Specifies whether to perform real-time monitoring of registered machines instead of using a polling mechanism.

Possible values: **Enabled** or **Disabled**

 Copyright © Acronis International GmbH, 2002-2013.

Default value: **Disabled**

By default, Acronis Backup & Recovery 11.5 Management Server connects to registered machines to perform synchronization—in particular, to retrieve data such as backup logs. This approach is known as a polling mechanism.

If **Real Time Monitoring** is set to **Enabled**, the management server instead sends requests to machines to provide new data whenever it will appear, and then enters a listening mode. This approach is called real-time monitoring.

Real-time monitoring may reduce network traffic—for example, when centralized backup tasks run infrequently. However, it is effective only when there are relatively few registered machines.

Avoid enabling real-time monitoring if the number of registered machines exceeds the maximum number of simultaneous connections (see **Maximum Connections** earlier in this topic).

Second Connection Attempt

Description: Specifies whether to try to connect to a registered machine by using its last-known IP address after an attempt to connect to it by using its host name has failed.

Possible values: **Enabled** or **Disabled**

Default value: **Disabled**

When connecting to a registered machine, Acronis Backup & Recovery 11.5 Management Server first uses the machine's network name—provided that the machine was added to the management server by name.

If **Second Connection Attempt** is set to **Enabled** and a connection to the machine by using its network name has failed, the management server performs a second connection attempt, this time using the latest IP address which was associated with that network name.

We recommend setting **Second Connection Attempt** to **Enabled** only in networks which often experience problems with their DNS servers, and provided that the machines' IP addresses change infrequently—as in cases of fixed IP addresses or long DHCP lease times.

This setting has no effect on machines that were added to the management server by IP address.

Offline Period Threshold (in seconds)

Description: Specifies the maximum interval, in seconds, between attempts to connect to a registered machine which appears to be offline.

Possible values: Any integer number between **1800** and **2147483647**

Default value: **1800**

Normally, the management server connects to each registered machine with a certain time interval (see **Period** and **Period-High Priority** earlier in this section). When the management server discovers that the machine is offline, it doubles this interval; it keeps doubling this interval on each further attempt until reaching the value specified in **Offline Period Threshold**. If the machine comes back online, the time interval becomes normal again.

This approach aims at efficient use of the management server resources and reducing the network load.

Snapshot Storage

Specifies the location and initial size of the snapshot storage—a temporary file that is used when backing up data by taking a snapshot. This file is deleted as soon as the backup is complete.

 Copyright © Acronis International GmbH, 2002-2013.

With the default settings, the snapshot storage is created in the temporary files folder of the corresponding agent and initially occupies 20 percent of the space available on the volume containing that folder. This size may then grow if more space is needed for the snapshot.

You may want to increase the initial size of the snapshot storage—or to place it on a different volume—when experiencing problems with backing up data that changes extensively during backup.

This parameter is used when creating a centralized backup plan. Changes to this parameter do not affect already existing centralized backup plans.

This parameter has the following settings:

Path to the snapshot folder

Description: Specifies the folder in which to place the snapshot storage.

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

An empty string means the folder %ALLUSERSPROFILE%\Application Data\Acronis\BackupAndRecovery\MMS\Temp (in Windows XP and Server 2003) or %PROGRAMDATA%\Acronis\BackupAndRecovery\MMS\Temp (in Windows Vista and later versions of Windows).

You can specify a local folder on any volume, including a volume you are backing up.

Pre-allocated storage size (in Megabytes)

Description: Specifies the initial size of the snapshot storage, in megabytes.

Possible values: Any integer number between **0** and **2147483647**

Default value: **0**

If this setting is **0**, the management server uses the **Pre-allocated storage size (in percent)** setting.

The initial size will not exceed the available space minus 50 MB.

Pre-allocated storage size (in percent)

This setting is effective only when the **Pre-allocated storage size (in Megabytes)** setting is **0**.

Description: Specifies the initial size of the snapshot storage as a percentage of the disk space that is available at the time of starting the backup.

Possible values: Any integer number between **0** and **100**

Default value: **50**

If this setting is **0**, the snapshot storage will not be created.

The initial size will not exceed the available space minus 50 MB.

Without the snapshot storage, taking snapshots is still possible.

The size of the snapshot storage does not affect the size of the backup.

Online Backup Proxy

Specifies proxy server settings for connection to Acronis Online Backup Storage over the Internet.

This parameter has the following settings:

Proxy

Description: Specifies whether to use a proxy server

Possible values: **Enabled** or **Disabled**

Default value: **Enabled**

If the value of this parameter is **Disabled**, all of the following parameters are ignored.

 Copyright © Acronis International GmbH, 2002-2013.

Proxy server address

Description: Specifies the name or IP address of the proxy server

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

Proxy server port

Description: Specifies the port number of the proxy server

Possible values: Any integer number between **0** and **65535**

Default value: **0**

Online Backup Proxy Credentials

Use the following two parameters if the proxy server for connection to Acronis Online Backup Storage requires authentication.

User name

Description: Specifies the user name for authentication with the proxy server

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

Password

Description: Specifies the password for authentication with the proxy server

Possible values: Any string 0 to 32765 characters long

Default value: Empty string

Important. The password can be viewed by any user who has access to the administrative template, such as to an administrator of the machine.

Customer Experience Program

Description: Specifies whether the management server participates in the Customer Experience Program.

Possible values: **Enabled** (participate) or **Disabled** (do not participate)

Default value: **Enabled**

15.5.1.5 Acronis Backup & Recovery 11.5 Management Console

The following are the parameters of Acronis Backup & Recovery 11.5 Management Console that can be set by using Acronis Administrative Template.

Check for updates

Description: Specifies whether the automatic check for software updates is performed each time you start the management console.

Possible values: **Enabled** (perform the check) or **Disabled** (do not perform the check)

Default value: **Enabled**

Customer Experience Program

Description: Specifies whether the management console participates in the Customer Experience Program.

Possible values: **Enabled** (participate) or **Disabled** (do not participate)

Default value: **Enabled**

Copyright © Acronis International GmbH, 2002-2013.

Smart Error Reporting

Description: Specifies whether an error message displayed by the management console will include a link to a relevant Acronis Knowledge Base article.

Possible values: **Enabled** (include) or **Disabled** (do not include)

Default value: **Enabled**

Copyright © Acronis International GmbH, 2002-2013.

16 Online backup

This section provides details about using the Acronis Backup & Recovery Online service. This service enables you to do online backups to Acronis Online Backup Storage.

Acronis Backup & Recovery Online might be unavailable in your region. To find more information, click here: http://www.acronis.eu/my/backup-recovery-online/

To configure backup to the online storage or recovery from the storage, follow the regular steps described in the corresponding sections:

Creating a backup plan (p. 55)

Creating a centralized backup plan (p. 360)

Recovering data (p. 134)

The main difference is that you select the online storage as the backup destination.

Host-based backups of virtual machines are possible with Acronis Backup & Recovery 11.5 Virtual Edition. You can back up all virtual machines managed by Agent for ESX(i) or Agent for Hyper-V with a single subscription for virtual machines.

16.1 Introduction to Acronis Backup & Recovery Online

This section contains a brief overview of Acronis Backup & Recovery Online and answers questions that may arise during evaluation and usage of this product.

16.1.1 What is Acronis Backup & Recovery Online?

Acronis Backup & Recovery Online is a service that enables you to back up data to Acronis Online Backup Storage. To use this service, you need to buy a subscription that determines the amount of storage space reserved for your backups (storage quota) and how long the online service will be available to you.

Examples of subscriptions:

- A 1 TB/ 1 year volume subscription means that you can back up data from an unlimited number of physical and/or virtual machines, for a period of one year. The backups can occupy no more than one terabyte.
- A 250 GB/ 1 year workstation subscription means that you can back up data from a machine running a non-server Windows operating system, for a period of one year. The backups can occupy no more than 250 GB.

16.1.2 What data can I back up and recover?

You can back up files, volumes, disks, or the entire physical machine as often as you wish. Unlike most online backup solutions, Acronis Backup & Recovery Online enables bare metal recovery directly from the online storage. Files can be recovered from disk-level backups as well as from file-level backups.

 Copyright © Acronis International GmbH, 2002-2013.

For information about backing up virtual machines see "How to back up virtual machines to the online storage?" (p. 421)

16.1.3 How long will my backups be kept in the online storage?

Your backups remain in the online storage until you delete them or until the subscription expires. Recovering data from the online storage is possible for 30 days following the subscription expiration date.

For effective use of the storage space, you have the option to set up the "**Delete backups older than**" retention rule.

Example

You might want to use the following backup strategy for a file server.

Back up the critical files twice a day on a schedule. Set the retention rule "**Delete backups older than**" 7 days. This means that after every backup the software will check for backups older than 7 days and delete them automatically.

Run backup of the server's system volume manually as required. For example, after the operating system updates. Manually delete the backups that you do not need.

16.1.4 How do I secure my data?

Backups can be encrypted using the Advanced Encryption Standard (AES) cryptographic algorithm and the password you set. This guarantees that your data is not accessed by anyone else.

16.1.5 How do I back up virtual machines to the online storage?

Use either of the following methods or both.

Install Acronis software onto the virtualization host

This approach comes in handy when the virtualization product installed on the host server *is* VMware ESX(i), Windows Server with Hyper-V, or Microsoft Hyper-V Server.

Host-based backup is available only for paid licenses of VMware ESXi. If your ESXi uses a free license, choose the alternative approach described later in this section.

In this approach, you install one or more Acronis agents onto the virtualization hosts or dedicated Windows machines. Each agent can back up multiple virtual machines by using a single subscription for virtual machines. Therefore, you need as many subscriptions as the number of the agents. Alternatively, the agents can use a volume subscription that can be shared with other virtual or physical machines.

