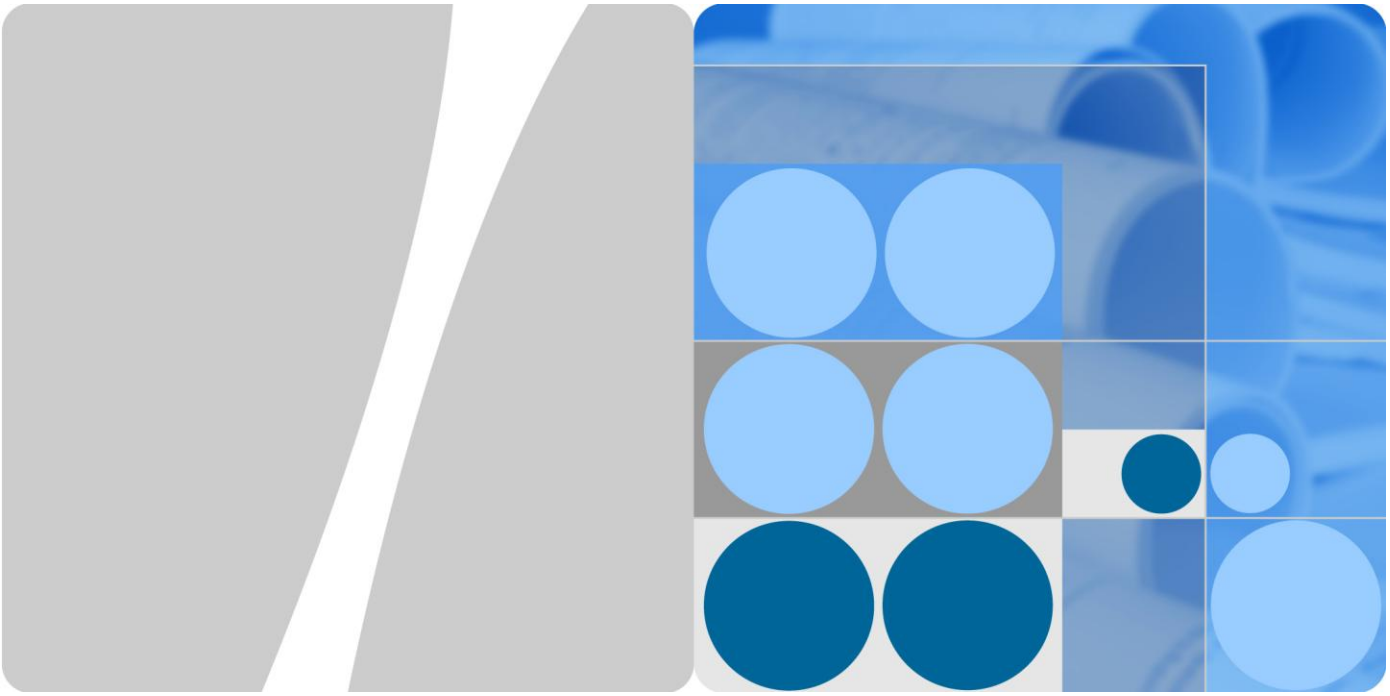

OceanStor UltraPath 21.1.0

Upgrade Guide

Issue 01

Date 2018-03-06

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About This Document

Purpose

This document guides you through the upgrade, rollback, and troubleshooting procedures for the UltraPath and provides answers to frequently asked questions (FAQs).

Intended Audience

This document is intended for the personnel who perform the upgrade. The personnel must:

- Be familiar with the current networking and version information of related network elements (NEs).
- Be experienced in operation and maintenance (O&M).

Symbol Conventions

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

Symbol	Description
DANGER	Alerts you to a high risk hazard that could, if not avoided, result in serious injury or death.
WARNING	Alerts you to a medium or low risk hazard that could, if not avoided, result in moderate or minor injury.
CAUTION	Alerts you to a potentially hazardous situation that could, if not avoided,result in equipment damage, data loss, performance deterioration,or unanticipated results.
TIP	Provides a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important pointsin the main text.

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Change History

Issue	Date	Description
01	2018-03-06	This issue is the first official release.

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1 Before You Start

1.1 Upgrade Schemes
1.2 Version Requirements Before the Upgrade
1.3 Impact of the Upgrade
1.4 Precautions

1.1 Upgrade Schemes

1.1.1 UltraPath for AIX

UltraPath for AIX can be upgraded in two schemes:

- Offline upgrade: applicable to UltraPath.
- Online upgrade: applicable to UltraPath V100R008C20SPC100 or later.

1.1.2 UltraPath for Windows

UltraPath for Windows can be upgraded in two schemes:

- Offline upgrade:
  - Indirect upgrade: Uninstall UltraPath of existing version and then install that of the new version.
  - Direct upgrade: Use an installation package to upgrade UltraPath directly. This schemes is applicable to UltraPath V100R005C00 or later (excluding V100R005C00SPC001).
- Online upgrade: applicable to UltraPath V100R008C00 or later.

NOTE

UltraPath for Windows does not support a direct upgrade on Itanium-based system. You need to uninstall UltraPath first and then install it after rebooting the host.

1.1.3 UltraPath for Solaris

UltraPath for Solaris can only be upgraded offline, which includes the following two schemes:

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- Direct upgrading: Uninstall UltraPath of existing version and then install that of the new version.
- Indirect upgrading: Run an upgrade script to upgrade UltraPath to a later version, without the need to uninstall UltraPath of existing version.

1.1.4 UltraPath for Linux

There are two schemes:

- **Offline upgrade**: It applies an upgrade between different R versions.
- **Online upgrade**: It applies an upgrade from V100R008C00 and following versions.

1.1.5 UltraPath for vSphere

There are two schemes about UltraPath for ESXi:

- **Offline upgrade**: It applies an upgrade between different R versions.
- **Online upgrade**: It applies an upgrade from V100R008C20 (just on the ESXi5.*x* operating system) and V100R008C30 and following versions.

1.1.6 UltraPath for FusionSphere

- UltraPath can be upgraded offline on a single node in a FusionCompute or FusionSphere OpenStack environment.

NOTE

It cannot be upgraded offline on a single node in the SAN Boot scenario of FusionSphere OpenStack.

- UltraPath allows batch upgrade based on the FusionSphere OpenStack framework of a required version.

  This document describes operations related to the UltraPath during an upgrade. For details about how to use FusionTool to batch upgrade the UltraPath on the FusionSphere OpenStack platform, see the upgrade guide for FusionSphere OpenStack of an applicable version.

  The upgrade scheme includes the following:

  a. Upgrade the UltraPath.
  b. Submit the project after verifying that the UltraPath has been successfully upgraded.

NOTE

Download path of FusionTool upgrade tool:

Carrier: http://support.huawei.com/carrier/ > Software > Carrier IT > Cloud Computing > FusionTool

Enterprise: http://support.huawei.com/enterprise/ > Software Download > Cloud Computing > FusionCloud > FusionTool

For specific software version, contact FusionSphere R&D personnel.

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1.2 Version Requirements Before the Upgrade

1.2.1 UltraPath for AIX

Table 1-1 Version requirements before the upgrade

Version	Description
V100R003C00	Offline upgrade to this version.
V100R005C00	Offline upgrade to this version.
V100R005C01	Offline upgrade to this version.
V100R006C00	Offline upgrade to this version.
V100R008C00	Offline upgrade to this version.
V100R008C20(Versions earlier than V100R008C20SPC100)	Offline upgrade to this version.
V100R008C20(V100R008C20SPC100 and later versions)	Offline upgrade or online upgrade to this version.
V100R008C30	Offline upgrade or online upgrade to this version.
V100R008C50	Offline upgrade or online upgrade to this version.
21.0.1	Offline upgrade or online upgrade to this version.
21.0.2	Offline upgrade or online upgrade to this version.

NOTE

You must use the install.sh script contailed in the UltraPath for AIX software pack for installation and upgrade. When running the ***sh install.sh*** command to upgrade UltraPath, you will be asked whether to uninstall the earlier version of UltraPath, If you input yes, the earlier version of UltraPath will be uninstalled and the lastest version will be installed.

1.2.2 UltraPath for Windows

Table 1-2 Version requirements before the upgrade

Version	Description
V100R001C00	Indirect offline upgrade to this version.
V100R002C00	Indirect offline upgrade to this version.
V100R003C00	Indirect offline upgrade to this version.
V100R005C00 (excluding V100R005C00SPC0	Offline upgrade to this version.

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Version	Description
01)	
V100R005C00SPC001	Indirect offline upgrade to this version.
V100R005C01	Offline upgrade to this version.
V100R006C00	Offline upgrade to this version.
V100R008C00	Offline upgrade or online upgrade to this version.
V100R008C20	Offline upgrade or online upgrade to this version.
V100R008C30	Offline upgrade or online upgrade to this version.
V100R008C50	Offline upgrade or online upgrade to this version.
21.0.1	Offline upgrade or online upgrade to this version.
21.0.2	Offline upgrade or online upgrade to this version.

1.2.2.1 Getting the Version Number for UltraPath for Windows V100R003

Double-click

on the desktop. The UltraPath for Windows Manager graphical user interface (GUI) is displayed. Click the **Version** tab. For example, as shown in the following figure, **3.01.016** is the version number.

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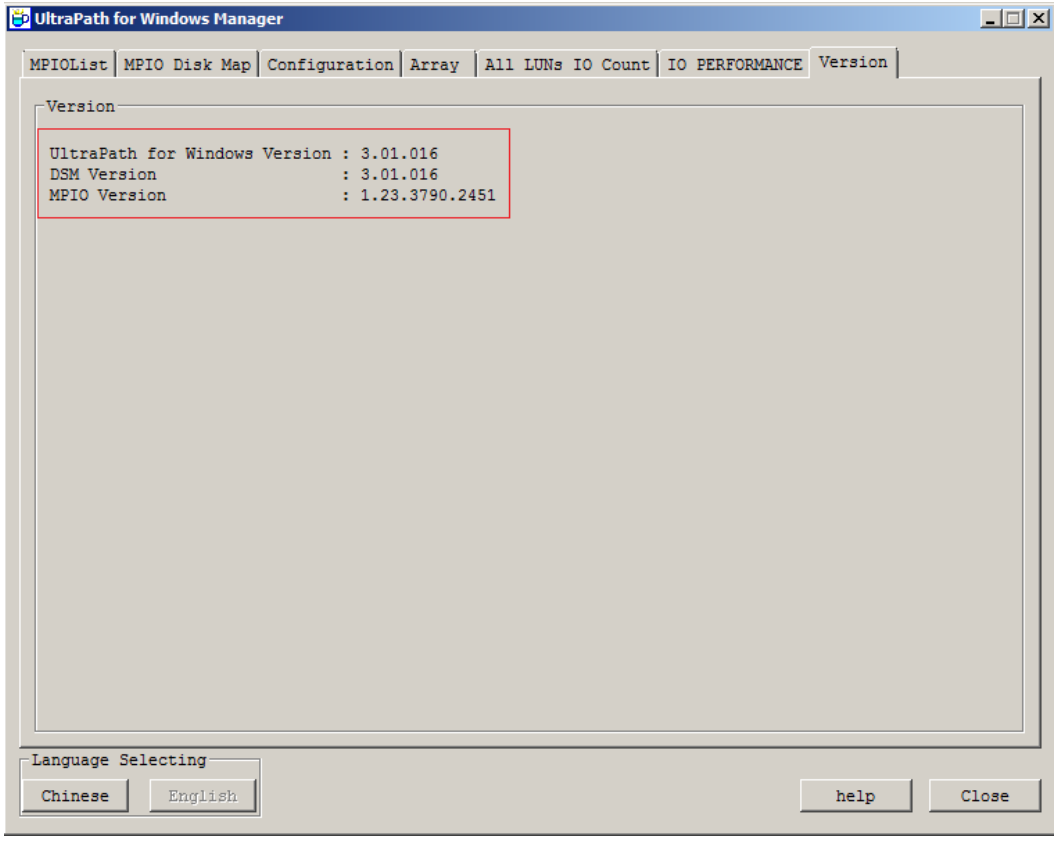
Figure 1-1 UltraPath V100R003 Version



1.2.2.2 Obtaining the Version Number for UltraPath for Windows V100R005 and Following Versions

Double-click

on the desktop. The UltraPath for Windows Manager GUI is displayed. Click **Help** on the menu bar and click **About UltraPath Console (A)**. For example, as shown in the following figure, **5.01.048** is the version number.

