Acronis Storage 2.4

Installation Using PXE

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Contents

CHAPTER 1

Introduction

This guide explains how to install Acronis Storage over network using a preboot execution environment (PXE) server.

To install Acronis Storage over a network, you need to complete the following steps:

1. Prepare for installation from a PXE server.
2. Create a kickstart file.
3. Install Acronis Storage.
4. Optionally, configure the management panel node or register storage nodes in the management panel.

These steps are explained in the following chapters in detail.

CHAPTER 2

Preparing for PXE Installation

The process of preparing for installation over network with a PXE server includes multiple steps described below in detail.

2.1 Choosing Servers

First, you should decide on the servers to participate in the PXE installation. You need these servers:

- PXE server. This is a server allowing your servers to boot and install Acronis Storage over the network. Any server capable of running a Linux operating system and having a network interface card (NIC) can play the role of a PXE server.
- DHCP server. This is a standard DHCP server serving computers on your network with the necessary TCP/IP settings. You can use an existing DHCP server, if you have one, or set up a DHCP server from scratch. In the latter case, you can install it on the PXE server or use a dedicated server.
- Acronis Storage server. This is a server running Acronis Storage. The server must meet the requirements described in the Installation Guide. In addition to the requirements listed in this chapter, the server must have a NIC with PXE support to be able to boot from the PXE server.
- HTTP server. This is a server storing the Acronis Storage installation files. You can use an existing HTTP server, if you have one, or set up an HTTP server from scratch. In the latter case, you can install it on the PXE server or use a dedicated server.

This guide assumes that you will store the installation files on an HTTP server and use HTTP as the installation protocol.

2.2 Installing Software on the PXE Server

Next, you are supposed to install the necessary software on the PXE server. First of all, you need to install a Linux operating system on the server. There are no specific requirements for which operating system to use, so you can choose any (e.g., CentOS 6 or Fedora 17).

Once your system is up and running, install the following packages:

- `tftp-server`
- `httpd` (Install this package only if you plan to deploy the PXE and HTTP servers on the same physical server.)
- `syslinux`
- `dhcp` (Install this package only if you plan to deploy the PXE and DHCP servers on the same physical server.)

Assuming that your PXE server is running an RHEL-like operating system, you can use the `yum` utility to install the packages:

```
# yum install tftp-server dhcp httpd syslinux
```

2.3 Configuring the TFTP Server

In the next step, you need to configure the TFTP server that you installed in the previous step. This section describes the process of configuring the TFTP server for BIOS-based systems. For information on how to configure the TFTP server for installing Acronis Storage on EFI-based systems, see the Red Hat Enterprise Linux Installation Guide.

To configure the TFTP server:

1. On the PXE server, open the `/etc/xinetd.d/tftp` file, and edit it as follows:

```
service tftp
{
disable         = no
socket_type     = dgram
protocol        = udp
wait            = yes
user            = root
```

```
server          = /usr/sbin/in.tftpd
server_args     = -v -s /tftpboot
per_source      = 11
cps             = 100 2
flags           = IPv4
}
```

Once you are done, save the file.

2. Copy the following files to the `/tftpboot` directory (if this directory does not exist, create it under the root (`/`) directory):

   - `vmlinuz`
   - `initrd.img`
   - `menu.c32`
   - `pxelinux.0`

   These files are necessary to start the installation of Acronis Storage. You can find the first two files in the `/images/pxeboot` directory of the Acronis Storage distribution. The `menu.c32` and `pxelinux.0` files are located in the `syslinux` installation directory on the PXE server (usually, this is the `/usr/share/syslinux` or `/usr/lib/syslinux` directory).

3. Create the `/tftpboot/pxelinux.cfg` directory, and inside this directory, make the `default` file.

4. Open the default file for editing, and add the following strings to it:

```
default menu.c32
prompt 0
timeout 100
ontimeout VZ
menu title Boot Menu
label VZ
        menu label Install
        kernel vmlinuz
        append initrd=initrd.img ip=dhcp
```

   For detailed information on the parameters you can specify in the `/tftpboot/pxelinux.cfg/default` file and their configuration, see the documentation for `syslinux` and its man pages.

5. Restart the `xinetd` service:

```
# /etc/init.d/xinetd restart
```

6. If necessary, configure your firewall on the PXE server to allow access to the TFTP server.

> **Note:** When running the TFTP server, you might get the "Permission denied" error. In this case, you may try to fix the problem by running the following command on the server: `# restorecon -Rv /tftboot/`.

