



Acronis[®] Snap Deploy[®] 3

User's Guide

Copyright © Acronis, Inc., 2007. All rights reserved.

"Acronis", "Acronis Compute with Confidence", and the Acronis logo are trademarks of Acronis, Inc.

Linux is a registered trademark of Linus Torvalds.

Windows is a registered trademark 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.

END-USER LICENSE AGREEMENT

BY ACCEPTING, YOU (ORIGINAL PURCHASER) INDICATE YOUR ACCEPTANCE OF THESE TERMS. IF YOU DO NOT WISH TO ACCEPT THE PRODUCT UNDER THESE TERMS, YOU CAN CHOOSE NOT TO ACCEPT BY SELECTING "I decline..." AND NOT INSTALLING THE SOFTWARE.

Acronis® Snap Deploy® (the Software) is Copyright © Acronis, Inc., 2008. All rights are reserved. The ORIGINAL PURCHASER is granted a LICENSE to use the software only, subject to the following restrictions and limitations.

1. The license is to the original purchaser only, and is not transferable without prior written permission from Acronis.
2. The original purchaser can use the software on a single computer. You cannot use the software on more than a single machine, even if you own or lease all of them, without the written consent of Acronis.
3. The original purchaser cannot engage in, nor permit third parties to engage in, any of the following:
 - A. Providing or permitting use of by, or transferring the software to, third parties.
 - B. Providing use of the software in a computer service business, network, timesharing or multiple user arrangement to users who are not individually licensed by Acronis.
 - C. Making alterations or copies of any kind in the software (except as specifically permitted above).
 - D. Attempting to unassemble, decompile or reverse-engineer the software in any way.
 - E. Granting sublicenses, leases, or other rights in the software to others.
 - F. Making copies, or verbal or media translations, of the users guide.
 - G. Making telecommunication data transmission of the software.

Acronis has the right to terminate this license if there is a violation of its terms or default by the original purchaser. Upon termination for any reason, all copies of the software must be immediately returned to Acronis, and the original purchaser shall be liable to Acronis for any and all damages suffered as a result of the violation or default.

ENTIRE RISK

THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE SOFTWARE IS WITH YOU THE PURCHASER. Acronis DOES NOT WARRANT THAT THE SOFTWARE OR ITS FUNCTIONS WILL MEET YOUR REQUIREMENTS OR THAT THE OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED OR ERROR FREE OR THAT ANY DEFECTS WILL BE CORRECTED.

NO LIABILITY FOR CONSEQUENTIAL DAMAGES IN NO EVENT SHALL Acronis OR ITS VENDORS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR THE LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THE SOFTWARE, EVEN IF Acronis HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

SOFTWARE USAGE TERMS AND CONDITIONS

Under current legislation, the «License Agreement» is considered a contract between you and Acronis Inc. The contract is a legal document and its violation may result in legal action. Illegal use and/or distribution of this software will be prosecuted.

Table of Contents

1. Introducing Acronis® Snap Deploy®	7
1.1 Overview	7
1.1.1 What is Acronis Snap Deploy	7
1.1.2 Who needs Acronis Snap Deploy?	7
1.1.3 Acronis Snap Deploy infrastructure	7
1.2 What you can do with Acronis Snap Deploy 3.0	8
1.2.1 Take an image of the master system (Acronis Snap Deploy 2.0 functionality)	8
1.2.2 Manual deployment (Acronis Snap Deploy 2.0 functionality)	8
1.2.3 Scheduled deployment (new in v 3.0)	8
1.2.4 Event-driven deployment (new in v 3.0)	9
1.2.5 Command line and scripting under Win PE (new in v 3.0)	9
1.2.6 Standalone deployment (new in v 3.0)	10
1.2.7 Custom Deployment (User-initiated deployment) (new in v 3.0)	10
1.2.8 Deployment of a disk partition or MBR (new in v 3.0)	11
1.2.9 Selective deployment (MAC filtering) (new in v 3.0)	11
1.2.10 Password protection (new in v 3.0)	11
1.2.11 Manage a remote computer (Acronis Snap Deploy 2.0 functionality)	11
1.3 What else is new in v 3.0?	12
1.3.1 Encrypted communication	12
1.3.2 Multicast TTL and network bandwidth throttling	12
1.4 Supported operating systems	12
1.5 License policy	13
1.5.1 Server and workstation licenses	13
1.5.2 Licenses for Acronis Universal Deploy	13
1.5.3 Acronis Universal Deploy trial version	13
1.6 Upgrade from v 2.0 to v 3.0	14
1.7 Technical support	14
2. Understanding Acronis Snap Deploy	15
2.1 Terminology	15
2.2 Components	16
2.3 Support for file systems and storage media	17
2.3.1 Supported file systems	17
2.3.2 Supported media	17
2.4 Usage	17
2.4.1 Offline imaging	18
2.4.2 Online imaging	19
2.4.3 Deployment	19
2.5 What is Acronis Universal Deploy	21
2.5.1 Acronis Universal Deploy purpose	21
2.5.2 Acronis Universal Deploy general principles	21
2.5.3 Acronis Universal Deploy and Microsoft Sysprep	22
2.5.4 Getting Acronis Universal Deploy	22
3. Installation	23
3.1 System requirements	23
3.2 Used ports and IP addresses	23
3.3 General rules of installation	24
3.3.1 Installation file	24
3.3.2 Common installation configurations	24
3.4 Installation of Acronis Snap Deploy Management Console	26
3.5 Installation of Acronis License Server	26
3.5.1 Installation	26
3.5.2 Adding licenses using Acronis Snap Deploy Management Console	27
3.5.3 Adding licenses in command line mode	28
3.6 Installation of Acronis OS Deploy Server	29
3.7 Installation and setup of Acronis PXE Server	29

3.7.1	Installation of Acronis PXE Server.....	29
3.7.2	Setting up a computer to boot from PXE.....	29
3.7.3	Setting up PXE and DHCP on the same server	30
3.7.4	Setting up the PXE to work in other subnet.....	30
3.8	Installation of Acronis WOL Proxy.....	30
3.9	Installation of Acronis Snap Deploy Management Agent	31
3.10	Installation of Acronis Universal Deploy.....	32
3.11	Extracting the Acronis Snap Deploy components.....	32
3.12	Using Acronis License Server.....	32
3.12.1	Understanding Acronis License Server.....	32
3.12.2	Viewing information about licenses.....	33
3.12.3	Removing licenses	34
3.12.4	Using the Acronis License Server Management Tool	34
4.	Using Acronis Snap Deploy Management Console	36
4.1	Connections	36
4.1.1	Connect to a local machine.....	36
4.1.2	Connect to another computer	36
4.2	Installation and update of Acronis components on remote computers.....	37
4.3	Browsing logs.....	38
5.	Creating Acronis bootable media	39
6.	Configuring PXE Server	43
7.	Taking an image.....	44
7.1	Preparation of the master OS.....	44
7.2	Online vs. offline imaging	44
7.3	Starting offline imaging	45
7.4	Starting online imaging	47
7.5	Steps of the Master Image Creation Wizard.....	48
7.5.1	Disks or partitions to image	48
7.5.2	Image name and location	48
7.5.3	Setting options	49
7.5.4	Comments and summary.....	51
8.	Checking the master image	52
9.	Deployment templates	53
9.1	Why save templates?	53
9.2	Creating templates.....	53
9.2.1	Master image selection.....	53
9.2.2	Disk/partition selection	54
9.2.3	Target disk and partition selection.....	56
9.2.4	User accounts.....	57
9.2.5	Computer names and domain/workgroup	57
9.2.6	Network settings.....	59
9.2.7	Security identifiers	60
9.2.8	Transferring files	60
9.2.9	Executing applications.....	60
9.2.10	Using Acronis Universal Deploy	60
9.2.11	Deployment options	62
9.2.12	Comments and summary.....	66
10.	Standalone deployment	68
11.	Manual deployment.....	69
11.1	Booting up the targets.....	69
11.2	Starting deployment.....	71
12.	Event-driven deployment.....	73
13.	Scheduled deployment	76
13.1	Preparation steps.....	76
13.1.1	Getting MAC addresses.....	76
13.1.2	Enabling WOL on targets.....	76
13.2	Scheduled deployment within one subnet.....	77
13.3	Scheduled deployment in other subnet	79

13.4 Operations with scheduled tasks	82
14. Custom deployment mode	83
14.1 Understanding custom deployment.....	83
14.2 Considerations and tips	84
14.3 Setting up the custom deployment mode	85
14.4 Changing parameters of the custom deployment mode	87
14.5 Closing the custom deployment mode.....	87
15. Command line and scripting under Win PE and Bart PE	88
15.1 Adding ASD command line utility to PE	88
15.1.1 Acronis Snap Deploy PE Builder.....	88
15.1.2 Adding ASD command line utility to PE 1.0.....	89
15.1.3 Adding ASD command line utility to PE 2.0.....	89
15.2 Uploading PE images to Acronis PXE Server.....	90
15.3 ASD command line syntax	91
15.3.1 Supported commands.....	91
15.3.2 Common options (options common for most asdcmd commands)	92
15.3.3 Specific options (options specific for individual asdcmd commands).....	93
15.3.4 asdcmd usage examples.....	95
15.5 Sample scenarios	95
15.5.1 Deploying images assigned to targets.....	95
15.5.2 Creating images assigned to targets	97
16. Managing a remote computer	98
16.1 File management on a remote computer.....	98
16.2 Executing applications on a remote computer.....	99

1. Introducing Acronis® Snap Deploy®

This chapter gives a general idea of how an IT department can meet various real life challenges using the Acronis Snap Deploy.

1.1 Overview

1.1.1 What is Acronis Snap Deploy

Acronis Snap Deploy is a flexible, efficient software solution for deployment of a fully configured operating system (with or without application software and any other data) to multiple computers. Because the product uses disk imaging technology, it is ideal for rapid bare-metal installations and flexible centralized provisioning.

1.1.2 Who needs Acronis Snap Deploy?

Acronis Snap Deploy is primarily designed to be used by:

Small and medium-size businesses:

- IT service providers
- Hardware retailers

IT departments of larger corporations

Schools and universities

R&D and software testing labs.

The enterprise features added to Acronis Snap Deploy v 3.0 (scheduled deployment, support for Preinstallation Environment, command line and scripting, to name a few) can help automate the tasks of the IT department in large enterprise environments.

1.1.3 Acronis Snap Deploy infrastructure

Components of the Acronis infrastructure are installed on Windows computers. Centralized imaging, deployment and managing the Acronis infrastructure is performed using Acronis Snap Deploy Management Console.

A reference image can be taken either in Windows or in the Acronis or Windows PE environment. The Acronis environment provides the GUI mode. Under Windows PE, command line mode and scripting are supported.

Deployment is performed in the Acronis or Windows PE environment.

A dedicated bootable utility enables full functional deployment with GUI on a [standalone computer \(a computer isolated from the network or included in a network without Acronis Snap Deploy infrastructure.\)](#)

1.2 What you can do with Acronis Snap Deploy 3.0

1.2.1 Take an image of the master system (Acronis Snap Deploy 2.0 functionality)

First, you create the desired system configuration and save the image of the system hard disk on a network share, detachable or removable media. [Image](#) is a file that contains the system in a packaged form.

Scenarios:

1. Usually, company departments, such as accounting, sales or technical support, use a fixed set of applications for daily work. Capture an entire library of images and deploy them to new hardware without having to manually configure the operating system and applications.
2. The administrator might need to deploy a standard configuration included in the library on various hardware. The separately sold [Acronis Universal Deploy](#) option can configure Windows system drivers so that Windows is able to boot on dissimilar hardware. Without this option the motherboard, processors and mass storage devices of the imaged and the target hardware must be identical. The same applies to non-Windows operating systems.

1.2.2 Manual deployment (Acronis Snap Deploy 2.0 functionality)

Boot the [target computers](#) (the computers to deploy to) into Acronis environment using Acronis bootable media or Acronis [PXE](#) (Preboot eXecution Environment) Server. Set up and save [parameters of the deployment operation](#) (the deployment [template](#).)

Launch the deployment. The program multicasts the image to the computers you specified and deploys the system on their hard disks. DNS names, domain or workgroup membership, TCP/IP settings, user accounts and security identifiers are assigned on the fly according to the settings you made.

Once the deployment is completed, the computers boot up from their hard disks. The program can shut down or restart the computers according to the settings you made. Sometimes you will have to complete configuration of devices, otherwise the computers are ready to work. (Activation of the operating system is needed though.)

1.2.3 Scheduled deployment (new in v 3.0)

Deployment can be run on a schedule.

Scheduling presumes that when the scheduled time comes, the program will power on the target computers with predefined MAC addresses using the BIOS Wake On LAN (WOL) functionality.

Computers in other subnets can be woken through a WOL proxy agent delivered with Acronis Snap Deploy.

Computers that do not support WOL can be booted into Acronis environment manually before the scheduled time comes. Such computers will also be deployed provided that their MAC addresses are included in the total list.

Scenarios:

1. An organization receives a shipment of computers from a manufacturer along with the list of their MAC addresses. The IT department has to deploy the operating system to the new hardware.
2. An Internet café, school or university lab has 100 computers with known MAC addresses. The nightly deployment of the initial standard image on these computers is needed.

1.2.4 Event-driven deployment (new in v 3.0)

Deployment can be run when the predefined number of computers is ready. The program counts how many computers have connected to the deployment server and starts multicasting when the predefined number of computers is connected.

The administrator can specify a time-out period. On time-out, deployment will start on the computers that are ready despite that the predefined number is not reached.

Scenario:

1. An organization receives 100 computers from a manufacturer. The IT department has to deploy systems, preconfigured according to the employees' roles, to the predefined number of computers. For example, 10 computers for accountants, 10 computers for the marketing department, 70 computers for sales and 10 for the managers.

1.2.5 Command line and scripting under Win PE (new in v 3.0)

Acronis Snap Deploy provides a command line utility that can be added to a Windows Preinstallation Environment (Win PE) image. The administrator uploads the customized PE image to a PXE server or transfers the PE image onto removable media.

Having booted a machine in the Preinstallation Environment, the administrator can perform imaging or deployment in the command line mode or execute scripts.

Using Acronis Snap Deploy in Windows Preinstallation Environment allows a combination of both the products facilities and provides more functionality than using only-Acronis bootable media. The following scenarios can be implemented using Acronis Snap Deploy command line and Win PE.

Scenarios:

1. The administrator might need to deploy diverse images on each of the networked computers.

The administrator writes a deployment script that can read the target's MAC address (for example, 01-02-03-04-05-06) and pull an image with a name corresponding to the MAC address (for example, image-01-02-03-04-05-06.tib) from any convenient location. The script can be executed on any number of targets.

2. The administrator might need to start imaging or deployment automatically each time a networked computer boots from the PXE server.

The administrator creates an imaging or deployment script, adds the script to the PE and includes the script in the *startnet.cmd* file. On booting into the PE, the operation will be performed automatically.

3. The administrator might need to automatically execute pre-deployment operations (disk partitioning, for example) on the networked computers.

The administrator creates a script that performs pre-deployment operations, adds the script along with deployment script to the PE and includes both scripts in the *startnet.cmd* file. On booting into the PE, both operations will be performed automatically.

4. The administrator might need to execute imaging or deployment in Win PE environment if the Acronis environment lacks Linux drivers for some exotic hardware.

Limitation:

Acronis Snap Deploy command line utility can generate a new SID but cannot adjust other settings on the fly. To change the computer name, domain or workgroup membership and other settings, apply the Microsoft System Preparation Tool (Sysprep) to the master system and specify the new settings in the Sysprep.inf answer file.

1.2.6 Standalone deployment (new in v 3.0)

The administrator might need to deploy on a computer isolated from a network or included in a network without Acronis Snap Deploy infrastructure. A dedicated bootable utility enables full functional deployment with GUI on a standalone computer.

The Acronis Universal Deploy option is not available in the standalone mode.

1.2.7 Custom Deployment (User-initiated deployment) (new in v 3.0)

Acronis Snap Deploy can be configured in such a way that users will be able to deploy and re-deploy their computers with one click on the boot menu.

Scenarios:

1. Software testers have to deploy clean operating systems or preconfigured systems on test machines. A test team leader creates custom bootable media or a PXE package that provides a fixed set of choices on the target side. A test team member reboots a test computer and selects what to deploy from the boot menu with one click. The deployment starts immediately.

The choices can be various operating systems, various editions of the same operating system, the same operating system with various settings or various applications, to name a few. The deployment proceeds independently on each computer.

2. The same scenario fits in a university or school lab when switching between exercises requires reconfiguring the computer entirely. Students can switch or restart exercises without the teacher's assistance.

If a student messes up the machine (deletes a file, changes configuration, etc.) then he/she could choose a self-restore option from the boot menu.

The custom deployment mode is intended for continual work without the administrator's assistance. Once the mode is set, other methods of deployment (manual, scheduled, event-driven deployment) become unavailable. Any scheduled task that has to start while the custom deployment mode is on, will not start. Only [users \(the ones on the target side\)](#) can initiate deployment. However, the administrator can view logs, create new deployment templates, change the custom deployment configuration (add, edit or remove boot menu items) and perform other management operations except for deployment.

To initiate deployment on the console side, the administrator switches off the custom deployment mode.

1.2.8 Deployment of a disk partition or MBR (new in v 3.0)

You do not necessarily have to deploy the entire disk. Provided the master and the target disks have a similar partitioning scheme, you can image and deploy only the system partition or only the data, depending on your needs.

Acronis Snap Deploy can image and deploy the Master Boot Record (MBR).

1.2.9 Selective deployment (MAC filtering) (new in v 3.0)

Acronis Snap Deploy has the ability to disable deployment on computers with specified MAC addresses. This protects production servers and user's systems from unfortunate events. The program can import the access list from a text file. Both straight (enabling) and inverse (disabling) lists are supported.

Scenario:

1. Let's say, a networked computer boots up from PXE by mistake. The new image then might be deployed on the computer by an event-driven operation or by the PE configured to start deployment upon booting. The original data will be lost.

1.2.10 Password protection (new in v 3.0)

Images taken with Acronis Snap Deploy can be protected with a password to prevent unauthorized deployment.

Acronis Snap Deploy also supports password protected images created with the Acronis True Image products family.

To prevent Acronis bootable components from unauthorized execution, the Acronis boot menu can also be protected with a password.

1.2.11 Manage a remote computer (Acronis Snap Deploy 2.0 functionality)

An administrator can perform operations on a remote computer using Acronis Snap Deploy.

File management: Create and edit text files (for example batch files or scripts), copy files/folders to the clipboard, paste them, rename and delete files and folders.

Applications management: Execute service applications (configuration files, scripts) on a remote computer by scheduling tasks. The scheduled task contains the application to execute and when the application will be run.

1.3 What else is new in v 3.0?

1.3.1 Encrypted communication

Acronis Snap Deploy components communicate to each other using the Secure Sockets Layer (SSL) cryptographic protocol. Encryption starts on the first (earliest) stage of connection attempt, so all data transferred in the next steps (including data required for client authentication) is encrypted.

Once Acronis Snap Deploy components are installed, encrypted communication between the components is enabled automatically. The deployment stream, being transferred via the communication protocol, is not encrypted.

1.3.2 Multicast TTL and network bandwidth throttling

Deployment configuration has a parameter that specifies time to live (TTL) for multicast packets. Using this setting, you can limit the distribution of multicast packets via gateways.

By setting the permitted bandwidth you can limit the network usage during deployment.

1.4 Supported operating systems

Acronis Snap Deploy provides full-featured imaging and deployment of the following operating systems:

	Deployment	Change settings	License type*
MS Windows Server 2008 (TBD)	Yes	Yes	S
MS Windows Server 2003 Service Pack 2 (x86, x64)	Yes	Yes	S
MS Windows Server 2003 R2 (x86, x64)	Yes	Yes	S
MS Windows Small Business Server 2003	Yes	Yes	S
MS Windows Storage Server 2003 R2	Yes	Yes	S
MS Windows Server 2003 x64 Editions	Yes	Yes	S
MS Windows 2000 Server	Yes	Yes	S
MS Windows 2000 Advanced Server	Yes	Yes	S
MS Windows 2000 Professional SP4	Yes	Yes	S
MS Windows Vista Home Basic (x86, x64)	Yes	Yes	WS
MS Windows Vista Home Premium (x86, x64)	Yes	Yes	WS
MS Windows Vista Business (x86, x64)	Yes	Yes	WS
MS Windows Vista Ultimate (x86, x64)	Yes	Yes	WS
MS Windows XP Home	Yes	Yes	WS
MS Windows XP Professional	Yes	Yes	WS
MS Windows XP Professional x64 Edition	Yes	Yes	WS
MS Windows XP Professional SP2	Yes	Yes	WS
MS Windows NT/4.0 Server	Yes	No	S
MS Windows 98/Me	Yes	No	WS
Linux (kernel: 2.4.9 – 2.6.x)	Yes	No	S

* - S – server license, WS – workstation license.

Acronis Snap Deploy enables, with certain limitations (some operations or options will not be available), imaging and deployment of any PC-based operating system. For example, Windows 98/NT/ME, NT/4.0 Server, Linux (kernel: 2.4.9 – 2.6.x) can be deployed only as is, on-the-fly settings adjustment is not performed.

The Acronis Universal Deploy option is not applicable to Windows 98/NT/ME and NT/4.0 Server.

1.5 License policy

Acronis Snap Deploy licensing is based on the number of deployed and/or managed computers (servers or workstations.) For example, to deploy a system on 100 computers you need 100 deployment licenses. No additional licenses are required to manage the deployed computers or re-deploy any of them.

1.5.1 Server and workstation licenses

Acronis Snap Deploy has two types of licenses. A license for the server product is needed to deploy a server operating system or install the management agent on a server operating system. A license for the workstation product is needed to deploy a workstation operating system or install the management agent on a workstation operating system.

A workstation license is needed to deploy a disk or partition that does not contain an operating system, if the target computer has not been assigned a license before.

Linux is considered as a server OS. The explicit list of server and workstation operating systems is in the previous section.

If Acronis Snap Deploy fails to identify the type of operating system, the operating system is considered as a workstation OS.

A server license could be used instead of a workstation license automatically or through a prompt.

1.5.2 Licenses for Acronis Universal Deploy

Acronis Universal Deploy is an add-on to Acronis Snap Deploy and has its own serial numbers and license agreement.

The Acronis Universal Deploy licenses are counted, used and upgraded in the same way as the Acronis Snap Deploy licenses. Acronis Universal Deploy also has two types of licenses for server and workstation operating systems. You need one Universal Deploy license per target computer.

You do not need a license to install Acronis Universal Deploy. However, do not forget to add the Acronis Universal Deploy licenses to the license server before starting deployment. If the licenses are not found during deployment, the Acronis Universal Deploy step will be skipped.

1.5.3 Acronis Universal Deploy trial version

The Acronis Universal Deploy trial version has all the functionality of the standard version. To upgrade from the trial version to the standard product you do not need to re-download the software. Simply buy the licenses and import them to the license server.

1.6 Upgrade from v 2.0 to v 3.0

To upgrade from Acronis Snap Deploy version 2.0 to version 3.0, buy the necessary number of upgrade licenses and import the licenses to your license server. For each v 2.0 license that you have on the license server, you can import one upgrade license that is considered as new and can be assigned to any computer.

Install the components of v 3.0 over the v 2.0 components.



Components of v 3.0 cannot communicate with v 2.0 components since they use cryptographic communication protocol that was not supported in v 2.0. Remove old Acronis Snap Deploy components, if the new components are installed on other computers.

1.7 Technical support

Users of legally purchased copies of Acronis Snap Deploy are entitled to free technical support from Acronis. If you experience problems installing or using Acronis products that you can't solve yourself by using this guide, then please contact Acronis Technical Support.

More information about contacting Acronis Technical Support is available at the following link:

<http://www.acronis.com/enterprise/support/>

2. Understanding Acronis Snap Deploy

This chapter describes the Acronis Snap Deploy infrastructure components and their interaction.

2.1 Terminology

The following table lists the common terms and descriptions used in this document.

<i>Master system</i>	The system to be deployed.
<i>Master image (Image)</i>	A file that contains the master system in a packaged form. The file has a ".tib" extension.
<i>Online imaging</i>	Taking an image while the master system is in a production state (the operating system is running on the master computer.)
<i>Offline imaging</i>	Taking an image while the master computer is booted into Acronis or Windows preinstallation environment.
<i>Deployment</i>	Transferring the operating system (OS), applications and data from the master image file to a physical hard disk. In most cases, deployment is performed by multicasting the image through the network.
<i>Standalone deployment</i>	Deployment on a computer isolated from a network or included in a network without Acronis Snap Deploy infrastructure. Standalone deployment is performed locally using the bootable Acronis Snap Deploy component.
<i>Target disk</i>	The physical disk to be deployed to (an internal hard disk of the target computer.)
<i>Target computer (Target)</i>	The hardware to be deployed to.
<i>Deployment template (Template)</i>	<p>Configuration parameters of the deployment operation:</p> <ol style="list-style-type: none">1. Path to the master image2. The operation mode (multicast or unicast, how to handle the target disk free space etc.)3. Settings to be applied to the deployed systems (DNS names, user accounts etc.)4. Operations to be performed on the deployed systems (transfer files, execute applications, shut down, restart) <p>Once you save a deployment template, you can use it in the future.</p>
<i>Administrator</i>	The person who has rights to manage Acronis Snap Deploy infrastructure.
<i>Custom deployment mode</i>	The mode when deployment can be initiated on the target side only.
<i>User</i>	The person on the target side who initiates the custom deployment. This term relates to the custom deployment mode only.

2.2 Components

Acronis Snap Deploy includes the following components:

1. **Acronis Snap Deploy Management Console** is an administrative tool for remote access to Acronis servers and Acronis Snap Deploy Management Agent.

When disconnected from the Acronis components, the console allows only installing Acronis products on remote machines.

2. **Acronis OS Deploy Server** is a component that performs centralized deployment through the network with the help of Acronis Snap Deploy Agents.
3. **Acronis Snap Deploy Agent** is a bootable component that performs deployment on each target computer under control of the Acronis OS Deploy Server.

There are two ways to load Acronis Snap Deploy Agent on target computers: locally from bootable media or remotely using Acronis PXE Server.

4. **Acronis Master Image Creator** is a bootable, locally controlled component that takes an image of the master system.

There are two ways to load Acronis Master Image Creator on a master computer: directly from bootable media or remotely using Acronis PXE Server.

5. **Acronis Snap Deploy Management Agent** is a component that takes an image of the master system in Windows environment under the administrator's control through the Acronis Snap Deploy Management Console. The administrator can also manage files and execute applications on a remote computer using Acronis Snap Deploy Management Agent.
6. **Acronis PXE Server** allows for network booting computers into Acronis Snap Deploy Agent, Acronis Master Image Creator or Preinstallation Environment. The computers must support PXE. Using Acronis PXE Server considerably reduces the time required for booting multiple computers as compared to using bootable media. It also eliminates the need to have a technician onsite to install the bootable media into the system that must be booted.
7. **Acronis Wake on LAN Proxy** is a component that enables the Acronis OS Deploy Server to wake the target computers located in the other subnet.
8. **Acronis Standalone Utility** is a bootable component that enables full functional deployment with GUI on a standalone computer (a computer isolated from the network or included in a network without Acronis Snap Deploy infrastructure.)
9. **Acronis License Server** is a component that tracks licenses of Acronis products.
10. **Acronis Universal Deploy** (optional) is an add-on to Acronis Snap Deploy that enables hardware-independent operating system deployment.

2.3 Support for file systems and storage media

2.3.1 Supported file systems

Acronis Snap Deploy provides full-featured imaging and deployment of the following file systems:

- FAT16/32
- NTFS
- Ext2/Ext3
- ReiserFS
- Reiser4
- Linux SWAP
- XFS
- JFS

2.3.2 Supported media

Acronis Master Image Creator can save an image:

- on a network share
- on the master computer internal hard drive
- on USB and FireWire (IEEE-1394) storage devices (hard drives, flash drives) attached to the master computer
- on DVD+R/RW, DVD-R/RW, CD-R/RW loaded in the master computer media drive.

A sizeable image can be split between multiple media automatically.

Acronis OS Deploy Server can deploy images located:

- in network shared folders
- on the deploy server internal hard drive
- on USB and FireWire (IEEE-1394) storage devices (hard drives, flash drives) attached to the deploy server
- on DVD+R/RW, DVD-R/RW, CD-R/RW loaded in the deploy server media drive.

The best practice is keeping images on the deploy server hard drive. This minimizes network traffic during deployment.

The image created on removable or detachable media has to fit into one media disk. To deploy an image spread over several CDs, DVDs or other media, copy all parts of the image to the same folder on the deploy server or on a network share.

Acronis Standalone Utility can deploy images located:

- in network shared folders
- on USB and FireWire (IEEE-1394) storage devices (hard drives, flash drives) attached to the managed computer
- on DVD+R/RW, DVD-R/RW, CD-R/RW loaded in the managed computer media drive.