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Figure 1-2 UltraPath V100R005 Version

Product version is displayed for UltraPath for Windows V100R008C50. For example, as shown in the following figure, **V100R008C50** is the product version.

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Figure 1-3 UltraPath V100R008C50 Product Version

1.2.3 UltraPath for Solaris

Table 1-3 Version requirements before the upgrade

Version	Description
V100R003C00	Indirect offline upgrade to this version.
V100R005C00	Offline upgrade to this version.
V100R005C01	Offline upgrade to this version.
V100R006C00	Offline upgrade to this version.
V100R008C00	Offline upgrade to this version.
V100R008C20	Offline upgrade to this version.
V100R008C30	Offline upgrade to this version.
V100R008C50	Offline upgrade to this version.
21.0.1	Offline upgrade to this version.
21.0.2	Offline upgrade to this version.

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1.2.4 UltraPath for Linux

Table 1-4 Version requirements before the upgrade

Version	Description
V100R001C00	Offline upgrade to this version.
V100R002C00	Offline upgrade to this version.
V100R003C00	Offline upgrade to this version.
V100R005C00	Offline upgrade to this version.
V100R005C01	Offline upgrade to this version.
V100R006C00	Offline upgrade to this version.
V100R008C00	Offline upgrade or online upgrade to this version.
V100R008C20	Offline upgrade or online upgrade to this version.
V100R008C30	Offline upgrade or online upgrade to this version.
V100R008C50	Offline upgrade or online upgrade to this version
21.0.1	Offline upgrade or online upgrade to this version.
21.0.2	Offline upgrade or online upgrade to this version.

1.2.5 UltraPath for vSphere

Table 1-5 Version requirements before the upgrade about UltraPath for ESXi

Version	Description
V100R008C00	Offline upgrade to this version.
V100R008C20	On the ESXi5.*x* operating system can be upgraded to this version in offline or online mode, but on the ESXi6.0 operating system can only be upgraded to this version in offline mode.
V100R008C30	Offline upgrade or online upgrade to this version.
V100R008C50	Offline upgrade or online upgrade to this version.
21.0.1	Offline upgrade or online upgrade to this version.
21.0.2	Offline upgrade or online upgrade to this version.

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1.2.6 UltraPath for FusionSphere

Table 1-6 Version requirements before the upgrade

Version	Description
V100R005C01	Offline upgrade to this version.
V100R006C00	Offline upgrade to this version.
V100R008C00	Offline upgrade to this version. Batch upgrade to this version in FusionSphere OpenStack.
V100R008C20	Offline upgrade to this version. Batch upgrade to this version in FusionSphere OpenStack.
V100R008C30	Offline upgrade to this version. Batch upgrade to this version in FusionSphere OpenStack.
V100R008C50	Offline upgrade to this version. Batch upgrade to this version in FusionSphere OpenStack.
21.0.1	Offline upgrade to this version. Batch upgrade to this version in FusionSphere OpenStack.
21.0.2	Offline upgrade to this version. Batch upgrade to this version in FusionSphere OpenStack.

1.3 Impact of the Upgrade

1.3.1 UltraPath for AIX

1.3.1.1 Impact on the System During the Upgrade

If you need to perform an offline upgrade from a version to this version or an online upgrade from V100R008C20SPC100 to this version, read this chapter to learn the possible impact the upgrade may have on the system.

1.3.1.1.1 Impact on Services

Offline upgrade: You must stop the services or migrate them to other servers before upgrading the UltraPath.

Online upgrade: None.

1.3.1.1.2 Impact on Network Communication

Offline Upgrade: None.

Online upgrade: None.

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1.3.1.2 Impact on the System After the Upgrade

Offline upgrade: In an upgrade from a version lower than V100R005 to the current version, if the disk before upgrading is updiskX, and LVM or VxVM is not used, you need to modify the service configuration after the upgrade to fit the new drive letter hdiskX.

If not in SAN Boot situation, the OceanStor UltraPath for AIX upgraded from a lower version to the current version takes effect without the need to restart the operating system.

If in SAN Boot situation, upgrade from a lower version to the current version takes effect only after the operating system is restarted.

Online upgrade: None.

1.3.2 UltraPath for Windows

1.3.2.1 Impact on the System During the Upgrade

1.3.2.1.1 Impact on Services

When the first scheme is used, the host restarts twice. As a result, services running on the host are suspended for about ten minutes.

If the second scheme is used, there are two scenarios. First, services running on the host are interrupted for 5 minutes when the user selects an offline upgrade. If Second, services running on the host are not interrupted when the user selects a non-disruptive upgrade.

1.3.2.1.2 Impact on Network Communication

When the host needs to be restarted, all network communications to the host are suspended for 3 minutes.

1.3.2.2 Impact on the System After the Upgrade

After the upgrade, the system loads a new kernel driver. This does not affect service running or modify the user-defined configuration file.

1.3.3 UltraPath for Solaris

1.3.3.1 Impact on the System During the Upgrade

1.3.3.1.1 Impact on Services

When the first scheme is used, the host restarts twice. As a result, services running on the host are suspended for about ten minutes.

If the offline upgrade is used, there are two scenarios. First, services running on the host are suspended for 5 minutes when the driver needs to be upgraded. Second, services running on the host are not interrupted when the user mode needs to be upgraded only.

1.3.3.1.2 Impact on Network Communication

When the host needs to be restarted, all network communications to the host are suspended for 3 minutes.

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1.3.3.2 Impact on the System After the Upgrade

After the upgrade, the system loads a new kernel driver. This does not affect service running or modify the user-defined configuration file.

1.3.4 UltraPath for Linux

1.3.4.1 Impact on the System During the Upgrade

1.3.4.1.1 Impact on Services

The system or UltraPath service will restart during an offline upgrade of the UltraPath. Therefore, stop services or migrate them to another server before performing an offline upgrade. The system will not restart during an online upgrade of the UltraPath. No need to stop services.

1.3.4.1.2 Impact on Network Communication

If the host is restarted to enable UltraPath to take effect after the offline upgrade, all links to the host will be interrupted. If UltraPath is restarted to enable it to take effect after the offline upgrade or the system is not restarted after the online upgrade, all links to the host will not be interrupted.

1.3.4.2 Impact on the System After the Upgrade

After the upgrade, the system loads a new kernel driver. This does not affect service running or modify the user-defined configuration file.

1.3.5 UltraPath for vSphere

1.3.5.1 Impact on the System During the Upgrade

1.3.5.1.1 Impact on Services

UltraPath for ESXi:

An offline upgrade can be performed using the command-line interface (CLI) or scripts.

If you use the CLI to perform an offline upgrade, UltraPath will be restarted. Before performing the offline upgrade,you must stop services or migrate the services to another server.

If you use scripts to perform an offline upgrade not in SAN Boot situation, UltraPath will not be restarted.However, you must stop services because the hostd service on the host will be restarted and the services such as clone, migration, and snapshot on vCenter will be interrupted. You must upgrade vCenter in offline mode. Then multiple paths of the ESXi host can be managed.If in SAN Boot situation,you must reboot your system.

An online upgrade does not affect ESXi host services but will restart hostd service on the host and interrupt ongoing services like clone, migration, and snapshot on vCenter.

You must upgrade vCenter in offline mode. Then multiple paths of the ESXi host can be managed.

If the ESXi is 5.5 and the **VMware ESXi 5.5, Patch Release ESXi550-201312001 (2063795)** patch is not installed, vCenter VM console may fail to be accessed after the hostd service is restarted due to known issues of ESXi 5.5. An error "Unable to connect to the MKS : the

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operation is not allowed in the current state" is displayed. For details, see section 6.2.7 Checking the Pre-upgrade Environment.

UltraPath for vCenter:

During an offline upgrade:

The VMware VirtualCenter Server service must be restarted for UltraPath for vCenter 5.x

The VMware vSphere Web Client service for vCenter 6.x must be restarted if the UltraPath for vCenter is downgrade to an older version.

The VMware vSphere Web Client service for vCenter 6.5 must be restarted .

When the service is being restarted, the vCenter can not be used.

For scenarios where platform service controllers (PSCs) are configured externally and manage multiple vCenter servers. For vCenter 6.0, restart VMware vSphere Web Client after UltraPath for vCenter is upgraded.When the service is being restarted, the vCenter can not be used.

UltraPath for vCenter can only be upgraded offline so that UltraPath for ESXi can be upgraded online.

.

1.3.5.1.2 Impact on Network Communication

UltraPath for ESXi:

Use the CLI to perform an offline upgrade: The service will be stopped during the upgrade, and all communications with hosts are interrupted.

Perform an online upgrade or use scripts to perform an offline upgrade: The hostd service restarts during the upgrade, which interrupts the connections between vClient and ESXi hosts.

UltraPath for vCenter:

None.

1.3.5.2 Impact on the System After the Upgrade

UltraPath for ESXi:

Use the CLI to perform an offline upgrade: The system loads a new kernel driver. This does not affect service running or modify the user-defined configuration file.

Perform an online upgrade or use scripts to perform an offline upgrade: The upgrade does not affect system running or modify the user-defined configuration file. Output of the **esxcli software vib list** command displays the old UltraPath version rather than the new one.

1.3.6 UltraPath for FusionSphere

1.3.6.1 Impact on the System During the Upgrade

NOTE

For impacts on FusionSphere OpenStack during a batch upgrade, see related FusionSphere OpenStack version upgrade guide.

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1.3.6.1.1 Impact on Services

Upgrading the UltraPath will restart the system or UltraPath services. Therefore, before the upgrade, stop the services or migrate the services to other servers.