2.4 Setting Up a DHCP Server

Now you can proceed with configuring a DHCP server. To configure the DHCP server for installing Acronis Storage over the network, open the `dhcpd.conf` file (usually, it is located in the `/etc` or `/etc/dhcp` directory) for editing and add the following strings to this file:

```
next-server <PXE_server_IP_address>;
filename "/pxelinux.0";
```

> **Note:** To configure a DHCP server for installation on EFI-based systems, specify `filename "/bootx64.efi"` instead of `filename "/pxelinux.0"` in the `dhcpd.conf` file (where `/bootx64.efi` is the directory to which you copied the EFI boot images when setting up the TFTP server).

2.5 Setting Up an HTTP Server

Now that you have set up the TFTP and DHCP servers, you need to make the Acronis Storage distribution files available for installation over the network. To do this:

1. Set up an HTTP server. You can also use an existing HTTP server, if you have one.
2. Copy the contents of your Acronis Storage installation DVD to some directory on the HTTP server (e.g., `/var/www/html/astor`).
3. On the PXE server, open the `/tftpboot/pxelinux.cfg/default` file for editing, and specify the path to the Acronis Storage installation files on the HTTP server.

   > **Note:** For EFI-based systems, the file you need to edit has the name of `/tftpboot/pxelinux.cfg/efidefault` or `/tftpboot/pxelinux.cfg/<PXE_server_IP_address>`.

   Assuming that you have the installation files in the `/var/www/html/astor` directory on the HTTP server with the IP address of 198.123.123.198 and the `DocumentRoot` directory is set to `/var/www/html`, you can

add the following option to the `append` line of the `default` file to make the Acronis Storage files accessible over HTTP:

```
inst.repo=http://198.123.123.198/astor
```

So your default file should look similar to the following:

```
default menu.c32
prompt 0
timeout 100
ontimeout ASTOR
menu title Boot Menu
label ASTOR
        menu label Install
        kernel vmlinuz
        append initrd=initrd.img ip=dhcp inst.repo=http://198.123.123.198/astor
```

2.6 Configuring Servers

Before you can start installing Acronis Storage, configure each server where you plan to install the product to boot from the network. To do this:

1. Power on the server.
2. Enter BIOS setup.
3. Enable network boot.

CHAPTER 3

Installing Acronis Storage

Now that you have prepared all the servers, you can start the Acronis Storage installation:

1. Restart the Acronis Storage server after configuring its BIOS settings to boot from the network.

   > **Note:** If you plan to perform an unattended installation of Acronis Storage, you need to additionally create a kickstart file. For more details, see *Creating a Kickstart File* on page 8.

2. Once the server boots, you will see a dialog box asking you to select the system to install. Select the entry for Acronis Storage and press **Enter**.

3. Follow the on-screen instructions to install Acronis Storage. For details, consult the Installation Guide.

CHAPTER 4

Creating a Kickstart File

If you plan to perform an unattended installation of Acronis Storage, you can use a kickstart file. A kickstart file is a simple text file containing the information used by the Acronis Storage installer to install and configure your physical server. The format of kickstart files used in Acronis Storage installations is similar to that used to perform unattended installations of Red Hat Enterprise Linux (RHEL).

You can include in your Acronis Storage kickstart file two groups of options:

- The first group comprises the same options that you use when installing any RHEL-like distribution.
- The second group comprises the options specific to Acronis Storage.

Both groups of options are described in the following sections in detail.

4.1 Standard Kickstart Options

Your kickstart file may include any of the standard Linux options used in kickstart files for installing Linux operating systems. For the full list of these options and their explanations, consult the respective Linux documentation (e.g., the *Red Hat Enterprise Linux Installation Guide*).

Listed below are the mandatory options and commands that you must include in each kickstart file.

Option	Description

`auth`
`--enableshadow`
`--passalgo=sha512`
	Specifies authentication options for the Acronis Storage physical server.

`cdrom`	Install the product from the first optical drive.
`cmdline`	Perform the installation in the unattended mode.

Option	Description
`firstboot --enable`	Starts the Setup Agent the first time the system is booted.
`keyboard`	Sets the system keyboard type.
`lang`	Sets the language to use during installation and the default language to use on the installed system.
`rootpw --iscrypted <value>`	Sets the root password for the server in the encrypted form.
`selinux --disabled`	Disables SElinux.
`services --enabled="chronyd"`	Enables time synchronization via NTP.
`timezone <zone>`	Sets the system time zone.
`autopart --type=lvm`	Sets the partitioning type to LVM.

