Oracle® Virtual Networking Host Drivers for Oracle Linux and Oracle VM Installation and Boot Guide

Part No: E76746-01
July 2016

ORACLE

Oracle Virtual Networking Host Drivers for Oracle Linux and Oracle VM Installation and Boot Guide

Part No: E76746-01

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Référence: E76746-01

Accessibilité de la documentation

Pour plus d'informations sur l'engagement d'Oracle pour l'accessibilité à la documentation, visitez le site Web Oracle Accessibility Program, à l'adresse `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc`.

Accès aux services de support Oracle

Les clients Oracle qui ont souscrit un contrat de support ont accès au support électronique via My Oracle Support. Pour plus d'informations, visitez le site `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info` ou le site `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs` si vous êtes malentendant.

Contents

Using This Documentation

- **Overview** – Describes how to install, upgrade, and activate Oracle Virtual Networking host drivers in Oracle Linux and Oracle VM host operating systems. Also describes different booting methods for Oracle Linux and Oracle VM operating systems.
- **Audience** – System administrators, authorized service providers, and users who have experience in administering advanced networks.
- **Required knowledge** – Advanced experience in using Oracle Virtual Networking host drivers for Oracle Linux and Oracle VM.

Product Documentation Library

Documentation and resources for this product and related products are available at http://www.oracle.com/goto/oracle-virtual-networking/docs.

Feedback

Provide feedback about this documentation at http://www.oracle.com/goto/docfeedback.

Understanding Host Drivers and Kernels

These topics provide information about host drivers and kernels for specific versions of Oracle Linux (or Oracle Enterprise Linux) and Oracle VM OSes. These topics also describe different boot methods and kernel installation types for the host drivers.

Overview of Unbundled and Embedded Host Drivers

The Oracle Virtual Networking host drivers are available in different OSes based on specific kernel versions on which the OS is built. Oracle Virtual Networking host drivers can be either unbundled or embedded:

- *Unbundled host drivers* are not part of the host OS and must be downloaded as a separate package and installed after the OS is installed.
- *Embedded host drivers* are part of the host OS. No separate package is required, but if you want to use Oracle Virtual Networking, you must activate the host drivers.

Note - The information about activating unbundled and embedded host drivers in this document applies to 64-bit x86 server architectures only.

You can choose to use unbundled host drivers or embedded host drivers. Depending on the type of host driver you choose, you need to perform the following:

- **For unbundled host drivers** – Install the host drivers with the base kernel. If you want to leave the host drivers unbundled, refer to the Oracle Virtual Networking product notes for the host OS for information about installing and activating the host drivers.
- **For embedded host drivers** – Install the host drivers with the base kernel version, then upgrade to the latest version of Oracle Virtual Networking host driver, which contains the latest kernel and embedded host drivers. After upgrading to an OS that is equal to or greater than the final kernel version, the host drivers are embedded into the OS. You can use the procedures in this document to activate the Oracle Virtual Networking host drivers.

The host drivers for Oracle Enterprise Linux or Oracle VM contain the following component modules:

- The vNIC module provides virtual network interface controller services.
- The vHBA module provides virtual host bus adapter services.

Related Information

- “Upgrading the Kernel” on page 23
- “Activating the Integrated Kernel” on page 31

Choosing a Kernel Installation Method

You can install Oracle Virtual Networking host drivers in any of the following ways:

- “Unbundled Installation Method” on page 10
- “Kernel Upgrade Method” on page 11
- “Embedded Host Driver Activation Method” on page 12

Unbundled Installation Method

The Oracle Virtual Networking host driver is unbundled when it is not embedded into the OS itself. Instead, the host driver is a separate, stand-alone package (for example, an individual RPM) that you must install after the OS is installed. When the host driver package is installed, you must reboot the host to load the host driver package into memory. The following table shows the existing host OSes that have unbundled host drivers. Note that the base kernel and final kernel version are the same because installing the host drivers does not change the kernel. For information about the base kernel and final kernel version, see “Base Kernels and Final Kernels” on page 18.

TABLE 1 Unbundled Host Driver and Kernel Information

OS Type	Base Kernel Version	Embedded Host Driver?	Final Kernel Version
Oracle Linux 5.9 (UEK2 kernel)	`kernel-uek-2.6.39-300.26.1.el5uek.x86_64`	In base kernel, no.	`kernel-uek-2.6.39-300.26.1.el5uek.x86_64`
Oracle Linux 6 Update 3 (UEK2 kernel)	`kernel-uek-2.6.39-300.0.6.el6.uek.x86_64`	In base kernel, no.	`kernel-uek-2.6.39-300.0.6.el6.uek.x86_64`
Oracle Linux 6 Update 4 (UEK2 kernel)	`kernel-uek-2.6.39-400.17.1.el6uek.x86_64`	In base kernel, no.	`kernel-uek-2.6.39-400.17.1.el6uek.x86_64`

Be aware that choosing to upgrade might change the way that your host drivers are installed. See “Behavior of Unbundled and Embedded Host Drivers” on page 17.

Related Information

- “Upgrading the Kernel” on page 23
- “Kernel Upgrade Method” on page 11
- “Embedded Host Driver Activation Method” on page 12

Kernel Upgrade Method

You can upgrade the Oracle Virtual Networking host driver on a host. When you upgrade, you change the OS from a kernel that has a base kernel version to an OS that has a final kernel version. For more information, see “Base Kernels and Final Kernels” on page 18.

In the following table, note that the base kernel and final kernel versions are different. This situation occurs if you upgrade from an OS kernel version without embedded host drivers to a kernel version that contains the embedded host drivers.

TABLE 2 Kernel Upgrade Information

OS Type	Base Kernel Version	Embedded Host Driver?	Final Kernel Version
Oracle Linux 5.9 (UEK2 kernel)	`kernel-uek-2.6.39-300.26.1.el5uek.x86_64`	In base kernel, no. After upgrade, yes.	`kernel-uek-2.6.400.209.1.el5uek.x86_64` to latest versions.
Oracle Linux 6 Update 3 (UEK2 kernel)	`kernel-uek-2.6.39-300.0.6.el6.uek.x86_64`	In base kernel, no. After upgrade, yes.	`kernel-uek-2.6.400.209.1.el6uek.x86_64` to next latest versions.
Oracle Linux 6 Update 4 (UEK3 kernel)	`kernel-uek-2.6.39-400.17.1.el6uek.x86_64`	In base kernel, no. After upgrade, yes.	`kernel-uek-3.8.13-19.el6uek.x86_64.rpm` to latest version

Be aware that choosing to upgrade might change the way that your host drivers are installed. See “Behavior of Unbundled and Embedded Host Drivers” on page 17.

For procedures to upgrade kernels, see “Upgrading the Kernel” on page 23.

Related Information

- “Unbundled Installation Method” on page 10

- "Kernel Upgrade Method" on page 11
- "Embedded Host Driver Activation Method" on page 12
- "Base Kernels and Final Kernels" on page 18

Embedded Host Driver Activation Method

Embedded host drivers occur when the Oracle Virtual Networking host driver is no longer a stand-alone RPM that you install. Instead, the host driver is built into the OS itself. In this situation, the host driver does not need to be installed, but rather activated within the OS.

TABLE 3 Embedded Host Driver Information

OS Type	Base Kernel Version	Embedded Host Driver?	Final Kernel Version
Oracle Linux 5.10 (UEK2 kernel)	`kernel-uek-2.6.39-400.209.1.el5uek.x86_64`	Yes. Use the user package to enable the Oracle Virtual Networking service on the host.	`kernel-uek-2.6.39-400.209.1.el5uek.x86_64`
Oracle Linux 6.5 Update 1 (UEK3 kernel)	`kernel-uek-3.8.13-22.el6uek.x86_64`	Yes. Use the `orclovn-user` package to enable the Oracle Virtual Networking service on the host.	`kernel-uek-3.8.13-22.el6uek.x86_64`
Oracle Linux 7.0 (UEK3 kernel)	`kernel-uek-3.8.13-35.2.1.el7uek.x86_64`	Yes. Use the `orclovn-user` package to enable the Oracle Virtual Networking service on the host.	`kernel-uek-3.8.13-35.2.1.el7uek.x86_64`
Oracle VM 3.3.1 (UEK3 kernel)	`kernel-uek-3.8.13-26.4.2.el6uek.x86_64`	Yes. Use the `orclovn-user` package to enable the Oracle Virtual Networking service on the host.	`kernel-uek-3.8.13-26.4.2.el6uek.x86_64`

With the embedded host drivers, you do not need to upgrade, because the host drivers are already in the server OS. As a result, you only need to install the user space package to start or enable the services at boot time.