You will be able to back up and recover entire virtual machines or individual disks and volumes. In addition, you can recover individual files and folders to the agent's local file system (in Windows only), a network share, FTP or SFTP server. You cannot recover files directly to a virtual machine’s file system.

Installing the software, backing up, and recovery are described in the "Backing up Virtual Machines" document for Acronis Backup & Recovery 11.5 Virtual Edition. When installing Acronis Backup & Recovery 11.5 for online backup only, you do not need to enter a license key during installation.

 Copyright © Acronis International GmbH, 2002-2013.

Because ESX(i) machines may be automatically redistributed among the agents, you need to manually bind the machines to their agents so that the machines always use the same subscription.

Install Acronis software into the guest system

This approach applies only to virtual machines running Windows.

This approach comes in handy when:

- the machine is not hosted on a virtualization server
- the virtualization product installed on the host server is *not* VMware ESX(i), Windows Server with Hyper-V, or Microsoft Hyper-V Server
- you want to back up an independent disk or an RDM disk attached in the physical compatibility mode on a running ESX(i) machine
- you want to back up a pass-through disk of a Hyper-V virtual machine
- you want to use pre/post backup or pre/post data capture commands on the virtual machine
- you want to back up individual files and folders of the virtual machine
- you want to recover files directly to the virtual machine's file system.

The machine will be treated as a physical one. If you do not have a volume subscription, you will need a separate server or workstation subscription for this machine.

Installing the software, backing up, and recovery are the same as with a physical machine.

16.1.6 Supported operating systems and virtualization products

Server operating systems supported by Acronis Backup & Recovery Online:

Windows 2000 SP4 – all editions except for the Datacenter and Professional editions

Windows Server 2003/2003 R2 – Standard and Enterprise editions (x86, x64)

Windows Small Business Server 2003/2003 R2

Windows Server 2008 – Standard, Enterprise, Datacenter, and Web editions (x86, x64)

Windows Small Business Server 2008

Windows Server 2008 R2 – Standard, Enterprise, Datacenter, Foundation, and Web editions

Windows MultiPoint Server 2010/2011

Windows Small Business Server 2011 – all editions

Windows Server 2012/2012 R2 – all editions

Windows Storage Server 2003/2008/2008 R2/2012

Workstation operating systems supported by Acronis Backup & Recovery Online:

Windows 2000 Professional SP4

Windows XP Professional SP2+ (x86, x64)

Windows Vista – all editions except for Vista Home Basic and Vista Home Premium (x86, x64)

Windows 7 – all editions except for the Starter and Home editions (x86, x64)

Windows 8/8.1 – all editions except for the Windows RT editions (x86, x64)

Virtualization products supported by Acronis Backup & Recovery Online (host-based backup of virtual machines):

VMware ESX Infrastructure 3.5 Update 2+

 Copyright © Acronis International GmbH, 2002-2013.

VMware ESX(i) 4.0, 4.1, 5.0, 5.1, and 5.5

(Host-based backup is available only for paid licenses of VMware ESXi.)

Windows Server 2008 (x64) with Hyper-V

Windows Server 2008 R2 with Hyper-V

Microsoft Hyper-V Server 2008/2008 R2

Windows Server 2012/2012 R2 with Hyper-V

Microsoft Hyper-V Server 2012/2012 R2

16.1.7 Backup and recovery FAQ

This section answers questions related to backup and recovery processes.

16.1.7.1 What backup methods are available?

Full and incremental backup methods are available through several backup schemes. Regardless of the backup scheme, the first task run produces a full backup; subsequent task runs produce incremental backups. The following backup schemes are available:

- **Manual start** (postponed start). You can run the task again manually.
- **Simple** (start on schedule). With this backup scheme, you can set up a retention rule to automatically delete old backups.
- **GFS (Grandfather-Father-Son)** (start on schedule). You specify which of the daily backups to consider as weekly backups and monthly backups. You can set up separate retention rules for daily, weekly, and monthly backups.
- **Tower of Hanoi** (start on schedule). You set up the number of levels. This is the number of backups stored at a time. The excessive backups will be deleted in a manner that leaves more recovery points for recent dates and fewer recovery points for older dates.
- An additional backup scheme that is available only for online storage is **Initial seeding**. With this scheme, the backup starts immediately to a local destination and using the full backup method. To use this scheme, you need a license for the Initial Seeding (p. 74) service.

16.1.7.2 What recovery methods are available?

There are two methods to recover your data from Acronis Online Backup Storage:

- Recovering disks or files by using Acronis Backup & Recovery 11.5 GUI or command line interface. This method enables you to use a wide range of Acronis Backup & Recovery 11.5 functionality.
- Retrieving files (p. 438) from file-level backups by using a Web browser. To do this, you only need a machine with Internet access.

16.1.7.3 Is the online storage available under Acronis bootable media?

Recovery from Acronis Online Backup Storage is available but backup to the storage is not.

16.1.7.4 Can I use Acronis Universal Restore when recovering a system from the online storage?

Yes. Acronis Universal Restore is always available when recovering a system from the online storage. Using Acronis Universal Restore when recovering from other types of storage will require a separate license.

Copyright © Acronis International GmbH, 2002-2013.

16.1.7.5 What if a network connection is lost during online backup or recovery?

The software will try to reach the online storage every 30 seconds. The attempts will be stopped as soon as the connection is resumed OR a certain number of attempts are performed, depending on which comes first. The default number of attempts is 300 when backing up and 30 when recovering.

You can change the number of attempts and the interval between the attempts in the **Error handling** > **Re-attempt, if an error occurs** option. Every backup plan or recovery task includes this option.

16.1.7.6 What happens if I run out of space?

When a machine's backups are about to exceed the storage space allowed by its subscription, you receive an e-mail notification with an alert. In addition, you can see this alert on the account management Web page near the machine. This means you have to free some space for future backups. Or, you can consider increasing the storage quota (p. 433). You may also want to set or edit the retention rule (p. 421) so that an overflow does not occur in future. Once the occupied space reaches the limit, the backups will cease to run.

16.1.7.7 What is the cleanup task for?

Any backup plan where the retention rule is set contains a cleanup task in addition to a backup task. The cleanup task checks the archive created by the backup plan for backups that have outlived their lifetime. If such backups are found, the task makes the online storage delete them. Since the deletion is performed on the online storage side, it does not take your machine's CPU resource.

The cleanup task runs after every online backup, even if the backup has failed. The last successful backup is always kept though. For more information about the retention rule please refer to "How long will my backups be kept in the online storage?" (p. 421)

Normally, there is no need to start and stop the cleanup task manually. But it is possible to do so in the **Backup plans and tasks** view.

16.1.7.8 How do I make a recovered machine recognize its subscription?

When you recover a physical machine from a backup, a new machine identifier is created. Therefore, the machine is not able to back up to the subscription it used before recovery.

To continue backing up the machine to the same subscription, reassign (p. 436) the subscription to the machine. If you do this, the next machine's backup can be incremental. If you assign a new subscription to the machine, the software will have to do a new full backup.

16.1.8 Initial Seeding FAQ

This section explains what Initial Seeding is, why you would want to use it and provides some usage details.

16.1.8.1 What is Initial Seeding?

Initial Seeding is an extra service that lets you save an initial full backup locally and then send it to Acronis on a hard disk drive.

 Copyright © Acronis International GmbH, 2002-2013.

Acronis uploads the backup to the online storage. After that, you can add incremental backups to this full backup, either manually or on a schedule.

The hard disk drive is sent back to you but it is not possible to recover from it. However, recovery from a locally attached device is possible with the Large scale recovery (p. 429) option.

16.1.8.2 Why would I want to use Initial Seeding?

This service helps you save time and network traffic during the initial full backup. It is useful when backing up very large volumes of data or entire machines to the online storage.

16.1.8.3 Is Initial Seeding a paid service?

Yes, you need to buy one Initial Seeding license per machine.

16.1.8.4 What types of hard drive can I use for Initial Seeding?

Acronis accepts hard disk drives of the following interface types: IDE, ATA, SATA, USB connected drives. SCSI drives are not accepted.

You can back up directly to the device or back up to a local or network folder and then copy the backup to the device. Make sure that the device has only one volume and that the file system on that volume is NTFS or FAT32.

16.1.8.5 Can I send more than one backup under a single Initial Seeding license?

No. An Initial Seeding license allows you to create only one backup on the machine.

However, if you have made a mistake or have decided to create another backup for any reason, you can cancel the initial seeding order. As a result, the license will become available again.

16.1.8.6 Can I send backups taken from a number of machines on a single hard drive?

Yes. However, the number of required licenses is still one per machine.

16.1.8.7 How to buy an Initial Seeding license?

You can buy an Initial Seeding license from an Acronis partner or in Acronis online store. Follow the link http://www.acronis.eu/my/backup-recovery-online/#buy to locate a partner or to buy online.

Having purchased a license from an Acronis partner, you receive a confirmation e-mail with a registration code. Click **Enter new registration code** on the same Web page and register the license. The license becomes available on the **Initial Seeding / Recovery** tab.

A license purchased in Acronis online store becomes available immediately after the payment is processed.

16.1.8.8 How do I perform initial seeding?

1. Ensure that you have activated an Acronis Backup & Recovery Online subscription on the machine where you will do initial seeding (skip this step if you have a volume subscription).

 Copyright © Acronis International GmbH, 2002-2013.

