



## **Cisco UCS Virtual Interface Card Drivers for Linux Installation Guide**

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## Preface

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This preface includes the following sections:

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## Organization

This document includes the following parts:

Chapter	Title	Description
Chapter 1	Overview	Contains an overview of Cisco UCS VIC drivers.
Chapter 2	Downloading and installing Cisco UCS VIC Drivers	Contains information about how to obtain and install Cisco UCS VIC drivers.
Chapter 3	Uninstalling Cisco UCS VIC Drivers	Contains information about uninstalling Cisco UCS VIC drivers.

## New and Changed Information for this Release

The following table provides an overview of the significant changes to this guide for this current release. The table does not provide an exhaustive list of all changes made to this guide or of the new features in this release. For information about new supported hardware in this release, see the *Release Notes for Cisco UCS Software* available through the [Cisco UCS B-Series Servers Documentation Roadmap](#).

**Table 1: New Features**

Feature	Description	Where Documented
New Cisco UCS VIC drivers installation guide	Platform-specific installation guides for Cisco UCS VIC drivers.	<i>Cisco UCS Virtual Interface Card Drivers for Linux Installation Guide</i>

## Related Cisco UCS Documentation

### Documentation Roadmaps

For a complete list of all B-Series documentation, see the *Cisco UCS B-Series Servers Documentation Roadmap* available at the following URL: <http://www.cisco.com/go/unifiedcomputing/b-series-doc>.

For a complete list of all C-Series documentation, see the *Cisco UCS C-Series Servers Documentation Roadmap* available at the following URL: <http://www.cisco.com/go/unifiedcomputing/c-series-doc>.

For a complete list of all M-Series documentation, see the *Cisco UCS M-Series Servers Documentation Roadmap* available at the following URL: [https://www.cisco.com/c/en/us/td/docs/unified\\_computing/ucs/overview/guide/UCS\\_M\\_Series\\_Servers\\_Documentation\\_Roadmap.html](https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/overview/guide/UCS_M_Series_Servers_Documentation_Roadmap.html)

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## Overview

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This chapter includes the following sections:

- [Overview of Cisco UCS Virtual Interface Card Drivers, page 1](#)
- [Supported Hardware and Software, page 2](#)

## Overview of Cisco UCS Virtual Interface Card Drivers

Cisco UCS Virtual Interface Card (VIC) drivers facilitate communication between supported operating systems and Cisco UCS Virtual Interface Cards (VICs).

Cisco UCS VIC driver ISO bundles include an eNIC driver and an fNIC driver. The eNIC is the driver for the Cisco UCS VIC Ethernet NIC. The fNIC is the driver for the Cisco UCS VIC Fibre Channel over Ethernet HBA.



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**Important** fNIC is not supported in Cisco UCS Manager Release 2.5.

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Cisco UCS Manager Release 2.5, which introduces Cisco UCS M-Series servers, continues to provide vNIC capabilities. Additionally, it provides for a new capability with its virtualized shared local storage. This virtual storage controller provides access to a virtual drive that is provided to the server through the shared storage controller and hard drives in the chassis. The virtual storage controller introduces a new PCIe device known as a SCSI NIC (sNIC), which is presented to the OS. The OS views these items as locally-attached SCSI devices.

The sNIC provides the pathway for SCSI commands from the server to the virtual drive. This controller is a new device to the OS and uses an sNIC driver that is loaded into the OS. Because the sNIC is a new PCIe device, the sNIC driver may not be part of some OS distributions. When that is the case, the sNIC driver must be loaded at the time of OS installation to see the storage device on the server. The sNIC driver, like the eNIC and fNIC drivers, is certified by the OS vendor and eventually included as part of the core OS install package. When the driver is present, the virtual drive is visible to the OS, and is presented as a standard hard drive connected through a RAID controller.

# Supported Hardware and Software

For a complete list of supported hardware and software, see the *Hardware and Software Interoperability Matrix* for this release located at: [http://www.cisco.com/en/US/products/ps10477/prod\\_technical\\_reference\\_list.html](http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html)





## CHAPTER 2

# Downloading and Installing Cisco UCS VIC Drivers

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This chapter contains the following sections:

- [Downloading Cisco UCS VIC Drivers, page 3](#)
- [Installing Cisco UCS VIC Drivers, page 4](#)

## Downloading Cisco UCS VIC Drivers

### Obtaining the ISO Image Bundle

This procedure describes how to download the UCS Drivers ISO bundle, which contains most Cisco UCS Virtual Interface Card drivers. In some cases, a driver may be contained in a different bundle, which will be noted in the installation procedure for that driver.

