



Virtuozzo Hybrid Server 9.0 Alpha

Evaluation Guide

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CHAPTER 1

Preparing for Installation

This chapter lists the system requirements of Virtuozzo Hybrid Server 9 and explains how to create a bootable USB flash drive from the distribution image.

You can download the distribution image from the [Virtuozzo repository](#).

Virtuozzo Storage can be installed only using the kickstart file as described in [Virtuozzo Hybrid Server 7 Installation Using PXE](#). Only the console tools are available. For instructions on how to use them, see the [Virtuozzo Storage Administrator's Command Line Guide](#).

1.1 Requirements for Standalone Installations

The recommended hardware requirements for running an alpha build of Virtuozzo Hybrid Server 9 as a standalone installation are as follows:

- x86-64 platform with hardware virtualization support: Intel VT-x (with “unrestricted guest”) or AMD Virtualization (tested only on AMD EPYC).

Note: To check if the Intel processor supports the “unrestricted guest” feature: 1) Download [vmxcap.py](#) from GitHub, 2) Run `python vmxcap.py | grep -i unrest`. The result must be yes.

- CPUs: at least 4 cores, a 64-bit processor is required for running 64-bit guest operating systems.
- RAM: 4 GB or more.
- HDD: the minimal required disk size is the sum of the minimal /vz and root partitions, as well as the swap size:

```
min_hdd_size = min_vz_size + min_root_size + swap_size
```

Where `min_root_size` is 12 GiB, `min_vz_size` is 30 GiB, and `swap_size` depends on the RAM size.

- SSD (optional): at least 30 GiB (at least 32 GiB with `/boot`).
- Network: an Ethernet network adapter and a valid IP address.

You can also install Virtuozzo Hybrid Server in a virtual machine with similar virtual hardware. Make sure that nested virtualization support is enabled in your hypervisor.

Note: For Virtuozzo Storage system requirements, see [Planning Infrastructure for Virtuozzo Storage with CLI Management](#)

1.2 Preparing for Installation from USB Storage Drives

To install Virtuozzo Hybrid Server from a USB storage drive, you will need a 2 GB or higher-capacity USB drive and the Virtuozzo Hybrid Server 9 distribution ISO image.

Make a bootable USB drive by transferring the distribution image to it.

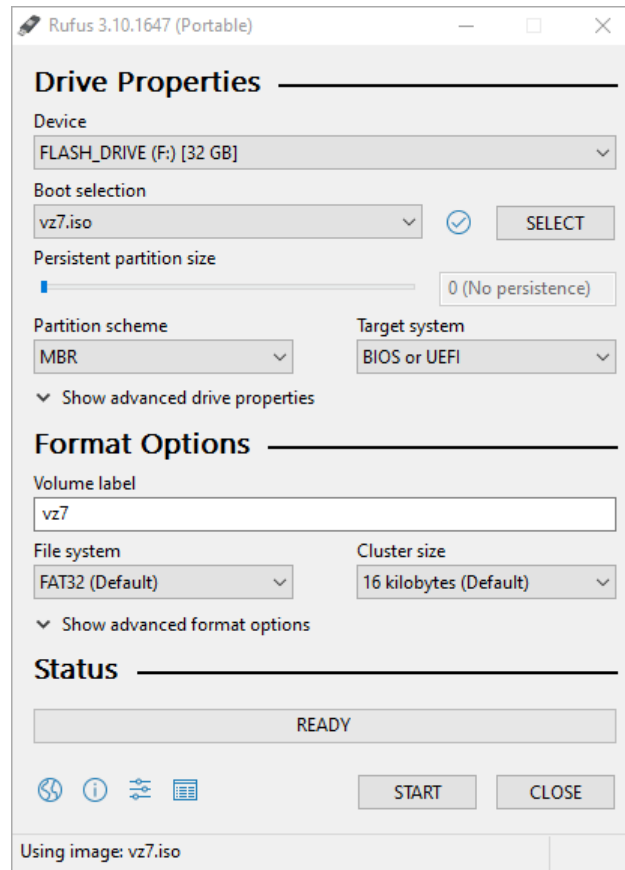
Important: Be careful to specify the correct drive to transfer the image to.

