Acronis Backup & Recovery 11 Virtual Edition

Working with Red Hat Enterprise Virtualization

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This document describes in brief how to use Acronis Backup & Recovery 11 Virtual Edition in Red Hat Enterprise Virtualization environments. It also guides you through P2V and V2V migrations that can be performed with Acronis Backup & Recovery 11.

For detailed information about the functionality provided by Acronis Backup & Recovery 11, please refer to the product Help system, Web Help or guides for Acronis Backup & Recovery 11 Advanced Editions.

1 Overview of the RHEV platform

Red Hat Enterprise Virtualization (RHEV) is a virtualization solution based on Red Hat Enterprise Linux. Its advanced functionalities allow enterprises to centrally manage their virtual environments while reducing the cost and complexity of large deployments.

Components

The RHEV platform consists of the following components:

- Red Hat Enterprise Virtualization Manager which allows system administrators to view and manage virtual machines via a single graphical user interface.
- Hosts running Red Hat Enterprise Virtualization Hypervisor or Red Hat Enterprise Linux where virtual machines are hosted.

Interfaces

The Red Hat Enterprise Virtualization Manager includes an Administration Portal and a User Portal.

- The Administration Portal is designed for setting up, configuring, and managing the Red Hat Enterprise Virtualization environment.
- The User Portal allows users to start, stop, reboot, and connect to virtual machines.

Storage domains

The RHEV platform uses the following storage domain types:

- **Data domains** store virtual disks, templates and snapshots. A data domain cannot be shared across different data centers. A data domain can be organized by using NFS, SAN (iSCSI/FCP-connected storages), or a local storage of a virtualization host.
- **ISO domains** store ISO files used to install and boot operating systems and applications for the virtual machines. An ISO domain can be shared across different data centers. An ISO domain can only be organized by using NFS.
- **An export domain** is used to copy or move images between data centers and RHEV Manager installations. An export domain can be moved between data centers. However, it can only be active in one data center at a time. An export domain can use NFS or SAN (iSCSI/FCP-connected storages).

2 How Acronis Backup & Recovery 11 works with RHEV

Acronis Backup & Recovery 11 can back up and recover virtual machines running in the Red Hat Enterprise Virtualization environment. Backup and recovery become available by installing Agent for

Linux or Agent for Windows into the guest systems. This means that Acronis Backup & Recovery 11 will treat the virtual machines as physical ones and provide the full scope of functionality it provides for physical machines. This also means that operations are not possible on the machines that are powered off.

Backup and recovery (p. 5)

Using Acronis Backup & Recovery 11 Management Server, you can:

- Centrally deploy the agents onto the virtual machines managed by your RHEV Manager.
- Create and deploy centralized backup plans which the agents will execute.
- Monitor how successfully the backup plans are executed.
- Recover disks, volumes, files or entire machines to their original location or to a different machine.
- View alerts, logs, reports, current activities and more.

In addition, you can directly manage each individual machine by connecting Acronis Backup & Recovery 11 Management Console to it.

P2V and V2V migration (p. 10)

Acronis Backup & Recovery 11 provides several migration methods for you to easily migrate physical machines to the RHEV environment. The methods differ in complexity and flexibility. They cover all possible scenarios of migration. These methods can also be used to migrate a virtual machine from a different virtualization platform to the RHEV platform.

Licensing

You need a license for each host running at least one machine that needs backing up. Taking into account that machines migrate within a cluster, you need one license for each clustered host. An Acronis Backup & Recovery 11 Virtual Edition license enables backing up an unlimited number of virtual machines which run on the same host and an unlimited number of migrations to that host. Using a trial license key, you can back up the hosted machines during a limited time period and perform 3 migrations to the host.

Supported versions of RHEV

- Red Hat Enterprise Virtualization Manager: versions 2.2, 3.0.
- Red Hat Enterprise Virtualization Hypervisor, Red Hat Enterprise Linux: versions 5.5 and higher.

Supported guest OS

Acronis Backup & Recovery 11 supports all the virtualized guest operating systems supported by RHEV.

- Red Hat Enterprise Linux 3 (32-bit and 64-bit).
- Red Hat Enterprise Linux 4 (32-bit and 64-bit).
- Red Hat Enterprise Linux 5 (32-bit and 64-bit).
- Red Hat Enterprise Linux 6 (32-bit and 64-bit)   .
- Windows XP Service Pack 3 and newer (32-bit only).
- Windows 7 (32-bit and 64-bit).
- Windows Server 2003 Service Pack 2 and newer (32-bit and 64-bit).
- Windows Server 2008 (32-bit and 64-bit).

■   Windows Server 2008 R2 (64-bit only).