#### Procedure

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- Step 1** In a web browser, navigate to <http://www.cisco.com>.
- Step 2** Under **Support**, click **All Downloads**.
- Step 3** In the product selector, click **Products**, then click **Servers - Unified Computing**.
- Step 4** If prompted, enter your Cisco.com username and password to log in.  
You must be signed in to download Unified Computing System (UCS) drivers.
- Step 5** Choose your server.  
Cisco UCS drivers are available for **Cisco UCS B-Series Blade Server Software**, **Cisco UCS C-Series Rack-Mount UCS-Managed Server Software**, and **Cisco UCS M-Series Modular Server Software**.
- Step 6** Click **Unified Computing System (UCS) Drivers**.
- Step 7** Click the **Release Notes** link to view the latest version of the Release Notes.
- Step 8** For each driver ISO that you want to download, do the following:
  - a) Click the link for the release that you want to download.

The latest release version is selected by default.

- b) Choose your download method and follow the prompts to complete your driver download.

**Download**

Downloads the software immediately.

**Add to Cart**

Adds the software driver ISO to your cart to be downloaded at a later time.

---

**What to Do Next**

Read the Release Notes before installing the Cisco UCS Virtual Interface Card drivers.

# Installing Cisco UCS VIC Drivers

## Installation Methods

Cisco UCS Virtual Interface Card drivers for Linux can be installed in the following ways:

- OS driver disks
  - To SAN Storage using the fNIC driver and OS driver disk. (only fNIC)
- RPM
- Source tarball

In Cisco UCS Manager Release 2.5, sNIC drivers support only the following Linux OS:

- RHEL
- Centos
- Ubuntu

sNIC drivers for Linux can be installed in the following ways:

- To DAS Storage using the sNIC driver disk.
- RPM (for RHEL and CentOS only).
- Ubuntu with the sNIC driver disk image.

Administrative privileges are required to install and update Cisco UCS Virtual Interface Card drivers.

## Installing Linux Drivers to the Local Drive Using a Driver Disk

The following steps can also be followed for SLES or XenServer.

### Before You Begin

Create a DVD from the driver disk ISO image.

### Procedure

- 
- Step 1** Insert the RHEL installation DVD and at the installation menu, enter `linux dd`.  
A prompt displays requesting the driver disk.
- Note** While performing a RHEL 7.0 installation of drivers with `dd.iso`, press **Tab** at the initial launch of the DVD, edit the line and enter `dd`.
- Step 2** Remove the RHEL installation DVD and insert the DVD generated from the `dd.iso` image.  
The RHEL installer reads the new drivers and overrides the default drivers.
- After the RHEL installer finishes reading the drivers from the `dd.iso`, the RHEL installer displays a prompt requesting that you reinsert the RHEL installation DVD.
- Step 3** Remove the DVD generated from the `dd.iso` image and insert the RHEL installation DVD.
- Step 4** Complete the RHEL installation.
- Note** During installation using RHEL 7.0, unmap the OS ISO image and map the driver ISO image. Run the `refresh` command, and then select the driver with a numerical option. Run the `continue` command, and then after extraction, remap the `dvd.iso`.
- Step 5** Verify that the default RHEL driver has been replaced by the driver in the `dd.iso` image.  
For the eNIC driver, `cat /sys/module/enic/version`  
For the fNIC driver, `cat /sys/module/enic/version`
- 

## Installing Linux to SAN Storage Using the fNIC Driver and OS Driver Disk




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**Important** fNIC is not supported in Cisco UCS Manager Release 2.5.

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### Procedure

- 
- Step 1** Create a vHBA on the Cisco UCS M81KR Virtual Interface Card.
- Step 2** In Cisco UCS Manager, mark the vHBA bootable and add the WWPN of the SAN storage.  
For more information on how to do this step, see the *Cisco UCS Manager CLI Configuration Guide* or *Cisco UCS Manager GUI Configuration Guide*.
- Step 3** Boot the server using the RHEL installation DVD through vMedia.
- Step 4** At the installation menu, enter `linux dd`.  
The installer displays the available installation disks, including the local disk and the SAN disk discovered by the Cisco UCS M81KR Virtual Interface Card.
- Step 5** For the installation target, choose the SAN storage device.

The RHEL installer reads the new drivers and overrides the default drivers to install RHEL on the SAN disk.

