

Huawei IN300 FC HBA Card

User Guide

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Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: <http://e.huawei.com>

About This Document

Purpose

This document describes the features of the IN300 standard PCIe FC HBA cards, how to upgrade the software, and how to install and use the management tool.

NOTE

The IN300 supports two types of brackets: full-height and half-height brackets. All figures in this document use the full-height bracket as an example.





Intended Audience


This document is intended for:

- Enterprise administrators
- Enterprise end users

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	<p>Calls attention to important information, best practices and tips.</p> <p>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.</p>

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue	Date	Description
08	2019-07-27	<p>This issue is the eighth official release.</p> <p>Deleted "NOTE" of "Hardware Requirements" in 1.5 System Requirements.</p>
07	2019-07-15	<p>This issue is the seventh official release.</p> <ul style="list-style-type: none">● Modified 1.3 Features.● Modified 1.5 System Requirements.● Added 3.4.32 Querying the Link Timeout Interval (fc_get_link_tmo) ~ 3.4.35 Reading Chip Register Values in Batches (csr_dump).
06	2019-05-10	<p>This issue is the sixth official release.</p> <ul style="list-style-type: none">● Added 1.3 Features.● Added information about the installation, upgrade, and uninstallation of drivers on the Neokylin, Linx, and Red Flag OSs in 2.2 Maintaining the Driver.● Added information about installing, upgrading, and uninstalling the hifcadm tool on the Neokylin, Linx, and Red Flag OSs in 3 Management Tool hifcadm.● Added 5 Configuring SAN Boot.
05	2019-01-30	<p>This issue is the fifth official release.</p> <p>Added the information about Microsoft Windows.</p>
04	2018-11-30	<p>This issue is the fourth official release.</p> <ul style="list-style-type: none">● Added the information about the SP522.● Added the information about VMware ESXi.

Issue	Date	Description
03	2018-09-11	This issue is the third official release. Modified supported commands.
02	2018-08-10	This issue is the second official release. Modified supported commands.
01	2018-05-20	This issue is the first official release.

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1 Getting to Know the IN300

- [1.1 Overview](#)
- [1.2 Physical Structure](#)
- [1.3 Features](#)
- [1.4 Specifications](#)
- [1.5 System Requirements](#)

1.1 Overview

The IN300 FC HBAs are IN300 series standard PCIe cards that are used on Huawei servers to provide external service ports.

- The Huawei IN300 2*8Gb provides two 8G SFP+ optical ports.
- The Huawei IN300 2*16Gb provides two 16G SFP+ optical ports.
- The Huawei IN300 2*32Gb provides two 32G SFP+ optical ports.

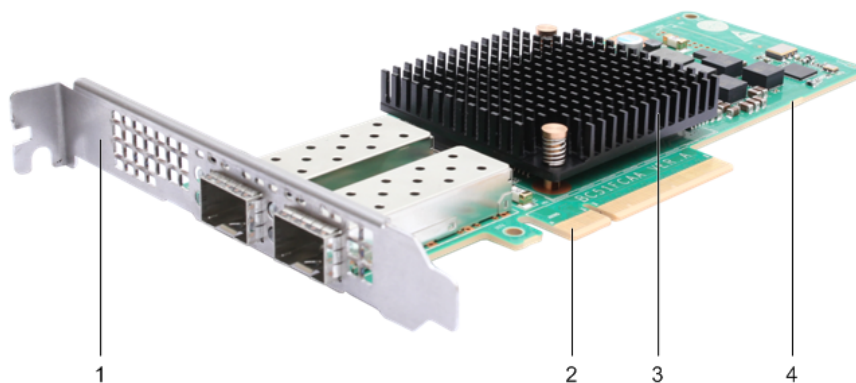
The IN300 are FC HBAs using the Huawei HiSilicon high-performance FC chip. Both support applications connected to the FC network and implement high-bandwidth and high-performance storage networking. The IN300 support PCIe 3.0 x8 and I²C (Inter-integrated Circuit) out-of-band management.

1.2 Physical Structure

Components

Figure 1-1 shows the components of the IN300.

Figure 1-1 IN300 components



1	Bracket	2	PCIe connector
3	FC chip+heat sink	4	Mainboard

Table 1-1 describes the components of the IN300.

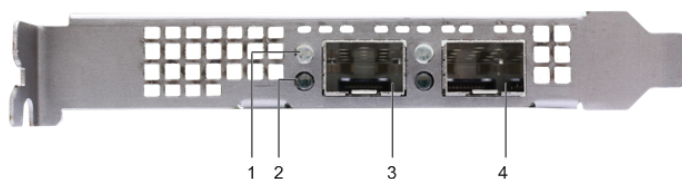
Table 1-1 IN300 component description

Component	Description
Mainboard	Includes the FC HBA module, FC port module, and power module.
FC chip	HBA chip that implements FC functions.
Heat sink	Cools the HBA chip.
Bracket	HBA bracket, which can be full-height or half-height.
PCIe connector	Connects to a PCIe slot on the server.

Panel

Figure 1-2 shows the panel of the IN300.

Figure 1-2 Panel



1	Speed indicator	2	Link/Active indicator
3	SFP+ optical port 2	4	SFP+ optical port 1

Indicators

The indicators display the working status of the IN300. [Table 1-2](#) describes the indicators on the panel of the IN300.

Table 1-2 Indicator description

Indicator	Meaning	Color	Description
Link/Active indicator	Network connection status indicator	Green	<ul style="list-style-type: none">● Off: No optical module is inserted or the inserted optical module is not identified.● Steady on: A link is established.● Blinking (1 Hz): No link is established.● Blinking (2 Hz): A link is established and data is being transmitted.

Indicator	Meaning	Color	Description
Speed indicator	Network data transmission status indicator	Yellow and green	<ul style="list-style-type: none"> ● Huawei IN300 2*8Gb: <ul style="list-style-type: none"> - Off: No optical module is inserted, the inserted optical module is not identified, or the transmission rate is 2 Gbit/s. - Blinking green (1Hz): No link is established. - Steady yellow: A 4 Gbit/s link is established. - Steady green: A 8 Gbit/s link is established. ● Huawei IN300 2*16Gb: <ul style="list-style-type: none"> - Off: No optical module is inserted, the inserted optical module is not identified, or the transmission rate is 4 Gbit/s. - Blinking green (1Hz): No link is established. - Steady yellow: A 8 Gbit/s link is established. - Steady green: A 16 Gbit/s link is established. ● Huawei IN300 2*32Gb: <ul style="list-style-type: none"> - Off: No optical module is inserted, the inserted optical module is not identified, or the transmission rate is 8 Gbit/s. - Blinking green (1 Hz): No link is established. - Steady yellow: A 16 Gbit/s link is established. - Steady green: A 32 Gbit/s link is established.
<p>NOTE When an optical module is inserted and identified but the link is not set up, both indicators will blink green at the same time.</p>			

1.3 Features

The features of the IN300 are as follows:

- Half-height half-length PCIe x8 card with a half-height or full-height bracket, applicable for various application scenarios.
- A Huawei dedicated chip on the x86 platform. Huawei IN300 2*8Gb provides two 8G FC ports, which are backward compatible with the 4G and 2G rates. Huawei IN300 2*16Gb provides two 16G FC ports, which are backward compatible with the 8G and 4G

rates. Huawei IN300 2*8Gb provides two 32G FC ports, which are backward compatible with the 16G and 8G rates.

- point-to-point service (P2P), Loop (8G or lower), and Fabric topologies.
- FC Buffer to buffer flow control management mechanism.
- Credit recovery in P2P/Fabric topology mode. This function is disabled by default.
- SAN Boot function in Unified Extensible Firmware Interface (UEFI) modes.
- Rate auto-negotiation.
- Topology auto-negotiation.
- RS-FEC for 32G ports. This function is enabled by default.
- KR-FEC for 16G ports. This function is disabled by default.

1.4 Specifications

Table 1-3 describes the specifications of the IN300.

Table 1-3 Basic specifications

Item	Specifications
Form factor	Low-profile NIC, supporting a full-height or half-height bracket
PCIe connector	PCIe x8 port, compatible with x4/x2/x1; PCIe 3.0, compatible with PCIe 2.0/1.0
Chip	Huawei HiSilicon HBA chip
FC port	<ul style="list-style-type: none">● Huawei IN300 2*8Gb: provides two 8G/4G/2G FC service ports.● Huawei IN300 2*16Gb: provides two 16G/8G/4G FC service ports.● Huawei IN300 2*32Gb: provides two 32G/16G/8G/4G service ports.

Item	Specifications
FC specification/protocol	<ul style="list-style-type: none"> ● Fibre Channel Framing and Signaling-2 (FC-FS-2) ● Fibre Channel Framing and Signaling-3 (FC-FS-3) ● Fibre Channel Framing and Signaling-3 (FC-FS-4) ● Fibre Channel Physical and Signaling Interface-3 (FC-PH-3) ● Fibre Channel Arbitrated Loop-2 (FC-AL-2) ● Fibre Channel Methodologies for Interconnects-2 (FC-MI-2) ● Fibre Channel Tape and Tape Medium Changers (FC-TAPE) ● Fibre Channel Protocol For SCSI-2 (FCP-2) ● Fibre Channel Protocol For SCSI-3 (FCP-3) ● Fibre Channel Protocol For SCSI-4 (FCP-4) ● Fibre Channel Link Services-2 (FC-LS-2) ● Fibre Channel Link Services-3 (FC-LS-3) ● Fibre Channel Generic Services-4 (FC-GS-4) ● Fibre Channel Generic Services-5 (FC-GS-5) ● Fibre Channel Generic Services-6 (FC-GS-6) ● Fibre Channel Physical Interface-4 (FC-PI-4) ● Fibre Channel Physical Interface-5 (FC-PI-5) ● Fibre Channel Physical Interface-6 (FC-PI-6) ● Fibre Channel - Methodologies for Jitter and Signal Quality Specification(FC-MJSQ) ● Fibre Channel - Methodologies for Signal Quality Specification(FC-MSQS) ● Fibre Channel - Methodologies for Signal Quality Specification-2(FC-MSQS-2)
Performance	<ul style="list-style-type: none"> ● Huawei IN300 2*8Gb: supports bidirectional bandwidth of 1,200,000 IOPS and 3200 Mbyte/s. ● Huawei IN300 2*16Gb: supports bidirectional bandwidth of 1,700,000 IOPS and 6400 Mbyte/s. ● Huawei IN300 2*32Gb: supports bidirectional bandwidth of 1,700,000 IOPS and 12800 Mbyte/s.
Reliability assurance function	<ul style="list-style-type: none"> ● FEC (Forward error correction) ● BB_CR (Buffer-to-Buffer Credit Recovery)
Mean time between failures (MTBF)	174324 hours
Mean time to repair (MTTR)	180 seconds

1.5 System Requirements

Hardware Requirements

The IN300 needs to be installed in a standard PCIe x8 or x16 slot.

Software Requirements

Table 1-4 lists Linux OSs supported by the IN300, **Table 1-5** lists supported VMware hypervisors, **Table 1-6** lists supported Windows hypervisors.

Table 1-4 Compatible Linux OSs

OS	x86 Version	ARM Version
CentOS	6.9/6.10/7.2/7.3/7.4/7.5/7.6	7.6
Neokylin	6.9/7.4	V7.0U6
RedFlag	7.3	-
SLES	11.4/12.2/12.3/12.4/15	-
RHEL	6.9/6.10/7.1/7.2/7.3/7.4/7.5/ 7.6	-
UVP	-	3.0
Ubuntu	18.04.0/18.04.1	18.04.2
Oracle	6.9/7.3/7.5/7.6	-
Linx	6.0.80	-
EulerOS	-	V2.0 SP8

Table 1-5 Compatible VMware hypervisor

Hypervisor	x86 Version
VMware ESXi	6.0.3/6.5/6.5.1/6.5.2/6.7/6.7.1

Table 1-6 Compatible Windows

Windows	x86 Version
Microsoft Windows	Windows Server 2012 R2/Windows Server 2016/Windows Server 2019

 **NOTE**

The preceding OSs are for reference only. For details about the OSs that can be purchased, see the [Intelligent Computing Compatibility Checker](#) or consult the local Huawei sales representatives.

Peripheral Requirements

Table 1-7 lists the peripheral devices supported by the IN300.

Table 1-7 Compatible peripheral devices

Type	Model
Switch	Huawei OceanStor SNS2124/2224/2248/3096
	Huawei OceanStor SNS2624/3664/5604/5608
	Huawei OceanStor SNS2120/5120
	Brocade 300/5100/5300/6510/G610/G620/G630/200E/DCX8510
	Cisco Nexus 5548/5596
	Cisco MDS 9148/9509/9513/9706/9132T/9250i
Storage	Huawei OceanStor 2100/2200/2600/2800 V3
	Huawei Oceanstor 5300/5500/5600/5800 V3
	Huawei OceanStor Dorado 5000/6000 V3
	Huawei Oceanstor 6800/6900/18500/18800 V3
	Huawei Oceanstor 2800/5300/5500/5600/5800 V5
	Huawei Oceanstor 6800/18500/18800 V5
	HDS AMS 2500/VSP G200/HUS VM
	HPE P2000/4000/6000/EVA8100/EVA4400/MSA2000/3PAR F200
	IBM DS4000/5000/6000/SVC/XIV/Huawei S3200(DS4700)
	EMC VNX5400/VNX5300/VPLEX/Xtrem IO
	NetApp FAS series (8040)/V3160
	SUN ST6140
	Fujitsu DX80/DX60
	DELL PS4000E
MacroSAN MS2500G2	

For more information about the IN300 compatibility, see the [Intelligent Computing Compatibility Checker](#).

2 Installation and Maintenance

The IN300 is a standard PCIe card and can be installed in the same way as a common NIC. For details about how to install the IN300, see the server user guide. This document describes only IN300 driver and firmware installation and maintenance.

[2.1 Obtaining Software Packages](#)

[2.2 Maintaining the Driver](#)

[2.3 Upgrading the Firmware](#)

2.1 Obtaining Software Packages

Downloading Installation Packages

Step 1 Log in to the [Huawei Enterprise Website](#).

Step 2 Choose **TECHNICAL SUPPORT > Product Support > Accelerator Components > IN500 Solution**.

Step 3 Click the **software Download** tab.

Step 4 Click the target version.

Step 5 Download the software package required (**IN500_solution_5.1.0.zip**).

 **NOTE**

The IN200/IN300/IN500 software package is named **IN500_solution_5.1.0.zip** or **IN500_solution_5.1.0.SPCXXX.zip**.

Step 6 Decompress the software package. [Table 2-1](#) lists the software packages to be downloaded.

 **NOTE**

You can obtain the VMware drivers of the IN300 from the official Huawei website or VMware website. On the VMware website, you can search for the drivers by using "Huawei IN300 Fibre Channel Adapter" as the key words.

Table 2-1 Required software packages

Software Package Type	OS Type	Path	Format	Installation Method
Driver package	Linux	driver\linux\fc\OS name\	*.rpm	2.2 Maintaining the Driver
	(Linux) Ubuntu/Linx	driver\linux\fc\OS name\	*.deb	
	VMware	driver\vmware\fc\OS name\ NOTE The driver package contains the hifcadm tool package. After the driver is installed, the hifcadm tool is automatically installed.	*.vib	
	Windows	driver\windows\fc\OS name\	*.msi	
Firmware upgrade package	-	<ul style="list-style-type: none"> ● firmware\update_bin\cfg_data_fc_prd_1h_4x8G\ ● firmware\update_bin\cfg_data_fc_prd_1h_4x16G\ ● firmware\update_bin\cfg_data_fc_prd_1h_4x32G\ 	*.bin	2.3 Upgrading the Firmware
Firmware log offline parsing dictionary file	-	firmware\dictionary	*.index	-
hifcadm tool package	Linux	tools\linux\fc\	*.rpm	3 Management Tool hifcadm
	(Linux) Ubuntu/Linx	tools\linux\fc\	*.deb	

Software Package Type	OS Type	Path	Format	Installation Method
	Linux	tools\linux\fc \collect_scripts NOTE This is a one-click information collection script, which is also applicable to the ARM platform.	*.sh	
	Windows	tools\windows\fc \OS name\	*.msi	



---End

 **NOTE**

- You are advised to use the latest driver, firmware, and management tool released on Huawei enterprise service website (<https://e.huawei.com/en/>).
- Ensure that the version of the firmware used for installation or upgrade is not earlier than the driver version. For example, if the driver version is 1.8.2.7, the firmware version must be 1.8.2.7 or a later.
- After the driver is upgraded, you must also upgrade the firmware and management tool.

Verifying Installation Package Integrity

Verify that the obtained installation packages are the same as those at the website.

On the download page, click  to obtain the digital software certificate, and click  to download the software.

Obtain the verification tool and method from [Digital Signature Verification Tool](#).

2.2 Maintaining the Driver

2.2.1 Preparations (SUSE Linux)

The IN300 has been certificated by SUSE. Before installing, or upgrading drivers for SUSE Linux, you need to import the SUSE Linux PLDP UEFI certificate (mandatory in the Secure Boot mode) and gpg public key of the installation package.

(Optional) Importing the SUSE PLDP Certificate

Before installing the IN300 driver on the server in the BIOS UEFI safe mode, import the SUSE PLDP UEFI certificate in the BIOS to support the certificated IN300 driver.

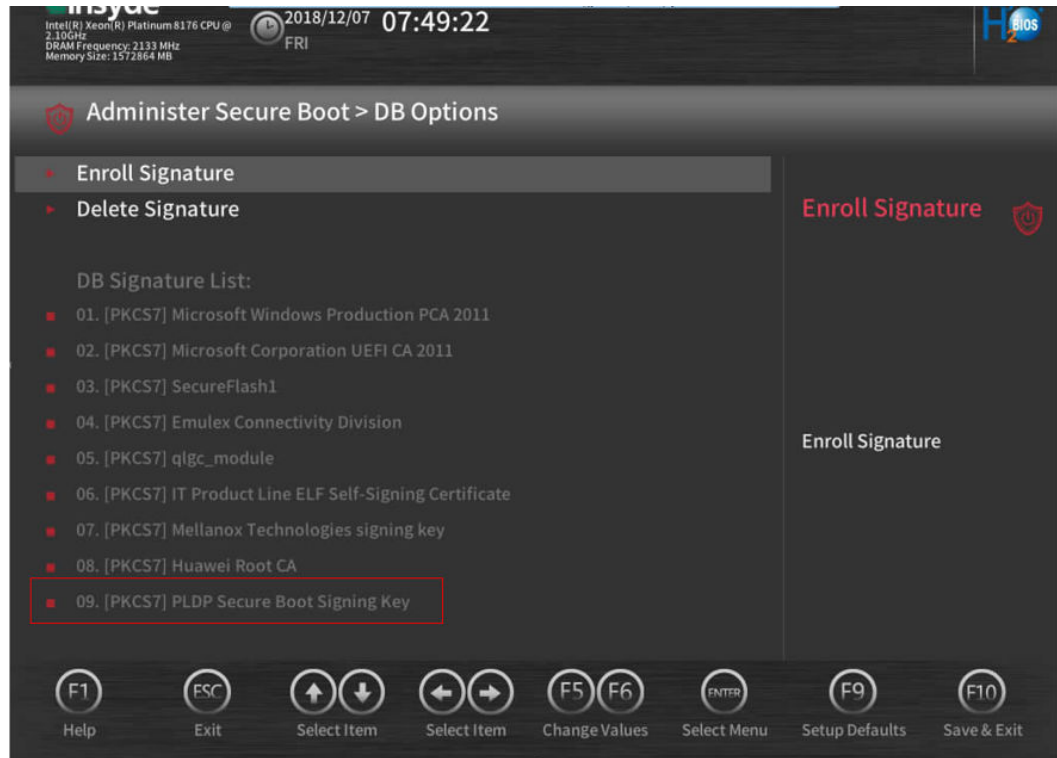
Step 1 Obtain the SUSE Linux PLDP UEFI certificate.

For details about the certificate address, see [2.1 Obtaining Software Packages](#).

Step 2 Import the SUSE Linux PLDP UEFI certificate to the BIOS.

On the BIOS screen, choose **Administer Secure Boot > DB Options > Enroll Signature** and import the SUSE LDAP UEFI certificate. After the certificate is imported, **PLDP Secure Boot Signing Key** is displayed in the **DB Signature List**, as shown in [Figure 2-1](#).

Figure 2-1 Importing a certificate



For details, see the server BIOS parameter reference.

----End

Importing the SUSE gpg Public Key

NOTICE

You only need to import the gpg public key of the SUSE installation package once.

Step 1 Obtain the SUSE gpg public key.

For details about the certificate address, see [2.1 Obtaining Software Packages](#).

Step 2 Upload the public file such as **gpg-pubkey-c2bea7e6-4c2de264.asc** to any directory of the operating system on the server.

Step 3 Run the **rpm --import** command to import the public key to the operating system.

Example:

```
rpm --import gpg-pubkey-c2bea7e6-4c2de264.asc
```

```
----End
```

2.2.2 Installing the Driver

Prerequisites

- The driver package of the IN300 has been downloaded.
For the package name and download method, see [2.1 Obtaining Software Packages](#).
- The driver package has been uploaded to the server OS.
- The IN300 driver has not been installed on the server.

Impact

It takes about 30 seconds to install the driver. The installation process cannot be interrupted. During the installation, the server OS cannot be restarted. Otherwise, the server OS may be abnormal or cannot be started.

Installing the Driver on Linux

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the driver package is stored.

Step 3 Install the driver package.

If the OS is RHEL, CentOS, Oracle, SUSE, UVP, RedFlag, or Neokylin, run the **rpm -ivh <driver software package name>** command to install the driver package..

Using RHEL as an example:

```
[root@localhost RedHat 6.9_1128]# rpm -ivh kmod-  
hifc-1.5.2.0_2.6.32_696-1.el6.x86_64.rpm  
Preparing... ##### [100%]  
package kmod-hifc-1.5.2.0_2.6.32_696-1.el6.x86_64 is already installed
```

NOTE

If the RPM package is not signed, before installing the driver package, perform the following operations:

1. run the **vim /etc/modprobe.d/10-unsupported-modules.conf** command and change the value of **allow_unsupported_modules** to **1**.
vim /etc/modprobe.d/10-unsupported-modules.conf
2. Run the **rpm -checksig hifc-kmp-default-<version>-<distribution>.<arch>.rpm** command to make the certificated driver package take effect.

```
rpm -checksig hifc-kmp-default-1.4.3.0_k4.4.73_5-100R.4.1.x86_64.rpm  
hifc-kmp-default-1.4.3.0_k4.4.73_5-100R.4.1.x86_64.rpm: rsa sha1 (md5) pgp  
md5 OK
```

Step 4 Make the driver take effect.

You can use either of the following methods to make the driver take effect. Select one as required.

- Method 1
Run the **reboot** command on the OS.

- Method 2
Run the following commands in sequence in the OS:
rmmod hifc
modprobe hifc
- End

Installing the Driver on (Linux) Ubuntu/Linx

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the driver package is stored.

Step 3 Install the driver package.

Run the **dpkg -i <driver software package name>** command to install the driver package..

Using Ubuntu as an example:

```
root@ubuntu1804:~# dpkg -i hifc-1.8.2.3-4.15.0_20_generic.ubuntu.amd64.deb
(Reading database ... 65984 files and directories currently installed.)
Preparing to unpack hifc-1.8.2.3-4.15.0_20_generic.ubuntu.amd64.deb ...
Unpacking hifc (1.8.2.3) ...
Setting up hifc (1.8.2.3) ...
Installing... Please wait for a moment.
Install hifc driver package successfully.
```

Step 4 Make the driver take effect.

You can use either of the following methods to make the driver take effect. Select one as required.

- Method 1
Run the **reboot** command on the OS.
 - Method 2
Run the following commands in sequence in the OS:
rmmod hifc
modprobe hifc
- End

Installing the Driver on VMware ESXi

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the driver package is stored, for example, **/tmp**.

Step 3 Install the driver package.

Run the **esxcli software vib install -v hifc-<version>-<kernel_version>.<arch>.vib** command.

NOTE

Enter a full path after **-v**.

Example:

```
esxcli software vib install -v /tmp/hifc-1.5.0.0-1OEM.650.0.0.4598673.x86_64.vib
Installation Result
  Message: The update completed successfully, but the system needs to be
rebooted for the changes to be effective.
  Reboot Required: true
  VIBs Installed: Huawei_bootbank_hifc_1.8.2.0-1OEM.600.0.0.2768847
  VIBs Removed:
  VIBs Skipped:
```

Step 4 Run the **reboot** command to restart VMware ESXi for the driver to take effect.

----End

Installing the Driver on Microsoft Windows

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

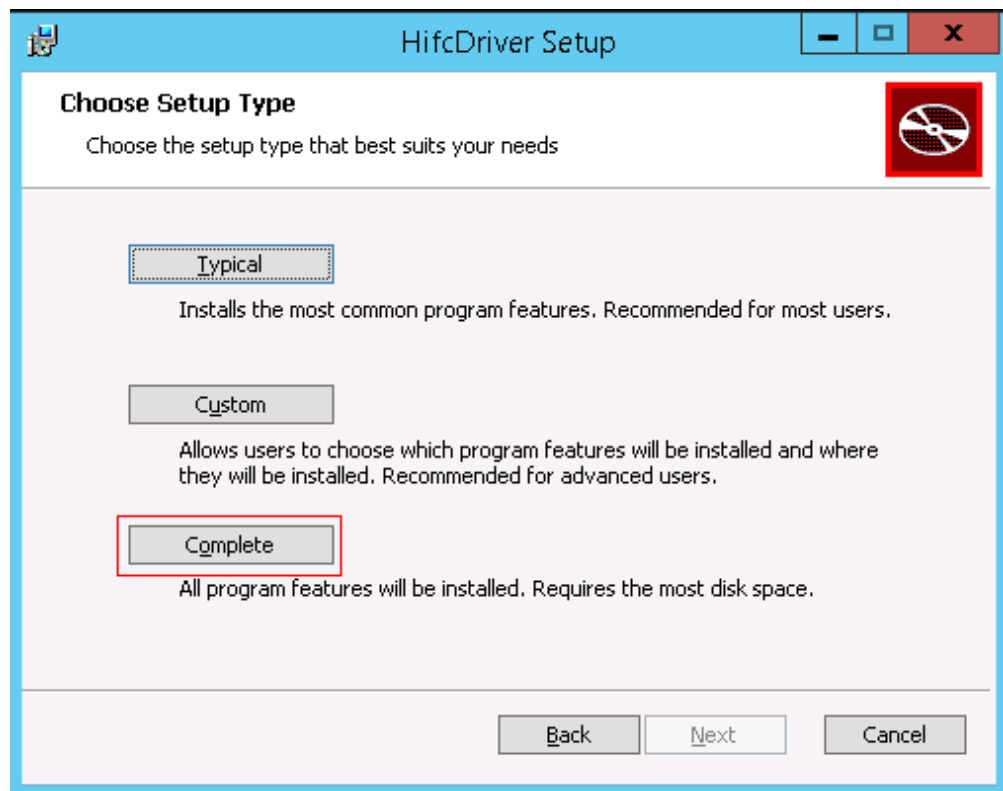
Step 2 Go to the directory where the driver package is stored, for example, "C:\".

Step 3 Install the driver package.

Double-click *hifc_<version>_<Windows_OS>_x86_64.msi* to install the driver package.

NOTE

Select **Complete** for **Choose Setup Type**.



Step 4 The driver takes effect after the installation. You are advised to restart Microsoft Windows after the installation.

----End

NOTICE

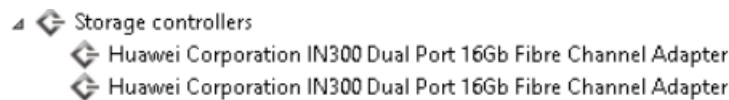
If an exception occurs during the installation (for example, the server is restarted or powered off), handle the problem by referring to [A.1 An Exception Occurs During Driver Installation or Uninstallation](#).

Follow-up Procedure

After the driver is installed, you can operate the following steps.