3   Backup and recovery of RHEV virtual machines

This section contains step-by-step instructions enabling you to quickly set up centralized backups of virtual machines and to see what recovery is like. These steps may be sufficient for protecting a basic RHEV environment. Nevertheless, you can use the full scope of the Acronis Backup & Recovery 11 functionality described in the product Help system, Installation Guide, User Guide for Advanced Editions, and Command-Line Reference.

3.1   Prerequisites

Make sure that:

■   You have the RHEV infrastructure deployed.

■   You know the name or IP address of the RHEV Manager server and the credentials to access the server.

■   You know the administrative user name and password for each of the guest systems you want to back up.

■   You have a machine running Windows that will act as the management server. This machine must be always turned on and available across the network.

■   You downloaded the setup program of Acronis Backup & Recovery 11.

■   You have the license keys for Acronis Backup & Recovery 11 Virtual Edition in a TXT or EML file. You need a license for each host running at least one machine that needs backing up. Taking into account that machines migrate within a cluster, you need one license for each clustered host. For multiple license keys, the text format is one line - one key.

3.2   Installing Acronis Backup & Recovery 11 Management Server

1.   On the machine that will act as the management server, log on as an administrator and start the Acronis Backup & Recovery 11 setup program.

2.   Click **Install Acronis Backup & Recovery 11**. Accept the terms of the license agreement.

3.   Select the **Centrally monitor and configure the backing up of physical and virtual machines** check box.

4.   Type all your license keys or import them from a text file.

5.   Click **Install**.

3.3   Adding RHEV machines to Acronis Backup & Recovery 11 Management Server

In this step, you will add machines from the RHEV environment to Acronis Backup & Recovery 11 Management Server. Acronis Backup & Recovery 11 agents will be automatically installed on these machines.

Alternatively, you can install the agents on each machine manually as described in the "Hot imaging..." (p. 15) section. After the agents are installed, add the machines to the management server.

To use the following procedure, you need:

- Red Hat Enterprise Virtualization Manager version 3.x. If your Manager version is 2.2, install the agents manually or use other installation methods described in the installation documentation.
- Guest tools installed on every machine you want to add.

Preparation of RHEV machines running Linux

1. For successful installation of Acronis Backup & Recovery 11 Agent for Linux, you may need to manually install the following Linux packages: **gcc**, **make**, and **kernel-devel**. For details, see the "Preparation" section in "Installation of Agent for Linux" (p. 15).

2. By default, the management server takes the installation packages from the %CommonProgramFiles%\Acronis\RemoteInstaller folder. To be able to remotely install Agent for Linux, download the agent installation files (.i686 or .x86_64) from the Acronis Web site and put them into this folder.

3. Make sure that TCP port 22 is opened and that the SSH daemon is running on each virtual machine you want to add.

Preparation of RHEV machines running Windows

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

2. For successful installation on a remote machine running Windows Vista or later, User Account Control (UAC) must be set to **Never notify**. To access this option, go to **Control panel > View by**: **Small icons > User Accounts > Change User Account Control Settings**. This change requires a machine reboot.

3. File and Printer Sharing must be *enabled* on the remote machine. To access this option:

   - On a machine running Windows XP with Service Pack 2 or Windows 2003 Server: go to **Control panel > Windows Firewall > Exceptions > File and Printer Sharing**.

   - On a machine running Windows Vista, Windows Server 2008, or Windows 7: go to **Control panel > Windows Firewall > Network and Sharing Center > Change advanced sharing settings**.

4. Acronis Backup & Recovery 11 uses TCP ports 445 and 25001 for remote installation. Make sure that these ports are added to exceptions in the firewall settings on the remote machines. TCP port 445 is added to exceptions automatically by Windows Firewall when you enable File and Printer Sharing.

   To add a port to exceptions:

   - In Windows XP and Windows Vista: go to **Control panel > Windows Firewall > Exceptions > Add Port**

   - In Windows 7: go to **Control panel > Windows Firewall > Advanced settings > Inbound Rules > New Rule > Port**

   *Tip: If the remote machines are members of an Active Directory domain and use no firewall other than Windows Firewall, you can add TCP port 25001 to exceptions by using Group Policy. On a domain controller, create a Group Policy object; then, go to **Administrative Templates > Network > Network Connections > Windows Firewall > Domain Profile > Windows Firewall: Define port exceptions** (or: **Define**

inbound port exceptions), and then add the following port exception:
25001:tcp:*:enabled:Acronis remote install

You can exclude both ports from exceptions after the remote installation is complete.

Connecting to the management server

1. Double-click the **Acronis Backup & Recovery 11** icon on the desktop to start the management console.
2. Connect the console to the management server: Click **Connect to a management server**.
   a. Enter the server name or IP address.
   b. If prompted for credentials, specify the user name and password.