Acronis Standalone Utility can deploy an image spread on multiple CDs, DVDs or other media.

2.4 Usage

This section gives a general idea of using the product and does not contain the detailed instructions on how to perform operations. Nevertheless, advanced users are welcome to use this section as a step-by-step quick start guide. The details can be found in the further User's Guide sections.

2.4.1 Offline imaging

Offline imaging means that the master system is stopped and the master computer boots into Acronis (or PE) environment.

1. Configure the master system.
2. Install Acronis Snap Deploy Management Console.
3. Do one of the following:

Create bootable media with Acronis Master Image Creator (or PE with Acronis Snap Deploy command line utility)

or

Install Acronis PXE Server, connect the console to the PXE server and upload Acronis Master Image Creator (or PE with Acronis Snap Deploy command line utility.)

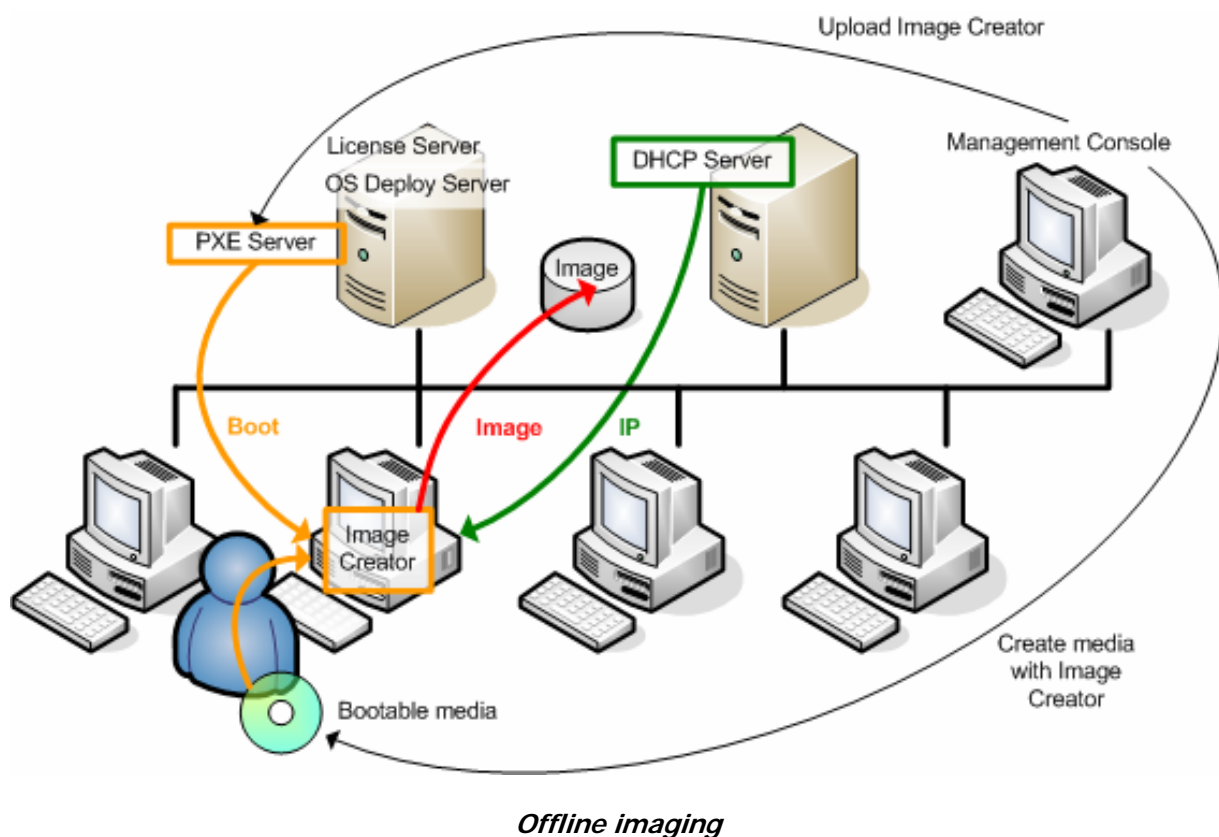
4. Do one of the following, depending on your choice in step 3:

Boot the master computer into Acronis Master Image Creator (or PE) from bootable media

or

Boot the master computer into Acronis Master Image Creator (or PE) from the PXE Server.

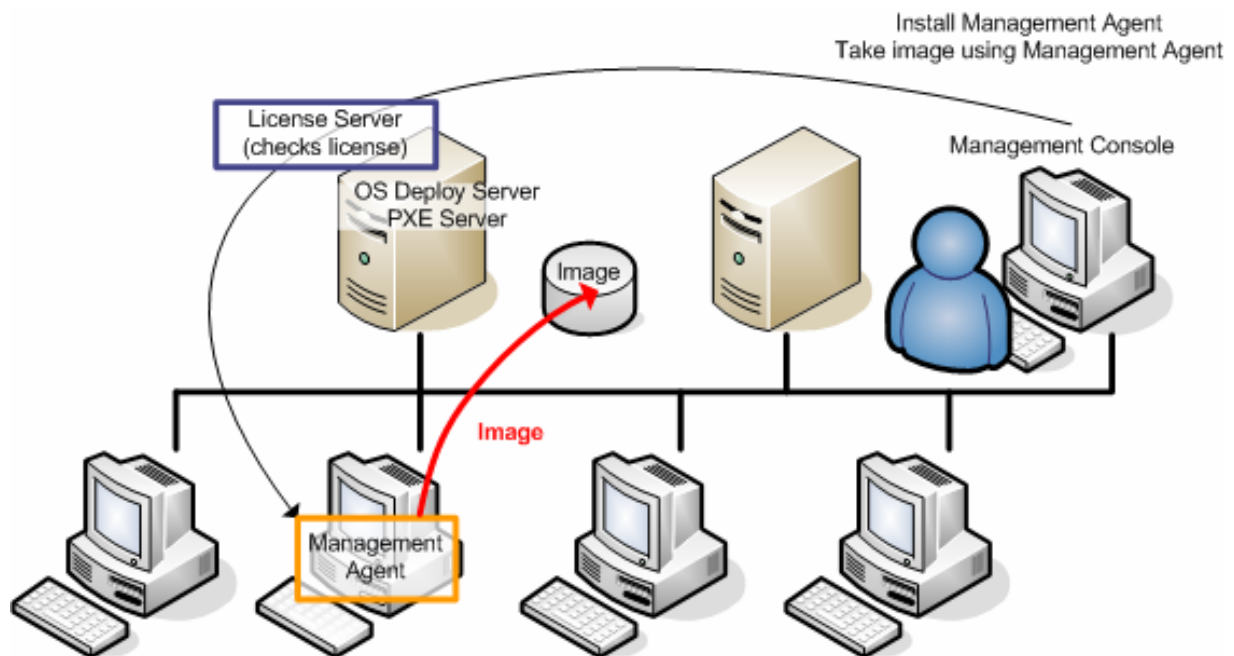
5. On the master computer, follow the Create Image Wizard instructions to configure and launch the imaging operation (or perform imaging in PE using Acronis command line). The image can be saved on a network share, detachable or removable media. To access the network from a bootable environment, you must have a DHCP server or configure the master computer network settings manually.



2.4.2 Online imaging

Online imaging means that the master system is imaged live (without reboot or suspending operations.) Online imaging can be performed remotely whenever you need. The disadvantage is that you have to install imaging software that (1) takes a license and (2) is included in the master image. This is not always rational.

1. Configure the master system.
2. Install Acronis Snap Deploy Management Console and Acronis License Server. Import licenses to the license server.
3. Install Acronis Snap Deploy Management Agent on the master system locally or remotely, using Acronis Snap Deploy Management Console. This will take a license from the license server. Reboot on prompt. Once Acronis Snap Deploy Management Agent is installed, you can image the master system online (without reboot) at any time.
4. Connect the console to the master system, click Create Master Image -> Next -> Create master image on a remote computer. Follow the Create Image Wizard instructions to configure and launch the imaging operation. The image can be saved on a network share, detachable or removable media.



Online imaging

2.4.3 Deployment

The following illustrates the Acronis components functionality by the example of manual deployment. During event-driven and scheduled deployment the components perform similarly.

Deployment presumes that you have created a master image, so at least the Acronis Snap Deploy Management Console is installed.

1. Install Acronis License Server. Import licenses to the license server. Install Acronis OS Deploy Server.
2. Do one of the following:

Create bootable media with Acronis Snap Deploy Agent (or PE with Acronis Snap Deploy command line utility)

or

Install Acronis PXE Server, connect the console to the PXE server and upload Acronis Snap Deploy Agent (or PE with Acronis Snap Deploy command line utility.)

3. Do one of the following, depending on your choice in step 2:

Boot the target computer(s) into Acronis Snap Deploy Agent (or PE) from bootable media

or

Boot the target computer(s) into Acronis Snap Deploy Agent (or PE) from the PXE Server.

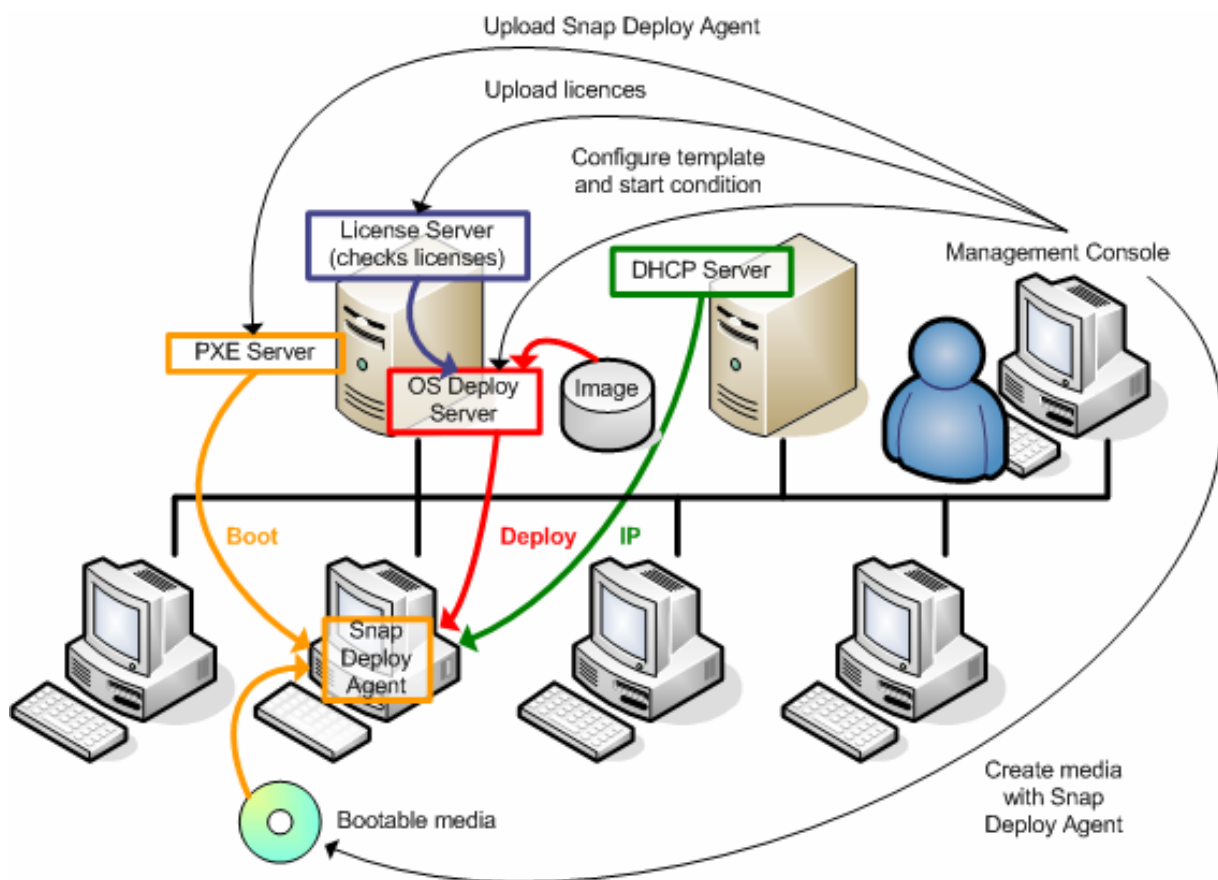
You must have a DHCP server or configure the target computers network settings manually to enable the target computers to connect to Acronis OS Deploy Server.

4. Do one of the following, depending on whether the agent or the PE is running:

- Connect the console to the Acronis OS Deploy Server. Select the Deployment tab
- Make sure that the target computers IP addresses are displayed on the Deployment tab. This means that the computers are connected and ready for deployment
- Click Manual Deployment and follow the Manual Deployment Wizard instructions to configure and launch the deployment operation

or

- perform deployment in PE using Acronis command line utility.



Manual deployment

2.5 What is Acronis Universal Deploy

This section describes the Acronis proprietary technology that helps deploy and boot up Windows on dissimilar hardware. Acronis Universal Deploy saves you from configuring a new master system for each make of hardware you have to deploy on.

If you plan to deploy Windows on multiple computers that are identical to each other, but differ from the master computer hardware; deploy the master image on one of the identical computers using Acronis Universal Deploy. This will adjust Windows to the dissimilar hardware. Then image the adjusted system and deploy it to the identical computers.

The Acronis Universal Deploy option is not available in the standalone mode.

2.5.1 Acronis Universal Deploy purpose

A system disk image can be deployed easily on the hardware where it was created or to identical hardware. However, if you change a motherboard or use another processor version, the deployed system could be unbootable. An attempt to transfer the system to a new, much more powerful computer will usually produce the same unbootable result because the new hardware is incompatible with the most critical drivers included in the image.

Using Microsoft System Preparation Tool (Sysprep) does not solve this problem, because Sysprep permits adding drivers only for Plug-and-Play devices (sound cards, network adapters, video cards etc.). As for the system Hardware Abstraction Layer (HAL) and mass storage device drivers, they must be identical on the source and the target computers (see Microsoft Knowledge Base, articles 302577 and 216915).

Acronis Universal Deploy technology provides an efficient solution for hardware-independent system deployment by adding the crucial Hardware Abstraction Layer (HAL) and mass storage device drivers.

2.5.2 Acronis Universal Deploy general principles

1. Automatic HAL and mass storage drivers selection

Acronis Universal Deploy searches the Windows default driver storage folders (in the image being deployed) for HAL and mass storage device drivers and installs drivers that better fit the target hardware. You can specify a custom driver repository (a folder or folders on a network share or CD) which will also be used for drivers search.



The Windows default driver storage folder is determined in the registry key `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\Current version\DevicePath`. This storage folder is usually `WINDOWS/inf`.

2. Manual selection of mass storage device driver

If the target hardware has a specific mass storage controller (such as a SCSI, RAID, or Fibre Channel adapter) for the hard disk, you can install the appropriate driver manually, bypassing the automatic driver search-and-install procedure.

3. Installing drivers for plug and play devices

Acronis Universal Deploy relies on built-in plug and play discovery and configuration process to handle hardware differences in devices that are not critical for the deployed system start-up, such as video, audio and USB. Windows takes control over this process during the logon phase, and if some of the new hardware is not detected, you will have a chance to install drivers for it later manually.

2.5.3 Acronis Universal Deploy and Microsoft Sysprep

Acronis Universal Deploy is not a system preparation tool. You can apply it to any system image created by Acronis products, including images of systems prepared with Microsoft System Preparation Tool (Sysprep).

2.5.4 Getting Acronis Universal Deploy

Acronis Universal Deploy is an add-on to Acronis Snap Deploy. It is purchased separately, has its own license, and is installed from a separate setup file. For more information please visit <http://www.acronis.com/enterprise/products/snapdeploy/universal-deploy.html>.

3. Installation

3.1 System requirements

The Acronis Snap Deploy components can be installed on computers running the following operating systems:

	<i>The type of license required for the Acronis Snap Deploy Management Agent installation</i>
MS Windows Server 2008 (TBD)	<i>S</i>
MS Windows Server 2003 Service Pack 2 (x86, x64)	<i>S</i>
MS Windows Server 2003 R2 (x86, x64)	<i>S</i>
MS Windows Small Business Server 2003	<i>S</i>
MS Windows Storage Server 2003 R2	<i>S</i>
MS Windows Server 2003 x64 Editions	<i>S</i>
MS Windows 2000 Server	<i>S</i>
MS Windows 2000 Advanced Server	<i>S</i>
MS Windows 2000 Professional SP4	<i>WS</i>
MS Windows Vista Home Basic (x86, x64)	<i>WS</i>
MS Windows Vista Home Premium (x86, x64)	<i>WS</i>
MS Windows Vista Business (x86, x64)	<i>WS</i>
MS Windows Vista Ultimate (x86, x64)	<i>WS</i>
MS Windows XP Home	<i>WS</i>
MS Windows XP Professional	<i>WS</i>
MS Windows XP Professional x64 Edition	<i>WS</i>
MS Windows XP Professional SP2	<i>WS</i>

* - S – server license, WS – workstation license.

3.2 Used ports and IP addresses

The Acronis OS Deploy Server and the Acronis Snap Deploy Management Console use the following ports and IP addresses for remote operation:

- UDP port: 9876
- TCP port: 9876, if busy, choose a port at random
- IPv4 multicast address: 239.255.219.45
- Acronis Snap Deploy Management Console UDP port: 9877, if busy, choose a port at random

The Acronis PXE Server uses the following ports and IP addresses:

- UDP port: 67, 68, 69.
- Broadcast address: 255.255.255.255

If you are using a firewall, you might have to set the appropriate access options.

3.3 General rules of installation

3.3.1 Installation file

Acronis Snap Deploy installation file includes the following components and the components' features:

Acronis Snap Deploy Management Console

- Acronis Snap Deploy PE Builder
- Media Builder for Acronis Image Creator
- Media Builder for Acronis Snap Deploy Agent
- Media Builder for Acronis Standalone Utility

Acronis License Server

- Acronis License Server
- Acronis License Server Management Console
- Acronis License Server Management Tool

Acronis OS Deploy Server

Acronis PXE Server

Acronis Snap Deploy Management Agent

Acronis WOL Proxy



The installation window

The **Acronis Universal Deploy** option installs from its own installation file.

3.3.2 Common installation configurations

Acronis Snap Deploy components can be installed in various configurations, in terms of distributing the components and features among the networked computers.

1. The minimal configuration that enables only **offline imaging and standalone deployment**:

- Acronis Snap Deploy Management Console (custom installation, including:
 - Media Builder for Acronis Image Creator
 - Media Builder for Acronis Standalone Utility.)

all on the same computer.

2. The minimal configuration that enables **offline imaging, standalone deployment and deployment through the network with Acronis OS Deploy Server:**

- Acronis Snap Deploy Management Console (custom installation, including:
 - Media Builder for Acronis Image Creator
 - Media Builder for Acronis Standalone Utility
 - Media Builder for Acronis Snap Deploy Agent.)
- Acronis License Server (custom installation, includes only:
 - Acronis License Server)
- Acronis OS Deploy Server

all on the same computer. On the target computers, no Acronis components are required.

3. The configuration that adds the **network boot of master and target computers** to the above functionality:

- Acronis Snap Deploy Management Console (custom installation, including:
 - Media Builder for Acronis Image Creator
 - Media Builder for Acronis Standalone Utility
 - Media Builder for Acronis Snap Deploy Agent.)
- Acronis License Server (custom installation, includes only:
 - Acronis License Server)
- Acronis OS Deploy Server
- Acronis PXE Server

all on the same computer. On the target computers, no Acronis components are required.

This is the recommended elementary configuration that enables most of the Acronis Snap Deploy functionality.

In case physical access to the powerful server is limited, you can install the console on a separate computer. Another common configuration is:

Workstation:

- Acronis Snap Deploy Management Console (custom installation, including:
 - Media Builder for Acronis Image Creator
 - Media Builder for Acronis Standalone Utility
 - Media Builder for Acronis Snap Deploy Agent.)

Server:

- Acronis License Server(custom installation, includes only:
 - Acronis License Server)
- Acronis OS Deploy Server
- Acronis PXE Server

Generally, you can install all Acronis servers on separate computers. In this case, you will have to connect the management console to each server separately to manage the server. With all servers on one computer, only one console connection is needed.

4. To add the **ability to deploy Windows on dissimilar hardware** to any configuration but (1), install the **Acronis Universal Deploy** add-on on a computer where Acronis OS Deploy Server is installed.

5. To add the **online imaging ability** and **the ability to validate images integrity** to any configuration, install **Acronis Snap Deploy Management Agent**.

Online imaging means that the master system is imaged live (without reboot or suspending operations.) Online imaging can be performed remotely whenever you need on connecting the console to the management agent installed on the master computer. The management agent will be included

in the master image and deployed on all target computers. This will enable you to manage files and execute applications on target computers at any time after deployment.

However, having excess software in the master image is not always rational. Besides, installation of the agent takes a license.

We recommend that you create a master image using bootable Acronis Master Image Creator or the command line utility in PE. Nevertheless, having at least one management agent on the network (not necessarily on the master computer) makes sense. You will be able to validate (check) your images integrity using the management agent.

6. To add the Acronis OS Deploy Server **ability to deploy in other subnet** (across a switch) to any configuration but (1), install **Acronis WOL Proxy** on any server in the subnet where the target computers are. No additional actions are required.

Acronis WOL Proxy has to be installed only if:

- you are going to perform scheduled deployment (manual or event-driven deployment do not require WOL Proxy Server)

AND

- all or some of the target computers are in subnet(s) other than Acronis OS Deploy Server.

3.4 Installation of Acronis Snap Deploy Management Console

Acronis Snap Deploy Management Console is an administrative tool for remote access to Acronis servers and Acronis Snap Deploy Management Agent. Install Acronis Snap Deploy Management Console on any networked computer from which you prefer to operate.

To install Acronis Snap Deploy Management Console:

1. Run the Acronis Snap Deploy setup program
2. Click **Install Acronis Snap Deploy Management Console**
3. Follow the Install Wizard instructions on the screen.

Typical and complete installations install, besides Acronis Snap Deploy Management Console, **Media Builder for Acronis Image Creator**, **Media Builder for Acronis Snap Deploy Agent** and **Media Builder for Acronis Standalone Utility**. We strongly recommend that you install all the features that enable creation of bootable CD, DVD or other removable media with bootable Acronis components.

Once Acronis Snap Deploy Management Console is installed, you can install the other components remotely using the console's remote installation feature (for more information, see *4.2 Installation and update of Acronis components on remote computers*).

3.5 Installation of Acronis License Server

3.5.1 Installation

Acronis License Server is a component that tracks licenses of Acronis products. Install **Acronis License Server** on a computer accessible to Acronis OS Deploy Server. Installing both products on the same computer would make sense.

A typical installation installs Acronis License Server and the Acronis License Server Management Console. A complete installation installs, besides these two, Acronis License Server Management Tool. A custom installation lets you choose components to install.

The **Acronis License Server Management Tool** is a simple command-line utility for controlling Acronis License Server. **Acronis License Server Management Console** provides an easy-to-use GUI. Alternatively, you can control Acronis License Server using Acronis Snap Deploy Management Console. So you can choose to install only the Acronis License Server.



If you have already installed Acronis License Server that came with another Acronis product, you still need to install Acronis License Server that came with Acronis Snap Deploy. You can install both license servers on the same computer. The Acronis License Server then will be seen as a common server for all Acronis products.

There is no need to install Acronis License Server Management Console or Acronis License Server Management Tool once again, because you already have the necessary management instruments.

To install Acronis License Server:

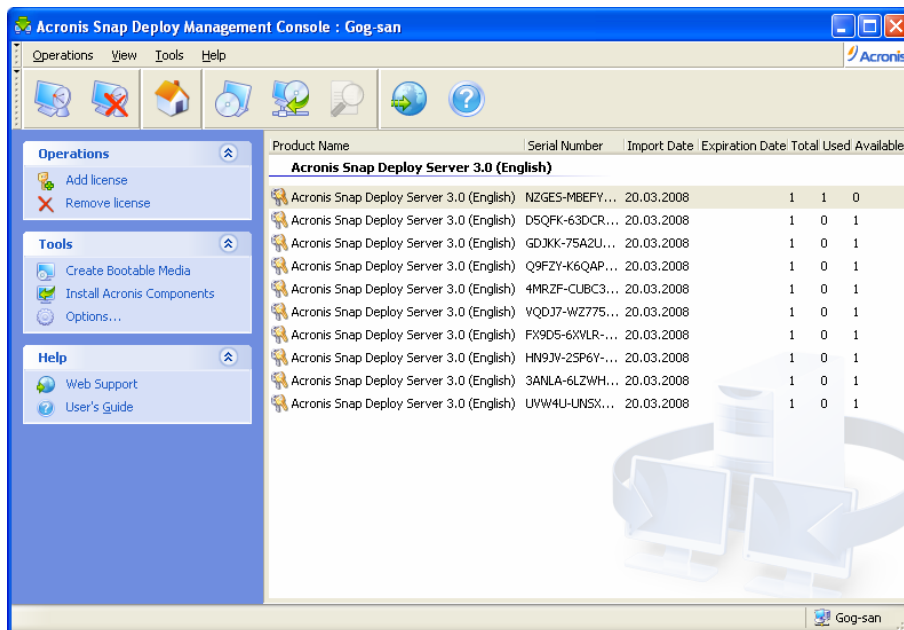
1. Run the Acronis Snap Deploy setup program
2. Click **Install Acronis License Server**
3. Follow the Install Wizard instructions on the screen.
4. Reboot on prompt.

After installation, Acronis License Server launches automatically as Windows service.

Before installing Acronis OS Deploy Server, import serial numbers to Acronis License Server either in command-line mode or using Acronis Snap Deploy Management Console.

3.5.2 Adding licenses using Acronis Snap Deploy Management Console

1. Run the Acronis Snap Deploy Management Console.
2. Click **Manage licenses**. Connect to the computer where Acronis License Server is installed.
3. Click **Add License** on the sidebar.
4. In the Add License window, type in the serial number or a path to the .txt or .eml file containing the serial numbers. Or you can browse to the file.
5. In the final window, click **Proceed**. Acronis License Server performs the operation and reports the number of newly-added licenses.



The license server has 10 server licenses

3.5.3 Adding licenses in command line mode

If you have installed Acronis License Server Management Tool, you can add licenses to the Acronis License Server in the command line mode.

1. Run cmd.exe (Windows Command Prompt)
2. Go to the folder where Acronis License Server is installed. By default, it is
\Program Files\Acronis\LicenseServer
3. Enter the following command:

```
LicenseServerCmdLine --import-file [servername] [filename]
```

where:

servername – name of the computer where Acronis License Server is installed

filename – name of the file (*.txt or *.eml) with the serial numbers

Example:

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 5.2.3790]
(C) Copyright 1985-2003 Microsoft Corp.