2. If you are currently using a trial subscription, make sure that you also have a paid subscription available and assigned to this machine. Do not use the Initial Seeding service if you do not have a paid subscription.
3. Decide on the media (p. 425) that you will send.
4. Attach the media to the machine you are going to back up. Alternatively, you can back up to a local or network folder and then copy/move the backup to the media.
5. Start Acronis Backup & Recovery 11.5, click **Create backup plan** and create a backup plan on this machine:
   - Under **What to back up**, select disks, volumes or files/folders you want to back up.
   - Under **Where to back up**, specify **Online Backup Storage**.
   - In **Backup scheme**, select **Initial seeding**. Specify the said media as the backup destination.
   - [Optional, but strongly recommended] Enable backup encryption in **Backup options** > **Archive protection**.

   The backup starts immediately after you click the final **OK**.
6. [Optional] If you want to add backups from another machine, attach the media to that machine and perform the same steps. You need a separate Initial Seeding license for each machine that you want to back up.
7. Package (p. 426) the media along with a prepaid return shipping label and send it to Acronis by physical mail. The address is available on your account management Web page > **Initial Seeding / Recovery** tab > **Orders in process** > **Initial Seeding orders** > **Datacenter address**.
8. On the same Web page, mark the order as "shipped" and track (p. 428) the order status.
9. Once you observe that the backup has been uploaded on the online storage, you can edit the backup plan to do incremental backups:
   - In **Backup scheme**, select the desired backup scheme and specify its settings.
   - Click **Save**.

   When started manually or on schedule, your backup plan will add incremental backups to the initial backup stored in the online storage.

16.1.8.9 How to package a hard drive for shipment?

It is very important that your hard drive be packaged carefully. Careful packaging will protect your drive from any damage during shipment.

Hard drive types

Acronis accepts hard disk drives of the following interface types: IDE, ATA, SATA, USB connected drives.

SCSI drives are not accepted.

Packaging

If possible, use the original packaging. Otherwise, packaging materials can be obtained at any shipping outlet or stationary store. You should also include all necessary cables or adapters to the drive. Acronis will not be able to process your initial seeding request if there are no cables included.

The following are instructions about how to package your hard disk drive.

Copyright © Acronis International GmbH, 2002-2013.

Step 1

Delicately remove your hard disk drive from the machine.

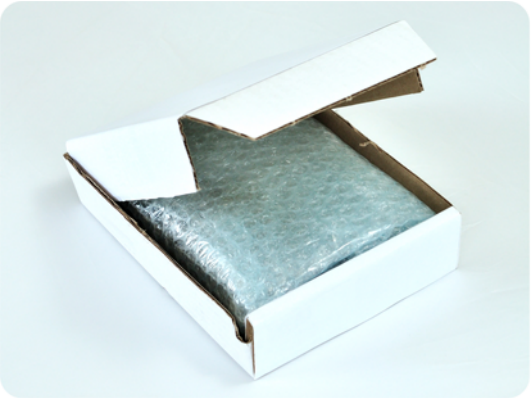
Step 2

Place the hard drive into an anti-static bag to protect the drive from electrostatic discharge. If you do not have an anti-static bag, simply wrap the hard drive into aluminum foil.

Step 3

Use a sturdy box that is at least twice the size of the drive. Pack the drive with a bubble wrap around all 6 sides so it can fit tight into the box and cannot be moved within.

DO NOT *use Styrofoam* ***peanuts*** *for packing as they do not provide enough protection.*
DO NOT *send your media in* ***jiffy*** *bags*



Copyright © Acronis International GmbH, 2002-2013.

Step 4

Choose the transport company that you will use for shipping. On that company's web site, prepare and print two prepaid shipping labels:

1. **Shipping label for sending** your hard drive. This label is placed on the top of the box. You should send your package to one of the Acronis data centers. The data center address can be obtained on the **Initial seeding / Recovery** tab of your account management page by clicking **Datacenter address**.

   We recommend that you use overnight shipping, if you want to start doing incremental backups as soon as possible. The data is generally available the next business day after the data center receives it.
2. **Shipping label for returning** your hard drive. Put this label in the box. When returning your hard drive, we will reuse the same packaging unless it is damaged. If you do not enclose the label, your drive will be **securely discarded**.

   You might want to use the most cost-efficient delivery method for having your hard drive returned.

Step 5

Securely seal the box with a sturdy tape. Then, stick the **shipping label for sending** your hard drive to the top of the box, so the label does not wrap around the edge of the package.

16.1.8.10 How do I track an Initial Seeding order status?

On the Acronis Web site, the **Initial Seeding / Recovery** tab shows you the status of all your orders. In addition, you will receive e-mail notifications about the most important events.

- **Available** – The license is available for using on any machine.

 Copyright © Acronis International GmbH, 2002-2013.

- **An order was created** – The backup is about to start and the license cannot be used for the same or any other machine. From this point on, you can cancel the order if something goes wrong. This will return the license to the pool of available licenses.
- **A full backup has started** – This status is set when the first backup starts. The order start time occurs at this moment.
- **A full backup has been successfully completed** – The backup has been completed and the order is ready to ship. You can now ship the media:

  Step 1. Package the media following the drive packaging and shipment instructions (p. 426) to avoid damage during shipment. If you want the media to be returned to you after the data is uploaded, prepare a prepaid return shipping label and place it inside the package together with the drive.

  Step 2. Send the drive via your preferred carrier to the Acronis datacenter.

  Step 3. Let us know when you have shipped the order by marking your order as "shipped".

  You will receive a notification message when Acronis receives the order and when the order is completed. If necessary, Acronis may contact you during order processing.
- [Occasional] **Backup creation error** – An error occurred when backing up. Please check the backup plan parameters and try again.
- **The media has been shipped** – This status is set after you mark the order as "shipped".
- **The media has been received by Acronis** – Acronis has started processing your order. From this point on, you cannot cancel the order. Creating a new initial seeding backup will require a new Initial Seeding license.
- **The data upload has started** – The process of uploading data to Acronis Online Backup Storage has started.
- **The data upload has been completed** – The initial full backup has been successfully uploaded to the online storage. You can do incremental online backups now.
- **The order has been completed. The media has been returned** (or: **Returning the media was not requested**) – Your media has been shipped back (the carrier and the tracking number are specified). If a prepaid shipping label was not provided with the media, the media will be discarded.
- [Occasional] **The order is on hold** – Your order was placed on hold due to technical difficulties processing the order. Acronis is working on resolving these issues.
- [Occasional] **The order has been cancelled** – The order had been cancelled before the media was shipped, so returning the media is not required.
- [Occasional] **The order has been cancelled. The media has been returned** (or: **Returning the media was not requested**) – The order was cancelled while the media was in the datacenter. The media has been shipped back (the carrier and the tracking number are specified). If a prepaid shipping label was not provided with the media, the media will be discarded.

16.1.9 Large Scale Recovery FAQ

This section explains what Large Scale Recovery is, why you would want to use it and provides some usage details.

16.1.9.1 What is Large Scale Recovery?

Large Scale Recovery is an extra service that enables you to obtain a copy of the backups you have in the online storage. You can then recover data from this copy.

 Copyright © Acronis International GmbH, 2002-2013.

Once you order Large Scale Recovery for a particular machine, Acronis sends you a USB hard disk drive with all of the backups made from this machine. You can recover data directly from the disk or copy the backups to a local or network folder.

16.1.9.2 Why would I use Large Scale Recovery?

In the event of a disaster or the need to recover large volumes of data or the entire machines quickly, this service helps you save time and network traffic. Recovering hundreds of gigabytes over the Internet may take days. This process will deliver a faster recovery.

16.1.9.3 Do I need to perform initial seeding to be able to use Large Scale Recovery?

No, these services are independent.

16.1.9.4 Is Large Scale Recovery a paid service?

Yes, you need to buy one Large Scale Recovery license per machine. The license enables you to get a disk with all of the currently available backups of this machine. To obtain backups that will be created in the future, you will need a new Large Scale Recovery license.

16.1.9.5 Can I perform large scale recovery on a different machine?

Yes. You can recover the data an unlimited number of times on any machine you wish. Acronis Universal Restore is included to help you recover an operating system to dissimilar hardware.

16.1.9.6 Can I obtain backups taken from a number of machines on a single hard drive?

No. A separate hard drive is required for each machine.

16.1.9.7 How to buy a Large Scale Recovery license?

You can buy a Large Scale Recovery license from an Acronis partner or in Acronis online store. Follow the link http://www.acronis.eu/my/backup-recovery-online/#buy to locate a partner or to buy online.

Having purchased a license from an Acronis partner, you receive a confirmation e-mail with a registration code. Click **Enter new registration code** on the same Web page and register the license. The license becomes available on the **Initial Seeding / Recovery** tab.

A license purchased in Acronis online store becomes available immediately after the payment is processed.

16.1.9.8 How do I track a Large Scale Recovery order status?

On the Acronis Web site, the **Initial Seeding / Recovery** tab shows you the status of all your orders. In addition, you will receive e-mail notifications about most important events.

- **Available** – The license can be used for any machine.
- **An order was created** – This status is set upon completion of the Large Scale Recovery order form. This means that the license cannot be used for any other machine. From this point on, you

 Copyright © Acronis International GmbH, 2002-2013.

can cancel the order if something goes wrong. This will return the license to the pool of available licenses.

- **The order is being processed** - Order processing in the datacenter started.
- **Writing data** – Your backups are being written onto the media. From this point on, you cannot cancel the order.
- **Writing data has been completed** – Your backups have been successfully written to the media.
- **Ready to ship the media** – Your order has been processed and the media will be shipped shortly.
- **The order has been completed. The media has been shipped** – The media has been shipped to you (the carrier and the tracking number are specified).
- [Occasional] **The order is on hold** – Your order was placed on hold due to technical difficulties processing the order. Acronis is working on resolving these issues.
- [Occasional] **The order has been cancelled** – The order has been cancelled.
- [Occasional] **Address is undeliverable** – Acronis cannot send the disk. On the same Web page, click **Change my delivery address** and specify the correct address for the order.
- [Occasional] **Address has been updated** – This status is set after you have updated the delivery address on Acronis web site.