Adding machines from RHEV environment

1. On the **Actions** menu, click **Add multiple machines**.
2. Click **From Red Hat Enterprise Virtualization environment**. Specify the name or IP address of the RHEV Manager server and credentials of the account with the rights to access this machine. When entering the name of an Active Directory user account, be sure to also specify the domain name (DOMAIN\Username or Username@domain).
3. In the opened window:
   a. Specify the machines you want to add to the management server:
      ▪ Click **Add** to specify the selected machine.
      ▪ Click **Add all** to specify all virtual machines included into the selected data center or cluster.

      Details. You can add only the machines that are currently powered on. To search for a machine, you can type its exact name or use wildcards in the search box.
   b. The software automatically retrieves IP addresses of the specified machines from the RHEV Manager. If a machine has several IP addresses, you can select the value from the drop-down list. If the **IP address** box is empty, enter the IP address manually.

      Details. The IP address may be not available if, for example, guest tools are not installed in the guest OS.
   c. Provide the credentials of the user with administrative privileges for each machine. If there is a universal administrator account on the network, enter the account credentials for one machine, and set the option to apply it to all the machines that you specified.
   d. Click **OK**.

Installing agents

Acronis Backup & Recovery 11 detects on which of the selected machines its agents are not installed. If there is at least one machine without an agent, do the following:

1. Agent for Windows and/or Agent for Linux is selected for installation by default. Click **Next**.
2. Click **Use licenses from the following license server**. In the opened window:
   a. Specify the name or IP address of the management server and administrative credentials.
   b. [Optional] If you need to specify additional licenses, click **Add license** and type the license keys or import them from a text file. Click **OK**.
   c. Click **Next**.
3. Leave the default installation options for the agent.
4. Specify whether the machines will participate in Acronis Customer Experience Program (CEP).

Details. Acronis Customer Experience Program applies only to machines running Windows.

5. The summary window displays a list of machines where the components will be installed. Click **Proceed** to start the installation.

Once the installation starts, the program displays the operation progress and names of the machines where the agent is being installed.

Managing the machines

For further work with the machines you added, select **Machines with agents** from the **Navigation** tree.

3.4   Creating a bootable media

In this step, you will install Acronis Media Builder and create a bootable media ISO. The ISO file is required when you recover (p. 17) an entire virtual machine. Also, you can back up a virtual machine using the ISO, if you do not want to install the backup software in the guest system.

Installing Acronis Media Builder

First, you need to install Acronis Media Builder on one of the machines running Linux. The machine must have Linux desktop GUI installed.

Download the Acronis Media Builder installation file and save it on the selected machine. Then, go to the directory where the installation file is located and run the following commands:

- If the machine is running a 32-bit operating system,
  ```
  chmod 755 ABR11*
  ./ABR11BCMBL_<locale>.i686 -a -l <license key>
  ```

- If the machine is running a 64-bit operating system,
  ```
  chmod 755 ABR11*
  ./ABR11BCMBL64_<locale>.x86_64 -a -l <license key>
  ```

Creating a bootable media

To create a bootable media:

1. Run Acronis Media Builder by using the following command:
   ```
   sudo mediabuilder
   ```

2. Follow the on-screen instructions. For detailed information, refer to the built-in Help. It is available in every program window by pressing F1.

3. In the **Select the media output** window, select **ISO image**. Then select a directory on the RHEV ISO domain and specify the ISO file name. The default name is AcronisMedia.iso. Or, you can enter the directory path manually; for example, nfs://10.200.200.10/opt/iso:/{ISO DOMAIN UUID}/images/11111111-1111-1111-1111-111111111111.

   Alternatively, you can save the ISO on a network share and then import it to the ISO domain using the ISO uploader utility.

3.5   Backing up RHEV machines

In this step, you will create an unmanaged centralized vault and set up a centralized backup plan for multiple machines.

An unmanaged vault is just a shortcut to a shared folder on the network. In general, it is recommended that you install a storage node and create a managed vault on the node to be able to use data deduplication and the centralized data catalog.

Creating a centralized vault

1. Create a shared folder on the network.
2. Start the management console.
3. Connect the console to the management server.
4. In the **Navigation** tree, click **Vaults**, and then click **Create**.
5. Specify the name of the new vault. Optionally, type the comments on the vault.
6. Click **Path**. In the **Path** field, type the folder path. Or, you can select this folder in the tree. Click **OK** to confirm your selection. If prompted, provide access credentials for the location.
7. Click **OK** to create the vault.