For information about installing and activating embedded host drivers, see "Activating the Integrated Kernel" on page 31.

Related Information

- "Unbundled Installation Method" on page 10

- “Kernel Upgrade Method” on page 11

Identifying the Boot Method

All computers boot from boot devices, which might include a local disk, a CD-ROM, a USB device, or an Ethernet controller. Depending on your requirements, you can configure your Oracle Enterprise Linux or Oracle VM host using either the local boot method or the remote boot method.

- “Local Boot Method” on page 13
- “Choosing a Remote Boot Method” on page 13

Local Boot Method

When an Oracle Enterprise Linux or Oracle VM host boots locally, it loads the OS and host drivers from an internal hard drive.

Choosing a Remote Boot Method

Oracle has implemented a ROM BIOS extension for its HCA cards. This extension, called XgBoot, enables you to use Oracle virtual I/O resources as boot devices for the server. You configure the system BIOS to include XgBoot in the boot order, and configure the Oracle Fabric Interconnect to make sure virtual resources are bootable.

Whatever remote booting process you select, you use the following high-level steps:

1. Set up the boot volume.

   You need the boot image to be available on the network.
2. Configure bootable I/O resources on the Oracle Fabric Interconnect.

   For SAN booting, this is a VHBA configured as bootable. For PXE boot, you use a bootable VNIC. Either resource must be assigned to a server profile that is bound to the server that boots remotely.
3. Configure the server.

   HCAs on the server must have compatible firmware, and their option ROM must be enabled.
4. Connect the server profile on the Oracle Fabric Interconnect to the server.

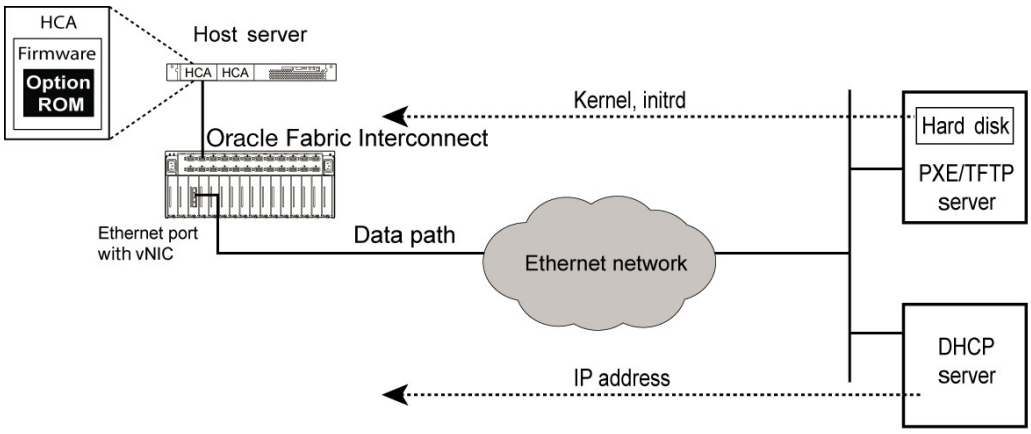
5. Set the server profile to SAN boot (`sanboot=`).

You can choose any one of the following boot methods:

- "PXE Boot Method" on page 14
- "iSCSI Boot Method" on page 15
- "SAN Boot Method" on page 16

PXE Boot Method

During the Oracle Enterprise Linux or Oracle VM host BIOS boot sequence, the PXE agent in the HCA option ROM scans the network for a PXE server through a VNIC. The PXE server delivers the kernel boot image and the `initrd` file containing the host drivers to the Oracle Enterprise Linux or Oracle VM host. The boot image and the `initrd` file are delivered for booting initially by using the DHCP and then the TFTP.

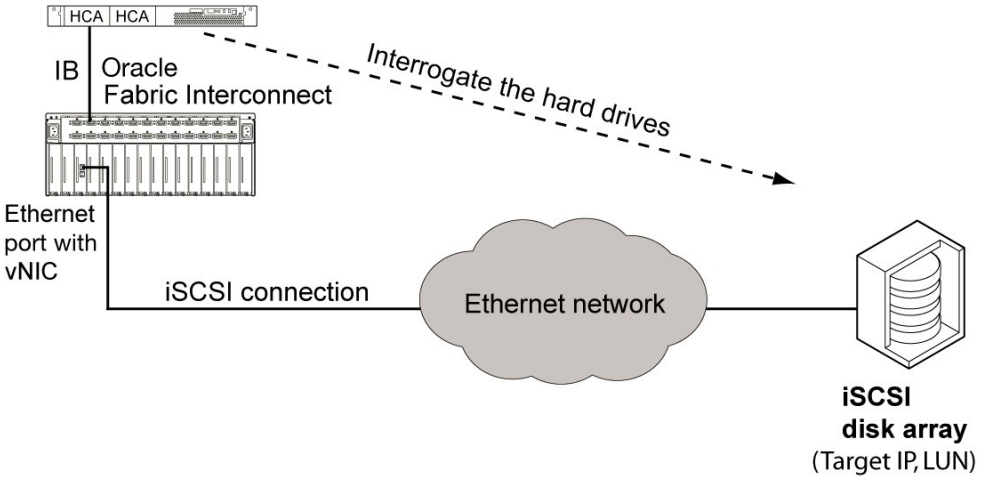


The process of PXE boot configuration is as follows:

1. Move the host drivers and OS image to the PXE server.
2. Load the host drivers into the `initrd` file.
3. Create a server profile.
4. Configure a bootable VNIC.
5. Modify the PXE configuration file.
6. Set the HCA to first in the boot order.
7. Load the `initrd` file and the OS image into the Oracle Enterprise Linux or Oracle VM host.

iSCSI Boot Method

iSCSI boot enables you to boot an Oracle Enterprise Linux or Oracle VM host from a LUN on an iSCSI array accessed through a VNIC. The remote disk to boot from is identified by a target IQN and LUN on a storage disk array device.



The process for iSCSI boot configuration is as follows:

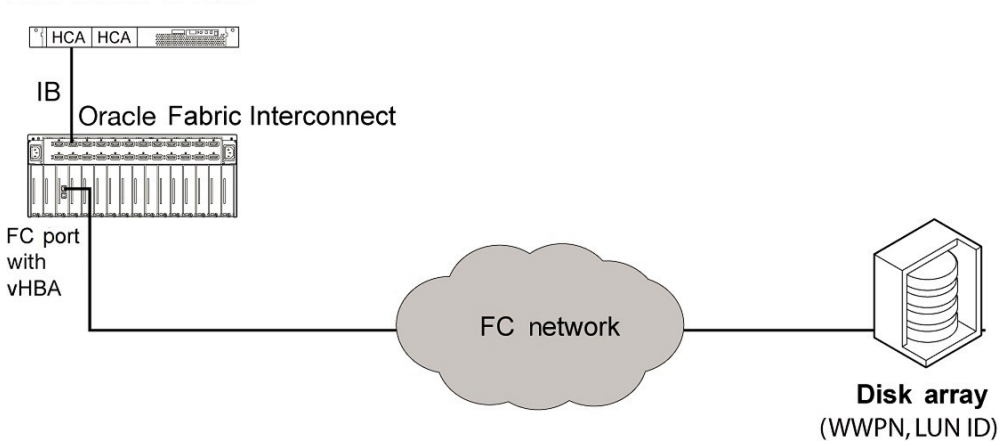
1. Load the host drivers into the OS image.
2. Move the OS image to a remote LUN.
3. Create a server profile.
4. Configure a bootable VNIC.
5. Set the HCA to first in the boot order.
6. Load the image into the Oracle Enterprise Linux or Oracle VM host.
7. Reboot the host.