**Step 6** Complete the RHEL installation and reboot the host, choosing SAN storage as the first boot option.

---

## Installing Linux Drivers using RPM

If the management connection is over the eNIC, we recommend that you use the serial or KVM console to complete the driver installation. Completing an `rmmod` of the current driver results in a loss of eNIC network connectivity.

### Before You Begin

Remove existing drivers by entering one of the following commands:

- `rmmod {enic | fnic}`
- `modprobe {-r enic | -r fnic}`



#### Note

If you are booting from SAN storage, you cannot remove the existing driver using the `rmmod fNIC` command because this driver is required to use the SAN LUNs. Instead, enter the `rpm --erase old-kmod-fnic-rpm-name` command to erase the old RPM. Then, enter the `rpm -ivh --nodeps new-kmod-fnic-rpm-name` command to update the driver and reboot the node. The `rpm -ivh --nodeps new-kmod-fnic-rpm-name` command replaces the older driver with the new driver in the system memory.

If an fNIC RPM is not installed, and the fNIC driver that is available with the OS kernel is used, then you need not remove any existing drivers.

To determine the package that the fNIC belongs to, perform the following steps:

- 1 Find the installed fNIC modules

```
$ find /lib/modules -name *fnic*
/lib/modules/2.6.18-194.el5/kernel/drivers/scsi/fnic/fnic.ko
```

- 2 Determine which package the fNIC modules belong to.

```
cd /lib/modules/2.6.18-194.el5/kernel/drivers/scsi/fnic/fnic.ko
rpm -qf ./fnic.ko
```

If this command displays the fNIC package name, then you must uninstall the fNIC RPM. You do not need to remove the fNIC RPM if it belongs to the Linux kernel package.

If drivers have previously been installed using the driver disk installation process, the driver disk's `enic/fnic.ko` file is in the `/lib/modules/uname -r/updates/` directory. The default search order of `depmod` (as specified in the `/etc/depmod.d/depmod.conf.dist` file) places a higher priority on the `updates/` directory. Because new RPM installations place the `enic/fnic.ko` file under `/lib/modules/uname -r/extra/`, you can rename, delete or move the driver in the `/lib/modules/uname -r/updates/` directory. Alternatively, you can also modify the `/etc/depmod.d/depmod.conf.dist` to change the search order by placing `extra/` before `updates/`. To ensure that the `depmod` picks up the RPM installation's driver and not the existing driver installed using the driver disk method.

**Procedure**

**Step 1** Install the binary RPM by entering the corresponding command for your driver:

Driver	Command
eNIC driver on RHEL	<code>rpm -ivh kmod-enic-version-0.x86_86.rpm</code>
eNIC driver on RHEL with XEN support	<code>rpm -ivh kmod-enic-version-0.x86_86.rpm</code>
eNIC driver on SuSE	<code>rpm -ivh cisco-enic-kmp-default-version-0.x86_64.rpm</code>
eNIC driver on SuSE with XEN support	<code>rpm -ivh cisco-enic-kmp-default-version-0.x86_64.rpm</code>
fNIC driver on RHEL	<code>rpm -ivh --nodeps kmod-fnic-</code>

The driver is installed but not loaded.

**Step 2** Load the driver in one of the following ways:

- Reboot the host
- Load the driver manually while the host is running by entering the `modprobe {enic | fnic}` command.

**Note** If an error message displays and says that the module is in use, remove any modules that are using the driver and then remove the driver. Issuing the `lsmod | grep {enic | fnic}` command can help you figure out which modules are in use.

If there are many references to the eNIC or fNIC module and it is not possible to remove all of the dependencies, reboot the system.

**Step 3** Verify the driver installation by entering the `sbin/lsmod | grep {enic | fnic}` command.

## Installing Linux Drivers Using the Source Tarball

To install the Linux driver for eNIC or fNIC for the first time, complete the entire procedure. To upgrade an existing driver, remove the currently running eNIC or fNIC module and then complete steps 3-10.

**Before You Begin**

Remove existing drivers by entering one of the following commands:

- `/sbin/rmmod {enic | fnic}`
- `modprobe {-r enic | -r fnic}`



**Note** If you are booting from SAN storage, you cannot remove the existing driver using the `rmmod fNIC` command because this driver is required to use the SAN LUNs. Instead, enter the `rpm --erase old-kmod-fnic-rpm-name` command to erase the old RPM. Then, enter the `rpm -ivh --nodeps new-kmod-fnic-rpm-name` command to update the driver and reboot the node. Entering the `rpm -ivh --nodeps new-kmod-fnic-rpm-name` command replaces the older driver with the new driver in the system memory.