Backing up the machines

1. In the management console, click **Create backup plan**.
2. Under **What to back up**, click **Items to back up**.
3. Expand the **Management Server** node, expand the **Machines with agents** node, and then expand the **All Machines** node.
4. Select the check boxes next to the machines you want to back up. Click **OK** to confirm your selection.
5. Under **Where to back up**, click **Location**. In the opened window, expand the **Centralized** node, and then select the vault you have created. Click **OK** to confirm your selection. If prompted, provide access credentials for the vault.
6. Under **How to back up**, in **Backup scheme** box, specify **Run now**.
7. Click **OK** to immediately start the backup.

   Details. You will see the **Backup plans and tasks** view with the backup plan you have just created. Later, you can manually run the same backup plan again.

3.6   Recovering RHEV machines

You can recover RHEV machines using one of the following methods:

- **Recovering to a machine running the operating system**

  Use this method if the Acronis agent is running on the machine and you need to recover the lost data (a data disk, a data volume, or an individual file) or add the backed up data from another machine.

  To recover the operating system itself, the Acronis agent will need to boot the machine into the bootable environment. If the machine is running Linux, make sure that, in addition to Agent for Linux, you have installed Acronis Backup & Recovery 11 Bootable Components & Media Builder for Linux.

- **Recovering to a machine booted with bootable media**

  Use this method when you need to recover the operating system that has crashed or is infected with malware. Installation of the bootable components is not required in this case because the components will be loaded from the media to the machine's RAM.

To recover to a machine running the operating system

1. Start the management console.

2. Connect the console to the management server or directly to the target machine.

3. Click **Recover**.

4. Under **What to recover**, click **Select data**. In the opened window:

   a. Select **Data path** box.

   b. Click **Browse**.

   c. In the opened window, expand the **Centralized** node, select the vault where your backup is stored and press **Enter**. If prompted, specify the user name and password to access the vault location.

   d. On the **Data view** tab, in the **Show** box, select **Machines/disks/volumes** to browse and search for entire disks and volumes in disk-level backups.

      Details. You should select **Folders/files** in the **Show** box when you want to recover individual files or folders.

   e. Select the check boxes for the data disks you want to recover.

   f. Select the date of the backup version you want to recover. By default, the latest version is selected.

   g. Click **OK**.

5. Make sure that under **Where to recover**, in **Recover to**, the **Physical machine** option is selected. As a result:

   ▪ If the console is connected to the management server, the data will be recovered to the original machine by default. To select a different target machine, click **Browse**. Make sure that the target machine has enough disks with sizes at least as big as the original disks.

   ▪ If the console is connected directly to the target machine, the data will be recovered to that machine.

6. [Optional] Acronis Backup & Recovery 11 maps the selected disks to the target disks automatically. If you are not satisfied with the mapping result, you can re-map the disks manually:

   a. Unmap the disks in the reverse order; that is, the last mapped disk should be unmapped first.

   b. Select the destination disk for each of the source disks.

7. Under **When to recover**, specify **Now** to perform the recovery immediately.

8. Click **OK** to start the recovery.

   Details. You will see the operation progress.

To recover to a machine booted with bootable media

For the detailed description of the procedure, see "Recovery to an existing virtual machine booted with bootable media" (p. 17).

4   Migrating a physical machine to a virtual machine

4.1   Considerations before migration

Migration of a physical machine to a RHEV environment is performed in two steps. First, you create an image of the machine in a .tib file on an intermediate storage. Next, you deploy this image to a new or existing RHEV virtual machine. Acronis Backup & Recovery 11 can create a new, fully

configured virtual machine directly in a RHEV export domain. You only need to import it to the required data center.

A machine image is also referred to as a "backup" because it is created using the backup software.

When choosing the migration method, take into account the following considerations.

Choose intermediate storage

Decide where you will save the image. With the default level of data compression, the required storage space is around 70% of the amount of data to be migrated. Consider an SMB (CIFS) or NFS network share or a fixed disk of the machine being migrated. External devices, such as USB drives, are also supported.

Migrate an entire machine or exclude some of the disks?

If there is a storage connected to the machine using iSCSI HBA, exclude it from the image. You will be able to add this storage to the resulting virtual machine using iSCSI software initiator after the migration completes.

A Fibre Channel-connected storage cannot be added to a RHEV virtual machine. If you need the storage on the resulting virtual machine, let it be included in the image. The storage will be converted to a virtual disk. Otherwise, exclude the storage from the image.

Imaging method: hot or cold?

The image can be taken under the operating system (hot imaging) or under bootable media (cold imaging). Take into account the following considerations.

- **Is the server reboot/downtime acceptable?**

  During cold imaging, the imaged machine will be off-line and will not provide the necessary services.

- **Do you need Acronis software on the resulting machine?**

  Hot imaging requires installation of an Acronis agent on the physical machine. The agent will be present in the migrated system as well. If you are planning to back it up using Acronis Backup & Recovery 11, having the agent already installed is a plus. If adding software to the system is not acceptable, use cold imaging.