During the iSCSI boot process, the Oracle Enterprise Linux or Oracle VM host logs in to the iSCSI array and gets the IQN information it needs. Because the VNIC has an OS available to boot from (on the iSCSI LUN connected to the VNIC), that OS is used, and the Oracle Enterprise Linux or Oracle VM host boots over the VNIC. This procedure occurs each time the Oracle Enterprise Linux or Oracle VM host is booted using the iSCSI boot method.

Note - The login message displayed while the VNIC is logging in to the iSCSI array appears so rapidly that you might not recognize that the ESXi host is booting from a VNIC. Additionally, no IQN or other recognizable iSCSI information is displayed on the screen.

SAN Boot Method

SAN boot enables you to boot an Oracle Enterprise Linux or Oracle VM host from a SAN volume accessed through a VHBA. The remote disk to boot from is identified by a target WWPN and LUN on a storage disk array device.



The process of configuring for PXE boot is as follows:

1. Load the host drivers into the OS image.
2. Move the OS image to a remote LUN.
3. Create a server profile.
4. Configure a bootable VHBA.
5. Set the HCA to first in the boot order.
6. Load the image into the Oracle Enterprise Linux or Oracle VM host.
7. Reboot the host.

Note - During SAN boot, the text `VHBA installing` indicates the name of the VHBA configured for SAN boot.

Upgrading Host Driver and Kernel Types

This topic describes the behaviour of host drivers when you upgrade to a different kernel. It also provides information about kernel file names, base and final kernels, and kernel firmware sites that are required while upgrading the kernel.

Behavior of Unbundled and Embedded Host Drivers

When you upgrade to a kernel that contains an embedded host driver, you might notice a change in the behavior of your host drivers. For example, the separate host drivers RPM file that accompanies your OS might be gone, and the way you activate and install the host drivers will be different than it was in the previous kernel version.

Caution - If you are using unbundled host drivers and you have a script for host driver installation from a central deployment server, then when you upgrade to a kernel version that has embedded host drivers, your scripts might not run. The scripts might even call an older version of host driver that is not embedded.

Related Information

- "Behavior of Unbundled and Embedded Host Drivers" on page 17
- "Base Kernels and Final Kernels" on page 18
- "Kernel and Kernel Firmware Sites" on page 18

Kernel File Names

The procedures and syntax for activating the host drivers in each kernel type are the same except for the kernel file names. So, for example, when you are required to enter a value for the *kernel-filename* option, you can enter either one of the following values depending on the host OS running on the server:

- `kernel-uek-2.6.39-400.204.0.el5uek.x86_64.rpm` (for a UEK2 kernel type)
- `kernel-uek-3.8.13-19.el6uek.x86_64.rpm` (for a UEK3 kernel type)

Related Information

- "Upgrading the Kernel" on page 23
- "Activating the Integrated Kernel" on page 31
- "Kernel File Names" on page 17

Base Kernels and Final Kernels

Some OSes, such as Oracle Linux 6.4, do not have the Oracle Virtual Networking host drivers embedded. OSes that do not have embedded host drivers can be upgraded to a later kernel version that contain embedded host drivers. In this case, the OS would come with a *base kernel*, which does not have host drivers embedded in the OS. After upgrade, the OS would have a *final kernel*, which does have host drivers embedded into the OS.

As an option, you can decide to not embed host drivers into the host OS. In this case, the host drivers are a separate software package that you can install after the host OS is completely installed. For information about installing the host drivers as a separate software package, see the Oracle Virtual Networking host driver product notes for the corresponding host OS.

Note - The presence or absence of host drivers embedded in the host OS is dependent on the kernel version of the OS. So if, for any reason, the OS kernel is equal to or greater than the "Final Version" shown in "Unbundled Installation Method" on page 10 and "Kernel Upgrade Method" on page 11, that OS will have embedded host drivers. Be aware that changes to the OS can lead to a change in kernel version that supports embedded host drivers. For example, adding patches or an SRU to the underlying OS can change the kernel build version from an unbundled kernel version to an embedded kernel version. In this example, the behavior of kernel installation/activation would change even though the reason for the change was not related to the host drivers.

Related Information

- "Kernel Upgrade Method" on page 11
- "Behavior of Unbundled and Embedded Host Drivers" on page 17
- "Kernel File Names" on page 17
- "Kernel and Kernel Firmware Sites" on page 18
- "Unbundled Installation Method" on page 10
- "Kernel Upgrade Method" on page 11

Kernel and Kernel Firmware Sites

When manually installing the kernel RPMs, you need to know where to get the required RPMs.

The following table shows some public domain repositories for kernel and kernel firmware RPMs. This information is useful only when performing a kernel upgrade installation to go

from an unbundled host-driver kernel to an embedded host-driver kernel. If you are using an updater, such as Yum, you do not need to manually get the RPMs.

TABLE 4 RPM Package Locations for Kernel Upgrade Installation

OS Type	Kernel Versions	Kernel and Kernel Firmware Site

Oracle Linux 5.9 (UEK2)	`kernel-uek-2.6.39-300.26.1.el5uek.x86_64` (before upgrade)
	
	`kernel-uek-2.6.39-400.209.1.el5uek.x86_64` to next latest versions (after upgrade)
		Kernel and kernel firmware:
		
		`http://public-yum.oracle.com/repo/OracleLinux/OL5/UEK/latest/x86_64`
		
		Oracle package:
		
		`http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage/orclovn-user-6.0.r7494-1.el5.x86_64.rpm`

Oracle Linux 6 Update 4 (UEK2)	`kernel-uek-2.6.39-400.17.1.el6uek.x86_64` (before upgrade)
	
	`kernel-uek-2.6.39-400.209.1.el6uek.x86_64` to next latest versions (after upgrade)
		Kernel and kernel firmware:
		
		`http://public-yum.oracle.com/repo/OracleLinux/OL6/UEK/latest/x86_64/`
		
		Oracle package:
		
		`http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage/orclovn-user-6.0.r7494-1.el6.x86_64.rpm`

Oracle Linux 6 Update 5 (UEK2	`kernel-uek-3.8.13-16.2.1.el6uek.x86_64` (before upgrade) `kernel-uek-3.8.13-19.el6uek.x86_64.rpm` to latest version (after upgrade)	**Kernel and kernel firmware**: `http://public-yum.oracle.com/repo/OracleLinux/OL6/UEKR3/latest/x86_64`/ **Oracle package:** `http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage/orclovn-user-6.0.r7494-1.el6.x86_64.rpm`

Related Information

- "Kernel Upgrade Method" on page 11
- "Downgrading to an Older Version of Kernel or Host Driver" on page 49
- "Behavior of Unbundled and Embedded Host Drivers" on page 17
- "Kernel File Names" on page 17
- "Base Kernels and Final Kernels" on page 18

Installing the Unbundled Host Drivers

Unbundled host drivers are released as separate packages (RPMs) that you must download and install separately after completely installing the underlying host OS. However, Oracle Virtual Networking host drivers are also embedded in various Oracle OSes. You can determine whether the host drivers are embedded or not by the kernel version of each host OS. For more information, see “Kernel Upgrade Method” on page 11.

Note - By upgrading a kernel, it is possible to change from an unbundled host driver to an embedded host driver. See “Behavior of Unbundled and Embedded Host Drivers” on page 17.

▼ Install Host Drivers for the UEK2 Kernel

You can install the host drivers with the UEK2 kernel by using he `rpm -ivh` command. The following procedure uses Oracle Linux 5 Update 9 UEK2 kernel host drivers as an example.

Before You Begin Be aware of the following considerations before attempting the installation procedure for host drivers with the UEK2 kernel:

- You must install the correct host drivers for your architecture. For example, do not put 64-bit host drivers on a 32-bit server
- By default, the UEK2 kernel contains an IB stack named `open-ib`, and this IB stack is installed when the UEK2 kernel is installed on the host. However, for the UEK2 kernel, the host drivers require an InfiniBand stack called `kernel-ib`, which is contained in the Oracle Virtual Networking host drivers package.
- There are considerations about which version of IB stack is used with which type of kernel. There are also considerations about using multipath files, and when to install and reboot the server with each version of the multipath file and IB stack.
- There is a dependency that the appropriate `kernel-ib` RPM is installed before the corresponding host drivers.