4.2 Acronis Storage Kickstart Options

Along with standard Linux options, Acronis Storage provides a number of specific parameters and keywords that you need to add to your kickstart file.

The table below lists the parameters you can use.

Important: Acronis Storage must have only one disk dedicated for the system. Specify it in the `<system_disk>` parameter.

Parameter	Description
`ignoredisk --only-use=<system_disk>`	The disk to install the product to. Other disks will be ignored.

`bootloader`
`--append=" crashkernel=auto"`
`--location=mbr`
`--boot-drive=<system_disk>`
	Sets bootloader parameters.
	Sets kernel parameters.
	Sets the boot record location.
	Sets the drive to boot from.

`clearpart --all --initlabel`
`--drives=<system_disk>`
`--disklabel=gpt`
	Removes all partitions from the system disk and initializes invalid partition tables.
	The system drive to clear partitions from.
	Sets the system disk's label to `gpt`.

Parameter	Description

`network --bootproto=dhcp`
`--device=<device_name>`
`--ipv6=auto --activate`
	Specifies the method to obtain network configuration with.
	Specifies the network adapter to configure.
	Sets the network adapter's IPv6 address and activates the adapter in the installer environment.

4.3 Standard Kickstart Scripts

After setting the standard parameters, you add a number of scripts that will do the following:

- install the minimal mandatory package group;
- add the public keys to the RPM database and reinstall the VZLinux release;
- enable kernel crash dumping.

To perform the above steps, add the following scripts to the kickstart file: `%packages`, `%post`, `%addon`. These scripts start with their respective names along with a `%` prefix and end with the `%end` command.

4.3.1 Packages Script

In the body of the `%packages` script, specify the minimal mandatory package group to install on the server:

```
%packages
@^minimal
%end
```

4.3.2 Post-Installation Script

In the post-installation script, you add the public keys to the RPM database and reinstall the VZLinux release:

```
%post
# Add public keys to rpm database
rpmkeys --import /etc/pki/rpm-gpg/*
# Reinstall vzlinux release
yum reinstall vzlinux-release -y
%end
```

4.3.3 Add-on Script

To enable kernel crash dumping during the installation, add the following lines to the end of the kickstart file:

```
%addon com_redhat_kdump --enable --reserve-mb='auto'
%end
```

4.4 Specifying Components to Install

Finally, you need to specify which Acronis Storage components you need to install on the node:

- management panel with or without storage,
- storage.

You can install the components in two ways:

- (Recommended) Do not specify the tokens for storage and superadmin password for the management panel in the kickstart file. In this case, you will need to manually run additional scripts after the installation.
- Specify the tokens and superadmin password in the kickstart file. In this case, you will not need to manually run additional scripts after the installation.

4.4.1 Installing Management Panel with or without Storage

To install both the management panel and storage components on the node without exposing the superadmin password and storage token in the kickstart file, do the following:

1. Add the `%addon com_vstorage` script to the end of the kickstart file:

   ```
   %addon com_vstorage --management --storage --bare
   %end
   ```

   If you do not want to install the storage component on the same node, omit the `--storage` option.

2. Once the installation is complete, execute the following command on the node to configure the management panel component:

```
echo <superadmin_password> | /usr/libexec/vstorage-ui-backend/bin/configure-backend.sh \
-x <public_iface> -i <private_iface>
```

where

- <superadmin_password> is the password of the superadmin account of management panel,
- <public_iface> is the name of the public network interface,
- <private_iface> is the name of the private network interface.

3. Start the management panel service:

```
# systemctl start vstorage-ui-backend
```

4. If you also installed the storage component on the node, execute the following command:

```
# /usr/libexec/vstorage-ui-agent/bin/register-storage-node.sh -m <management_IP_address>
```

To install the components without running scripts afterwards, specify the interfaces for the public (external) and private (internal) networks and the password for the superadmin account of the management panel in the end of the kickstart file. For example:

```
%addon com_vstorage --internal-iface=<private_iface> --external-iface=<public_iface> \
--password=<password> --management --storage
%end
```

If you do not want to install the storage component on the same node, omit the --storage option.

4.4.2 Installing Storage Component Only

The storage component alone, without the management panel, is installed by default and does not require any scripts in the kickstart file unless you want to specify the token.

If you do not want to expose the token in the kickstart file, run the following command on the node after the installation to register the node in the management panel:

```
# /usr/libexec/vstorage-ui-agent/bin/register-storage-node.sh -m <MN_IP_address> -t <token>
```

where

- <token> is the token that can be obtained in the management panel,
- <MN_IP_address> is the IP address of the private network interface on the node with the management panel.