- **Do you need migration on a schedule?**

  A migration that uses hot imaging can be scheduled. This comes in handy for updating the virtual "standby" server. Cold migration is performed interactively.

- **Is it critical that the latest changes to the original system will be missing in the migrated system?**

  Once the hot imaging starts, Acronis Backup & Recovery 11 takes a snapshot of the physical machine. Then, it compresses the snapshot data and saves it to the location you specify. During this process, changes to the original system may occur. The changes will not be transferred to the migrated system because they are not present in the snapshot. If you decommission the physical machine or return it to a lessor, the changes will be lost. To avoid the data loss, use cold imaging.

Deployment method: convert or recover?

Acronis Backup & Recovery 11 can deploy the image automatically as soon as it is created. This method is called "conversion to a virtual machine". The resulting virtual machine will be similar to the original machine. If you configure the deployment as a separate operation (recovery), you will be

able to change the machine configuration: add/remove/resize disks, and set the virtual machine memory.

Resizing the disks during recovery makes good sense because the newly created disks always have the Raw format. They will needlessly occupy a lot of space if the data size is much less than the disk size. The alternative way to save space is recovery to a previously created virtual machine with the optimal disk sizes.

Let Acronis create a virtual machine or do it yourself?

Take into account the following considerations.

- **Recreate logical volumes or convert them to basic ones?**

  A machine created by Acronis always has basic volumes. If logical volumes or MD devices are present in the image, they will be converted to basic ones. The same applies to dynamic volumes used in Windows systems. The operating system remains bootable, since Acronis properly updates GRUB and standard Windows loaders. Custom boot loaders may require manual reactivation.

  The original LVM structure can be reproduced only if you create the RHEV virtual machine in advance and boot it using bootable media. Then, either perform recovery with the enabled **Apply RAID/LVM** option, or create the LVM structure manually and then perform recovery with the disabled option.

  There is no option to recreate dynamic volumes during recovery. If you need dynamic volumes on the resulting machine, create the volume group using the disk management functionality of the bootable media. Then, perform recovery over these volumes.

- **Are you ready to provide necessary drivers for Universal Restore?**

  When Acronis creates a virtual machine on its own and deploys an image to it, the necessary drivers are installed automatically because the software knows what drivers or modules are required for the machine. When you create a machine and boot it using bootable media, Acronis treats it as a physical machine. This is why you need to explicitly apply Universal Restore and specify the path to the necessary drivers. The ISO of the floppy disk with the drivers can be found in the RHEV ISO domain. Its default name is virtio*.iso.

4.2   Migration methods

Based on the considerations described in the previous section, we suggest the following methods of migration. Choose the one that best suits your needs.

Cold imaging + recovery to a new machine

This is the simplest method. It fits most cases and does not require software installation. It allows you to modify basic settings of the virtual machine, including disk size.

Step-by-step instructions (p. 13)

Hot imaging + conversion to a virtual machine

This is a simple method. It requires software installation unless the machine is already protected with an Acronis agent. The virtual machine settings cannot be modified on the fly. The method is useful in the "stand-by server" scenario when you create a spare virtual machine and update it from time to time. Also, you can easily back it up using Acronis Backup & Recovery 11 because the virtual machine contains an Acronis agent.

Hot imaging + recovery to a new machine

This is a combination of the previous two methods. It is useful for migrating a machine already protected with an Acronis agent. It allows you to modify basic settings of the virtual machine, including disk size.

Step-by-step instructions can be combined from the ones of the previous two methods.

Recovery to an existing virtual machine booted with bootable media

This is the most advanced and flexible method. This is the only way to reproduce LVMs or software RAID on the resulting virtual machine. With this method, you can use all the functionality available at a physical machine recovery and create whatever volume layout you wish. The imaging method can be either cold or hot. It does not influence the recovery.

4.3   Cold imaging + recovery to a new machine

4.3.1   Preparation

Configuring an NFS export domain

1. Make sure that an NFS export domain is attached to the data center where you want to save the virtual machine.

2. For RHEV Manager to be able to import the resulting virtual machine to the data center, the virtual machine files must have the same owner (**vdsm:kvm**) as the NFS export directory.

    This can be achieved by adding the following NFS export settings:

    -   Map all users to the anonymous account.

    -   Set the user ID of the anonymous account to **36** (**vdsm**).

    -   Set the group ID of the anonymous account to **36** (**kvm**).

    With these settings, files written to the directory by any user will be owned by **vdsm:kvm**. After the migration is finished, you may revert the NFS export settings to the original values.