1. Run the **lsmod | grep hifc** command on Linux or **vmkload_mod -l | grep hifc** command on VMware ESXi to check whether the driver has taken effect.
 - If no command output is displayed, the driver has not taken effect, and you need to perform the operation again.
 - If the command output about the IN300 driver is displayed, the driver has taken effect.
2. Run the **version** command to query the current driver version using hifcadm.
3. In Microsoft Windows, you can scan for hardware detection changes in the Device Manager and check whether the driver has been installed on the IN300 and whether the driver has been identified.

For example:



2.2.3 Upgrading the Driver

Prerequisites

- The IN300 driver already exists on the server OS.
- The new driver package of the IN300 has been downloaded.
For the package name and download method, see [2.1 Obtaining Software Packages](#).
- The new driver package has been uploaded to the server OS.
- In Linux, before upgrading the driver, ensure that the key has been correctly installed in the system. For details about how to download and install the key, see https://drivers.suse.com/doc/Usage/Package_Signing_Key.html#package-signing-key.
- On the Windows OS, ensure that no program occupies the original driver file (hifc.sys) before upgrading the driver. Otherwise, the system prompts you to restart the system during the upgrade and the upgrade fails. If the upgrade fails, check whether the fault is caused by the preceding situation.
- Before upgrading the driver on Microsoft Windows, you must power off VMs where the Hyper-V NPIV function is enabled.

Constraints

- The target version must be later than the source version.
- If the target version is earlier than or the same as the source version, the upgrade fails.

- If you want to roll back to an earlier version, you need to **uninstall the current driver** and then **install the new driver**.

Impact

The upgrade process cannot be interrupted. During the upgrade, the server OS cannot be restarted. Otherwise, the server OS may be abnormal or cannot be started.

Upgrading the Driver on Linux

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the driver package is installed.

Step 3 Upgrade the driver package.

If the OS is RHEL, CentOS, Oracle, SUSE, UVP, RedFlag, or Neokylin, run the **rpm -Uvh <driver software package name>** command to upgrade the driver package.

Using RHEL as an example:

```
rpm -Uvh kmod-hifc-1.2.3.0_3.10.0_514-1.e17.x86_64.rpm
Preparing... ##### [100%]
package kmod-hifc-1.2.3.0_3.10.0_514-1.e17.x86_64 is already installed
```

Step 4 Make the new driver take effect.

You can use either of the following methods to make the driver take effect. Select one as required.

- Method 1
Run the **reboot** command on the OS.
- Method 2:
 - a. Check that the current IN300 program has stopped.
 - b. Run the **modprobe -r hifc** on the OS to install the existing driver.
 - c. Run the **modprobe hifc** command on the OS to load the new driver.

----End

NOTE

When SAN Boot is used, run the **dracut --add-drivers "hifc.ko hifc_sdk.ko" --force** command after the driver is upgraded to forcibly add the driver to initrd.

Upgrading the Driver on (Linux) Ubuntu/Linx

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the driver package is installed.

Step 3 Run the **dpkg -i <driver software package name>** command to upgrade the driver package.

Using Ubuntu as an example:

```
root@ubuntu1804:~# dpkg -i hifc-1.8.23-4.15.0_20_generic.ubuntu.amd64.deb
(Reading database ... 65986 files and directories currently installed.)
Preparing to unpack hifc-1.8.23-4.15.0_20_generic.ubuntu.amd64.deb ...
```

```
Unpacking hifc (1.8.2.3) over (1.8.2.3) ...  
Uninstalling... Please wait for a moment.  
Uninstall hifc driver package successfully.  
Setting up hifc (1.8.2.3) ...  
Installing... Please wait for a moment.  
Install hifc driver package successfully.
```

Step 4 Make the new driver take effect.

You can use either of the following methods to make the driver take effect. Select one as required.

- Method 1
Run the **reboot** command on the OS.
- Method 2:
 - a. Check that the current IN300 program has stopped.
 - b. Run the **modprobe -r hifc** on the OS to install the existing driver.
 - c. Run the **modprobe hifc** command on the OS to load the new driver.

---End

Upgrading the Driver on VMware ESXi

- To update the driver to a later version, perform operations in [2.2.2 Installing the Driver](#). The system automatically replaces the original vib driver package based on the version and restarts for the update to take effect.
- To update the driver to an earlier version, perform operations in [2.2.4 Uninstalling the Driver](#), restart the system, and then perform the operations in [2.2.2 Installing the Driver](#). The update takes effect after restart.

Upgrading the Driver on Microsoft Windows

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

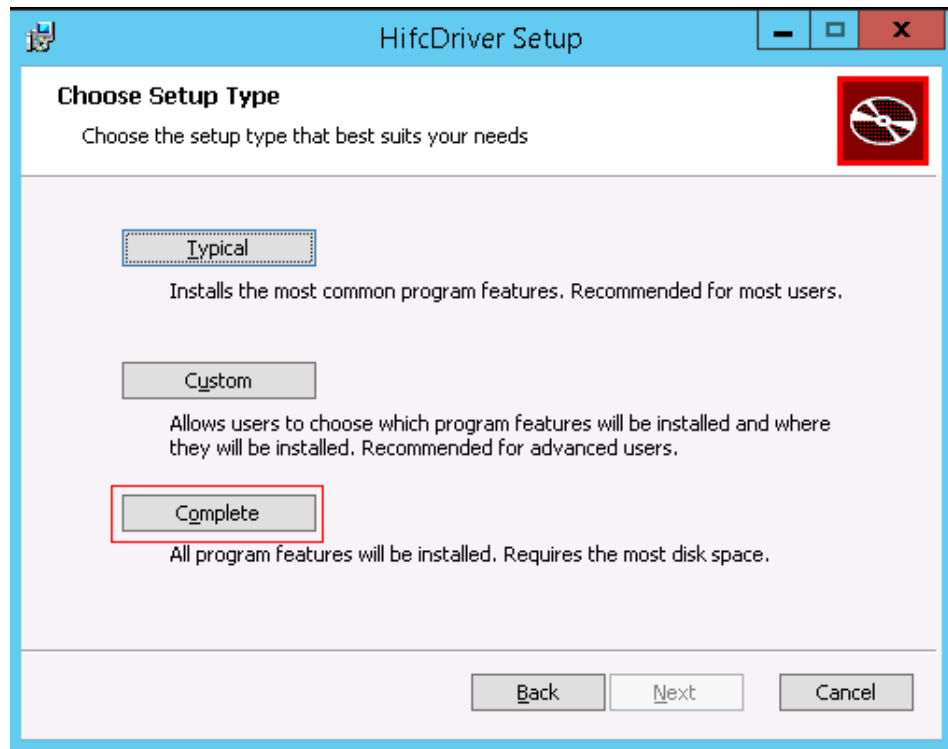
Step 2 Go to the directory where the driver package is stored, for example, "C:\".

Step 3 Upgrade the driver package.

Double-click ***hifc_<version>_<Windows_OS>_x86_64.msi*** to install the driver package.

 NOTE

- Select **Complete** for **Choose Setup Type**.



- The target version must be later than the source version; otherwise, uninstall the driver package and install a later one.

Step 4 Restart Microsoft Windows after the installation, the driver takes effect.

----End

Follow-up Procedure

After the driver is installed, you can run the **version** command to query the current driver version using hifcadm.

2.2.4 Uninstalling the Driver

Prerequisites

The IN300 driver already exists on the server OS.

Impact

During the uninstallation, the server OS cannot be restarted. Otherwise, the server OS may be abnormal or cannot be started.

Uninstalling the Driver from Linux

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the installation directory where the driver is installed.

Step 3 Uninstall the driver.

If the OS is RHEL, CentOS, Oracle, SUSE, UVP, RedFlag, or Neokylin, run the **rpm -Uvh <driver software package name>** command to uninstall the driver.

Using RHEL as an example:

```
rpm -e kmod-hifc-1.2.3.0_3.10.0_514-1.e17.x86_64
```

 **NOTE**

You can run the **rpm -qa | grep hifc** command to query the driver software package name.

Step 4 Make the uninstallation operation take effect.

You can use either of the following methods to make the uninstallation operation take effect. Select one as required.

- Method 1
Run the **reboot** command on the OS.
- Method 2
 - a. Check that the current IN300 program has stopped.
 - b. Run the following commands in sequence in the OS:
 - **rmmod hifc**
 - **rmmod hifc_sdk**

----End

Uninstalling the Driver from (Linux) Ubuntu/Linx

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the installation directory where the driver is installed.

Step 3 Uninstall the driver

Run the **dpkg -r hifc** command to uninstall the driver.

```
root@ubuntu1804:~# dpkg -r hifc
(Reading database ... 65985 files and directories currently installed.)
Removing hifc (1.8.2.3) ...
Uninstalling... Please wait for a moment.
Uninstall hifc driver package successfully.
```

Step 4 Make the uninstallation operation take effect.

You can use either of the following methods to make the uninstallation operation take effect. Select one as required.

- Method 1
Run the **reboot** command on the OS.
- Method 2
 - a. Check that the current IN300 program has stopped.
 - b. Run the following commands in sequence in the OS:

- `rmmod hifc`
- `rmmod hifc_sdk`

----End

Uninstalling the Driver from VMware ESXi

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the driver package is installed.

Step 3 Uninstall the driver.

For example, to uninstall the driver, run the `esxcli software vib remove -n hifc` command.

```
esxcli software vib remove -n hifc
Message: The update completed successfully, but the system needs to be rebooted
for the changes to be effective.
  Reboot Required: true
  VIBs Installed:
  VIBs Removed: Huawei_bootbank_hifc_1.8.2.3-10EM.650.0.0.4598673
  VIBs Skipped:
```

Step 4 Run the `reboot` command to restart VMware ESXi.

----End

Uninstalling the Driver from Microsoft Windows

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Click , choose **Control Panel > Programs and Features**.

Step 3 Right-click the **HifcDriver** program name and choose **Uninstall/Change** from the short-cut menu.

----End

NOTE

If an exception occurs during the uninstallation (for example, the server is restarted or powered off), handle the problem by referring to [A.1 An Exception Occurs During Driver Installation or Uninstallation](#).

2.3 Upgrading the Firmware

Prerequisites

- The IN300 driver has been installed.
- The IN300 firmware upgrade package has been downloaded.
For the package name and download method, see [2.1 Obtaining Software Packages](#).
- The upgrade package has been uploaded to the server OS.
- The hifcadm tool has been installed.

Impact

The upgrade process cannot be interrupted. During the upgrade, the server OS cannot be restarted. Otherwise, the server OS may be abnormal or cannot be started.

Procedure

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the upgrade package is stored.

Step 3 Upgrade the firmware and make the upgrade take effect.

1. Run the **hifcadm updatefw -i <FC device name> -f <Firmware file path>** command.

In this command, FC device name is the name of the FC card in the system. For example, **hifc0** indicates the first FC card, and **hifc1** indicates the second FC card.

```
# hifcadm updatefw -i hifc0 -f fc_prd_1h_2x32G.bin
Please do not remove driver or network device.
Loading...
Firmware update start: 2019-03-20 13:09:29
[>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>] [100%][\]
Firmware update finish: 2019-03-20 13:09:35
Firmware update time used: 6s
Loading firmware image succeed.
Please reboot OS to take firmware effect.
```

2. Run the **reboot** command for the upgrade to take effect.

----End

Follow-up Procedure

After the firmware upgrade is complete, you can run the **hifcadm version -i hifcX** command to query the IN300 firmware version to confirm that the upgrade is successful.

3 Management Tool hifcadm

The hifcadm is a management tool customized for the IN300. You can use this tool to manage the IN300.

[3.1 Installing hifcadm](#)

[3.2 Using hifcadm](#)

[3.3 Command List](#)

[3.4 Command Reference](#)

[3.5 Upgrading hifcadm](#)

[3.6 Uninstalling hifcadm](#)

3.1 Installing hifcadm

Prerequisites

- The hifcadm installation package has been downloaded.
For the package name and download method, see [2.1 Obtaining Software Packages](#).
- The installation package has been uploaded to the Linux, VMware ESXi, or Microsoft Windows.

Installing hifcadm on Linux

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Install the hifcadm tool.

If the OS is RHEL, CentOS, Oracle, SUSE, UVP, RedFlag, or Neokylin, run the **rpm -ivh <driver software package name>** command to install the hifcadm tool.

Using RHEL as an example:

```
# rpm -ivh hifcadm-1.2.3.0-1.x86_64.rpm  
Preparing... ##### [100%]
```



```
Updating / installing...
 1:hifcadm-1.2.3.0-1          ##### [100%]
```

----End

Installing hifcadm on (Linux) Ubuntu/Linx

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Run the `dpkg -i hifcadm-<version>-<release>.<arch>.deb` command to install the hifcadm tool.

Example:

```
root@ubuntu1804:~# dpkg -i hifcadm-1.8.2.3-1.x86_64.deb
Selecting previously unselected package hifcadm.
(Reading database ... 65981 files and directories currently installed.)
Preparing to unpack hifcadm-1.8.2.3-1.x86_64.deb ...
Unpacking hifcadm (1.8.2.3) ...
Setting up hifcadm (1.8.2.3) ...
Installing... Please wait for a moment.
Install hifcadm tool successfully.
```

----End

NOTE


If the hifcadm tool cannot be used, check whether the hifcadm tool is running in the **root** user.

Installing hifcadm on Microsoft Windows

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the directory where the msi package is stored, for example, **C:**.

Step 3 Double-click `hifcadm_<version>x86_64.msi` to install the hifcadm tool. During the installation, click  on the task bar and click **Install** in the displayed window to install the 7z-Zip tool. You can use 7z-Zip to compress and parse logs. The default installation path is **C:\Program Files (x86)\hifcadm**.

NOTE

The default installation path includes the hifcadm tool, log collection script `collect_log_hifcadm.exe`, and log packing tool 7z.

----End

3.2 Using hifcadm

Command Format

The hifcadm supports the following command format:

```
hifcadm <major cmd> <minor cmd> <parameter> ...<minor cmd> <parameter>
```

The command function is determined by the major command (*major cmd*) and minor commands (*minor cmd*).

 **NOTE**

On Microsoft Windows, you cannot double-click **hifcadm.exe** to use the tool. The following describes how to use the commands on Microsoft Windows:

1. Run **cmd** to open the command line interface (CLI), right-click the title bar and choose **Properties** from the menu, click the **Layout** tab, and set **Width** under **Screen Buffer Size** to **999** to ensure that the command output format is correct.
2. Go to the tool installation directory, for example, **C:\Program Files (x86)\hifcadm**.
3. Enter **hifcadm.exe<major cmd> <minor cmd> <parameter> ...<minor cmd> <parameter>**.

Obtaining Help Information

When using the hifcadm tool, you can use the following commands to obtain help information:

- Obtaining the tool version information
Short command: **hifcadm -v**
Long command: **hifcadm --version**
- Obtaining the list of major commands supported by the tool
Short command: **hifcadm -h**
Long command: **hifcadm --help**
- Obtaining the list of minor commands supported by the tool
Short command: **hifcadm <major cmd> -h**
Long command: **hifcadm <major cmd> --help**

In addition, you can add **-h** to any major command to obtain the value ranges of all minor commands and the parameters in the commands.

3.3 Command List

Table 3-1 lists the major commands and their functions supported by hifcadm on Linux.

Table 3-1 Major hifcadm commands on Linux

Major Command	Function
version	Queries version information.
info	Queries the system device list or the basic information about a specified device.
log	Obtains online logs and parses offline logs.
updatefw	Upgrades and activates the firmware.
counter	Collects statistics.
temperature	Queries the chip temperature.
clear	Clears statistics.
fc_allinfo	Queries information about all FC ports.

Major Command	Function
fc_port	Resets, enables, or disables a port.
fc_topo	Changes the port topology mode.
fc_speed	Sets the link rate.
fc_port_info	Queries the port status.
fc_port_clear	Clears port error code statistics.
fc_sfpinfo	Queries information about the optical module connected to an optical port.
fc_fec	Queries and enables the FEC function when the rate is 16G.
fc_bbscn	Queries and enables the credit recovery function.
fc_dfx	Queries and clears the port statistics of the SP520, SP521, or SP522.
fc_dif	Sets the switching status of DIF.
fc_dif_config	Configures other DIF functions.
fc_port_monitor	Queries I/O statistics of an IN300 port.
fc_dumpmac	Collects FC MAC logs of an IN300 card.
hilink_param	Queries the ctle, ffe, and dfe parameters of the device.
fe_epc	Obtains Fusion Engine (FE) error information.
serdes	Obtains port serdes information.
fc_vport	Sets the NPIV feature of a specified port.
fc_qos	Queries and sets the QoS function of a specified port.
fc_delay	Queries connection delay of a specified port.
fc_savedata	Saves and deletes the configuration of a specified port.
fc_portstat	Queries the session information of a specified port.
fc_portxchg	Queries the xchg information of a specified port
csr_dump	Reads and saves chip register values in batches.
fc_set_link_tmo	Sets the Link Timeout Period Permanently
fc_get_link_tmo	Queries the Link Timeout Interval
fc_set_loglevel	Sets the Driver Log Level
fc_get_loglevel	Queries the Driver Log Level
reg	Querying the RegisterInformation of a Specified Device

Table 3-2 lists the major commands and their functions supported by hifcadm on VMware ESXi.

Table 3-2 Major hifcadm commands on VMware ESXi

Major Command	Function
version	Queries version information.
info	Queries the system device list or the basic information about a specified device.
log	Obtains online logs and parses offline logs.
updatefw	Upgrades and activates the firmware.
counter	Collects statistics.
temperature	Queries the chip temperature.
clear	Clears statistics.
fc_allinfo	Queries information about all FC ports.
fc_port	Resets, enables, or disables a port.
fc_topo	Changes the port topology mode.
fc_speed	Sets the link rate.
fc_port_info	Queries the port status.
fc_port_clear	Clears port error code statistics.
fc_sfpinfo	Queries information about the optical module connected to an optical port.
fc_bbscn	Queries and enables the credit recovery function.
fc_dfx	Obtains the FC port statistics count.
fc_port_monitor	Queries I/O statistics of an IN300 port.
fc_dumpmac	Collects FC MAC logs of an IN300 card.
hilink_param	Queries the ctle, ffe, and dfe parameters of the device.
fe_epc	Obtains FE error information.
serdes	Obtains port serdes information.
fc_qos	Queries and sets the QoS function of a specified port.
fc_delay	Queries connection delay of a specified port.
fc_fec	Queries and enables the FEC function when the rate is 16G.

Major Command	Function
fc_portstat	Queries the session information of a specified port.
fc_portxchg	Queries the Xchg information of a specified port

Table 3-3 lists the major commands and their functions supported by hifcadm on Microsoft Windows.

Table 3-3 Major hifcadm commands on Microsoft Windows

Major Command	Function
version	Queries version information.
info	Queries the system device list or the basic information about a specified device.
log	Obtains online logs and parses offline logs.
updatefw	Upgrades and activates the firmware.
counter	Collects statistics.
temperature	Queries the chip temperature.
clear	Clears statistics.
fc_allinfo	Queries information about all FC ports.
fc_port	Resets, enables, or disables a port.
fc_topo	Changes the port topology mode.
fc_speed	Sets the link rate.
fc_port_info	Queries the port status.
fc_port_clear	Clears port error code statistics.
fc_sfpinfo	Queries information about the optical module connected to an optical port.
fc_bbscn	Queries and enables the credit recovery function.
fc_dfx	Obtains the FC port statistics count.
fc_port_monitor	Queries I/O statistics of an IN300 port.
fc_dumpmac	Collects FC MAC logs of an IN300 card.
hilink_param	Queries the ctle, ffe, and dfe parameters of the device.
fe_epc	Obtains FE error information.
serdes	Obtains port serdes information.

Major Command	Function
fc_qos	Queries and sets the QoS function of a specified port.
fc_delay	Queries connection delay of a specified port.
fc_portstat	Queries the session information of a specified port.
fc_fec	Queries and enables the FEC function when the rate is 16 Gbit/s.
fc_portxchg	Queries the Xchg information of a specified port

3.4 Command Reference

This section describes the meanings, parameters, and usage of the common commands of the hifcadmin tool. For more information about the commands, you can run the **-h** command on the hifcadmin.

NOTE

On Microsoft Windows, you cannot double-click **hifcadmin.exe** to use the tool. The following describes how to use the commands on Microsoft Windows:

1. Run **cmd** to open the command line interface (CLI), right-click the title bar and choose **Properties** from the menu, click the **Layout** tab, and set **Width** under **Screen Buffer Size** to **999** to ensure that the command output format is correct.
2. Go to the tool installation directory, for example, **C:\Program Files (x86)\hifcadmin**.
3. Enter **hifcadmin.exe<major cmd> <minor cmd> <parameter> ...<minor cmd> <parameter>**.

3.4.1 Querying the Version Information of a Device (version)

Function

The **version** command is used to query the version information about the IN300 driver, firmware, and management tools.

Format

```
hifcadmin version -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1

Usage Instruction

None

Example

Query the version information of a specified IN300.

```
[root@localhost final]# hifcadm version -i hifc0
boot: 1.2.3.0 2018-02-07_21:45:47
up: 1.2.3.0 2018-02-07_21:45:47
ucode: 1.2.3.0 2018-02-07_21:45:47
hifcadm tool: 1.2.3.0
hifc_sdk driver: 1.2.3.0
hifc driver: 1.2.3.0
```

3.4.2 Querying Basic Information (info)

Function

The **info** command is used to query information about all IN300 cards or a specified IN300 on a server.

Format

hifcadm info

hifcadm info -i <devicename>

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1

Usage Instruction

None

Example

Query information about all IN300 cards in the server.

```
[root@localhost final]# hifcadm info
Card num:1
Hi1822 device Information:
      Card      PCIe Function
|---- hifc0(FC_32G)
|-----0000:83:00.0(FC:hifc0000)
|-----0000:84:00.0(FC:hifc0001)
|---- hifc1(FC_32G)
|-----0000:88:00.0(FC:hifc0100)
|-----0000:8a:00.0(FC:hifc0101)
```

Query the basic information of a specified IN300.

```
[root@localhost final]# hifcadm info -i hifc0
Card information:
card type      : FC_32G
port num       : 2
```

```
port speed      : 32GE
pcie width     : 8
host num       : 1
pf num        : 2
vf total num   : 5
tile num      : 2
qcm num       : 6
core num      : 4
work mode     : 2
service mode   : 6
pcie mode     : X16_MODE
cfg addr      : 0x20000
boot sel      : 0
```

3.4.3 Collecting Logs (log)

3.4.3.1 Collecting All Firmware Logs of a Specified Device (-a)

Function

The **log -a** command is used to collect all firmware logs of a specified device, including the firmware and microcode logs of the RAM and flash memory as well as the last words of the firmware and microcode.

The collected logs are automatically saved to the installation directory of the tool.

The logs collected in Windows are stored in the C:\Program Files (x86)\hifc directory.

Format

hifcadm log -i <devicename> -a

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1

Usage Instruction

None

Example

Query all logs on a specified IN300.

```
[root@localhost final]# hifcadm log -i hifc0 -a
/opt/hifc/fwlog/up_ram_hifc0_2018_02_11_17_56_19.log create succeed.
/opt/hifc/fwlog/up_flash_hifc0_2018_02_11_17_56_20.log create succeed.
/opt/hifc/fwlog/ucode_ram_hifc0_2018_02_11_17_56_20.log create succeed.
/opt/hifc/fwlog/ucode_flash_hifc0_2018_02_11_17_56_20.log create succeed.
/opt/hifc/fwlog/up_lastword_flash_hifc0_2018_02_11_17_56_20.log create succeed.
/opt/hifc/fwlog/ucode_lastword_flash_hifc0_2018_02_11_17_56_20.log create succeed.
```


3.4.3.2 Collecting Logs of a Specified Type (-t)

Function

The **log -t** command is used to collect logs of a specified type and save the collected logs to the installation directory of the tool.

The logs collected in Windows are stored in the **C:\Program Files (x86)\hifc** directory.

Format

```
hifcadm log -i <devicename> -t <logtype>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1
<i>logtype</i>	Indicates the type of logs to be collected.	<ul style="list-style-type: none">● 0: indicates the firmware logs in the RAM.● 1: indicates the firmware logs in the flash memory.● 2: indicates the microcode logs in the RAM.● 3: indicates the microcode logs in the flash memory.● 4: indicates the last words of the firmware and microcode.

Usage Instruction

None

Example

Query the firmware logs in the flash memory on a specified IN300.

```
[root@localhost final]# hifcadm log -i hifc0 -t 1  
/opt/hifc/fwlog/ up_flash_hifc0_2018_02_11_17_05_41.log create succeed.
```

3.4.3.3 Parsing Run Logs Offline (-o1)

Function

The **log -o1** command is used to parse firmware and microcode run logs offline and save the parsing results to the installation directory of the tool.

Format

```
hifcadmin log -o1 <logfile> -m <mgmt_index> -u <ucode_index>
```

Parameters

Parameter	Description	Value
<i>logfile</i>	Indicates the name of the log file to be parsed. NOTE This file is the out-of-band run log file of the IN300 obtained using the one-click information collection function of the iBMC. For details about the file obtaining method and save path, see the iBMC User Guide.	Example: err_log.bin
<i>mgmt_index</i>	Indicates the firmware index file corresponding to the log file to be parsed. NOTE The archive address and download method of this file are the same as those of the IN300 driver and firmware. For details, see 2.1 Obtaining Software Packages .	Example: up_index
<i>ucode_index</i>	Indicates the microcode index file corresponding to the log file to be parsed. NOTE The archive address and download method of this file are the same as those of the IN300 driver and firmware. For details, see 2.1 Obtaining Software Packages .	Example: ucode_index

Usage Instruction

Before running this command, transfer the log files and index files to be parsed to the installation directory of the tool.

When running this command, you can specify either **-m** or **-u** or both.

Example

```
# Parse the logs of the IN300 offline.
```

```
[root@localhost final]# hifcadmin log -o1 error_log.bin -m up_index -u ucode_index
/opt/hifc/fwlog/ up_ram_offline_2018_01_15_18_52_32.log create succeed.
/opt/hifc/fwlog/ up_flash_offline_2018_01_15_18_52_32.log create succeed.
/opt/hifc/fwlog/ ucode_ram_offline_2018_01_15_18_52_32.log create succeed.
/opt/hifc/fwlog/ ucode_flash_offline_2018_01_15_18_52_32.log create succeed.
[root@localhost final]# /opt/hifc/fwlog # ls
/opt/hifc/fwlog/ up_ram_offline_2018_01_15_18_52_32.log create succeed.
/opt/hifc/fwlog/ up_flash_offline_2018_01_15_18_52_32.log create succeed.
/opt/hifc/fwlog/ ucode_ram_offline_2018_01_15_18_52_32.log create succeed.
/opt/hifc/fwlog/ ucode_flash_offline_2018_01_15_18_52_32.log create succeed.
```

3.4.3.4 Parsing Last Words Offline (-o2)

Function

The **log -o2** command is used to parse firmware and microcode last words offline and save the parsing results to the installation directory of the tool.

Format

```
hifcadm log -o2 <logfile>
```

Parameters

Parameter	Description	Value
<i>logfile</i>	Indicates the name of the last-word file to be parsed. NOTE This file is the out-of-band last-word file of the IN300 obtained using the one-click information collection function of the iBMC. For details about the file obtaining method and save path, see the iBMC User Guide.	Example: last_word.bin

Usage Instruction

Before running this command, transfer the last-word files and index files to be parsed to the installation directory of the tool.

Example

```
# Parse the last words of the IN300 offline.
```

```
[root@localhost final]# hifcadm log -o2 last_word.bin  
/opt/hifc/fwlog/ ucode_lastword_flash_offline_2018_01_15_18_58_25.log create  
succeed.  
/opt/hifc/fwlog/ up_lastword_flash_offline_2018_01_15_18_58_25.log create succeed.  
[root@localhost final]# /opt/hifc/fwlog # ls  
ucode_lastword_flash_offline_2018_01_15_18_58_25.log  
up_lastword_flash_offline_2018_01_15_18_58_25.log
```

3.4.3.5 Collecting Windows Driver Logs (-path)

Function

The **log -path** command is used to collect Windows driver logs and save the logs in the directory where the tool is installed.