16.1.9.9 How to perform large scale recovery?

The recovery procedure is the same as when recovering from the online storage. Just specify the path to the location where your backups are. For detailed information about recovery please refer to the context-sensitive help.

16.1.10 Subscription lifecycle FAQ

This section explains a subscription lifecycle and subscription operations that you can perform on your account management Web page.

16.1.10.1 How do I access my account management Web page?

To access this Web page from the Acronis Web site:

1. Select **User Login**.
2. Log in to your account (create one if you are not registered yet).
3. Navigate to **Online backup** > **for Business**.

To access this Web page from Acronis Backup & Recovery 11.5:

1. On the **Actions** menu, click **Back up now** or **Create backup plan**.
2. Click **Location**, and then click **Buy or manage your subscriptions**.
3. Log in to your account (create one if you are not registered yet).

16.1.10.2 Where do I find the subscriptions that I purchased?

If you purchased your subscriptions from an Acronis partner, you should have received an e-mail confirming the registration codes for each subscription. Create an account on the Acronis web site, if you do not have one already, and log in to it. Navigate to **Online Backup** > **for Business**. This is your *account management Web page*. Click **Enter new registration code** and enter the registration codes. The subscriptions will appear in the list of available subscriptions under the **Manage subscriptions** tab.

 Copyright © Acronis International GmbH, 2002-2013.

If you purchased your subscriptions online using the Acronis Web site, they are available immediately on your account management Web page. The newly obtained subscriptions are listed at the **Manage subscriptions** tab.

16.1.10.3 When does my subscription begin?

The subscription period of a **volume** subscription begins at the time of purchase.

The subscription period of a **machine** subscription begins as soon as a subscription is activated on a machine.

16.1.10.4 What happens when my subscription expires?

A month before the subscription expiration date you receive an e-mail notification with an alert. In addition, you can see this alert on the account management Web page near the machine. This means you need to renew (p. 432) the subscription to continue backing up the machine.

If you do not renew the subscription, you will be able to back up data to the online storage for five days following the expiration date. You will be able to recover data from the online storage for 30 days following the expiration date.

16.1.10.5 How do I renew a subscription?

Buy another subscription and specify it as the next subscription of the same machine. The new subscription will be activated as soon as the current subscription expires.

An expired subscription can be renewed within five days after expiration. In such cases, the new subscription will be activated immediately.

Renewing a single subscription

You can renew an activated subscription to a subscription with the same or a larger storage quota.

To renew a **volume** subscription, you need a volume subscription. To renew a **machine** subscription, you need a machine subscription of the same type or a **volume** subscription.

Example: To renew the Acronis Backup & Recovery Online Workstation 250GB subscription, you need one of the following subscriptions: Acronis Backup & Recovery Online Workstation 250GB, Acronis Backup & Recovery Online Workstation 500GB, or a volume subscription.

To renew a subscription

1. Go to the account management Web page.
2. If several suitable subscriptions are available, select the one you want to use.
3. Select the machine that you want to renew the subscription for, and then click **Renew**.

The subscription appears in the **Next subscription** column for the selected machine.

Renewing a number of activated subscriptions at once

This operation is possible if the appropriate number of new subscriptions are identical to the currently used subscriptions.

 Copyright © Acronis International GmbH, 2002-2013.

Make sure the new subscriptions are available on your account management Web page. Then click **Renew all**. The confirmation window will summarize which subscriptions will be renewed. If identical subscriptions are not found for some of the machines, you have the option to cancel automatic renewal and renew each subscription individually.

What does "Auto-renew" mean?

Auto-renewal means that when the current subscription expires, the next subscription will be automatically selected from the available subscriptions. The next subscription must be identical to the current subscription.

If an identical subscription is not found, auto-renewal will not take place and your backups may fail. No subscriptions will be bought automatically. Only those subscriptions available at the time of auto-renewal can be used. You can select auto-renewal for each individual subscription or set up bulk auto-renewal of all of the activated subscriptions you have.

16.1.10.6 How do I increase a storage quota for a machine?

Replace the subscription assigned to the machine with another subscription that has a larger storage quota. The new subscription has the same type as the old one. For example, you can replace a workstation subscription only with another workstation subscription with a larger quota.

The storage quota increase is free of charge. After the completion, the operation cannot be reverted.

The new subscription will have a lesser subscription period. It is calculated in the following way:

$$Pn = Po * (Qo / Qn)$$

where

- Pn – new subscription remaining period
- Po – old subscription remaining period
- Qo – old subscription storage quota
- Qn – new subscription storage quota.

Example. You have a 250 GB subscription and you decide to increase its storage quota 2 months before the subscription expiration. The new subscription storage quota is 500 GB. So, the new subscription remaining period will be

$$Pn = 2 \text{ months} * (250 \text{ GB} / 500 \text{ GB}) = 1 \text{ month}$$

To increase a storage quota

1. Go to the account management Web page.
2. Select the machine for which you want to increase a storage quota, and then click **Increase**.
3. If the existing subscription has the maximum available storage quota for this subscription type, the software notifies you. Otherwise, select the new storage quota.
4. Click **Increase**, and then click **OK** to confirm the operation.

16.1.10.7 What is the “Group” column for?

So you can apply actions, such as **Renew all** or **Auto-renew all**, to your selection of the subscriptions. Specify the desired group name, for example, SalesDept, near each of the subscriptions you want to

 Copyright © Acronis International GmbH, 2002-2013.

group. Click the **Group** column header to sort the subscriptions and then apply the desired actions to the group.

16.1.10.8 Can I revoke a subscription from a machine?

You cannot return an activated subscription to the list of available subscriptions, but you can reassign (p. 436) it to a different machine in Acronis Backup & Recovery 11.5 GUI.

16.1.10.9 Can I cancel my subscription?

Just wait until the subscription expires. Refunds are not available for the online backup subscriptions.

16.2 Where do I start?

On the Acronis Web site, log in to your account (create one if you are not registered yet) and navigate to **Online Backup** > **for Business**. This is your *account management Web page*. Here you can get a trial subscription, locate an Acronis partner or buy subscriptions online. The newly obtained subscriptions are listed as available subscriptions in the **Manage subscriptions** tab.

If you purchased your subscriptions from an Acronis partner, register them manually using the **Enter new registration code** link. The registration codes come with the purchase confirmation e-mail.

Next, install Acronis software (if not yet installed) and assign (p. 435) each subscription to a machine. The subscriptions become activated. After that, you can start backing up to Acronis Online Backup Storage.

16.3 Choosing a subscription

Volume subscriptions

A **volume** subscription enables you to back up an unlimited number of physical and/or virtual machines. All backed up machines share a common storage quota. The subscription period begins at the time of purchase.

Machine subscriptions

A **machine** subscription enables you to back up either a single physical machine or all virtual machines managed by one Agent for ESX(i) or Agent for Hyper-V. The storage quota applies to this physical machine or to all of the virtual machines managed by the agent. The subscription period begins when the subscription is activated on the machine.

For a physical machine, choose the **server** or **workstation** subscription based on the Windows operating system that the machine is running. If you doubt whether the machine is a server or a workstation, refer to the list of the supported operating systems (p. 422).

For virtual machines managed by Agent for ESX(i) or Agent for Hyper-V, use the dedicated subscription for **virtual machines**. In addition to backing up virtual machines, this subscription allows you to back up their physical host.

What if the subscription storage quota does not match the storage space you need?

If your backups are likely to exceed the storage quota for the subscription, you may want to use a subscription with a larger storage quota. For example, you can use a server subscription or a

 Copyright © Acronis International GmbH, 2002-2013.

subscription for virtual machines on a workstation. Or, you can use a subscription for virtual machines on a server which is not a virtualization server.

The inverse usage is not possible. You cannot back up a server by using a workstation subscription. If you try to back up ESX(i) or Hyper-V virtual machines from a host that uses a server subscription, the backup will fail.

Trial subscriptions

You can get one free **machine** subscription per account. The storage quota of the trial subscription is equal to that of the standard subscription. The subscription period is limited to two months.

Obtaining a trial subscription is possible until you buy a paid subscription. You can use a trial subscription along with paid ones. The same expiration rules apply to trial and paid subscriptions.

To continue using the service after the trial subscription expires, buy a **machine** subscription of the same type or a **volume** subscription, and then renew the trial subscription specifying the paid subscription. Your backed up data will be kept online. Regular backups of your machines will continue uninterrupted. The service will not need to perform a new full backup.

To get a trial subscription, do either of the following:

- Go to the account management Web page, click **Try Now Free for 60 Days**, and select the necessary subscription type.
- Install Acronis Backup & Recovery 11.5, start the product, connect the console to the machine you want to back up, click **Back up now** or **Create backup plan**, click **Location**, and click **Get trial subscription**. Log in to your account (create one if you are not registered yet). A trial subscription will be automatically created and assigned to the machine.

16.4 Activating online backup subscriptions

Activating a subscription on a machine means allowing the machine to back up to the online storage.

A **volume** subscription is activated automatically as soon as you start backing up the machine to Acronis Online Backup Storage.

A **machine** subscription (for workstation, server, or virtual machines) needs to be activated manually. Its subscription period starts at the moment of activation.

Important *Before activating the* first *subscription for your account, check the country selected in your profile. Depending on this country, the service determines the data center where your backups will be sent. Make sure to select the country where all or most of the machines you want to back up to the online storage are located. Otherwise, the data may unnecessarily travel a long way. Later, you will not be able to change the data center even if you change the country in your profile. To access your profile, go to the Acronis website, select* ***User Login****, log in to your account, and then click* ***Personal Profile****.*

16.4.1 Activating subscriptions

To begin with, make sure that the machines whose subscriptions you want to activate are registered on the management server and available (turned on).