If drivers have previously been installed using the driver disk installation process, the driver disk's `enic/fnic.ko` file is in the `/lib/modules/uname -r/updates/` directory. The default search order of `depmod` (as specified in the `/etc/depmod.d/depmod.conf.dist` file) places a higher priority on the `updates/` directory. Because new RPM installations place the `enic/fnic.ko` file under `/lib/modules/uname -r/extra/`, you can rename, delete or move the driver in the `/lib/modules/uname -r/updates/` directory. Alternatively, you can also modify the `/etc/depmod.d/depmod.conf.dist` to change the search order by placing `extra/` before `updates/`. To ensure that the `depmod` picks up the RPM installation's driver and not the existing driver installed using the driver disk method.

**Procedure**

**Step 1** Copy the source tarball to the specified folder.  
`cp {enic- | fnic}version-num.tar.gz folder-name`

**Step 2** Change directories to the specified folder.  
`cd folder-name`

**Step 3** Extract the source tarball.  
`tar xvfz {enic- | fnic}version-num.tar.gz`

**Step 4** Change directories to the eNIC or fNIC *version* folder.  
`cd {enic- | fnic}version-num`

**Step 5** Make the driver by entering one of the following commands:

Driver	Command
eNIC	<code>make CONFIG_ENIC=m</code>
fNIC	<code>make CONFIG_FNIC=m</code>

Making the driver builds the new `.ko` file and removes the existing driver. The new driver is copied to `/lib/modules/uname -r/kernel/drivers/scsi/fnic/`.

**Step 6** Install the driver by entering one of the following commands:

Driver	Command
eNIC	<code>make CONFIG_ENIC=m install</code>
fNIC	<code>make CONFIG_FNIC=m install</code>

If an `enic` or `fnic.ko` file already exists in that directory, it is renamed as `enic` or `fnic.ko.orig` during the make installation. The make file backs up the currently installed `enic` or `fnic.ko` module and replaces it with the

newly build module. For the fNIC, if libfc.ko, fcoe.ko, and libfcoe.ko exist on the system, they are left unmodified.

**Step 7** (Optional) If you installed and are booting from SAN storage, rebuild the initrd file with the updated fNIC drivers.

**Example:**

```
# cp /boot/initrd-'uname -r'.img /boot/initrd-'uname -r'.img.orig
# mkinitrd /boot/initrd-'uname -r'.img 'uname -r'
```

**Step 8** Load the driver in one of the following ways:

- Reboot the host
- Load the driver manually while the host is running by entering the **modprobe {enic | fnic}** command.
- Load the installed module manually by entering the **/sbin/insmod /lib/modules/uname-r/extra/{enic | fnic}/{enic | fnic}.ko** command.

**Note** If an error message displays and says that the module is in use, remove any modules that are using the driver and then remove the driver. Entering the **lsmod | grep {enic | fnic}** command can help you figure out which modules are in use.

If there are many references to the eNIC or fNIC module and it is not possible to remove all of the dependencies, reboot the system.

**Step 9** Verify the new driver is loaded.  
**/sbin/lsmod | grep {enic | fnic}**

**Step 10** (Optional) Enter the **fcc** command with any of the following arguments to run the FCC tool.

Argument	Description
No arguments specified	Lists all FC hosts, remote ports, and LUNs.
<b>fcc --help</b>	Lists all of the FC commands. <b>Note</b> Only the list, luns, stats, info, and reset commands work at this time. The other options are supported in the software FCoE stack only.
<b>fcc list host/host-num</b>	Lists only the hosts, ports, and LUNs associated with a single host.
<b>fcc reset host/host-num</b>	Resets the specified host.

The FCC tool that is packaged with the driver and can be used to list all of the associated Fibre Channel HBAs, remote ports, and LUNs. Entering the **make install** command copies the FCC to the /root/bin/ directory and creates a link to this file in the /bin/ directory.