Format

```
hifcadm log -path <logpath\\>
```

Parameters

Parameter	Description	Value
<i>logpath</i> \\	Name of the folder (in the directory where the tool is installed) for storing the collected logs.	For example: drv_log \\

Usage Instruction

In the CMD window, navigate to the directory where the tool is installed.

Example

#Collect Windows driver logs.

```
C:\Program Files (x86)\hifcadm>hifcadm.exe log -path drv_log\\
```

3.4.4 Upgrading Firmware (updatefw)

Function

The **updatefw** command is used to upgrade firmware.

Format

```
hifcadm updatefw -i <devicename> -f <fwfile> [-a <activemode>]
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be upgraded in the system.	Example: hifc0 and hifc1
<i>fwfile</i>	Indicates the path to the firmware upgrade package.	Format: <i>Path/Upgrade package name</i>
<i>activemode</i>	Indicates the effective mode of the hot upgrade.	<ul style="list-style-type: none">● now: The setting takes effect immediately after the upgrade.● later: The setting does not take effect immediately after the upgrade, and will be manually activated after the upgrade.

Usage Instruction

- If the **-a** parameter is not specified, the common upgrade mode is used. After the upgrade is complete, restart the OS for the upgrade to take effect.
- If the **-a** parameter is specified, the hot upgrade mode is used.
 - If the effective mode is **now**, the setting takes effect immediately after the upgrade.
 - If the effective mode is **later**, the upgrade does not take effect immediately after the upgrade, and will take effect after you run the **hifcadm updatefw -i <devicename> -a now** command.
 - The hot upgrade can be performed only when any differences exist between minimum versions, such as 1.3.7.x and 1.3.7.y.
- Currently, only parameters and functions described in this document are supported.

Example

Upgrade the Huawei IN300 2*16Gb firmware.

```
[root@localhost final]# hifcadm updatefw -i hifc0 -f fc_prd_1h_2x16G.bin -a now
Please do not remove driver or network device.
Loading...[>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>] [100%][\]
Do not operate the device during the hot upgrade.
Firmware is activating.
Please waiting...
```

3.4.5 Querying Statistics (counter)

3.4.5.1 Querying the Statistics of a Specified Device (-t, -x)

Function

The **counter** command is used to query all statistics of a specified device, including the MIB, microcode, firmware, and IPSU statistics.

The **counter -t** command is used to query the statistics of a specified device type.

The **counter -t -x** command is used to query the statistics of a specified sequence of a specified device type.

Format

```
hifcadm counter -i <devicename>
```

```
hifcadm counter -i <devicename> -t <countertype>
```

```
hifcadm counter -i <devicename> -t <countertype> -x <counterindex>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1

Parameter	Description	Value
<i>countertype</i>	Indicates the statistics type.	<ul style="list-style-type: none">● 0: firmware statistics● 1: microcode statistics
<i>counterindex</i>	Indicates the statistics sequence.	You can run the counter -h command to obtain the value range.

Usage Instruction

None.

Example

Query all statistics of the IN300.

```
[root@localhost final]# hifcadm counter -i hifc0

uP Statistics:

uP Common Counter:
pcie:module_except: 2
upcomm:module_except: 60
general_level_except: 2
suggest_level_except: 60
common:cnt_up_i2c_rx_full: 60

uP FC Counter:
port0:tx_sn_speed: 32
port0:rx_sn_speed: 32
```

Query the microcode statistics of the IN300.

```
[root@localhost final]# hifcadm counter -i hifc0 -t 1

uCode Statistics:
FC Global Counter:
fc_sqe_consumer: 2
fc_exch_time_out: 34
fc_hash_loopup_failed: 1

FC Functional Counter:
port0:fc_init_sqc: 2
port0:fc_init_scqc: 34
port0:fc_del_scqc: 1
port0:fc_clear_sqc: 1
...
```

Query the statistics of a specified sequence of the microcode type of the IN300.

```
[root@localhost final]# hifcadm counter -i hifc0 -t 1 -x 22

uCode Statistics:

FC Global Counter:
fc_sqe_consumer: 2
fc_exch_time_out: 34
```

3.4.5.2 Parsing Inspection Information Offline (-o)

Function

The **counter -o** command is used to parse inspection information offline and save the parsing results to the installation directory of the tool.

Format

hifcadm counter -o <countfile>

Parameters

Parameter	Description	Value
<i>countfile</i>	Indicates the name of the inspection file to be parsed. NOTE This file is the out-of-band inspection information file of the IN300 obtained using the one-click information collection function of the iBMC. For details about the file obtaining method and save path, see the iBMC User Guide.	Example: running_log.bin

Usage Instruction

Before running this command, transfer the inspection information file to be parsed to the installation directory of the tool.

Example

Parse the inspection information of the IN300 offline.

```
[root@localhost final]# hifcadm counter -o running_log_20180206095647.bin  
/opt/hifc/fwlog/inspection_info_bmc_offline_2018_02_07_10_22_38.log create  
succeed.
```

3.4.6 Querying the Chip Temperatures (temperature)

Function

The **temperature** command is used to query the chip temperature of a specified IN300.

Format

hifcadm temperature -i <devicename>

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1

Usage Instruction

None

Example

Query the chip temperature of the IN300.

```
[root@localhost final]# hifcadm temperature -i hifc0
current temperature (unit: degree centigrade)
controller: 49
```

3.4.7 Clearing Statistics of a Specified Device (clear)

Function

The **clear** command is used to clear the statistics of a specified type of a specified device type.

Format

```
hifcadm clear -i <devicename> -t <countertype>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 whose statistics are to be cleared in the system.	Example: hifc0 and hifc1
<i>countertype</i>	Indicates the statistics type to be cleared.	<ul style="list-style-type: none">● 0: asynchronous information statistics● 1: DFX information statistics

Usage Instruction

None

Example

Clear the asynchronous event statistics of the IN300.


```
[root@localhost final]# hifcadm clear -i hifc0 -t 0
Clear event stats info succeed.
```

3.4.8 Querying Information About All FC Ports (fc_allinfo)

Function

The **fc_allinfo** command is used to query information about all IN300 FC ports on a server.

Format

```
hifcadm fc_allinfo
```

Usage Instruction

None

Example

Query information about all the FC ports on a server.

```
[root@localhost final]# hifcadm fc_allinfo
```

```
linux-av4l:/home/vport # hifcadm fc_allinfo
```

port	mode	state	plnk	tlnk	Rate	WPN	Tape	MSI-X	IOR	Topology	MSpeed
hifc0000	INI	open	sync	LinkUp	32Gbps(AUTO)	200400e0fcffb644	0	-X	0	P2P_F(Auto)	32Gbps
LossOfSignal		Bad CRC	Bad RX Char	Loss of Sync	Link Fail	RxE0Fa	DisFrame	Proto error	A_Y_G		
		0	0	0	0	0	0	0	0	1_0_1	
virtual port	mode	state	plnk	tlnk	Rate	WPN	Topology	NportID			
0x1110000	INI	open	sync	LinkUp	32Gbps(AUTO)	2000286EFCFF0000	P2P_F(Auto)	0x011101			
virtual port	mode	state	plnk	tlnk	Rate	WPN	Topology	NportID			
0x2110000	INI	open	sync	LinkUp	32Gbps(AUTO)	2000286EFCFF0001	P2P_F(Auto)	0x011102			
virtual port	mode	state	plnk	tlnk	Rate	WPN	Topology	NportID			
0x3110000	INI	open	sync	LinkUp	32Gbps(AUTO)	2000286EFCFF0002	P2P_F(Auto)	0x011103			
virtual port	mode	state	plnk	tlnk	Rate	WPN	Topology	NportID			
0x4110000	INI	open	sync	LinkUp	32Gbps(AUTO)	2000286EFCFF0003	P2P_F(Auto)	0x011104			
virtual port	mode	state	plnk	tlnk	Rate	WPN	Topology	NportID			
0x5110000	INI	open	sync	LinkUp	32Gbps(AUTO)	2000286EFCFF0004	P2P_F(Auto)	0x011105			
virtual port	mode	state	plnk	tlnk	Rate	WPN	Topology	NportID			
0x6110000	INI	open	sync	LinkUp	32Gbps(AUTO)	2000286EFCFF0005	P2P_F(Auto)	0x011106			
virtual port	mode	state	plnk	tlnk	Rate	WPN	Topology	NportID			
0x7110000	INI	open	sync	LinkUp	32Gbps(AUTO)	2000286EFCFF0006	P2P_F(Auto)	0x011107			
port	mode	state	plnk	tlnk	Rate	WPN	Tape	MSI-X	IOR	Topology	MSpeed
hifc0001	INI	open	sync	LinkUp	32Gbps(AUTO)	200400e0fcffb645	0	-X	0	P2P_F(Auto)	32Gbps
LossOfSignal		Bad CRC	Bad RX Char	Loss of Sync	Link Fail	RxE0Fa	DisFrame	Proto error	A_Y_G		
		0	0	0	0	0	0	0	0	1_0_1	
port	mode	state	plnk	tlnk	Rate	WPN	Tape	MSI-X	IOR	Topology	MSpeed
hifc0100	INI	open	sync	LinkDown	NoLink(AUTO)	200400e0fcffb634	0	-X	0	NA(Auto)	32Gbps
LossOfSignal		Bad CRC	Bad RX Char	Loss of Sync	Link Fail	RxE0Fa	DisFrame	Proto error	A_Y_G		
		0	0	0	0	0	0	0	0	0_0_0	
port	mode	state	plnk	tlnk	Rate	WPN	Tape	MSI-X	IOR	Topology	MSpeed
hifc0101	INI	open	sync	LinkDown	NoLink(AUTO)	200400e0fcffb635	0	-X	0	NA(Auto)	32Gbps
LossOfSignal		Bad CRC	Bad RX Char	Loss of Sync	Link Fail	RxE0Fa	DisFrame	Proto error	A_Y_G		
		0	0	0	0	0	0	0	0	0_0_0	

Get FC port all information succeed

3.4.9 Setting the Status of a Specified Port (fc_port)

Function

The **fc_port** command is used to set the status of an IN300 FC port, including resetting, enabling, or disabling the port.

Format

hifcadm fc_port -i <devicename> -m <modetype> -s <portstate>

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose status is to be set in the system.	Example: hifc0000 and hifc0001
<i>modetype</i>	Indicates the operation type.	<ul style="list-style-type: none"> ● 1: reset ● 2: enable or disable
<i>portstate</i>	Indicates the port status to be set when <i>modetype</i> is 2.	<ul style="list-style-type: none"> ● 0: disable ● 1: disable

Usage Instruction

None

Example

Reset an IN300 port.

```
[root@localhost final]# hifcadm fc_port -i hifc0001 -m 1
[hifc0001]reset fcport_succeed
```

Enable an IN300 port.

```
[root@localhost final]# hifcadm fc_port -i hifc0001 -m 2 -s 1
[hifc0001]turn on sfp succeed
```

Disable an IN300 port.

```
[root@localhost final]# hifcadm fc_port -i hifc0001 -m 2 -s 0
[hifc0001]turn off sfp succeed
```

3.4.10 Changing the Topology Mode of a Specified Port (fc_topo)

Function

The **fc_topo** command is used to change the topology mode of a specified IN300 port.

Format

hifcadm fc_topo -i <devicename> -t <topomode>

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose topology mode is to be set in the system.	Example: hifc0000 and hifc0001
<i>topomode</i>	Indicates the topology mode to be set.	<ul style="list-style-type: none"> ● 3: loop ● 12: non-loop ● 15: adaptive

Usage Instruction

None

Example

Set the topology mode of an IN300 FC port to **Loop**.

```
[root@localhost final]# hifcadm fc_topo -i hifc0001 -t 3
[hifc0001]set topo[Loop] succeed
```

3.4.11 Setting the Rate of a Specified Port (fc_speed)

Function

The **fc_speed** command is used to set the rate for an IN300 FC port.

Format

hifcadm fc_speed -i <devicename> -s <speedvalue>

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose rate is to be set in the system.	Example: hifc0000 and hifc0001
<i>speedvalue</i>	Indicates the port rate to be set.	<ul style="list-style-type: none"> ● 0: adaptive ● 2: 2 Gbit/s ● 4: 4 Gbit/s ● 8: 8 Gbit/s ● 16: 16 Gbit/s ● 32: 32 Gbit/s

Usage Instruction

None

Example

Set the rate of an IN300 FC port to 8 Gbit/s.

```
[root@localhost final]# hifcadm fc_speed -i hifc0001 -s 8
[hifc0001]set speed[8G] succeed
```

3.4.12 Querying the Status of a Specified Port (fc_port_info)

Function

The **fc_port_info** command is used to query the status information of a specified IN300 FC port.

Format

```
hifcadm fc_port_info -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose status is to be queried in the system.	Example: hifc0000 and hifc0001

Usage Instruction

None

Example

Query the status of an IN300 FC port.

```
[root@localhost tool]# hifcadm fc_port_info -i hifc0001
[hifc0001]link up [topo]=P2P_D [speed]=16Gbps
[hifc0001]Get port info succeed
```

3.4.13 Clearing Error Code Information of a Specified Port (fc_port_clear)

Function

The **fc_port_clear** command is used to clear the error code information of a specified IN300 FC port.

Format

```
hifcadm fc_port_clear -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose error code information is to be cleared in the system.	Example: hifc0000 and hifc0001

Usage Instruction

None

Example

Clear the error code information of an IN300 FC port.

```
[root@localhost final]# hifcadm fc_port_clear -i hifc0001  
[hifc0001]clear port stat succeed
```

3.4.14 Querying the Optical Module Information of a Specified Port (fc_sfpinfo)

Function

The **fc_sfpinfo** command is used to query the optical module information of a specified IN300 FC port.

Format

```
hifcadm fc_sfpinfo -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose optical module information is to be queried in the system.	Example: hifc0000 and hifc0001

Usage Instruction

None

Example

Query the optical module information of an IN300 FC port.

```
[root@local host final]# hifcadm fc_sfpinfo -i hifc0000
-----show sfp info-----
Vendor name:      AVAGO
Vendor OUI:      00176a
Serial Num:      AD1631305G7
Date:           20160804
Bitrate:         8500
Temperature:     28 ( -10 Y,  95 Y)
Vcc (mV) :       3296 ( 2970 Y, 3630 Y)
Tx pow(uW) :     564 ( 100 Y,  700 Y)
Tx bias (uA) :   6160 ( 2000 Y,10500 Y)
Rx pow(uW) :     0 (  49 N, 1100 Y)
Id:              0x03
IdExt:           0x04
Connector:       0x07
Encoding:        1
RateIdentifier:  0
LengthSmfKm:    0 (km)
LengthSmf:      0 (100m)
LengthSmfOm2    5 (10m)
LengthSmfOm1    3 (10m)
LengthCable:    0 (m)
LengthOm3       15 (10m)
Transceiver     0
aucVendorRev:   G2.3
aucWaveLength:  850
UnAllocated:    0
CcBase:         207
-----Get sfp information succeed-----
```

3.4.15 Querying and Setting the FEC Mode of a Specified Port (fc_fec)

Function

The **fc_fec** command is used to query and set the FECViaTTS mode of a specified Huawei IN300 2*16Gb, and Huawei IN300 2*32Gb FC port running at 16 Gbit/s.

The Huawei IN300 2*8Gb does not support this command.

Format

```
hifcadm fc_fec -i <devicename> -m <mode>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose FECViaTTS mode is to be queried or set in the system.	Example: hifc0000 and hifc0001

Parameter	Description	Value
<i>mode</i>	Indicates the FEC mode to be set.	<ul style="list-style-type: none"> ● 0: Disable the FECViaTTS mode. ● 1: Enable the FECViaTTS mode. ● 2: Query the enabling status of the current FECViaTTS mode.

Usage Instruction

None

Example

Query the FEC mode of an Huawei IN300 2*16Gb/Huawei IN300 2*32Gb FC port.

```
[root@localhost final]# hifcadm fc_fec -i hifc0001 -m 2
Current FC 16G FECViaTTS mode is 0
```

Enable the FEC mode of an Huawei IN300 2*16Gb/Huawei IN300 2*32Gb FC port.

```
[root@localhost final]# hifcadm fc_fec -i hifc0001 -m 1
Set FC 16G FECViaTTS mode(1) succeeded
Please reset port. Mode will be valid after reset port
```

3.4.16 Querying and Setting the BB_SC_N Function of a Specified Port (fc_bbscn)

Function

The **fc_bbscn** command is used to query and configure the BB_SC_N parameters of a specified IN300 FC port.

After the parameters are configured, the BB_Credit Recovery function is enabled.

Format

```
hifcadm fc_bbscn -i <devicename> -m <mode> -v <value>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose BB_SC_N function is to be queried or set in the system.	Example: hifc0000 and hifc0001

Parameter	Description	Value
<i>mode</i>	Specifies whether to set or query the BB_SC_N function.	<ul style="list-style-type: none"> ● 0: Set the BB_SC_N function. ● 1: Query BB_SC_N parameters.
<i>value</i>	Indicates the BB_SC_N value to be set.	0 to 14

Usage Instruction

None

Example

Query the BB_SC_N parameters of an IN300 FC port.

```
[root@localhost final]# hifcadm fc_bbscn -i hifc0000 -m 1
Link FC BBSCN value is 0
Configured FC BBSCN value is 0
```

Set the BB_SC_N value for an IN300 FC port.

```
[root@localhost final]# hifcadm fc_bbscn -i hifc0000 -m 0 -v 12
Set FC BBSCN value(12) succeeded
```

3.4.17 Querying and Clearing the Statistics of a Specified Port (fc_dfx)

Function

The **fc_dfx** command is used to query and clear the statistics of a specified IN300 FC port.

Format

```
hifcadm fc_dfx -i <devicename> -m <countertmode> [-s <sessionid>] [-c <cleartype>]
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 FC port whose statistics is to be queried in the system.	Example: hifc0000 and hifc0001

Parameter	Description	Value
<i>countertmode</i>	Indicates the type of the statistics to be queried.	<ul style="list-style-type: none"> ● 0: WQE receiving or sending count ● 1: WQE receiving or sending error count ● 2: error status count on the uP management module ● 3: connection status count ● 4: I/O statistics of the host ● 5: I/O statistics of a specified session of a host ● 6: DIF error statistics
<i>sessionid</i>	ID of the session to be queried when countertmode is set to 5.	-
<i>cleartype</i>	Indicates the type of statistics to be cleared when countertmode is set to 6.	The value can only be 1, which indicates the cleared DIF error count.

Usage Instruction

None

Example

Query the statistics of an IN300 FC port.

```
[root@localhost final]# hifcadm fc_dfx -i hifc0000 -m 1
HBA WQE and SCQE error statistic:
HIFC_RECV_IRESP                : 512

Total WQE error type number=1

HIFC_STAT_CTXT_FLUSH_DONE      : 0
HIFC_STAT_ROOT_SQ_EMPTY_T0    : 0
HIFC_STAT_LAST_GS_SCQE        : 4300
...
```

3.4.18 Setting the Switching Status of DIF (fc_dif)

Function

The **fc_dif** command is used to switch on or off DIF for all SP520s or SP521s on the current server. Enable DIF to protect the integrity of data read or written between hosts and disks.

The 8-byte DIF field consists of a two-byte Guard Tag, a two-byte App Tag, and a four-byte Ref Tag. After the function is enabled, DIF provides T10 DIF Type 1 end-to-end protection (DIX+DIF) by default. In the DIX protection phase, IP Checksum is used to calculate the Guard Tag information by default.

Format

```
hifcadm fc_dif -s <switch>
```

Parameters

Parameter	Description	Value
<i>switch</i>	Switching status of DIF.	<ul style="list-style-type: none">● 0: off● 1: on

Usage Instruction

None

Example

Switch on DIF for all IN300 cards.

```
[root@localhost final]# hifcadm fc_dif -s 1
DIF switch is in operation. Please wait...
Switch on FC DIF succeed
```

Switch off DIF for the IN300 cards.

```
[root@localhost final]# hifcadm fc_dif -s 0
DIF switch is in operation. Please wait...
Switch off FC DIF succeed
```

3.4.19 Configuring Other DIF Functions (fc_dif_config)

Function

The `fc_dif_config` command is used to modify other DIF configurations for all IN300 cards.

Format

```
hifcadm fc_dif_config -m <mode> -o <option> [-a <algorithm>]
```

Parameters

Parameter	Description	Value
<i>mode</i>	Indicates the DIF function mode.	<ul style="list-style-type: none">● 0: switches to the protection mode.● 1: enables the DIF data selective check.

Parameter	Description	Value
<i>option</i>	Indicates configuration options in different function modes	<p>When switching to the protection mode:</p> <ul style="list-style-type: none"> ● 0: Switch off the DIF and DIX protection modes at the same time. ● 1: Switch on the DIF and DIX protection modes at the same time. ● 2: Switch on the DIF protection mode. <p>When enabling the DIF data check:</p> <ul style="list-style-type: none"> ● 0: The DIF data is not verified when app tag is 0xFFFF and ref tag is 0xFFFFFFFF. The DIF data is verified when other values are used. ● 1: The DIF data is not verified when ref tag is 0xFFFFFFFF. The DIF data is verified when other values are used. ● 2: The DIF data is not verified when app tag is 0xFFFF. The DIF data is verified when other values are used. ● 3: The DIF data is verified when app tag is 0xFFFF and ref tag is 0xFFFFFFFF. The DIF data is not verified when other values are used.
<i>algorithm</i>	The check algorithm is used by the Guard tag in the DIX when the protection mode is enabled.	<ul style="list-style-type: none"> ● 0: CRC ● 1: IP checksum

Usage Instruction

None

Example

Set the IN300 DIX check algorithm to CRC.

```
[root@localhost final]# hifcadm fc_dif_config -m 0 -o 1 -a 0
DIF&DIX(CRC algorithm) switch is in operation. Please wait...
Set FC DIF&DIX mode(0) option(1) succeed
```

Verify DIF data **app tag** is **0xFFFF** and **ref tag** is **0xFFFFFFFF**.

```
[root@localhost final]# hifcadm fc_dif_config -m 1 -o 3
hifcadm fc_dif_config -m 1 -o 3
Set FC DIF&DIX mode(1) option(3) succeed
```

3.4.20 Querying IO Statistics of a Specified Port (fc_port_monitor)

Function

The **fc_port_monitor** command is used to query I/O statistics of an IN300 port within two minutes.

Format

```
hifcadm fc_port_monitor -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 port to be queried in the system.	Example: hifc0000 and hifc0001

Usage Instruction

None

Example

```
# Query I/O statistics of an IN300 port.
```

```
[root@localhost final]# hifcadm fc_port_monitor -i hifc0001
| Port | I/O Count | IOPS | TX M/BPS | RX M/BPS | Time |
|hifc0001| 7567709 | 1897 | 474 | 474 |18:26:40|

| Port | I/O Count | IOPS | TX M/BPS | RX M/BPS | Time |
|hifc0001| 7586673 | 1895 | 473 | 474 |18:26:50|

| Port | I/O Count | IOPS | TX M/BPS | RX M/BPS | Time |
|hifc0001| 7605641 | 1898 | 474 | 474 |18:27:00|

| Port | I/O Count | IOPS | TX M/BPS | RX M/BPS | Time |
|hifc0001| 7624625 | 1895 | 474 | 473 |18:27:10|
...
```

3.4.21 Obtaining FC MAC Logs (fc_dumpmac)

Function

The **fc_dumpmac** command is used to obtain the FC MAC log information of a specified IN300. The log information is saved to the current directory after the command is executed.

Format

```
hifcadm fc_dumpmac -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1

Usage Instruction

None

Example

Save the FC MAC register logs of the IN300 to the current directory.

```
[root@localhost final]# hifcadm fc_dumpmac -i hifc0
[root@localhost final]# ls
mac_hifc0_2018_04_19_00_43_26.log
```

3.4.22 Querying Physical Parameters of a Device in Specified Mode (hilink_param)

Function

The **hilink_param** command is used to query the **ctle**, **dfe**, and **ffe** parameters of a device in specified mode.

Format

```
hifcadm hilink_param -i <devicename> -t<type> [-p <portid>]
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1
<i>type</i>	Indicates the mode for the query.	0: indicates the PCIe mode. 1: indicates the FC mode.
<i>portid</i>	Indicates the number of a port to be queried.	This parameter takes effect when <i>type</i> is set to 1 .

Usage Instruction

None

Example

Queries parameters of the PCIe mode.

```
[root@localhost final]# hifcadm hilink_param -i hifc0 -t 0
HI16 parameter info:

lane 0 :
  TX_FFE: pre= a;main= b;post= a
  RX_CTLE: PASSGN=-2dB; ACTGN= 6 815; BST= 9 4 4; ZA= 1 1 1; SQH= 1 1 1;
RMBAND=      2 2 2; CMBAND= 1 1 1;
  RX_DFE1: Tap1=-2; Tap2=2; Tap3=1; Tap4=2; Tap5=0;
  RX_DFE2: Tap1=0; Tap2=0; Tap3=0; Tap4=0; Tap5=0; Tap6=0;
...
```

3.4.23 Querying Serdes Information of a Specified Device (serdes)

Function

The **serdes** command is used to query serdes information of a specified device.

Format

hifcadm serdes -i <devicename> [-t <mode> [-m <macroid>]]

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1
<i>mode</i>	Indicates the mode for the query.	<ul style="list-style-type: none"> ● 0: query all serdes information. ● 1: query serdes information of a specified Marco.
<i>macroid</i>	This parameter takes effect when <i>type</i> is set to 1 , and indicates the Marco ID.	0 to 4

Usage Instruction

None

Example

Query serdes information.

```
[root@localhost final]# hifcadm serdes -i hifc0 -t 0
-----show hi16 info-----
macro is 0 dsnum is 0
cs0_csr2 = 0 (success)
```

```
cs0_csr_51 = 0 (success)
cs0_csr54 = 12394
cs0_csr63 = 568
cs1_csr2 = 0 (success)
...
```

3.4.24 Obtaining FE Error Information of a Specified Device (fe_epc)

Function

The `fe_epc` command is used to obtain FE error information of a specified device.

Format

```
hifcadm fe_epc -i <devicename> show -c <coreid> -t <tid> -n <num>
```

```
hifcadm fe_epc -i <devicename> show -b
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1
<i>coreid</i>	Indicates the core ID to be queried.	-
<i>tid</i>	Indicates the thread ID to be queried.	-
<i>num</i>	Indicates the number of FE error records.	-

Usage Instruction

The `-b` is used to display all abnormal records.

Example

Query all the error information about history FE threads of the hifc0.

```
[root@localhost final]# hifcadm fe_epc -i hifc0 show -b
index is: 0
index: 192
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
...
```

3.4.25 Setting the NPIV Feature of a Specified Port (fc_vport)

Function

The **fc_vport** command is used to configure N_Port Identifier Virtualization (NPIV) features of a IN300 port, including creating and deleting a virtual interface and setting the Quality of Service (QoS) priority.

Format

hifcadm fc_vport -i <devicename> -m <modetype> -w <vportname> [-q <QoS>]

hifcadm fc_vport -i <devicename> -m <modetype> -d <vportindex>

hifcadm fc_vport -i <devicename> -m <modetype> -n <number> [-q <QoS>]

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1
<i>modetype</i>	Indicates the operation type.	<ul style="list-style-type: none"> ● 1: Create a virtual interface. ● 2: Delete a virtual interface. ● 3: Create multiple virtual interfaces at the same time. ● 4: Delete all virtual interfaces.
<i>vportname</i>	Less significant 32 bits of the WWPN of the virtual interface to be created when the operation type is 1.	The value can be a decimal or hexadecimal number. <ul style="list-style-type: none"> ● Value range in hexadecimal format: 0x1 to 0xFFFFFFFF ● Value range in decimal format: 1 to 4294967295
<i>vportindex</i>	Index of the virtual interface to be deleted when the operation type is 2.	The value can be a decimal or hexadecimal number. <ul style="list-style-type: none"> ● Value range in hexadecimal format: 0x1 to 0x40 ● Value range in decimal format: 1 to 64
<i>number</i>	Number of virtual interfaces to be created at the same time when the operation type is 3.	The value can be a decimal or hexadecimal number. <ul style="list-style-type: none"> ● Value range in hexadecimal format: 0x1 to 0x40 ● Value range in decimal format: 1 to 64

Parameter	Description	Value
<i>Qos</i>	QoS priority of the virtual port to be created when the operation type is 1 or 3.	This configuration item is optional. <ul style="list-style-type: none">● 0: low priority (default)● 1: high priority● 2: medium priority

Usage Instruction

- The WWPN consists of the lower 32 bits (vportname) and the upper 32 bits. Ensure that the WWPN is globally unique.
- The **vportindex** parameter used for deleting a virtual interface is the most significant eight bits ([31:24]) of the virtual interface ID. The virtual interface ID can be obtained by running the **hifcadm fc_allinfo** command.
- The constraints on the priority of virtual ports in the system are as follows: Number of virtual ports with high priority \leq Number of virtual ports with medium priority \leq Number of virtual ports with low priority.
- Virtual port creation supports only the Fabric mode in which port topology type is point-to-point and does not support other topologies.
- Multiple NPIVs cannot be created concurrently. You can only create NPIVs one by one.

Example

Create a virtual port.