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1.3.6.1.2 Impact on Network Communication

Upgrading UltraPath in batch will disconnect all networks to hosts. However, if you upgrade UltraPath offline and make UltraPath take effect by restarting UltraPath services, you do not need to restart the system and therefore the networks to hosts will not be disconnected.

1.3.6.2 Impact on the System After the Upgrade

After upgrade, the system kernel loads a new kernel driver, which does not affect the system startup. There is no need to modify the OS configuration file.

1.4 Precautions

1.4.1 UltraPath for AIX

1.4.1.1 Data Consistency

Offline upgrade: Before performing an upgrade, stop services and uninstall the file system.

Online upgrade: None.

1.4.1.2 Others

Offline upgrade:

- An upgrade of UltraPath for AIX is classified into two cases:
  - An upgrade from a version earlier than V100R008 to this version, for example, from V100R005C01 to this version
  - An upgrade from a version later than V100R008, for example, from V100R008C20 to this version

  In the scenario of upgrading UltraPath for AIX from a version later than V100R008, upgraded from V100R008C00, V100R008C10 or V100R008C20 to this version, not support SAN Boot situation, ensure that all virtual disks are set to the **Defined** state. Upgraded from V100R008C30, V100R008C50, 21.0.1 or 21.1.0 to this version, if not in SAN Boot situation, ensure that all virtual disks are set to the **Defined** state, if in SAN Boot situation, ensure that all virtual disks are set to the **Defined** state except rootvg. For details about how to set virtual disks to the **Defined** state, see section 2.3.1 Setting Virtual Disks to the Defined State.
- In the scenario of upgrading UltraPath for AIX from a version earlier than V100R008 to this version, ensure that all virtual disks are deleted. For details about how to delete virtual disks, see section 2.4.1 Deleting Virtual Disks.
- In the scenario of upgrading UltraPath for AIX from an earlier version to V100R008C50, ensure that the **/opt** directory on the server has at least 200 MB of free space, the **/usr** directory has at least 30 MB of free space, the **/tmp** directory has at least 250 MB of free space, and the / directory has at least 20 MB of free space.

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- Upgrade from V100R008C00 or V100R008C20 to this version, the UltraPath will not support to be changed into SAN Boot situation by methods such as migrate rootvg or extend rootvg, etc.

```
-bash-3.00# df -m
Filesystem    MB blocks      Free    %Used   Iused %Iused  Mounted on
/dev/hd4      10752.00   1028.62   91%   135898    36% /
/dev/hd2       3840.00   1681.39   57%    39508    10% /usr
/dev/hd3       5120.00    991.02   81%      870     1% /tmp
/dev/hd10opt    2176.00   1548.43   29%     3060     1% /opt
```

NOTE

If the free space is insufficient, run the **chfs -a size=+200M /opt** command to expand the capacity of the **/opt** directory, run the **chfs -a size=+30M /usr** command to expand the capacity of the **/usr** directory, run the **chfs -a size=+250M /tmp** command to expand the capacity of the **/tmp** directory, and the **chfs -a size=+20M** /command to expand the capacity of the /directory.

- Run the following commands to query the version and bit information of the AIX operating system.

```
-bash-3.00# oslevel -r
 5300-06
-bash-3.00# bootinfo -K
 64
```

- Query the version of UltraPath for AIX installed on the AIX operating system.

  Run the **lslpp -l U*.*.rte** command to view the version of existing UltraPath for AIX and obtain its name. For example, run the following command:

```
 -bash-3.00# lslpp -l U*.*.rte
  Fileset                  Level  State     Description
  ----------------------------------------------------------------------------
Path: /usr/lib/objrepos
  UltraPath.AIX.ppc_64.rte   6.1.6.1  COMMITTED  Multipath for Array
                                                disk devices
```

- Ensure that the correct UltraPath for AIX upgrade package is ready for use.
- Before upgrading UltraPath for AIX, stop all I/O applications.
- In some case, drive letters might change after the offline upgrade, back up related information for virtual disks before the upgrade, and see the related steps in section 2.5.3 Checking Whether Virtual Disks and Paths Remain the Same After the Upgrade to recover.
- After upgrading UltraPath for AIX, restore properties of virtual disks.

In a cluster environment, after upgrading UltraPath for AIX, restore virtual disk reservation policies to the previous ones. For details, see the related step in section 2.2.8 Backing Up Information About UltraPath for AIX Before the Upgrade. In a SAN networking scenario, check whether the **fc_err_recov** property of the Fibre Channel HBA is **fast_fail** and the **dyntrk** property of the Fibre Channel HBA is **yes**. If not, change the property values. For details about how to change the property values, see the related steps in sections 2.3.2 Upgrading UltraPath for AIX Offline and 2.4.2 Upgrading UltraPath for AIX Offline.

Online upgrade:

- During the upgrade, do not run system commands such as **cfgmgr**, **rmdev**, **rmpath**, **chdev**, and **chpath.** If you executed the **cfgmgr** command, the new added disk can not read or write in the online upgrade process.
- Online upgrade is not recommended in a scenario where there are limited resources available (few memory resources, 100% CPU usage, or insufficient free space on disks).

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- During an upgrade, do not terminate an online upgrade using **kill -9** or **Ctrl+C**.
- Online upgrade is supported since V100R008C20SPC100 versions.
- Do not copy the UltraPath installation package to a directory that contains a space in its name, such as **/home/Dad Dir/**. Otherwise, the **install.sh** may not be executed properly.
- If UltraPath was installed on the host and the old UltraPath installation package directory still exists, do not copy the new UltraPath installation package to this directory, or you may find it difficult to distinguish the two packages.
- The new UltraPath version takes effect immediately after the upgrade. You can run a system command or UltraPath command to check the new version.
- The takeover-online environment cannot support the online upgrade.
- Online upgrade from V100R008C20 to this version, the UltraPath will not support to be changed into SAN Boot situation by methods such as migrate rootvg or extend rootvg, etc.
- Before an online upgrade for a version earlier than 21.1.0, run the **upadm show path** command to check the number of paths. If the number of paths exceeds 4096, contact the R&D personnel for help.

1.4.2 UltraPath for Windows

1.4.2.1 System Administrator

The user who upgrades the UltraPath must have **administrative** permissions.

1.4.2.2 Host Restarting

- After the offline upgrade, restart the host so that UltraPath can take effect.
- It is not necessary to restart the host after the online upgrade.
- A drive letter change refers to a disk ID change after the host is restarted or the disk devices are enumerated again. The Windows system cannot prevent a drive letter (disk ID) change. After disks are formatted, a file system is established, and volumes are created, the Windows system maintains the mapping relationship between the logical volumes and drive letters (such as D, E, and F) to ensure that the drive letters are not affected by the change of disk IDs.

1.4.2.3 UltraPath Direct Upgrade

V100R003 cannot be directly upgraded to this version. Uninstall V100R003, restart the host, install this version, and restart the host.

1.4.3 UltraPath for Solaris

1.4.3.1 System Administrator

The user who upgrades the UltraPath must use user **root**.

1.4.3.2 Host Restarting

After the upgrade, restart the host so that UltraPath can take effect.

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1.4.4 UltraPath for Linux

1.4.4.1 System Administrator

The user who upgrades the UltraPath must use user **root**.

1.4.4.2 Host Restarting

- For an offline upgrade of UltraPath in SAN Boot mode, you must restart the host to enable UltraPath to take effect.
- For an offline upgrade of UltraPath in non-SAN Boot mode, you can restart the UltraPath service to enable it to take effect instead of restarting the host.
- It is not necessary to restart the host after the online upgrade.

1.4.5 UltraPath for vSphere

1.4.5.1 System Administrator

UltraPath for ESXi:

The user who upgrades the UltraPath must use user **root**.

UltraPath for vCenter:

1.UltraPath for vCenter 5.x :Users must use the delivery-attached administrator account to upgrade UltraPath software, instead of creating a new administrator account.

2.UltraPath for vCenter 6.x deployed on Windows :Users must use the delivery-attached administrator account to upgrade UltraPath software, instead of creating a new administrator account.

3.UltraPath for vCenter 6.x for VCSA 6.x :Users must use the delivery-attached root account to upgrade UltraPath software.

1.4.5.2 Host Restarting

UltraPath for ESXi:

Offline upgrade: For the CLI-based upgrade, you must restart the host.

For the script-based upgrade, if there is not PE LUN managed by UltraPath or in SAN Boot situation, you can upgrade UltraPath without restring the host. If not, you must restart the host.

Online upgrade: UltraPath for ESXi takes effect immediately after the upgrade is complete.

UltraPath for vCenter:

It is not necessary to restart the host after the upgrade.

1.4.6 UltraPath for FusionSphere

NOTE

For precautions for FusionSphere OpenStack during a batch upgrade, see related FusionSphere OpenStack version upgrade guide.

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1.4.6.1 System Administrator

- In an offline upgrade,The user who upgrades the UltraPath must use user **root**.
- In a batch upgrade,The account used for an upgrade is determined by the upgrade tool.

1.4.6.2 Host Restarting

- In an offline upgrade, you only need to restart the UltraPath services to make UltraPath take effect. You do not need to restart the hosts.
- In a batch upgrade, the hosts will be restarted to make UltraPath take effect.

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2 UltraPath for AIX Upgrade Guide

2.1 Upgrade Process Overview
2.2 Preparations for the Upgrade
2.3 Upgrading UltraPath for AIX from a version earlier than V100R008
2.4 Upgrading UltraPath for AIX from a version earlier than V100R008
2.5 Verifying the Upgrade
2.6 Rolling Back to the Source Version
2.7 Troubleshooting

2.1 Upgrade Process Overview

2.1.1 Upgrade Flowchart

Offline upgrade:

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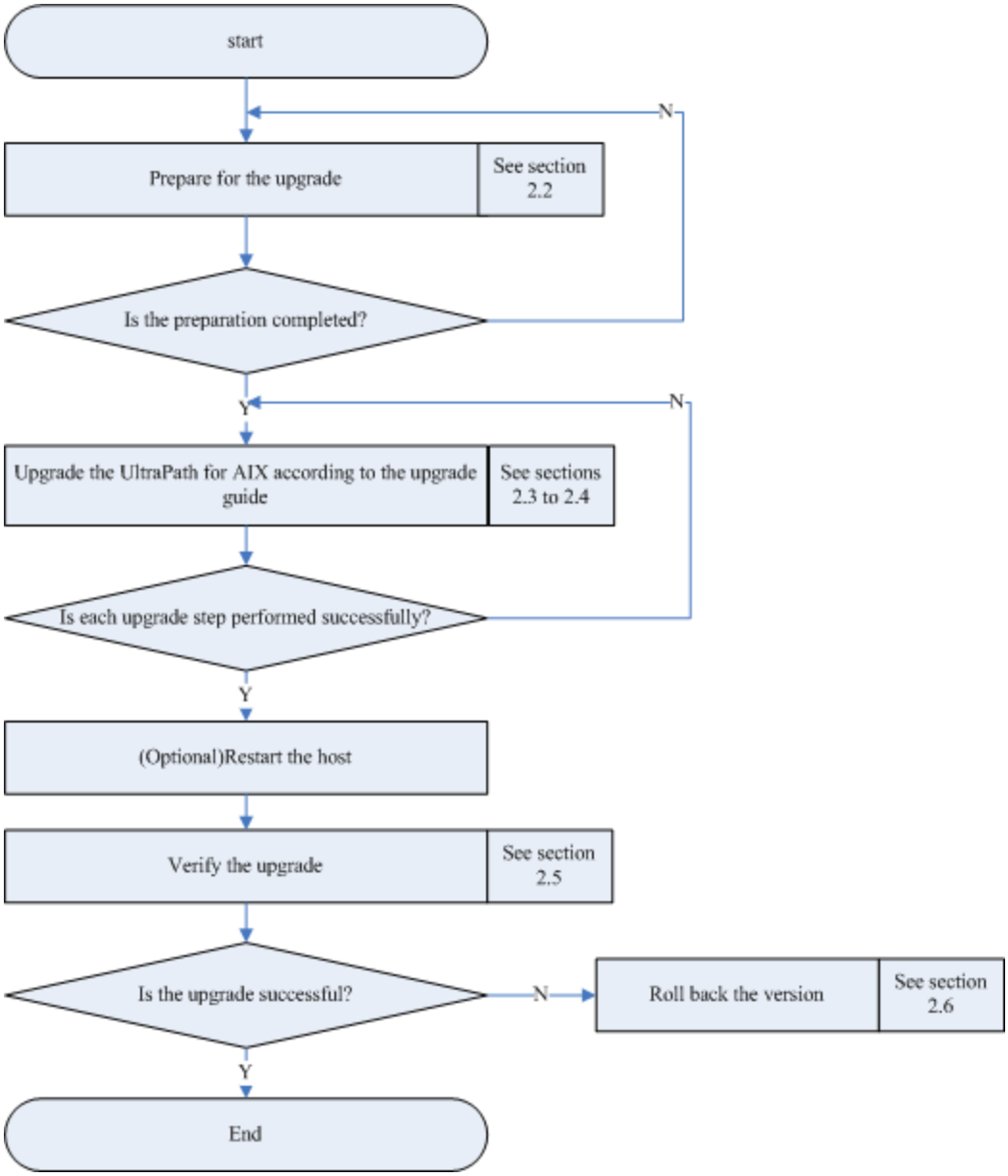
Figure 2-1 Flowchart of upgrading UltraPath for AIX offline



Online upgrade:

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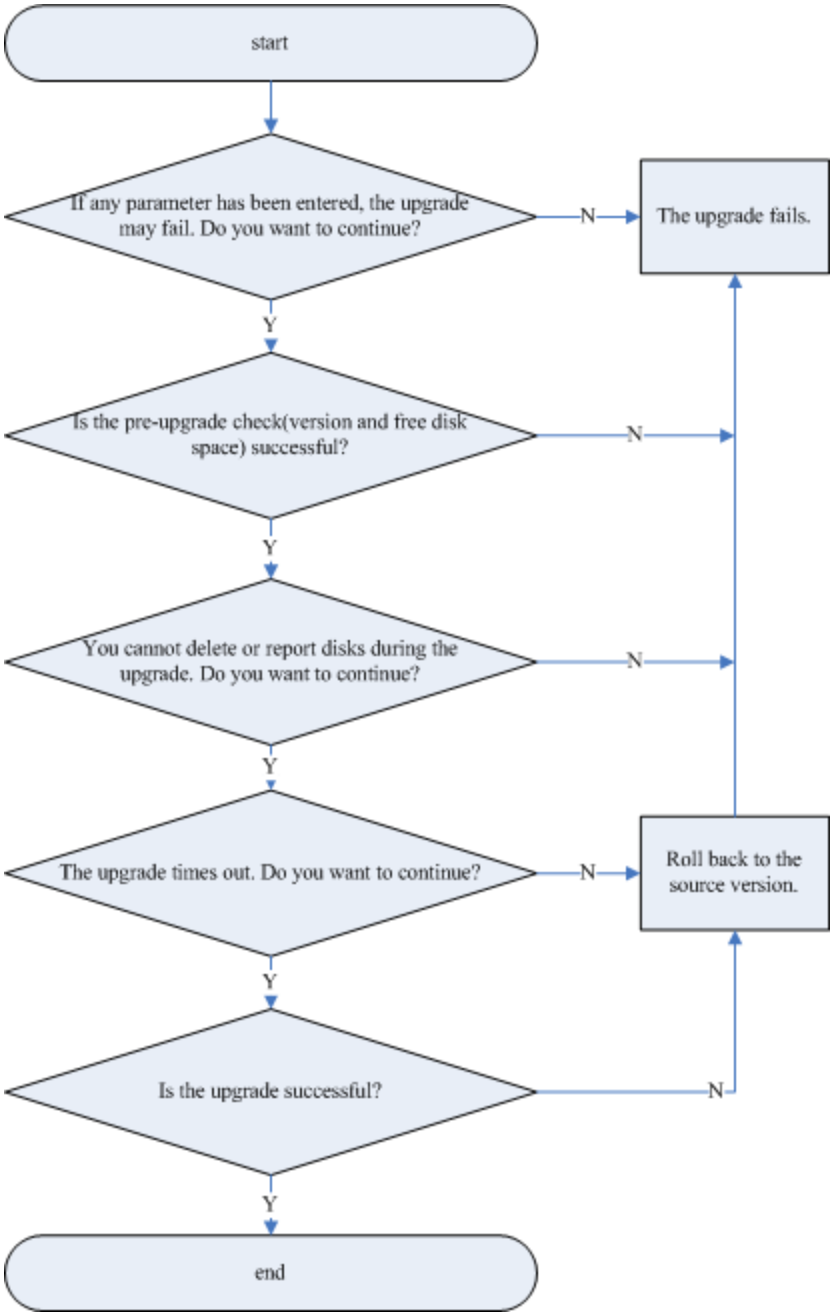
Figure 2-2 Flowchart of upgrading UltraPath for AIX online



2.1.2 Upgrade Steps and Time Required

Offline upgrade:

Table 2-1 Steps and time required for upgrading UltraPath for AIX offline

No.	Upgrade Step	Time Required	Impact	Remarks
1	Prepare for the	About 20	None	Mandatory

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No.	Upgrade Step	Time Required	Impact	Remarks
	upgrade.	minutes		
2	Delete and set virtual disks.	Depending on the total number of virtual disks, where one second is needed per virtual disk	None	Mandatory
3	Upgrade UltraPath for AIX.	About 5 minutes	None	Mandatory
4	Restart the host.	About 8 to 20 minutes	None	Optional
5	Verify the upgrade.	About 5 minutes	None	Mandatory

Online upgrade:

Table 2-2 Steps and time required for upgrading UltraPath for AIX online

No.	Upgrade Step	Time Required	Impact	Remarks
1	Perform the pre-upgrade check.	About one minute or longer if disks are not reported.	None	Mandatory
2	Upgrade UltraPath for AIX.	About 10 minutes. If there are a large number of disks or faults occurred during the upgrade, users are notified of the errors and are asked to confirm whether they want to continue the online upgrade.	None	Mandatory

2.2 Preparations for the Upgrade

2.2.1 Prerequisites

- The engineer who will perform the upgrade has experience in using AIX operating systems.
- The engineer who will perform the upgrade has logged in as user **root** to the AIX operating system.

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- Services are stopped. For details about how to check whether services are stopped, see section 2.2.9 Checking the Environment Before the Upgrade.

2.2.2 Obtaining Upgrade Tools

The following table lists the tools required for upgrading UltraPath.

Table 2-3

Name	Download Address	Remarks
Secure Shell (SSH)	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	You can use this tool to remotely log in to the server on which you want to upgrade UltraPath.
Secure File Transfer Protocol (SFTP) tool	http://www.coreftp.com/server/download/msftpsrvr.exe	You can use this tool to upload the UltraPath software package.

NOTE

If copyright is involved, obtain tools by yourself. For details, contact Huawei technical support engineers.

2.2.3 Obtaining Upgrade Reference Documents

Table 2-4 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE

You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

2.2.4 Obtaining Upgrade Software

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

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NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

2.2.5 Obtaining the Rollback Package

Offline upgrade:

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

Online upgrade:

None.

2.2.6 Obtaining the Version Number of UltraPath for AIX

Task Description

Obtain the version number of UltraPath for AIX in use and determine whether an upgrade is needed.

Procedure

Offline upgrade:

On the CLI, run the **upadm show version** command and collect the version number of UltraPath for AIX displayed in command output. Then, determine whether the UltraPath needs to be upgraded from a version earlier than V100R008 (V100R003, V100R005 or V100R006) to this version or from a version later than V100R008 to 21.1.0. If the version in the command output is 3.xx.xxx, 5.xx.xxx or 6.xx.xxx, you need to perform an upgrade from a version earlier than V100R008 to this version. If the version in the command output is 8.01.xxx, 8.03.xxx, 8.05.xxx, 8.06.xxx, 21.01.xxx or 21.02.xxx, you need to perform an upgrade from a version later than V100R008 to this version.You can run **upadm show version verbose** to query product version about V100R008C50 and later versions.

Online upgrade:

On the CLI, run the **upadm show version** command. Check the version displayed in the output. If the version is not newer than 8.03.028, do not perform an online upgrade.

Verification

The following are two examples:

```
1.  -bash-3.00# upadm show version
Software Version : 8.06.001
Driver Version  : 8.06.001
```

Refer to section 2.3 Upgrading UltraPath for AIX from a version earlier than V100R008 for details about the steps of the offline upgrade and the steps of the online upgrade.

```
2.  -bash-3.00# upadm show version verbose
Software Version  : 8.06.063
```


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```
Driver  Version   : 8.06.063
Product Version   : V100R008C50SPC500
```

Refer to section 2.3 Upgrading UltraPath for AIX from a version earlier than V100R008 for details about the steps of the offline upgrade and the steps of the online upgrade.

```
3.  -bash-3.00# upadm show version
Software Version : 6.01.041
Driver Version   : 6.01.041
```

For details about the steps of upgrading an early version to this version offline, see section 2.4 Upgrading UltraPath for AIX from a version earlier than V100R008. Online upgrade can be performed to upgrade to this version only since V100R008C20SPC100.

2.2.7 Backing Up Service Information

Task Description

This section applies to an offline upgrade only.

Before stopping services, back up service-related information for service restoration after the upgrade, including information about the activated volume groups (VGs), imported disk groups (DGs), and mounted file systems.

Precautions

Back up service information with the assistance of the customer's service engineers.

Procedure

Step 1 Run the **vxdisk list** command and check whether the VxVM is installed.

- If **command not found** is displayed, the VxVM is not installed. In this case, go to step 2.
- If the command is executed successfully, the VxVM is installed. In this case, perform the following operations:

1. Run the **vxdisk -e list** command and save the command output, which includes the status of DGs on virtual disks and information about online virtual disks. The command output is used for service restoration after the upgrade. In the following example, **DG001** and **DG002** exist on virtual disks **hdisk1**, **hdisk2**, and **hdisk3**. Virtual disk **hdisk4** is only in the **online** state.