1. **Remove any existing host drivers and IB stack including the `open-ib` stack that was installed as part of the UEK2 kernel completely before installing the new host drivers.**

Caution - By default, the OS installs a different IB stack named `open-ib`. You must remove this IB stack and install the IB stack that is released with the host drivers (`kernel-ib`). The `kernel-ib` stack included with this host driver must be used, and you must install it before installing the actual host Oracle Virtual Networking host driver.

2. **Install the `kernel-ib` package and not the `open-ib` package for your architecture.**

```
# rpm -ivh kernel-ib-1.5.5.151-2.6.39_300.26.1.el5uek.x86_64.rpm
```

Note - This command installs the IB stack onto a server that does not contain the stack. If you want to upgrade a server that has an existing IB stack already installed, use the `rpm -uvh` command with the IB stack file name.

3. **After the IB stack is installed, install the correct host driver for your architecture.**

```
# rpm -ivh xsigo-hostdrivers-kmod-2.6.39_300.26.1.el5uek.5.0.7.LX-1.x86_64.rpm
```

Note - This command installs the host drivers onto a server that does not contain the host drivers. If you want to upgrade a server that has existing host drivers already installed, use the `rpm -uvh` command with the RPM file name.

4. **After the host drivers are installed, reboot the server to load the new drivers into memory.**

Upgrading the Kernel

You can upgrade the Oracle Virtual Networking host driver on a host. When you upgrade, you change the OS from a kernel that has a base kernel version to an OS that has a final kernel version. For more information, see “Kernel Upgrade Method” on page 11.

Note - By upgrading a kernel, it is possible to change from an unbundled host driver to an embedded host driver. See “Behavior of Unbundled and Embedded Host Drivers” on page 17.

You can use any of the following methods to upgrade the kernel:

- “Installing Host Drivers (Local Disk Method)” on page 23
- “Installing the Kernel to Local Disk (PXE Installation Method)” on page 26
- “Installing the Kernel to iSCSI and vHBA Disk (PXE Installation Method)” on page 28

Installing Host Drivers (Local Disk Method)

You can install the host drivers through either an automated installer, such as Yum, or by manually installing the RPM.

- “Install Host Drivers (Yum)” on page 23
- “Install Host Drivers (Manually)” on page 24
- “Activate the Oracle Virtual Networking Service” on page 24
- “Verify That the Server Is Detected by the Oracle Fabric Interconnect” on page 25

▼ Install Host Drivers (Yum)

Before installing the host drivers, ensure that the following prerequisites are met:

- The Yum repository is reachable through the network by the Oracle Linux server.
- The Yum service is running correctly.
- You have root access to the Yum repository.

Using Yum, you will install the kernel and Oracle Virtual Networking user space application from the Yum repository by using the `yum install` command. Using Yum, you do not install the software from the Oracle server or the Oracle Fabric Interconnect.

Note - To install the latest kernels, which are not mentioned in "Unbundled Installation Method" on page 10, you can use the `yum install` *kernel-file* command, or you can manually download the *kernel-file* and then install it.

- **Install the Oracle Virtual Networking user space application.**

  ```
  yum install orclovn-user.x86_64
  ```

Install Host Drivers (Manually)

If you are not using an automated update manager, you can install the kernel like any other software. Before installing the host drivers, ensure that the following prerequisites are met:

- The Oracle Linux OS or Oracle VM hypervisor is installed on the server, including all required patches and updates.
- All RPMs for Oracle Virtual networking are downloaded to the Oracle Linux servers' hard drive. See "Kernel and Kernel Firmware Sites" on page 18.
- You have root access on the server.

When manually installing the RPMs, you will load the UEK2 or UEK3 firmware, kernel, and Oracle Virtual Networking user space application by using the `rpm -ivh` command. Using the manual installation procedure, you install the software directly from the server, not from the Oracle Fabric Interconnect.

1. **Install the firmware.**

   ```
   rpm -ivh kernel-filename .noarch.rpm
   ```

2. **Install the kernel.**

   ```
   rpm -ivh  kernel-filename
   ```

3. **Install the Oracle Virtual Networking user space application.**

   ```
   rpm -ivh oclovn-user.x86_64.rpm
   ```

Activate the Oracle Virtual Networking Service

Follow these steps to enable the Oracle Virtual Networking service, which is named `xsigo`.

1. **Turn on the Oracle Virtual Networking service:**

   ```
   chkconfig xsigo on
   ```

2. **Verify that the Oracle Virtual Networking service is on:**

   ```
   chkconfig –list xsigo

   xsigo           0:off   1:off   2:on    3:on    4:on    5:on    6:off
   ```

3. **(Oracle Linux 7 hosts) Enable the `ovn.service` module:**

   ```
   systemctl enable ovn.service
   ```

4. **Re-create the `INITRD` with xsigo modules inserted into it.**

   ```
   /opt/xsigo/bin/orclovn-setup --install
   ```

   By default, the `orclovn-user` package chooses the first UEK from your current `grub.conf` file.

5. **Reboot the host.**

   Wait until the host reboots, then proceed to the next section.

▼ Verify That the Server Is Detected by the Oracle Fabric Interconnect

After the server has completed its reboot, verify that the server is detected from the Oracle Fabric Interconnect.

- **Locate the server:**

  ```
  show physical-server
  name    guid         descr port          os                                    version
          server-profile
  ------------------------------------------------------------------------

  dalek 21280001fc8f22 davros:ServerPort20 Linux/2.6.39-400.209.1.el6uek/x86_64  2.11.2010
  /3.0.0  elbert
  ```

Related Information

- “Installing the Kernel to Local Disk (PXE Installation Method)” on page 26

Installing the Kernel to Local Disk (PXE Installation Method)

You can install the new kernel to a local disk on the host by using the PXE installation method. You can use either an updater such as Yum, or you can install it manually. The following procedures describe how to install the new kernel to a local disk.

▼ Download and Extract the Image

Download `xsigo-boot-5.0.7-LX.tar` for XGboot and get the standard Red Hat image (`rhdd.img`) by extracting the `.tar` file.

1. **Access the tar file from the following location:**

   `http://download.oracle.com/otn-pub/otn_software/xsigo/RHEL-5_0_7-LX.tgz`

2. **Extract files and locate RHDD for `2.6.32-358.el6.x86_64` file.**

3. **Extract the `xsigo-boot.tar` file to a folder and make a PXE label by appending with `xsigo-rhdd.img`.**

4. **Create or append the driver disk based on your host server type.**

▼ Append the Driver Disk (Oracle Linux 6)

For Oracle Linux 6, Update 4 OS, you can append the PXE label directly to the driver disk. However, for Oracle Linux 5, Update 9, you need to manually make a customer driver disk.

- **(Oracle Linux 6) To append the host drivers to the driver disk, create a PXE label or settings on PXE server and install on the network as follows:**

  In this example, you are appending Red Hat-based driver disk (2.6.32-358.el6) with base OS `initrd`.

```
Label    OEL6u4-LX507

    Kernel    OEL6u4-vmlinuz
```

```
    append    initrd=OEL6u4-initrd.img,OEL6u4-xsigo-rhdd-2.6.32-358.el6.x86_64-5.0.7.LX-
x86_64.img network
```

Make a Custom Driver Disk (Oracle Linux 5 and Oracle VM)

To make the driver disk for Oracle Linux 5, Update 9 or Oracle VM, you need to use the stock `initrd` that Red Hat provides (included in the `.tar` file). You run a proprietary Oracle Virtual Networking tool named `xg-insert-dd` to inject specific information into the stock `initrd`. When the custom `initrd` is created and used as the server's boot image, Oracle Linux 5, Update 9 servers boot up with the Oracle Virtual Networking vNIC and vHBA drivers included, and vNICs and vHBAs are loaded into the OS like any physical device.

1. **Download `xsigo-boot-5.0.7-LX.tar` for XGboot from `http://download.oracle.com/otn-pub/otn_software/xsigo/RHEL-5_0_7-LX.tgz`.**

2. **Extract the downloaded tar file to a separate folder.**

   The `rhdd.img` will be part of the extracted files.

3. **Copy the stock `initrd.img` that comes with the Red Hat distribution CD or the Oracle Linux distribution CD image to the extracted folder.**

4. **Insert the Oracle Virtual Networking host drivers into the stock `initrd.img`.**

   ```
   ./xg-insert-dd xsigo-rhdd-2.6.18-348.el5-5.0.7.LX-x86_64.img initrd.img
   ```

   When you run the proprietary tool `xg-insert-dd`, the tool opens the default `initrd` for editing, places the Oracle Virtual Networking host drivers inside, then repacks the `initrd` as a custom `initrd` with the prefix `xsigo-initrd.img`.