If you need to back up ESX(i) virtual machines, bind them to Agent for ESX(i) as described in the "Agent for ESX(i) binding" section of the "Backing up virtual machines" document. When activating the subscription for virtual machines, select the machine where the agent is running.

 Copyright © Acronis International GmbH, 2002-2013.

To activate subscriptions

1. Connect the console to the management server.
2. On the **Actions** menu, click **Activate online backup subscriptions**.
3. Specify the credentials to log in to the online storage.
4. Select any number of machines from either the **Workstations** or the **Servers** list, and then click **Select subscription**.
5. Select the type of subscriptions you want to activate for the machines. The number of the subscriptions must be at least the same as the number of the selected machines.
6. Click **Activate now**.
7. Perform the previous three steps for other machines you want to activate subscriptions on.

Alternatively, you can activate a subscription when the console is connected to a machine instead of the management server.

16.4.2 Reassigning an activated subscription

Sometimes you may want to use an already activated subscription instead of an available subscription. In these cases, for example:

- You no longer need to back up one of your machines and you want to reuse that machine's subscription for another machine.
- You reinstalled Acronis Backup & Recovery 11.5 on a machine and want to resume its online backups.
- You recovered a machine to bare metal (or to a state when it did not yet have an activated subscription) and want to resume its online backups.

Reassigning a subscription does not restart its subscription period.

To assign an activated subscription to a machine

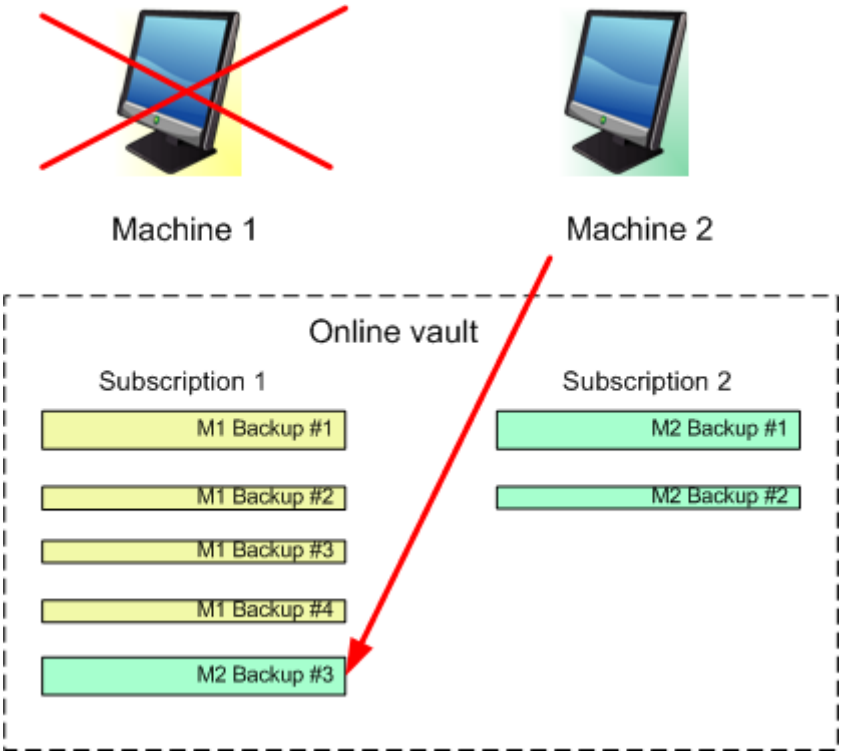
1. On the machine to which you want to assign an activated subscription, go to the subscription activation window.
2. Click **Reassign an already used subscription**.
3. Select the machine whose subscription you want to reassign to the current machine.
4. Click **Reassign now**.

Example

The diagram below shows what happens if you reassign a subscription to a different machine. Let's assume Machine 1 has four backups in Subscription 1. Machine 2 has two backups in Subscription 2. At that point, you reassign Subscription 1 to Machine 2. Machine 2 does its third backup to Subscription 1.

Copyright © Acronis International GmbH, 2002-2013.

Depending on your settings, this backup will be either full or incremental. But its size is not likely to be less than a full backup size. Therefore, it is not practical to reassign a subscription to a machine whose first backup was done as an initial seeding. You will need to either redo the initial seeding (which requires a new license) or to transfer the sizeable backup over the Internet.



All earlier created backups remain intact. You can delete them manually if necessary. Keep in mind though, backups can be deleted from a subscription only by the machine to which the subscription is assigned. In our example, you have the following options.

Before reassigning

Delete backups from Subscription 1 using Machine 1 (if it is available and turned on). Delete backups from Subscription 2 using Machine 2.

After reassigning

Delete backups from Subscription 1 using Machine 2. You cannot delete backups from Subscription 2, unless you assign this subscription to any machine.

16.5 Configuring proxy settings

If one or more machines where you installed agents connect to the Internet through a proxy server, you need to configure each of the agents to use the proxy server.

The management server connects to the Internet to retrieve information about online backup subscriptions. The proxy settings for the management server also need to be configured.

Proxy settings for the agent and the management server are configured separately, even if both are installed on the same machine.

Copyright © Acronis International GmbH, 2002-2013.

To configure proxy settings for an agent

1. Connect the console to the machine for which you want to configure proxy settings.
2. On the **Options** menu, click **Machine options**.
3. Click **Online backup proxy**.
4. Enter the proxy server settings. For detailed information (p. 348) about the settings please refer to the context-sensitive help.
5. Repeat steps 2–4 for all machines that connect to the Internet through a proxy server.

To configure proxy settings for the management server

1. Connect the console to the management server.
2. On the **Options** menu, click **Management server options**.
3. Click **Online backup proxy**.
4. Enter the proxy server settings. For detailed information (p. 403) about the settings please refer to the context-sensitive help.

16.6 Retrieving files from the online storage by using a Web browser

By using a Web browser, you can browse Acronis Online Backup Storage, view contents of file-level archives, and download the selected files and folders.

The following browsers support these operations:

- Internet Explorer 7 or later
- Mozilla Firefox 3.5 or later
- Google Chrome 10 or later
- Safari 5.0.5 or later

To retrieve files from the online storage:

1. Go to the account management Web page (p. 431) and click **Recover files from Acronis Cloud**. You will see the list of the machines backed up by using the specified account.
2. Click the name of the machine whose data you want to retrieve. The software displays both file-level and disk-level archives of this machine's data.

   Note for users of the Initial Seeding (p. 74) service. While an initial seeding backup is being uploaded from your hard drive to Acronis Online Backup Storage, the backup is visible but its data is not retrievable.
3. Click the required file-level archive. If prompted, enter the archive password. The software displays all of files and folders that were ever backed up to this archive.
4. If necessary, browse to the required folder or use search to obtain the list of the required files and folders.

   Details. The search string can contain one or more wildcard characters * and ?.
5. Do one of the following:
   - To get the latest version of a single file or folder, simply click its name.
   - To get the latest versions of multiple files and folders, select the check boxes to the left of them and click the green **Recover** button.

Copyright © Acronis International GmbH, 2002-2013.

- To get an earlier version of a single file or folder, click the ⚙ icon to the right of it and choose **View versions**. This opens a window with the version list. In this window, select the required version by its date and time and click **Recover**.
- [Not available if you used search] To get earlier versions of multiple files and folders, select the required date and time from the **Versions** list. Select the check boxes to the left of the files and folders and click the green **Recover** button.

  Details. You will get the file and folder versions that were backed up prior and closest to the selected point in time.

6. To download the selected files, click **Save**.

   Details. If you selected a single file, it is downloaded as is. Otherwise, the selected data will be archived into a .zip file (named AcronisArchive.zip by default).
7. Select the location to save the data to, and then click **Save**.

16.7 Limitations of the online storage

Unlike other types of storage available in Acronis Backup & Recovery 11.5, the online storage has the following limitations.

Operations

The following operations are not possible.

Backup operations:

- Backing up from bootable media
- Backing up under Linux
- Backing up with Agent for Microsoft Exchange Server
- Creating differential backups
- Using the **Custom** backup scheme
- Simplified naming of backup files
- Simultaneous host-based backup of multiple virtual machines
- Setting up regular conversion of backups to a virtual machine

Operations with backups:

- Validating a backup*
- Exporting a backup
- Mounting a backup
- Replicating or moving backups *from* the online storage
- Converting an incremental backup to full

Operation with archives (an archive is a set of backups):

- Validating an archive
- Exporting an archive

These limitations also apply to backing up data using Initial Seeding and to recovering data using Large Scale Recovery.

Copyright © Acronis International GmbH, 2002-2013.

* An initial seeding backup is automatically validated immediately after its creation.

Backup and recovery options

Some backup and recovery options are not supported by online backups. For example, **Backup splitting** (p. 113).

By using the **Backup performance > Network connection speed** option, you can vary the transferring speed as kilobytes per second, but not as a percentage.

16.8 Terminology reference

The following is the list of terms related to the Acronis Backup & Recovery Online service.

Activate a subscription

Allow the machine to use the online storage according to the subscription.

Activated subscription

A subscription that is currently being used by a machine.

Assign a subscription to a machine

Reserve a subscription for a particular machine in order to renew its current subscription.

Assigned subscription

A subscription that has been assigned to a machine.

Available subscription

A subscription that is not assigned to any machine.

Extra service

A service that you can use in addition to online backup subscriptions.

Increase storage quota

Replace a subscription with another one that has a greater storage quota. The remaining subscription period is reduced in proportion to the capacity increase.

Initial Seeding

An extra service that enables you to save an initial full backup locally and then send it to Acronis on a hard disk drive. Acronis uploads the backup to the online storage. After that, you can add incremental backups to this full backup, either manually or on a schedule.