```
bash-3.00# vxdisk -e list
DEVICE    TYPE    DISK    GROUP    STATUS   OS_NATIVE_NAME
Disk_0    auto     -        -       LVM       hdisk0
Disk_1    auto    Disk_1   DG001    online     hdisk3
Disk_2    auto    Disk_2   DG002    online     hdisk1
Disk_3    auto    Disk_3   DG002    online     hdisk2
Disk_4    auto     -        -      online     hdisk4
Disk_5    auto     -        -       LVM       hdisk5
```

NOTE

- In the preceding command output, the **DEVICE** column lists the names of disks managed by the VxVM, and the **OS_NATIVE_NAME** column lists the corresponding names of the disks displayed on the AIX operating system.
- The **GROUP** column lists the names of DGs.

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- **hdisk0** is a local disk. **hdisk5** is a virtual disk managed by the LVM.

2. Run the **mount** command and save the command output.

   The command output lists all mounted file systems. The following is an example:

```
bash-3.00# mount
  node     mounted      mounted over   vfs   date   options
-------- --------------  --------------  ------ ------------ ---------------
       /dev/hd4       /             jfs2   Nov 24 19:18 rw,log=/dev/hd8
       /dev/hd2       /usr           jfs2   Nov 24 19:18 rw,log=/dev/hd8
       /dev/hd9var     /var           jfs2   Nov 24 19:18 rw,log=/dev/hd8
       /dev/hd3       /tmp           jfs2   Nov 24 19:18 rw,log=/dev/hd8
       /dev/fwdump     /var/adm/ras/platform jfs2   Nov 24 19:18 rw,log=/dev/hd8
       /dev/hd1       /home          jfs2   Nov 24 19:18 rw,log=/dev/hd8
       /proc          /proc          procfs Nov 24 19:18 rw         /dev/hd10opt
/opt           jfs2   Nov 24 19:18 rw,log=/dev/hd8
       /dev/lv00       /var/adm/csd    jfs    Nov 24 19:18 rw,log=/dev/loglv00
       /dev/vx/dsk/DG01/LV02 /home/vxfs02    vxfs   Nov 25 14:21
rw,delaylog,suid,ioerror=mwdisable,largefiles
       /dev/vx/dsk/DG02/LV02 /home/vxfs03    vxfs   Nov 25 14:21
rw,delaylog,suid,ioerror=mwdisable,largefiles
       /dev/fslv00     /home/compareMountDir0 jfs2   Nov 25 14:28 rw,log=INLINE
```

NOTE

Pay attention to the VxFS file systems in the preceding command output.

Step 2 Back up service information managed by the LVM.

1. Run the **lspv** command and save the current VG status.

   The following example indicates that on virtual disks, only **vg001** is activated.

```
bash-3.00# lspv
hdisk0       0001fa696441ac6d             None
hdisk1       0001f090dc830ea9             rootvg        active
hdisk2       0001f0906c346eb8             vg001         active
hdisk3       0001f0908c629de6             vg001         active
hdisk4       00f6e0743a973991             datavg
hdisk5       0001f0908d097431             datavg
```

2. Run the **mount** command and save the command output.

   The command output lists all mounted file systems. The following is an example:

```
bash-3.00# mount
node      mounted       mounted over   vfs      date      option --------
--------------  --------------  ------ ------------ -------         /dev/hd4
/             jfs2   Nov 25 11:01 rw,log=/dev/hd8
         /dev/hd2       /usr           jfs2   Nov 25 11:01 rw,log=/dev/hd8
         /dev/hd9var     /var           jfs2   Nov 25 11:01 rw,log=/dev/hd8
         /dev/hd3       /tmp           jfs2   Nov 25 11:01 rw,log=/dev/hd8
         /dev/fwdump     /var/adm/ras/platform jfs2   Nov 25 11:02
rw,log=/dev/hd8
         /dev/hd1       /home          jfs2   Nov 25 11:02 rw,log=/dev/hd8
         /dev/hd11admin   /admin         jfs2   Nov 25 11:02 rw,log=/dev/hd8
         /proc          /proc          procfs Nov 25 11:02 rw
/dev/hd10opt    /opt           jfs2   Nov 25 11:02 rw,log=/dev/hd8
         /dev/livedump    /var/adm/ras/livedump jfs2   Nov 25 11:02
rw,log=/dev/hd8
         /dev/fslv00     /home/compareMountDir0 jfs2   Nov 25 16:06 rw,log=INLINE
         /dev/fslv03     /home/compareMountDir3 jfs2   Nov 25 16:08 rw,log=INLINE
```


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----End

Verification

None.

Troubleshooting

None.

2.2.8 Backing Up Information About UltraPath for AIX Before the Upgrade

Task Description

This section applies to an offline upgrade only.

Before upgrading UltraPath for AIX, back up information about virtual disks and paths. Verify the information after the upgrade.

Precautions

None.

Procedure

Step 1 Run the **lsdev -Cc disk** command to distinguish between local disks and virtual disks.

```
bash-3.00# lsdev -Cc disk
hdisk0  Available 04-08-01-5,0 16 Bit LVD SCSI Disk Drive
hdisk1  Available 04-08-01-8,0 16 Bit LVD SCSI Disk Drive
hdisk2  Available 07-08-01    Huawei S5500T FC Disk Drive
hdisk3  Available 07-08-01    Huawei S5500T FC Disk Drive
hdisk4  Available 07-08-01    Huawei S5500T FC Disk Drive
```

Disks with the **Huawei S5500T** string are virtual disks.

Step 2 Run the **ls -l /dev/diskname** and **ls -l /dev/rhdiskname** commands to back up the disk permission.

Where **diskname** indicates the disk, and **rhdiskname** indicates the character device related to the disk, for example:

```
bash-3.00# ls -l /dev/hdisk2
brw-------1 root system 25,3 Aug 27 14:52 /dev/hdisk2
bash-3.00# ls -l /dev/rhdisk2
crw-------1 root system 25,3 Aug 27 14:52 /dev/rhdisk2
```

Step 3 Run the **lspv** command. Information similar to the following is displayed. Save the information.

```
bash-3.00# lspv
hdisk0        0001fa696441ac6d            rootvg      active
hdisk1        0001f090dc830ea9            None
hdisk2        0001f0906c346eb8            datavg
```


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```
hdisk3          00f6e0743a9738c3            datavg
hdisk4          00f6e0743a973991            datavg
```

Step 4 Run the **lspath** command. Information similar to the following is displayed. Save the information.

- Run the **lspath -F "name status path_id parent connection"** command to back up information on paths:

```
bash-3.00# lspath -F "name status path_id parent connection"
hdisk0 Enabled 0 scsi15,0
hdisk1 Enabled 0 scsi18,0
hdisk2 Enabled 0 fscsi0 20080022a10bb2d5,1000000000000
hdisk3 Enabled 0 fscsi0 20080022a10bb2d5,2000000000000
hdisk4 Enabled 0 fscsi0 20080022a10bb2d5,3000000000000
hdisk2 Enabled 1 fscsi0 20090022a10bb2d5,1000000000000
hdisk3 Enabled 1 fscsi0 20090022a10bb2d5,2000000000000
hdisk4 Enabled 1 fscsi0 20090022a10bb2d5,3000000000000
hdisk2 Enabled 2 fscsi0 20180022a10bb2d5,1000000000000
hdisk3 Enabled 2 fscsi0 20180022a10bb2d5,2000000000000
hdisk4 Enabled 2 fscsi0 20180022a10bb2d5,3000000000000
hdisk2 Enabled 3 fscsi0 20190022a10bb2d5,1000000000000
hdisk3 Enabled 3 fscsi0 20190022a10bb2d5,2000000000000
hdisk4 Enabled 3 fscsi0 20190022a10bb2d5,3000000000000
```

- Run the **lspath -l *hdiskname* -p *parent* -w *connection* -a priority -F value** command to back up the priority of each path.

Where **hdiskname** indicates the device name, **parent** indicates the logical device name of a path's parent device, and **connection** indicates information about the connection. The following is an example: In **hdisk2 Enabled 0 fscsi0 20080022a10bb2d5**,1000000000000, **fscsi0** is **parent, 20080022a10bb2d5,1000000000000** is **connection**. If you want to query the priority of the path, run the **lspath -l hdisk2 -p fscsi0 -w 20080022a10bb2d5,1000000000000 -a priority -F value** command.

```
-bash-3.00# lspath -l hdisk2 -p fscsi0 -w 20080022a10bb2d5,1000000000000 -a priority
-F value
1
```

Note: You can run the following script to collect the path information and query the priority.

```
#!/bin/sh

Check_String="huawei|huasy|symantec|ultrapath"
echo "name status path_id parent connection priority"
lsdev -Cc disk | grep -E -i "$Check_String" | awk '{print $1}' | while read diskline
do
lspath -F "name status path_id parent connection" -l $diskline | while read pathline
do
parent=`echo $pathline | awk '{print $4}'`
connection=`echo $pathline | awk '{print $5}'`
priority=`lspath -l $diskline -p $parent -w $connection -a priority -F value`
echo "$pathline $priority"
done
done
```

The command output is as follows:

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```
name status path_id parent connection priority
hdisk2 Enabled 0 fscsi0 20080022a10bb2d5,1000000000000 3
hdisk2 Enabled 1 fscsi0 20090022a10bb2d5,1000000000000 1
hdisk2 Enabled 2 fscsi0 20180022a10bb2d5,1000000000000 1
hdisk2 Enabled 3 fscsi0 20190022a10bb2d5,1000000000000 1
hdisk3 Enabled 0 fscsi0 20080022a10bb2d5,2000000000000 1
hdisk3 Enabled 1 fscsi0 20090022a10bb2d5,2000000000000 1
hdisk3 Enabled 2 fscsi0 20180022a10bb2d5,2000000000000 1
hdisk3 Enabled 3 fscsi0 20190022a10bb2d5,2000000000000 1
```

In the command output, the last line indicates the priority of the path.

Step 5 Run the **upadm show lun** or **upadm show vlun** command. Information similar to the following is displayed. Save the information.

- Use **upadm show lun** for V100R005 and earlier version.

```
bash-3.00# upadm show lun
------------------------------------------------------------------------------
------------------------------
Device Name:       Lun Name:                  Vendor ID:  Type:         Serial Number:
Device WWN:
------------------------------------------------------------------------------
------------------------------
/dev/hdisk2       LUN001_10                  HUAWEI     S5300         1T50214955
6001882100552bcf000ad6a70000000d
/dev/hdisk3       LUN001_14                  HUAWEI     S5300         1T50214955
6001882100552bcf000b027100000011
/dev/hdisk4       LUN 4                     HUAWEI     S5300        1T50214955
6001882100552bcf0039697300000003
```

- Use **upadm show vlun** for V100R006 and later version. Command output for UltraPath V100R006 is used as an example.