5. **Make a PXE label on the PXE server by appending the following to the `xsigo-initrd.img` file.**

   ```
   Label   OEL5U9-LX507

       kernel   OEL5U9-vmlinuz-507LX

       append   initrd=xsigo-initrd-OEL5U9-5.0.7-LX.img network
   ```

Install With Driver Disk (PXE Installation Method)

1. **Boot the server with HCA.**

XGBoot finds vNIC/vHBA by establishing XSMP session with chassis.

2. **Provide the PXE label when the PXE prompts, and start the installation on the local disk.**
3. **Proceed with the OS installation and reboot the server.**
4. **Install the host drivers.**

   See "Installing Host Drivers (Local Disk Method)" on page 23.

Installing the Kernel to iSCSI and vHBA Disk (PXE Installation Method)

You can install the new kernel to an iSCSI and vHBA disk on the host by using the PXE installation method. You can use either an updater such as Yum, or you can install it manually.

Note - In case of PXE installation to iSCSI and vHBA disk, you must install the drivers before reboot.

▼ Install the Kernel to iSCSI and vHBA Disk

1. **Download and extract the image.**

   See "Download and Extract the Image" on page 26.
2. **(Oracle Linux 6) Append the PXE label to the driver disk.**

   See "Append the Driver Disk (Oracle Linux 6)" on page 26.
3. **(Oracle Linux 5, Update 9 or Oracle VM) Make a custom driver disk.**

   See "Make a Custom Driver Disk (Oracle Linux 5 and Oracle VM)" on page 27.

▼ Install With Driver Disk (PXE Installation Method)

1. **Boot the server with HCA.**

   XGBoot finds vNIC/vHBA by establishing XSMP session with chassis.
2. **Provide the PXE label when the PXE prompts, and start the installation on the specified storage device, vHBA based LUN, or iSCSI based LUN.**

3. **Install the host driver or kernel before reboot by accessing the console.**

Note - You must install the host driver, kernel firmware, or kernel on vHBA- and iSCSI-based remote disk before rebooting the host.

---

4. **Perform the following steps from the host console command line, which is accessible by using the Ctrl+Alt+F2 key sequence.**

   a. **Mount the new system disk and enable SSH for the SCP.**

   ```
   chroot /mnt/sysimage

   /etc/init.dsshd start
   ```

   b. **Copy kernel and user space RPMs through SCP from a TFTP server or from wherever the RPMs reside.**

5. **Follow the instructions in the section "Installing Host Drivers (Local Disk Method)" on page 23 to install the drivers.**

Activating the Integrated Kernel

With embedded host drivers, you do not need to download and install a separate host driver package because the host drivers are in the host OS. For information, see “Embedded Host Driver Activation Method” on page 12.

You can use any of the following methods for installing the host OS and kernel:

- “Installing Host Drivers (Local Install Method)” on page 31
- “Installing to Local Disk (PXE Installation Method)” on page 34
- “Installing to SAN Disk (PXE Installation Method)” on page 39
- “Installing to iSCSI Disk (PXE Install Method)” on page 43

Installing Host Drivers (Local Install Method)

When you install the Oracle Linux OS or Oracle VM hypervisor on the server, the Oracle Virtual Networking host drivers are also installed. However, by default, the host drivers are not loaded into memory, so they are not automatically active after a server boot up. To support vNICs and vHBAs on the Oracle Linux server, you will need to explicitly enable the locally installed Oracle Virtual Networking host drivers.

Note - A PXE installation to local disk/SAN disk for Oracle VM is not supported at this point. You can install Oracle VM through CD image to local disk, then install the Oracle Virtual Networking user space application from the Yum repository or the RPM.

Enabling the host drivers contains the following main tasks:

- “Install Host Drivers (Yum)” on page 31
- “Install Host Drivers (Manually)” on page 32
- “Activate the Oracle Virtual Networking Service” on page 33
- “Verify That the Server Is Detected by the Oracle Fabric Interconnect” on page 33

▼ Install Host Drivers (Yum)

Before installing the host drivers, ensure that the following prerequisites are met:

- The Yum repository is reachable through the network by the Oracle Linux server.
- The Yum service is running correctly.
- You have root access to the Yum repository.

Using Yum, you can install the kernel and Oracle Virtual Networking user space application from the Yum repository by using the `yum install` command. Using Yum, you do not install the software from the Oracle server or the Oracle Fabric Interconnect.

Note - To install the latest kernels, which are not mentioned in "Unbundled Installation Method" on page 10, you can use the `yum install` *kernel-file* command, or you can manually download the *kernel-file* and then install it.

- **Install the Oracle Virtual Networking user space application.**

```
yum install orclovn-user.x86_64
```

Install Host Drivers (Manually)

If you are not using an automated update manager, you can install the kernel like any other software. Before installing the host drivers, ensure that the following prerequisites are met:

- The Oracle Linux OS or Oracle VM hypervisor is installed on the server, including all required patches and updates.
- All RPMs for Oracle Virtual Networking are downloaded to the Oracle Linux server's hard drive.
- You have root access on the server.

When manually installing the RPMs, you need to load the UEK2 or UEK3 firmware, kernel, and Oracle Virtual Networking user space application by using the `rpm -ivh` command. Using the manual installation procedure, you install the software directly from the server, not from the Oracle Fabric Interconnect.

Note - To install the latest kernels, which are not mentioned in "Unbundled Installation Method" on page 10, you can use the `yum install` *kernel-file* command, or you can manually download the *kernel-file* and then install it.

---

1. **Install the firmware.**

```
rpm -ivh kernel-filename .noarch.rpm
```

2. **Install the kernel.**

```
rpm -ivh  kernel-filename
```

3. **Install the Oracle Virtual Networking user space application.**

   For example:

   ```
   rpm -ivh oclovn-user.x86_64.rpm
   ```

Activate the Oracle Virtual Networking Service

Enable the Oracle Virtual Networking service, which is named `xsigo`.

1. **Turn on the Oracle Virtual Networking service.**

   ```
   chkconfig xsigo on
   ```

2. **Verify that the Oracle Virtual Networking service is on.**

   ```
   chkconfig –list xsigo
   xsigo           0:off   1:off   2:on    3:on    4:on    5:on    6:off
   ```

3. **For Oracle Linux 7 hosts only (not OSes based on Oracle Linux 6 or Oracle Linux 5), enable the `ovn.service` module.**

   ```
   systemctl enable ovn.service
   ```

4. **Re-create the `INITRD` with xsigo modules inserted into it.**

   ```
   /opt/xsigo/bin/orclovn-setup --install
   ```

   By default, the `orclovn-user` package chooses the first UEK from your current `grub.conf` file.

5. **Reboot the host.**

   Wait until the host reboots, then proceed to "Verify That the Server Is Detected by the Oracle Fabric Interconnect" on page 33.

Verify That the Server Is Detected by the Oracle Fabric Interconnect

After the server has completed its reboot, verify that the server is detected from the Oracle Fabric Interconnect.

- **Log in to the Oracle Fabric Interconnect and verify that the host server is shown in the physical server list:**

  ```
  show physical-server
  ```

```
name  guid           descr port          os                                  version
       server-profile
-------------------------------------------------------------------------------------------------------

dalek 21280001fc8f22 davros:ServerPort20 Linux/2.6.39-400.209.1.el6uek/x86_64  2.11.2010
/3.0.0 elbert
```

Related Information

- "Installing to Local Disk (PXE Installation Method)" on page 34
- "Installing to SAN Disk (PXE Installation Method)" on page 39
- "Installing to iSCSI Disk (PXE Install Method)" on page 43

Installing to Local Disk (PXE Installation Method)

These topics describe how to install the Oracle Virtual Networking host drivers onto the server's local hard disk for Oracle Linux 6 Update 4, Oracle Linux 5 Update 9, or Oracle VM servers by using the PXE installation method.

Note - PXE installation to local disk is not supported for Oracle Linux 7 hosts.