The Initial Seeding service might be unavailable in your region. To find more information, click here: http://kb.acronis.com/content/15118.

Large Scale Recovery

An extra service that enables you to obtain a copy of the backups you have in the online storage. You can then recover data from this copy.

 Copyright © Acronis International GmbH, 2002-2013.

The Large Scale Recovery service might be unavailable in your region. To find more information, click here: http://kb.acronis.com/content/15118.

License

Not to be confused with Acronis Backup & Recovery 11.5 product license.

Permission for a machine to use an extra service of Acronis Backup & Recovery Online.

You can buy Initial Seeding licenses and/or Large Scale Recovery licenses.

Reassign a subscription

Assign a subscription that is already activated, to a different machine.

Registration code

A character string for registering a subscription or license that was bought from an Acronis partner.

When you purchase such subscriptions or licenses, you receive a confirmation e-mail containing the registration codes for each of them. You then enter the registration codes on the account management Web page, and these subscriptions and licenses become available for use.

Renew a subscription

Assign a subscription of the same type and with the same or a larger storage quota as the current, activated subscription.

This subscription will become activated as soon as the current subscription expires.

Storage quota

The amount of storage space that can be occupied according to the subscription.

Subscription

Permission for a machine or for multiple machines to use a specific amount of space in the online storage, for a specific period of time.

Subscription period

The period during which the subscription remains activated. You can back up and recover the machine during this period. Recovery is possible for extra 30 days after this period ends.

Unassign a subscription

Make an assigned subscription available again.

You can unassign a subscription as long as it is not activated.

Copyright © Acronis International GmbH, 2002-2013.

17 Glossary

A

Acronis Active Restore

The Acronis proprietary technology that brings a system online immediately after the system recovery is started. The system boots from the backup (p. 448) and the machine becomes operational and ready to provide necessary services. The data required to serve incoming requests is recovered with the highest priority; everything else is recovered in the background. Limitations:

- the backup must be located on the local drive (any device available through the BIOS except for network boot)
- does not work with Linux images
- GPT disks and the UEFI boot mode are not supported.

Acronis Plug-in for WinPE

A modification of Acronis Backup & Recovery 11.5 Agent for Windows that can run in the preinstallation environment. The plug-in can be added to a WinPE (p. 455) image using Bootable Media Builder. The resulting bootable media (p. 445) can be used to boot any PC-compatible machine and perform, with certain limitations, most of the direct management (p. 447) operations without the help of an operating system. Operations can be configured and controlled either locally through the GUI or remotely using the console (p. 446).

Acronis Secure Zone

A secure volume for storing backup archives (p. 443) within a managed machine (p. 452). Advantages:

- enables recovery of a disk to the same disk where the disk's backup resides
- offers a cost-effective and handy method for protecting data from software malfunction, virus attack, operator error
- eliminates the need for a separate media or network connection to back up or recover the data. This is especially useful for mobile users
- can serve as the primary location from which backups are replicated further.

Limitation: Acronis Secure Zone cannot be organized on a dynamic disk (p. 449).

Acronis Secure Zone is considered as a personal vault (p. 453).

Acronis Startup Recovery Manager (ASRM)

A modification of the bootable agent (p. 444), residing on the system disk and configured to start at boot time when F11 is pressed. Acronis Startup Recovery Manager eliminates the need for rescue media or network connection to start the bootable rescue utility.

Acronis Startup Recovery Manager is especially useful for mobile users. If a failure occurs, the user reboots the machine, hits F11 on prompt "Press F11 for Acronis Startup Recovery Manager…" and performs data recovery in the same way as with ordinary bootable media.

Copyright © Acronis International GmbH, 2002-2013.

Limitation: requires re-activation of loaders other than Windows loaders and GRUB.

Acronis Universal Restore

The Acronis proprietary technology that helps boot up Windows or Linux on dissimilar hardware or a virtual machine. Universal Restore handles differences in devices that are critical for the operating system start-up, such as storage controllers, motherboard or chipset.

Universal Restore is not available:

- when the image being recovered is located in Acronis Secure Zone (p. 442) or
- when using Acronis Active Restore (p. 442),

because these features are primarily meant for instant data recovery on the same machine.

Activity

An action performed by Acronis Backup & Recovery 11.5 for achievement of some user goal. Examples: backing up, recovery, exporting a backup, cataloging a vault. An activity may be initiated by a user or by the software itself. Execution of a task (p. 454) always causes one or more activities.

Agent (Acronis Backup & Recovery 11.5 Agent)

An application that performs data backup and recovery and enables other management operations on the machine (p. 452), such as task management and operations with hard disks.

The type of data that can be backed up depends on the agent type. Acronis Backup & Recovery 11.5 includes the agents for backing up disks and files and the agents for backing up virtual machines residing on virtualization servers.

Archive

See Backup archive (p. 443).

B

Backup

A backup is the result of a single backup operation (p. 443). Physically, it is a file or a tape record that contains a copy of the backed-up data as of a specific date and time. Backup files created by Acronis Backup & Recovery 11.5 have a TIB extension. The TIB files which are the result of a backup export (p. 450) or consolidation (p. 447) are also called backups.

Backup archive (Archive)

A set of backups (p. 443) created and managed by a backup plan (p. 444). An archive can contain multiple full backups (p. 450) as well as incremental (p. 451) and differential backups (p. 447). Backups belonging to the same archive are always stored in the same location. If the backup plan includes replication (p. 453) or moving of backups to multiple locations, the backups in each location form a separate archive.

Copyright © Acronis International GmbH, 2002-2013.

Backup operation

An operation that creates a copy of the data that exists on a machine's (p. 452) hard disk for the purpose of recovering or reverting the data to a specified date and time.

Backup options

Configuration parameters of a backup operation (p. 443), such as pre/post backup commands, maximum network bandwidth allotted for the backup stream or data compression level. Backup options are a part of a backup plan (p. 444).

Backup plan (Plan)

A set of rules that specify how the given data will be protected on a given machine. A backup plan specifies:

- what data to back up
- the backup archive (p. 443) name and location
- the backup scheme (p. 444). This includes the backup schedule and [optionally] the retention rules (p. 453)
- [optionally] additional operations to perform with the backups (replication (p. 453), validation (p. 454), conversion to a virtual machine)
- the backup options (p. 444).

For example, a backup plan can contain the following information:

- back up volume C: **(this is the data the plan will protect)**
- name the archive MySystemVolume and place it in \\server\backups\ **(this is the backup archive name and location)**
- perform a full backup monthly on the last day of the month at 10:00AM and an incremental backup on Sundays at 10:00PM. Delete backups that are older than 3 months **(this is a backup scheme)**
- validate the last backup immediately after its creation **(this is a validation rule)**
- protect the archive with a password **(this is an option)**.

Physically, a backup plan is a bundle of tasks (p. 454) executed on a managed machine (p. 452).

A backup plan can be created directly on the machine, imported from another machine (local plan) or propagated to the machine from the management server (centralized plan (p. 445)).

Backup scheme

A part of the backup plan (p. 444) that includes the backup schedule and [optionally] the retention rules and the cleanup (p. 446) schedule. For example, perform a full backup (p. 450) monthly on the last day of the month at 10:00AM and an incremental backup (p. 451) on Sundays at 10:00PM. Delete backups that are older than 3 months. Check for such backups every time the backup operation is completed.

Acronis Backup & Recovery 11.5 provides the ability to use well-known optimized backup schemes such as GFS and Tower of Hanoi, to create a custom backup scheme or to back up data once.

Copyright © Acronis International GmbH, 2002-2013.

Bootable agent

A bootable rescue utility that includes most of the functionality of the Acronis Backup & Recovery 11.5 Agent (p. 443). Bootable agent is based on Linux kernel. A machine (p. 452) can be booted into a bootable agent using either bootable media (p. 445) or Acronis PXE Server. Operations can be configured and controlled either locally through the GUI or remotely using the console (p. 446).

Bootable media

A physical media (CD, DVD, USB flash drive or other media supported by a machine (p. 452) as a boot device) that contains the bootable agent (p. 444) or Windows Preinstallation Environment (WinPE) (p. 455) with the Acronis Plug-in for WinPE (p. 442). A machine can also be booted into the above environments using the network boot from Acronis PXE Server or Windows Deployment Service (WDS). These servers with uploaded bootable components can also be thought of as a kind of bootable media.

Bootable media is most often used to:

- recover an operating system that cannot start
- access and back up the data that has survived in a corrupted system
- deploy an operating system on bare metal
- create basic or dynamic volumes (p. 450) on bare metal
- back up sector-by-sector a disk that has an unsupported file system
- back up offline any data that cannot be backed up online because of restricted access, being permanently locked by the running applications or for any other reason.

Built-in group

A group of machines permanently located on a management server (p. 452).

Built-in groups cannot be deleted, moved to other groups or manually modified. Custom groups cannot be created within built-in groups. There is no way to remove a machine from the built-in group except by removing the machine from the management server.

C

Cataloging

Cataloging a backup (p. 443) adds the contents of the backup to the data catalog (p. 447). Backups are cataloged automatically as soon as they are created. Backups stored on a storage node (p. 454) are cataloged by the node. Backups stored anywhere else are cataloged by the agent (p. 443). In the backup options (p. 444), a user can choose between full and fast cataloging. Full cataloging can also be started manually.

Centralized backup plan

A backup plan (p. 444) that is deployed to a managed machine (p. 452) from the management server (p. 452). Such plan can be modified only by editing the original backup plan on the management server.

Copyright © Acronis International GmbH, 2002-2013.