```
bash-3.00# upadm show vlun
------------------------------------------------------------------------------
------------------------------------------------------------------------------
-
 Vlun ID  Host Lun ID  Disk Name  Vlun Name            Vlun WWN             Status    In
Use  Capacity  Controller(Own/Work)    Array Name         Array SN
    2        1       hdisk2    Lun_001   60022A11000BB2D5002A757700000000  Available
No    1.00GB         0A/0A         Huawei.Storage  210235G6GSZ0C4000008
    3        2       hdisk3    Lun_002   60022A11000BB2D5002A762800000001  Available
No    2.00GB         0B/0B         Huawei.Storage  210235G6GSZ0C4000008
    4        3       hdisk4    Lun_003   60022A11000BB2D5002A766400000002  Available
No    10.00GB        0A/0A         Huawei.Storage  210235G6GSZ0C4000008
```

NOTE

In the event that drive letters are changed after the upgrade, perform the following operations:

- If a volume manager is used to manage virtual disks, directly import VGs or DGs. The volume manager prevents the impact of drive letter change. For details about how to import VGs or DGs, see section 2.5.4 Restoring Services.
- If no volume manager is used, delete virtual disks on the host side and change host LUN IDs of LUNs on the ISM to make the ascending order of host LUN IDs identical to the sequence of LUNs corresponding to the virtual disks before the upgrade. This ensures that the LUN sequence queried by running the **upadm show lun**(for V100R005 and earlier version) or **upadm show vlun** (for V100R006 and later version) command before the upgrade and that queried after the upgrade are the same. If host LUN IDs cannot be changed on a storage device, delete mappings on the storage device, add mappings again (when adding a mapping, you are allowed to select a LUN ID), and run the **cfgmgr** command to scan for disks.

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In a cluster environment, if services are not stopped, LUNs that correspond to virtual disks will be reserved by a host that is running services. In this case, after the **upadm show lun** (for V100R005 and earlier version) or **upadm show vlun** (for V100R006 and later version) command is executed on another host, information about the reserved virtual disks is not displayed. To resolve this problem, stop services and then perform this step again.

Step 6 Save desired attribute information of virtual disks in one-to-one relationship with PVIDs.

The information is used to restore attributes of virtual disks to the previous ones after the upgrade. Attribute information includes the path selection algorithm, the queue depth, and the reserve policy of virtual disks.Run the **lsattr -El hdiskX** command and save the command output.

```
-bash-3.00# lsattr -El hdisk1
PCM           PCM/friend/UPpcm_S5500T        Path Control Module            False
PR_key_value   none                          Persistant Reserve Key Value    True
algorithm      round robin                   Algorithm                      True
clr_q          no                            Device CLEARS its Queue on error True
dist_err_pcnt   0                             Distributed Error Percentage    True
dist_tw_width   50                            Distributed Error Sample Time   True
hcheck_cmd     test unit rdy                  Health Check Command           True
hcheck_interval 10                            Health Check Interval          True
hcheck_mode    nonactive                      Health Check Mode              True
location                                     Location Label                 True
lun_id         0x0                           Logical Unit Number ID         False
lun_reset_spt   yes                           LUN Level Reset                True
max_transfer    0x100000                      Maximum TRANSFER Size          True
node_name      0x21000022a1073fdd             FC Node Name                   False
pvid          00007e1daedaaa2f0000000000000000 Physical volume identifier    False
q_err          yes                           Use QERR bit                   True
q_type         simple                        Queuing TYPE                   True
queue_depth     32                            Queue DEPTH                    True
reassign_to     120                           REASSIGN time out value        True
reserve_policy  no_reserve                    Reserve Policy                 True
rw_timeout      30                            READ/WRITE time out value      True
scsi_id        0x10600                       SCSI ID                        False
start_timeout   60                            START unit time out value      True
ww_name        0x20180022a1073fdd             FC World Wide Name             False
```

Alternatively, run the **lsattr -E -a attr_name -F value -l hdiskX** command to query a specific property of a virtual disk each time, and save the command output. In the command, **attr_name** indicates the property name that you want to query.

Table 2-5 Querying and modifying virtual disk attributes

Operation	Command	Parameter Description	Example
Query virtual disk properties.	**lsattr -E -a attr_name -F value -l Name**	**attr_name**: indicates the name of a virtual disk's property, for example, **reserve_policy** and **algorithm**. **Name**: indicates the device name of a	**lsattr -E -a reserve_policy -F value -l hdisk2** (used to query the reservation policy configured for **hdisk2**)

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Operation	Command	Parameter Description	Example
		virtual disk.	
Modify the reservation policy for a virtual disk.	**chdev -a attr_name=attr_value -l Name**	**attr_name**: indicates the name of a virtual disk's property. **attr_value**: indicates the value that you want to specify. **Name**: indicates the device name of a virtual disk.	**chdev -a reserve_policy=single_path -l hdisk2** **NOTE** • If **hdisk2 changed** is displayed, the reservation policy is successfully modified. • Do not interrupt the execution of the **chdev** command. Otherwise, the configuration database may be damaged. (Only user **root** and members of the security group are allowed to run this command.)

In a cluster environment, you must restore virtual disk reservation policies to the previous ones after the upgrade. The following reservation policies are supported: **single_path**, **no_reserve**, **PR_exclusive**, and **PR_shared**. The following information is an example:

```
bash-3.00# lsattr -E -a reserve policy -F value -l hdisk2
no_reserve
bash-3.00# lsattr -E -a reserve_policy -F value -l hdisk3
single_path
```

no_reserve is the default value. Therefore, only reservation policies except **no_reserve** need to be saved. Local disks do not need to be considered.

NOTE

- The network environment is complex. It is difficult to determine whether LUNs work in active-active or active-standby mode. The reservation configuration after the upgrade must remain the same as that before the upgrade. However, upgrading UltraPath for AIX causes reservation policies of virtual disks to change to **no_reserve**. Therefore, before upgrading UltraPath for AIX and deleting virtual disks, you must back up reservation policies of virtual disks. After the upgrade, restore reservation policies according to the backup information.
- After the upgrade, you must reset reservation policies of virtual disks for all nodes.
- Before the upgrade, save reservation policies of all virtual disks in one-to-one relationship with PVIDs to prevent the impact of drive letter change.
- If the output of the **lspv** command indicates that the VG status is **concurrent**, the reservation policy should be **no_reserve**. If reservation policy is changed after the upgrade, change the reservation policy back to **no_reserve**.

```
diskName: PVID: VGname: VGstatus:
hdisk4 00c0bf6016fc6aa3 datavg concurrent;
```

----End

Verification

None.

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2.2.9 Checking the Environment Before the Upgrade

Task Description

This section applies to an offline upgrade only.

Verify that file systems on the virtual disks are uninstalled, VGs are disabled, and DGs are removed.

Precautions

Perform operations with the assistance of the customer's service engineers.

Procedure

Step 1 Run the **vxdisk list** command and check whether the VxVM is installed.

- If **command not found** is displayed, the VxVM is not installed. In this case, go to step 2.
- If the VxVM is installed, perform the following operations:

1. Run the **vxdisk -e list** command and check that DGs are removed from virtual disks and virtual disks are in the **offline** state. Pay attention only to the virtual disks in the **online** state.

   In the following example, virtual disk **hdisk4** is in the **offline** state, and virtual disks **hdisk1**, **hdisk2**, and **hdisk3** are in the **online** state. Virtual disks **hdisk1** and **hdisk2** belong to DG **DG002**, and the DG to which virtual disk **hdisk3** belongs has been removed.

   ```
   bash-3.00# vxdisk -e list
   DEVICE    TYPE     DISK     GROUP    STATUS OS_NATIVE_NAME
   Disk_0    auto     -          -      LVM      hdisk0
   Disk_1    auto     -          -     online    hdisk3
   Disk_2    auto     Disk_2    DG002   online    hdisk1
   Disk_3    auto     Disk_3    DG002   online    hdisk2
   Disk_4    auto     -          -     offline   hdisk4
   Disk_5    auto     -          -      LVM      hdisk5
   ```

   NOTE
   - If execution of the **vxdisk -e list** command fails, the VxVM is not installed.
   - In the preceding command output, the **DEVICE** column lists the names of disks managed by the VxVM, and the **OS_NATIVE_NAME** column lists the corresponding names of the disks displayed on the AIX operating system.
   - The **GROUP** column lists the names of DGs.
   - **hdisk0** is a local disk. **hdisk5** is a virtual disk managed by the LVM. For details about operations related to the LVM, see Step 2.

2. Check whether the file system mounted on the DG is identified. If yes, go to sub-step 3. If no, perform the following operations:
   - Run the **vxinfo -g DgName** command. The logical volume of the DG is displayed. The logical volume contains the file system information. In the following example, the logical volume of **DG002** is **testlv**.

     ```
     bash-3.00# vxinfo -g DG002
     testlv       fsgen   Started
     ```


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- Run the **vxprint -g DgName -l LvName | grep path** command to obtain the path to the logical volume. In the following example, the path to logical volume **testlv** of **DG002** is **/dev/vx/dsk/DG002/testlv**.

```
bash-3.00# vxprint -g DG002 -l testlv|grep path   device:  minor=42000
bdev=62/42000 cdev=62/42000 path=/dev/vx/dsk/DG002/testlv
```

- Run the **mount |grep "LvPath"** command to obtain the mount point of the file system. In the following example, **/home/vxfs002** is the mount point of the file system in the logical volume that is saved to **/dev/vx/dsk/DG002/testlv**.

```
bash-3.00# mount |grep "/dev/vx/dsk/DG002/testlv"   /dev/vx/dsk/DG002/testlv
/home/vxfs002   vxfs  Nov 24 09:38
rw,delaylog,suid,ioerror=mwdisable,largefiles
```

NOTE

If no command output is displayed, no file system is mounted on the logical volume.

3. After obtaining the mount point of the file system mounted on the DG, run the **umount mountPoint** command to uninstall the file system, the **vxdg deport DgName** command to remove the DG, and the **vxdisk offline DeviceName** command to get the virtual disks offline.

   The following is an example:

```
bash-3.00# umount /home/vxfs002
bash-3.00# vxdg deport DG002
bash-3.00# vxdisk offline Disk_1
bash-3.00# vxdisk offline Disk 2
bash-3.00# vxdisk offline Disk_3
```

NOTE

- If no file system is mounted, directly remove the DG.
- **DeviceName** of an offline disk is a device name used by the VxVM, not a disk name displayed on the AIX operating system.

4. Run the **vxdisk -e list** command and check that the DG is removed and that virtual disks are in the **offline** state.

   In the following example, the DG is removed, and virtual disks are in the **offline** state.

   bash-3.00# vxdisk -e list

```
DEVICE    TYPE    DISK    GROUP    STATUS    S_NATIVE_NAME    Disk_0    auto
-       -       LVM       hdisk0
Disk_1    auto    -       -      offline     hdisk3
Disk_2    auto    -       -      offline     hdisk1
Disk_3    auto    -       -      offline     hdisk2
Disk_4    auto    -       -      offline     hdisk4
Disk_5    auto    -       -       LVM       hdisk5
```

Step 2 Deactivate virtual disks managed by the LVM.

1. Run the **lspv** command and check that VGs on virtual disks are disabled.

   In the following example, **vg001** is in the **active** state. **datavg** is disabled.