Creating the PXE installation image for local disk contains of the following main tasks:

- "Download and Extract the Image" on page 34
- "Append the Host Drivers to the Driver Disk (Oracle Linux 6)" on page 35
- "Make a Custom Driver Disk (Oracle Linux 5, Update 9 or Oracle VM)" on page 35
- "Install Host Drivers (Manually)" on page 36
- "Install Host Drivers (Yum)" on page 37
- "Enable the Oracle Virtual Networking Service" on page 38
- "Verify That the Server Is Detected by the Oracle Fabric Interconnect" on page 38

▼ Download and Extract the Image

Download `xsigo-boot-5.0.7-LX.tar` for XgBoot and get the standard Red Hat image (`rhdd.img`) by extracting the `tar` file.

1. **Access the tar file from:**

http://www.oracle.com/technetwork/server-storage/xsigo-1870185.html?ssSourceSiteId=ocomen and

2. **On that page, download *Oracle Virtual Networking Drivers for Red Hat Enterprise Linux*.**

3. **Extract the `xsigo-boot.tar` file to folder, and make a PXE label by appending the file with `xsigo-rhdd.img`.**

4. **Create the driver disk based on your host server type:**
   - "Append the Host Drivers to the Driver Disk (Oracle Linux 6)" on page 35
   - "Make a Custom Driver Disk (Oracle Linux 5, Update 9 or Oracle VM)" on page 35

Append the Host Drivers to the Driver Disk (Oracle Linux 6)

For the Oracle Linux 6, Update 4 OS, you can append the PXE label directly to the driver disk.

1. **Run the `rpm ivh -append` command and type the following text:**

```
Label  OEL6u4-LX507

Kernel OEL6u4-vmlinuz

append initrd=OEL6u4-initrd.img,OEL6u4-xsigo-rhdd-2.6.32-358.el6.x86_64-

                              5.0.7.LX-x86_64.img network
```

2. **Install the host drivers either through Yum or manually.**
   See either "Install Host Drivers (Manually)" on page 36 or "Install Host Drivers (Yum)" on page 37.

Make a Custom Driver Disk (Oracle Linux 5, Update 9 or Oracle VM)

To make the driver disk for Oracle Linux 5, Update 9 or Oracle VM, you need to use the stock `initrd` that Red Hat provides (included in the `.tar` file). You can run a proprietary Oracle Virtual Networking tool named `xg-insert-dd` to inject specific information into the stock `initrd`. When the custom `initrd` is created and used as the server's boot image, Oracle Linux 5, Update 9 servers boot up with the Oracle Virtual Networking vNIC and vHBA drivers included, and vNICs and vHBAs are loaded into the OS like any physical device.

1. **Download `xsigo-boot-5.0.7-LX.tar` for XGboot from `http://download.oracle.com/otn-pub/otn_software/xsigo/RHEL-5_0_7-LX.tgz`.**

2. **Extract the downloaded tar file to a separate folder.**
   The `rhdd.img` file will be part of the extracted files.

3. **Copy the stock `initrd.img` that comes with the Red Hat distribution CD or Oracle Linux distribution CD image to the extracted folder.**

4. **Insert the Oracle Virtual Networking host drivers into the stock `initrd.img`.**

   ```
   ./xg-insert-dd xsigo-rhdd-2.6.18-348.el5-5.0.7.LX-x86_64.img initrd.img
   ```

   When you run the proprietary tool `xg-insert-dd`, it opens the default `initrd` for editing, places the Oracle Virtual Networking host drivers inside, then repacks the `initrd` as a custom `initrd` with the prefix `xsigo-initrd.img`.

5. **Make a PXE label on the PXE server by appending the following to the `xsigo-initrd.img`.**

   ```
   Label   OEL5U9-LX507

       kernel   OEL5U9-vmlinuz-507LX

       append   initrd=xsigo-initrd-OEL5U9-5.0.7-LX.img network
   ```

6. **Boot the server over an HCA.**
   XGBoot finds a vNIC or vHBA by establishing an XSMP session with the Oracle Fabric Interconnect.

7. **Give the PXE label at the PXE prompt, start the installation on the local disk, and reboot the server.**

8. **Install the host drivers either through Yum or manually.**
   See “Install Host Drivers (Manually)” on page 36 or “Install Host Drivers (Yum)” on page 37.

▼ Install Host Drivers (Manually)

If you are not using an automated update manager, you can install the host drivers manually.

Note - To install the latest kernels, which are not mentioned in “Unbundled Installation Method” on page 10, you can use the `yum install` *kernel-file* command or manually download the *kernel-file* and then install.

- **Install the user space application.**

  For example:

  ```
  rpm -ivh orclovn-user-6.0.0-1.x86_64.rpm
  ```

Note - If you are installing or configuring host drivers for any other kernel, you have to override the kernel version by using the following command:

```
/opt/xsigo/bin/orclovn-setup --kversion <Kernel-version> --ofed-version <ofed
Version> --install
```

By default, the first UEK kernel in your current `grub.conf` file is chosen.

Examples for Oracle Linux 6:

- For kernel `2.6.39-400.209.1.el6uek` and `OFED` version `1.5.5.151`, use:

  ```
  opt/xsigo/bin/orclovn-setup --kversion 2.6.39-400.209.1.el6uek --ofed-
  version 1.5.5.151 —-install
  ```

- For kernel `2.6.39-400.209.1.el5uek` and native `OFED` drivers, use:

  ```
  opt/xsigo/bin/orclovn-setup —-kversion 2.6.39-400.209.1.el6uek --ofed-
  version native —-install
  ```

For Oracle Linux 5 or Oracle VM, the examples and syntax are the same except for the kernel version string.

Install Host Drivers (Yum)

Before installing the host drivers, ensure that the following prerequisites are met:

- The Yum repository is reachable through the network by the Oracle Linux server
- The Yum service is running correctly
- You have root access to the Yum repository

Using Yum, you will install the kernel and Oracle Virtual Networking user space application from the Yum repository by using the `yum install` command. Using Yum, you do not install the software from the Oracle server or the Oracle Fabric Interconnect.

- **Install the Oracle Virtual Networking user space application from the Yum repository of the RPM.**

  For example:

  ```
  yum install orclovn-user.x86_64
  ```

Enable the Oracle Virtual Networking Service

This procedure describes how to activate the Oracle Virtual Networking service, which is called `xsigo`.

1. **Turn on the Oracle Virtual Networking Service:**

   ```
   chkconfig xsigo on
   ```

2. **Verify that the service is running:**

   ```
   chkconfig –list xsigo
   xsigo           0:off   1:off   2:on    3:on    4:on    5:on    6:off
   ```

3. **Re-create the `INITRD` with Oracle Virtual Networking modules inserted into it.**

   ```
   /opt/xsigo/bin/orclovn-setup --install
   ```

   By default, the `orclovn-user` package chooses the first UEK from your current `grub.conf` file.

4. **(Oracle Linux 7 hosts only) Enable the `ovn.service` module.**

   ```
   systemctl enable ovn.service
   ```

5. **Reboot the host server.**

   By default, the `orclovn-user` package chooses the first UEK from your current `grub.conf` file.

Verify That the Server Is Detected by the Oracle Fabric Interconnect

After the server has completed its reboot, verify that the server is detected from the Oracle Fabric Interconnect.

- **Log in to the Oracle Fabric Interconnect and verify that the host server is show in the physical server list.**

  ```
  show physical-server

  name      guid         descr port        os                                    version
        server-profile

  ----------------------------------------------------------------------------------------------------------------

  elbert 21280001fc8f22 jammu:ServerPort20 Linux/2.6.39-400.209.1.el6uek/x86_64 2.11.2010
  /3.0.0 elbert
  ```

Related Information

- “Installing Host Drivers (Local Install Method)” on page 31
- “Installing to SAN Disk (PXE Installation Method)” on page 39
- “Installing to iSCSI Disk (PXE Install Method)” on page 43

Installing to SAN Disk (PXE Installation Method)

PXE installing involves creating a server boot image that resides on another device, typically a LUN in the SAN. PXE booting is useful for blades and other diskless servers that lack an internal hard drive where the kernel, OS/hypervisor, and host drivers can be loaded. When PXE installing a server's boot information, you will create a driver disk, inject the Oracle Virtual Networking host drivers into the boot image, then reboot the server.