On Linux, you can use `dd`. For example:

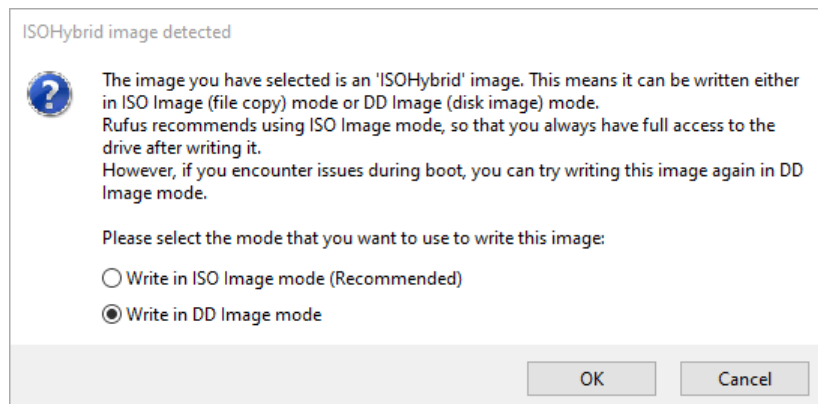
```
# dd if=<VZ9_ISO_image> of=/dev/sdb
```

On Windows, you can use [Rufus](#):

1. In the **Drive Properties** section, select your flash drive from the **Device** drop-down menu and click **SELECT**. Then, select the distribution image from your local machine.
2. Click **START**.



3. In the pop-up window, select **Write in DD Image mode** and click **OK**.



CHAPTER 2

Installing

This chapter explains how to install an alpha build of Virtuozzo Hybrid Server 9.

2.1 Starting Installation

Virtuozzo Hybrid Server can be installed from:

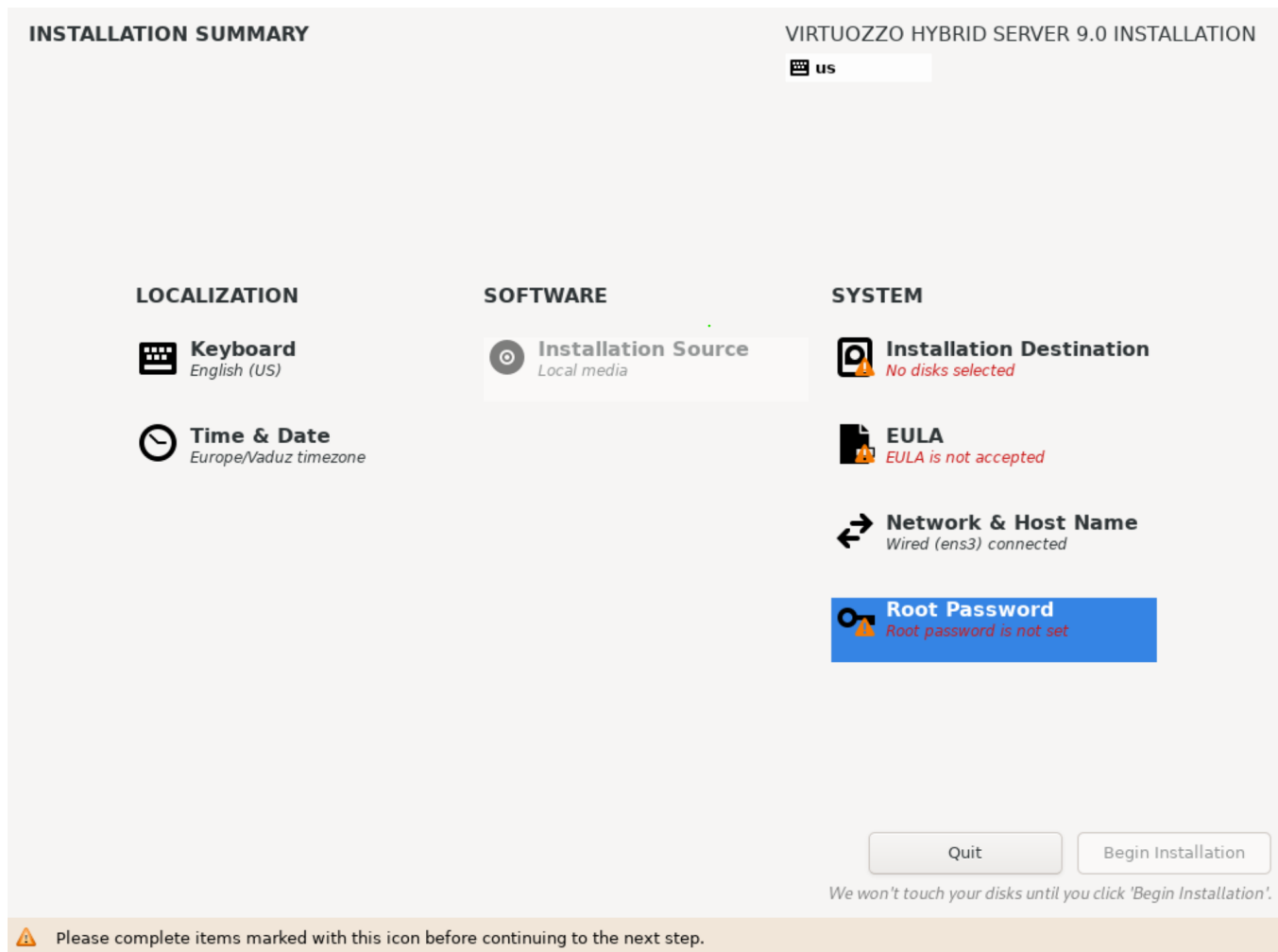
- IPMI virtual drives
- USB drives (see *Preparing for Installation from USB Storage Drives* on page 2)