The following example extracts version 11 of the tarball to a folder called tmp and installs the driver. The driver is loaded using the reboot method.

```
$ cp enic-11.tar.gz /tmp
$ cd /tmp
$ tar xvfz enic-11.tar.gz
$ cd enic-11
$ make CONFIG_ENIC=m
# make CONFIG_ENIC=m install
```

### What to Do Next

After the reboot, you can run the following commands to ensure that the correct driver is loaded:

```

$ ([root@linux-host]# dmesg | grep -i fnic
$ fnic: Cisco FCoE HBA Driver, ver 1.5.0.1
$ scsi0 : fnic
$ scsil : fnic

```

## Installing sNIC Drivers for Linux

### Installing Linux to DAS Storage Using the sNIC Driver Disk

#### Procedure

- 
- Step 1** In the **Navigation** pane of Cisco UCS Manager, click the **Servers** tab.
  - Step 2** On the **Servers** tab, expand **Servers > Service Profiles**.
  - Step 3** Create a service profile with two LUNs and associate it with a server.  
Detailed information about creating a service profile and associating it with a server is available in *Cisco UCS Manager CLI Configuration Guide, Release 2.2*.
  - Step 4** For the service profile that you created, configure a local disk as the first boot device.  
Detailed information about configuring a local disk as the first boot device is available in *Cisco UCS Manager CLI Configuration Guide, Release 2.2*.
  - Step 5** Boot the server using the OS installation DVD through vMedia.
  - Step 6** At the installation menu, enter `linux dd`.  
A message appears that asks you whether you have a driver disk.
  - Step 7** If you have a driver disk, select **Yes** and map the driver disk `dd-snic-version` to the vMedia.
  - Step 8** Select the relevant vMedia.  
The OS installer reads the new drivers and overrides the default drivers to install the OS on the DAS disk.
  - Step 9** Ensure that the DAS storage is discovered.
  - Step 10** Complete the OS installation, and reboot the host.
- 

### Installing sNIC Linux Drivers using RPM

You can use RPM to install sNIC drivers only on RHEL and CentOS.



**Important** Use this procedure only to upgrade driver versions



## Procedure

---

- Step 1** Install the binary RPM on RHEL and CentOS by using the **rpm -ivh *snic-rpm-package*** command for the sNIC driver.  
The driver is installed, but not loaded.  
If the OS is already installed by using DD, then using this command displays an error message. You can use the RPM package only for upgrading the driver version by using the **rpm -Uvh *snic-rpm-package*** command. After this is done, you cannot unload the sNIC driver.
- Step 2** List the module information for the sNIC driver by entering the **modinfo snic** command.  
The driver version in the kernel may not be upgraded before rebooting the host.
- Step 3** Reboot the host.  
After reboot, the host boots successfully with the latest driver.
- Step 4** Verify that the driver version is the same when you run the **modinfo snic** command and the **cat /sys/module/snic/version** command.
- 

## Installing sNIC Linux Drivers Using the Source Tarball

### Procedure

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- Step 1** Copy the source tarball to the specified folder.  
**cp {snic}version-num.tar.gz folder-name**
- Example:**  
**cp snic-0.0.19.tar.gz**
- Step 2** Change directories to the specified folder.  
**cd folder-name**
- Example:**  
**cd /tmp**
- Step 3** Extract the source tarball.  
**tar xvfz {snic}version-num.tar.gz**
- Example:**  
**# tar xvf snic-0.0.19.tar**
- Step 4** Change directories to the sNIC *version* folder.  
**cd {snic}version-num**
- Example:**  
**# cd snic-0.0.19**
- Step 5** Make the driver by entering the following command:  
**make CONFIG\_SCSI\_SNIC=m**

Making the driver builds the new .ko file and removes the existing driver. The new driver is copied to /lib/modules/`uname -r`/kernel/drivers/scsi/snic/.

**Example:**

```

]# make CONFIG_SCSI_SNIC=m
make -C /lib/modules/2.6.32-431.el6.x86_64/build M=/root/snic-0.0.1.19/drivers/scsi modules
make[1]: Entering directory `/usr/src/kernels/2.6.32-431.el6.x86_64'
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_attrs.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_main.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_res.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_isr.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_ctl.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_io.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_scsi.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_disc.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_debugfs.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_trc.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic_dbg.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/vnic_cq.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/vnic_intr.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/vnic_dev.o
CC [M] /root/snic-0.0.1.19/drivers/scsi/snic/vnic_wq.o
LD [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic.o
Building modules, stage 2.
MODPOST 1 modules
CC /root/snic-0.0.1.19/drivers/scsi/snic/snic.mod.o
LD [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic.ko.unsigned
NO SIGN [M] /root/snic-0.0.1.19/drivers/scsi/snic/snic.ko
make[1]: Leaving directory `/usr/src/kernels/2.6.32-431.el6.x86_64'

```

**Step 6** Install the driver by entering the following command:

**make CONFIG\_SCSI\_sNIC=m install**

If the snic.ko file already exists in that directory, it is renamed as snic.ko.orig during the make installation. The make file backs up the currently installed snic.ko module and replaces it with the newly built module.