Centralized management

Management of the Acronis Backup & Recovery 11.5 infrastructure through a central management unit known as Acronis Backup & Recovery 11.5 Management Server (p. 452). The centralized management operations include:

- creating centralized backup plans (p. 445) for the registered machines (p. 453) and groups of machines
- creating and managing static (p. 454) and dynamic groups (p. 449) of machines (p. 452)
- managing the tasks (p. 454) existing on the machines
- creating and managing centralized vaults (p. 446) for storing archives
- managing storage nodes (p. 454)
- monitoring activities of the Acronis Backup & Recovery 11.5 components, creating reports, viewing the centralized log and more.

Centralized task

A task (p. 454) propagated to a machine from the management server (p. 452). Such task can be modified only by editing the original task or centralized backup plan (p. 445) on the management server.

Centralized vault

A networked location allotted by the management server (p. 452) administrator to serve as storage for the backup archives (p. 443). A centralized vault can be managed by a storage node (p. 454) or be unmanaged. The total number and size of archives stored in a centralized vault are limited by the storage size only.

As soon as the management server administrator creates a centralized vault, the vault name and path to the vault are distributed to all machines registered (p. 453) on the server. The shortcut to the vault appears on the machines in the **Vaults** list. Any backup plan (p. 444) existing on the machines, including local plans, can use the centralized vault.

On a machine that is not registered on the management server, a user having the privilege to back up to the centralized vault can do so by specifying the full path to the vault. If the vault is managed, the user's archives will be managed by the storage node as well as other archives stored in the vault.

Cleanup

Deleting backups (p. 443) from a backup archive (p. 443) or moving them to a different location in order to get rid of outdated backups or prevent the archive from exceeding the desired size.

Cleanup consists of applying retention rules (p. 453) to an archive. The retention rules are set by the backup plan (p. 444) that produces the archive. Cleanup may or may not result in deleting or moving backups depending on whether the retention rules are violated or not.

Console (Acronis Backup & Recovery 11.5 Management Console)

A tool for remote or local access to Acronis agents (p. 443) and Acronis Backup & Recovery 11.5 Management Server (p. 452).

Copyright © Acronis International GmbH, 2002-2013.

Having connected the console to the management server, the administrator sets up centralized backup plans (p. 445) and accesses other management server functionality, that is, performs centralized management (p. 445). Using the direct console-agent connection, the administrator performs direct management (p. 447).

Consolidation

Combining two or more subsequent backups (p. 443) belonging to the same archive (p. 443) into a single backup.

Consolidation might be needed when deleting backups, either manually or during cleanup (p. 446). For example, the retention rules require to delete a full backup (p. 450) that has expired but retain the next incremental (p. 451) one. The backups will be combined into a single full backup which will be dated with the incremental backup's date. Since consolidation may take a lot of time and system resources, retention rules provide an option to not delete backups with dependencies. In our example, the full backup will be retained until the incremental one also becomes obsolete. Then both backups will be deleted.

D

Data catalog

Allows a user to easily find the required version of data and select it for recovery. On a managed machine (p. 452), users can view and search data in any vault (p. 455) accessible from this machine. The centralized catalog available on the management server (p. 452) contains all data stored on its storage nodes (p. 454).

Physically, data catalog is stored in catalog files. Every vault uses its own set of catalog files which normally are located directly in the vault. If this is not possible, such as for tape storages, the catalog files are stored in the managed machine's or storage node's local folder. Also, a storage node locally stores catalog files of its remote vaults, for the purpose of fast access.

Deduplicating vault

A managed vault (p. 452) in which deduplication (p. 447) is enabled.

Deduplication

A method of storing different duplicates of the same information only once.

Acronis Backup & Recovery 11.5 can apply the deduplication technology to backup archives (p. 443) stored on storage nodes (p. 454). This minimizes storage space taken by the archives, backup traffic and network usage during backup.

Differential backup

A differential backup stores changes to the data against the latest full backup (p. 450). You need access to the corresponding full backup to recover the data from a differential backup.

Copyright © Acronis International GmbH, 2002-2013.

Direct management

An operation that is performed on a managed machine (p. 452) using the direct console (p. 446)-agent (p. 443) connection (as opposed to centralized management (p. 445) when the operations are configured on the management server (p. 452) and propagated by the server to the managed machines).

The direct management operations include:

- creating and managing local backup plans (p. 451)
- creating and managing local tasks (p. 451) such as recovery tasks
- creating and managing personal vaults (p. 453) and archives stored there
- viewing the state, progress and properties of the centralized tasks (p. 446) existing on the machine
- viewing and managing the log of the agent's operations
- disk management operations, such as clone a disk, create volume, convert volume.

A kind of direct management is performed when using bootable media (p. 445).

Disaster recovery plan (DRP)

A document that contains a list of backed up data items and detailed instructions on how to recover these items from a backup.

If the corresponding backup option (p. 444) is enabled, a DRP is created after the first successful backup is performed by the backup plan, and also after any change to the list of data items or the DRP parameters. A DRP can be sent to the specified e-mail addresses or saved as a file to a local or network folder.

Disk backup (Image)

A backup (p. 443) that contains a sector-based copy of a disk or a volume in a packaged form. Normally, only sectors that contain data are copied. Acronis Backup & Recovery 11.5 provides an option to take a raw image, that is, copy all the disk sectors, which enables imaging of unsupported file systems.

Disk group

A number of dynamic disks (p. 449) that store the common configuration data in their LDM databases and therefore can be managed as a whole. Normally, all dynamic disks created within the same machine (p. 452) are members of the same disk group.

As soon as the first dynamic disk is created by the LDM or another disk management tool, the disk group name can be found in the registry key HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\dmio\Boot Info\Primary Disk Group\Name.

The next created or imported disks are added to the same disk group. The group exists until at least one of its members exists. Once the last dynamic disk is disconnected or converted to basic, the group is discontinued, though its name is kept in the above registry key. In case a dynamic disk is created or connected again, a disk group with an incremental name is created.

Copyright © Acronis International GmbH, 2002-2013.

When moved to another machine, a disk group is considered as 'foreign' and cannot be used until imported into the existing disk group. The import updates the configuration data on both the local and the foreign disks so that they form a single entity. A foreign group is imported as is (will have the original name) if no disk group exists on the machine.

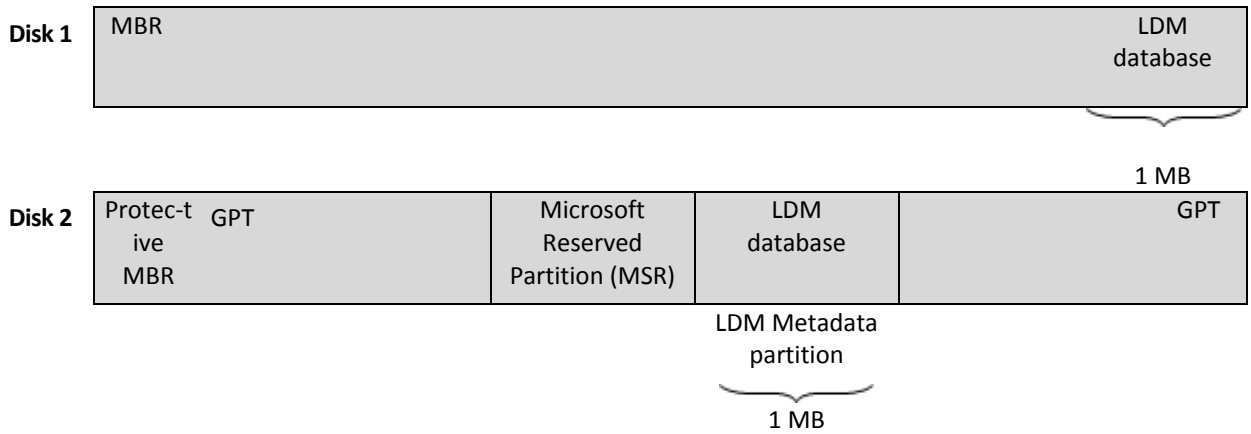
For more information about disk groups please refer to the following Microsoft knowledge base article:

222189 Description of Disk Groups in Windows Disk Management
http://support.microsoft.com/kb/222189/EN-US/

Dynamic disk

A hard disk managed by Logical Disk Manager (LDM) that is available in Windows starting with Windows 2000. LDM helps flexibly allocate volumes on a storage device for better fault tolerance, better performance or larger volume size.

A dynamic disk can use either the master boot record (MBR) or GUID partition table (GPT) partition style. In addition to MBR or GPT, each dynamic disk has a hidden database where the LDM stores the dynamic volumes' configuration. Each dynamic disk holds the complete information about all dynamic volumes existing in the disk group which makes for better storage reliability. The database occupies the last 1MB of an MBR disk. On a GPT disk, Windows creates the dedicated LDM Metadata partition, taking space from the Microsoft Reserved Partition (MSR.)



Dynamic disks organized on MBR (Disk 1) and GPT (Disk 2) disks.

For more information about dynamic disks please refer to the following Microsoft knowledge base articles:

Disk Management (Windows XP Professional Resource Kit)
http://technet.microsoft.com/en-us/library/bb457110.aspx

816307 Best practices for using dynamic disks on Windows Server 2003-based computers
http://support.microsoft.com/kb/816307

Dynamic group

A group of machines (p. 452) which is populated automatically by the management server (p. 452) according to membership criteria specified by the administrator. Acronis Backup & Recovery 11.5 offers the following membership criteria:

- Operating system

Copyright © Acronis International GmbH, 2002-2013.

- Active Directory organizational unit
- IP address range
- Listed in txt/csv file.

A machine remains in a dynamic group as long as the machine meets the group's criteria. However, the administrator can specify exclusions and not include certain machines in the dynamic group even if they meet the criteria.

Dynamic volume

Any volume located on dynamic disks (p. 449), or more precisely, on a disk group (p. 448). Dynamic volumes can span multiple disks. Dynamic volumes are usually configured depending on the desired goal:

- to increase the volume size (a spanned volume)
- to reduce the access time (a striped volume)
- to achieve fault tolerance by introducing redundancy (mirrored and RAID-5 volumes.)