```
[root@localhost final]# hifcadm fc_vport -i hifc0000 -m 1 -w 0xFCFF0000
Create Vport(0xfcff0000) succeed
```

Create a virtual port based on WWPN and set the priority to high.

```
[root@localhost final]# hifcadm fc_vport -i hifc0000 -m 1 -w 0xFDF00000 -q 1
Create Vport(0xfdf00000) succeed
```

Create two virtual ports at the same time.

```
[root@localhost final]# hifcadm fc_vport -i hifc0001 -m 3 -n 2
Create 1 Vport succeed
Create 2 Vport succeed
```

Create two virtual ports at the same time and set their priority to medium.

```
[root@localhost final]# hifcadm fc_vport -i hifc0001 -m 3 -n 2 -q 2
Create 1 Vport succeed
Create 2 Vport succeed
```

Query information about the current port.

```
[root@localhost final]# hifcadm fc_allinfo
```

```

linux-yhnc:~# hifcadm fc_allinfo
-----
port | mode | state | plnk | tlkn | Rate | WWPN | Tape | MSI-X | IOR | Topology | MSpeed |
hifc0000 | INI | open | sync | LinkDown | Nolink | ( AUTO) | 200300e0fcffb598 | 0 | -X | 0 | NA | ( Auto) | 32Gbps |
LossOfSignal | Bad CRC | Bad RX Char | Loss of Sync | Link Fail | RxEOFa | DisFrame | Proto | error | A_Y_G |
0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
-----
port | mode | state | plnk | tlkn | Rate | WWPN | Tape | MSI-X | IOR | Topology | MSpeed |
hifc0001 | INI | open | sync | LinkUp | 32Gbps | ( AUTO) | 200300e0fcffb599 | 0 | -X | 0 | P2P_F | ( Auto) | 32Gbps |
LossOfSignal | Bad CRC | Bad RX Char | Loss of Sync | Link Fail | RxEOFa | DisFrame | Proto | error | A_Y_G |
0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 1 | 0 | 1 |
-----
virtual port | mode | qos | state | plnk | tlkn | Rate | WWPN | Tape | MSI-X | IOR | Topology | MSpeed |
0x5110001 | INI | 0 | open | sync | LinkUp | 32Gbps | ( AUTO) | 2000286EFCFF0000 | 0 | -X | 0 | P2P_F | ( Auto) | 0x050c01 |
LossOfSignal | Bad CRC | Bad RX Char | Loss of Sync | Link Fail | RxEOFa | DisFrame | Proto | error | A_Y_G |
0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
-----
virtual port | mode | qos | state | plnk | tlkn | Rate | WWPN | Tape | MSI-X | IOR | Topology | MSpeed |
0x6110001 | INI | 1 | open | sync | LinkUp | 32Gbps | ( AUTO) | 2000286EFDFF0000 | 0 | -X | 0 | P2P_F | ( Auto) | 0x050c02 |
LossOfSignal | Bad CRC | Bad RX Char | Loss of Sync | Link Fail | RxEOFa | DisFrame | Proto | error | A_Y_G |
0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
-----
virtual port | mode | qos | state | plnk | tlkn | Rate | WWPN | Tape | MSI-X | IOR | Topology | MSpeed |
0x7110001 | INI | 0 | open | sync | LinkUp | 32Gbps | ( AUTO) | 200700E0FCFB596 | 0 | -X | 0 | P2P_F | ( Auto) | 0x050c03 |
LossOfSignal | Bad CRC | Bad RX Char | Loss of Sync | Link Fail | RxEOFa | DisFrame | Proto | error | A_Y_G |
0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
-----
virtual port | mode | qos | state | plnk | tlkn | Rate | WWPN | Tape | MSI-X | IOR | Topology | MSpeed |
0x8110001 | INI | 2 | open | sync | LinkUp | 32Gbps | ( AUTO) | 200000E0FCFB599 | 0 | -X | 0 | P2P_F | ( Auto) | 0x050c04 |
LossOfSignal | Bad CRC | Bad RX Char | Loss of Sync | Link Fail | RxEOFa | DisFrame | Proto | error | A_Y_G |
0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

```

Delete a specified virtual port.

```

[root@localhost final]# hifcadm fc_vport -i hifc0000 -m 2 -d 0x05
Delete Vport(0x5) succeed

```

Delete all virtual ports.

```

[root@localhost final]# hifcadm fc_vport -i hifc0001 -m 4
Delete all Vport succeed

```

3.4.26 Querying and Setting the QoS Function of a Specified Port (fc_qos)

Function

The `fc_qos` command is used to query and set the quality of service (QoS) feature of a specified port in the link and CS_CTL modes on a IN300 card.

Format

`hifcadm fc_qos -i <devicename> -m <modetype> [-w <wwpn>] [-l <level>]`

`hifcadm fc_qos -i <devicename> -m <modetype> [-p <priority>]`

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0000 and hifc0001

Parameter	Description	Value
<i>modetype</i>	Operation type.	<ul style="list-style-type: none"> ● 0: Set QoS priority according to the link (WWPN). ● 1: Query the WWPN information and the current level of QoS priority. ● 2: Enable or disable the QoS function in CS_CTL mode. ● 3: Query the enabling mode and negotiation result of the current CS_CTL. ● 4: Set the QoS priority of the LUN based on the LUN ID (only for VMware). ● 5: Query the QoS priority of a LUN (only for VMware)
<i>wwpn</i>	WWPN for the port whose QoS priority is to be set when the operation type is 0 .	The value can be obtained by performing operation type 1 .
<i>level</i>	QoS priority to be set when the operation type is 0 .	<ul style="list-style-type: none"> ● 0: low priority (default) ● 1: high priority ● 2: medium priority
<i>priority</i>	Enabling or disabling the QoS priority function when the operation type is 2 .	<ul style="list-style-type: none"> ● 0: disable ● 1: enable

Usage Instruction

- Before enabling the QoS function in CS_CTL mode, ensure that the priority has been set according to WWPN or that the priority of the virtual port has been set by running the **fc_vport** command.
- After the QoS function is enabled in CS_CTL mode, **restart the port** for the setting to take effect.
- The constraints on the priority of virtual ports in the system are as follows: Number of virtual ports with high priority \leq Number of virtual ports with medium priority \leq Number of virtual ports with low priority.
- The QoS cannot be configured in public loop mode.
- In the VMware system, you are not advised to set the QoS priorities of LUNs and links at the same time.
- In the VMware system, if a LUN has multiple paths, set the QoS for all paths of the LUN to the same value.

Example

```
# Query physical link information of a specified port.
```

```
[root@localhost final]# hifcadm fc_qos -i hifc0001 -m 1
index          nportid          wwpn              level
0              50a00            200304f938f1df29 2
```

Set the priority of the current link to high based on WWPN.

```
[root@localhost final]# hifcadm fc_qos -i hifc0001 -m 0 -w 200304f938f1df29 -l 1
Set wwpn 200304f938f1df29 qos mode(1) succeed
```

Query the CS_CTL (priority) mode (configuration mode and negotiation result mode) of a port.

```
[root@localhost final]# hifcadm fc_qos -i hifc0001 -m 3
Link priority mode(1)
Configured priority mode(1)
```

Disable the CS_CTL (priority) of the current port.

```
[root@localhost final]# hifcadm fc_qos -i hifc0001 -m 2 -p 0
Set priority mode(0) succeed
Please reset port
```

Set the LUN priority to high based on the LUN ID.

```
[root@localhost final]# hifcadm fc_qos -i hifc0001 -m 4 -w 200304f938f1df29 -u 1 -l 1
Set lun qos success
```

Query the LUN priority.

```
[root@localhost final]# hifcadm fc_qos -i hifc0001 -m 5 -w 200304f938f1df29 -u 1
lun qos is 1
```

3.4.27 Querying Connection Delay of a Specified Port (fc_delay)

Function

The **fc_delay** command is used to query the connection delay (in μ s) of a specified port on a IN300 card.

Format

```
hifcadm fc_delay -i <devicename> -n <nport>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hifc0 and hifc1
<i>nport</i>	Peer ID of the delay port to be queried.	<ul style="list-style-type: none"> ● If the connection delay between the port and a switch is queried, the value is 0xfffffc. ● If the connection delay between the port and other Hi1822 chips is queried, the value of this parameter is the same as that of nPortId of the current port. You can run the fc_qos command to obtain the value.

Usage Instruction

This command can be used only when the interconnected device is a fabric switch or Huawei 1822 series NIC (the NIC chip is Huawei Hi1822) and the link is available.

Example

```
# Query the current delay between a specified port and a switch.
```

```
[root@localhost final]# hifcadm fc_delay -i hifc0001 -n 0xfffffc  
FC session delay is 500us
```

3.4.28 Saving and Deleting the Configuration of a Specified Port (fc_savedata)

Function

The **fc_savedata** command is used to save and delete the configuration of an IN300 port.

After the host is restarted, the configuration of a port is restored to the most recently saved configuration. The configuration includes:

- Physical port: topology mode, rate, FEC mode, BB_SC_N, and link-based QoS information
- Virtual port: configuration and QoS information

Format

```
hifcadm fc_savedata -i <devicename> -m <mode>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the target IN300 port in the system.	Example: hifc0000 and hifc0001
<i>mode</i>	Indicates the operation type.	<ul style="list-style-type: none">● 0: saves the configuration of the port.● 1: deletes the configuration of the port.

Usage Instruction

None

Example

```
# Save the configuration of a port.
```

```
[root@localhost final]# hifcadm fc_savedata -i hifc0000 -m 0
[hifc0000]save Info succeed
```

Delete the configuration of a port.

```
[root@localhost final]# hifcadm fc_savedata -i hifc0000 -m 1
[hifc0000]clean saved Info succeed
```

3.4.29 Querying the Session Information of a Specified Port (fc_portstat)

Function

The **fc_portstat** command is used to query the session information of a specified port on an IN300 card.

Format

```
hifcadm fc_portstat -i <devicename> [-s <session_start>] [-e <session_end>]
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 port to be queried in the system.	Example: hifc0000 and hifc0001
<i>session_start</i>	Indicates the first session to be displayed.	The value range is 0 to 2047 and the maximum value is the value of session_end .
<i>session_end</i>	Indicates the last session to be displayed.	The value range is 0 to 2047 and the minimum value is the value of session_start .

Usage Instruction

If the **-s** and **-e** parameters are not specified, information about all sessions on the specified port is displayed.

In the VMware system, this command is supported if the **hifcadm** version is 1.5.2.0 or later.

Example

#Query the information about all sessions on a specified port.

```
[root@localhost final]# hifcadm fc_portstat -i hifc0000
*****Port(0x110000), Total Rport Num is 2, Init(1), offloading(0),
offloaded(1), destroying(0)*****

SQ#0: Rport=0x0, XID=0x0, CID=0xffffffff, SID=0xffffffff, DID=0xffffffff,
VPID=0x10, CMDN=0x0-0x0, STSN=0x1-0x1, COS=0x1, Offload=0x0
IoStat: Cmsn=0x0, Pmsn=0x0, DbCnt=0x0, SqeCnt=0x0, CqeCnt=0x0, InSqCnt=0xffff,
InChipCnt=0xffff0002

SQ#1: Rport=0x1, XID=0x1, CID=0xc5d8e, SID=0x50e00, DID=0xfffffc, VPID=0x10,
```

```
CMDN=0x2-0x2, STSN=0x3-0x3, COS=0x2, Offload=0x2  
IoStat: Cmsn=0xf, Pmsn=0x10, DbCnt=0x10, SqeCnt=0x10, CqeCnt=0x11, InSqCnt=0x0,  
InChipCnt=0x0
```

3.4.30 Querying the xchg Information of a Specified Port (fc_portxchg)

Function

The **fc_portxchg** command is used to query the xchg information of a specified port on an IN300 card.

Format

```
hifcadm fc_portxchg -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 port to be queried in the system.	Example: hifc0000 and hifc0001

Usage Instruction

None

Example

#Query the information about xchg on a specified port.

```
[root@ localhost]# hifcadm fc_portxchg -i hifc0000  
Port(hifc0000), Xchg: Free=<3968>, Aborted=<0>, IniBusy=<0>, TgtBusy=<0>,  
Delay=<0>, Wait=<0>, SfsFree=<2048>, SfsBusy=<0>
```

3.4.31 Setting the Link Timeout Period Permanently (fc_set_link_tmo)

Function

The **fc_get_link_tmo** command is used to set the link timeout interval of a specified IN300 port.

Format

```
hifcadm fc_set_link_tmo -i <devicename> -v <value> [-s <sync>]
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 port to be queried in the system.	Example: hifc0000 and hifc0001
value	Indicates the timeout interval in seconds.	0~90
sync	Synchronized the link timeout intervals of all ports on the server.	<ul style="list-style-type: none"> ● 0: Synchronized ● 1: Not synchronized

Usage Instruction

None

Example

Set the link timeout interval of a specified IN300 port.

```
linux-p3dh:~ # hifcadm fc_set_link_tmo -i hifc0000 -v 39 -s 1
Set FC link tmo(30 -> 39) success.
```

NOTE

1. On Linux, you can also use a system interface to set the link timeout interval of a specified port. The link timeout interval set by using the system interface must be less than or equal to the current value.


```
linux-p3dh:/sys/class/fc_host/host11 # echo 29 > dev_loss_tmo
```
2. If you use the hifcadm tool to set the link timeout interval on Linux, you need to restart the system for the setting to take effect.

3.4.32 Querying the Link Timeout Interval (fc_get_link_tmo)

Function

The **fc_get_link_tmo** command is used to query the link timeout interval of a specified IN300 port.

Format

```
hifcadm fc_get_link_tmo -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 port to be queried in the system.	Example: hifc0000 and hifc0001

Usage Instruction

None

Example

Query the link timeout interval of a specified IN300 port.

```
linux-p3dh:~ # hifcadm fc_get_link_tmo -i hifc0000
FC link tmo value is 30
```

3.4.33 Setting the Driver Log Level (fc_set_loglevel)

Function

The `fc_set_loglevel` command is used to set the driver log level of a specified IN300 port.

Format

hifcadm fc_set_loglevel -i <devicename> -l <level> -f <frequency>

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 port to be queried in the system.	Example: hifc0000 and hifc0001
level	Indicates the driver log level. When the log level is higher, the system prints more logs. This may affect the driver performance. Therefore, exercise caution when setting the log level to a number greater than or equal to 4.	<ul style="list-style-type: none"> ● 0: closed ● 1: critical ● 2: error ● 3: warning ● 4: event ● 5: major ● 6: minor ● 7: information
frequency	Indicates the maximum number of log entries that can be printed every 2s	≥ 0

Usage Instruction

None

Example

Query the driver log level of an IN300 port.

```
linux-p3dh:~ # hifcadm fc_set_loglevel -i hifc0000 -l 4 -f 600
Set FC log level(4 -> 4), frequce(100 -> 600)in 2s success.
```

3.4.34 Querying the Driver Log Level (fc_get_loglevel)

Function

The `fc_get_loglevel` command is used to query the log level of a specified IN300 port.

Format

```
hifcadm fc_get_loglevel -i <devicename>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 port to be queried in the system.	Example: hifc0000 and hifc0001

Usage Instruction

None

Example

```
# Query the driver log level of an IN300 port.
```

```
linux-p3dh:~ # hifcadm fc_get_loglevel -i hifc0000  
FC log level is 4, frequence is 100 in 2s
```

3.4.35 Reading Chip Register Values in Batches (csr_dump)

Function

The `csr_dump` command is used to read and save the chip register values in batches.

Format

```
hifcadm csr_dump -i <devicename> -m <module name> -t <type>
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the target IN300 in the system.	Example: hifc0 and hifc1
<i>module name</i>	Module type.	cpb, ipsurx, ipsutx, qu, pe, esch, mqm, lcam, sml0, sml1, smf, tile0, ppe0, ppe1, or all
<i>type</i>	Register type	cfg, err, merr, int, cnt, ctp, cap, hst, mem, dummy, or all

Usage Instruction

- Stop the services before running this command.
- Do not run this command twice on the same IN300.
- When this command is run, the registers of the chip cannot be read or written.

Example

Read and save the register values of the hifc0 chip in batches.

```
linux-58og:~ # hifcadm csr_dump -i hifc0 -m all -t all
addr:0x800100, csr name:ipsurx_indirect_ctrl, mem grp value:1, mem grp name:tpt
addr:0x800100, csr name:ipsurx_indirect_ctrl, mem grp value:0, mem grp name:tcam
addr:0x8030c0, csr name:ipsutx_indirect_ctrl, mem grp value:0, mem grp
name:difx_error_ram
addr:0xa0057c, csr name:iq_indirect_ctrl, mem grp value:0, mem grp name:srv_type
addr:0xa0057c, csr name:iq_indirect_ctrl, mem grp value:1, mem grp name:ichn
addr:0xa0057c, csr name:iq_indirect_ctrl, mem grp value:2, mem grp name:pre_alloc
addr:0xa0057c, csr name:iq_indirect_ctrl, mem grp value:3, mem grp name:pc_ptr
addr:0xa0057c, csr name:iq_indirect_ctrl, mem grp value:4, mem grp name:msg_type
addr:0xa0057c, csr name:iq_indirect_ctrl, mem grp value:5, mem grp name:link_iq
```

3.4.36 Querying the Register Information of a Specified Device (reg)

Function

The `reg` command is used to query the current register value of a specified device.

Format

```
hifcadm reg -i <devicename> -t <registertype> -a <address> [-n <num>] [-c <channel>]
```

Parameters

Parameter	Description	Value
<i>devicename</i>	Indicates the name of the IN300 to be queried in the system.	Example: hinic0 and hinic1
<i>registertype</i>	Indicates the type of the register to be queried	<ul style="list-style-type: none"> ● 0: mag register ● 1: read register ● 2: Indirect register
<i>address</i>	Indicates the address of the register to be queried	The value must be a hexadecimal address.
<i>num</i>	Indicates the number of registers to be queried.	The value must range from 1 to 32.
<i>channel</i>	Indicates the channel type of registers to be queried.	The value must range from 0 to 1.

Usage Instruction

If the command does not contain `-n`, it queries only the value of a register whose address has been specified.

Example

Query the current values of the three consecutive registers starting from 0x1022C in the IN300.

```
[root@localhost tool]# hifcadm reg -i hifc0 -t 0 -a 0x1022c -n 3
addr:          0x1022c
val[0] = 0x00
val[1] = 0x00
val[2] = 0x00
```

Query the value of the read register whose address is 0x1d00000.

```
[root@localhost tool]# hifcadm reg -i hifc0 -t 1 -a 0x1d00000
addr:          0x1d00000
data:          0x182219e5
```

3.5 Upgrading hifcadm

Prerequisites

- The hifcadm installation package has been downloaded.
For the package name and download method, see [2.1 Obtaining Software Packages](#).
- The installation package has been uploaded to the Linux, VMware ESXi, or Microsoft Windows.

Constraints

- The target version must be later than the source version.
- If the target version is the same as or later than the source version, the upgrade fails.
- If you want to roll back to an earlier version, you need to [uninstall the current hifcadm](#) and then [install the new hifcadm](#).

Upgrading hifcadm on Linux

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Run the `rpm -Uvh hifcadm-<version>-<release>.<arch>.rpm` command to upgrade hifcadm.

Example:

```
linux-CiyPcr:~/fc/tools/linux # rpm -Uvh hifcadm-1.1.9.0-1.x86_64.rpm
Preparing...                               ##### [100%]
Updating / installing...
   1:hifcadm-1.1.9.0-1                       ##### [100%]
```

----End

Upgrading hifcadm on (Linux) Ubuntu/Linx

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Run the `dpkg -i hifcadm-<version>-<release>.<arch>.deb` command to upgrade hifcadm.

----End

Upgrading hifcadm on VMware ESXi

In the VMware ESXi system, the management tool is combined with the driver package. After the driver is upgraded, the hifcadm tool is automatically upgraded.

If an independent management tool has been installed, perform operations in [3.6 Uninstalling hifcadm](#) before performing operations in [3.5 Upgrading hifcadm](#).

Upgrading hifcadm on Microsoft

Perform operations in [3.1 Installing hifcadm](#) and the new driver package automatically replaces the existing one.

3.6 Uninstalling hifcadm

Uninstalling hifcadm from Linux

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the hifcadm installation directory.

Step 3 Run the `rpm -e hifcadm` command to uninstall hifcadm.

----End

Uninstalling hifcadm from (Linux) Ubuntu/Linx

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the hifcadm installation directory.

Step 3 Run the `dpkg -r hifcadm` command to uninstall hifcadm

----End

Uninstalling hifcadm from VMware ESXi

In the VMware ESXi system, the management tool is combined with the driver package. After the driver is uninstalled, the hifcadm tool is automatically uninstalled.

If an independent management tool package has been installed, perform the following steps to uninstall the independent management tool before uninstalling the driver and management tool by referring to [2.2.4 Uninstalling the Driver](#).

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Go to the installation directory where hifcadm is installed.

Step 3 Run the `esxcli software vib remove -n huawei-esx-hifcadm` command to uninstall hifcadm.

Step 4 Run the `reboot` command to restart VMware ESXi.

----End

Uninstalling hifcadm from Microsoft Windows

Step 1 Log in to the server OS.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Click , choose **Control Panel > Programs and Features**.

Step 3 Right-click the **HifcadmTool** program name and choose **Uninstall/Change** from the short-cut menu.

----End

4 Operations Specific to VMware ESXi

On VMware ESXi, hifcadm does not support NPIV configuration. You can use the following method to configure the NPIV feature.

4.1 Creating an NPIV Port

4.2 Deleting an NPIV Port

4.1 Creating an NPIV Port

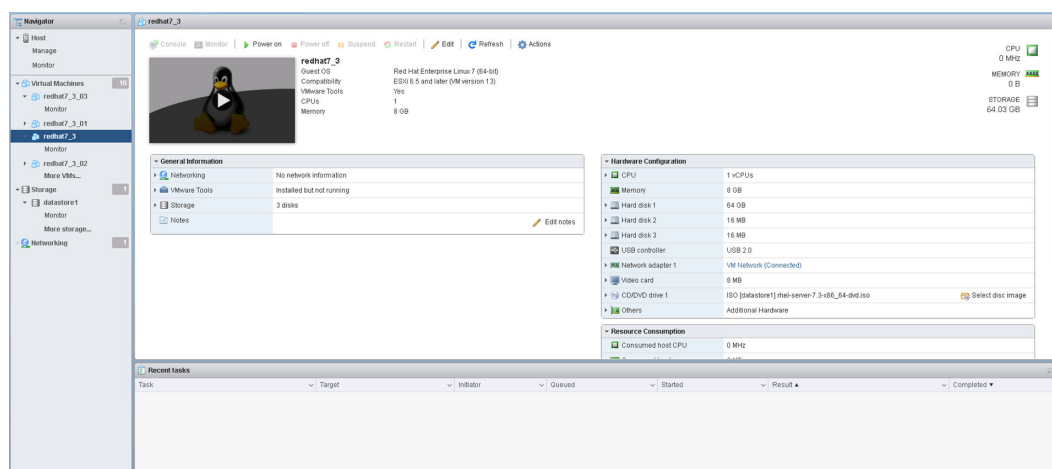
VMware ESXi 6.5 and Later

Step 1 Log in to the VMware ESXi WebUI.

Step 2 Click the target VM.

The VM management page is displayed, as shown in [Figure 4-1](#).

Figure 4-1 VM management page



Step 3 Click **Edit**.

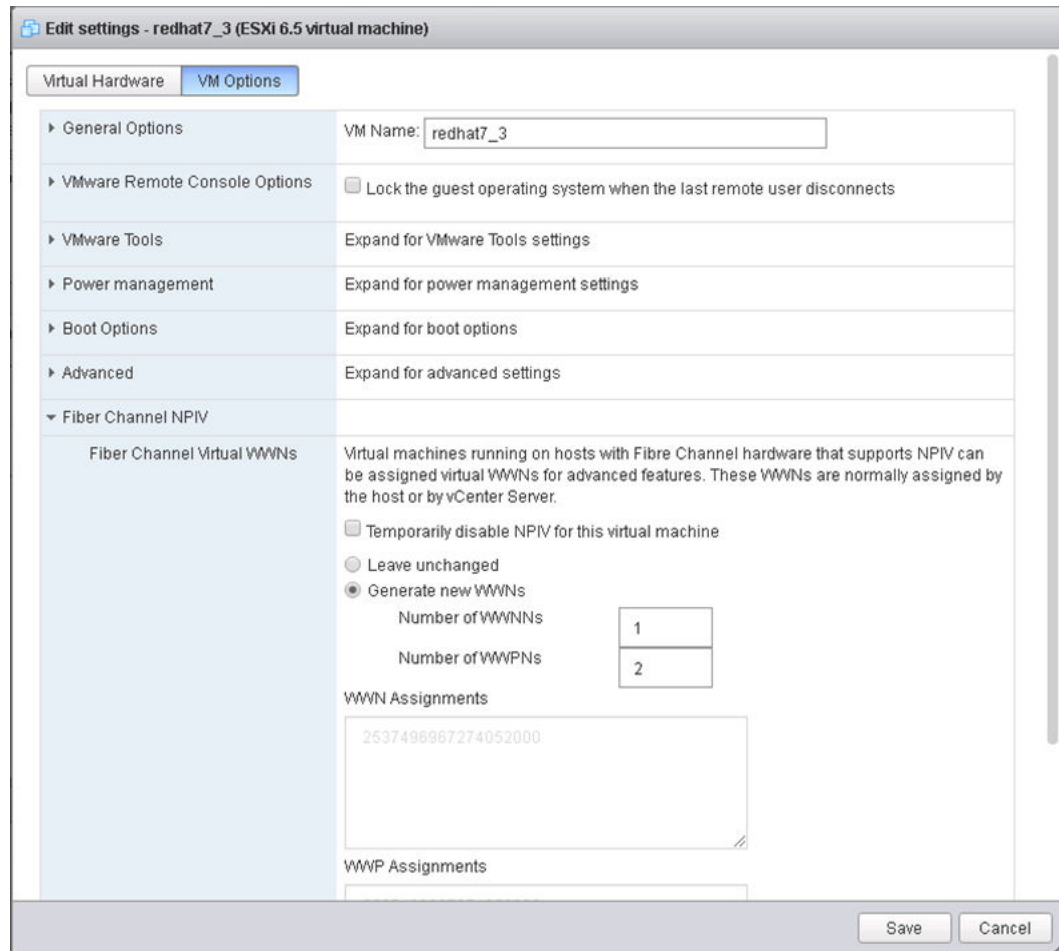
The **Edit settings** window is displayed.

Step 4 Click **VM Options**.

Step 5 Choose **Fiber Channel NPIV > Fiber Channel Virtual WWNs**.

The dialog box for setting FC virtual WWNs is displayed, as shown in [Figure 4-2](#).

Figure 4-2 Setting FC virtual WWNs



Step 6 Select **Generate new WWNs**, and set **Number of WWNNs** and **Number of WWPNS**.

Step 7 Click **Save**.

The VM management page is displayed.

Step 8 Click **Power on**.

Step 9 On the vSphere CLI of the ESXi host, run the **esxcli storage core adapter list** command to check whether the NPIV port is created successfully.