To install the storage component without running scripts afterwards, specify the token and the IP address of the node with the management panel in the kickstart file. For example:

```
%addon com_vstorage --storage --token=<token> --mgmt-node-addr=<MN_IP_address>
%end
```

4.5 Kickstart File Example

Below is an example of kickstart file that you can use to install and configure Acronis Storage in the unattended mode. You can use this file as the basis for creating your own kickstart files.

```
# Use the SHA-512 encryption for user passwords and enable shadow passwords.
auth --enableshadow --passalgo=sha512
# Install from the CD-ROM drive.
cdrom
# Install without invoking the GUI.
cmdline
# Run the Setup Agent on first boot.
firstboot --enable
# Set the target device for the system here!
ignoredisk --only-use=sda
# Use the US English keyboard.
keyboard --vckeymap=us --xlayouts='us'
# Use English as the language during the installation and as the default system
# language.
lang en_US.UTF-8

# If you intend to run configuration scripts after installation,
# uncomment the following and specify a network device to configure network.
#network  --bootproto=dhcp --device=<network_device> --ipv6=auto --activate
#network  --bootproto=dhcp --hostname=<hostname>

# Specify the encrypted root password for the node.
rootpw --iscrypted xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
# Disable SELinux.
selinux --disabled
# Enable time synchronization via NTP.
services --enabled="chronyd"
# Set the system time zone.
timezone America/New_York
# Configure the bootloader. Set the target device for the system as the first
# drive in the BIOS boot order and write the boot record to MBR.
bootloader --append=" crashkernel=auto" --location=mbr --boot-drive=sda
# Set the partition type to LVM.
autopart --type=lvm
# Configure the partition removal for the system drive.
```

```
# Set the target device for the system here!
clearpart --all --initlabel --drives=sda --disklabel=gpt

# Make the installation program run the post-installation script and configure
# it to add keys to RPM database and reinstall the vzlinux release.
%post
rpmkeys --import /etc/pki/rpm-gpg/*
yum reinstall vzlinux-release -y
# Uncomment to install the trial license.
#vzlicupdate -a trial
# Uncomment to configure SElinux.
#yes | fixfiles -f -F relabel /
%end

# Install the packages on the node.
%packages
@^minimal
%end

# Enable kernel crash dumping during the installation.
%addon com_redhat_kdump --enable --reserve-mb='auto'
%end

# Uncomment to install the management panel and storage components without
# running scripts on the node after installation. If you do not intend to
# install the storage component, remove the '--storage' parameter.
# Specify an internal interface for the management network and
# an external interface for the management panel network.
#%addon com_vstorage --internal-iface=eth0 --external-iface=eth1 \
#--password=xxxxxxxxx --management --storage
#%end

# Uncomment to install the management panel and storage. Running configuration
# scripts required after the installation. If you do not intend to install the
# storage component, remove the --storage parameter.
#%addon com_vstorage --management --storage --bare
#%end

# Uncomment to install the storage component without running scripts on the
# node after installation. To register the node, specify the token as well as
# the IP address of the management panel.
#%addon com_vstorage --storage --token=xxxxxxxxx --mgmt-node-addr=10.37.130.1
#%end
```

4.6 Copying the Kickstart File

To install Acronis Storage using a kickstart file, you first need to make the kickstart file accessible over the network. To do this:

1. Copy the kickstart file to the same directory on the HTTP server where the Acronis Storage installation files are stored (e.g., to `/var/www/html/astor`).
2. Add the following string to the `/tftpboot/pxelinux.cfg/default` file on the PXE server:

   ```
   ks=<HTTP_server_address>/<path_to_kickstart_file>
   ```

   Note: For EFI-based systems, the file you need to edit has the name of `/tftpboot/pxelinux.cfg/efidefault` or `/tftpboot/pxelinux.cfg/<PXE_server_IP_address>`.

Assuming that the HTTP server has the IP address of 198.123.123.198, the `DocumentRoot` directory is set to `/var/www/html` and the full path to your kickstart file on this server is `/var/www/html/astor/ks.cfg`, your `default` file may look like the following:

```
default menu.c32
prompt 0
timeout 100
ontimeout ASTOR
menu title Boot Menu
label ASTOR
                menu label Install
                kernel vmlinuz
                append initrd=initrd.img ks=http://198.123.123.198/astor/ks.cfg \
ip=dhcp inst.repo=http://198.123.123.198/astor
```