E

Encrypted archive

A backup archive (p. 443) encrypted according to the Advanced Encryption Standard (AES). When the encryption option and a password for the archive are set in the backup options (p. 444), each backup belonging to the archive is encrypted by the agent (p. 443) before saving the backup to its destination.

Encrypted vault

A managed vault (p. 452) to which anything written is encrypted and anything read is decrypted transparently by the storage node (p. 454), using a vault-specific encryption key stored on the node. In case the storage medium is stolen or accessed by an unauthorized person, the malefactor will not be able to decrypt the vault contents without access to the storage node. Encrypted archives (p. 450) will be encrypted over the encryption performed by the agent (p. 443).

Export

An operation that creates a copy of an archive (p. 443) or a self-sufficient part copy of an archive in the location you specify. The export operation can be applied to a single archive, a single backup (p. 443) or to your choice of backups belonging to the same archive. An entire vault (p. 455) can be exported by using the command line interface.

F

Full backup

A self-sufficient backup (p. 443) containing all data chosen for backup. You do not need access to any other backup to recover the data from a full backup.

Copyright © Acronis International GmbH, 2002-2013.

G

GFS (Grandfather-Father-Son)

A popular backup scheme (p. 444) aimed to maintain the optimal balance between a backup archive (p. 443) size and the number of recovery points (p. 453) available from the archive. GFS enables recovering with daily resolution for the last several days, weekly resolution for the last several weeks and monthly resolution for any time in the past.

For more information please refer to GFS backup scheme (p. 66).

I

Image

The same as Disk backup (p. 448).

Incremental backup

A backup (p. 443) that stores changes to the data against the latest backup. You need access to other backups from the same archive (p. 443) to recover data from an incremental backup.

Indexing

An activity (p. 443) performed by a storage node (p. 454) after a backup (p. 443) has been saved to a deduplicating vault (p. 447).

During indexing, the storage node performs the following operations:

- Moves data blocks from the backup to a special file within the vault. This file is called the deduplication data store.
- In the backup, replaces the moved blocks with their fingerprints ("hashes")
- Saves the hashes and the links that are necessary to "assemble" the deduplicated data, to the deduplication database.

Indexing can be thought of as "deduplication at target", as opposed to "deduplication at source" which is performed by the agent (p. 443) during the backup operation (p. 443). A user can suspend and resume indexing.

L

Local backup plan

A backup plan (p. 444) created on a managed machine (p. 452) using direct management (p. 447).

Local task

A task (p. 454) created on a managed machine (p. 452) using direct management (p. 447).

Logical volume

This term has two meanings, depending on the context.

Copyright © Acronis International GmbH, 2002-2013.

- A volume, information about which is stored in the extended partition table. (In contrast to a primary volume, information about which is stored in the Master Boot Record.)
- A volume created using Logical Volume Manager (LVM) for Linux kernel. LVM gives an administrator the flexibility to redistribute large storage space on demand, add new and take out old physical disks without interrupting user service. Acronis Backup & Recovery 11.5 Agent (p. 443) for Linux can access, back up and recover logical volumes when running in Linux with 2.6.x kernel or a Linux-based bootable media (p. 445).

M

Machine

A physical or virtual computer uniquely identified by an operating system installation. Machines with multiple operating systems (multi-boot systems) are considered as multiple machines.

Managed machine

A machine (p. 452), either physical or virtual, where at least one Acronis Backup & Recovery 11.5 Agent (p. 443) is installed.

Managed vault

A centralized vault (p. 446) managed by a storage node (p. 454). Archives (p. 443) in a managed vault can be accessed as follows:

bsp://node_address/vault_name/archive_name/

Physically, managed vaults can reside on a network share, SAN, NAS, on a hard drive local to the storage node or on a tape library locally attached to the storage node. The storage node performs cleanup (p. 446) and validation (p. 454) for each archive stored in the managed vault. An administrator can specify additional operations that the storage node will perform (deduplication (p. 447), encryption).

Management server (Acronis Backup & Recovery 11.5 Management Server)

A central server that drives data protection within the enterprise network. Acronis Backup & Recovery 11.5 Management Server provides the administrator with:

- a single entry point to the Acronis Backup & Recovery 11.5 infrastructure
- an easy way to protect data on numerous machines (p. 452) using centralized backup plans (p. 445) and grouping
- enterprise-wide monitoring and reporting functionality
- the ability to create centralized vaults (p. 446) for storing enterprise backup archives (p. 443)
- the ability to manage storage nodes (p. 454)
- the centralized catalog (p. 447) of all data stored on the storage nodes.

If there are multiple management servers on the network, they operate independently, manage different machines and use different centralized vaults for storing archives.

Media builder

A dedicated tool for creating bootable media (p. 445).

 Copyright © Acronis International GmbH, 2002-2013.

P

Personal vault

A local or networked vault (p. 455) created using direct management (p. 447). Once a personal vault is created, a shortcut to it appears on the managed machine in the **Vaults** list. Multiple machines can use the same physical location; for example, a network share; as a personal vault.

Plan

See Backup plan (p. 444).

R

Recovery point

Date and time to which the backed-up data can be reverted.

Registered machine

A machine (p. 452) managed by a management server (p. 452). A machine can be registered on only one management server at a time. A machine becomes registered as a result of the registration (p. 453) procedure.

Registration

A procedure that adds a managed machine (p. 452) to a management server (p. 452).

Registration sets up a trust relationship between the agent (p. 443) residing on the machine and the server. During registration, the console retrieves the management server's client certificate and passes it to the agent which uses it later to authenticate clients attempting to connect. This helps prevent any attempts by network attackers from establishing a fake connection on behalf of a trusted principal (the management server).

Replenishable pool

A tape pool that is allowed to take tapes from the **Free tapes** pool when required.

Replication

Copying a backup (p. 443) to another location. By default, the backup is copied immediately after creation. A user has the option to postpone copying the backup by setting up replication inactivity time.

This feature replaces and enhances the dual destination backup feature, which was available in Acronis Backup & Recovery 10.

Retention rules

A part of backup plan (p. 444) that specifies when and how to delete or move the backups (p. 443) created by the plan.

Copyright © Acronis International GmbH, 2002-2013.

S

Single-pass backup

A single-pass backup (aka application-aware backup) is a disk backup containing metadata of VSS-aware applications that are present on the disk. This metadata enables browsing and recovery of the backed-up application data without recovering the entire disk or volume.

Static group

A group of machines which a management server (p. 452) administrator populates by manually adding machines to the group. A machine remains in a static group until the administrator removes it from the group or from the management server.

Storage node (Acronis Backup & Recovery 11.5 Storage Node)

A server aimed to optimize usage of various resources required for protection of enterprise data. This goal is achieved by organizing managed vaults (p. 452). Storage Node enables the administrator to:

- use a single centralized catalog (p. 447) of data stored in the managed vaults
- relieve managed machines (p. 452) of unnecessary CPU load by performing cleanup (p. 446), validation (p. 454) and other operations with backup archives (p. 443) which otherwise would be performed by agents (p. 443)
- drastically reduce backup traffic and storage space taken by the archives (p. 443) by using deduplication (p. 447)
- prevent access to the backup archives, even in case the storage medium is stolen or accessed by a malefactor, by using encrypted vaults (p. 450).

T

Task

A set of actions to be performed by Acronis Backup & Recovery 11.5 at a certain time or event. The actions are described in a non human-readable service file. The time or event (schedule) is stored in the protected registry keys (in Windows) or on the file system (in Linux).

Tower of Hanoi

A popular backup scheme (p. 444) aimed to maintain the optimal balance between a backup archive (p. 443) size and the number of recovery points (p. 453) available from the archive. Unlike the GFS (p. 450) scheme that has only three levels of recovery resolution (daily, weekly, monthly resolution), the Tower of Hanoi scheme continuously reduces the time interval between recovery points as the backup age increases. This allows for very efficient usage of the backup storage.

For more information please refer to "Tower of Hanoi backup scheme (p. 72)".

U

Unmanaged vault

Any vault (p. 455) that is not a managed vault (p. 452).

Copyright © Acronis International GmbH, 2002-2013.

V

Validation

An operation that checks the possibility of data recovery from a backup (p. 443).

Validation of a file backup imitates recovery of all files from the backup to a dummy destination. Validation of a disk backup calculates a checksum for every data block saved in the backup. Both procedures are resource-intensive.

While the successful validation means a high probability of successful recovery, it does not check all factors that influence the recovery process. If you back up the operating system, only a test recovery under the bootable media to a spare hard drive can guarantee successful recovery in the future.

Vault

A place for storing backup archives (p. 443). A vault can be organized on a local or networked drive or detachable media, such as an external USB drive. There are no settings for limiting a vault size or the number of backups in a vault. You can limit the size of each archive using cleanup (p. 446), but the total size of archives stored in the vault is limited by the storage size only.

Virtual machine

On Acronis Backup & Recovery 11.5 Management Server (p. 452), a machine (p. 452) is considered virtual if it can be backed up from the virtualization host without installing an agent (p. 443) on the machine. Such machine appears in the **Virtual machines** section. If an agent is installed into the guest system, the machine appears in the **Machines with agents** section.

W

WinPE (Windows Preinstallation Environment)

A minimal Windows system commonly used by OEMs and corporations for deployment, test, diagnostic and system repair purposes. A machine can be booted into WinPE via PXE, CD-ROM, USB flash drive or hard disk. Acronis Plug-in for WinPE (p. 442) enables running the Acronis Backup & Recovery 11.5 Agent (p. 443) in the preinstallation environment.

Copyright © Acronis International GmbH, 2002-2013.