```
bash-3.00# lspv
hdisk0          0001fa696441ac6d          None
hdisk1          0001f090dc830ea9          rootvg       active
hdisk2          0001f0906c346eb8          vg001        active
hdisk3          0001f0908c629de6          vg001        active
hdisk4          00f6e0743a973991          datavg
hdisk5          0001f0908d097431          datavg
```


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NOTE

The preceding command output contains four columns, indicating the disk name, PVID, VG name, and VG status.

2. If a VG is in the **active** state, run the **lsvg -l vgName** command to identify the file system on the VG and run the **mount** command and check whether the file system is mounted.

   The following is an example:

```
bash-3.00# lsvg -l vg001
vg001:
LV NAME      TYPE      LPs   PPs   PVs  LV STATE    MOUNT POINT
lv001        jfs       2     2     1    closed/syncd  N/A
loglv00      jfs2log   1     1     1    open/syncd    N/A
fslv00       jfs2      5     5     1    open/syncd    /home/fs001
bash-3.00# mount
node      mounted       mounted over    vfs    date     options
-------- ------------  ---------------  ------ --------- --------
/dev/hd4       /             jfs2   Nov 10 04:25 rw,log=/dev/hd8
/dev/hd2       /usr           jfs2   Nov 10 04:25 rw,log=/dev/hd8
/dev/hd9var    /var           jfs2   Nov 10 04:25 rw,log=/dev/hd8
/dev/hd3       /tmp           jfs2   Nov 10 04:25 rw,log=/dev/hd8
/dev/fwdump    /var/adm/ras/platform jfs2   Nov 10 04:26 rw,log=/dev/hd8
/dev/hd1       /home          jfs2   Nov 10 04:26 rw,log=/dev/hd8
/proc          /proc          procfs Nov 10 04:26 rw
/dev/hd10opt   /opt           jfs2   Nov 10 04:26 rw,log=/dev/hd8
/dev/fslv00    /home/fs001     jfs2   Nov 10 04:57 rw,log=/dev/loglv00
```

NOTE

In the preceding command output, file system **fslv00** is mounted on **vg001**, and the mount point is **/home/fs001**.

3. Run the **umount mountPoint** command to uninstall the file system.

   The following is an example:

```
bash-3.00# umount /home/fs001
```

NOTE

If **busy** is returned, ask the customer's engineers to confirm that services have been stopped.

4. After all file systems are uninstalled, run the **varyoffvg vgName** command to disable VGs.

```
bash-3.00# varyoffvg vg001
```

5. Run the **lspv** command and check that all VGs are disabled.

```
bash-3.00# lspv
 hdisk0          0001fa696441ac6d                    None
 hdisk1          0001f090dc830ea9                    rootvg          active
 hdisk2          0001f0906c346eb8                    vg001
 hdisk3          0001f0908c629de6                    vg001
 hdisk4          00f6e0743a973991                    datavg
```

Step 3 Ensure that the **/opt** directory on the server has at least 200 MB of free space, the **/usr** directory has at least 30 MB of free space, the **/tmp** directory has at least 250 MB of free space, the / directory has at least 20 MB of free space.

```
# df -m
Filesystem    MB blocks      Free    %Used    Iused %Iused  Mounted on
/dev/hd4       10752.00   1028.62    91%   135898    36% /
/dev/hd2        3840.00   1681.39    57%    39508    10% /usr
```


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```
/dev/hd3       5120.00   991.02   81%     870     1% /tmp
/dev/hd10opt    2176.00  1548.43   29%     3060     1% /opt
```

NOTE

If the free space is insufficient, run the **chfs -a size=+200M /opt** command to expand the capacity of the **/opt** directory, run the **chfs -a size=+30M /usr** command to expand the capacity of the **/usr** directory, run the **chfs -a size=+250M /tmp** command to expand the capacity of the **/tmp** directory, and the **chfs -a size=+20M** /command to expand the capacity of the /directory.

----End

Verification

If the output of the **mount** command executed in Step 1 and Step 2 does not include any file systems created on virtual disks, the file system has been uninstalled. Otherwise, run the **umount** command to uninstall the file system.

In the output of the **lspv** command executed in Step 2, if the VG status is not **active**, the VG is disabled. Otherwise, run the **varyoffvg VGname** command to disable the VG.

2.3 Upgrading UltraPath for AIX from a version earlier than V100R008

For details about upgrading to this version online or offline from a version later than V100R008, see section 2.3 Upgrading UltraPath for AIX from a version earlier than V100R008. (For details about how to determine whether an upgrade from a version later than V100R008 is required, see section 2.2.6 Obtaining the Version Number of UltraPath for AIX.)

For details about how to upgrade from a version earlier than V100R008 to this version, see section 2.4 Upgrading UltraPath for AIX from a version earlier than V100R008. (For details about how to determine whether an upgrade from a version earlier than V100R008 is required, see section 2.2.6 Obtaining the Version Number of UltraPath for AIX.)

2.3.1 Setting Virtual Disks to the Defined State

Task Description

This section applies to an offline upgrade only.

If not in SAN Boot situation, set virtual disks to the **Defined** state.

If in SAN Boot situation, set virtual disks to the **Defined** state except rootvg.

Precautions

None.

Prerequisites

None.

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Procedure

Step 1 Run the **lsdev -Cc disk** command to query the status of virtual disks. If no virtual disk exists or all virtual disks are in the **Defined** state, skip step 2.

```
bash-3.00# lsdev -Cc disk
hdisk0 Available 03-08-00-5,0 16 Bit LVD SCSI Disk Drive
hdisk1 Available 00-08-02    Huawei S5500T FC Disk Drive
```

Step 2 Run the **rmdev -l diskName** command to set all virtual disks to the **Defined** state.The following is an example:

```
bash-3.00# rmdev -l hdisk1
hdisk1 Defined
```

----End

Verification

Run the **lsdev -Cc disk** command to confirm that virtual disks have been set to the **Defined** state.

```
-bash-3.00# lsdev -Cc disk
hdisk0 Available 03-08-00-5,0 16 Bit LVD SCSI Disk Drive
hdisk1 Defined   00-08-02    Huawei S5500T FC Disk Drive
```

Troubleshooting

Step 1 If the **rmdev** command fails to be executed and the **busy** error is displayed, confirm that file systems are uninstalled, VGs are disabled, and DGs are removed. For details, see section 2.2.9 Checking the Environment Before the Upgrade.

Step 2 If virtual disks cannot be set to the **Defined** state after all services are stopped, VGs are disabled, and DGs are removed, run the **fuser -kxuc /dev/hdiskX** command to stop all processes that are accessing **hdiskX**, and then run the **rmdev -l diskName** command to set all virtual disks to the **Defined** state.

Step 3 If other error information is displayed, proceed as prompted.

----End

2.3.2 Upgrading UltraPath for AIX Offline

Task Description

Upgrade UltraPath for AIX offline.

Precautions

See section 1.4.1.2 Others.

Prerequisites

- Services are stopped.
- File systems are uninstalled.

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- All users have quit the **upadm** mode.
- If not in SAN Boot situation, all virtual disks are deleted or set to the **Defined** state.
- If in SAN Boot situation, all virtual disks are deleted or set to the **Defined** state except rootvg.

Procedure

Step 1 Copy the UltraPath for AIX upgrade package to any directory. Do not change the structure of the upgrade package. For example, if the upgrade package is copied to the **/ultrapath** directory, ensure that the directory contains three folders **Docs**, **Packages**, **Tools**, one compressed script **install.tar** and one configuration file **unattend_install.conf** .

Figure 2-3 Structure of the UltraPath for AIX upgrade package

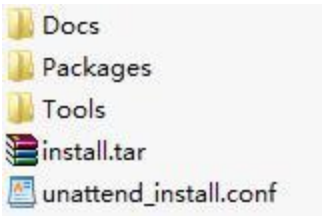
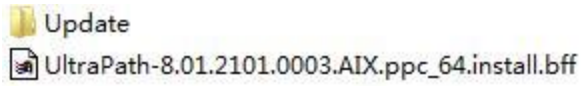


Figure 2-4 Contents in the Packages folder




```
-bash-3.00# ls -l
total 312
drwxr-xr-x   2 root     system          256 Mar 08 07:19 Docs
drwxr-xr-x   3 root     system          256 Mar 08 07:19 Packages
drwxr-xr-x   2 root     system          256 Mar 08 07:19 Tools
-rw-r--r--   1 root     system       153600 Mar 08 07:19 install.tar
-rw-r--r--   1 root     system          899 Mar 08 07:19 unattend_install.conf
```

NOTE

If you use an FTP tool to copy the upgrade package to the target host, set the transmission mode to automatic, not binary transmission.

Step 2 Run the **cd /ultrapath** command to go to the directory where the upgrade package resides.

Step 3 Run the **tar -xvf install.tar** command to decompress the **.tar** file. The **install.sh** is obtained.

Step 4 Run the **chmod +x install.sh** command to modify the file execution permission.

Step 5 Run the **sh install.sh** command to upgrade UltraPath for AIX.

If the upgrade is successful, the following information is displayed. If the **Result** column shows **Failed**, the upgrade fails. In this case, proceed as prompted.

```
-bash-3.00# sh install.sh
       NOTICE     :For properties of SAN HBA,please set dyntrk to yes and set fc err recov
to fast_fail.
                 If not,the function of fail_over may be invalid.
```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```
The os is AIX 5.3
      NOTICE : UltraPath software UltraPath.AIX.ppc_64.rte 8.1.803.28 has already
exist in the system.
            Before update software,please make sure there are no disks or disks are
defined status! update it(Y/y)or(N/n)? : -->
y
Begin to update UltraPath...
+-----------------------------------------------------------------------------+
                Pre-installation Verification...
+-----------------------------------------------------------------------------+
Verifying selections...done
Verifying requisites...done
Results...

SUCCESSES
---------
  Filesets listed in this section passed pre-installation verification
  and will be installed.

  Selected Filesets
  -----------------
  UltraPath.AIX.ppc 64.rte 8.1.2101.3        # UltraPath for AIX

  << End of Success Section >>

FILESET STATISTICS
------------------
    1  Selected to be installed, of which:
       1  Passed pre-installation verification
  ----
    1  Total to be installed

+-----------------------------------------------------------------------------+
                    Installing Software...
+-----------------------------------------------------------------------------+

installp:  APPLYING software for:
       UltraPath.AIX.ppc_64.rte 8.1.2101.3

--------------------------------------------------------------------------------
Warning: Check the status of disks. If the status of a disk is not
       'Defined', set the status of all disks to Defined and scan for
       the disks again to enable the new version to take effect
--------------------------------------------------------------------------------
Add smit for ultrapath success.
Finished processing all filesets.  (Total time:  15 secs).

+-----------------------------------------------------------------------------+
                  Pre-commit Verification...
+-----------------------------------------------------------------------------+
Verifying requisites...done
Results...