**Example:**

```

]# make CONFIG_SCSI_SNIC=m install
install: backing up old versions of modules
#
# Just find all .ko files in /lib/modules/2.6.32-431.el6.x86_64/kernel/drivers/scsi/
# directory,
# and backup the file if it isn't a soft link.
#
find /lib/modules/2.6.32-431.el6.x86_64/kernel/drivers/scsi/ \
 \(-name snic.ko -o -false\) | \
 xargs -t -r -I {} -i sh -c '[ -h {} ] || cp {} {}.orig'
install: completed backing up original OS .ko files
install: backing up last built .ko files
find /lib/modules/2.6.32-431.el6.x86_64/extra/ \
 \(-name snic.ko -o -false\) | \
 xargs -t -r -I {} -i sh -c 'mv {} {}.prev '
sh -c mv /lib/modules/2.6.32-431.el6.x86_64/extra/snic.ko
/lib/modules/2.6.32-431.el6.x86_64/extra/snic.ko.prev
make -C /lib/modules/2.6.32-431.el6.x86_64/build M=/root/snic-0.0.1.19/drivers/scsi
modules_install
make[1]: Entering directory `/usr/src/kernels/2.6.32-431.el6.x86_64'
INSTALL /root/snic-0.0.1.19/drivers/scsi/snic/snic.ko
DEPMOD 2.6.32-431.el6.x86_64
make[1]: Leaving directory `/usr/src/kernels/2.6.32-431.el6.x86_64'
if [ -d /lib/modules/2.6.32-431.el6.x86_64/kernel/drivers/scsi/7snic ]; then \
 find /lib/modules/2.6.32-431.el6.x86_64/extra/ \
 \(-name snic.ko -o -false\) | \
 xargs -t -r -I {} -i sh -c 'rm -f `echo {} | sed -e \
 "s!extra!kernel/drivers/scsi!g"`; ln -s {} `echo {} | \
 sed -e "s!extra!kernel/drivers/scsi!g"`' ; \
 fi

```

```
#
# Finally, copy the snic_admin script to /bin/
#
rm -f /bin/snic_admin
cp /root/snic-0.0.1.19/tools/bin/snic_admin /bin/
/sbin/depmod -a > /dev/null
```

**Step 7** (Optional) If you installed and are booting from DAS storage, rebuild the initrd file with the updated sNIC drivers.

**Example:**

```
# cp /boot/initrd-'uname -r'.img /boot/initrd-'uname -r'.img.orig
# mkinitrd /boot/initrd-'uname -r'.img 'uname -r'
```

**Step 8** Verify that the new driver is loaded.

```
/sbin/lsmmod | grep {snic}
```

**Example:**

```
# lsmod | grep snic

snic                108564  2
```

**What to Do Next**

After the reboot, you can run the following command to ensure that the correct driver is loaded:

```
$ ([root@linux-host]# dmesg | grep -i snic
snic: Cisco SCSI NIC Driver, ver 0.0.1.19
snic: Trace Facility Enabled.
snic: snic device 1137: 46:1137: 12a:
snic: snic device bus 5: slot 0: fn 0
scsi host0: snic0 = ffff880414a9a5e0 shost = ffff880414a9a000 device bus 5: slot 0: fn 0
snic 0000:05:00.0: PCI INT B -> GSI 17 (level, low) -> IRQ 17
snic 0000:05:00.0: setting latency timer to 64
snic: vNIC resources wq 64
snic: vNIC mtu 2048 intr timer 0
snic: vNIC flags 0x0 luns per tgt 256
snic: vNIC io throttle count 64
snic: vNIC port down timeout 0 port down io retries 30
snic: vNIC back end type = 1
snic: vNIC hid = 4
snic 0000:05:00.0: irq 33 for MSI/MSI-X
snic 0000:05:00.0: irq 34 for MSI/MSI-X
snic 0000:05:00.0: irq 35 for MSI/MSI-X
snic: vNIC interrupt mode: MSI-X
snic:wq 1 cq 2 intr 3
scsi0 : snic
scsi host0: snic state change from SNIC_INIT to SNIC_ONLINE
scsi host0: Retrieving snic params.
scsi host0: SNIC Device Probe Successful.
scsi host0: Scanning snic_das_tgt:0:0-5.
scsi host0: Scanning snic_das_tgt:0:0-4.
```

**Installing Ubuntu with sNIC Driver Disk Image**

**Procedure**

- Step 1** Download the disk image from the build server.
- Step 2** Map the driver disk image and OS ISO images to vMedia.