Enabling the host drivers consists of the following main tasks:

- “Download and Extract the Image” on page 39
- “Append the Host Drivers to the Driver Disk (Oracle Linux 6)” on page 40
- “Make a Custom Driver Disk (Oracle Linux 5 Update 9 or Oracle VM)” on page 40
- “Install the Kernel Software and Host Drivers” on page 41
- “Enable the Oracle Virtual Networking Service” on page 42
- “Verify That the Server Is Detected by the Oracle Fabric Interconnect” on page 42

▼ Download and Extract the Image

Download `xsigo-boot-5.0.7-LX.tar` for XgBoot and get the standard Red Hat image (`rhdd.img`) by extracting the tar file.

1. **Access the tar file from:**

   `http://www.oracle.com/technetwork/server-storage/xsigo-1870185.html?ssSourceSiteId=ocomen and`

2. **On that page, download *Oracle Virtual Networking Drivers for RedHat Enterprise Linux*.**

3. **Extract the `xsigo-boot.tar` file to a folder and make a PXE label by appending the file with `xsigo-rhdd.img`.**

Append the Host Drivers to the Driver Disk (Oracle Linux 6)

For the Oracle Linux 6, Update 4 OS, you can append the PXE label directly to the driver disk.

- **Run the `rpm ivh -append` command, and type the following text:**

```
Label  OEL6u4-LX507

Kernel OEL6u4-vmlinuz

append initrd=OEL6u4-initrd.img,OEL6u4-xsigo-rhdd-2.6.32-358.el6.x86_64-

                          5.0.7.LX-x86_64.img network
```

Make a Custom Driver Disk (Oracle Linux 5 Update 9 or Oracle VM)

To make the driver disk for the Oracle Linux 5, Update 9 or Oracle VM, you need to use the stock `initrd` file that Red Hat provides (included in the `.tar` file). You run a proprietary Oracle Virtual Networking tool named `xg-insert-dd` to inject specific information into the stock `initrd`. When the custom `initrd` is created and used as the server's boot image, Oracle Linux 5 Update 9 servers boot up with the Oracle Virtual Networking vNIC and vHBA drivers included, and vNICs and vHBAs are loaded into the OS like any physical device.

1. **Download `xsigo-boot-5.0.7-LX.tar` for XGboot from `http://download.oracle.com/otn-pub/otn_software/xsigo/RHEL-5_0_7-LX.tgz`.**

2. **Extract the downloaded tar file to a separate folder.**

   The `rhdd.img` will be part of the extracted files.

3. **Copy the stock `initrd.img` that comes with the Red Hat distribution CD or the Oracle Linux distribution CD image to extracted folder.**

4. **Insert Oracle Virtual Networking host drivers into the stock `initrd.img`.**

   ```
   ./xg-insert-dd xsigo-rhdd-2.6.18-348.el5-5.0.7.LX-x86_64.img initrd.img
   ```

   When you run the proprietary tool `xg-insert-dd`, it opens the default `initrd` for editing, places the Oracle Virtual Networking host drivers inside, then repacks the `initrd` as a custom `initrd` with the prefix `xsigo-initrd.img`.

5. **Make a PXE label on the PXE server by appending the following to the `xsigo-initrd.img` file.**

```
Label   OEL5U9-LX507

    kernel   OEL5U9-vmlinuz-507LX

    append   initrd=xsigo-initrd-OEL5U9-5.0.7-LX.img network
```

Proceed with the OS installation, but do not reboot the host. Before rebooting the host, you need to install the host drivers to boot from SAN-based disk.

Note - In the case of PXE installation to iSCSI and vHBA disk, you must install the drivers before reboot.

▼ Install the Kernel Software and Host Drivers

You must perform this procedure from the host console command line, which is typically accessible through the Ctrl+Alt+F2 key sequence.

1. **Mount the new system disk and enable SSH for the SCP.**

```
chroot /mnt/sysimage
/etc/init.d/sshd start
```

2. **Copy the userspace RPM through SCP from TFTP server.**

3. **Perform one of the following:**

   - **Install the userspace RPM manually.**

     ```
     rpm -ivh orclovn-user-6.0.0-1.x86_64.rpm
     ```

   - **Install the userspace RPM by using YUM.**

     ```
     yum install orclovn-user-6.0.0-1.x86_64.rpm
     ```

4. **Run the setup script to load the Oracle Virtual Networking software modules into the `initrd` (or `initramfs`) files.**

```
/opt/xsigo/bin/orclovn-setup --install
title Oracle Linux Server (2.6.39-400.209.1.el6uek)

Oracle Linux Server release 6.4

Creating new initrd using /sbin/xgmkinitrd /boot/initrd-2.6.39-400.209.1.el6uek.img
 2.6.39-400.209.1.el6uek
```

```
Running /sbin/mkinitrd -f --preload mlx4_ib --preload mlx4_core --preload
 xscore --preload xsvhba --preload xsvnic --with dm-multipath  /boot/
initrd-2.6.39-400.209.1.el6uek.img 2.6.39-400.209.1.el6uek

WARNING: using /tmp for temporary files

Please use /sbin/xgmkinitrd /boot/initrd-2.6.39-400.209.1.el6uek.img
 2.6.39-400.209.1.el6uek to create any new initrd files.

This is a wrapper script around mkinitrd which includes the Xsigo drivers

Done
```

Note - The setup script runs for Oracle Linux 6, Oracle Linux 5, and Oracle VM. The script's syntax is the same regardless of server OS or hypervisor, but the output of the script differs based on the OS or hypervisor.

Enable the Oracle Virtual Networking Service

This procedure describes how to activate the Oracle Virtual Networking service, which is called `xsigo`.

1. **On the host, turn on the Oracle Virtual Networking service:**

   ```
   chkconfig xsigo on
   ```

2. **Verify that the service is running:**

   ```
   chkconfig –list xsigo
   xsigo           0:off   1:off   2:on  3:on   4:on   5:on  6:off
   ```

3. **(Oracle Linux 7 hosts only) Enable the `ovn.service` module:**

   ```
   systemctl enable ovn.service
   ```

4. **Reboot the host.**

Verify That the Server Is Detected by the Oracle Fabric Interconnect

After the server has completed its reboot, verify that the server is detected from the Oracle Fabric Interconnect.

- **Log in to the Oracle Fabric Interconnect and verify that the host server is shown in the physical server list:**

```
show physical-server
name      guid           descr port        os    version         server-profile
-------------------------------------------------------------------------------
elbert 21280001fc8f22  jammu:ServerPort20 Linux/2.6.39-400.209.1.el5uek/x86_64 2.11.2010
/3.0.0 elbert
```

Related Information

- “Installing Host Drivers (Local Install Method)” on page 31
- “Installing to Local Disk (PXE Installation Method)” on page 34
- “Installing to iSCSI Disk (PXE Install Method)” on page 43

Installing to iSCSI Disk (PXE Install Method)

PXE installing involves creating a server boot image that resides on another device, typically a LUN in the iSCSI array (target). iSCSI booting is useful for blades and other diskless servers that lack an internal hard drive where the kernel, OS/hypervisor, and host drivers can be loaded. When PXE installing a server's boot information, you will create a driver disk, inject the Oracle Virtual Networking host drivers into the boot image, and then reboot the server.

During the host boot process, you are prompted for the iSCSI initiator's and target's IQN, which you will need to supply for the boot process to complete.

Enabling the host drivers consists of the following main tasks:

- “Download and Extract the Image” on page 43
- Depending on your host server type, either:
  - “Append the Host Drivers to the Driver Disk (Oracle Linux 6)” on page 44
  - “Make a Custom Driver Disk (Oracle Linux 5, Update 9 or Oracle VM)” on page 44
- “Install the Kernel Software and Host Drivers” on page 45
- “Enable the Oracle Virtual Networking Service” on page 46.
- “Verify That the Server Is Detected by the Oracle Fabric Interconnect” on page 47

▼ Download and Extract the Image

Download `xsigo-boot-5.0.7-LX.tar` for XgBoot and get the standard Red Hat image (`rhdd.img`) by extracting the tar file.