    Example. In Linux, NFS exports are controlled by the **/etc/exports** configuration file. In this file, the line corresponding to the export directory can look as follows:

    ```
    /opt/export *(rw,sync,all_squash,anonuid=36,anongid=36)
    ```

    where **/opt/export** is the export path; **all_squash** maps all user IDs and group IDs to the anonymous account; **anonuid** and **anongid** explicitly set the user ID and group ID of the anonymous account to the specified values.

Getting bootable media

If you have a *trial* version of Acronis Backup & Recovery 11, do the following:

-   Download the ISO of "**Migration to RHEV media**" from the Acronis Web site. Burn the ISO to a CD or DVD using a third-party tool.

If you have a *standard* version of Acronis Backup & Recovery 11, do either of the following:

-   Download the ISO of either "**Migration to RHEV media**" or regular "**Bootable media**" from the Acronis Web site. Burn the ISO to a CD or DVD using a third-party tool.

OR

■ Create the regular bootable media using Acronis Media Builder.

Booting the machine

1. Boot the physical machine using the bootable media.

2. In the boot menu, click **Acronis Backup & Recovery 11** or **Conversion to RHEV only** (depending on the media you have).

3. [Optional] Click **Configure network...** to check the network settings and to change them if necessary. These settings are used as long as the machine is booted from the media.

4. Click **Manage this machine locally**.

5. On the **Tools** menu, click **Change volume representation**. If the machine's operating system is Linux, make sure that the media is in the "Linux-style volume representation" mode. If the machine's operating system is Windows, make sure that the media is in the "Windows-style volume representation" mode.

4.3.2   Imaging

1. Click **Back up now**.

2. By default, all disks of the machine are selected for imaging. If you need to exclude a disk or volume, under **What to back up**, click **Items to back up** and clear the check box near the disk or volume. For more details about the exclusion, see "Considerations before migration" (p. 10).

   Details. In addition, you can use the **Show exclusions** control to exclude files. Do not try to use this control to exclude disks. It works at a file level.

3. Under **Where to back up**, click **Location**. In the opened window:

   a. Specify the location where to save the image. For more details about the location, see "Considerations before migration" (p. 10).

   b. [Optional, but recommended] In the **Name** box, type the image name. It could be the name of the machine being imaged. The name cannot end with a number.

   c. Click **OK**.

4. [Optional] Under **Parameters**, in **Backup options**, you can set other parameters of the imaging such as compression or network bandwidth usage.

5. Click **OK** to start the imaging.

   Details. You will see the operation progress.

6. After the operation is completed, click **Close** in the progress window.

   Details. To view the operation log, select **Navigation** > **Log** from the menu.

4.3.3   Recovery

1. Click **Recover**.

2. Under **What to recover**, click **Select data**. In the opened window:

   a. In the **Data path** box, enter the path to the image location and press **Enter**. If prompted, specify the user name and password to access the location.

   b. In the **Archive view** tab, expand the archive you have created in the "Imaging" step and select the image. Normally, it is named like "Backup #1".

   c. Select the check boxes for all of the MBRs and volumes.

   d. Click **OK**.

3. Under **Where to recover**, in **Recover to**, select **New virtual machine**.

4. Click **VM type**, select **Save as files of the VM type that I select to the folder that I specify**, and then select **Red Hat Enterprise Virtualization** in the tree. Click **OK** to confirm your selection.

5. Click **Virtual machine settings**. In the opened window:

   a. [Optional] Change the number and size of the virtual machine's disks, memory, virtual machine name and/or the number of processors.

   Details: Resizing the disks makes good sense because the newly created disks always have the Raw format. They will needlessly occupy a lot of space if the data size is much less than the disk size. On the other hand, make sure that you do not set the disk size too low. The disks must have enough free space for the growing data and for the operating system to work.

   b. Click **Storage**, click **Browse**, and then do the following:

      ▪ If the media is in the Linux-style volume representation mode, expand the **NFS drives** node, and then select the path to the RHEV export domain. Or, you can enter the NFS path manually; for example, nfs://10.200.200.10/opt/export:/{EXPORT DOMAIN UUID}.

      ▪ If the media is in the Windows-style volume representation mode, expand the **Network folders** node, expand the **NFS** workgroup, and then select the path to the RHEV export domain. Or, you can enter the path manually; for example, \\10.200.200.10\opt\export\{EXPORT DOMAIN UUID}.

      Click **OK** to confirm your selection.

   c. Click **OK**.

6. The destination disk for each of the source MBRs and volumes is selected automatically. You can change the destination if required.

7. [Optional] Under **Task**, in **Recovery options**, you can set other parameters of the recovery.

8. Click **OK** to start the recovery.

   Details. You will see the operation details.