To start the installation, do the following:

1. Configure the server to boot from the chosen media.
2. Boot the server and wait for the welcome screen.

2.2 Installation Steps

To install an alpha build of Virtuozzo Hybrid Server 9, choose **Install Virtuozzo Hybrid Server** on the welcome screen. After the installation program loads, you will see the **Installation Summary** screen. On this screen, you need to specify a number of parameters required to install Virtuozzo Hybrid Server.



Click **Installation Destination** screen and select a disk to install the system on.

Warning: All disks found by the installation program will be cleaned from partitions once you click **Begin Installation**.

Click **EULA** and accept the user agreement.

Click **Network & Host Name** and enter a valid host name. The Internet is not required to install an alpha build. Make sure, however, that a network adapter is up and working properly.

Click **Root Password** and set the password for the root user.

Note: The kdump feature is enabled by default. It can be configured by setting the `crashkernel` parameter

to auto or by specifying memory reservation in the `/lib/modules/5.14.0-42.vz9.14.3/crashkernel.default` file as described in the [Red Hat documentation](#).

Having configured everything necessary on the **INSTALLATION SUMMARY** screen, click **Begin Installation**.

Once the installation is complete, click **Reboot** to restart the server.

Note: If you are installing Virtuozzo Hybrid Server from a USB drive, remove the drive before restarting the server.

CHAPTER 3

Managing Virtual Environments

This chapter lists basic commands that you can use to create and manage virtual environments and storage pools.

Note that by default, creating and performing actions on virtual environments is done by `virt-install` and `virsh` tools. The `prl*` tools are not provided by default but can be installed with:

```
# yum groupinstall "Virtuozzo Hypervisor - Legacy Tools"
# systemctl start prl-disp
```

3.1 Creating Virtual Environments

You can create virtual machines and containers using `virt-install`.

Note: The default file system in containers is XFS.