```
vmhba64 hifc link-up fc.2337000c29003a28:2337000c29003b28 Second
Level Lun ID () virtual
vmhba65 hifc link-up fc.2337000c29003a28:2337000c29003c28 Second
Level Lun ID () virtual
```

----End

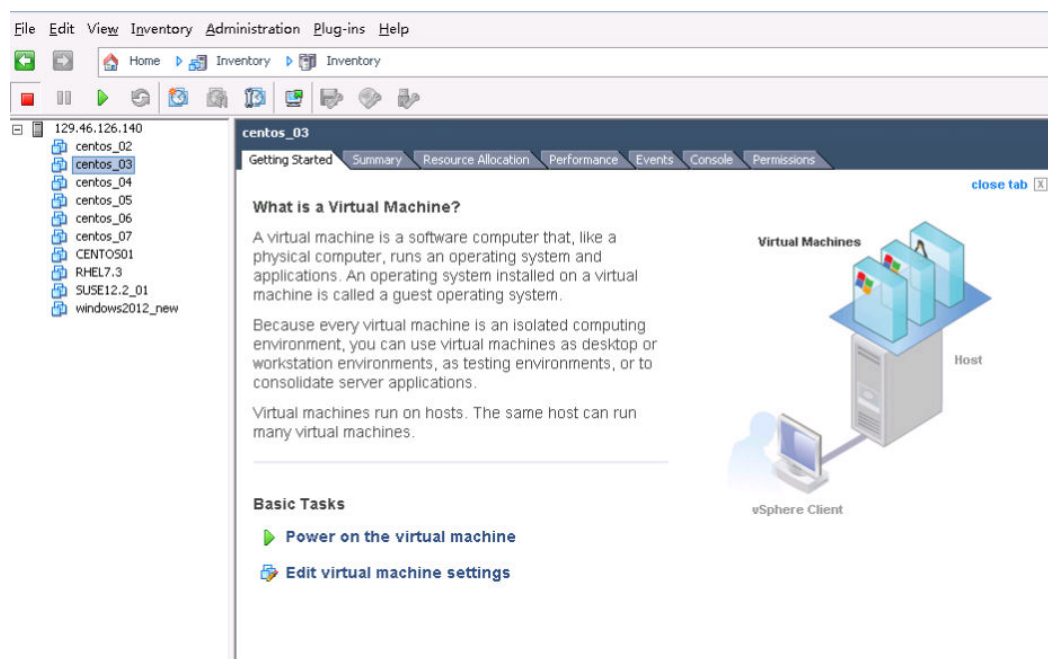
VMware ESXi 6.0

Step 1 Start VMware vSphere Client.

Step 2 Click the target VM.

The VM management window is displayed, as shown in [Figure 4-3](#).

Figure 4-3 VM management window

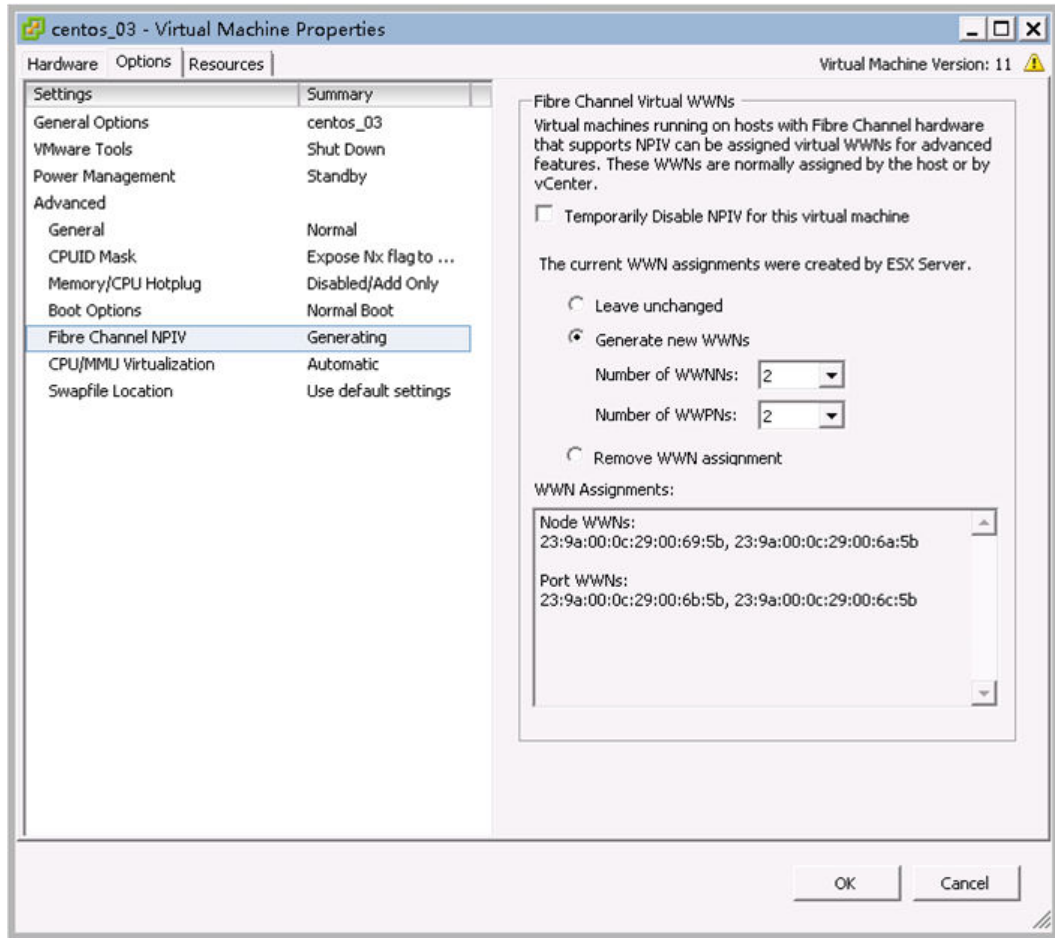


Step 3 Click **Edit virtual machine settings**.

The **Virtual Machine Properties** window is displayed.

Step 4 Click the **Options** tab.

Figure 4-4 Options



Step 5 Select **Fibre Channel NPIV**.

Step 6 Select **Generate new WWNs**, and set **Number of WWNNs** and **Number of WWPNS**.

Step 7 Click **OK**.

The VM management window is displayed.

Step 8 Click **Power on the virtual machine**.

Step 9 On the vSphere CLI of the ESXi host, run the **esxcli storage core adapter list** command to check whether the NPIV port is created successfully.

```
vmhba64 hifc link-up fc.2337000c29003a28:2337000c29003b28 Second
Level Lun ID () virtual
vmhba65 hifc link-up fc.2337000c29003a28:2337000c29003c28 Second
Level Lun ID () virtual
```

----End

4.2 Deleting an NPIV Port

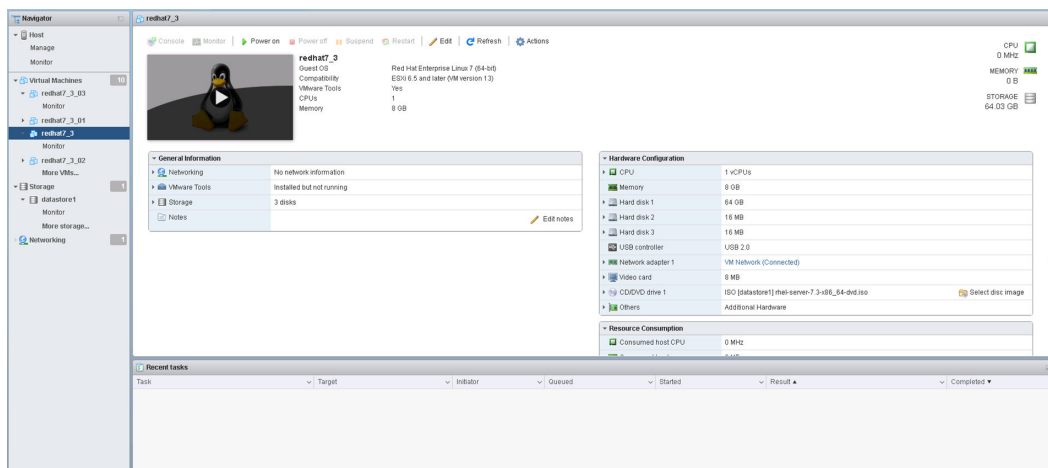
VMware ESXi 6.5 and Later

Step 1 Log in to the VMware ESXi WebUI.

Step 2 Click the target VM.

The VM management page is displayed, as shown in [Figure 4-5](#).

Ensure that all VMs that have NPIV enabled are powered off.

Figure 4-5 VM management page**Step 3** Click **Edit**.

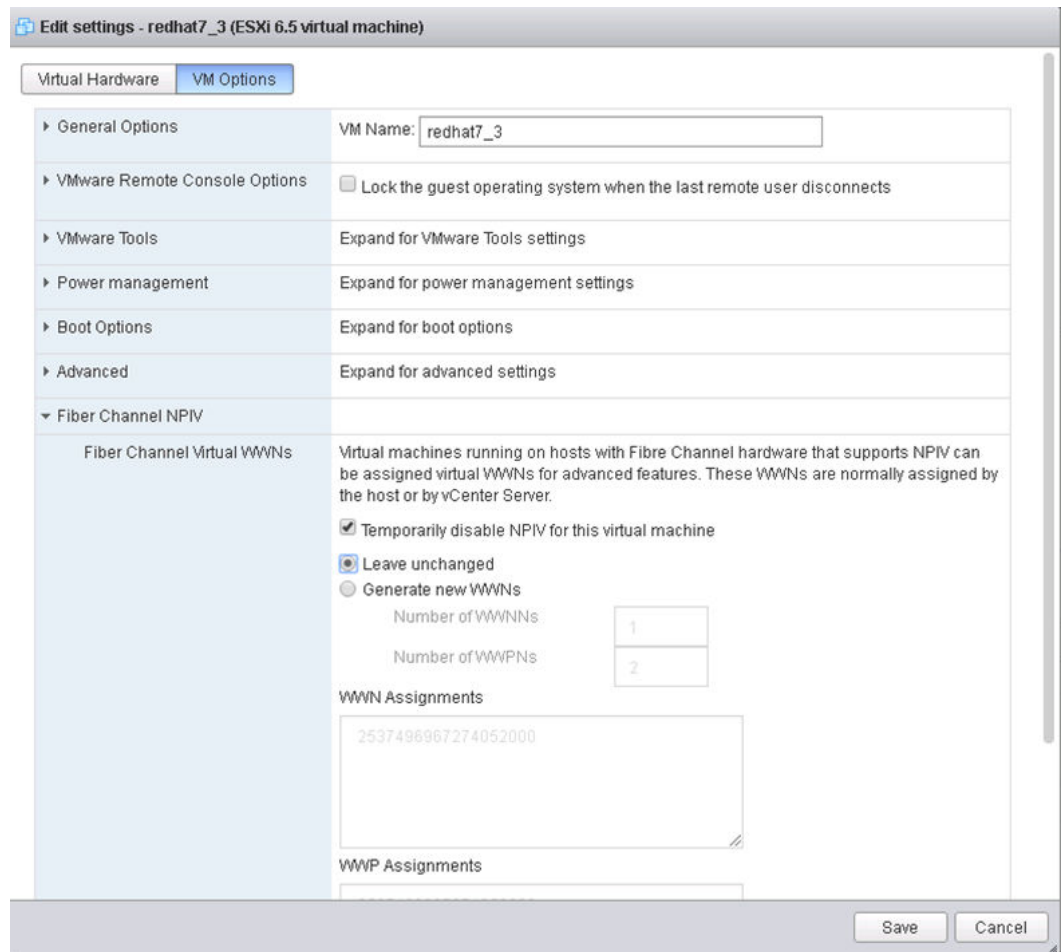
The **Edit settings** window is displayed.

Step 4 Click **VM Options**.**Step 5** Choose **Fiber Channel NPIV > Fiber Channel Virtual WWNs**.

The dialog box for setting FC virtual WWNs is displayed, as shown in

[Figure 4-6](#).

Figure 4-6 Setting FC virtual WWNs



Step 6 Select **Temporarily disable NPIV for this virtual machine**.

Step 7 Click **Save**.

The VM management page is displayed.

----End

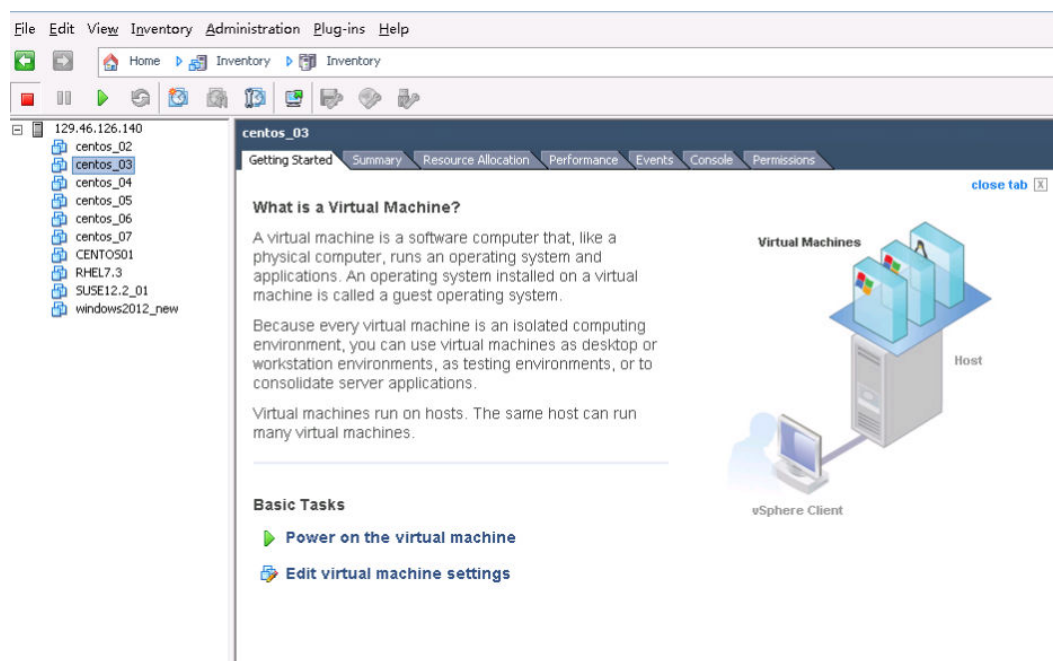
ESXi 6.0

Step 1 Start VMware vSphere Client.

Step 2 Click the target VM.

The VM management window is displayed, as shown in [Figure 4-7](#).

Figure 4-7 VM management window

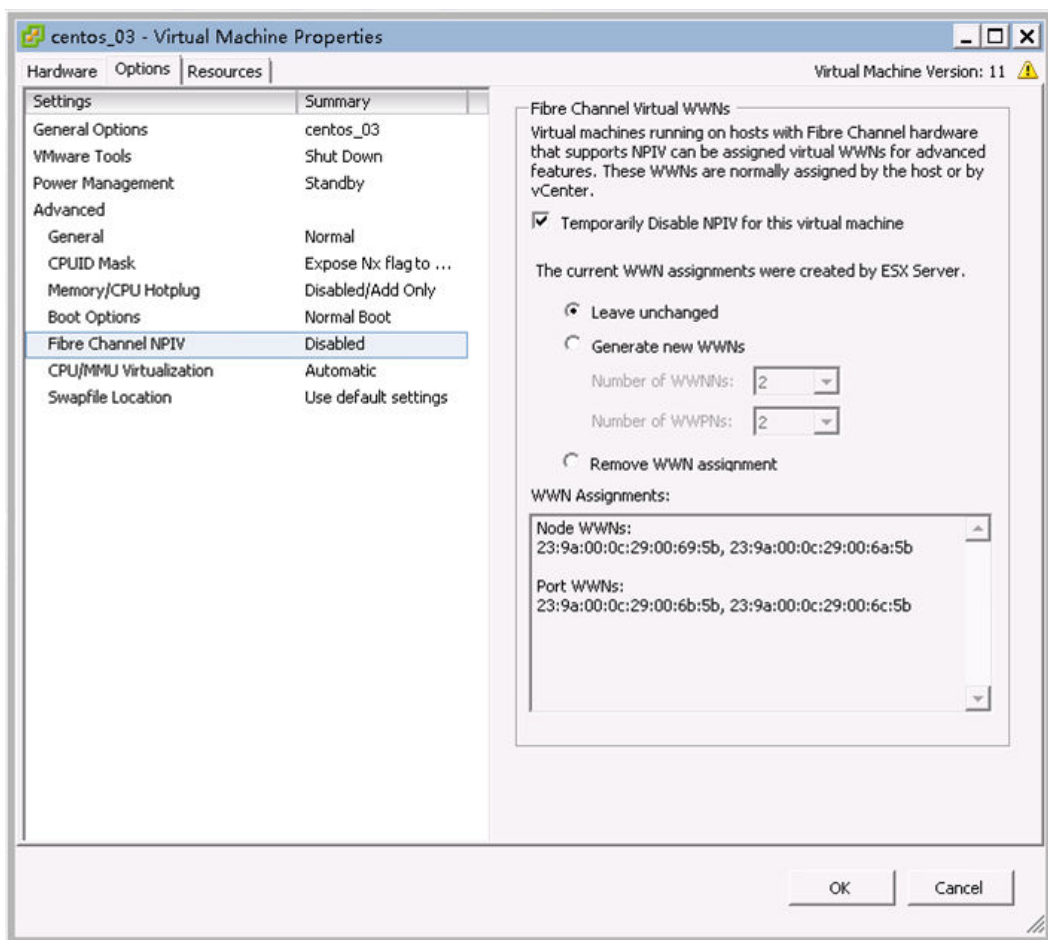


Step 3 Click **Edit virtual machine settings**.

The **Virtual Machine Properties** window is displayed.

Step 4 Click the **Options** tab.

Figure 4-8 Options



Step 5 Select **Fibre Channel NPIV**.

Step 6 Select **Temporarily disable NPIV for this virtual machine**.

Step 7 Click **OK**.

----End

5 Configuring SAN Boot

In the UEFI mode, IN300 supports SAN Boot. You can start an OS from a remote LUN.

[5.1 Checking Whether the Current Firmware Version Supports SAN Boot](#)

[5.2 Upgrading the SAN Boot Firmware](#)

[5.3 Installing an OS on a Remote LUN](#)

[5.4 Starting the System by Using SAN Boot](#)

[5.5 Collecting Logs](#)

[5.6 Constraints](#)

5.1 Checking Whether the Current Firmware Version Supports SAN Boot

After the local OS is started and the FC driver is loaded, query the IN300 version by referring to [3.4.1 Querying the Version Information of a Device \(version\)](#). If the **up** version is 1.8.2.7 or later, SAN boot is supported.

If the **up** version is earlier than 1.8.2.7, see [2.3 Upgrading the Firmware](#) to upgrade the **up** version.

5.2 Upgrading the SAN Boot Firmware

To upgrade the SAN Boot firmware, see [2.3 Upgrading the Firmware](#).

5.3 Installing an OS on a Remote LUN

5.3.1 Installing Linux on a Remote LUN

This section describes how to create driver files and install RHEL and SLES. The methods for other Linux OSs, such as CentOS, are similar.

 **NOTE**

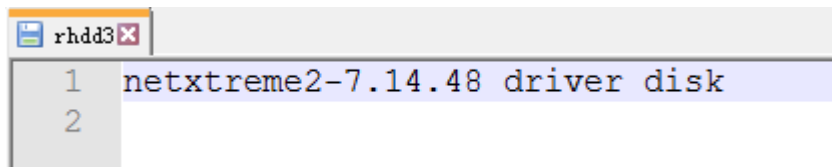
The following uses Windows as an example. Prepare the RHEL driver DD file by referring to [5.3.1.1.1 Preparing the RHEL Driver DD File](#), and prepare the SLES driver DUD file by referring to [5.3.1.2.1 Preparing a SLES Driver DUD File](#).

5.3.1.1 Installing RHEL on a Remote LUN

5.3.1.1.1 Preparing the RHEL Driver DD File

- Step 1** Obtain the RPM driver file of the RHEL OS by referring to [2.1 Obtaining Software Packages](#).
- Step 2** RHEL 7.4 is used as an example. Create the `red7.4/rpms/x86_64` directory. Put the RPM OS driver file in the `x86_64` folder, and put the `rhdd3` file in the `red7.4` folder. [Figure 5-1](#) shows the content of the `rhdd3` file.

Figure 5-1 Content of the `rhdd3` file



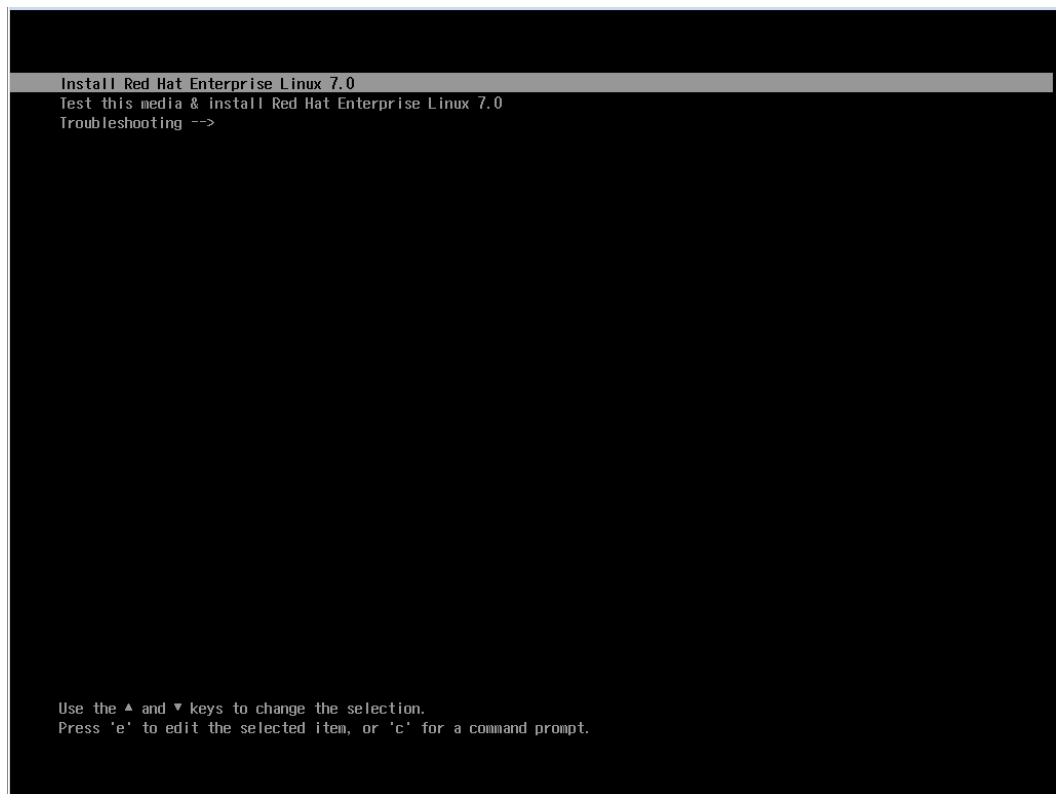
- Step 3** Use the UltraISO tool to generate an ISO file by using the `red7.4` folder. The DD file is created.

----End

5.3.1.1.2 Installing RHEL

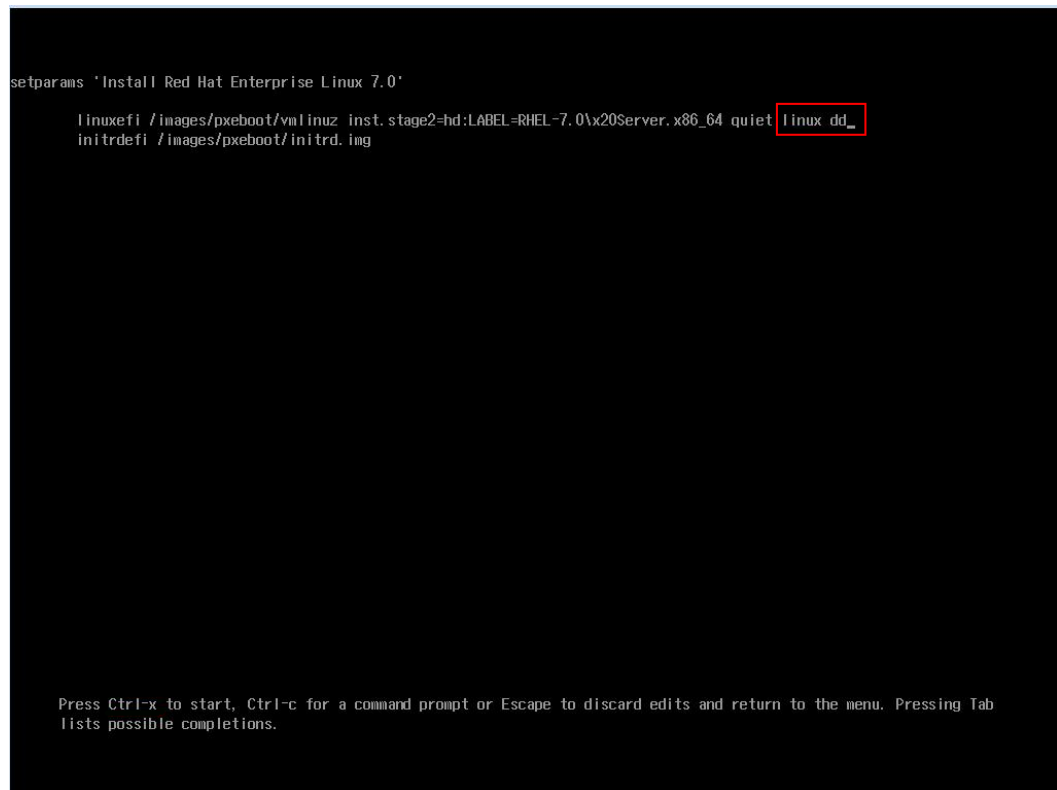
- Step 1** On the initial installation screen, select **Install Red Hat Enterprise Linux 7.0**, as shown in [Figure 5-2](#). Press **E** to edit the selected file.

Figure 5-2 RHEL initial installation screen



Step 2 Add `linux dd` at the end of the `linuxefi` line, as shown in [Figure 5-3](#). Press **Ctrl+X** to go to the next step.

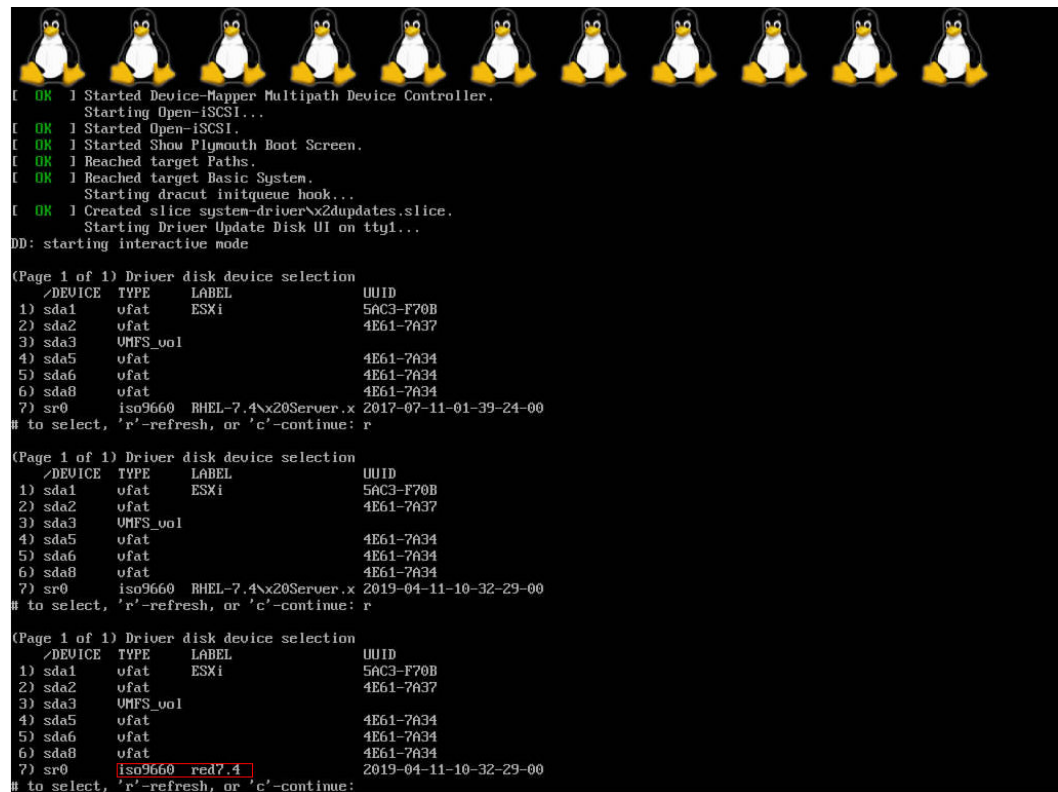
Figure 5-3 Editing the selected file



Step 3 A virtual DVD-ROM drive and a virtual floppy drive (FDD) are displayed. Unmount the OS image from the virtual DVD-ROM drive and mount the driver ISO file, as shown in [Figure 5-4](#).

Enter **r** to refresh the screen and press **Enter**.

Figure 5-4 Mounting the driver ISO image