**Note** The driver disk image must be mapped as a removable disk under vMedia.

- Step 3** Boot from the **BIOS boot menu**, by using the mapped DVD.  
The Ubuntu OS detects the virtual driver disk.
- Step 4** Select **Yes** to load drivers from the internal virtual driver disk.

## Upgrading Ubuntu with sNIC Driver Disk Image

Upgrading Ubuntu drivers includes upgrading three packages in the following order:

- 1 `snic-image-generic_<version>-0ubuntu1_amd64.deb`
- 2 `snic_<version>-0ubuntu1_amd64.deb`
- 3 `snic-common_<version>-0ubuntu1_amd64.deb`

### Procedure

- Step 1** Upgrade the three packages.

**Example:**

```
# sudo dpkg -i snic-3.13.0-32-generic_0.0.1.14-0ubuntu1_amd64.deb
(Reading database ... 55192 files and directories currently installed.)
Preparing to unpack snic-3.13.0-32-generic_0.0.1.14-0ubuntu1_amd64.deb ...
Unpacking snic-3.13.0-32-generic (0.0.1.14-0ubuntu1) over (0.0.1.12-0ubuntu1) ...
Setting up snic-3.13.0-32-generic (0.0.1.14-0ubuntu1) ...

# sudo dpkg -i snic_0.0.1.14-0ubuntu1_amd64.deb
(Reading database ... 55192 files and directories currently installed.)
Preparing to unpack snic_0.0.1.14-0ubuntu1_amd64.deb ...
Unpacking snic (0.0.1.14-0ubuntu1) over (0.0.1.14-0ubuntu1) ...
Setting up snic (0.0.1.14-0ubuntu1) ...
Building module database ...
filename:      /lib/modules/3.13.0-32-generic/extra/snic/snic.ko
author:       abc <abc@email.com>
version:      0.0.1.14
description:   Cisco SCSI NIC Driver
license:      GPL v2
srcversion:    FE26EB9752C9F8C25FBCD95
alias:        pci:v00001137d00000046sv*sd*bc*sc*i*
depends:
vermagic:     3.13.0-32-generic SMP mod_unload modversions
parm:         snic_log_level:bitmask for snic logging levels (int)
parm:         snic_trace_max_pages:Total allocated memory pages for snic trace buffer
              (uint)
parm:         snic_max_qdepth:Queue depth to report for each LUN (uint)
Updating initramfs ...
update-initramfs: Generating /boot/initrd.img-3.13.0-32-generic

# sudo dpkg -i snic-common_0.0.1.14-0ubuntu1_amd64.deb
(Reading database ... 55192 files and directories currently installed.)
Preparing to unpack snic-common_0.0.1.14-0ubuntu1_amd64.deb ...
Unpacking snic-common (0.0.1.14-0ubuntu1) over (0.0.1.12-0ubuntu1) ...
Setting up snic-common (0.0.1.14-0ubuntu1) ...
```

- Step 2** Verify that the upgrade has completed successfully.

**Example:**

```
$ sudo dpkg -s snic
Package: snic
Status: install ok installed
Priority: standard
Section: kernel
Installed-Size: 26
Maintainer: abc <abc@email.com>
Architecture: amd64
Version: 0.0.1.14-0ubuntu1
Provides: snic
Depends: snic-3.13.0-32-generic (= 0.0.1.14-0ubuntu1)
Description: Meta-package for installing the latest snic drivers.
 This is meta-package for Cisco sNIC driver (meta).
```

## Displaying sNIC Status Using the sNIC Admin Utility

**Procedure**

**# snic\_admin**

Displays the status of the sNIC device.

This example shows how to display the status of the sNIC device:

```
# snic_admin
SNIC HBAs:
host2
SCSI States:
HBA      Device      Mode      State      Busy [ DrVer ]
host2    snic2       Initiator running    0      [ 0.0.1.2 ]

host2 Targets
snic_sas_tgt:2:0-0          SNIC Target

host2 LUNs:
Path      Device      Size  Vendor      Model      State
2:0:0:0   sdb         32 GB LSI          MR9271-8i  running
2:0:0:1   sdc         32 GB LSI          MR9271-8i  running
```

## Displaying sNIC Statistics Using the sNIC Admin Utility

**Procedure**

	Command or Action	Purpose
<b>Step 1</b>	# snic_admin stats	Displays the statistics of the sNIC device.