The following guest operating systems are supported in the alpha build:

Guest OS	VM OS variant	Container EZ template
AlmaLinux 8	almalinux8	almalinux-8-x86_64
CentOS 7 (VM preset default)	centos7.0	centos-7-x86_64
Debian 10	debian10	debian-10.0-x86_64
Red Hat Enterprise Linux 7	rhel7.9	rhel-7-x86_64
Red Hat Enterprise Linux 8	rhel8.4	rhel-8-x86_64
Ubuntu 18.04 LTS	ubuntu18.04	ubuntu-18.04-x86_64

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Table 3.1.1 -- continued from previous page

Guest OS	VM OS variant	Container EZ template
Ubuntu 20.04 LTS	ubuntu20.04	ubuntu-20.04-x86_64
Virtuozzo Linux 7	vzlinux7	vzlinux-7-x86_64
Virtuozzo Linux 8	vzlinux8	vzlinux-8-x86_64
Microsoft Windows Server 2016	win2k16	n/a
Microsoft Windows Server 2019	win2k19	n/a
Microsoft Windows Server 2022	win2k22	n/a

Note:

1. Creating Red Hat Enterprise Linux containers requires additional steps. See [Prerequisites for Creating Red Hat Enterprise Linux Containers](#) on page 9.
2. VHS 9 utilizes the SCSI controllers (drivers) for QEMU Q35 machines. IDE controllers are not supported.

Use the OS variant with the `--os-variant` option of `virt-install`. You can also replace the default `centos7.0` in the Linux VM preset `/etc/virt-manager/presets/vz_vm_linux`. Use the EZ template when creating container hard disks with `vzpkg`. If the EZ template is not installed, it will be downloaded from the repository.

To create a Linux virtual machine, it is recommended to use the `vz_vm_linux` preset. For example:

```
# mkdir -p /vz/mylinuxvm
# virt-install \
--name mylinuxvm \
--preset vz_vm_linux \
--ram 2048 \
--vcpus 'sockets=1,cores=2' \
--disk 'path=/vz/mylinuxvm/harddisk1.hdd,bus=scsi,startup_policy=optional,boot_order=1,size=64' \
--disk 'path=<linux_dist>.iso,device=cdrom,bus=scsi,boot_order=2' \
--boot cdrom \
--graphics vnc,port=5901,listen=0.0.0.0 \
--import
Starting install...
Allocating 'harddisk1.hdd' | 64 GB 00:00:08
Domain creation completed.
```

To create a Microsoft Windows virtual machine, it is recommended to use the `vz_vm_windows` preset. For example:

```
# mkdir -p /vz/mywindowsvm
# virt-install \
```

```
--name mywindowsvm \
--os-variant win2k19 \
--preset vz_vm_windows \
--ram 2048 \
--vcpus 'sockets=1,cores=2' \
--disk 'path=/vz/mywindowsvm/harddisk1.hdd,bus=scsi,startup_policy=optional,boot_order=1,size=64' \
--disk 'path=<windows_dist>.iso,device=cdrom,bus=scsi,boot_order=2' \
--graphics vnc,port=5902,listen=0.0.0.0 \
--import
Starting install...
Allocating 'harddisk1.hdd' | 64 GB 00:00:08
Domain creation completed.
```

To create a container (except Red Hat Enterprise Linux, see further), do the following:

1. Create a disk image with vzpkg. For example:

```
# mkdir -p /vz/mylinuxct
# vzpkg create image centos-7-x86_64 /vz/mylinuxct/mylinuxct.hdd
Creating Container root image at /vz/mylinuxct/mylinuxct.hdd (centos-7-x86_64)
<...>
Image was succesfully created at /vz/mylinuxct/mylinuxct.hdd
```

2. Create the container based on the disk image. For example:

```
# virt-install \
--connect vzct:///system \
--name mylinuxct \
--memory 2048 \
--disk 'path=/vz/mylinuxct/mylinuxct.hdd,boot_order=1,size=64' \
--graphics vnc,port=5903,listen=0.0.0.0 \
--import
Starting install...
Domain creation completed.
You can restart your domain by running:
virsh --connect vzct:///system start mylinuxct
```

3.1.1 Prerequisites for Creating Red Hat Enterprise Linux Containers

Creating Red Hat Enterprise Linux containers requires certificates being present on the host. You will need a working Red Hat Enterprise Linux 7 or 8 installation. The same certificates can be used for both versions.