C:\Documents and Settings\adm-tor>cd c:\program files\acronis\licenseserver
C:\Program Files\Acronis\LicenseServer>licenseservercmdline --import-file Ltest-2 c:\acronisenglish.txt
Imported 1 new license

C:\Program Files\Acronis\LicenseServer>_
```

This will add the serial numbers from C:\AcronisEnglish.txt to the license server Ltest-2.

3.6 Installation of Acronis OS Deploy Server

Acronis OS Deploy Server is a component that performs centralized deployment through the network with the help of Acronis Snap Deploy Agents.

Before installing Acronis OS Deploy Server, you need to install the Acronis License Server and import license numbers to it (for more information see the previous section).

To install Acronis OS Deploy Server:

1. Run the Acronis Snap Deploy setup program
2. Click **Install Acronis OS Deploy Server**
3. Follow the Install Wizard instructions on the screen.
4. Reboot on prompt.

The wizard will ask you for **Acronis License Server**. Browse to the server, or enter its name or IP address, or let the server be found automatically on the network. This will not decrease the number of deployment licenses. The program just checks the availability of the licenses and stores the specified Acronis License Server parameters to be able to access the Acronis License Server later, when the deployment is launched.

3.7 Installation and setup of Acronis PXE Server

Acronis PXE Server allows the network booting of the Acronis Snap Deploy Agent, Acronis Master Image Creator or Preinstallation Environment on target computers. Using Acronis PXE Server considerably reduces the time required for booting the computers as compared to using bootable media. It also eliminates the need to have a technician onsite to install the bootable media into the system that must be booted. This allows for unattended scheduled deployment.

Using Acronis PXE Server makes sense if there is a Dynamic Host Control Protocol (DHCP) server in your network, so that the booting computers can automatically get IP addresses. Without DHCP, you can boot computers from PXE, but have to configure their network settings manually.

We recommend that you have only one PXE server within a subnet to ensure predictability of the booting computers behavior.

3.7.1 Installation of Acronis PXE Server

To install Acronis PXE Server:

1. Run the Acronis Snap Deploy setup program
2. Click **Install Acronis PXE Server**
3. Follow the on screen Install Wizard instructions.

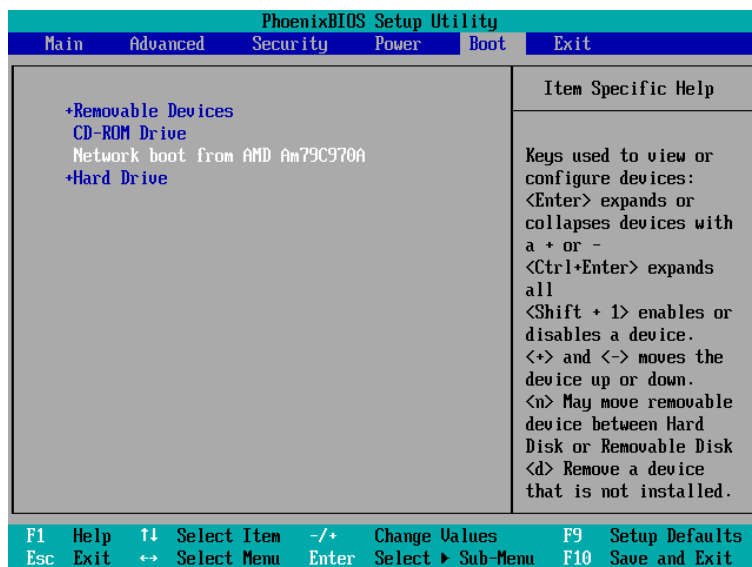
Acronis PXE Server runs as a service immediately after installation. Later on it will automatically launch at each system restart. You can stop and start this program in the same way as other services.

3.7.2 Setting up a computer to boot from PXE

For bare metal, it is enough that the machine's BIOS supports network booting.

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 the Hard Drive device. The

example below shows one of reasonable BIOS configurations. If you don't insert bootable media, the computer will boot from the network.



Setting up the BIOS (example) for network boot

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.

3.7.3 Setting up PXE and DHCP on the same server

If **Acronis PXE Server** and the **DHCP server** are on the same computer, add to the DHCP server option 60: "Client Identifier" with string value "PXE Client". This can be done as follows:

```
C:\WINDOWS\system32>netsh
netsh>dhcp
netsh>dhcp>server \\<server_machine_name> or <IP address>
netsh dhcp>add optiondef 60 PXEClient STRING 0 comment="Option added for
PXE support"
netsh dhcp>set optionvalue 60 STRING PXEClient
```

3.7.4 Setting up the PXE to work in other subnet

To enable the **Acronis PXE Server** to work in other 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>

3.8 Installation of Acronis WOL Proxy

Acronis Wake on LAN Proxy enables the Acronis OS Deploy Server to wake the target computers located in the other subnet.

Acronis WOL Proxy has to be installed only if:

- you are going to perform scheduled deployment (manual or event-driven deployment do not require WOL Proxy)

AND

- all or some of the target computers are in subnet(s) other than Acronis OS Deploy Server.

Install Acronis WOL Proxy on any server in the same subnet as the target computers. No additional actions are required.

To install Acronis WOL Proxy Server:

1. Run the Acronis Snap Deploy setup program
2. Click **Acronis WakeOnLAN Proxy**
3. Follow the Install Wizard instructions on the screen.

Acronis WOL Proxy runs as a service immediately after installation. Later on it will automatically launch at each system restart. You can stop and start this program in the same way as other services.

3.9 Installation of Acronis Snap Deploy Management Agent

Installation of **Acronis Snap Deploy Management Agent** adds the online imaging ability and the ability to validate integrity of your images.

Online imaging means that the master system is imaged live (without reboot or suspending operations.) Online imaging can be performed remotely whenever you need on connecting the console to the management agent installed on the master computer. The management agent will be included in the master image and deployed on all target computers. This will enable you to manage files and execute applications on target computers at any time after deployment.

However, having excess software in the master image is not always rational. Besides, installation of the agent takes a license.

We recommend that you create a master image using bootable Acronis Master Image Creator or the command line utility in PE. Nevertheless, having at least one management agent on the network (not necessarily on the master computer) makes sense. You will be able to validate (check) your images integrity using the management agent.

To install Acronis Snap Deploy Management Agent:

1. Run the Acronis Snap Deploy setup program
2. Click **Install Acronis Snap Deploy Management Agent**
3. Follow the Install Wizard instructions on the screen
4. The wizard will ask you for **Acronis License Server**. Browse to the server, or enter its name or IP address, or let the server be found automatically on the network.

There must be at least one Acronis Snap Deploy license of appropriate type on the license server. A license for the server product is needed to install the agent on a server operating system. A license for the workstation product is needed to install the agent on a workstation operating system. A server license can be used instead of a workstation license through a prompt. The management agent installation will decrease the number of free licenses by one.

5. Reboot on prompt.

3.10 Installation of Acronis Universal Deploy

Acronis Universal Deploy is an add-on to Acronis Snap Deploy. It is purchased separately and installed from a separate setup file.

Acronis Universal Deploy can be installed only on a computer where Acronis OS Deploy Server is installed.

Acronis Universal Deploy can be installed on a networked computer either locally, by running the setup program, or remotely. To install Acronis Universal Deploy remotely, extract the setup file (.msi) to a network share (see below) and install Acronis Universal Deploy in the same way as other Acronis Snap Deploy components (see *4.2 Installation and update of Acronis components on remote computers*).

After installation Acronis Universal Deploy automatically plugs in Acronis OS Deploy Server.



You do not need a license to install Acronis Universal Deploy. However, do not forget to add the Acronis Universal Deploy licenses to the license server before starting deployment. If the licenses are not found during deployment, the Acronis Universal Deploy step will be skipped.

3.11 Extracting the Acronis Snap Deploy components

During Acronis Snap Deploy Management Console installation, all Acronis Snap Deploy components' setup (.msi) files will be placed in the \Program Files\Common Files\Acronis\RemoteInstall folder. Thus, you will be able to remotely install, modify or repair the components using Acronis Snap Deploy Management Console or **msiexec.exe** utility.

When installing Acronis Snap Deploy components on a local computer, you can save setup files for each component separately on a local or network drive. This will help when modifying or recovering the existing component installation on a local computer.

To save a component's setup file:

1. Run the Acronis Snap Deploy setup file
2. In the Install Menu, right-click on the component name and select **Extract**
3. Select a location for the setup file and click **Save**.

3.12 Using Acronis License Server

This section does not describe steps of the installation procedure. It contains general information necessary for understanding Acronis License Server and covers more operations with licenses than described in *3.5.2 Adding licenses using Acronis License Server Management Console* and *3.5.3 Adding licenses in command line mode*.

3.12.1 Understanding Acronis License Server

The Acronis License Server is a mechanism that tracks licenses of Acronis products. Acronis Snap Deploy licensing is based on the number of deployed and/or managed computers (servers or workstations). For example, to deploy a system on 100 computers you need 100 deployment licenses. No additional licenses are required to manage the deployed computers or re-deploy any of them.

Acronis Universal Deploy is an add-on to Acronis Snap Deploy and has its own serial number and license agreement.

Acronis License Server tracks the licenses using a MAC address, which is unique for each network interface card (NIC). Although a MAC address is usually hardwired to the NIC, some operating systems offer a way to change it. It is important to note that attempting to change the MAC address on a system may impede the Acronis License Server operation and prevent you from other deployments to the same computer or from managing that computer remotely.

When installing Acronis OS Deploy Server, you have to specify the Acronis License Server. Once the Acronis License Server is found the program checks for available licenses on the server and stores its net address to be able to access the Acronis License Server later, when deployment is launched.

When starting a deployment, Acronis OS Deploy Server checks the availability of free licenses on the Acronis License Server. If there are enough free licenses for the deployment, the process will run and the number of free licenses will decrease by the number of deployed systems.

Acronis License Server can import multiple license numbers from .txt or .eml files, saving you from the time-consuming procedure of typing in each number.

When upgraded, recovered or reinstalled, the Acronis License Server keeps all the imported licenses intact. However, it is recommended that you copy the file(s) with license numbers to removable media, or create a hard copy of that file(s) and keep it in a safe place. This ensures that you have license data available in case of hardware failure.

3.12.2 Viewing information about licenses

1. Run the Acronis Snap Deploy Management Console.
2. Click **Manage licenses**. Connect to the computer where Acronis License Server is installed. This will display all serial numbers available on the Acronis License Server. One serial number can contain multiple licenses.

Acronis Snap Deploy Management Console : Gog-san

OperationsViewToolsHelp

Operations

Add license

Remove license

Tools

Create Bootable Media

Install Acronis Components

Options...

Help

Web Support

User's Guide

Product Name	Serial Number	Import Date	Expiration Date	Total Used	Available	
Acronis Snap Deploy 3.0 (English)						
Acronis Snap Deploy 3.0 (English)	28GEZ-CMZSN-...	20.03.2008		1	0	1
Acronis Snap Deploy 3.0 (English)	HCDK3-QP6VZ-...	20.03.2008		1	0	1
Acronis Snap Deploy 3.0 (English)	4VG72-MWVA8-...	20.03.2008		1	0	1
Acronis Snap Deploy 3.0 (English)	WAZYE-8D3CK-...	20.03.2008		1	0	1
Acronis Snap Deploy 3.0 (English)	RWDAP-AGCU2-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)						
Acronis Snap Deploy Server 3.0 (English)	NZGES-MBEFY-...	20.03.2008		1	1	0
Acronis Snap Deploy Server 3.0 (English)	D5QFK-63DCR-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	GDJKK-75A2U-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	Q9FZY-K6QAP-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	4MRZF-CUBC3-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	VQDJ7-WZ775-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	FX9DS-6XVLR-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	HN9JV-2SP6Y-K...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	3ANLA-6LZWH-...	20.03.2008		1	0	1
Acronis Snap Deploy Server 3.0 (English)	UWW4U-UN5XK-...	20.03.2008		1	0	1

Gog-san

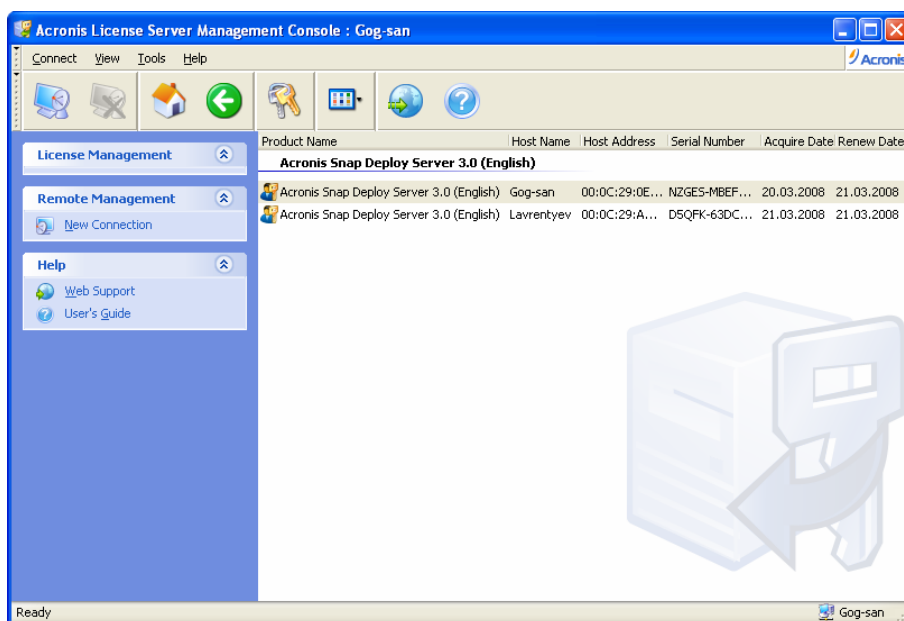
You have 10 server licenses and 5 workstation licenses

Right-click on the column headings bar to choose the details to display: Product Name, Serial Number, Import Date, Expiration Date and Total number of licenses assigned to each serial number, as well as

how many of them are available (i.e. free) and used. For example, if one license corresponds to one serial number, Total=1, Available=1, Used=0 (if the license is free) or Available=0, Used=1 (if the license has been allocated.)

3. To display more information about used licenses, select **Manage Used Licenses** on the sidebar. (This item does not appear while all licenses are free.)

The **Used** mode lists all licenses that are allocated. Right-click on the column headings bar to choose the details to display: Product Name, Host Name, Host Address, Serial Number, Acquire Date (date of deployment or installation that used the license) and Renewal Date (the latter is not valid for Acronis Snap Deploy licenses).



Two licenses are used

You can sort any list using **View -> Arrange Icons by**.

3.12.3 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 sidebar.

3.12.4 Using the Acronis License Server Management Tool

The **Acronis License Server Management Tool** is a command-line utility for controlling Acronis License Server. The **LicenseServerCmdLine.exe** file installs with only the Acronis License Server complete installation. The tool is located in the installation folder, by default it is \Program Files\Acronis\LicenseServer. If the file is not found, install it by running the Acronis Snap Deploy setup program. For more information, see *3.5 Installation of Acronis License Server*.

LicenseServerCmdLine.exe uses the following syntax:

```
LicenseServerCmdLine [command] [option1] [option2]
```

LicenseServerCmdLine.exe supports the following commands and command options:

`--list`

Displays the list of Acronis License Servers found on the local network.

`--status [servername or server IP-address]`

Displays the status of the specified License Server, i.e. the number of total/free licenses for each Acronis product.

`--import [servername] [serial key]`

Adds information about a new license (new serial key). You can specify multiple serial numbers (space separated).

`--import-file [servername] [filename]`

Imports license serial keys from .txt or .eml file.

`--help`

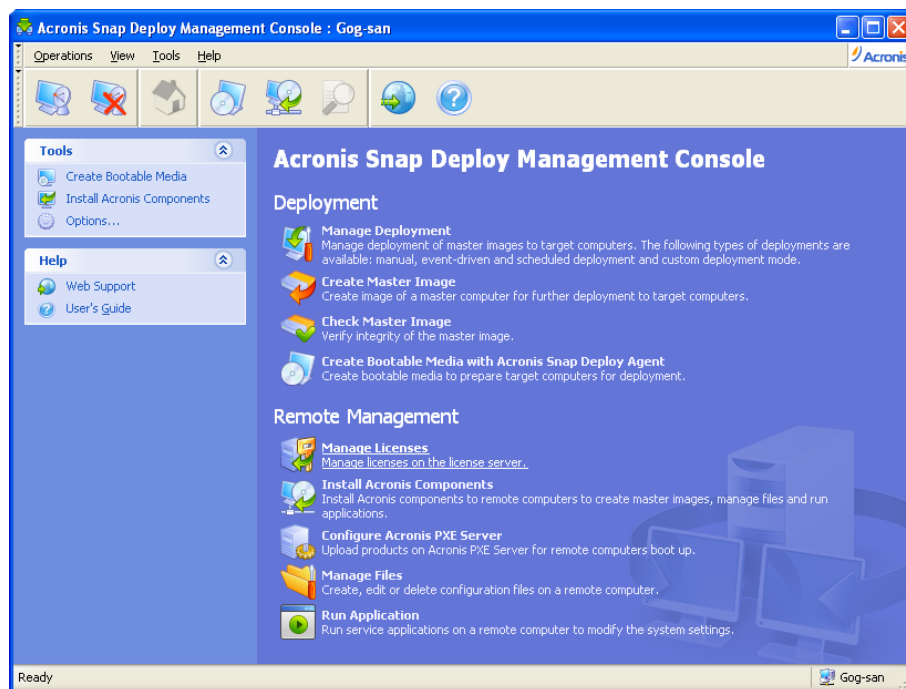
Shows usage.

4. Using Acronis Snap Deploy Management Console

4.1 Connections

4.1.1 Connect to a local machine

When started, Acronis Snap Deploy Management Console connects to the local machine if there is a manageable Acronis Snap Deploy component on this machine. You can manage any Acronis server or Acronis Snap Deploy Management Agent installed on the same machine without any additional actions.



The management console home window

4.1.2 Connect to another computer

Acronis Snap Deploy Management Console can connect to any networked computer where an Acronis server or Acronis Snap Deploy Management Agent is installed. Once connected, you can manage the Acronis server or perform operations using the Acronis Snap Deploy Management Agent.

Manage Deployment – connect to Acronis OS Deploy Server

Create Master Image – connect to Acronis Snap Deploy Management Agent (or start Acronis Media Builder)

Check master image – connect to Acronis Snap Deploy Management Agent

Create Bootable media with Acronis Snap Deploy Agent – connection is not needed

Manage Licenses – connect to Acronis License Server

Install Acronis components – connection is not needed

Configure Acronis PXE Server – connect to Acronis PXE Server

Manage files – connect to Acronis Snap Deploy Management Agent

Execute Applications - connect to Acronis Snap Deploy Management Agent.

4.2 Installation and update of Acronis components on remote computers

The following components of Acronis Snap Deploy can be installed remotely:

- Acronis OS Deploy Server
- Acronis License Server
- Acronis PXE Server
- Acronis WOL Proxy
- Acronis Snap Deploy Management Agent.



Acronis Snap Deploy components cannot be installed onto remote computers running Windows Vista and Windows Server 2008. Please install the components locally on such machines.

Preparation

For successful installation on a remote computer running any Windows XP version, the option **Control panel -> Folder options -> View -> Use simple file sharing** must be disabled on that computer.

For successful installation on a remote computer running Windows XP with Service Pack 2 or Windows 2003 Server, the option **Control panel -> Windows Firewall -> Exceptions -> File and Printer Sharing** must be enabled on that computer.

Installation

1. Click **Install Acronis components**.
2. Select the installer location from the list (**Registered Components**, **Search removable media** or **Specify location**). The default selection **Registered Components** will use setup files from the default C:\Program Files\Common Files\Acronis\RemoteInstall folder.
3. Select the Acronis component and specify the component features you want to install (for component features see *3.3 General rules of installation*).
4. Browse to the remote computer or specify its network name or IP address.
5. Enter the administrator's username and password for the remote machine.
6. Specify the Acronis License Server, if the wizard asks. You must have at least one free license on the license server to install Acronis OS Deploy Server or Acronis Snap Deploy Management Agent.
7. Installation of some Acronis components requires system restart. If you allow immediate remote computer reboot, check the **Reboot the remote computer** box.
8. Click **Proceed**.
The Acronis component then will be installed on the remote computer. If system restart is necessary, the remote machine will reboot or the program will prompt you to restart the remote machine, depending on your choice in step 6.

To update an Acronis component on a remote computer, perform the same procedure.

4.3 Browsing logs

To view operation logs of the Acronis OS Deploy Server or Acronis PXE Server, connect the console to the server. Logs are displayed in the lower part of the console window.

The log browsing window can be accessed by selecting **Tools -> Show log**.

The log browsing window contains two panes: the left one features the log list, while the right one shows selected log contents.

The left panel can contain up to 50 logs. If there are more, you can browse the list using the **More** and **Less** buttons with the left and right arrows.

To delete a log, select it and click **Delete**.

If any step was terminated by an error, the corresponding log will be marked with a red circle with a white "X" inside.

The right window features the list of steps contained in the selected log. The three buttons to the right control message filters: the white "X" in the red circle filters error messages, the exclamation sign in a yellow triangle filters warnings, and the "i" in the blue circle filters information messages.

To select columns (step parameters) to display, right-click the headers line or left-click the **Choose Details** button. Then check the desired parameters.

To sort messages by a particular parameter, click its header (click again to reverse order) or the **Arrange Icons by** button (the second from the right) and select the desired parameter.

You can also change column width by dragging the borders with a mouse.

5. Creating Acronis bootable media

Acronis Snap Deploy has three bootable components that can boot and perform operations on any PC-compatible hardware, including bare metal and computers with non-supported file systems. The components are:

- **Acronis Snap Deploy Agent** (boots on a target computer to enable deployment performed by Acronis OS Deploy Server)
- **Acronis Standalone Utility** (boots on a target computer and performs deployment on its own)
- **Acronis Master Image Creator** (boots on a master computer and takes an image of the system.)

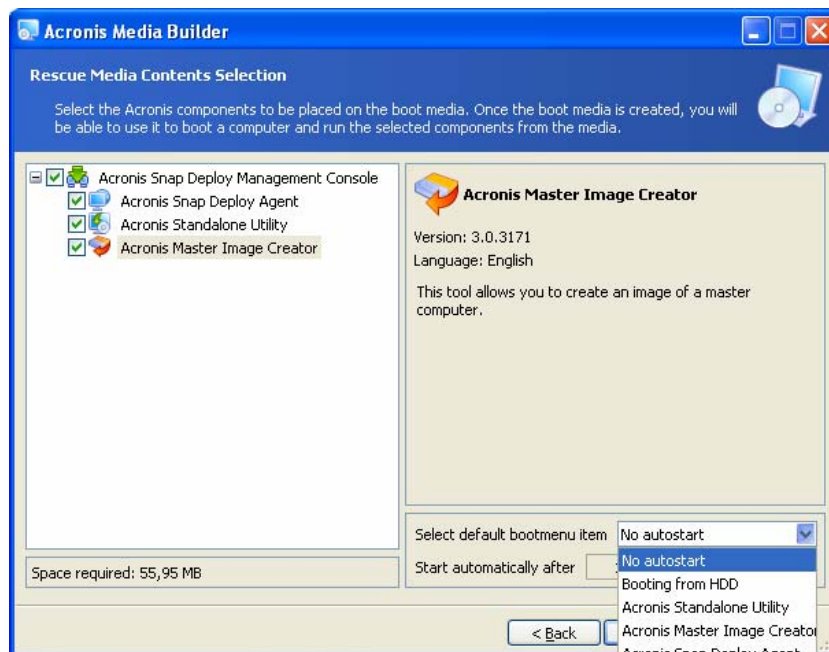
A computer can be booted into a bootable component using physical media or Acronis PXE Server.

Acronis bootable media is a physical media (CD, DVD, USB flash drive, diskettes or other media supported by the computer BIOS as a boot device) that contains bootable components of Acronis Snap Deploy.

Acronis PXE Server with uploaded bootable components can also be thought of as a kind of bootable media. That's why you can create bootable media or configure the PXE server using the same wizard.

To start the bootable media builder, select from the start menu **Acronis -> Acronis Snap Deploy Management Console -> Bootable Media Builder**. You can also run the Bootable Media Builder from the Acronis Snap Deploy Management Console window (click **Create Bootable Media** on the toolbar or the sidebar, or select **Create Bootable Media** from the **Tools** menu.)

1. Select bootable components to be placed on the media.



Selecting bootable components

Select the component that will start automatically (such component is also referred as the default boot menu item) and specify the timeout interval for the component automatic start. If you choose, say, Acronis Snap Deploy Agent, and set the **Start automatically after** parameter to 10 sec, the agent will launch 10 seconds after the boot menu is displayed. You also have the options:

No auto start - the Acronis loader will display the boot menu and wait for someone to select whether to boot the OS or one of the Acronis components.

Booting from HDD – the operating system, if present on the booting computer's hard disk, will start after the specified time runs out. This option is designed to make the target computer to boot into the deployed OS after deployment. The main usage scenario is as follows.

You create a PXE package for scheduled deployment and configure the Acronis Snap Deploy Agent to start automatically. After the scheduled deployment is completed, the target computer reboots into the agent again and might be deployed by some other deployment operation. How to avoid this situation?

To ensure that the target computer boots into the agent *before the deployment*, tune the PXE Server to work with your deployment server when scheduling the deployment. To ensure that the target computer boots into the deployed OS *after the deployment*, choose the **Booting from HDD** option when creating the PXE package for the scheduled deployment.



Acronis Standalone Utility can be placed on a physical media only. This component is not designed to boot from a PXE server.

2. Acronis Snap Deploy Agent can be configured to connect to a specified deployment server. This setting allows you to have multiple deployment servers that perform different functions on the same network.

The deployment server (along with the agent network interface settings) can be specified also onsite when booting up the agent. To be able to enter the agent configuration onsite, set up a reasonable delay before applying the default network settings. See details in *11.1 Booting up the targets*.

If not configured in either way, the deployment server will be found automatically.



Settings for the Acronis Snap Deploy Agent

The option to save the agent's log to the deploy server is designed for troubleshooting. Normally, you should leave this checkbox unchecked because additional operations performed by the agent

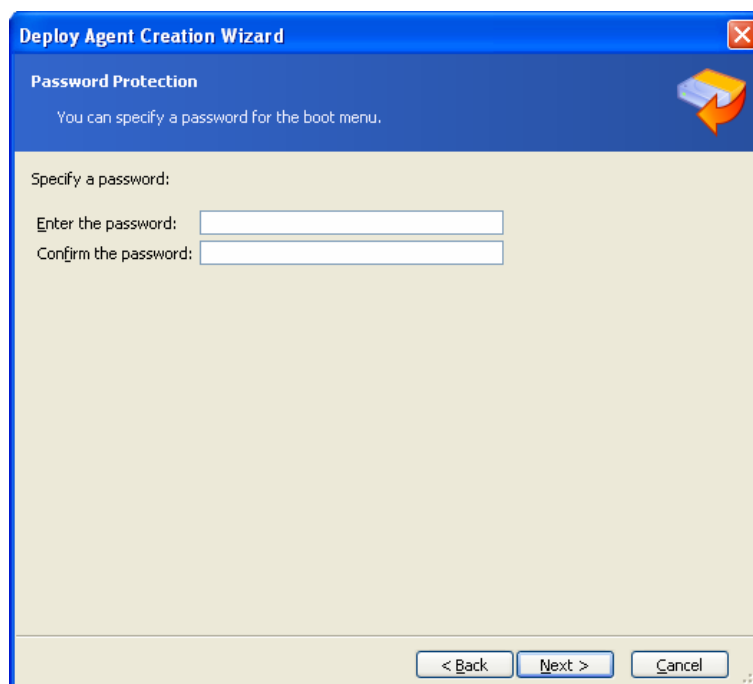
can slow down the deployment. If you choose to save the agent's log, the log will be available on the deploy server in:
\\Documents and Settings\\All Users\\Application Data\\Acronis\\DeployServer\\AgentsLogs.

3. Select the type of bootable media to create. You can:

- create CD, DVD, diskettes or other bootable media such as USB flash drive if the hardware BIOS allows for boot from such media
- build an ISO image of a bootable disc to burn it later onto a blank disc
- upload the selected components to the PXE server. The previously uploaded components will be deleted from the PXE server before uploading the newly selected ones.

When using 3.5" diskettes, you will be able to write only one component at a time on a diskette (or a set of the diskettes) — for example, Acronis Snap Deploy Agent. To write another component, start the Bootable Media Builder once again.

4. To create physical media, insert the blank disk, so the program can determine its capacity, or attach the flash drive.
To create a bootable disk ISO image, specify the ISO file name and the folder in which to place it.
To upload the components to a PXE server, specify the server and provide the user name and password to access it.
5. The components being uploaded to the PXE server can be protected with a password to prevent the components from unauthorized execution. The password prompt will come up before displaying the Acronis boot menu.



Protecting the boot menu with a password

6. Next, the program will calculate how many blank disks are required (in case you have not chosen ISO or PXE) and give you time to prepare them. When you have finished, click **Proceed**.

After you create a boot disk, mark it and keep it in a safe place.



Acronis Snap Deploy bootable components are based on Linux kernel and equipped with the Linux system and device drivers.

Acronis regularly supplements the driver set with drivers for new devices. However, there may be a chance of drivers being incompatible with your hardware and the bootable component cannot start, hangs or cannot access the necessary device. In this case, try to elude using Linux drivers by building Bart PE or Win PE media with Acronis Snap Deploy command line utility.

6. Configuring PXE Server

You can access Acronis PXE server configuration in the following ways:

- when creating Acronis bootable media
- when creating bootable media for custom deployment mode
- using direct server configuration.

To perform the direct PXE server configuration:

1. Start Acronis Snap Deploy Management Console
2. Click **Configure PXE Server**
3. Connect to the server.

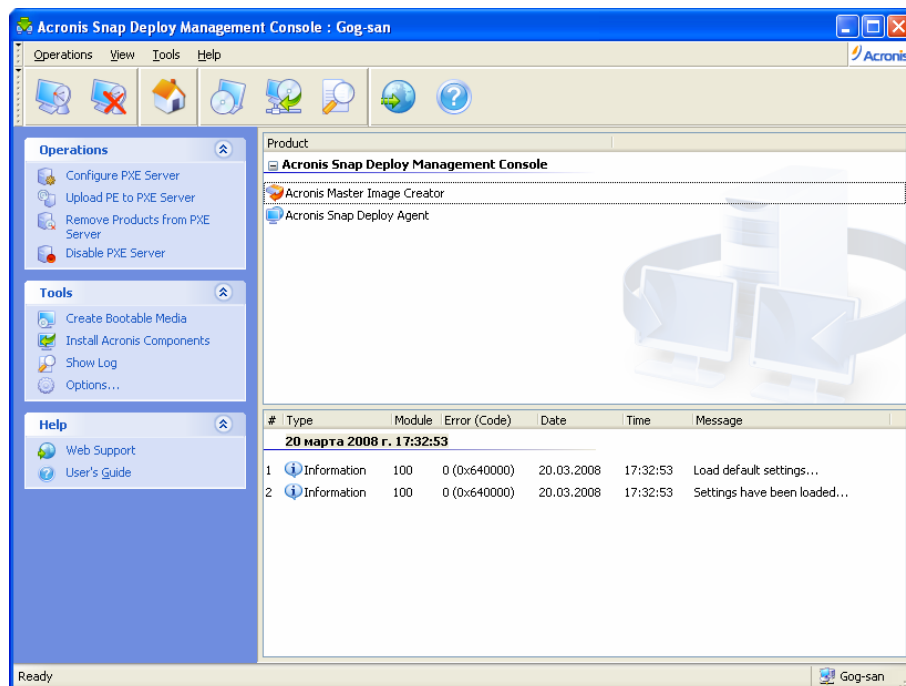
Configure PXE Server – click to upload Acronis Snap Deploy bootable components in the same way as when creating Acronis bootable media. The previously uploaded components, including PE image, will be deleted from the PXE server before uploading the newly selected ones.

Upload PE to PXE Server – click to upload the Preinstallation Environment image (.wim or .iso) previously created with Acronis Snap Deploy PE builder. See details in *15.2 Uploading PE images to Acronis PXE Server*.

Remove products from PXE Server – click to remove any component or PE from the PXE server.

Disable PXE Server – click to disable the PXE server. The service does not stop, but no longer responds to incoming requests.

Enable PXE Server – click to enable the disabled PXE server.



Acronis bootable components are uploaded

7. Taking an image

To be able to deploy a system, you need to create the desired system configuration and save the image of the system hard disk on a network share, detachable or removable media.

Acronis Snap Deploy also supports images taken with the Acronis True Image products family, including password protected images.

7.1 Preparation of the master OS

It is very common to prepare a master operating system with the Microsoft System Preparation Tool (Sysprep) before creating the system image. Sysprep is designed for corporate system administrators, OEMs, and others who need to deploy and automatically configure operating systems on multiple computers.

After a syspreped operating system is deployed, Sysprep generates a unique security ID (SID) for the new host, initiates Windows mini-setup for plug-and-play devices, applies the computer name, domain or workgroup membership and other settings specified in the Sysprep.inf answer file.

Use Sysprep on the master system if the system image will be deployed in Preinstallation Environment with Acronis Snap Deploy command line utility. The command line utility cannot generate a SID or adjust settings on the fly, it simply deploys the system as is.

In Acronis environment (any case except for command line mode), Acronis Snap Deploy automatically configures the deployed system using parameters you set in the deployment template. Therefore, you have the choice of using the functionality of either Sysprep or Acronis Snap Deploy.

You can download Sysprep from www.microsoft.com or extract it from deploy.cab located on Windows NT/2000/XP/Server 2003 installation CD.



We strongly recommend that you read articles about Sysprep and disk duplication in the Microsoft Knowledge Base.

7.2 Online vs. offline imaging

A master image can be taken:

- online, in Windows, using Acronis Snap Deploy Management Agent installed on the master computer and Acronis Snap Deploy Management Console
- offline, in Acronis environment, using bootable Acronis Master Image Creator
- offline, in Win PE environment, using the Acronis Snap Deploy command line utility or scripting.

Running the agent in Windows is an obvious choice if you plan periodic remote imaging. Imaging with the agent does not require the master computer reboot. Acronis Snap Deploy Management Agent will be included in the master image and deployed on all target computers. This will enable you to manage files and execute applications on target computers at any time after deployment.

Normally you do not want excess software in a master image. Besides, installation of the agent will take a license. Therefore, we recommend that you do not install Acronis Snap Deploy Management Agent and create a master image using Acronis Master Image Creator or the command line utility in PE.

The next sections describe imaging with Acronis Snap Deploy Management Agent and Acronis Master Image Creator. For information about imaging in PE please see *15. Command line and scripting under Win PE*

7.3 Starting offline imaging

Offline imaging means that the master system is stopped and the master computer boots into Acronis (or PE) environment.

1. Install Acronis Snap Deploy Management Console.
2. Do one of the following:

Create bootable media with Acronis Master Image Creator

or

Install Acronis PXE Server, connect the console to the PXE server and upload Acronis Master Image Creator. Make sure that network booting is enabled on the master computer (see *3.7.2 Setting up a computer to boot from PXE* for details.)

3. Configure the master system.
4. Do one of the following:

Boot the master computer into Acronis Master Image Creator from bootable media

or

Boot the master computer into Acronis Master Image Creator from the PXE Server.



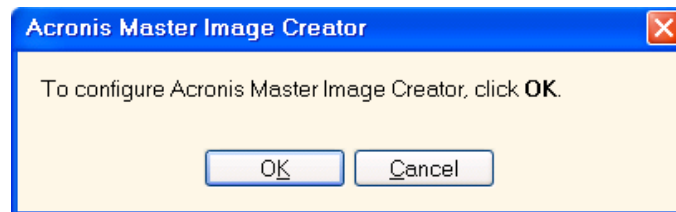
The boot menu on the master computer

5. Select Acronis Master Image Creator in the boot menu.

While creating bootable media or uploading Acronis Master Image Creator to the PXE server, the image creator can be configured to start automatically on timeout.

6. The Master Image Creator establishes network connection to be able to save the image on a network share. A dialog box comes up suggesting that you configure the network connection used by the image creator.

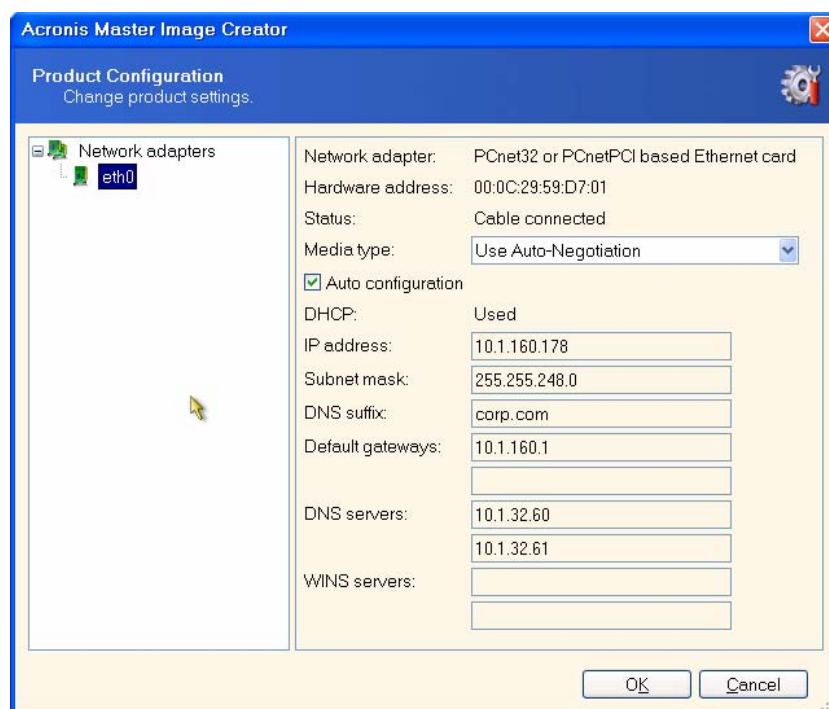
By default, Acronis Master Image Creator uses DHCP auto configuration. Ignore the prompt (click **Cancel**) if there is a DHCP server on the network or the image has to be placed on a local HDD or media.



Prompt for configuring the master image creator

The image creator can be pre-configured to apply the default network settings automatically on timeout.

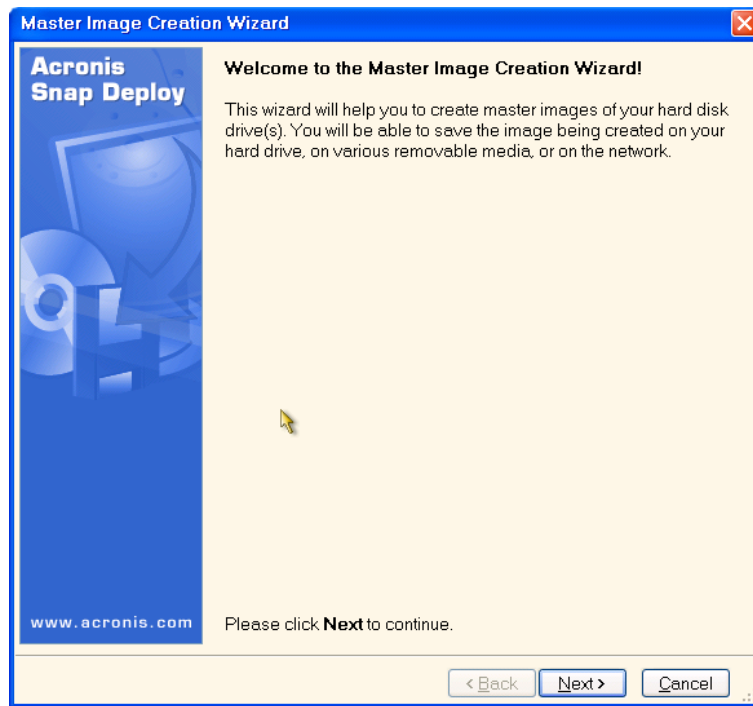
The manual configuration is needed if auto configuration is not possible (no DHCP server on the network) or does not succeed. To configure the network connections manually, click **OK** in the prompt window.



Acronis Master Image Creator configuration: network settings

Set the preferable values and click **OK**.

7. When Acronis Master Image Creator starts, it displays the Master Image Creator welcome window:



Master Image Creation Wizard: welcome window

8. In this window, click **Next** and go to step 7.5.1 *Disks or partitions to image*.

7.4 Starting online imaging

Online imaging means that the master system is imaged live (without reboot or suspending operations). Online imaging can be performed remotely whenever you need. The disadvantage is that you have to install imaging software that is included in the master image. This is not always rational.

1. Install Acronis Snap Deploy Management Console and Acronis License Server. Import licenses to the license server.
2. Configure the master system.
3. Install Acronis Snap Deploy Management Agent on the master system locally or remotely, using Acronis Snap Deploy Management Console. Reboot on prompt. Once Acronis Snap Deploy Management Agent is installed, you can image the master system online (without reboot) at any time.
4. Start the Acronis Snap Deploy Management Console.
5. Connect to the master computer.
6. Select **Create Master Image -> Next -> Create master image on a remote computer**.

If you choose **Create master image using bootable media**, the program will suggest that you create the bootable media for offline imaging.

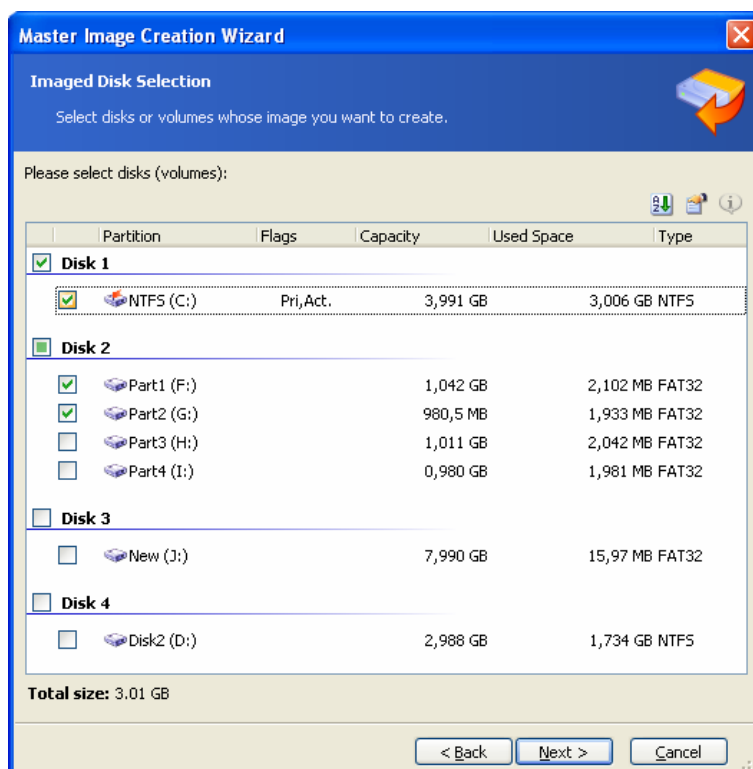
7.5 Steps of the Master Image Creation Wizard

7.5.1 Disks or partitions to image

Select the disks or partitions to image. You can select a random set of disks and partitions. The Master Boot Record (MBR) will be also included in the image.



If your operating system and its loader reside on different partitions, always include both partitions in the image. The partitions must also be deployed together; otherwise there is a high risk that the operating system will not start.



Select disks and partitions to image

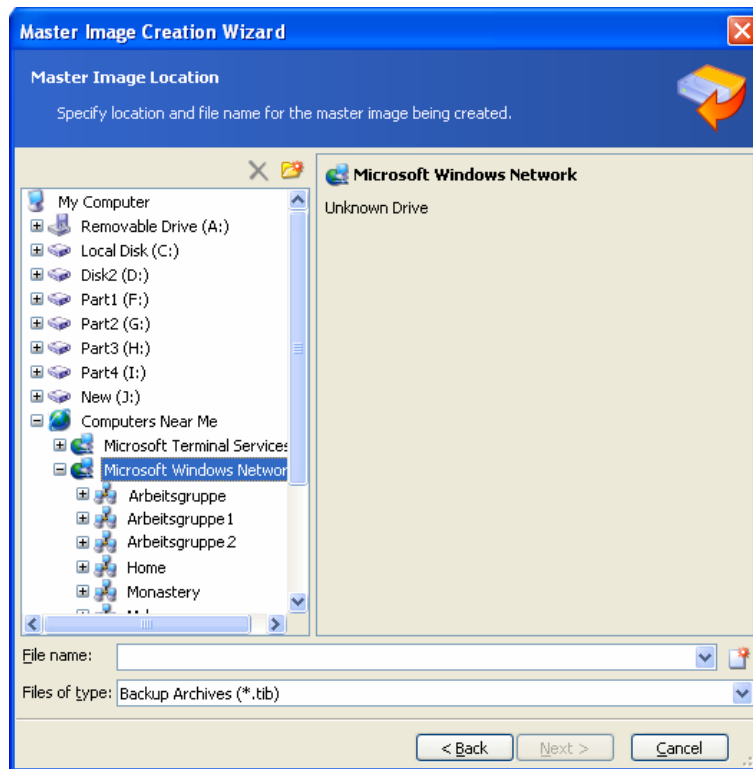
7.5.2 Image name and location

Acronis Master Image Creator can save an image:

- on a network share
- on the master computer internal hard drive
- on USB and FireWire (IEEE-1394) storage devices (hard drives, flash drives) attached to the master computer
- on DVD+R/RW, DVD-R/RW, CD-R/RW loaded in the master computer media drive.

A sizeable image can be split between multiple media automatically.

Select the image location in the device tree. Type the name of the file in the Filename field. The program can generate a unique file name. Just click the **Generate name for a new file** button on the right.



Selecting the image location

7.5.3 Setting options

Set the options for creating the master image.

1. [OPTIONAL] Password for the image

The preset is **no password**.

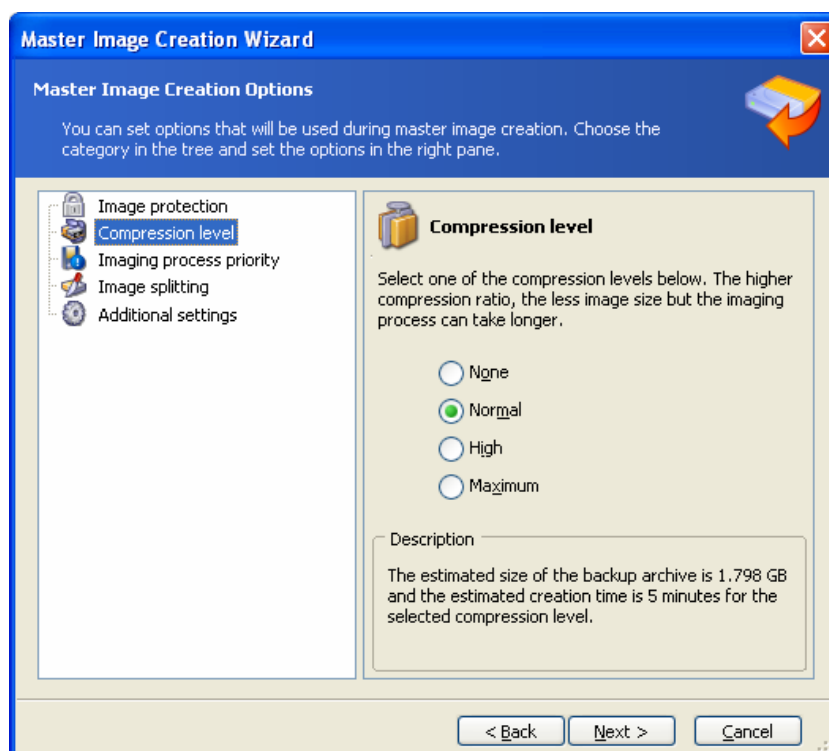
Protect the image with a password to prevent unauthorized deployment.

2. Compression level

The preset is **Normal**.

The data compression level for the image being created.

The description field provides estimations for image size and image creation time for each compression level. You can select the compression level based on these estimations. The default **Normal** level is recommended in most cases.



Selecting the data compression level

3. [FOR ONLINE IMAGING ONLY] Image creation priority

The preset is **Low**.

The priority of any process running in a system determines the amount of CPU usage and system resources allocated to that process. Decreasing the image creation priority will free more resources for other CPU tasks. Increasing of image creation priority could speed up the imaging by taking resources from the other running processes. The effect will depend on total CPU usage and other factors.

4. Archive splitting

Sizeable images can be split into several files that together make up the original image.

The preset is **Automatic**. With this setting, the program will act as follows.

When creating an image on a hard disk:

If the selected disk has enough space and its file system allows the estimated file size, the program will create a single image file.

If the storage disk has enough space, but its file system does not allow the estimated file size, the image will automatically be split into several files. Such might be the case when the image is placed on FAT16 and FAT32 file systems that have a 4 GB file size limit.

If free space on the disk runs out while creating an image, the program will warn you and wait for your decision as to how you plan to fix the problem. You can try to free some additional space and continue or click **Back** and select another disk.

When creating an image on a CD-R/RW, DVD-R/RW or DVD+R/RW diskette:

Acronis Master Image Creator will ask you to insert a new disk when the previous one is full.

You also can select **Fixed size** and enter the desired file size or select it from the drop-down list. The image will then be split into multiple files of the specified size. This comes in handy when creating an image that you plan to burn to multiple CD-R/RW, DVD-R/RW or DVD+R/RW later on.



Creating images directly on CD-R/RW, DVD-R/RW or DVD+R/RW usually takes more time than it would on a hard disk.

5. [OPTIONAL] Additional settings

Validate the image upon operation completion

The preset is **disabled**.

If enabled, the program will check the integrity of the just created image.

Reboot the computer automatically after imaging is finished.

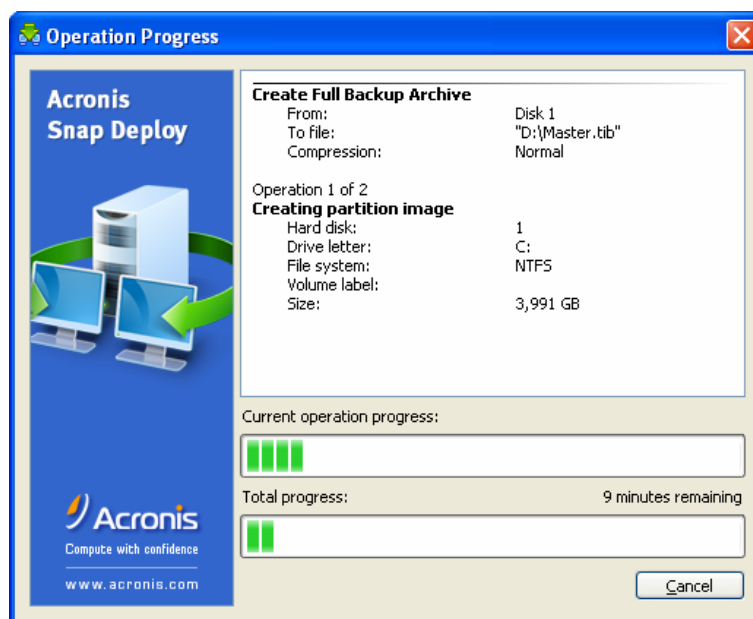
The preset is **disabled**.

7.5.4 Comments and summary

[OPTIONAL] It is recommended that you provide a comment for easy identification of the image.

Next you will see the imaging procedure summary. Check the settings and click **Proceed**.

The imaging operation starts and its progress is displayed.



Acronis Snap Deploy is taking the master image

8. Checking the master image

To be assured that a master image is not damaged, you can check its integrity.

1. Connect to a computer where Acronis Snap Deploy Management Agent is installed.
2. Select **Check master image**.
3. Follow the wizard's instructions to select the image.
4. Click **Proceed** in the summary window.

The checking operation starts. You can stop the operation if need be by clicking **Cancel**.

After the check is complete, the program shows the result.

9. Deployment templates

A deployment template is a set of configuration parameters of the deployment operation. This includes:

1. A path to the master image
2. The operation mode (multicast or unicast, how to handle the target disk free space etc.)
3. Settings to be applied to the deployed systems (DNS names, user accounts etc.)
4. Operations to be performed on the deployed systems (transfer files, execute applications, shut down, restart.)

9.1 Why save templates?

Deployment templates can be saved on the Acronis OS Deploy Server. Once you save a deployment template, you can use it in the future. When setting up a manual, scheduled or event-driven deployment, simply select a template and set up the condition for starting deployment. Otherwise, you will have to configure the above parameters while setting up the deployment operation.

Templates also enable the custom deployment mode. In this mode users can perform one-click deployment on their computers without the administrator's assistance. To set up this mode, the administrator must create the standard deployment templates in advance.

The saved templates are listed in the **Templates** tab. A template can be viewed, edited or deleted from the Acronis OS Deploy Server.

9.2 Creating templates

1. Connect the console to the Acronis OS Deploy Server.
2. Select the **Templates** tab.
3. Click **Create Template** on the sidebar.

Further sections of this chapter tell you how to use the Create Deployment Template Wizard.

9.2.1 Master image selection

Specify:

- The master image.
- The user name and password for the network shared folder if the image is on the network. The best practice is to map the shared folder as a local drive (Windows Explorer -> Tools -> Map Network Drive.)

Acronis OS Deploy Server can deploy images located:

- in network shared folders
- on the deploy server internal hard drive
- on USB and FireWire (IEEE-1394) storage devices (hard drives, flash drives) attached to the deploy server
- on DVD+R/RW, DVD-R/RW, CD-R/RW loaded in the deploy server media drive.

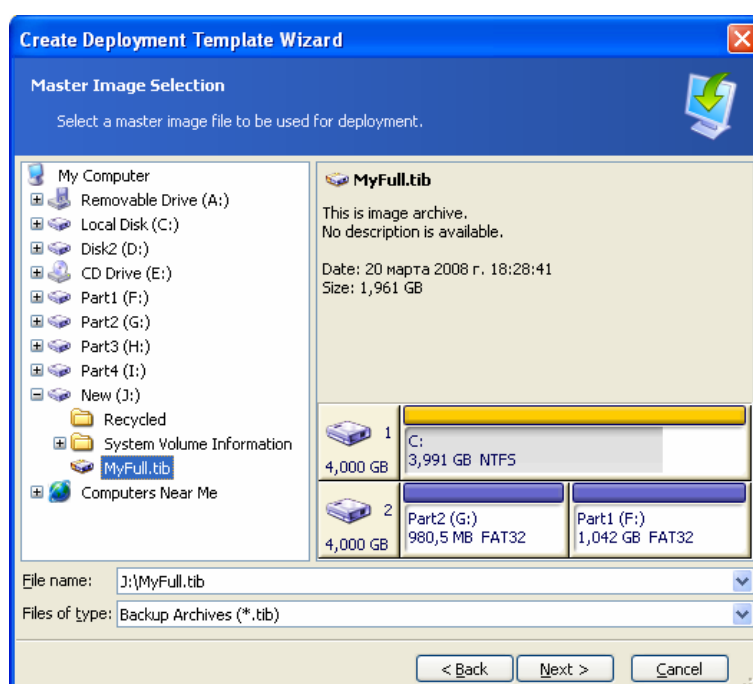
The best practice is keeping images on the deploy server hard drive. This minimizes network traffic during deployment.

The image created on removable or detachable media has to fit onto one media disk. To deploy an image spread on several CDs, DVDs or other media, copy all parts of the image to the same folder on the deploy server or on a network share.