9. Click the **Progress** tab to see the operation progress.

10. After the operation is completed, click **Close** in the progress window.

11. Import (p. 19) the machine to the required data center using RHEV Manager.

4.4   Hot imaging + conversion to a virtual machine

4.4.1   Installation of Agent for Linux

This section describes how to install Acronis Backup & Recovery 11 Agent for Linux and Management Console on a machine running Red Hat Enterprise Linux.

Preparation

Installing Agent for Linux requires that the following Linux packages be present on the machine: **gcc**, **make**, and **kernel-devel**. Acronis Backup & Recovery 11 installer will download and install them automatically using your Red Hat subscription.

You need to install the packages manually if:

▪ The machine does not have an active Red Hat subscription or Internet connection.

▪ The installer cannot find the **kernel-devel** version corresponding to the kernel version. If the available **kernel-devel** is more recent than your kernel, you need to either update the kernel or install the matching **kernel-devel** version manually.

- You have the required packages on the local network and do not want to spend time for automatic search and downloading.

To install the packages manually, run the following command as the root user:

```
rpm -ivh PACKAGE_FILE1 PACKAGE_FILE2 PACKAGE_FILE3
```

Make sure that the **kernel-devel** version is the same as the kernel version.

Installation in a 32-bit operating system

To install Agent for Linux and Management Console in a 32-bit operating system, go to the directory where the installation files are located and run the following commands:

```
chmod 755 ABR11*
./ABR11AL_<locale>.i686 -a -l <license key>
./ABR11MCL_<locale>.i686 -a
```

Installation in a 64-bit operating system

To install Agent for Linux and Management Console in a 64-bit operating system, go to the directory where the installation files are located and run the following commands:

```
chmod 755 ABR11*
./ABR11AL64_<locale>.x86_64 -a -l <license key>
./ABR11MCL64_<locale>.x86_64 -a
```

4.4.2   Installation of Agent for Windows

The following procedure describes how to install Acronis Backup & Recovery 11 Agent for Windows and Management Console on a machine running Windows. To do so:

1. Log on as an administrator, go to the directory where the setup file **ABR11A_<locale>.exe** is located, and run this file.
2. Click **Install Acronis Backup & Recovery 11**.
3. Accept the terms of the license agreement, and then click **Next**.
4. Select the **Back up this machine's data** check box, and then click **Next**.
5. Click **I will enter the keys manually**.
6. Type your license key or import it from a text file. Click **Next**.
7. In the next window, leave the default setting: **I will register the component(s) later**. Click **Next**.
8. Specify whether the machine will participate in the Acronis Customer Experience Program (CEP). Click **Next**.
9. Click **Install** to proceed with installation.
10. On successful installation, click **Finish** to close the wizard window.

As a result, Acronis Backup & Recovery 11 is installed and started.

4.4.3   Hot imaging + conversion to a virtual machine

1. Configure an NFS export domain as described in the "Preparation" (p. 13) section.
2. Start Acronis Backup & Recovery 11 Management Console by double-clicking the **Manage Local Machine** icon on the desktop.

If your machine is running Linux and if you log on as a user other than root, Acronis Backup & Recovery 11 console fails to start. In this case, run the following command:

```
sudo acronis_console
```

3. Click **Create backup plan**.

4. By default, all disks of the machine are selected for imaging. If you need to exclude a disk, under **What to back up**, click **Items to back up** and clear the check box near the disk. For more details about the exclusion, see "Considerations before migration" (p. 10).

    Details. In addition, you can use the **Show exclusions** control to exclude files. Do not try to use this control to exclude disks. It works at a file level.

5. Under **Where to back up**, click **Location**. In the opened window:

    a. Specify the location where to save the image. For more details about the location, see "Considerations before migration" (p. 10).

    b. [Optional, but recommended] In the **Name** box, enter the image name. It could be the name of the machine being imaged.

    c. Click **OK**.

6. In **Backup scheme**, select **Run now**. As a result, the image will be created immediately after you click **Save**.

7. Click **Show backup type, 2nd location, validation, convert to virtual machine**.

8. In **Convert to virtual machine**, select **Convert**.

9. By default, the current machine will perform the conversion. If you have selected a network share as the image location, you can click **Browse** and select another machine with the agent. Specify the credentials to access the machine.

10. Click **VM type**, select **Save as files of the VM type that I select to the folder that I specify**, and then select **Red Hat Enterprise Virtualization** in the tree. Click **OK** to confirm your selection.

11. Click **Storage**, and then do the following, depending on the machine's operating system:

    ▪ If the machine is running **RHEL**, expand the **NFS drives** node, and then select the path to the RHEV export domain. Or, you can enter the NFS path manually; for example, nfs://10.200.200.10/opt/export:/{EXPORT DOMAIN UUID}.

    ▪ If the machine is running **Windows**, select any convenient storage such as a local or network folder.