```
[ OK ] Started Device-Mapper Multipath Device Controller.  
Starting Open-iSCSI...  
[ OK ] Started Open-iSCSI.  
[ OK ] Started Show Plymouth Boot Screen.  
[ OK ] Reached target Paths.  
[ OK ] Reached target Basic System.  
Starting dracut initqueue hook...  
[ OK ] Created slice system-driver\x2dupdates.slice.  
Starting Driver Update Disk UI on tty1...  
DD: starting interactive mode  
  
(Page 1 of 1) Driver disk device selection  
# /DEVICE TYPE LABEL UUID  
1) sda1 ufat ESXi 5A63-F70B  
2) sda2 ufat 4E61-7A37  
3) sda3 UMF5_vo1  
4) sda5 ufat 4E61-7A34  
5) sda6 ufat 4E61-7A34  
6) sda8 ufat 4E61-7A34  
7) sr0 iso9660 RHEL-7.4\x20Server.x 2017-07-11-01-39-24-00  
# to select, 'r'-refresh, or 'c'-continue: r  
  
(Page 1 of 1) Driver disk device selection  
# /DEVICE TYPE LABEL UUID  
1) sda1 ufat ESXi 5A63-F70B  
2) sda2 ufat 4E61-7A37  
3) sda3 UMF5_vo1  
4) sda5 ufat 4E61-7A34  
5) sda6 ufat 4E61-7A34  
6) sda8 ufat 4E61-7A34  
7) sr0 iso9660 RHEL-7.4\x20Server.x 2019-04-11-10-32-29-00  
# to select, 'r'-refresh, or 'c'-continue: r  
  
(Page 1 of 1) Driver disk device selection  
# /DEVICE TYPE LABEL UUID  
1) sda1 ufat ESXi 5A63-F70B  
2) sda2 ufat 4E61-7A37  
3) sda3 UMF5_vo1  
4) sda5 ufat 4E61-7A34  
5) sda6 ufat 4E61-7A34  
6) sda8 ufat 4E61-7A34  
7) sr0 iso9660 red7.4 2019-04-11-10-32-29-00  
# to select, 'r'-refresh, or 'c'-continue:
```

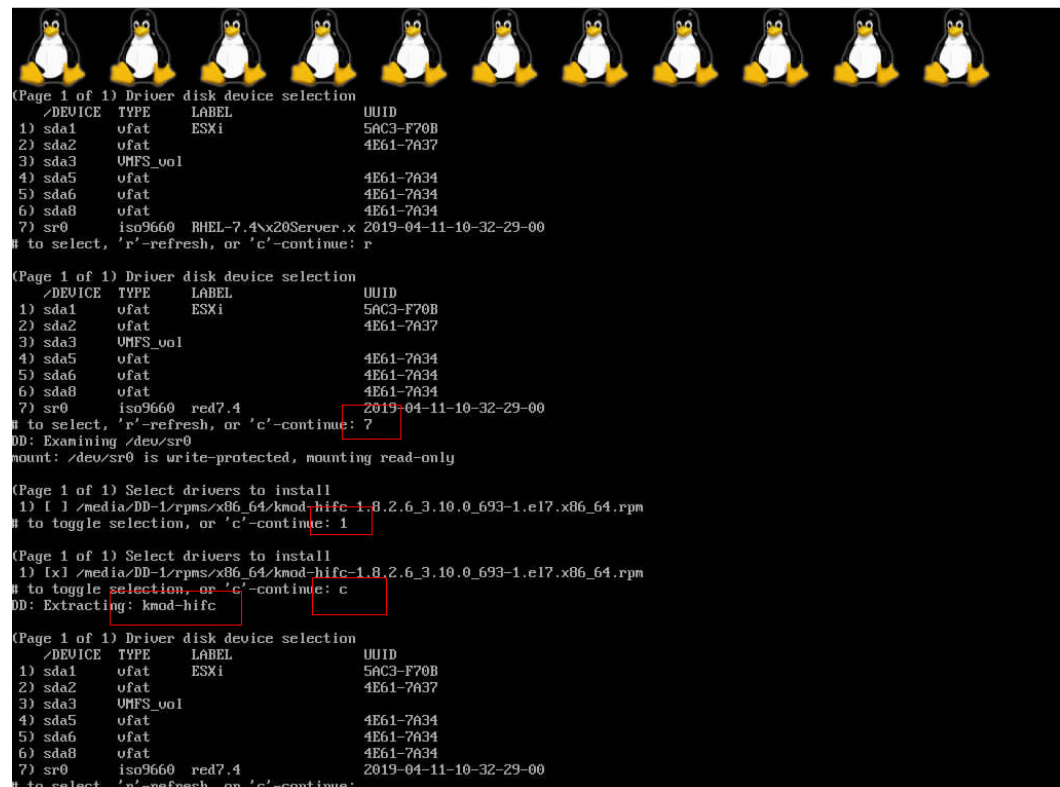
Step 4 Select the DVD-ROM drive, enter 7, and press **Enter**.

Enter 1 and press **Enter**.

Enter c and press **Enter**.

Load the driver as prompted, as shown in [Figure 5-5](#).

Figure 5-5 Loading drivers



```
(Page 1 of 1) Driver disk device selection
# /DEVICE  TYPE  LABEL  UUID
1) sda1  ufat  ESXi  5aC3-F70B
2) sda2  ufat  4E61-7a37
3) sda3  UMFS_ool
4) sda5  ufat  4E61-7a34
5) sda6  ufat  4E61-7a34
6) sda8  ufat  4E61-7a34
7) sr0   iso9660  RHEL-7.4.x20Server.x 2019-04-11-10-32-29-00
# to select, 'r'-refresh, or 'c'-continue: r

(Page 1 of 1) Driver disk device selection
# /DEVICE  TYPE  LABEL  UUID
1) sda1  ufat  ESXi  5aC3-F70B
2) sda2  ufat  4E61-7a37
3) sda3  UMFS_ool
4) sda5  ufat  4E61-7a34
5) sda6  ufat  4E61-7a34
6) sda8  ufat  4E61-7a34
7) sr0   iso9660  red7.4  2019-04-11-10-32-29-00
# to select, 'r'-refresh, or 'c'-continue: 7
DD: Examining /dev/sr0
mount: /dev/sr0 is write-protected, mounting read-only

(Page 1 of 1) Select drivers to install
1) [ ] /media/DD-1/rpms/x86_64/kmod-hifc-1.8.2.6_3.10.0_693-1.e17.x86_64.rpm
# to toggle selection, or 'c'-continue: 1

(Page 1 of 1) Select drivers to install
1) [x] /media/DD-1/rpms/x86_64/kmod-hifc-1.8.2.6_3.10.0_693-1.e17.x86_64.rpm
# to toggle selection, or 'c'-continue: c
DD: Extracting: kmod-hifc

(Page 1 of 1) Driver disk device selection
# /DEVICE  TYPE  LABEL  UUID
1) sda1  ufat  ESXi  5aC3-F70B
2) sda2  ufat  4E61-7a37
3) sda3  UMFS_ool
4) sda5  ufat  4E61-7a34
5) sda6  ufat  4E61-7a34
6) sda8  ufat  4E61-7a34
7) sr0   iso9660  red7.4  2019-04-11-10-32-29-00
# to select, 'r'-refresh, or 'c'-continue:
```

Step 5 Unmount the driver ISO image, mount the OS image, enter **r** to refresh the screen, and press **Enter** to continue the OS installation.

Set the installation location to a remote LUN.

----End

5.3.1.2 Installing SLES on a Remote LUN

5.3.1.2.1 Preparing a SLES Driver DUD File

Step 1 Obtain the driver RPM file of the SLES OS by referring to [2.1 Obtaining Software Packages](#). Upload the RPM file to the local Linux OS and run the `rpm2cpio *.rpm | cpio -idmv` command to obtain the directories of the `hifc.ko` and `hifc_sdk.ko` files for creating the DUD file.

For example, run the following command:

```
rpm2cpio hifc-kmp-default-1.8.2.8_k4.4.21_69-sles.x86_64.rpm | cpio -idmv
```

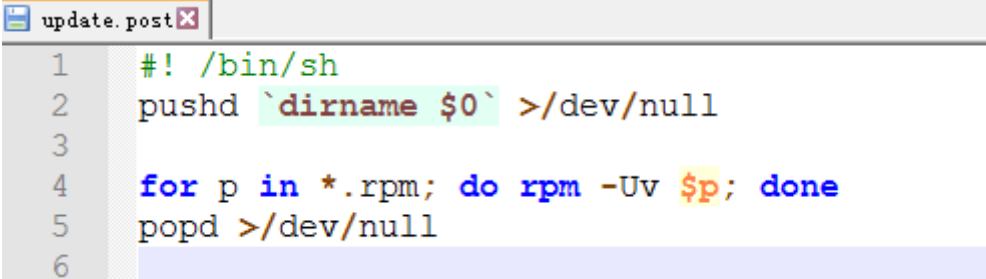
The command output is as follows:

```
./etc/modprobe.d/hifc-load.conf
./etc/modules-load.d/hifc-modules.conf
./lib/modules/4.4.21-69-default
./lib/modules/4.4.21-69-default/updates
./lib/modules/4.4.21-69-default/updates/hifc
./lib/modules/4.4.21-69-default/updates/hifc/hifc.ko
./lib/modules/4.4.21-69-default/updates/hifc/hifc_sdk.ko
59145 blocks
```

Step 2 The following uses SLES 12 SP2 as an example. Create the **linux\suse\x86_64-sles12** directory and create the **install** and **modules** folders in the **x86_64-sles12** folder.

- Put the driver RPM file and the **update.post** file in the **install** folder. **Figure 5-6** shows the content of the **update.post** file.

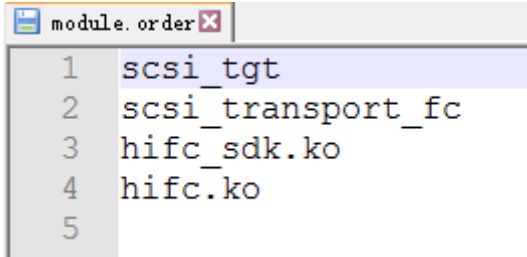
Figure 5-6 Content of the update.post file



```
update.post x
1 #!/bin/sh
2 pushd `dirname $0` >/dev/null
3
4 for p in *.rpm; do rpm -Uv $p; done
5 popd >/dev/null
6
```

- Put the **hifc.ko**, **hifc_sdk.ko**, and **module.order** files into the **modules** folder. **Figure 5-7** shows the content of the **module.order** file.

Figure 5-7 Content of the module.order file