Acronis Standalone Utility can deploy images located:

- in network shared folders
- on USB and FireWire (IEEE-1394) storage devices (hard drives, flash drives) attached to the managed computer
- on DVD+R/RW, DVD-R/RW, CD-R/RW loaded in the managed computer media drive.

Acronis Standalone Utility can deploy an image spread on multiple CDs, DVDs or other media.

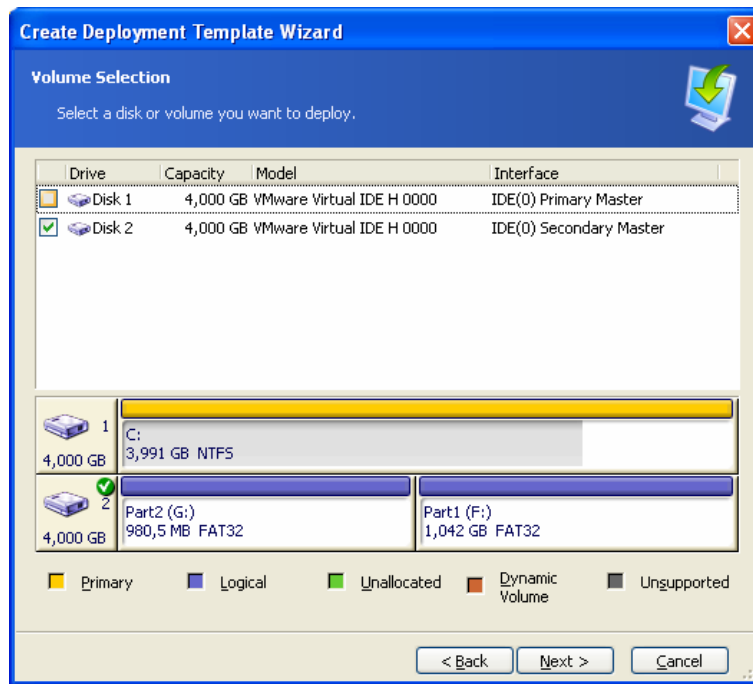


Selecting a master image

9.2.2 Disk/partition selection

Specify:

- The disk to deploy, if the image contains multiple disks.
- The disk partitions to deploy, if the image of the selected disk contains multiple partitions.



Selecting a disk from the master image

The further steps will depend on how many partitions you select.

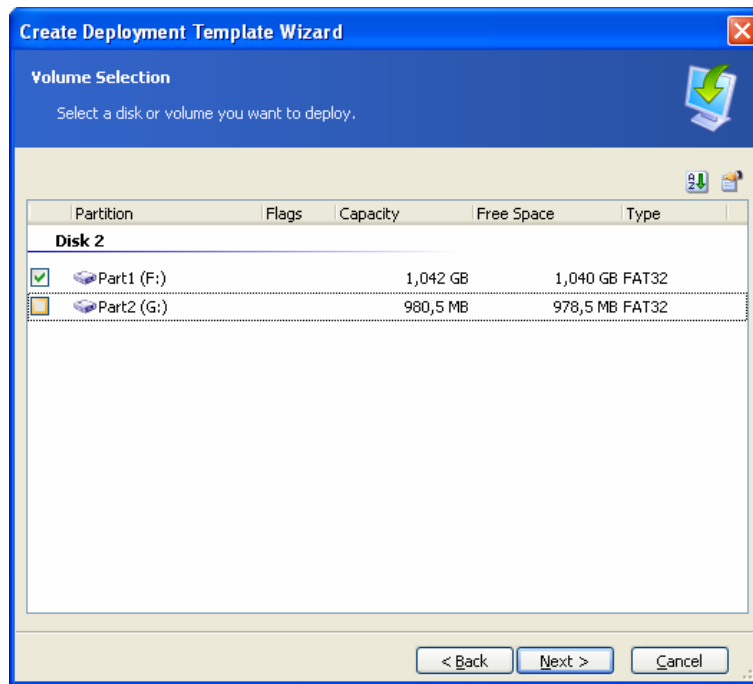
If you deploy one partition, it is assumed that the target disk has partitions and you will have to select the target partition, to deploy over it. Other partitions will remain untouched. The active partition of the target disk will remain active - even if you deploy an active partition side by side with it, the newly deployed partition will not become active. Therefore, deploy an active partition to an active partition if you want to boot from the deployed partition.

Deploying more than one partition will clear partitioning of the target disk. Only the newly deployed partitions will exist on the disk after deployment.

The Master Boot Record (MBR) is always deployed from the image regardless of your choice.



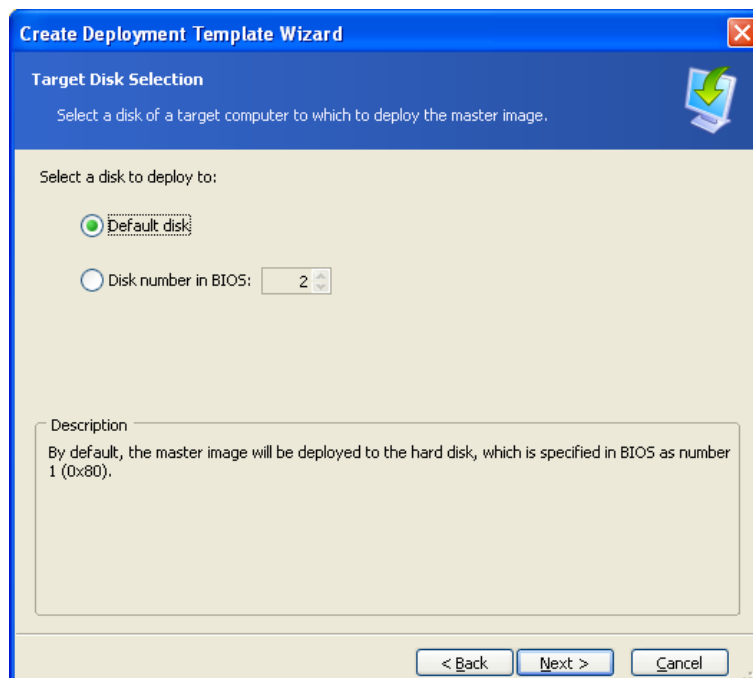
If your operating system and its loader reside on different partitions, always include both partitions in the image. The partitions must also be deployed together; otherwise there is a high risk that the operating system will not start.



Selecting disk partitions to deploy

9.2.3 Target disk and partition selection

Select the target disk for deployment. By default, the image will be deployed to the hard disk, which is specified in BIOS as number 1 (0x80).

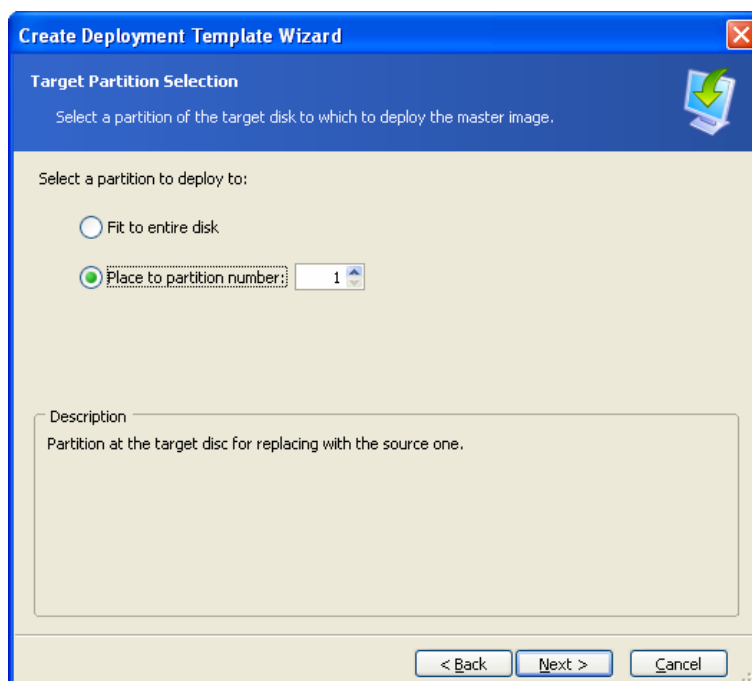


Selecting the target disk

Select the target partition to deploy, if one partition was selected for deployment. By default, the partition image will be deployed to partition 1 of the selected hard disk. To deploy a single partition to

unallocated space or bare metal, first create the target partition using a third-party partitioning tool, such as Microsoft Disk Management or Acronis Disk Director.

When deploying a whole disk or multiple partitions, you will not see the target partition selection window. In this case, the target disk partitioning will not be preserved.



Selecting the target partition

9.2.4 User accounts

[OPTIONAL] Specify local user accounts that you want to create on the target computers in addition to the accounts that exist in the master system.

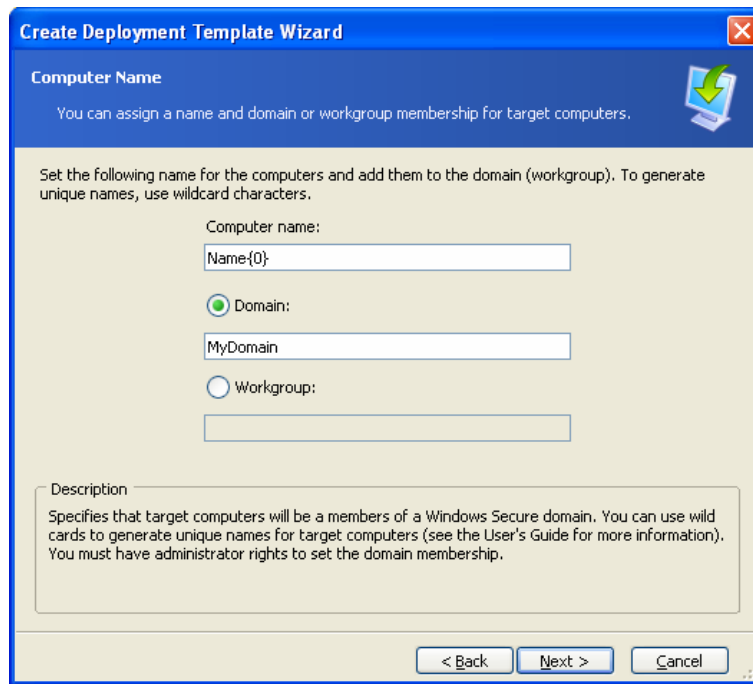
Users can be added to the **Administrators**, **Power Users** or **Users** groups. Here you have an opportunity to add a unified administrator's account to all the systems, if needed. The **Edit** and **Delete** buttons are provided to change the accounts you typed in.

The password complexity has to meet the password policy set for the master computer. To view or edit the password policy on the master computer:

1. Run Microsoft Management Console (MMC)
2. File -> Open -> %windir%\system32\secpol.msc
3. Select Account Policies\Password Policy.

9.2.5 Computer names and domain/workgroup

[OPTIONAL] Specify DNS names and domain or workgroup membership of the target computers. If you have selected the domain membership, later you will be asked for the domain administrator's name and password.



Naming the computers

To generate unique names for target computers use wild cards as follows.

{start}

{1}

This will generate names 1, 2, 3...N

{start,count}

{1,5}

This will generate names 1, 2, 3, 4, 5

Text{start}

Name{1}

This will generate names Name1, Name2, Name3...NameN

Text{start,count}

Name{1,5}

This will generate names Name1, Name2, Name3, Name4, Name5

{start1,count1}{start2,count2}

start1 – the first figure in a two-figured number

count1 – increasing quantity of first figures

start2 – the second figure in a two-figured number

count2 – increasing quantity of second figures

{1,3}{1,4}

This will generate names 11, 12, 13, 14, 21, 22, 23, 24, 31, 32, 33, 34

{1,9}{0,10}

This will generate names 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24...99

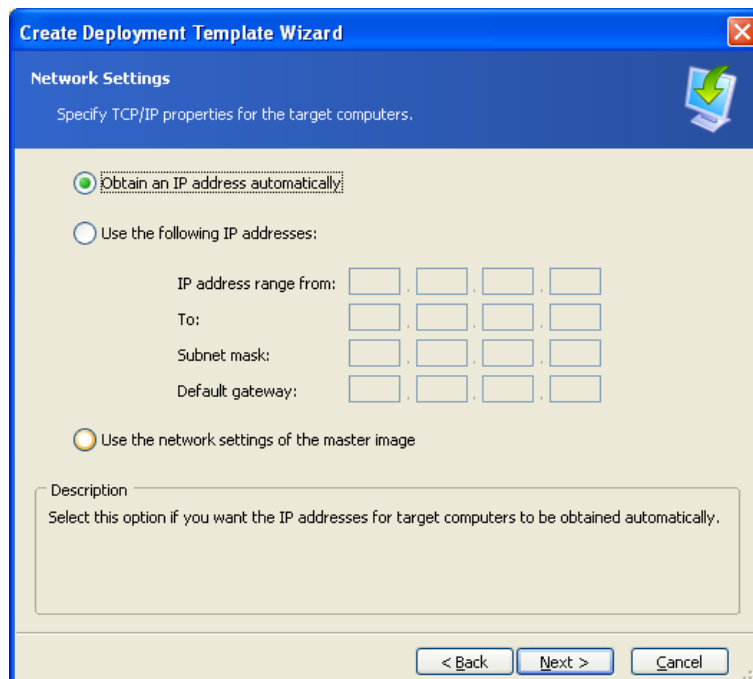
Text{start1,count1}{start2,count2}

Computer{2,3}{5,4}

This will generate names Computer25, Computer26, Computer27, Computer28, Computer35, Computer36, Computer37, Computer38, Computer45, Computer46, Computer47, Computer48

9.2.6 Network settings

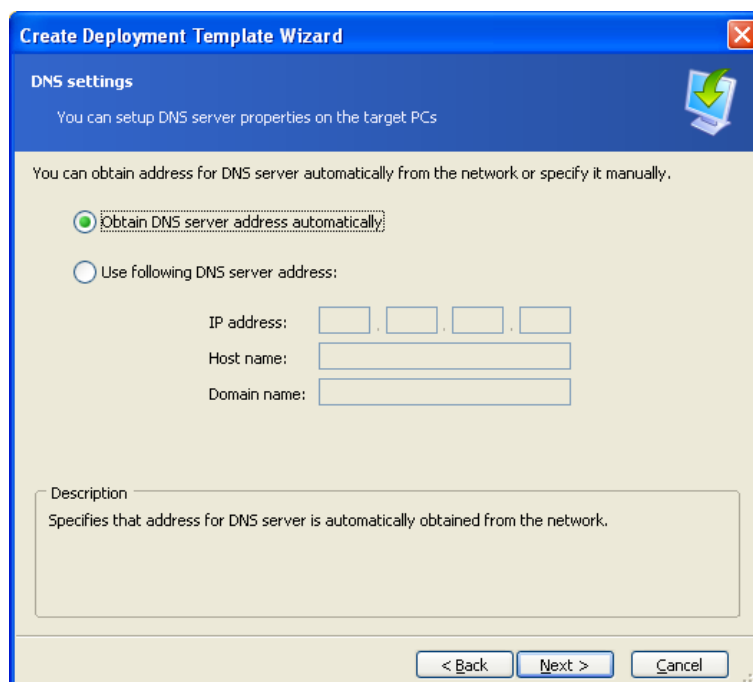
Configure the Internet Protocol (IP) settings for the target computers. You have options to preserve the master system network settings, to obtain IP addresses automatically from DHCP server or to specify a range of static IP's, subnet mask and default gateway in case you network does not have DHCP capability.



The screenshot shows the 'Create Deployment Template Wizard' window, specifically the 'Network Settings' step. The title bar reads 'Create Deployment Template Wizard'. The window has a blue header with the title and a close button. Below the header, the text 'Network Settings' is displayed, followed by the instruction 'Specify TCP/IP properties for the target computers.' and a green arrow icon. The main area contains three radio button options: 'Obtain an IP address automatically:' (selected), 'Use the following IP addresses:', and 'Use the network settings of the master image'. The 'Use the following IP addresses:' option is expanded, showing fields for 'IP address range from:', 'To:', 'Subnet mask:', and 'Default gateway:', each with four input boxes. Below these is a 'Description' box with the text: 'Select this option if you want the IP addresses for target computers to be obtained automatically.' At the bottom are buttons for '< Back', 'Next >', and 'Cancel'.

Network settings: TCP/IP

[OPTIONAL] If you have not selected to preserve the master system settings, specify DNS properties as well. Otherwise this step is skipped.

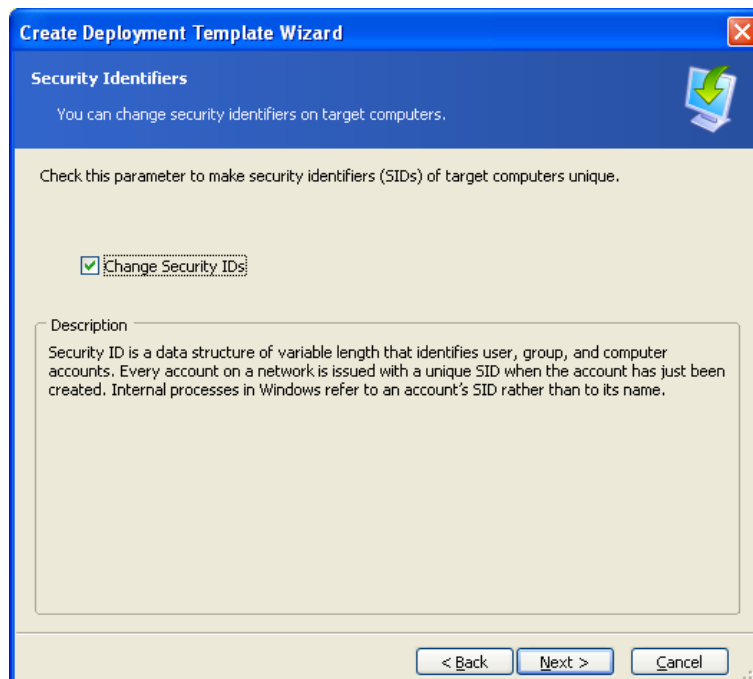


The screenshot shows the 'Create Deployment Template Wizard' window, specifically the 'DNS settings' step. The title bar reads 'Create Deployment Template Wizard'. The window has a blue header with the title and a close button. Below the header, the text 'DNS settings' is displayed, followed by the instruction 'You can setup DNS server properties on the target PCs' and a green arrow icon. The main area contains two radio button options: 'Obtain DNS server address automatically:' (selected) and 'Use following DNS server address:'. The 'Use following DNS server address:' option is expanded, showing fields for 'IP address:', 'Host name:', and 'Domain name:', each with input boxes. Below these is a 'Description' box with the text: 'Specifies that address for DNS server is automatically obtained from the network.' At the bottom are buttons for '< Back', 'Next >', and 'Cancel'.

Network settings: DNS server

9.2.7 Security identifiers

Acronis Snap Deploy can generate unique security identifiers (SIDs) for the target computers. This option is normally enabled. The SID can remain unchanged if there is no computer with the same SID in the same workgroup or domain. Also, it is recommended not to change the SID if the image is deployed on the same computer where the image was taken from.



New SIDs will be generated for the target computers

9.2.8 Transferring files

[OPTIONAL] Select files to be transferred to all target computers after deployment (for example, installation files.) The files must be located on a network share. Check **Execute file** if you want to execute the files after deployment.

9.2.9 Executing applications

[OPTIONAL] You can specify service applications (from the master system image) for executing on the target computers after deployment.

9.2.10 Using Acronis Universal Deploy

[OPTIONAL]

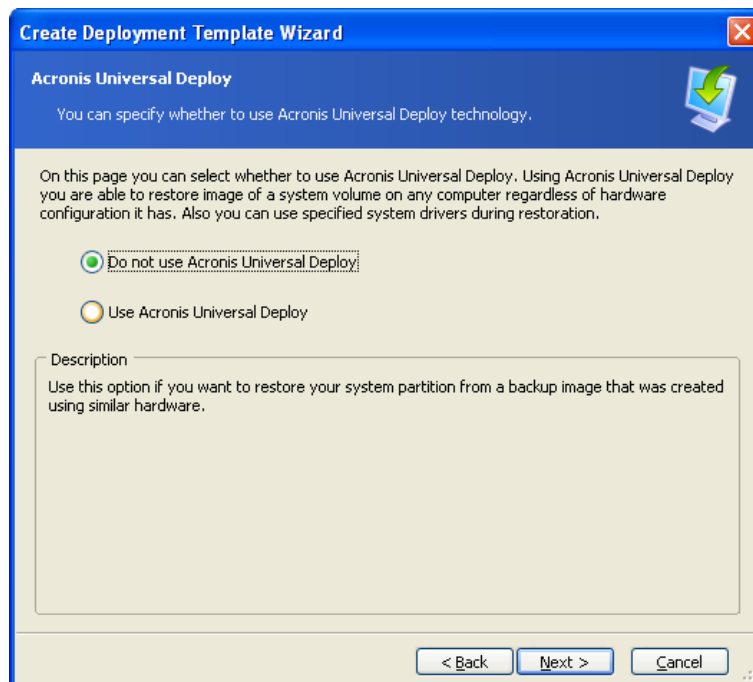
Acronis Universal Deploy is an add-on to Acronis Snap Deploy. It is purchased separately and installed from a separate setup file.

Skip this section if one of the following is true:

- you do not have Acronis Universal Deploy
- you want to deploy an image that does not contain Windows.

1. Select whether to use Acronis Universal Deploy.

Acronis Universal Deploy will help you create a bootable Windows clone on different hardware by automatically installing the necessary system drivers. Use Acronis Universal Deploy when deploying Windows to a computer with a dissimilar processor, different motherboard or other mass storage device than in the imaged system. For detailed information see *2.5 What is Acronis Universal Deploy*.



Select whether to use Acronis Universal Deploy

Acronis Universal Deploy uses three sources for drivers:

- the Windows default driver storage folder (in the image being deployed)
- the mass storage device driver specified by the user
- the driver repository - a folder or folders on a network share or removable media.

The program will find the most suitable drivers of all available drivers and install them into the deployed system. However, the driver defined by the user, will have the priority. It will be installed, with appropriate warnings, even if the program finds a better driver.

2. [OPTIONAL] Specify the mass-storage driver

If the target hardware has a specific mass storage controller (such as a SCSI, RAID, or Fibre Channel adapter) for the hard disk, explicitly specify the appropriate driver for this controller. The driver will be installed in any case, bypassing the automatic driver search-and-install procedure.

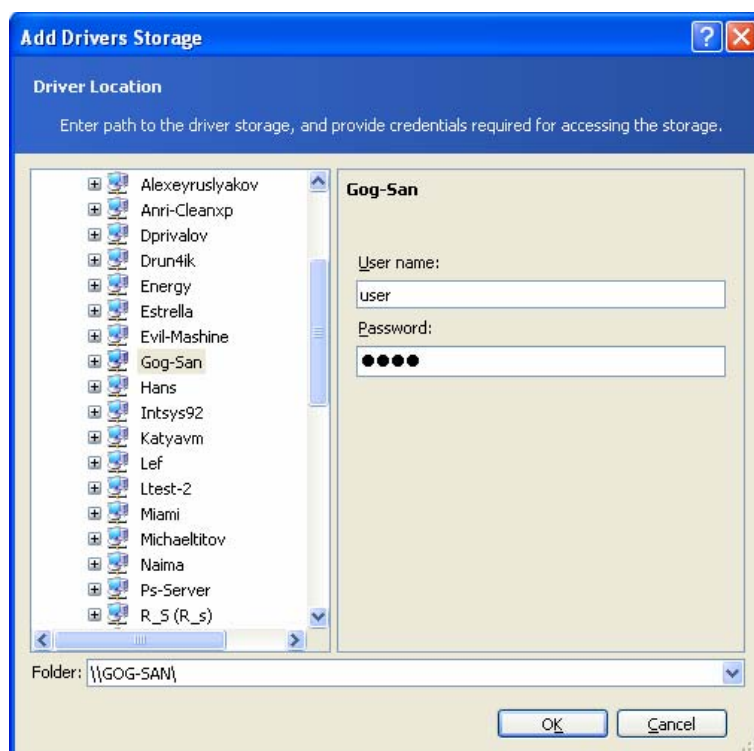
Use this option only if the automatic search-and-install procedure was unsuccessful.



When deploying the system to a virtual machine that uses SCSI hard drive controller, be sure to specify SCSI drivers for virtual environment. For example, VMware requires Buslogic or LSI logic drivers. Use drivers bundled with your virtualization software or download the latest driver versions from the software manufacturer website.

3. [OPTIONAL] Specify the driver repository

Specify a driver storage to search for HAL and storage device drivers during the automatic search-and-install procedure. You can add network locations and enable a search of removable media for drivers.

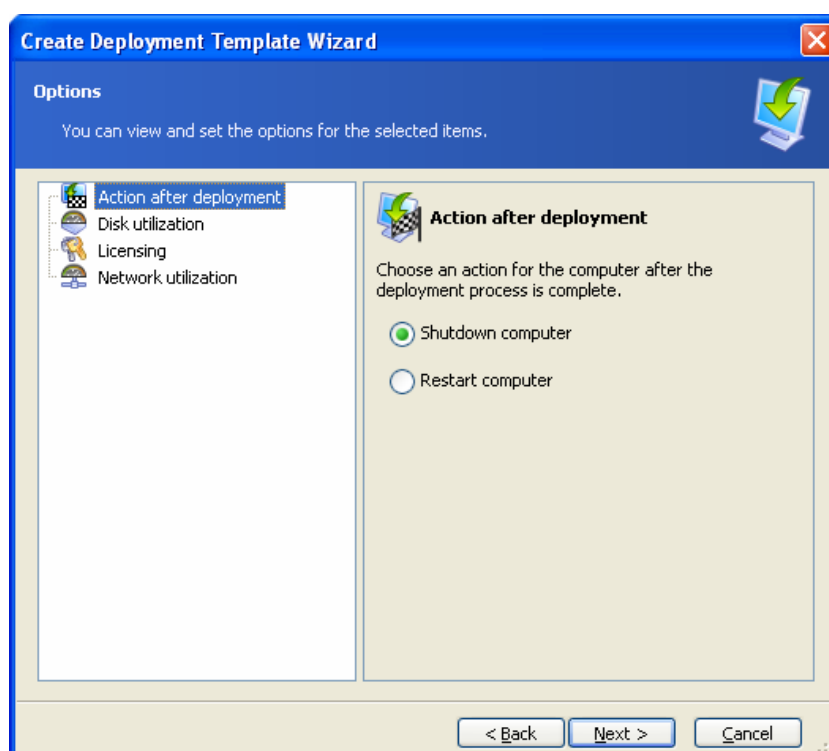


Adding a driver repository

9.2.11 Deployment options

Select the options for the deployment operation. You may select **Use default options** or **Set the options manually**. If the latter is the case, the settings will be applied only to the current deployment template.

Alternatively, you can edit the default options. To do so, select **Use default options** and click **Tools** -> **Options** in the description field. Edit the options and click **OK**. Your settings will be saved as the defaults. When not creating a template, you can access default options through Tools -> Options in the program menu or on the toolbar.



The full list of deployment options

Action after deployment

The preset is **Shutdown**.

Choose whether to turn off or restart the target computer after the deployment and all associated operations, scheduled in this wizard (transferring files, executing applications) are completed.

Disk utilization

The preset is **Occupy disk space entirely**.

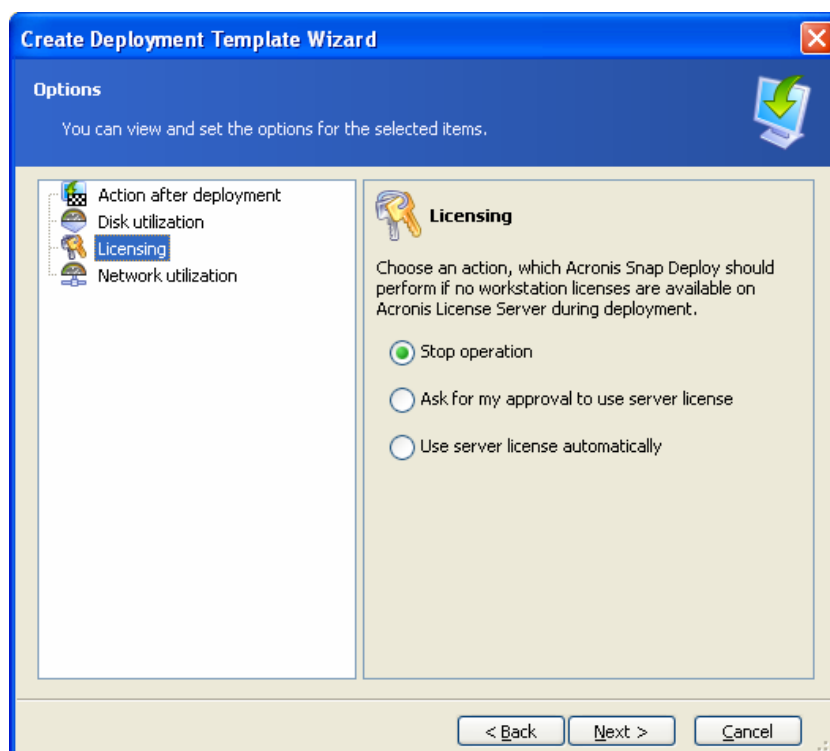
If the target disk capacity is not equal to that of the master computer's disk, the program can enlarge (or reduce) each partition according to the proportion of the master and target disk capacities. Alternatively, if the target disk is larger, the program can keep the original partitions' size and leave the remaining disk space unallocated.

Licensing

The preset is **Stop operation**.

Acronis Snap Deploy uses two types of licenses. A license for the server product is needed to deploy a server operating system. A license for the workstation product is needed to deploy a workstation operating system. By default, a workstation OS will not be deployed if the Acronis License Server has licenses only for the server product.

You have an option to use the server product license instead of the workstation license automatically or through a prompt.



Licensing

Network utilization

The preset is **Multicast**.

You can choose the data transfer mode for the deployment. With the Multicast transfer mode, Acronis OS Deploy Server sends data to a group of recipients simultaneously. Using the Unicast transfer mode, the server sends a copy of the data to each recipient (this can significantly reduce the deployment speed.)

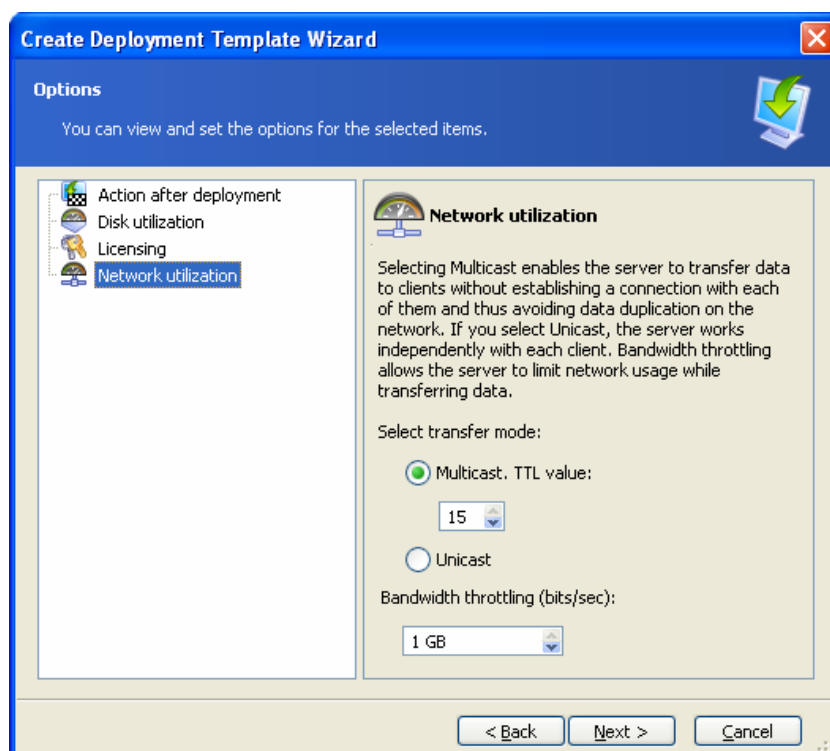
For example, you have 128 KB/sec bandwidth and want to deploy a system on 10 target computers.

- With **Unicast** mode, the server divides 128 KB/sec among 10 computers, therefore the data transfer speed will be 12.8 KB/sec for each target machine.
- With **Multicast** mode, the server sends one copy of data to a multicast address, and each client will receive data at 128 KB/sec speed.

Multicast configuration has a parameter that specifies the time to live (TTL) for multicast packets. Use this parameter to limit multicast packets distribution via gateways.

The default value is 15. In practice, this enables the packets to pass up to 15 hops which may be treated as unlimited distance. The minimal value 1 will limit the packets circulation to one subnet.

By setting the permitted bandwidth you can limit the network usage during deployment.



Adjusting network utilization

Acronis Snap Deploy uses Internet Group Management Protocol (IGMP) for the multicasting. Therefore, all the network hardware (routers and/or switches) must be IGMP-capable and correctly configured. The specific information on configuring any particular router or switch is usually available in the documentation, provided with the hardware.

If there is no IGMP-capable hardware (or you cannot configure it correctly) in the network, use the Unicast data transfer mode.

MAC filtering

Acronis Snap Deploy has the ability to disable deployment on computers with specified MAC addresses. This protects production servers and user's systems from unfortunate events. The program can import the access list from a text file or save the MAC addresses you type in.

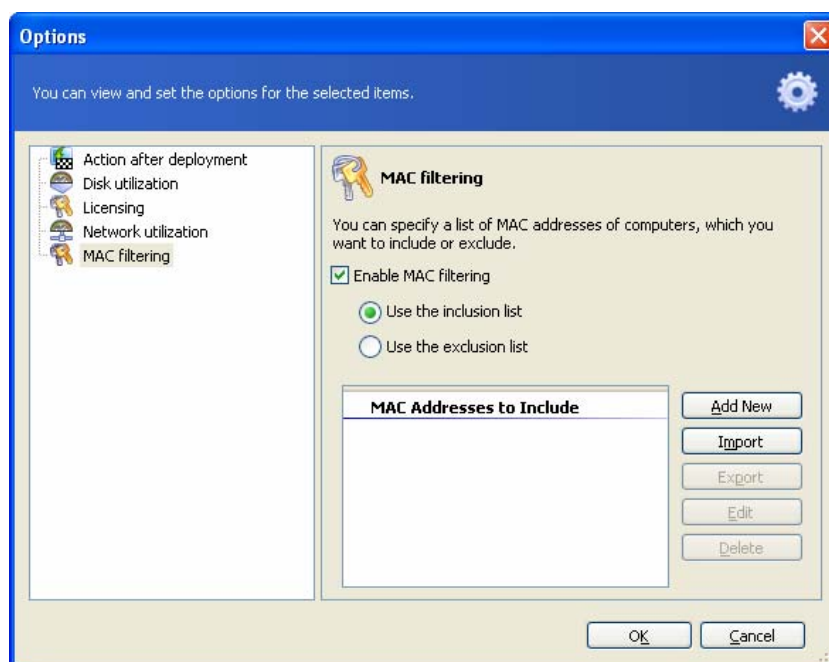
Both straight (enabling) and inverse (disabling) lists are supported, but only one list can be active at any one time.

The enabling (inclusion) list has to contain all computers that are allowed to be the deployment targets. You can add only one MAC address if a computer has more than one network interface card. Deployment through any network interface that is not in the list will be prohibited.

The disabling (exclusion) list has to include all computers that are not allowed to be the deployment targets. Add all MAC addresses if a computer has more than one network interface card. Deployment through any network interface that is not in the list will be permitted.



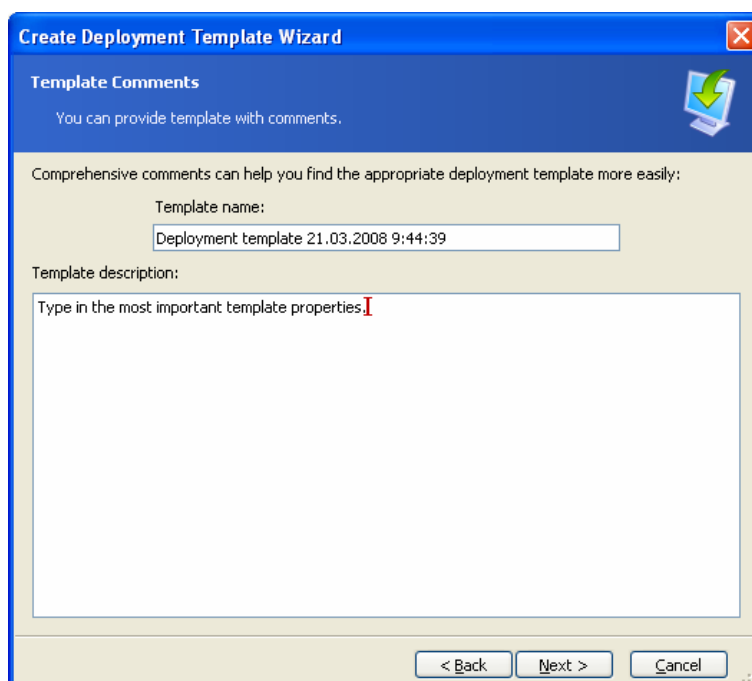
MAC filtering is a general option of Acronis OS Deploy Server and not a property of a deployment template. Whenever and whatever type deployment is executed, the program uses the access list that exists at that time. That's why the option can be found when editing the default options only.



MAC filtering

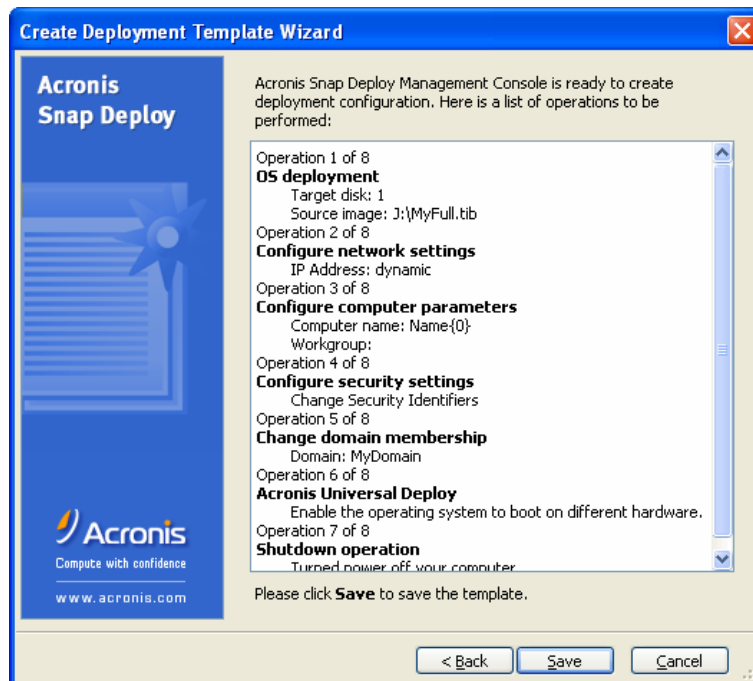
9.2.12 Comments and summary

[OPTIONAL] It is recommended that you provide a comment for easy identification of the template.



Type in a comment

Check your settings in the summary window and click **Save**.



The summary window

10. Standalone deployment

Standalone deployment is deployment on a computer isolated from a network or included in a network without Acronis Snap Deploy infrastructure, to be exact, without Acronis OS Deploy Server. Standalone deployment is performed locally using the bootable Acronis Standalone Utility.

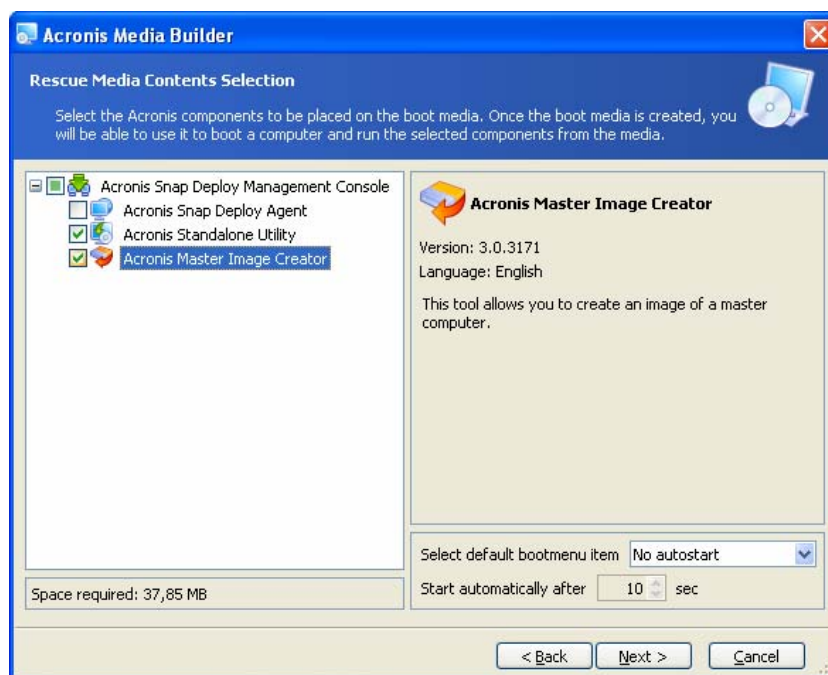
The Acronis Universal Deploy option is not available in the standalone mode.

Steps:

1. Install Acronis Snap Deploy Management Console.
2. Create bootable media with Acronis Master Image Creator and Acronis Standalone Utility.



Acronis Standalone Utility can be placed on a physical media only. This component is not designed to boot from a PXE server.



The Acronis standalone components to be placed on the bootable media

3. Configure and image the master system. Save the image on a network share, detachable or removable media, because internal hard disks of the target computer cannot be accessed during the standalone deployment.
4. Boot the target computer into Acronis Standalone Utility.
5. Attach or insert the media if the master image or files to transfer are located on the media.

Acronis Standalone Utility can deploy images located:

- in network shared folders
 - on USB and FireWire (IEEE-1394) storage devices (hard drives, flash drives) attached to the managed computer
 - on DVD+R/RW, DVD-R/RW, CD-R/RW loaded in the managed computer media drive.
- Acronis Standalone Utility can deploy an image spread on multiple CDs, DVDs or other media.

6. Configure the deployment operation as described in 9.2.1 – 9.2.12. Note that the template cannot be saved because the standalone utility does not access the Acronis OS Deploy Server.
7. Run the manual deployment.

11. Manual deployment

Manual deployment presumes that you first boot up the target computers and then apply the deployment template. The deployment will start immediately on clicking **Proceed** in the deployment wizard.

11.1 Booting up the targets

To perform manual or event-driven deployment you need to boot the target computers into Acronis Snap Deploy Agent using either bootable media or Acronis PXE Server.

Deployment presumes that you have created a master image, so at least the Acronis Snap Deploy Management Console is installed.

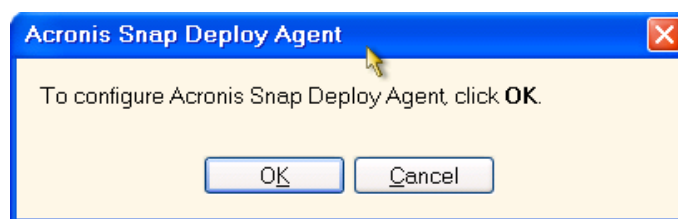
1. Install Acronis License Server. Import licenses to the license server. Install Acronis OS Deploy Server.
2. Do one of the following:
Create bootable media with Acronis Snap Deploy Agent
or
Install Acronis PXE Server, connect the console to the PXE server and upload Acronis Snap Deploy Agent
3. Do one of the following:
Boot the target computer(s) into Acronis Snap Deploy Agent from bootable media
or
Boot the target computer(s) into Acronis Snap Deploy Agent from the PXE Server.



The boot menu on the target side

4. Select Acronis Snap Deploy Agent in the boot menu.
While creating bootable media or uploading Acronis Snap Deploy Agent on the PXE server, the agent can be configured to start automatically on timeout.

-
5. The agent has to establish network connection to be able to connect to Acronis OS Deploy Server. A dialog box comes up suggesting that you configure the network connection used by Acronis Snap Deploy Agent.

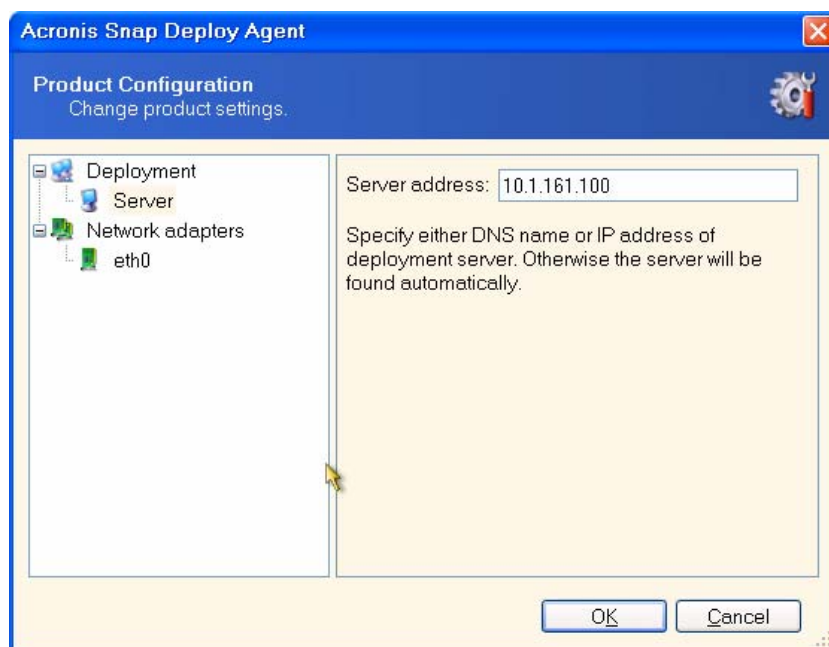


Prompt for configuring the agent on the target side

By default, the agent will use DHCP auto configuration and connect to the first deploy server that is found on the network. You can ignore the prompt (click **Cancel**) if there is a DHCP server and only one Acronis OS Deploy Server on the network. The agent can be pre-configured to apply the default settings automatically on timeout.

To configure the network connections manually, click **OK** in the prompt window. You can set up:

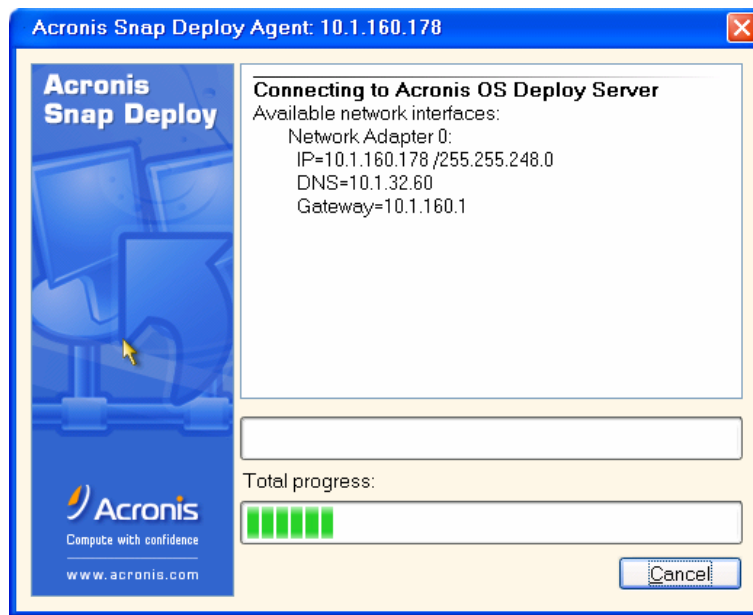
- TCP/IP settings for each network interface of the target computer.
Acronis Snap Deploy Agent uses DHCP auto configuration by default. The manual configuration is needed if auto configuration is not possible (no DHCP server on the network) or does not succeed.
- The Acronis OS Deploy Server the agent will connect to.
This setting allows you to have multiple deployment servers that perform different functions on the same network. The deployment server can be specified also when creating bootable media with Acronis Snap Deploy Agent. If not specified in either way, the server will be found automatically.



Configuring the agent on the target side

Set the preferable values and click **OK**.

- When the Acronis Snap Deploy Agent starts and the target computer is ready for deployment, the target computer displays:

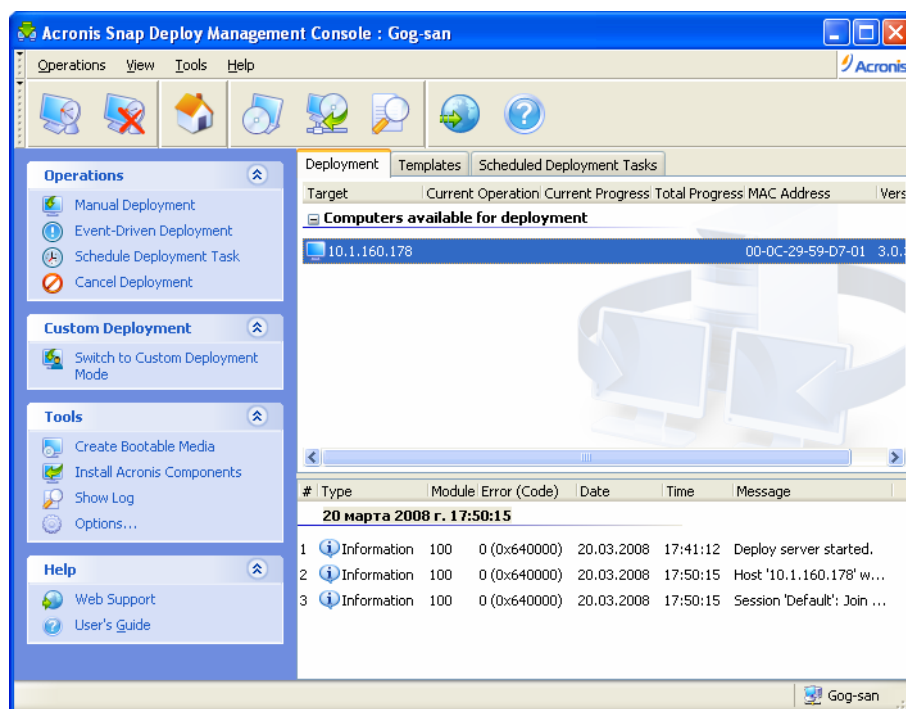


Acronis Snap Deploy Agent: ready for deployment

The progress bar is frozen because the computer is waiting for deployment.

11.2 Starting deployment

- Connect the console to the Acronis OS Deploy Server.
- Select the **Deployment** tab. The tab shows the computers booted into Acronis Snap Deploy Agent and ready for deployment.



Acronis OS Deploy Server: the agent is ready for deployment

-
3. Click **Manual Deployment** on the sidebar.
 4. Select the computers to deploy to from the list of the connected computers.
 5. Select the previously created deployment template or configure the deployment operation as described in 9.2.1 – 9.2.12.
 6. Review the deployment operation summary and click **Proceed** to start the deployment.

12. Event-driven deployment

Deployment can be configured to start when the predefined number of computers is ready. The Acronis OS Deploy Server counts how many computers have connected to the server and starts multicasting when the desired number of computers is reached.

The administrator can specify a time-out period. On time-out, deployment will start on the computers that are ready despite that the predefined number is not reached.

This decouples configuring the deployment operation from booting up the target computers. With manual deployment, you boot up the targets first, configure deployment for these targets and start the operation manually. With event-driven deployment, you configure the deployment first, no matter if the targets are ready or not, and then boot up the targets. The operation will start as soon as the targets are ready or (optionally) on time-out.

The administrator is able to skip these events and initiate deployment manually.

Scenario:

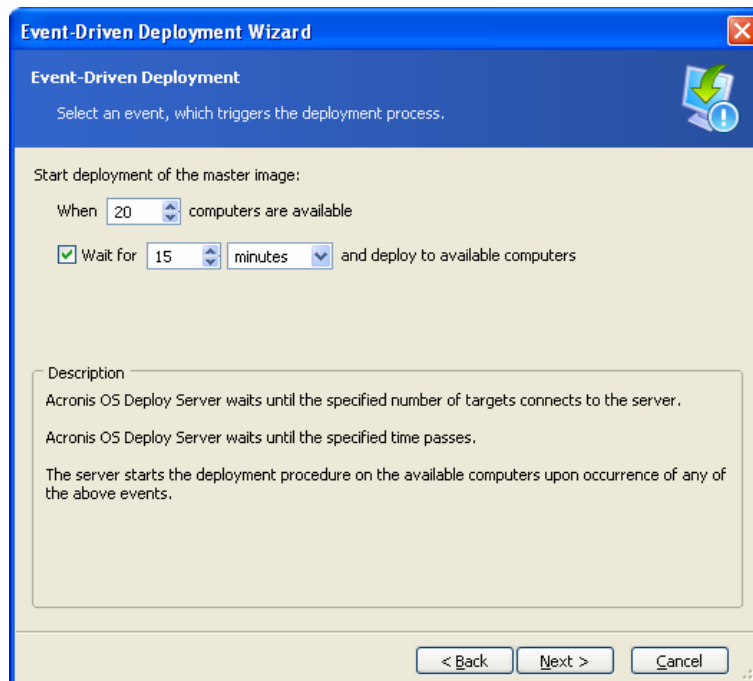
An organization receives 100 computers from a manufacturer. The IT department has to deploy systems, preconfigured according to the employees' roles, to a predefined number of computers. For example, 10 computers for accountants, 10 computers for the marketing department, 70 computers for sales and 10 for the managers.

Steps:

1. Install Acronis Snap Deploy Management Console and Acronis License Server. Import licenses to the license server. Install Acronis OS Deploy Server.
2. Create bootable media with Acronis Master Image Creator.
3. Configure and image the master system.
4. Create and save a deployment template. The template includes a path to the master image. Let's say the master image is configured for sales people.
5. Do one of the following:
Create bootable media with Acronis Snap Deploy Agent
or
Install Acronis PXE Server, connect the console to the PXE server and upload Acronis Snap Deploy Agent.
6. Connect to the Acronis OS Deploy Server and click **Event-Driven Deployment** on the sidebar.
7. Select the condition that triggers the deployment.
Enter the number of computers you need to deploy, say, 70 computers for sales.

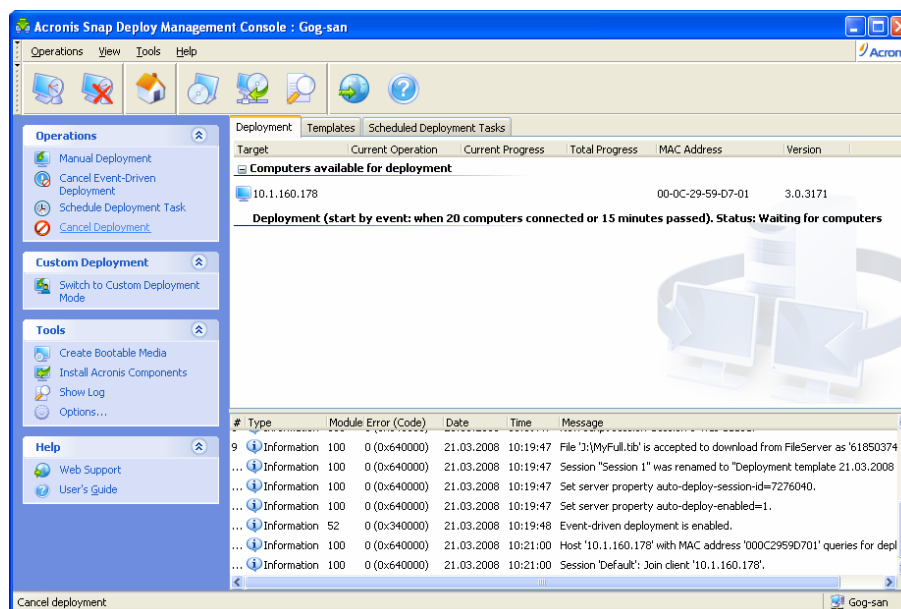
If the time-out is not specified (the check box is not checked), the deploy server will wait until any 70 computers boot into Acronis Snap Deploy Agent and connect to the server.

If you specify the time-out (check the box and set the time), the deployment will start either when any 70 computers connect, or when the time runs out and at least one computer is connected.



Triggering conditions for event-driven deployment

8. Select the previously created deployment template or configure the deployment operation as described in 9.2.1 – 9.2.12.
9. Review the deployment operation summary and click **Proceed** to commit the event-driven deployment. The **Deployment** tab will appear like the graphic below.



Acronis OS Deploy Server is waiting for targets to connect to start event-driven deployment

10. Do one of the following:
 Boot the target computer(s) into Acronis Snap Deploy Agent from bootable media
 or
 Boot the target computer(s) into Acronis Snap Deploy Agent from the PXE Server.

See details in *11.1 Booting up the targets*.

11. As target computers connect to the deploy server, they appear in the upper list “**Computers available for deployment**”. While the deploy server is waiting, you are able to:
 - Cancel event-driven deployment
 - Start the manual deployment on the available computers (click **Manual deployment** on the sidebar)

As soon as the triggering condition arises, the available computers become engaged in the event-driven deployment and move to the lower list “**Deployment (Start by event)**”.

13. Scheduled deployment

Deployment can be run on a schedule. Scheduling presumes that when the scheduled time comes, the program will power on the computers with predefined MAC addresses using the BIOS Wake On LAN (WOL) functionality.

Computers in other subnets can be woken through a WOL proxy agent delivered with Acronis Snap Deploy.

Computers that do not support WOL can be booted into Acronis environment manually before the scheduled time comes. Such computers will also be deployed provided that their MAC addresses are included in the total list.

Scenarios:

1. An organization receives a shipment of computers from a manufacturer along with the list of their MAC addresses. The IT department has to deploy the operating system to the new hardware.
2. An Internet café, a school or university lab has 100 computers with known MAC addresses. The nightly deployment of the initial standard image on these computers is needed.

13.1 Preparation steps

13.1.1 Getting MAC addresses

Media Access Control address (MAC address) is a 48-bit physical (hardware) address of a network device. In Windows, the physical address can be obtained with **ipconfig /all** or by selecting **Local Area Connection -> Status -> Support -> Details**.

MAC addresses for bare metal are usually supplied by the hardware manufacturer. You can get a MAC address of any PC-compatible hardware by entering the network configuration menu of any Acronis bootable component (Acronis Master Image Creator, for example):

An administrator can execute a script that collects MAC addresses of networked computers and saves them in a text file. The text file can then be imported by Acronis Snap Deploy. This can be a plain text file:

```
; comment
00-01-23-45-67-1A      ; comment
02-01-23-45-67-1B
```

An option to type in the hex MAC addresses is also provided.

13.1.2 Enabling WOL on targets

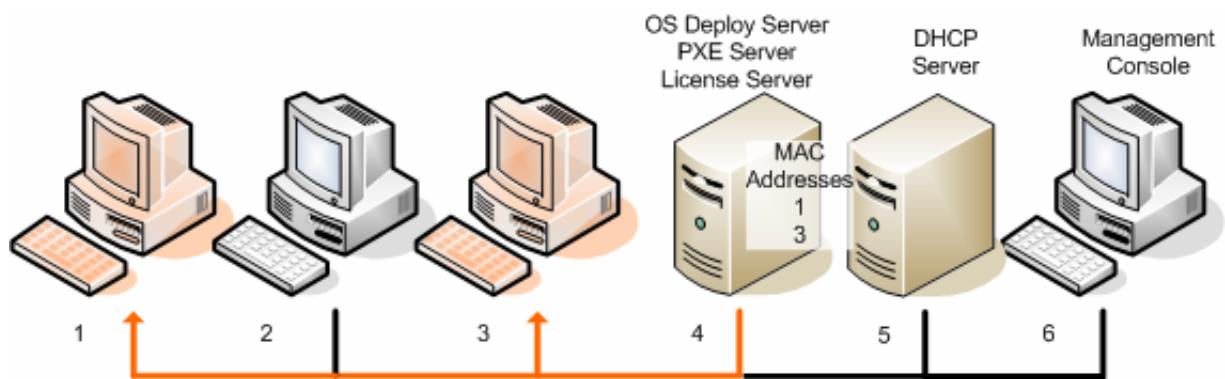
Before using scheduled deployment, make sure that Wake on LAN is enabled on the target computers. Enter the computer BIOS and set **Power -> Wake On PCI PME -> Power On** (the exact names might vary depending on the BIOS version.)

To enable the Wake on LAN feature on a Windows computer set the NIC properties on the computer as follows:

Control Panel -> System -> Device Manager -> Network adapters -> select the NIC -> Properties -> Advanced:
Enable PME -> Enabled
Wake On Link Settings -> OS Controlled
Wake On Settings -> Wake On Magic Packet.

13.2 Scheduled deployment within one subnet

When the scheduled time comes, Acronis OS Deploy Server sends out magic packets according to the predefined list of MAC addresses. (A magic packet is a packet that contains 16 contiguous copies of the receiving NIC's Ethernet address.) The targets wake, boot into Acronis Snap Deploy Agent from the Acronis PXE Server and connect to the deploy server. When all (or some, depending on your choice) targets connect, the deploy server starts multicasting.



Scheduled deployment within one subnet

Steps:

1. Install Acronis Snap Deploy Management Console and Acronis License Server. Import licenses to the license server. Install Acronis OS Deploy Server and Acronis PXE Server.
2. If Acronis PXE Server and the DHCP server are on the same computer, add to the DHCP server option 60: "Client Identifier" with string value "PXE Client". This can be done as follows:

```
C:\WINDOWS\system32>netsh
netsh>dhcp
netsh>dhcp>server \\<server_machine_name> or <IP address>
netsh dhcp>add optiondef 60 PXEClient STRING 0 comment="Option added for
PXE support"
netsh dhcp>set optionvalue 60 STRING PXEClient
```

3. Make sure that Wake on LAN is enabled on the target computers. If you cannot or do not wish to use Wake on LAN on some or all of the target computers, you will have to boot them into Acronis Snap Deploy Agent manually before the scheduled time comes.
4. Create bootable media with Acronis Master Image Creator.
5. Configure and image the master system.
6. Create and save a deployment template.
7. Create a list of target MAC addresses. This can be a plain text file:

```
; comment
00-01-23-45-67-1A      ; comment
02-01-23-45-67-1B
```

8. Configure Acronis PXE Server:

- upload Acronis Snap Deploy Agent (to boot the targets into the agent before deployment)
- set **Booting from HDD** as the default boot menu item (to boot the targets into the deployed OS after the deployment)
- set up a reasonable timeout so that the OS can start automatically.

9. Connect to the Acronis OS Deploy Server and click **Scheduled Deployment** on the sidebar.

10. Import or type in the list of target MAC addresses.

11. Select **Wake-on-LAN**.

12. The next window suggests that you tune the PXE server to use with the deployment server you are connected to. The goal of this setting is to boot the woken machine into Acronis Snap Deploy Agent even if another component on the PXE server is configured to start automatically.

The tuned PXE Server will redirect the boot menu configuration requests that come from the booting machines, to the current OS Deploy Server. The deploy server responds with the file specifying the boot menu item for the given MAC address. If the MAC address of the booting machine is included in the list of target MAC addresses, the machine will boot into Acronis Snap Deploy Agent, despite that **Booting from HDD** is configured as the default boot menu item.

Tuning a PXE server implies that you can guarantee that the woken machines will be served by this PXE server. Normally, you have only one PXE server in the given subnet.

Once tuned to the certain OSDS, the PXE server remains tuned at this setting unless it is tuned to another OSDS by another scheduled task. If this setting has never been configured, the woken machine will boot into the component that is configured to start automatically.

Type in "localhost" if the PXE server and the deployment server are on the same machine.

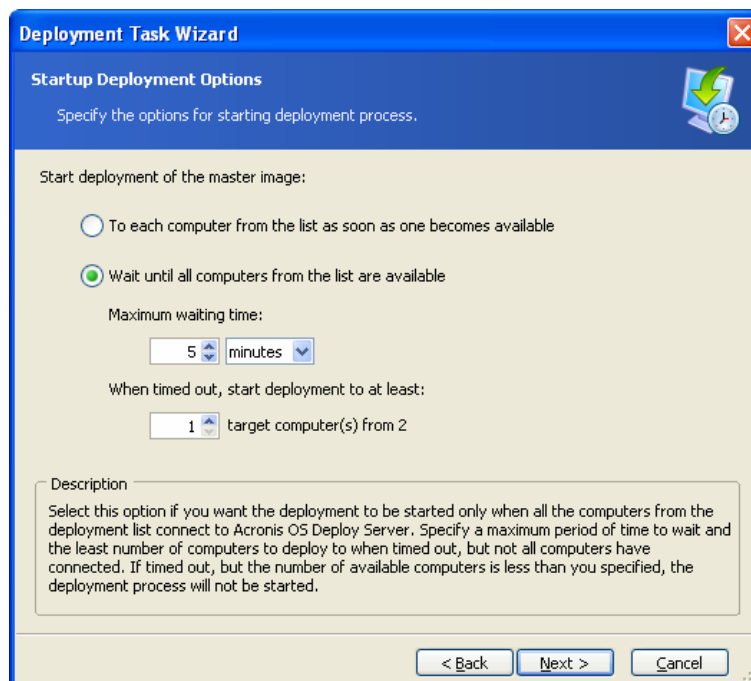


Tune PXE server

13. Select whether to start deployment one-by-one, as computers connect to the deploy server, or to wait for all the computers to connect.

In practical situations, some of the listed computers might not connect because they are in use, for example. One-by-one deployment task will continue waiting for missing computers, while the

rest of the computers are already deployed. Because it may not be practical or efficient for you to have the task suspended (especially a periodic task), the program allows you to specify the maximum waiting time and the minimum number of computers on which the deployment will start when the time is out.



Triggering conditions for scheduled deployment

14. Select the deployment template.
15. Set up the deployment schedule:
 - One time only – the task will be executed once at the specified time and day
 - Daily (or several times a day) - the task will be executed once a day or once in several days
 - Weekly - the task will be executed once a week or once in several weeks on the selected day
 - Monthly - the task will be executed once a month on the selected day

Do not forget that the target computers must be powered off or booted into the Acronis Snap Deploy Agent before the scheduled time comes.

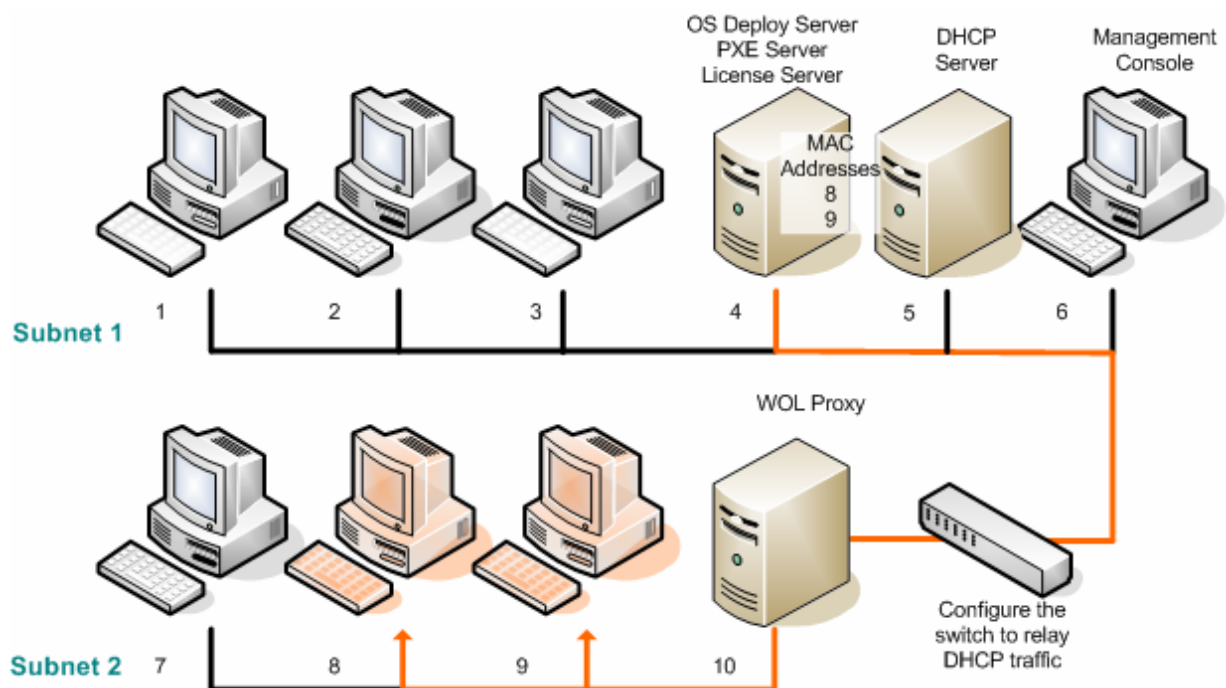
16. Review the scheduled task summary and click **Proceed** to save the task.
17. Select the **Scheduled Deployment Tasks** tab and make sure that the task is saved.
18. When the task is started, the connected computers' IPs and the task progress will be displayed on the **Deployment** tab.
19. When the task is finished, its log will be available in the Acronis OS Deploy Server log.

13.3 Scheduled deployment in other subnet

Computers in other subnets can be woken through a WOL proxy. The WOL Proxy agent is delivered with Acronis Snap Deploy.

When the scheduled time comes, Acronis OS Deploy Server sends out magic packets according to the predefined list of MAC addresses. (A magic packet is a packet that contains 16 contiguous copies of

the receiving NIC's Ethernet address.) Acronis WOL Proxy transfers the packets to targets located in other subnet. The targets wake, boot into Acronis Snap Deploy Agent from the Acronis PXE Server and connect to the deploy server. When all (or some, depending on your choice) targets connect, the deploy server starts multicasting.



Scheduled deployment in other subnet using Acronis WOL Proxy

Steps:

1. Install Acronis Snap Deploy Management Console and Acronis License Server. Import licenses to the license server. Install Acronis OS Deploy Server and Acronis PXE Server.
2. To enable the Acronis PXE Server to work in other 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>

3. If Acronis PXE Server and the DHCP server are on the same computer, add to the DHCP server option 60: "Client Identifier" with string value "PXE Client". This can be done as follows:

```
C:\WINDOWS\system32>netsh
netsh>dhcp
netsh>dhcp>server \\<server_machine_name> or <IP address>
netsh dhcp>add optiondef 60 PXEClient STRING 0 comment="Option added for
PXE support"
netsh dhcp>set optionvalue 60 STRING PXEClient
```

4. Install Acronis WOL Proxy in the subnet where the target computers are.
5. Make sure that Wake on LAN is enabled on the target computers. If you cannot or do not wish to use Wake on LAN on some or all of the target computers, you will have to boot them into Acronis Snap Deploy Agent manually before the scheduled time comes.
6. Create bootable media with Acronis Master Image Creator.
7. Configure and image the master system.
8. Create and save a deployment template.

9. Configure Acronis PXE Server:

- upload Acronis Snap Deploy Agent (to boot the targets into the agent before deployment)
- set **Booting from HDD** as the default boot menu item (to boot the targets into the deployed OS after the deployment)
- set up a reasonable timeout so that the OS can start automatically.

10. Create a list of target MAC addresses. This can be a plain text file:

```
; comment  
00-01-23-45-67-1A      ; comment  
02-01-23-45-67-1B
```

11. Connect to the Acronis OS Deploy Server and click **Scheduled Deployment** on the sidebar

12. Import or type in the list of MAC addresses

13. Select **Wake-on-LAN Proxy** and type in the Acronis WOL Proxy's IP address and the access credentials. Test the credentials.

The screenshot shows the 'Deployment Task Wizard' window with the 'Wake-On-LAN Options' tab selected. The window has a blue title bar and a light beige background. At the top, it says 'Specify a method to be used for Wake-On-LAN.' Below this, there are two radio buttons: 'Wake-on-LAN' and 'Wake-on-LAN proxy'. The 'Wake-on-LAN proxy' option is selected. To the right of these buttons are three text input fields labeled 'IP address:', 'User name:', and 'Password:'. A 'Test' button is located to the right of the 'Password:' field. Below these fields is a 'Description' section with a text box containing the text: 'Select this option if the target computers are not in the same subnet as the Acronis OS Deploy Server.' At the bottom of the window are three buttons: '< Back', 'Next >', and 'Cancel'.

Specifying Acronis WOL Proxy

14. The next window suggests that you tune the PXE server to use with the deployment server you are connected to. The goal of this setting is to boot the woken machine into Acronis Snap Deploy Agent even if another component on the PXE server is configured to start automatically. See details in the previous section.

15. Select whether to start deployment one-by-one, as computers connect to the deploy server, or to wait for all computers to connect.

16. Select the deployment template.

17. Select and set up the deployment schedule:

- One time only
- Daily (or several times a day)
- Weekly
- Monthly

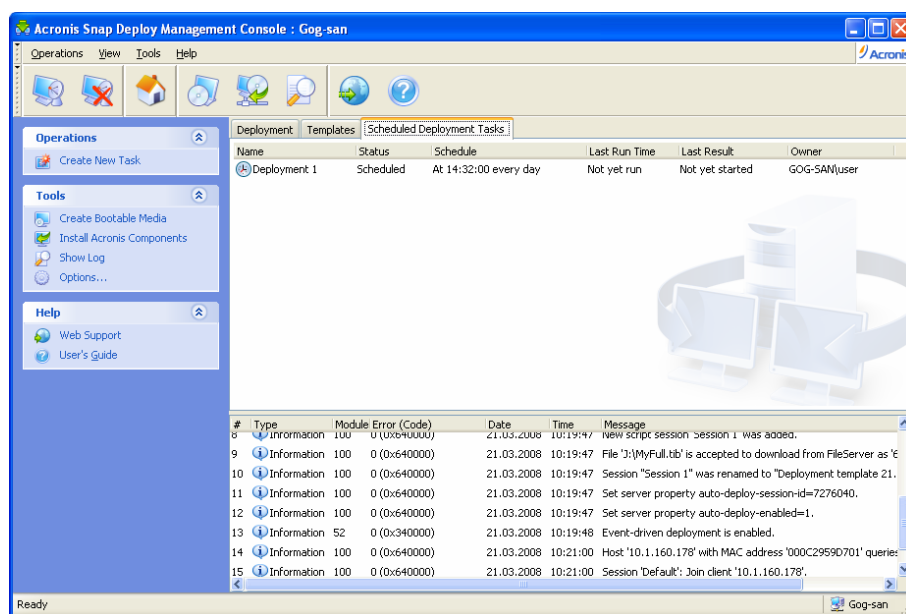
Do not forget that the target computers must be powered off or booted into the Acronis Snap Deploy Agent before the scheduled time comes.

18. Review the scheduled task summary and click **Proceed** to save the task.
19. Select the **Scheduled Deployment Tasks** tab and make sure that the task is saved.
20. When the task is started, the connected computers' IP addresses and the task progress will be displayed on the **Deployment** tab.
21. When the task is finished, its log will be available in the Acronis OS Deploy Server log.

13.4 Operations with scheduled tasks

Once a deployment task is scheduled, it appears on the **Scheduled Deployment Tasks** tab.

A task scheduled for periodical execution stays on the deploy server until you delete it. A task scheduled for one-time execution will disappear as soon as the execution is completed.



Acronis OS Deploy Server: the deployment task is scheduled

To delete a task, select it and click **Delete**.

To edit a task, select it and click **Edit**. Editing is performed in the same way as creation, however, the earlier selected options will be set, and so you have to enter only the changes.

Deleting or editing a task does not affect the current task execution. A task, that has been edited or deleted while running, will come to an end without any changes. The changes you made will be applied when execution is completed.

To run a task immediately, select the task and click **Start Task**. The task schedule remains valid.

To re-schedule a task or clear the task schedule, click **Change Task Schedule**. By clearing the task schedule you disable the task execution while not deleting the task. The task can be executed in the future when you add a new schedule using the same wizard.

14. Custom deployment mode

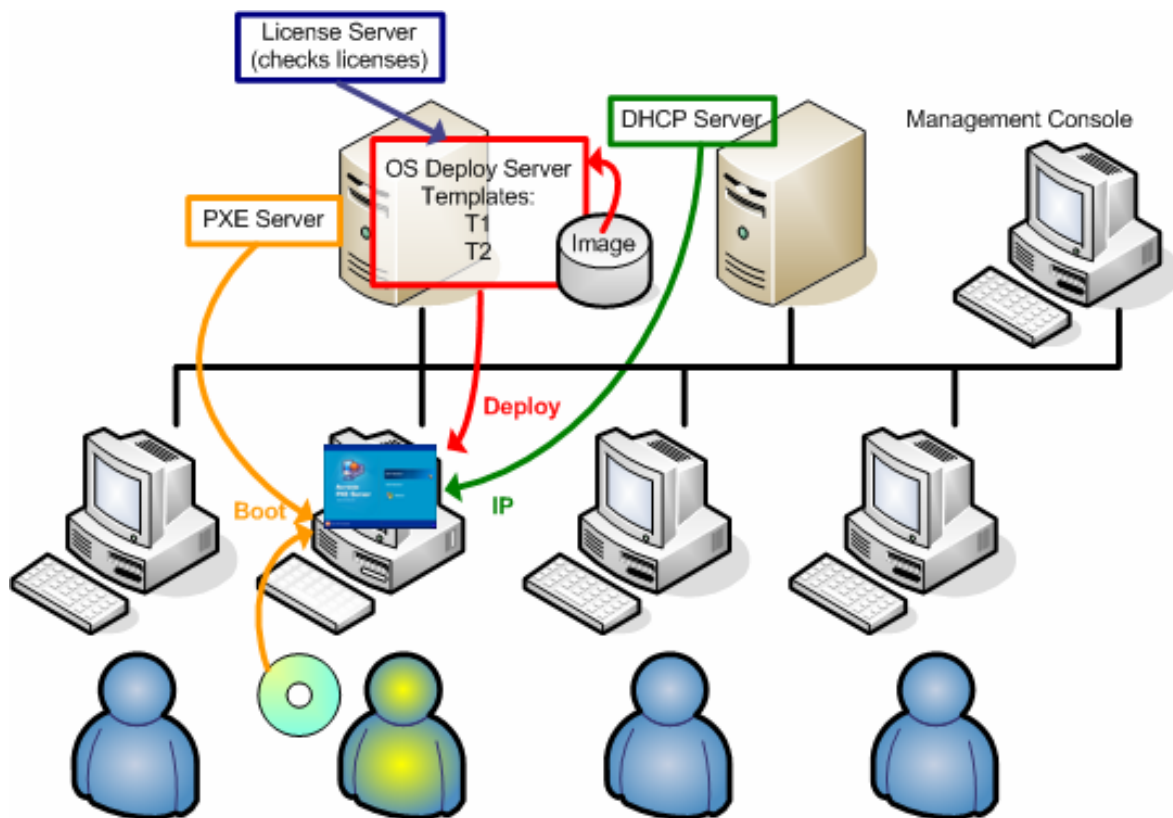
Acronis Snap Deploy can be configured in such a way that users will be able to deploy and re-deploy their computers with one click on the boot menu.

14.1 Understanding custom deployment

An administrator creates a set of deployment templates that meet the organization's needs and assigns to each template a name that can be easily understood by a user.

The administrator creates bootable media or a PXE package containing the set of templates and switches on the custom deployment mode.

Users that need to re-deploy their computers boot the computers from bootable media or PXE and select the template by name from the boot menu. The deployment starts immediately and proceeds independently on each computer.



Custom deployment mode: a user initiates deployment

In software testing labs the choices can be various operating systems, various editions of the same operating system, the same operating system with various settings or various applications. In a university or school lab the choices can be various exercises that students have to explore or the initial system image for the purpose of self-restore.



The custom boot menu
A user can start deployment with any of the two templates or boot into Windows

The custom deployment mode is intended for continual work without administrator's assistance. Once the mode is set, other methods of deployment (manual, scheduled, event-driven deployment) become unavailable. Any scheduled task, that has to start while the custom deployment mode is on, will not start. Only users (the ones on the target side) can initiate deployment. However, the administrator can view logs, create new deployment templates, change the custom deployment configuration (add, edit or remove boot menu items) and perform other management operations except for deployment.

To initiate deployment on the console side, the administrator switches off the custom deployment mode.

14.2 Considerations and tips

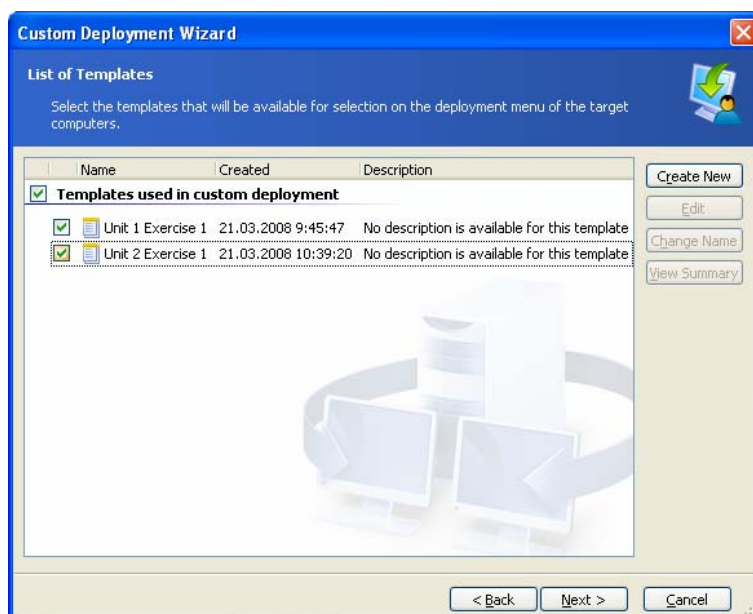
When enabling or configuring the custom deployment mode with PXE, the program first removes all bootable utilities (Acronis Snap Deploy Agent, Acronis Master Image Creator, PE image) from the PXE server since users might be confused by the unknown items appearing in the boot menu. Then the program uploads to the PXE the templates selected by the administrator. So you will have to upload the bootable utilities again, if they are needed after switching off the custom deployment mode.

You can use another Acronis OS Deploy Server to perform manual, scheduled or event-driven deployment while one OS Deploy Server is in the custom deployment mode. To do so, ensure that the targets connect to the appropriate deployment server by specifying the OSDS on the bootable media or by configuring the Acronis Snap Deploy Agent at boot up. The deploy servers cannot share the Acronis PXE Server though.

14.3 Setting up the custom deployment mode

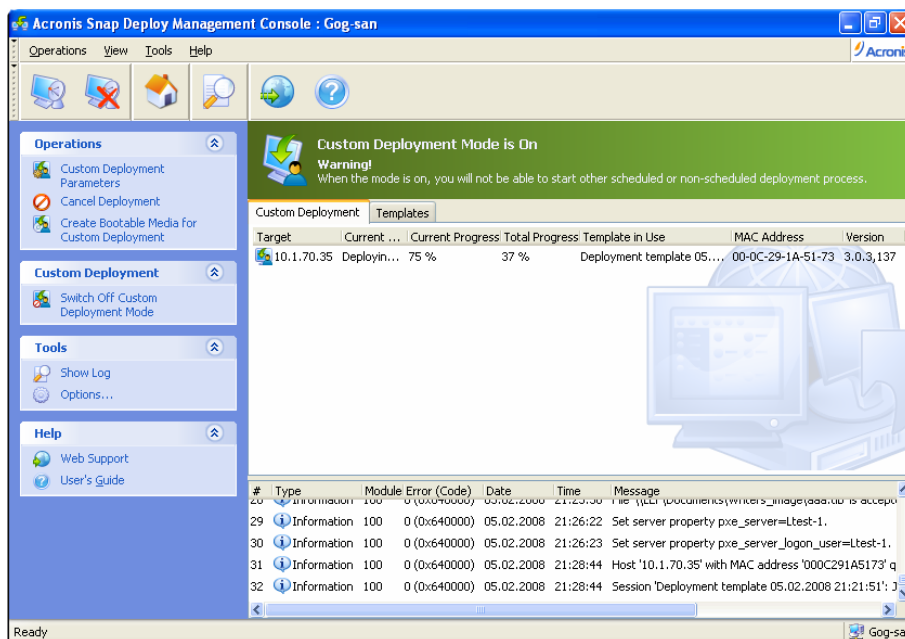
Steps:

1. Install Acronis Snap Deploy Management Console and Acronis License Server. Import licenses to the license server. Install Acronis OS Deploy Server and Acronis PXE Server.
2. Create bootable media with Acronis Master Image Creator.
3. Configure and image the master system(s).
4. Create and save the deployment templates according to your organization's needs. Assign to each template a name that can be easily understood by the users.
5. Connect to the Acronis OS Deploy Server. If some deployment operations are active, either cancel the operations or wait until the operations are completed.
6. Click **Switch to Custom Deployment Mode** on the sidebar.
7. Select the templates to be added to the boot menu.



Adding templates to the custom boot menu

8. Select **Create boot media**
9. Select whether you want to create removable media, the media ISO or upload the templates to Acronis PXE Server. Having saved the media ISO, you can create as many media copies as the users need using third-party CD/DVD burning software.
10. The templates being uploaded to the PXE server can be protected with a password to prevent the templates from unauthorized execution. The password prompt will come up before displaying the Acronis boot menu.
11. Review the operation summary and click **Proceed**
12. The program creates the media with the custom boot menu. Acronis OS Deploy Server switches to the custom deployment mode.



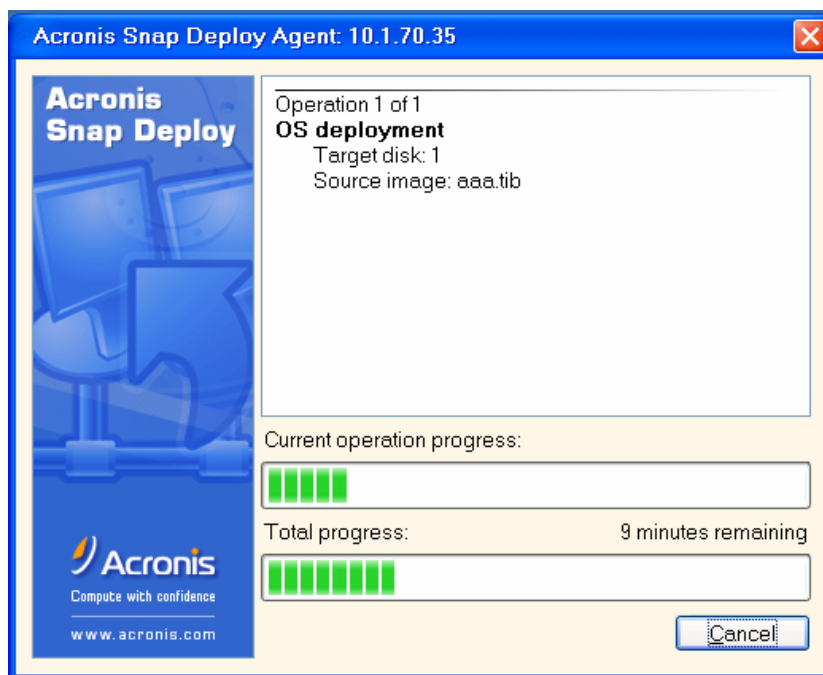
Acronis OS Deploy Server is in custom deployment mode

12. The **Custom Deployment** tab shows the status of deployment operations performed on users' requests. The tab is empty if none of the users are deploying at the moment.

While the deploy server is in custom deployment mode, you are able to:

- change parameters of the custom deployment mode
- create new media for the custom deployment mode
- stop the selected operation, if need be, by selecting **Cancel Deployment**
- switch off the custom deployment mode.

The user that requested deployment sees the following screen while the deployment is progress.



Custom deployment in progress: view on the target side

14.4 Changing parameters of the custom deployment mode

To change the templates or the boot menu password, used in the custom deployment mode, you will have to re-configure the custom deployment mode.

1. If some user-initiated deployment operations are active, either stop the operations or wait until the operations are completed.
2. Click **Custom Deploy Parameters** on the sidebar and repeat steps 6-10 in section 14.3.

14.5 Closing the custom deployment mode

1. If some user-initiated deployment operations are active, either stop the operations or wait until the operations are completed.
2. Click **Switch off the custom deployment mode** on the sidebar.
3. In case the custom deployment mode used Acronis PXE Server, the program has to remove custom boot media from the server. Type in the credentials for the PXE server, if prompted.

15. Command line and scripting under Win PE and Bart PE

Windows Preinstallation Environment (Win PE) is a minimal Windows system based on the Windows XP Professional, the Windows Server 2003 or the Windows Vista kernels. Win PE is commonly used by OEMs and corporations for deployment, test, diagnostic and system repair purposes.

Acronis Snap Deploy provides a command line utility that can be added to a Windows Preinstallation Environment (Win PE) image. The Acronis Universal Deploy add-on, if installed, will also be included in the PE. The administrator can then upload the PE to a PXE server or transfer the PE image onto removable media.

Having booted a machine in Preinstallation Environment, the administrator can perform imaging or deployment in the command line mode or execute scripts. Section 15.5 *Sample scenarios* provides examples of what you can do in PE.

Limitation:

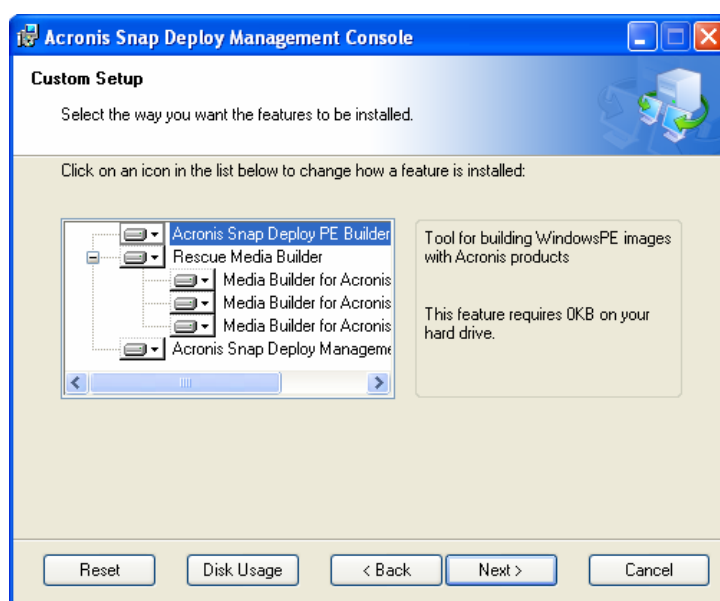
Acronis Snap Deploy command line utility can generate a new SID but cannot adjust other settings on the fly. To change the computer name, domain or workgroup membership and other settings, apply the Microsoft System Preparation Tool (Sysprep) to the master system and specify the new settings in the Sysprep.inf answer file.

15.1 Adding ASD command line utility to PE

15.1.1 Acronis Snap Deploy PE Builder

Acronis Snap Deploy PE Builder is a dedicated component for adding Acronis Snap Deploy command line utility to PE image.

Acronis Snap Deploy PE Builder is installed with the Acronis Snap Deploy Management Console **Typical** or **Complete** installation. You can install the PE Builder alone using the **Custom** way of installation.



The PE builder comes with Acronis Snap Deploy Management Console

The PE Builder can add the Acronis Snap Deploy command line utility to a Bart PE, Win PE 1.0 or Win PE 2.0 image. To be able to add the command line utility to a Win PE 2.0 image (a .WIM file or a folder with PE 2.0 unpacked files) you must have Windows Automated Installation Kit (AIK) installed.

For this purpose, install Acronis Snap Deploy PE Builder on a computer where AIK is installed. If you do not have such machine, do as follows:

- Download Windows Automated Installation Kit (AIK) from <http://www.microsoft.com/Downloads/details.aspx?familyid=C7D4BC6D-15F3-4284-9123-679830D629F2&displaylang=en>
- Burn the AIK to DVD or copy to a flash drive
- Install the Microsoft .NET Framework v.2.0 from this kit (NETFXx86 or NETFXx64, depending on your hardware)
- Install Microsoft Core XML (MSXML) 5.0 or 6.0 Parser from this kit
- Install Windows AIK from this kit
- Install Acronis Snap Deploy PE builder.

15.1.2 Adding ASD command line utility to PE 1.0

1. Do one of the following:

Unpack all files of your Win PE 1.0 ISO to a separate folder on the hard disk

or

Install Bart PE builder

Use Bart PE builder and your Windows distribution to create a folder with Bart PE files

To be able to boot from a PXE server, PE 1.0 must contain PXE loader. Check whether your Windows distribution has this loader. It appears as a packed file named **STARTROM.N1_**.

2. Select **Acronis -> Acronis Snap Deploy -> Acronis Snap Deploy PE Builder** from the start menu.

3. Do one of the following, depending on your choice in step 1:

Specify path to the folder with PE 1.0 unpacked files

or

Specify path to the destination folder of Bart PE builder

4. Specify the full path to the resulting file including the file name.

5. Check your settings in the summary screen and click **Proceed**.

6. Burn the .ISO to CD or DVD using a third-party tool or copy to a flash drive. For how to upload the .ISO to Acronis PXE Server, see *15.2 Uploading PE images to Acronis PXE Server*.

15.1.3 Adding ASD command line utility to PE 2.0

1. Select **Acronis -> Acronis Snap Deploy -> Acronis Snap Deploy PE Builder** from the start menu.

2. Do one of the following:

Specify path to the source WINPE.WIM file. The standard path to this file for x86 hardware is \Program Files\Windows AIK\Tools\PETools\x86\winpe.wim.

or

Specify path to a folder with Win PE 2.0 unpacked files.

3. Specify the full path to the resulting file including the file name.

The builder will create a .WIM file if the source is WINPE.WIM.

You can choose whether to create .WIM or .ISO file if the source is the folder. Choose .WIM if you are going to upload the PE image to the PXE server. Choose .ISO if you are going to put the PE image on physical media.

4. Check your settings in the summary screen and click **Proceed**.

5. Burn the .ISO to DVD using a third-party tool or copy to a flash drive. For how to upload the .WIM to Acronis PXE Server, see the next section.

15.2 Uploading PE images to Acronis PXE Server

You can upload to Acronis PXE Server either PE 1.0 .ISO or PE 2.0 .WIM.

To be able to upload a PE 1.0 ISO, copy the I386 folder from your Windows distribution CD to the hard disk.

1. Start Acronis Snap Deploy Management Console

2. Click **Configure PXE Server**

3. Connect to the server

4. Click **Upload PE to PXE Server**

5. Do one of the following:

Specify path to PE 1.0 .ISO file to upload

or

Specify path to PE 2.0 .WIM file to upload

The **Start automatically after** parameter specifies the timeout interval for the boot menu. If not specified, the Acronis loader will display the boot menu and wait for someone to select whether to boot the OS or the PE. If you set, say, 10 sec, the PE will start 10 seconds after the menu is displayed. This enables unattended operation on the target side.

6. Do one of the following, depending on your choice in step 5:

Specify path to the **I386** folder

or

Specify path to the **Windows AIK** folder

7. Check your settings in the summary screen and click **Proceed**.



A PE image based on Win PE 2.0 requires at least 256MB RAM to work. The recommended memory size for PE 2.0 is 512MB.

15.3 ASD command line syntax

15.3.1 Supported commands

Acronis Snap Deploy command line utility has the following format:

```
asdcmd /command /option1 /option2...
```

Commands may be accompanied with options. Some options are common for most asdcmd commands, while others are specific for individual commands. Below is a list of supported commands and compatible options.

Command	Common Options	Specific Options
create Creates an image of specified disks and partitions	/filename:[file name] /password:[password] /net_user:[username] /net_password:[password] /incremental /differential /compression:[0...9] /split:[size in MB] /oss_numbers /reboot /log:[file name] /log_net_user:[remote user] /log_net_password:[password]	/harddisk:[disk number] /partition:[partition number] /file_partition:[partition letter] /raw /progress:[on off]
deploy Deploys disks and partitions, including the MBR, from an image	/filename:[file name] /password:[password] /net_user:[username] /net_password:[password] /oss_numbers /reboot /log:[file name] /log_net_user:[remote user] /log_net_password:[password]	/harddisk:[disk number] /partition:[partition number] /target_harddisk:[disk number] /target_partition:[partition number] /start:[start sector] /fat16_32 /size:[partition size in sectors] /type:[active primary logical] /preserve_mbr /license_server:[the server IP] /grant_server_license When using the Acronis Universal Deploy add-on: /ud_path:[path] /ud_username:[user] /ud_password:[pwd] /ud_driver:[inf-filename]
verify Verifies the image integrity	/filename:[file name] /password:[password] /net_user:[username] /net_password:[password] /reboot /log:[file name] /log_net_user:[remote user] /log_net_password:[password]	

<code>list</code> Lists available drives and partitions. With the filename option; lists the image contents	<code>/password:[password]</code> <code>/net_user:[username]</code> <code>/net_password:[password]</code>	<code>/filename:[file name]</code>
--	---	------------------------------------

15.3.2 Common options (options common for most asdcmd commands)

Option	Description	Image location
Access to images		
<code>/filename:[file name]</code>	Full path to the image including the file name	Any
<code>/password:[password]</code>	The password for the image (if required)	Any
<code>/net_user:[username]</code>	Specify a user name for network drive access	Network drive
<code>/net_password:[password]</code>	Specify a password for network drive access	Network drive
Imaging options		
<code>/incremental</code>	Set the image type to incremental. If not specified or there is no basic full image, a full image will be created	Any
<code>/differential</code>	Set the image type to differential. If not specified or there is no basic full image, a full image will be created	Any
<code>/compression:[0...9]</code>	Specify the data compression level. It ranges from 0 to 9 and is set to 3 by default	Any
<code>/split:[size in MB]</code>	Split the image into parts of the specified size	
General options		
<code>/oss_numbers</code>	Declares that numbers of partitions in the <code>/partition</code> option are adjusted for the MBR partition table, rather than just as ascending numbers. This means that primary partitions have numbers 1-1, 1-2, 1-3, 1-4; logical partitions numbers start with 1-5. For example, if the disk has one primary and two logical partitions, their numbers can appear as follows: <code>/partition:1-1,1-2,1-3</code> or <code>/oss_numbers /partition:1-1,1-5,1-6</code>	Any

/reboot	Reboot the computer after the operation is completed	Any
/log:[file name]	Create a log file of the current operation with the specified file name	Any
/log_net_user:[remote user]	If the log file is created on a network share, include the user name for logon to the share	Any
/log_net_password:[password]	If the log file is created on a network share, include the password for logon to the share	Any

15.3.3 Specific options (options specific for individual asdcmd commands)

Option	Description
create	
/harddisk:[disk number]	Specifies the hard disks to include into the image file. The list of available hard disks is provided by the <code>/list</code> command. An image may contain data of more than one hard disk. In that case, separate disk numbers by commas, e.g.: <code>/harddisk:1,3</code>
/partition:[partition number]	Specifies the partitions to include into the image file. The list of available partitions is provided by <code>/list</code> . Partition numbers are specified as <disk number>-<partition number>, e.g.: <code>/partition:1-1,1-2,3-1</code>
/raw	Use this option to create an image of a disk (partition) with an unrecognized or unsupported file system. This will copy all disk/partition contents sector-by-sector. Without this option only the sectors containing useful system and user data are imaged (for the supported file systems).
/progress:[on off]	Shows/hides the progress information (percent completed). The progress is shown by default.
deploy	
/harddisk:[disk number]	Specifies the hard disk in the image.
/partition:[partition number]	Specifies the partitions in the image.
/target_harddisk:[disk number]	Specifies the target hard disk by number.
/target_partition:[partition number]	Specifies the target partition number for deploying a partition over the existing one. If the option is not specified, the program assumes that the target partition number is the same as the partition number specified with the <code>/partition</code> option.

<code>/start:[start sector]</code>	Sets the start sector for restoring a partition to the unallocated space on the hard disk.
<code>/size:[partition size in sectors]</code>	Sets the new partition size (in sectors).
<code>/fat16_32</code>	Enables the file system conversion from FAT16 to FAT32 if the partition size after deployment is likely to exceed 2GB. Without this option, the deployed partition will inherit the file system from the image.
<code>/restore_bootable:[auto :on:off]</code>	<p>Sets the rule of MBR deployment when deploying a partition (when deploying a disk, MBR is always deployed.)</p> <p>Auto – deploy MBR, if an active partition that contains an operating system is deployed. Use this to ensure that the OS can boot up.</p> <p>On - deploy MBR, if an active partition is deployed, no matter whether the partition contains an OS or not.</p> <p>Off – do not deploy MBR. Use this to preserve the Unix loader, for example.</p>
<code>/type:[active primary logical]</code>	<p>Sets the deployed partition to active, primary or logical, if possible (for example, there cannot be more than four primary partitions on the disk.) Setting a partition to active always sets it to primary, while a partition set to primary may stay inactive.</p> <p>If the type is not specified, the program tries to keep the target partition type. If the target partition is active, the deployed partition is set to active. If the target partition is primary, and there are other primary partitions on the disk, one of them will be set to active, while the deployed partition becomes primary. If no other primary partitions remain on the disk, the deployed partition is set to active.</p> <p>When deploying a partition on unallocated space, the program extracts the partition type from the image. For the primary partition, the type will be set as follows:</p> <ul style="list-style-type: none"> - if the target disk is the 1st according to BIOS and it has no other primary partitions, the deployed partition will be set to active - if the target disk is the 1st according to BIOS and there are other primary partitions on it, the deployed partition will be set to logical - if the target disk is not the 1st, the deployed partition will be set to logical.
<code>/preserve_mbr</code>	When deploying a partition over an existing one, the target partition is deleted from the disk along with its entry in the target disk MBR. Then, with the <code>/preserve_mbr</code> option, the deployed partition's entry will occupy the upper empty position in the target disk MBR. Thus, the target disk MBR is preserved. If not specified, the deployed partition's entry will occupy the same position as in the source disk MBR saved in the image. If the position is not empty, the existing entry will be moved to another position.
<code>/patching_sid</code>	Generate the unique security identifier (SID) for the target computer. If not specified, the SID of the master system will be preserved.
<code>/license_server:[the server IP]</code>	Specifies the license server if the PE was booted from the PXE server.

/grant_server_license	Permits to take a server product license for deploying a workstation operating system (if the PE was booted from PXE server.)
To use the following options you must have the Acronis Universal Deploy add-on in your PE. Also, the Acronis License Server must be accessible from the computer booted into the PE. For more information see <i>2.5 What is Acronis Universal Deploy</i> .	
/ud_path:[path] /ud_username:[user] /ud_password:[pwd]	Specifies using Acronis Universal Deploy and the path to the drivers storage.
/ud_driver:[inf-filename]	Specifies using Acronis Universal Deploy and the mass-storage driver to be installed.
list	
/filename:[file_name]	<p>With this option, the image content is displayed.</p> <p>When listing image content, partition numbers may not coincide with those in the drives/partitions list, if the image does not contain all the disk partitions. For example, if the image contains partitions 2-3 and 2-5, they will be listed as 2-1 and 2-2.</p> <p>If the deploy /partition command cannot find a partition in the image by its physical number, use the /partition:<number in the image> /target_partition:<physical number of the target partition> keys. For the above example, to deploy partition 2-5 to its original place use:</p> <p>/partition:2-2 /target partition:2-5.</p>

15.3.4 asdcmd usage examples

```
asdcmd /create /harddisk:1 /filename:\\server1\folder\arc.tib
/net_user:user1 /net_password:pw1 /log:\\server2\dir\log1.log
/log_net_user:user2 /log_net_password:pw2
```

This will create an image arc.tib of hard disk 1 in the shared folder \\server1\folder. The operation log file log1.log will be saved on another share \\server2\dir. Credentials for both shares are provided.

```
asdcmd /create /filename:h:\raw.tib /partition:1-2 /raw /log5.txt
```

This will image partition 1-2 sector-by-sector (raw) and save the image on partition H.

```
asdcmd /deploy /filename:\\server1\folder\1.tib /password:qwerty
/harddisk:2
```

This will deploy hard disk 2 from the password-protected image 1.tib located in the shared folder \\server1\folder to the disk with the same number 2.

15.5 Sample scenarios

15.5.1 Deploying images assigned to targets

Scenario:

An administrator might need to deploy diverse images on each of the target computers.

Solution:

The administrator puts the images in a shared location that can be accessed from each target.

The administrator renames each image according to the target's MAC address. The image destined to the computer with MAC address **01-02-03-04-05-06** will have the name, say, **image-01-02-03-04-05-06.tib**.

The administrator writes a deployment script that can read the target's MAC address and pull an image with a name corresponding to the MAC address from the shared location. The script can be executed on any number of targets.

Sample script:

```
setlocal
SET IMG_PATH=\\image_server\images
SET TMP_DRV_LETTER=h:

net use %TMP_DRV_LETTER% %IMG_PATH%
echo off
for /f "tokens=1-13 delims= " %%a in ('ipconfig /all') do (
IF %%a EQU Physical (
for /f "tokens=1-3 delims= " %%a in ('echo %%1') do (
IF EXIST %TMP_DRV_LETTER%\%%a.tib (
echo DEPLOYMENT IMAGE file: %%a.tib
asdcmd.exe /deploy /filename:%TMP_DRV_LETTER%\%%a.tib /harddisk:1
/target_partition:c
goto end
) ELSE (
echo THE IMAGE FILE %IMG_PATH%\%%a.tib NOT FOUND
)
)
)
)
:end
echo on
net use %TMP_DRV_LETTER% /d
wpeutil Reboot
endlocal
```

What this script does:

Mounts the shared folder containing the set of images (one image corresponds to one target.)

Retrieves the target's MAC address.

Generates a TIB file name (if MAC address is 01-02-03-04-05-06 then the TIB file name must be 01-02-03-04-05-06.tib.)

Searches the shared folder for an image with such name.

Deploys the image if found.

[OPTIONAL] Reboots or shutdowns the target.

Environment variables:

SET IMG_PATH – path to a shared folder on the deploy server.

SET TMP_DRV_ - mounted drive on target side.

15.5.2 Creating images assigned to targets

Scenario:

The administrator might need to deploy on a computer a previously created image of the same system, to roll back the system to the imaged state.

Solution:

The administrator creates a script that images the computers and names each image according to the computer's MAC address. The images can be deployed to the corresponding targets as described in the previous section.

Sample script:

```
setlocal
SET IMG_PATH=\\image_server\images
SET TMP_DRV_LETTER=h:

net use %TMP_DRV_LETTER% %IMG_PATH%
echo off
for /f "tokens=1-13 delims= " %%a in ('ipconfig /all') do (
IF %%a EQU Physical (
for /f "tokens=1-3 delims= " %%a in ('echo %%1') do (
echo IMAGE FILE: %%a.tib
asdcmd.exe /create /filename:%TMP_DRV_LETTER%\%%a.tib /harddisk:1
/compression:8
goto end
)
)
)
:end
echo on
net use %TMP_DRV_LETTER% /d
wpeutil Reboot
endlocal
```

What this script does:

Mounts the shared folder

Retrieves the booted computer's MAC address.

Generates a TIB file name (if MAC address is 01-02-03-04-05-06 then the TIB file name must be 01-02-03-04-05-06.tib.)

Images partition C of the computer to the shared folder using the generated file name.

[OPTIONAL] Reboots or shutdowns the computer.

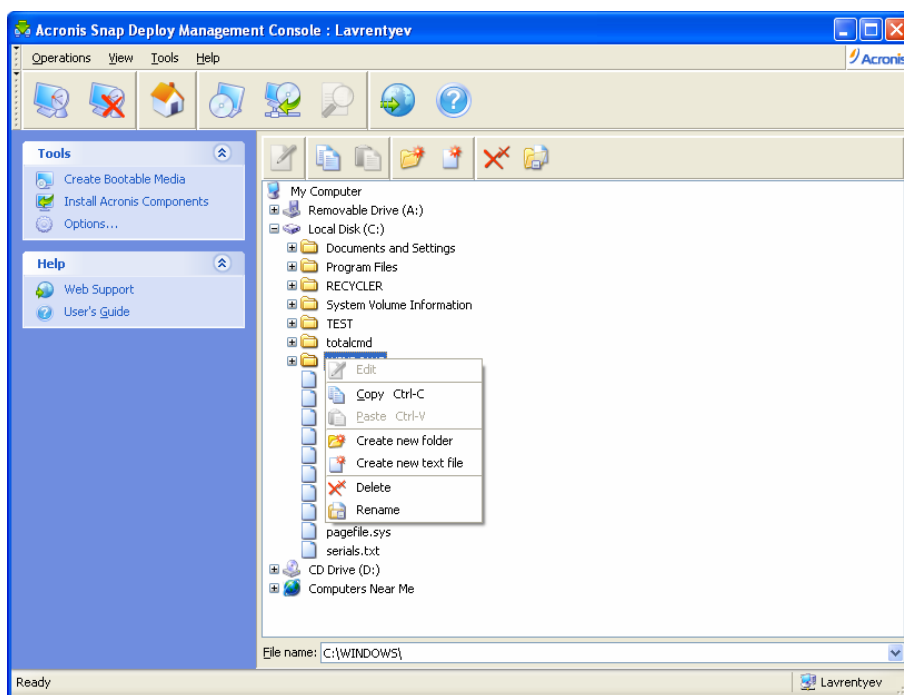
16. Managing a remote computer

16.1 File management on a remote computer

The following operations with files and folders are available on remote computers through Acronis Snap Deploy Management Agent:

- creating and editing text files (for example batch files or scripts)
- copying to the clipboard
- pasting from the clipboard
- renaming
- deletion.

1. Install the Acronis Snap Deploy Management Agent on the managed machine.
2. Connect the console to the managed machine.
3. Select **Manage files** from the list of operations.
4. Use the toolbar buttons or context menu to perform operations.



File management

Create new text file

Select the target folder -> **Create new text document** -> Type in the new file name -> **OK**.

Edit file

Select the file -> **Edit**.

The file will be opened with the associated editor. The file will be opened with Windows Notepad, if the file type is not associated with any editor.

Create folder

Select the target folder -> **Create new folder** -> Type in the new folder name -> **OK**.

Copy file or folder to clipboard

Select the file or folder -> **Copy**.

You can copy files and folders on the remote computer and paste them to your local machine and vice versa.

Paste file or folder from clipboard

Select the target directory -> **Paste**.

Rename file or folder

Select the file or folder -> **Rename** -> Enter new name -> **OK**.

Delete file or folder

Select the file or folder -> **Delete** -> **OK**.

16.2 Executing applications on a remote computer

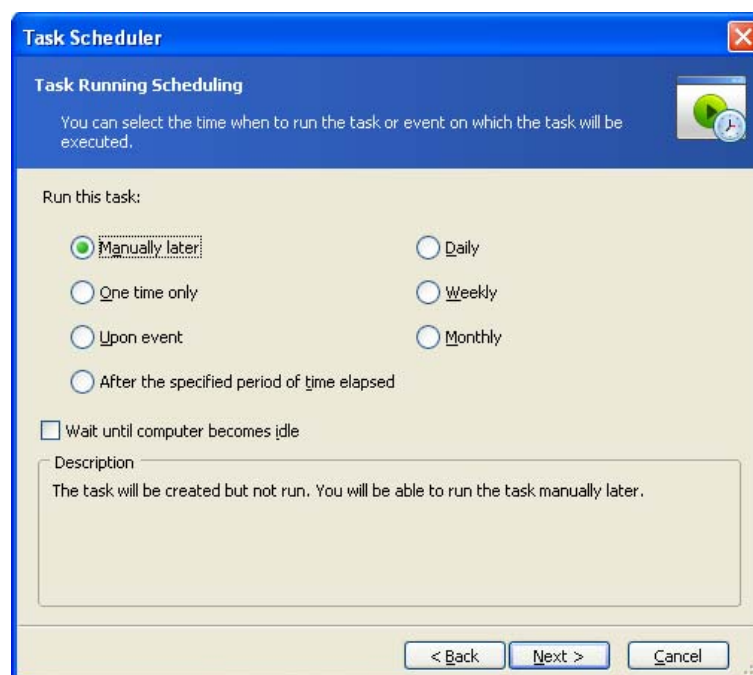
You can schedule execution of service applications such as batch files or scripts on a remote machine through Acronis Snap Deploy Management Agent. The purpose of running applications is to make changes to the deployed system. The applications run silently in the background, so please do not try to run applications such as Explorer, Notepad or any other application that has the user interface.

For example, you can execute the Movefile.bat file, which contains the following commands:

```
mkdir c:\Folder  
copy c:\Somefile.txt c:\Folder  
del c:\Somefile.txt
```

This will create the new folder **\Folder** and place the **Somefile.txt** file into the folder.

1. Install the Acronis Snap Deploy Management Agent on the managed machine.
2. Connect the console to the managed machine.
3. Select **Run application** from the list of operations.
4. Click **Create new scheduled task** to launch the wizard.
5. Select the application.
6. Select the task start parameters.

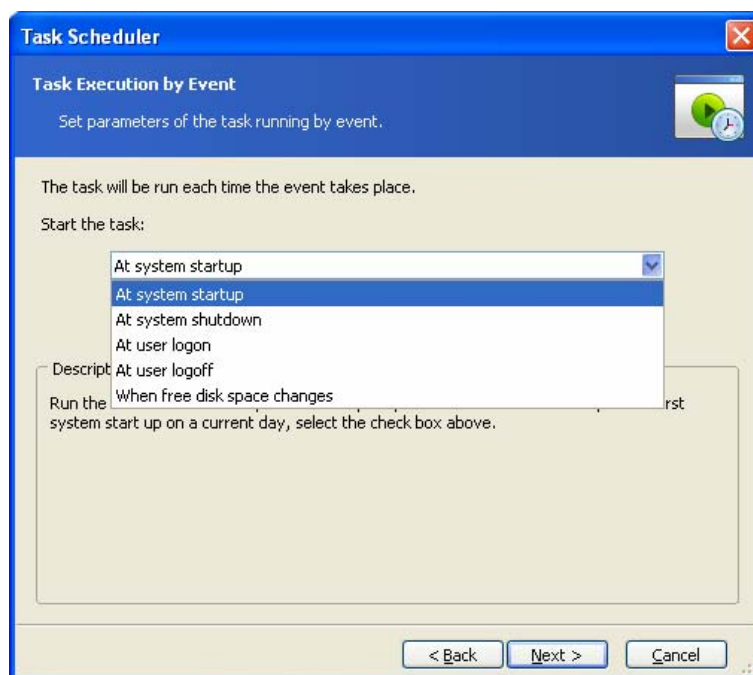


Start parameters

Manually later – the task will be saved, but not launched automatically. You will be able to launch it later

One time only – the task will be executed once at the specified time and date

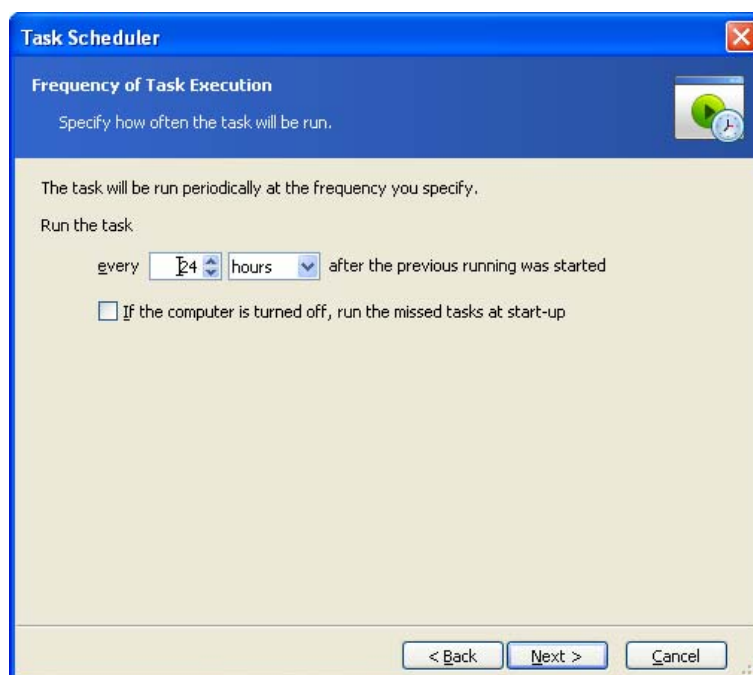
Upon event:



Application can be executed on event

An application can be executed at system startup or shutdown, at user logon or logoff or when free space on any internal hard disk either increases or decreases by the specified value. The preset is 20MB.

After the specified period of time elapsed:



Set the time interval between executing application

Daily – the task will be executed once a day or once in several days

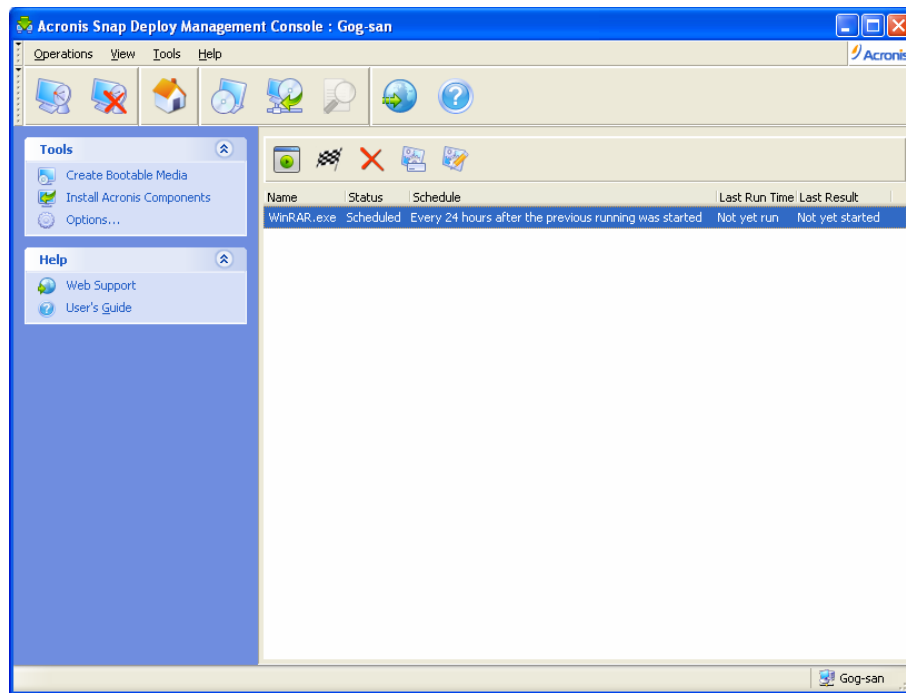
Weekly – the task will be executed once a week or once in several weeks on the selected day

Monthly – the task will be executed once a month on the selected day

7. Specify the name of the user who owns the executed task.

8. Check your settings in the summary screen and click **Finish**.

Once the task is scheduled, you can access it at any time in order to edit the task or view the task's results. To do so, connect to the managed machine and select **Run application**.



Executing application is scheduled

You can run, edit, rename or delete the task using the toolbar buttons.

Editing is performed in the same way as creation, however, the earlier selected options will be set, so you only have to enter the changes.

Deleting or editing a task does not affect the current task execution. A task, that has been edited or deleted while running, will come to an end without any changes. The changes you made will be applied when execution is completed.

To run the task immediately, click **Execute selected task now**. The task schedule remains valid.