    Click **OK** to confirm your selection.

12. [Optional] Under **Plan parameters**, in **Backup options**, you can set other parameters of the imaging, such as compression or network bandwidth usage.

13. Click **OK** to start the operation.

14. If the machine is running Windows: once the operation is completed, copy the created virtual machine to the RHEV export domain by using the operating system tools or third-party software.

15. Import (p. 19) the machine to the required data center using RHEV Manager.

4.5 Recovery to an existing virtual machine booted with bootable media

Preparation

1. If you do not have an image (a .tib file) of the machine you want to migrate, create it in either of the following ways:

- Perform the "Preparation (p. 13)" and "Imaging (p. 14)" stages of the cold imaging (p. 13) procedure.
- Perform steps 1-5 and 11-12 of the hot imaging (p. 16) procedure.

2. If you do not have Acronis Bootable Media ISO, download it or create it using Acronis Media Builder. Save the ISO on the RHEV ISO domain.

3. Prepare a RHEV virtual machine to perform the recovery to. If necessary, create it using the Red Hat Enterprise Virtualization Manager.

4. If the source machine has logical volumes, decide whether you want the target virtual machine to have logical volumes as well.

   - If you want to reproduce the original LVM structure, make sure the target virtual machine has enough disks with sizes at least as big as the original disks. The volume structure will be created automatically if you choose the **Apply RAID/LVM** option.

   - If you want to obtain a different logical volume structure, you will need to create it manually. Make sure that the total size of the machine's disks is greater than the amount of data you are going to recover. The disks must have enough free space for the growing data and for the operating system to work.

Booting the machine

1. Boot the target machine using the Acronis Bootable Media ISO.
2. In the boot menu, click **Acronis Backup & Recovery 11**.
3. [Optional] Click **Configure network...** to check the network settings and to change them if necessary.
4. Click **Manage this machine locally**.

[Optional] Creating the logical volumes

If you chose to create the logical volume structure manually, do the following:

1. On the **Actions** menu, click **Start shell**. Alternatively, you can press CTRL+ALT+F2.
2. Create the volume structure by using the `lvm` utility.
3. Press ALT+F1 to return to the graphical interface.

Selecting the image

1. Click **Recover**.
2. Under **What to recover**, click **Select data**. In the opened window:
   a. In the **Data path** box, enter the path to the image location and press **Enter**. If prompted, specify the user name and password to access the location.
   b. In the **Archive view** tab, expand the archive that contains the image, and select the image. Normally, it is named like "Backup #1".
   c. In **Backup contents**, select **Volumes**.
   d. Select the check boxes for all of the volumes and MBRs.
   e. Click **OK**.

[Optional] Applying RAID/LVM

If you chose to reproduce the original LVM structure, click **Apply RAID/LVM** and confirm the expected result that appears in a pop-up window. Otherwise, skip this step.

Mapping volumes

If you created the logical volume structure manually, specify where to place each of the volumes being recovered. Otherwise, the software automatically maps volumes from the image to the target machine disks. MBRs and boot volumes are always mapped automatically.

To map an MBR or a volume:

    a. Click **Required** next to it, and select the desired destination.

    b. If you need to resize a volume or change other volume properties, click **Properties** next to the volume. Make the necessary changes and click **OK**.

To change the mapping or size of a volume, you need to clear the mapping of the subsequent volumes. To clear the mapping of an MBR or a volume, click **Clear** next to it. To clear the mapping of all of the MBRs and volumes at once, click **Clear all**.

Configuring Universal Restore

1. Under **Universal Restore for Linux/Universal Restore for Windows**, select **Use**.

    Details. This step is required because Acronis Backup & Recovery 11 treats a machine booted using bootable media as a physical machine. Universal Restore ensures that the operating system can boot on the new hardware.

2. If the system being recovered is Windows, provide the RHEV drivers for it:

    a. In the RHEV Manager, right-click the virtual machine being recovered to, select **Change CD**, and select the ISO of the floppy disk with the drivers. This ISO can be found in the RHEV ISO domain. Its default name is virtio*.iso.

    b. On the machine, under **Automatic driver search**, click **Add folder**, expand the **Local folders** node, select the CD drive, and then click **OK**.

Starting the recovery

Click **OK** to start the recovery.

4.6   Importing a virtual machine to a data center

To import a machine from the export domain to the data center where the export domain is attached:

1. Go to the Red Hat Enterprise Virtualization Manager Web console.

2. In the upper row of tabs, click **Storage**.

3. Select the export domain to which the machine was added.

4. In the lower row of tabs, click **VM Import**.

5. Select the required virtual machine, and click **Import**.

6. Select the **Destination Cluster** and **Destination Storage** of the data center.

7. Click **OK** to start the import.