```
module.order x
1 scsi_tgt
2 scsi_transport_fc
3 hifc_sdk.ko
4 hifc.ko
5
```

Step 3 Use the UltraISO tool to generate an ISO file by using the **linux** folder. The DUD file is created.

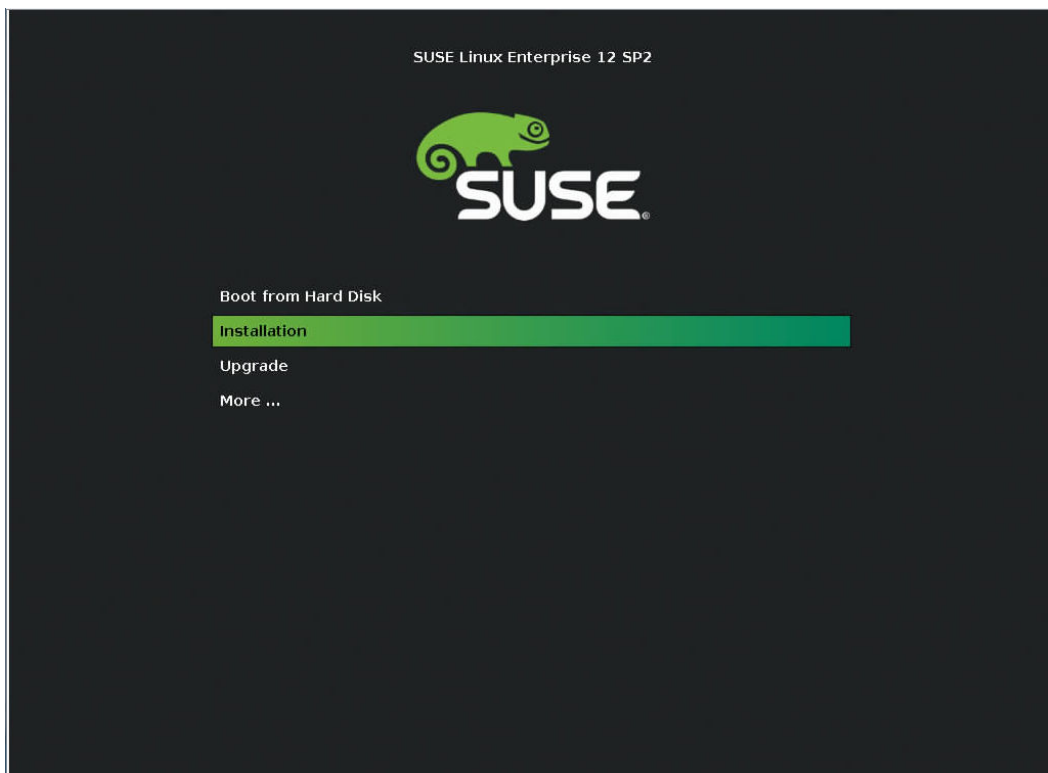
----End

5.3.1.2.2 Installing SLES

Step 1 SLES 12 SP2 is used as an example. On the initial installation screen, select **Installation**, as shown in **Figure 5-8**.

Press **E** to edit the selected file.

Figure 5-8 SLES 12 SP2 initial installation screen



Step 2 Add `linux dud=1` at the end of the `linuxefi` line, as shown in [Figure 5-9](#).

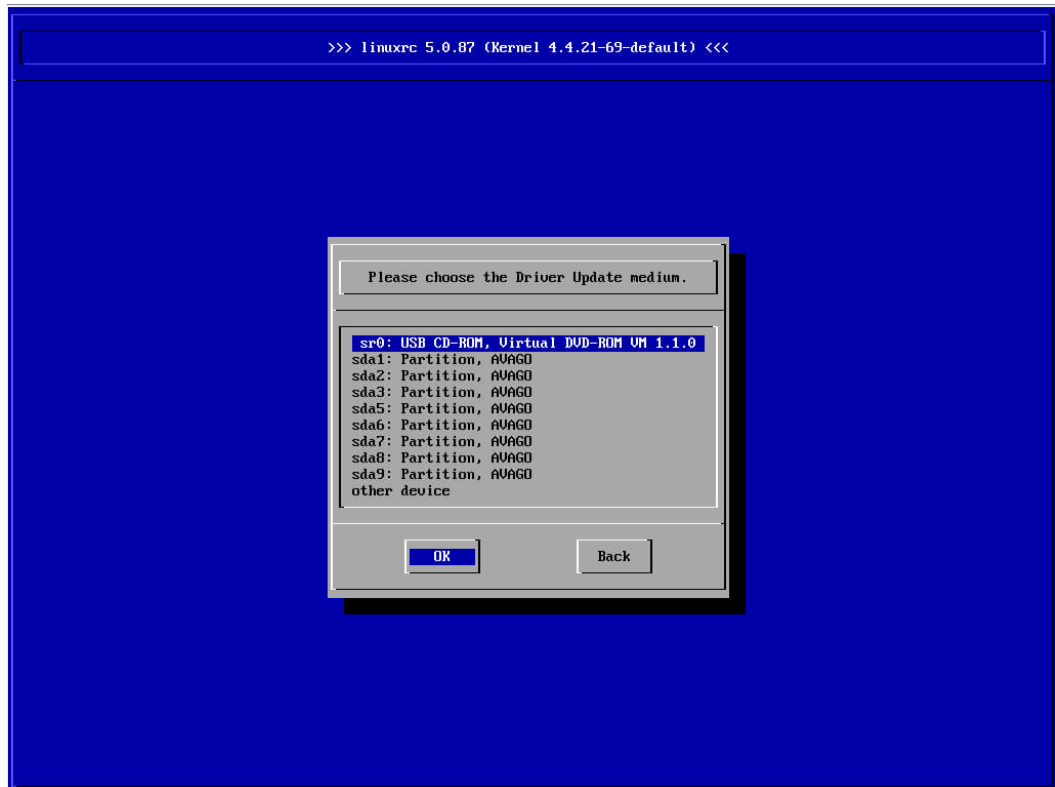
Press **Ctrl+X** or **F10**.

Figure 5-9 Editing the selected file



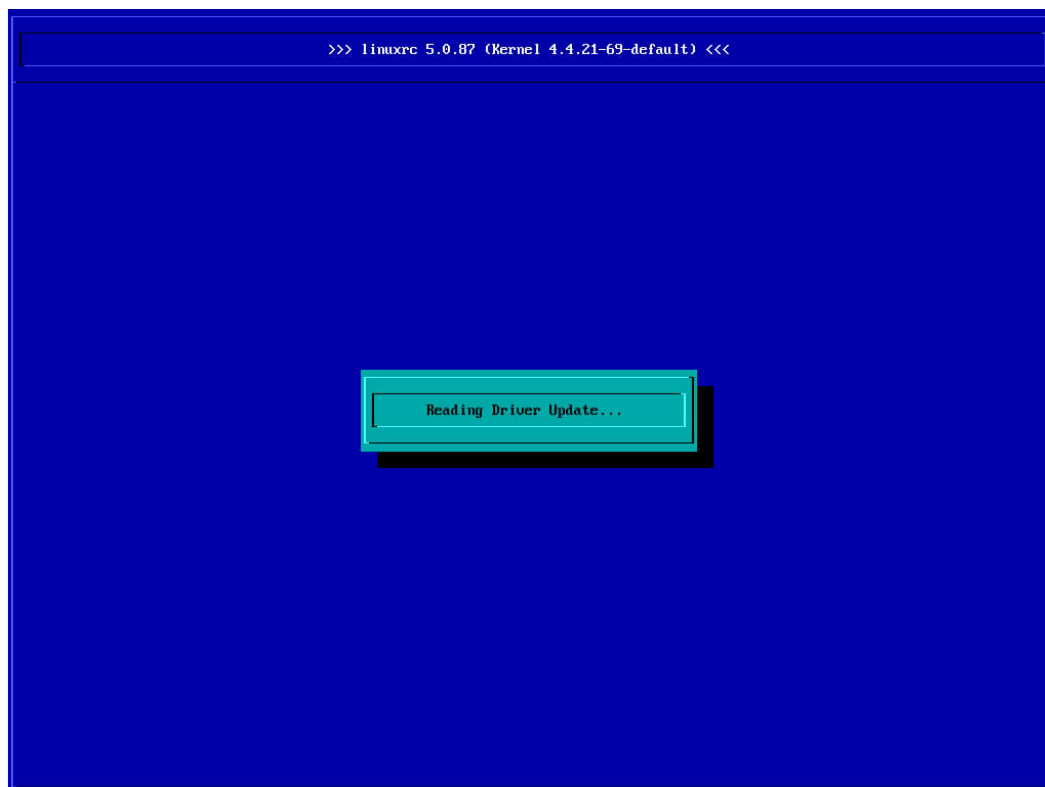
- Step 3** Unmount the OS image from the virtual DVD-ROM drive, mount the prepared DUD ISO file, click **OK**, and press **Enter**, as shown in **Figure 5-10**.

Figure 5-10 Mounting the DUD ISO file



- Step 4** The driver loading starts.

Figure 5-11 Loading the driver



Step 5 Mount the OS ISO file again to install the OS. On the installation location selection screen, select a remote LUN for installation.

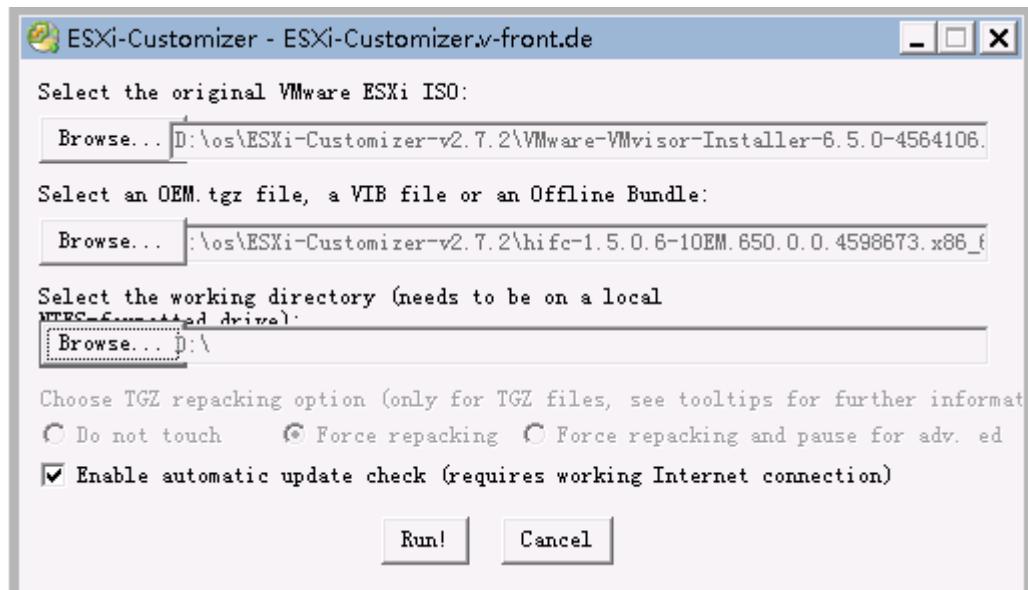
----End

5.3.2 Installing VMware ESXi on a Remote LUN

Step 1 Obtain the VIB driver file of the VMware ESXi OS. Use ESXi-Customizer or other ESXi ISO customization tools to combine the VIB driver file and ESXi ISO file into a customized ISO file.

Figure 5-12 shows how to use ESXi-Customizer to generate an ISO file. Select the path of VMware ESXi ISO file in the first row, select the path of the VIB driver file in the second row, select the path of the file to be generated in the third row, and click **Run!** to generate a customized ISO file.

Figure 5-12 Customizing an ISO file by using ESXi-Customizer



Step 2 Use the customized ISO file to install VMware ESXi on a remote LUN.

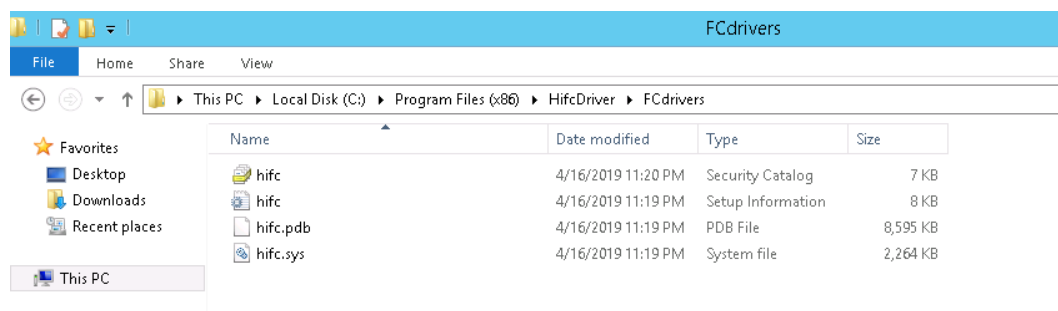
----End

5.3.3 Installing Microsoft Windows on a Remote LUN

Step 1 Obtain the MSI driver file of Microsoft Windows by referring to [2.1 Obtaining Software Packages](#).

Step 2 To obtain the original driver files from the MSI file, install the driver on a server with a Windows OS of the required version. After the installation, obtain the **FCdrivers** folder from the default installation path **C:\Program Files (x86)\HifcDriver\FCdrivers**, as shown in [Figure 5-13](#).

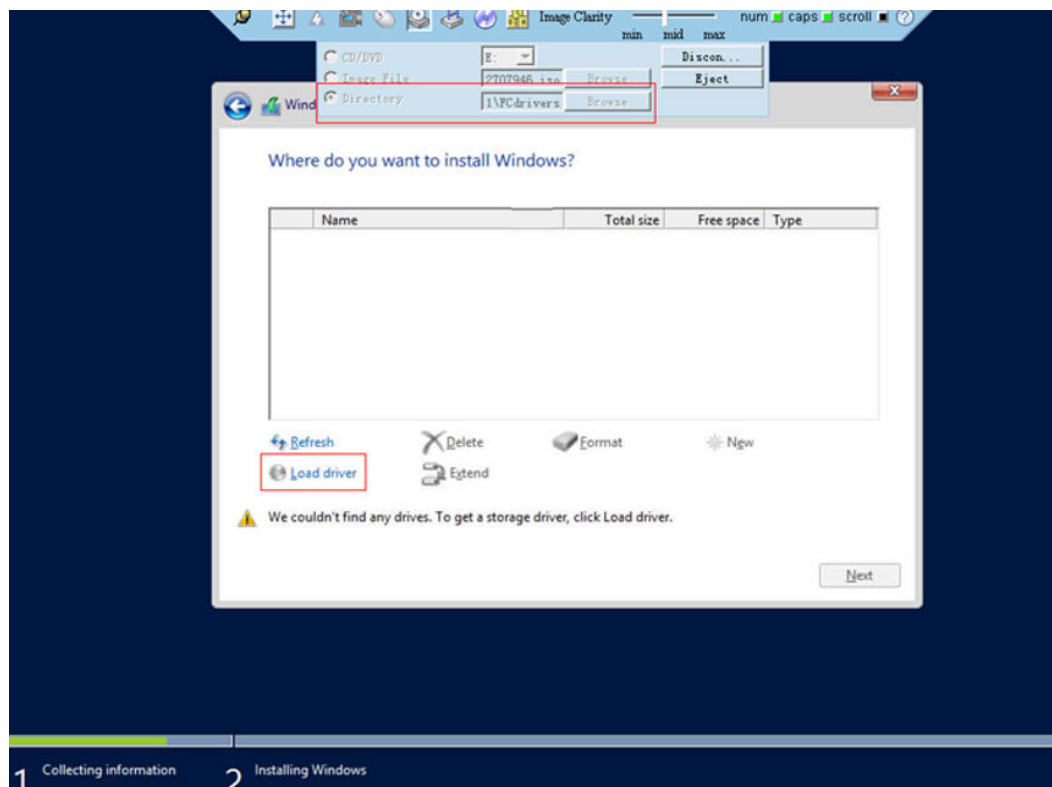
Figure 5-13 Driver files after the driver is installed on Windows



Step 3 Install the Windows OS on a remote LUN.

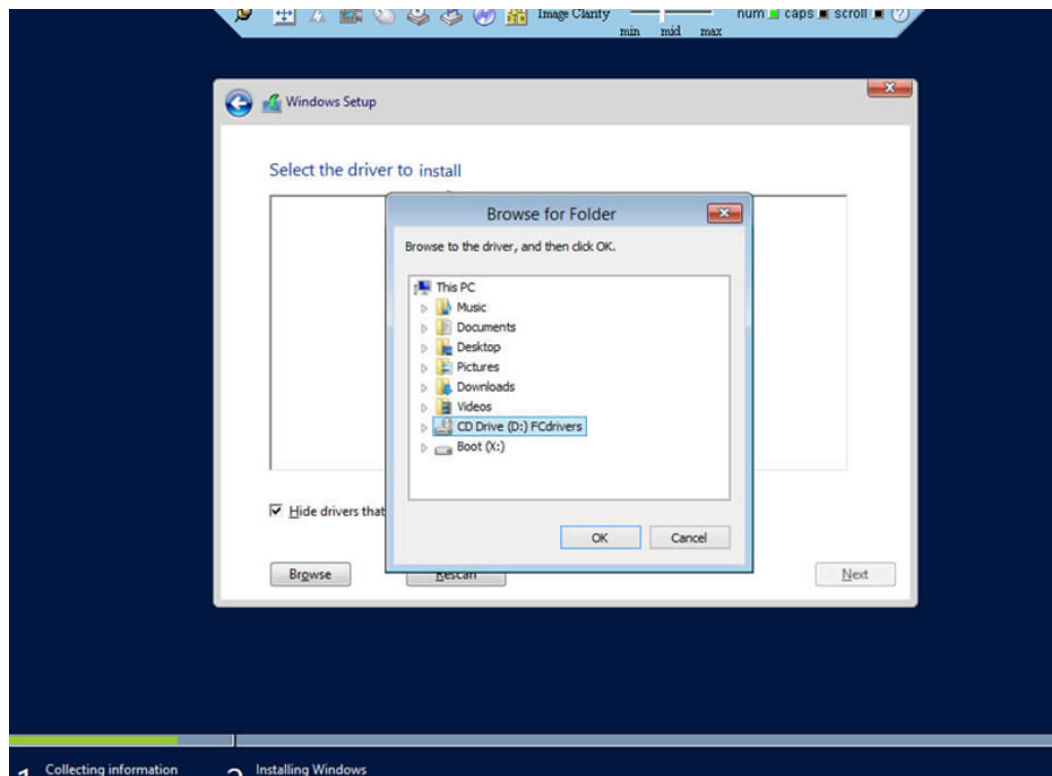
Windows Server 2012 R2 is used as an example. On the screen for selecting the installation location, mount the **FCdrivers** folder to the virtual DVD-ROM drive, and click **Load driver**, as shown in [Figure 5-14](#).

Figure 5-14 Mounting the Windows driver folder



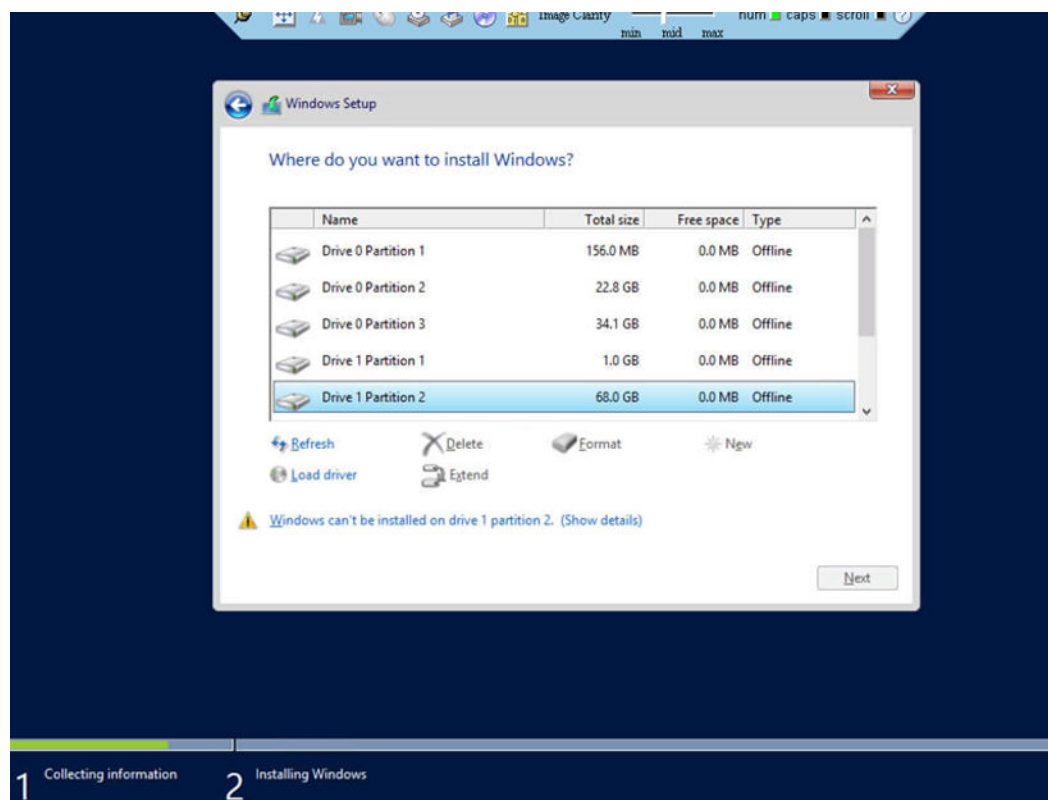
Step 4 Select the HBA driver of the Windows OS and click **OK** to load the Windows driver, as shown in [Figure 5-15](#).

Figure 5-15 Loading the Windows driver



- Step 5** Select a remote LUN and mount the OS ISO file again to install the OS, as shown in [Figure 5-16](#).

Figure 5-16 Remote LUN detected after the driver is loaded



----End

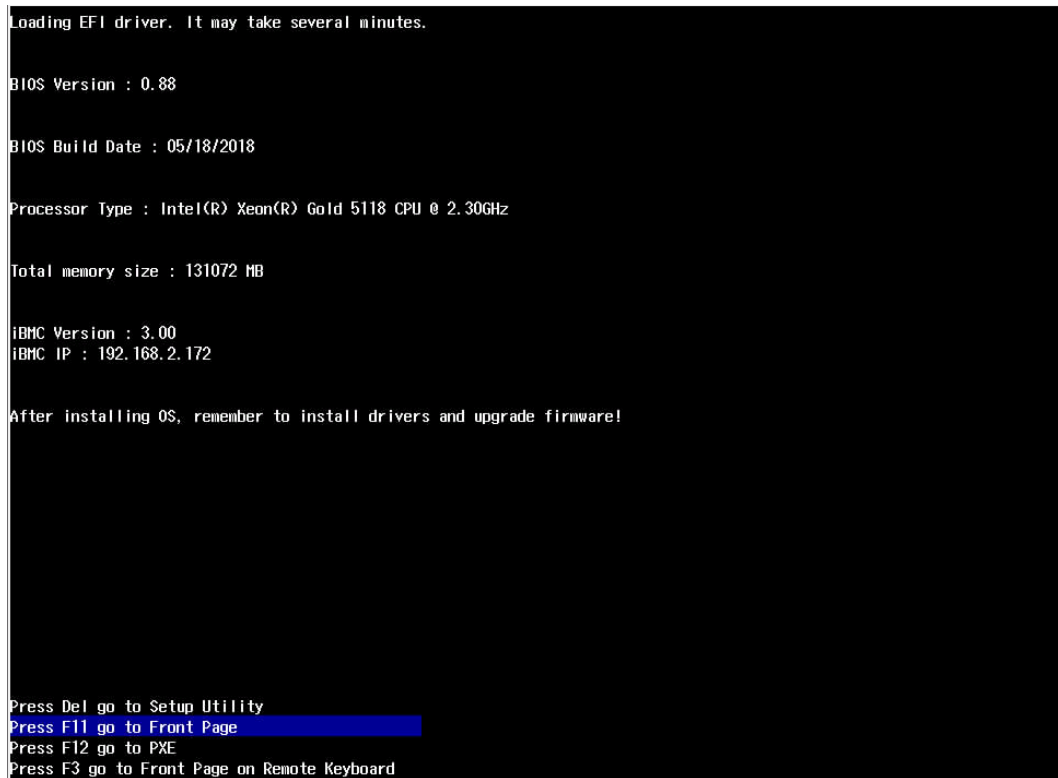
5.4 Starting the System by Using SAN Boot

5.4.1 Enabling SAN Boot

SAN Boot is disabled by default. Currently, SAN Boot supports only the UEFI mode. Set the boot mode to UEFI in the BIOS and perform the following steps to enable SAN Boot.

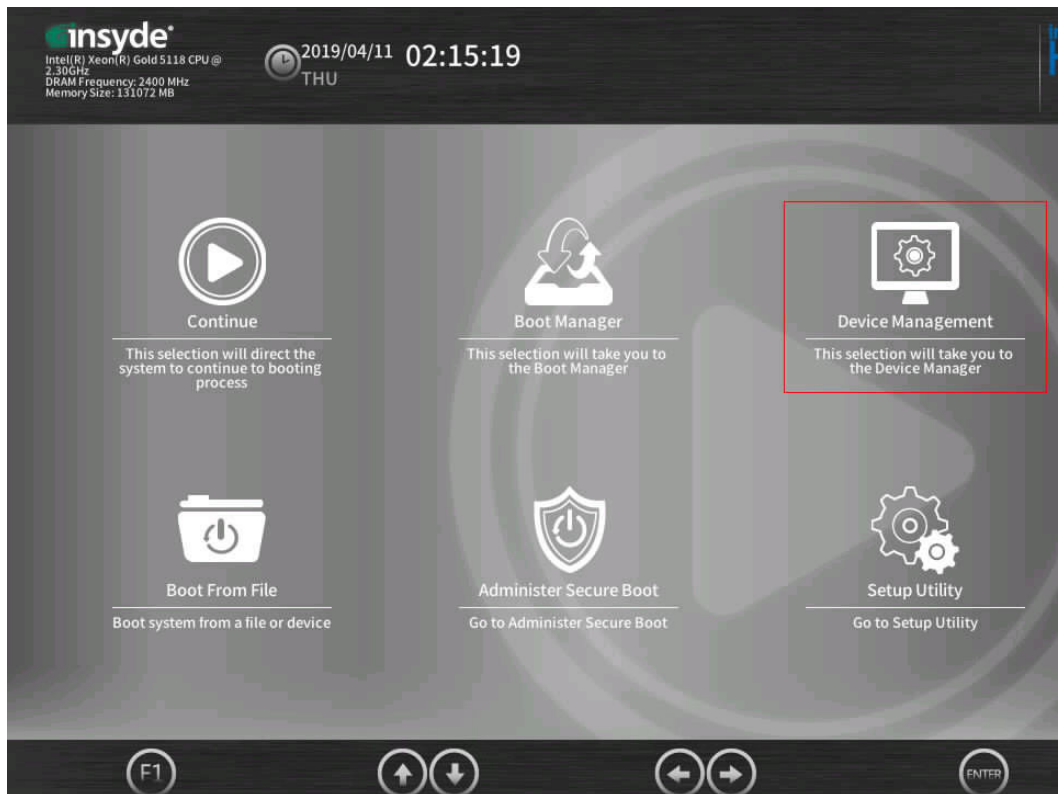
- Step 1** Access the server real-time desktop by using the remote virtual console.
For details, see [6.1 Logging In to the Real-Time Server Desktop](#).
- Step 2** Restart the server.
- Step 3** When information shown in [Figure 5-17](#) is displayed, press **F11**.

Figure 5-17 Accessing the BIOS from iBMC



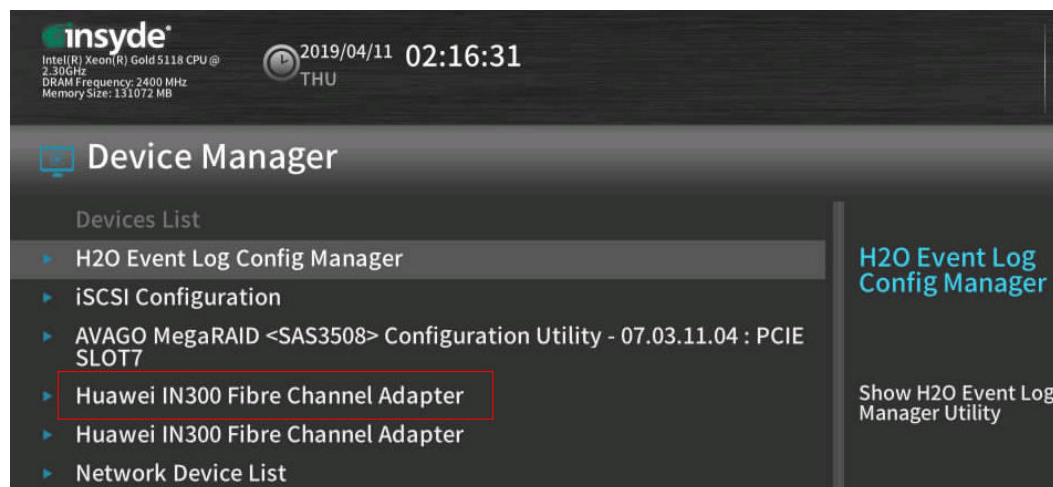
The BIOS front page is displayed.

Figure 5-18 Front page



Step 4 Use the arrow keys to select **Device Management** and press **Enter**.

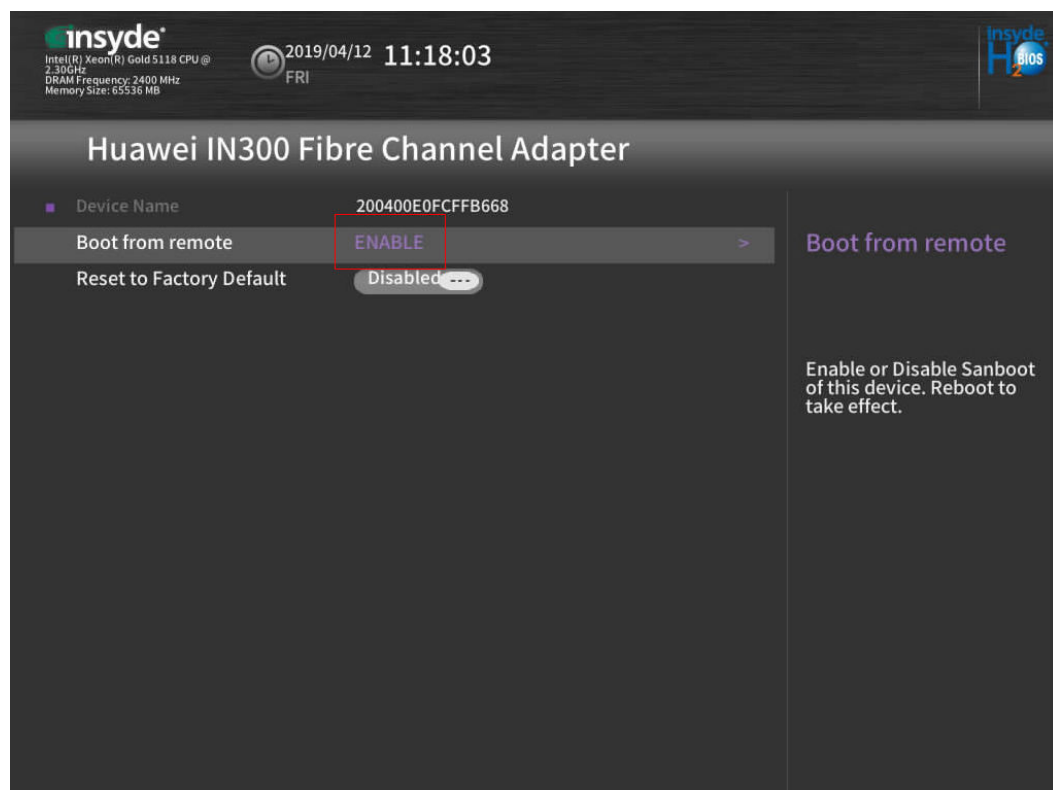
Figure 5-19 Device Management screen.



Step 5 Use the arrow keys to select **Huawei IN300 Fibre Channel Adapter** and press **Enter**. The IN300 SAN Boot screen is displayed.

Boot from remote is disabled by default. Set this parameter to **ENABLE**. Press **Esc** to exit the screen.

Figure 5-20 Enabling SAN Boot



Step 6 Restart the server.

----End

5.4.2 Starting an OS from a Remote LUN.

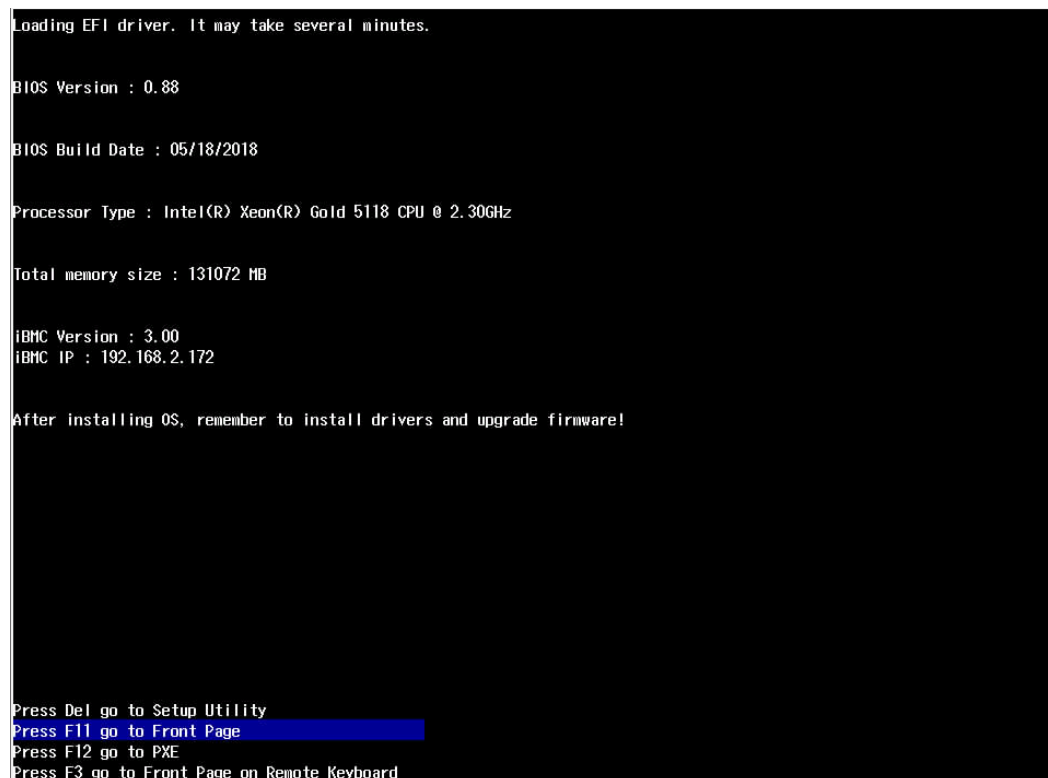
Step 1 Access the server real-time desktop by using the remote virtual console.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 Restart the server.

Step 3 When information shown in [Figure 5-21](#) is displayed, press **F11**.

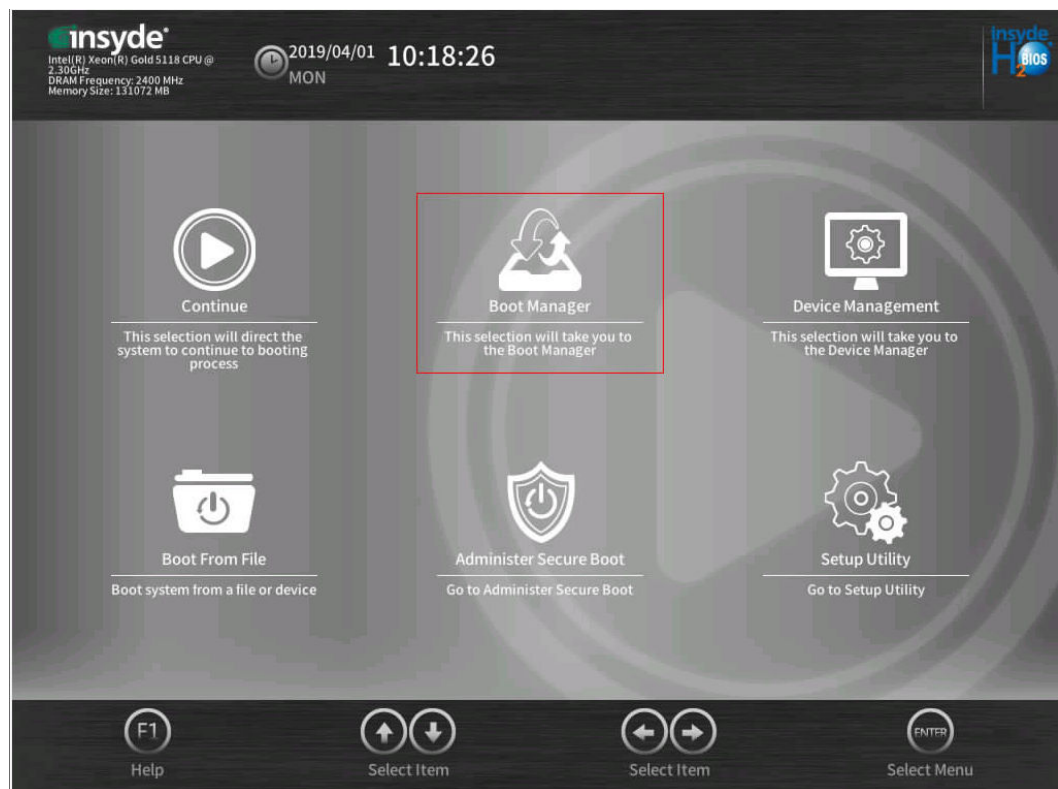
Figure 5-21 Accessing the BIOS from iBMC

A screenshot of a BIOS front page displayed on a black background with white text. The text includes system information such as BIOS Version (0.88), BIOS Build Date (05/18/2018), Processor Type (Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz), Total memory size (131072 MB), iBMC Version (3.00), and iBMC IP (192.168.2.172). At the bottom, there are instructions for navigating through the BIOS using function keys: Del for Setup Utility, F11 for Front Page (highlighted in blue), F12 for PXE, and F3 for Front Page on Remote Keyboard. A note at the top states 'Loading EFI driver. It may take several minutes.' and another note at the bottom says 'After installing OS, remember to install drivers and upgrade firmware!'.

```
Loading EFI driver. It may take several minutes.  
  
BIOS Version : 0.88  
  
BIOS Build Date : 05/18/2018  
  
Processor Type : Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz  
  
Total memory size : 131072 MB  
  
iBMC Version : 3.00  
iBMC IP : 192.168.2.172  
  
After installing OS, remember to install drivers and upgrade firmware!  
  