This example shows how to display the statistics of the sNIC device:

```
# snic_admin stats
host0 Statistics:
```

```

-----
      IO Statistics
-----
Active IOs           : 28
Max Active IOs      : 50
Total IOs           : 37751401
IOs Completed       : 37751373
IOs Failed          : 0
IOs Not Found       : 0
Memory Alloc Failures : 0
REQs Null           : 0
SCSI Cmd Pointers Null : 0
Max SGL for any IO  : 60
Max IO Size         : 1024 Sectors
Max Queuing Time    : 1
Max Completion Time : 1
Max IO Process Time(FW) : 363 (363 msec)

SGL Counters
  117396      4038      5428      623191      590080      1787      1542      30045078
  6356933      578      2157      253      158      99      67      1918
      86      99      46      26      31      27      36      30
      19      29      27      45      20      25      31      56
      13      1      1      1      1      1      3      4
      2      1      2      0      1      0      2      1
      0      0      2      3      2      2      0      1
      1      1      2      12

-----
      Abort Statistics
-----
Aborts           : 0
Aborts Fail      : 0
Aborts Driver Timeout : 0
Abort FW Timeout : 0
Abort IO NOT Found : 0

-----
      Reset Statistics
-----
HBA Resets           : 0
HBA Reset Cmpls      : 0
HBA Reset Fail       : 0

-----
      Firmware Statistics
-----
Active FW Requests   : 28
Max FW Requests      : 50
FW Out Of Resource Errs : 0
FW IO Errors         : 0
FW SCSI Errors       : 0

-----
      Other Statistics
-----
Last ISR Time        : 4367682369 ( 4367018.481279912)
Last Ack Time        : 4367682355 ( 4367018.467282040)
ISRs                 : 64909272
Max CQ Entries       : 9
Data Count Mismatch  : 0
IOs w/ Timeout Status : 0
IOs w/ Aborted Status : 0
IOs w/ SGL Invalid Stat : 0
WQ Desc Alloc Fail   : 0
Queue Full           : 0
Queue Ramp Up        : 0
Queue Ramp Down      : 0
Queue Last Queue Depth : 0
Target Not Ready     : 0
IOs fw processing (<= 10ms) : 1042938
IOs fw processing (>10 && <= 100ms) : 34946117
IOs fw processing (>100 && <= 500ms) : 1762320

```

IOs fw processing (>500ms) : 0

-----  
 IO Compl CQ Info  
 -----

CQ ring base : 0x413854000  
 CQ ring size : 192  
 CQ head : 0  
 CQ tail : 143  
 CQ tail color : 0  
 CQ to clean idx : 143  
 CQ last color : 1







## Uninstalling Cisco UCS VIC Drivers

This chapter contains the following sections:

- [Unloading sNIC Drivers, page 19](#)
- [Uninstalling Linux Drivers, page 19](#)

### Unloading sNIC Drivers

You can unload the sNIC driver, but uninstalling the sNIC drivers would require uninstalling the OS.



**Important**

To unload an sNIC driver that is in use, reboot the host.

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<code># modprobe -r snic</code>	Unloads the sNIC driver when the driver is not in use. <b>Note</b> You cannot use this command to unload an sNIC driver that is in use.

This example shows how to unload sNIC drivers:

```
# modprobe -r snic
```

### Uninstalling Linux Drivers

If the management connection is over the eNIC, we recommend that you use the serial or KVM console to complete the driver installation. Completing an `rmmmod` of the current driver results in a loss of eNIC network connectivity.

If you are booting from SAN storage, you cannot remove the existing fNIC driver using the **rmmod** fNIC command because this driver is required to use the SAN LUNs. Instead, enter the **rpm --erase old-kmod-fnic-rpm-name** command to erase the old RPM.

### Procedure

**Step 1** Remove existing drivers by entering one of the following commands:

Driver	Command
eNIC driver for RHEL	<b>rpm -e kmod-enic</b>
eNIC driver for SuSE	<b>rpm -e cisco-enic-kmp-default</b>
fNIC driver for RHEL	<b>/sbin/rmmod fnic</b>
fNIC driver for SuSE	<b>rpm -e cisco-fnic-kmp-default</b>

**Step 2** Reboot the host.

If it is not possible to reboot the host, manually unload the running driver and reload the previously installed driver by entering the following commands:

```
rmmod enic
```

```
modprobe enic
```

**Step 3** Verify that the driver is deleted from the host.

```
sbin/lsmmod | grep {enic | fnic}
```