1. **Access the tar file from:**

   http://www.oracle.com/technetwork/server-storage/xsigo-1870185.html?ssSourceSiteId=ocomen and

2. **On that page, download *Oracle Virtual Networking Drivers for RedHat Enterprise Linux*.**

3. **Extract the `xsigo-boot.tar` file to a folder, and make a PXE label by appending the file with `xsigo-rhdd.img`.**

Append the Host Drivers to the Driver Disk (Oracle Linux 6)

For the Oracle Linux 6, Update 4 OS, you can append the PXE label directly to the driver disk.

- **Run the `rpm ivh -append` command and type the following text:**

```
Label  OEL6u4-LX507

Kernel OEL6u4-vmlinuz

append initrd=OEL6u4-initrd.img,OEL6u4-xsigo-rhdd-2.6.32-358.el6.x86_64-

                          5.0.7.LX-x86_64.img network
```

Make a Custom Driver Disk (Oracle Linux 5, Update 9 or Oracle VM)

To make the driver disk for Oracle Linux 5, Update 9 or Oracle VM, you need to use the stock `initrd` that Red Hat provides (included in the `.tar` file) and run a proprietary Oracle Virtual Networking tool named `xg-insert-dd` to inject specific information into the stock `initrd`. When the custom `initrd` is created and used as the server's boot image, Oracle Linux 5, Update 9 servers boot up with the Oracle Virtual Networking vNIC and vHBA drivers included, and vNICs and vHBAs are loaded into the OS like any physical device.

1. **Download the `xsigo-boot-5.0.7-LX.tar` tar file for XGboot from `http://download.oracle.com/otn-pub/otn_software/xsigo/RHEL-5_0_7-LX.tgz`.**

2. **Extract the downloaded tar file to a separate folder.**

   The `rhdd.img` file will be part of the extracted files.

3. **Copy the stock `initrd.img` file that comes with the Red Hat distribution CD or the Oracle Linux distribution CD image to the extracted folder.**

4. **Insert Oracle Virtual Networking host drivers into the stock `initrd.img`.**

```
./xg-insert-dd xsigo-rhdd-2.6.18-348.el5-5.0.7.LX-x86_64.img initrd.img
```

When you run the proprietary tool `xg-insert-dd`, it opens the default `initrd` for editing, places the Oracle Virtual Networking host drivers inside, and then repacks the `initrd` as a custom `initrd` with the prefix `xsigo-initrd.img`.

5. **Make a PXE label on the PXE server by appending the following to the `xsigo-initrd.img`.**

```
Label   OEL5U9-LX507

    kernel   OEL5U9-vmlinuz-507LX

    append   initrd=xsigo-initrd-OEL5U9-5.0.7-LX.img network
```

6. **Boot the server with HCA.**

XGBoot finds vNIC/vHBA by establishing XSMP session with chassis.

7. **Provide the PXE label when the PXE prompts, and start the installation on the specified iSCSI based LUN.**

8. **Install the user-space RPM by accessing the console.**

Note - You must install the host driver, kernel firmware, or kernel on vHBA and iSCSI-based remote disk before rebooting the host.

▼ Install the Kernel Software and Host Drivers

You must perform this procedure from the host console command line, which is typically accessible through the Ctrl+Alt+F2 key sequence.

1. **Mount the new system disk and enable SSH for the SCP.**

```
chroot /mnt/sysimage
/etc/init.d/sshd start
```

2. **Copy the user space RPMs through SCP from a TFTP server.**

3. **Perform one of the following:**

- **Install the userspace RPM manually.**

  ```
  rpm -ivh orclovn-user-6.0.0-1.x86_64.rpm
  ```

- **Install the user-space RPM by using YUM.**

  ```
  yum install orclovn-user-6.0.0-1.x86_64.rpm
  ```

4. **Run the setup script to load the Oracle Virtual Networking software modules into the `initrd` (or `initramfs`) files.**

```
/opt/xsigo/bin/orclovn-setup --install

title Oracle Linux Server (2.6.39-400.209.1.el6uek)

Oracle Linux Server release 6.4

Creating new initrd using /sbin/xgmkinitrd /boot/initrd-2.6.39-400.209.1.el6uek.img
 2.6.39-400.209.1.el6uek

Running /sbin/mkinitrd -f --preload mlx4_ib --preload mlx4_core --preload xscore --preload xsvhba --
preload xsvnic --with dm-multipath  /boot/initrd-2.6.39-400.209.1.el6uek.img 2.6.39-400.209.1.el6uek

WARNING: using /tmp for temporary files

Please use /sbin/xgmkinitrd /boot/initrd-2.6.39-400.209.1.el6uek.img 2.6.39-400.209.1.el6uek to create
 any new initrd files.

This is a wrapper script around mkinitrd which includes the Xsigo drivers

Done
```

Note - The setup script runs for Oracle Linux 6, Oracle Linux 5, and Oracle VM. The script's syntax is the same regardless of server OS or hypervisor, but the output of the script differs based on the OS or hypervisor.

▼ Enable the Oracle Virtual Networking Service

This procedure describes how to activate the Oracle Virtual Networking service, which is called `xsigo`.

1. **On the host, turn on the Oracle Virtual Networking service:**

   ```
   chkconfig xsigo on
   ```

2. **Verify that the service is running:**

```
chkconfig –list xsigo
xsigo           0:off   1:off   2:on  3:on   4:on   5:on  6:off
```

3. **(Oracle Linux 7 hosts only) Enable the ovn.service module.**

```
# systemctl enable ovn.service
```

4. **Reboot the server.**

Verify That the Server Is Detected by the Oracle Fabric Interconnect

After the server has completed its reboot, verify that the server is detected from the Oracle Fabric Interconnect.

- **Log in to the Oracle Fabric Interconnect and verify that the host server is shown in the physical server list:**

```
show physical-server
name      guid           descr port        os    version         server-profile
-------------------------------------------------------------------------------
elbert 21280001fc8f22  jammu:ServerPort20 Linux/2.6.39-400.209.1.el5uek/x86_64
 2.11.2010/3.0.0 elbert
```

Related Information

- “Installing Host Drivers (Local Install Method)” on page 31
- “Installing to Local Disk (PXE Installation Method)” on page 34
- “Installing to SAN Disk (PXE Installation Method)” on page 39

Downgrading to an Older Version of Kernel or Host Driver

If you need to install an earlier version of host driver, you cannot just reinstall the older version while the newer version is still in memory. If you do so, the older version of host driver does not overwrite the newer version, and mismatches can occur among the various software modules installed. See “Mismatched Driver Error Messages” on page 50.

If you will be installing an older version of host driver, you must completely uninstall all components of the newer version, and perform a fresh install of the older host driver software.

▼ Downgrade to an Earlier Version of Host Driver

1. **Uninstall the kernel RPM and user space RPM from the system.**
2. **Install the host driver and reboot the host.**
3. **Confirm that the host is shown on the Oracle Fabric Interconnect in the physical server list:**

```
show physical-server

name      guid           descr port        os                                  version
       server-profile

------------------------------------------------------------------------------

elbert 21280001fc8f22  jammu:ServerPort20 Linux/2.6.39-400.17.1.el6uek/x86_64  2.11.2010
/3.0.0 elbert
```

Related Information

- “Upgrading Host Driver and Kernel Types” on page 16

Mismatched Driver Error Messages

If you install user space application and old host drivers simultaneously on the same server, the following error messages will be displayed when you install the mismatched drivers:

```
rpm -ivh xsigo-hostdrivers-kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64.rpm

Preparing...          ########################################### [100%]

        file /etc/init.d/xsigo from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64

        file /opt/xsigo/.config/xen/__init__.pyc from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64

        file /opt/xsigo/.config/xen/__init__.pyo from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64

        file /opt/xsigo/.config/xen/xg.pyc from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64

        file /opt/xsigo/.config/xen/xg.pyo from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64

        file /opt/xsigo/.config/xen/xsigoutils.pyc from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64

        file /opt/xsigo/.config/xen/xsigoutils.pyo from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64

        file /opt/xsigo/bin/xsigo-support from install of xsigo-hostdrivers-
kmod-2.6.39_400.17.1.el6uek.5.0.7.LX-1.x86_64 conflicts with file from package orclovn-
user-6.0.r7493-1.x86_64.
```

If these messages appear, use the procedure documented in “Downgrade to an Earlier Version of Host Driver” on page 49.