Press Del go to Setup Utility  
Press F11 go to Front Page  
Press F12 go to PXE  
Press F3 go to Front Page on Remote Keyboard
```

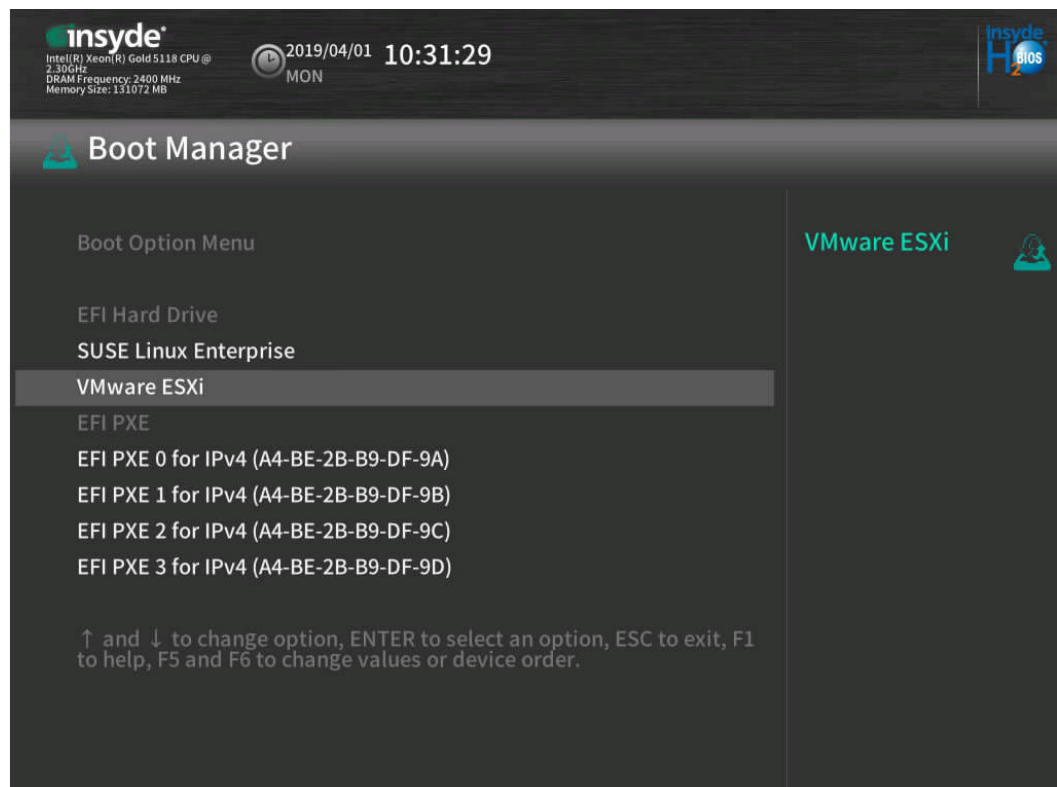
The BIOS front page is displayed.

Figure 5-22 Front page



- Step 4** Use the arrow keys to select **Boot Manager** and press **Enter**.
Select a remote OS, for example, VMware ESXi.

Figure 5-23 Boot Manager screen



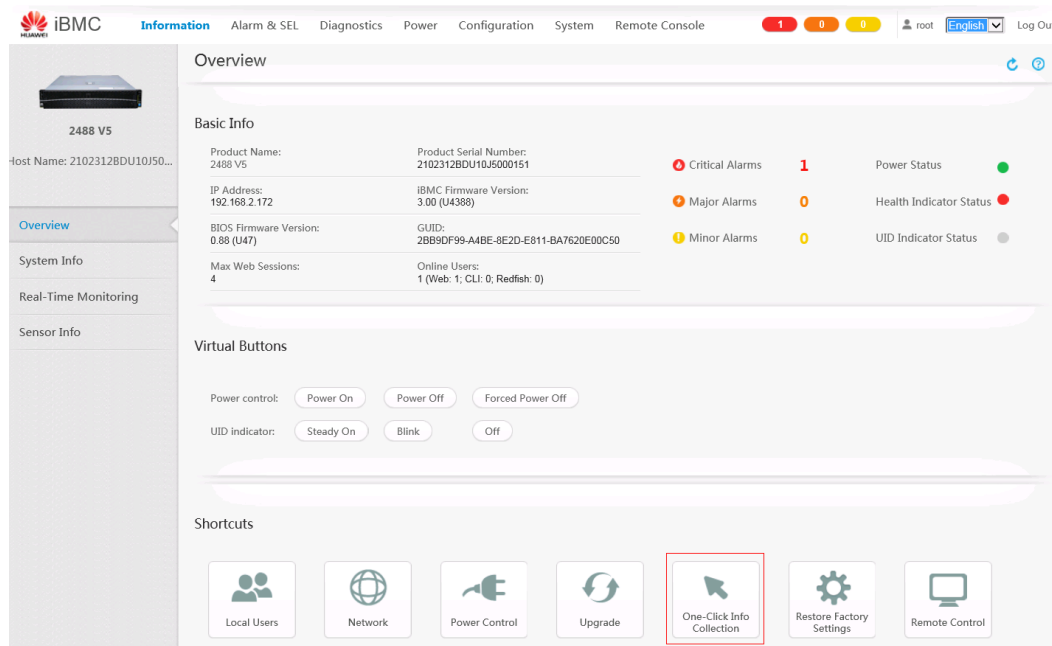
You can use the OS after it is started.

----End

5.5 Collecting Logs

Log in to the iBMC of the server, click **One-Click Info Collection**, wait until the log collection is complete, and download the logs.

Figure 5-24 One-Click Info Collection



5.6 Constraints

When SAN Boot is used for starting a remote Windows, the FC driver cannot be upgraded directly. To upgrade the FC driver, reinstall the OS on the remote LUN by using a driver of the required version. For details see [5.3 Installing an OS on a Remote LUN](#).

6 Appendix

[6.1 Logging In to the Real-Time Server Desktop](#)

[6.2 Restarting the Server](#)

[6.3 Transferring a File Using the Virtual Directory](#)

6.1 Logging In to the Real-Time Server Desktop

To log in to the server OS, you can use the server multi-port connector to connect to the KVM as the login terminal or use the remote console provided by the server iBMC for remote login.

The following is the procedure for using the remote console provided by the server iBMC to log in to the real-time server desktop.

Step 1 Configure the login environment.

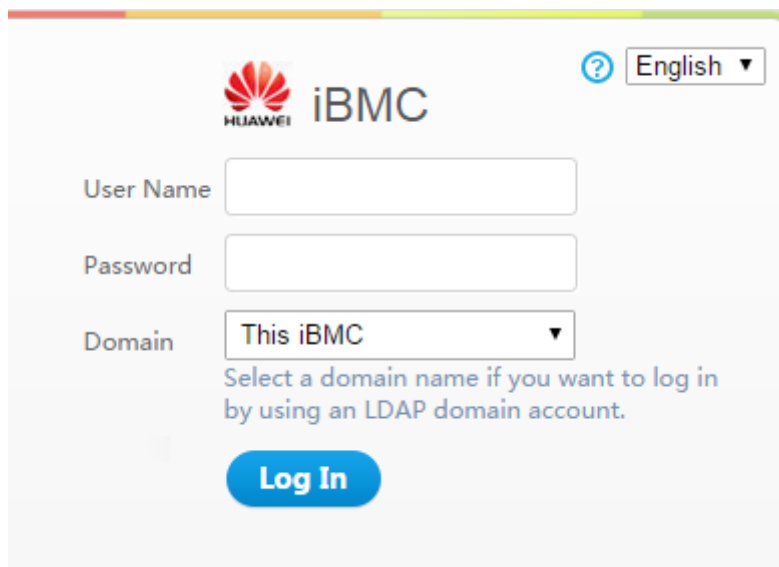
1. Connect the PC to the iBMC management network port using a network cable.
2. Set an IP address for the PC, and ensure that the IP address is on the same network segment as that of the iBMC management network port.

For example, set the IP address to **192.168.2.10** and the subnet mask to **255.255.255.0**.

Step 2 Log in to the iBMC WebUI.

1. Open a browser, enter **https://IP address of the iBMC management network port** in the address box, and press **Enter**.

Figure 6-1 iBMC login page

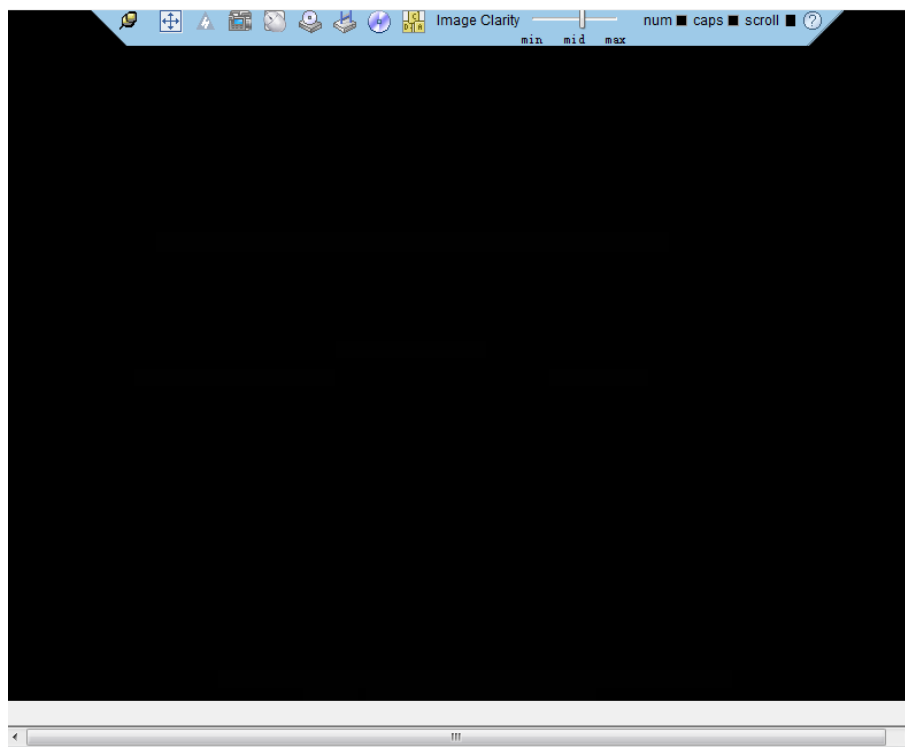


2. On the iBMC login page, perform the following operations:
 - Select the language to be used.
 - Enter the user name.
 - Enter the password.
 - Set **Domain** to **This iBMC**.
 - Click **Log In**.The iBMC WebUI home page is displayed.

Step 3 Go to the Remote Virtual Console.

1. In the navigation tree, choose **Remote Control**.
The **Remote Control** page is displayed.
2. Click the Remote Virtual Console button.
 - If Java is integrated, click **Java Integrated Remote Console**.
 - If HTML5 is integrated, click **HTML5 Integrated Remote Console**.The following uses the Java integrated Remote Virtual Console as an example.
The **Remote Virtual Console** screen is displayed, as shown in [Figure 6-2](#).

Figure 6-2 Remote Virtual Console screen



----End

6.2 Restarting the Server

You can use the iBMC to power off and then power on the server for the firmware upgrade to take effect.

Restarting the Server on the iBMC WebUI

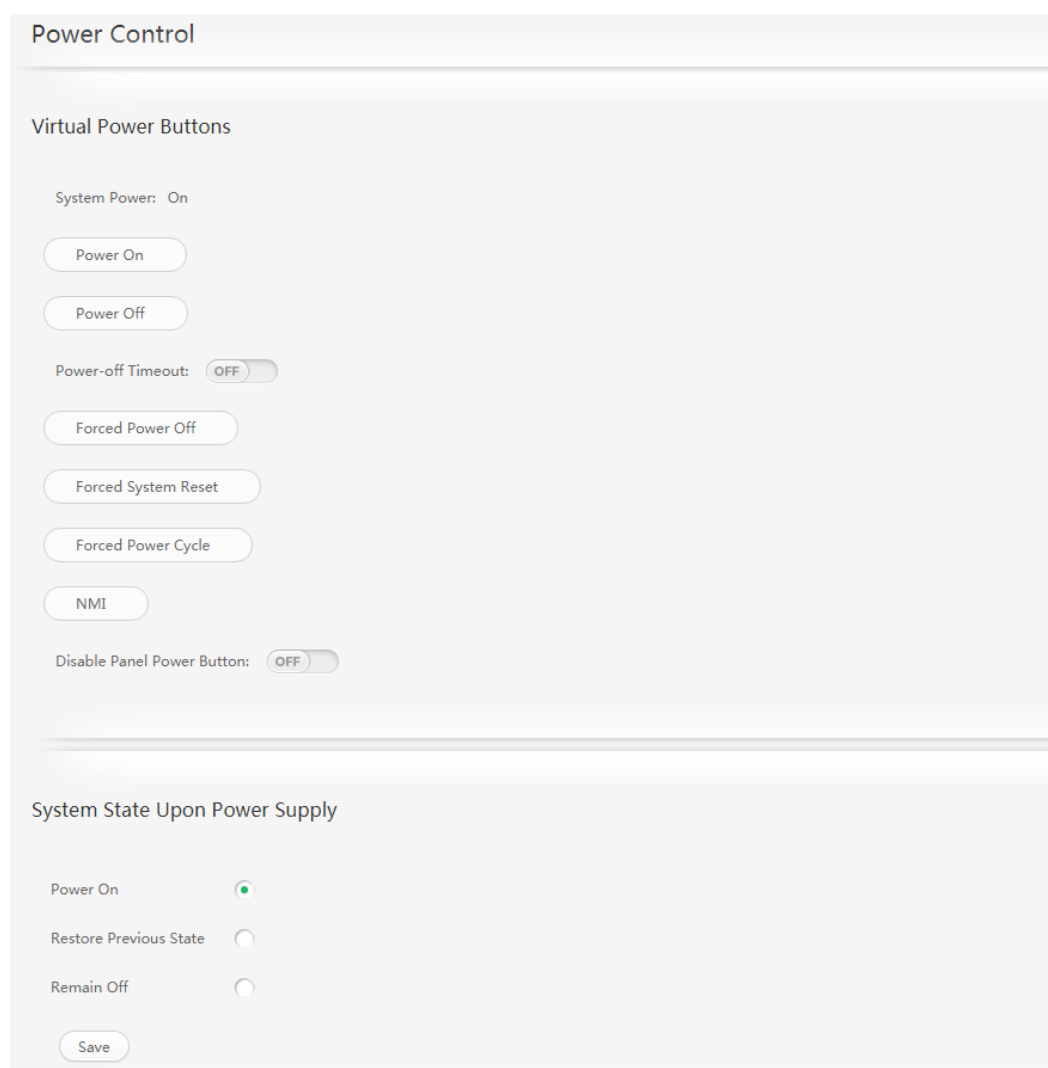
Step 1 Log in to the iBMC WebUI.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 In the navigation tree, choose **Power > Power Control**.

The **Power Control** page is displayed, as shown in [Figure 6-3](#).

Figure 6-3 Power Control page



Step 3 Select **Forced Power Cycle**.

Step 4 Confirm the operation in the operation confirmation dialog box displayed.

----End

Restarting the Server Through the Remote Virtual Console

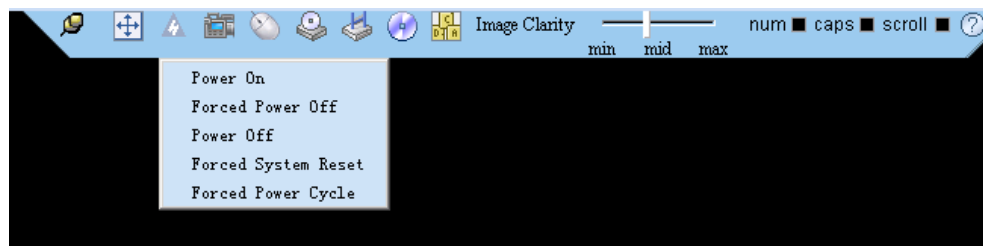
Step 1 Log in to the real-time server desktop using the Remote Virtual Console.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 On the toolbar of the Remote Virtual Console, click .

The power control menu is displayed, as shown in [Figure 6-4](#).

Figure 6-4 Power control menu



Step 3 Choose **Forced Power Cycle**.

Step 4 Confirm the operation in the operation confirmation dialog box displayed.

----End

6.3 Transferring a File Using the Virtual Directory

Before installing and upgrading the driver, upgrading the firmware, and installing management tool, you need to transfer the corresponding file to the OS of the server.

The following describes how to transfer a file using the virtual directory function of the Virtual Remote Console.

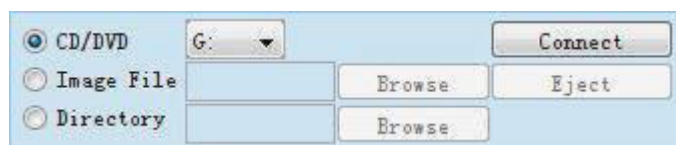
Step 1 Log in to the real-time server desktop using the Remote Virtual Console.

For details, see [6.1 Logging In to the Real-Time Server Desktop](#).

Step 2 On the toolbar of the Remote Virtual Console, click .

The virtual device list is displayed, as shown in [Figure 6-5](#).

Figure 6-5 Virtual device menu



Step 3 Select **Directory** and click **Browse**.

Step 4 Select the local path where the file is.

Step 5 Click **Connect**.

Step 6 Copy the file to the server OS.

The device type and location of a virtual directory varies depending on the operating system type. For details, see the official website of each respective OS vendor.

----End

A FAQ

A.1 An Exception Occurs During Driver Installation or Uninstallation

On the Windows OS, if the server is restarted or powered off during the driver installation or uninstallation, the residual entries may exist in the registry. As a result, driver installation or uninstallation may fail. You can use one of the following methods to delete the residual registry entries:

- For exceptions during driver installation, use **PsExec.exe** or **MicrosoftProgram_Install_and_Uninstall.meta.diagcab** to delete the residual registry entries.
- For exceptions during driver uninstallation, use **MicrosoftProgram_Install_and_Uninstall.meta.diagcab** to delete the residual registry entries.

Use the PsExec.exe tool to delete the residual registry

Step 1 Download the [PsExec.exe](#) tool.

Step 2 Open the registry and find the name of the residual registry entry. The paths are **HKEY_LOCAL_MACHINE\DRIVERS\DriverDatabase\DriverPackages\hifc.inf_arm64xxxx**, and **HKEY_LOCAL_MACHINE\SYSTEM\DriverDatabase\DriverPackages\hifc.inf_arm64xxxx**.

Step 3 Open the cmd window and run the following command to delete the residual registry entry (**hifc.inf_arm64xxxx** is used as an example):

```
PsExec.exe -d -i -s reg delete HKEY_LOCAL_MACHINE\DRIVERS\DriverDatabase  
\DriverPackages\hifc.inf_arm64xxxx /f
```

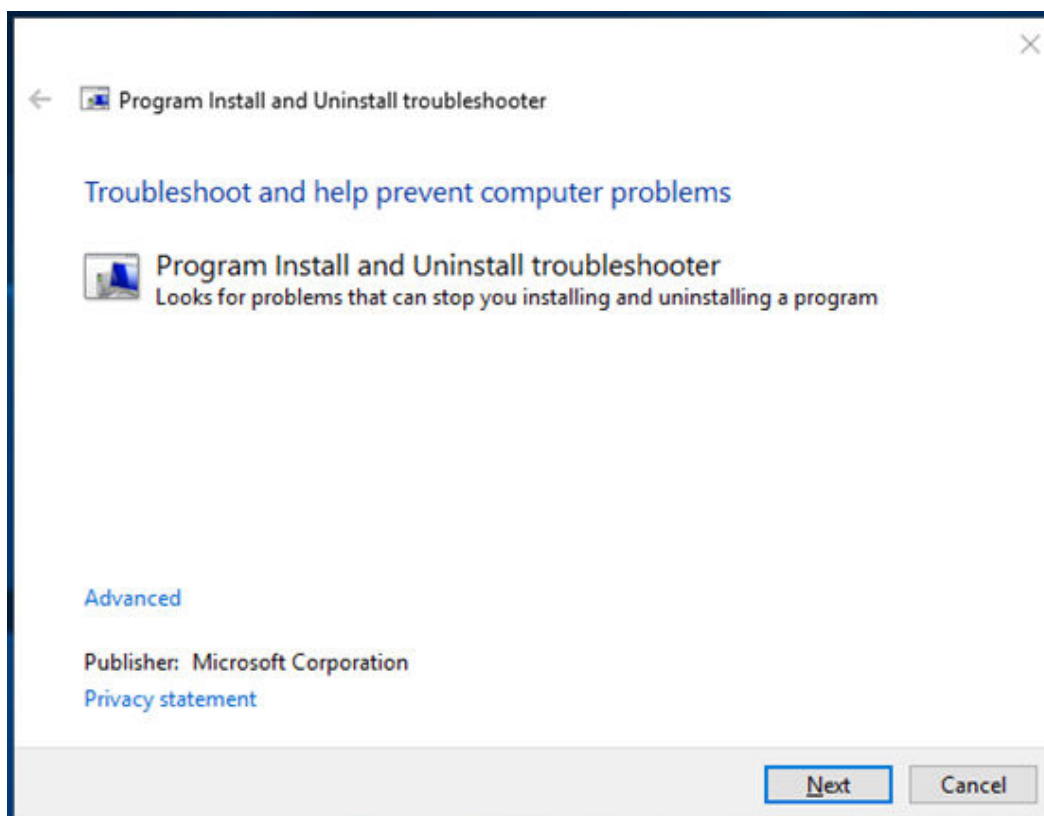
```
PsExec.exe -d -i -s reg delete HKEY_LOCAL_MACHINE\SYSTEM\DriverDatabase  
\DriverPackages\hifc.inf_arm64xxxx /f
```

----End

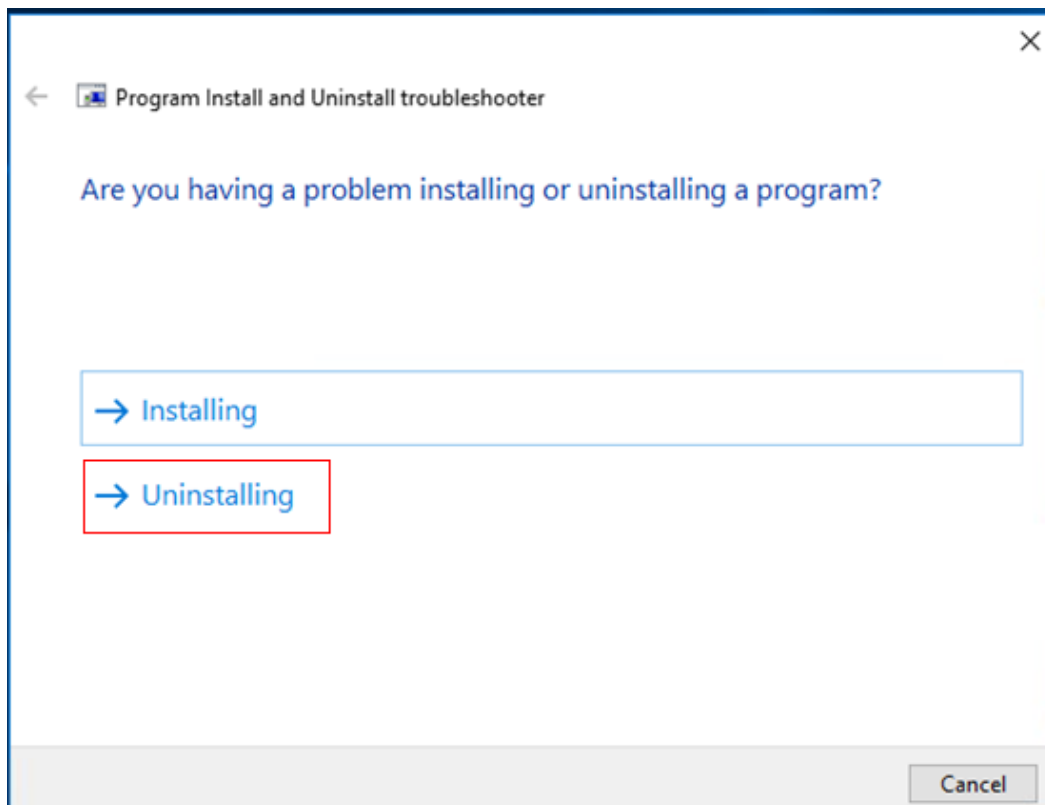
Use the `MicrosoftProgram_Install_and_Uninstall.meta.diagcab` tool to delete the residual registry entries

Download the `MicrosoftProgram_Install_and_Uninstall.meta.diagcab` tool from the official Windows website, and use the tool to delete the residual information generated during the installation or uninstallation of the `hifcDriver` driver.

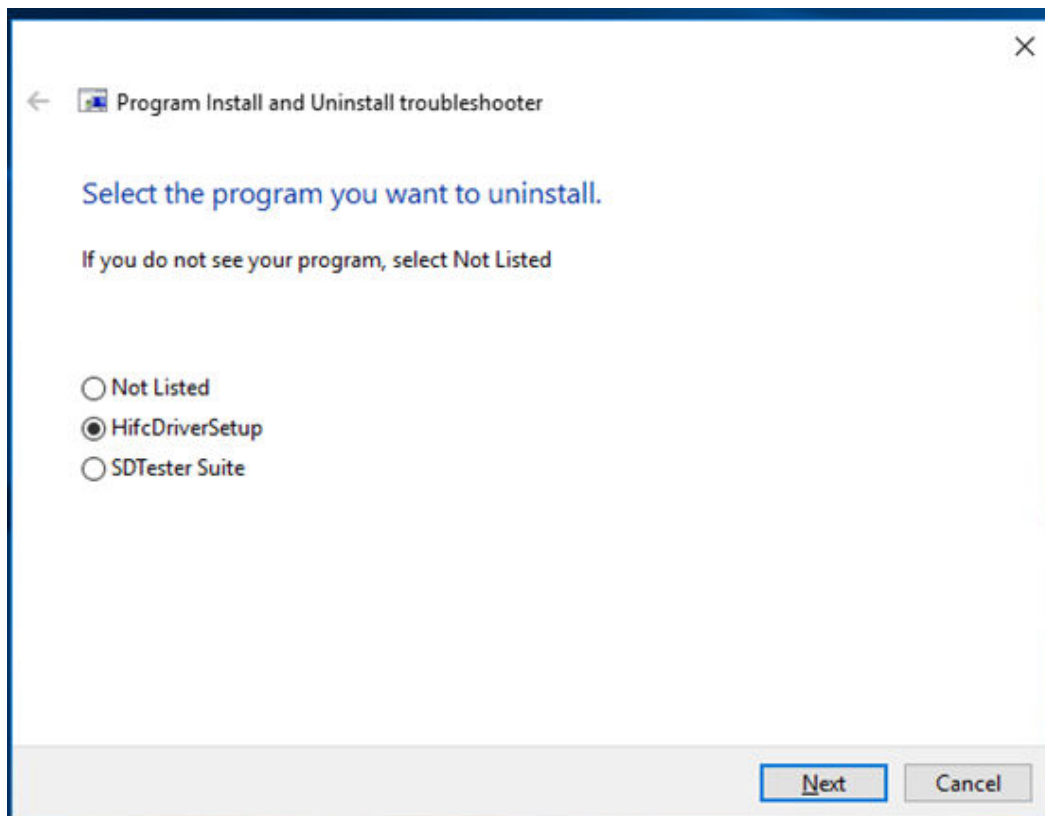
- Step 1** Double-click the `MicrosoftProgram_Install_and_Uninstall.meta` program. On the **Program Install and Uninstall troubleshooter** window, click **Next**.



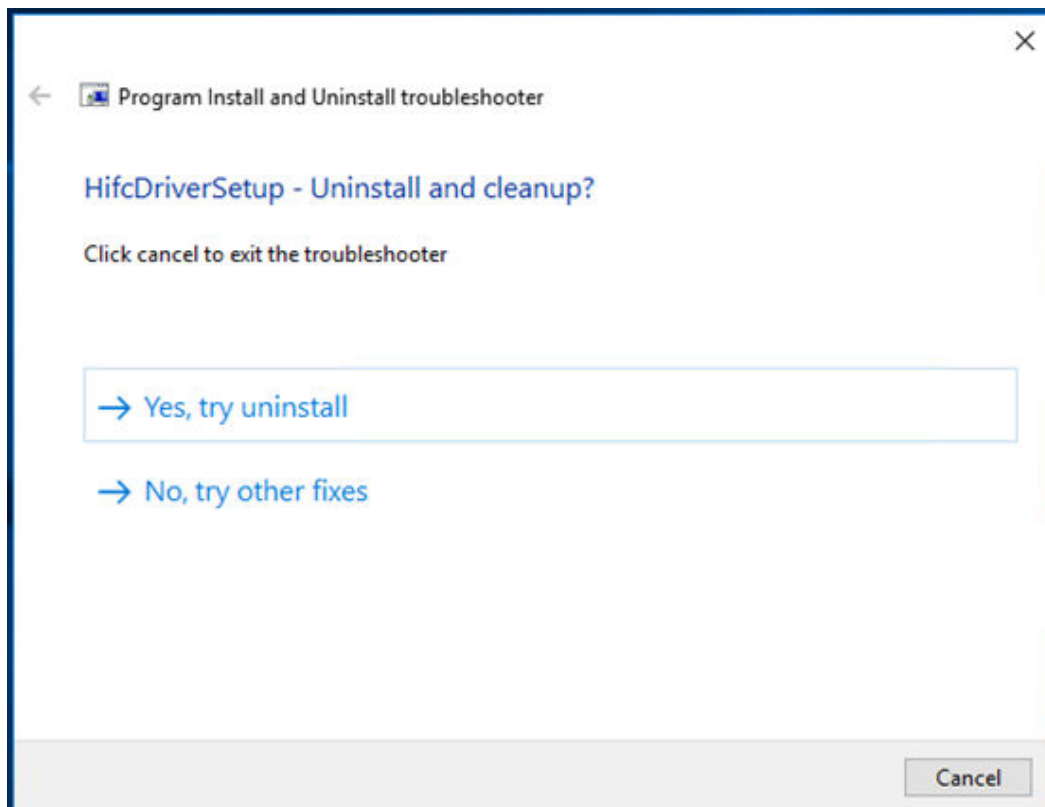
- Step 2** Click **Uninstalling**.



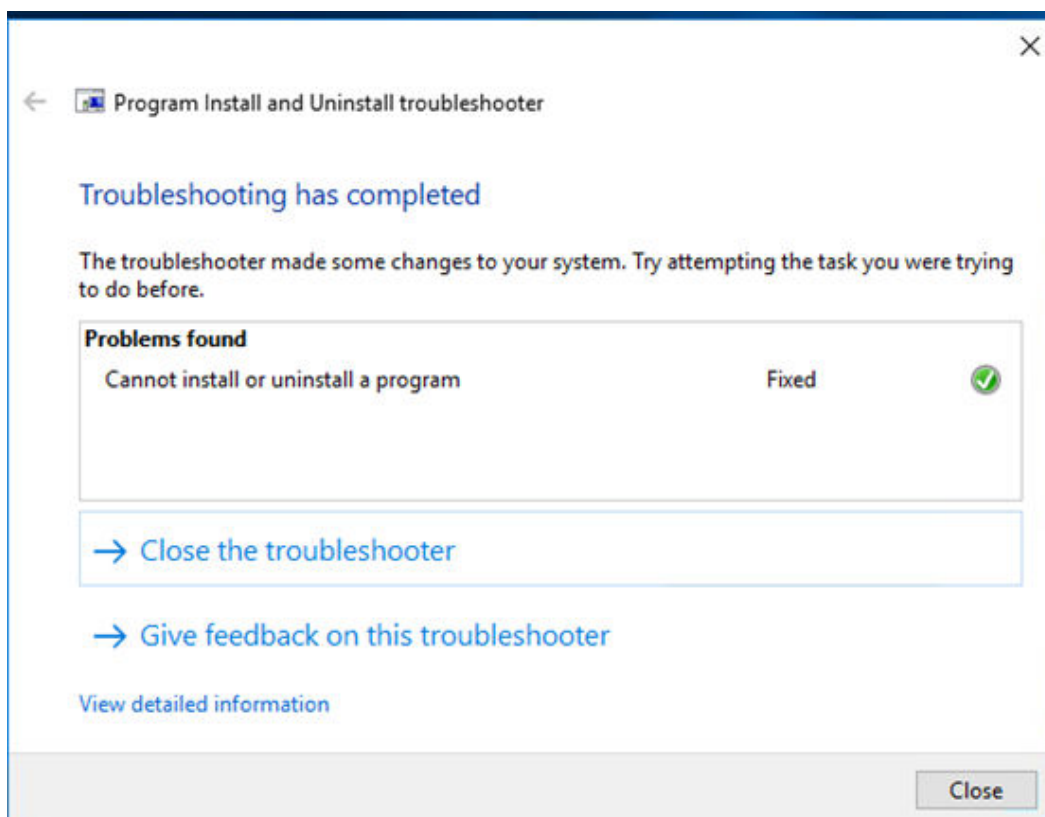
Step 3 Select driver package whose residual information is left in the system. Click **Next**.



Step 4 Select **Yes, try uninstall** to uninstall the driver.



Step 5 Check the repair result after the execution is complete.



Step 6 Close the program and restart the server. The driver can be installed and uninstalled again.

---End

B Acronyms and Abbreviations

F	
FC	Fiber Channel
FEC	Forward Error Correction
G	
GE	Gigabit Ethernet
H	
HBA	Host Bus Adapter
HTTP	Hypertext Transfer Protocol
I	
I²C	Inter-integrated Circuit
IOPS	Input/Output Operations per Second
IP	Internet Protocol
P	
PCIe	Peripheral Component Interconnect Express
R	
RH	Relative Humidity
U	
UEFI	Unified Extensible Firmware Interface