Do the following before creating such containers:

1. In the repository file, e.g., `/etc/yum.repos.d/redhat.repo`, find the certificate paths. For example:

```
sslcacert = /etc/rhsm/ca/redhat-uep.pem
sslclientkey = /etc/pki/entitlement/4662537897317115958-key.pem
```

```
sslclientcert = /etc/pki/entitlement/4662537897317115958.pem
```

2. Copy these certificates to `/etc/rhel/` on the host where you will be creating Red Hat Enterprise Linux containers.

3.2 Creating Storage Pools and Volumes

Aside from regular virtual disks, you can create libvirt storage pools and divide them into volumes. The latter can be assigned to virtual environments as virtual disks.

Do the following:

1. Create a storage pool definition. For example, `mypool.xml`:

```
<pool type='dir'>
  <name>mypool</name>
  <target>
    <path>/vz/mypool</path>
  </target>
</pool>
```

2. Create the pool directory:

```
# mkdir /vz/mypool
```

3. Define and start the pool:

```
# virsh pool-define mypool.xml
Pool mypool defined from mypool.xml
# virsh pool-start mypool
Pool mypool started
```

4. Create a volume definition. For example, `mypool-volume1.xml`:

```
<volume type='file'>
  <name>volume1</name>
  <capacity unit='G'>64</capacity>
  <target>
    <format type='qcow2' />
  </target>
</volume>
```

5. Create the volume in the storage pool:

```
# virsh vol-create mypool mypool-volume1.xml
Vol disk1 created from mypool-volume1.xml
```

6. Delete the default volume file:

```
# rm -f /vz/mypool/volume1
```

You can now specify volume1 when creating a virtual machine. For example:

```
# virt-install \
<...>
--disk 'source.pool=mypool,source.volume=volume1,boot_order=1,size=64<...>' \
<...>
```

Or when creating a container. For example:

```
# vzpkg create image centos-7-x86_64 /vz/mypool/volume1
# ploop resize -s 64G /vz/mypool/volume1/DiskDescriptor.xml
# virt-install \
<...>
--disk 'source.pool=mypool,source.volume=volume1,boot.order=1'
<...>
```

3.3 Performing Actions on Virtual Environments

Use `virsh` to manage virtual environments. By default `virsh` connects to the `qemu:///system` hypervisor used for virtual machines. To manage containers, connect to the `vzct:///system` hypervisor instead with `--connect vzct:///system`.

- To start a virtual machine, use `virsh start`. For example:

```
# virsh start mylinuxvm
Domain mylinuxvm started
```

To start a container, use the same command with the corresponding hypervisor. For example:

```
# virsh --connect vzct:///system start mylinuxct
Domain mylinuxct started
```

Note: You may need to install the `pr1-vzncserver.x86_64` package to be able to start containers.

- To connect to a running virtual environment via VNC, use the port you provided in the creation command in the `--graphics` option, e.g., `port=5901`.
- To connect to a running container, use `vzctl enter <CT_name_or_ID>`.

- To stop a virtual environment, use either `virsh shutdown` (graceful) or `virsh destroy` (forced, which may corrupt virtual environment's hard disks). For example:

```
# virsh shutdown mylinuxvm
Domain mylinuxvm is being shutdown
# virsh --connect vzct:///system destroy mylinuxct
Domain mylinuxct destroyed
```

- To delete a stopped virtual environment, use `virsh undefine`. This command will only delete the virtual environment's configuration. The hard disks will not be deleted. For example:

```
# virsh undefine mylinuxvm
Domain mylinuxvm has been undefined
```

CHAPTER 4

Troubleshooting

If you find any issues while you are testing an alpha build of Virtuozzo Hybrid Server 9, please feel free to report them to the technical support:

```
# vzreport -s
```

If the reporting tool is not available, install it with

```
# yum install vzreport
```