SUCCESSES
---------
```


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```
  Filesets listed in this section passed pre-commit verification
  and will be committed.

  Selected Filesets
  -----------------
  UltraPath.AIX.ppc_64.rte 8.1.2101.3        # UltraPath for AIX

  << End of Success Section >>

+-----------------------------------------------------------------------------+
                     Committing Software...
+-----------------------------------------------------------------------------+

installp:  COMMITTING software for:
       UltraPath.AIX.ppc 64.rte 8.1.2101.3

Finished processing all filesets.  (Total time:  15 secs).

+-----------------------------------------------------------------------------+
                            Summaries:
+-----------------------------------------------------------------------------+

Installation Summary
--------------------
Name                     Level         Part       Event      Result
-------------------------------------------------------------------------------
UltraPath.AIX.ppc 64.rte   8.1.2101.3     USR        APPLY      SUCCESS
UltraPath.AIX.ppc_64.rte   8.1.2101.3     USR        COMMIT     SUCCESS
```

Step 6 In a SAN networking scenario, check whether the **fc_err_recov** property of the Fibre Channel HBA is **fast_fail** and the **dyntrk** property of the Fibre Channel HBA is **yes**. If not, delete subdevices on fscsi devices, and change the property values.

1. Run the **lsdev -Cc driver|grep fscsi** command to list existing fscsi devices.

   ```
   -bash-3.00# lsdev -Cc driver|grep fscsi
   fscsi0 Available 06-08-01 FC SCSI I/O Controller Protocol Device
   fscsi1 Available 0B-08-01 FC SCSI I/O Controller Protocol Device
   ```

2. Run the **lsdev -p fscsiX** command to query whether fscsi devices have subdevices.

   ```
   -bash-3.00# lsdev -p fscsi0
   sfwcomm0 Available 06-08-01-FF Fibre Channel Storage Framework Comm
   ```

3. Run the **rmdev -l subDevice** command to set subdevices to the **Defined** state if there are any.

   ```
   -bash-3.00# rmdev -l sfwcomm0
   sfwcomm0 Defined
   ```

4. Modify the properties of the Fibre Channel HBA.

   ```
   -bash-3.00# chdev -l fscsi0 -a fc_err_recov=fast_fail   fscsi0 changed
   -bash-3.00# chdev -l fscsi0 -a dyntrk=yes    fscsi0 changed
   ```

Table 2-6 describes the command used to modify the properties of the Fibre Channel HBA.

Table 2-6 Modifying the properties of the Fibre Channel HBA in a SAN networking scenario

Operation	Command	Parameter Description	Example

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Operation	Command	Parameter Description	Example
Modify the properties of the Fibre Channel HBA.	**chdev -l Name -a fc_err_recov=fast_fail** **chdev -l Name -a dyntrk=yes**	**Name**: indicates the logical name of a customized device whose property names or values need to be displayed. **fc_err_recov**: indicates fast error recovery. **dyntrk**: indicates dynamic tracking.	**# chdev -l fscsi0 -a fc_err_recov=fast_fail** **fscsi0 changed** **# chdev -l fscsi0 -a dyntrk=yes** **fscsi0 changed**

NOTE

- Before changing the properties of the Fibre Channel HBA, query subdevices and set subdevices to the **Defined** state.
- In a direct-connection environment, if the values of **fc_err_recov** and **dyntrk** are **fast_fail** and **yes** respectively, set **fc_err_recov** to **delayed_fail** and **dyntrk** to **no**.

Table 2-7 Querying subdevices and setting subdevices to the Defined state

Operation	Command	Parameter Description	Example
Querying subdevices	lsdev -p parent	**-p**: lists subdevices of a parent device.	#lsdev -p fscsi0
Setting subdevices to the **Defined** state	rmdev -l hdiskX	**-l**: followed by a disk name.	#rmdev -l hdisk2

Step 7 Run the **cfgmgr** command to scan for disks.

Step 8 Run the **lspv** command and check whether virtual disks are generated.

```
bash-3.00# lspv
hdisk0        0001fa696441ac6d           None
hdisk1        0001f090dc830ea9           rootvg        active
hdisk2         0001f0906c346eb8          vg001
hdisk3         0001f0908c629de6          vg001
hdisk4         00f6e0743a973991          datavg
hdisk5         0001f0908d097431          datavg
```

If all virtual disks are deleted before the upgrade, perform the following step:

Step 9 Run the **chdev -a attr_name=attr_value -l hdiskX** command to restore properties of virtual disks to those saved before the upgrade. In the command, **attr_name** indicates a property name, and **attr_value** indicates the property value to be set.

For example, run the **chdev -a reserve_policy=single_path -l hdiskX** command to restore virtual disk's reservation polices by using the reservation polices saved before the upgrade. Note the mappings between the reservation polices before the upgrade and the PVIDs.

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```
bash-3.00# chdev -a reserve_policy=single_path -l hdisk2
hdisk2 changed
```

NOTE

- If a reservation policy is changed to **single_path**, change the path selection algorithm to **fail_over** for the virtual disk.
- After the upgrade is complete, do not run the **upkill up_restart_warn** command.

----End

Verification

Run the **lslpp -l U*.*.rte** command to obtain the name of the installed UltraPath for AIX and check that the version is the target version.

Troubleshooting

Proceed as prompted.

2.3.3 Upgrading UltraPath for AIX Online

Task Description

Upgrade UltraPath for AIX from an earlier version to the latest version without interrupting services. UltraPath for AIX takes effect immediately after the upgrade is complete.

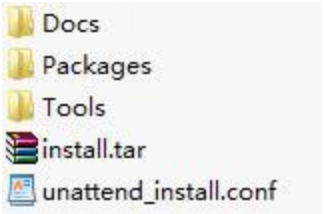
Precautions

See section 1.4.1 UltraPath for AIX.

Procedure

Step 1 Copy the UltraPath installation package to the host.

Figure 2-5 UltraPath for AIX installation package directories



Step 2 Run the following commands to upgrade UltraPath for AIX online. Table 2-8 lists the parameters that can be specified by users:

```
~ # tar -xvf install.tar
~ # sh install.sh -ndu [ndu_free_mem_size=xxx] [ndu_used_cpu_percent=yyy]
[ndu_free_disk_space=zzz]
```


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Table 2-8 Parameters that can be specified by users during the online upgrade

Parameter	Function	Description
ndu_free_mem_size	Minimum available memory size required to check the UltraPath before the upgrade.	Unit: MB. Default value:200
ndu_used_cpu_percent	Maximum CPU usage percentage allowed by the pre-upgrade check.	The value ranges between **0** and **100**. Default value:80
ndu_free_disk_space	Free space in the root directory required by the online upgrade check.	Unit: MB. Default value:200

Step 3 Perform the pre-upgrade check. If the pre-upgrade check fails, the system will quit the online upgrade. If the pre-upgrade check succeeds, the latest UltraPath will be installed, and you will be asked not to report or delete disks. Entering **N** will roll back UltraPath for AIX and quit the online upgrade. Entering **Y** will continue the upgrade.

```
+-----------------------------------------------------------------------------+
                 Pre-installation Verification...
+-----------------------------------------------------------------------------+
Verifying selections...done
Verifying requisites...done
Results...

SUCCESSES
---------
  Filesets listed in this section passed pre-installation verification
  and will be installed.

  Selected Filesets
  -----------------
  UltraPath.AIX.ppc_64.rte 8.1.2101.3        # UltraPath for AIX

  << End of Success Section >>

FILESET STATISTICS
------------------
   1  Selected to be installed, of which:
      1  Passed pre-installation verification
  ----
   1  Total to be installed

+-----------------------------------------------------------------------------+
                    Installing Software...
+-----------------------------------------------------------------------------+

installp:  APPLYING software for:
       UltraPath.AIX.ppc_64.rte 8.1.2101.3
```


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```
Broadcast message from root@AIX196 (tty) at 16:10:34 ...

Add smit for ultrapath success.
Finished processing all filesets.  (Total time:  5 secs).

+-----------------------------------------------------------------------------+
                            Summaries:
+-----------------------------------------------------------------------------+

Installation Summary
--------------------
Name                     Level         Part       Event      Result
-------------------------------------------------------------------------------
UltraPath.AIX.ppc 64.rte   8.1.2101.3     USR        APPLY      SUCCESS
During the non-disruptive upgrade, do not run the cfgmgr, rmdev, rmpath, chdev, and
chpath commands. Otherwise, the non-disruptive upgrade may fail. Are you sure you want
to continue?
<Y|N>:
```

If there are a large number of disks, no message will be displayed temporarily. After a maximum of 10 minutes, you will be asked whether to continue the online upgrade.

Step 4 After the upgrade is successful, the following messages are displayed:

```
+-----------------------------------------------------------------------------+
                    Pre-commit Verification...
+-----------------------------------------------------------------------------+
Verifying selections...done
Verifying requisites...done
Results...

SUCCESSES
---------
  Filesets listed in this section passed pre-commit verification
  and will be committed.

  Selected Filesets
  -----------------
  UltraPath.AIX.ppc_64.rte 8.1.2101.3        # UltraPath for AIX

  << End of Success Section >>

FILESET STATISTICS
------------------
    1  Selected to be committed, of which:
        1  Passed pre-installation verification
  ----
    1  Total to be committed

+-----------------------------------------------------------------------------+
                     Committing Software...
+-----------------------------------------------------------------------------+

installp:  COMMITTING software for:
       UltraPath.AIX.ppc_64.rte 8.1.2101.3
```


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```
Finished processing all filesets.  (Total time:  0 secs).

+-----------------------------------------------------------------------------+
                            Summaries:
+-----------------------------------------------------------------------------+

Installation Summary
--------------------
Name                     Level         Part       Event      Result
-------------------------------------------------------------------------------
UltraPath.AIX.ppc_64.rte   8.1.2101.3     USR        COMMIT     SUCCESS

bosboot: Boot image is 24413 512 byte blocks.
The non-disruptive upgrade is complete.
```

----End

Verification

Step 1 Run the **upadm show version** command to check whether the UltraPath version is the latest.

Step 2 Run the **genkex | grep Ultra** command to check whether the UltraPath module is loaded properly.

For example, the module before the upgrade is:

~ # genkex | grep Ultra

44da000 3f08a8 /usr/lib/drivers/UltraPath_pcmextA

44c1000 186d0 /usr/lib/drivers/UltraPath_pcmke

The module after the upgrade is:

~ # genkex | grep Ultra

44db000 3f07a8 /usr/lib/drivers/UltraPath_pcmextB

44c1000 186d0 /usr/lib/drivers/UltraPath_pcmke

Step 3 Check whether services are running normally.

----End

Troubleshooting

If faults occur during the upgrade, contact Huawei R&D engineers for troubleshooting.

2.4 Upgrading UltraPath for AIX from a version earlier than V100R008

This section applies to an offline upgrade only.

This section describes how to upgrade from a version earlier than V100R008 to this version see section 2.3 Upgrading UltraPath for AIX from a version earlier than V100R008. (For

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details about how to determine whether an upgrade from a version earlier than V100R008, see section 2.2.6 Obtaining the Version Number of UltraPath for AIX.)

2.4.1 Deleting Virtual Disks

Task Description

Delete all virtual disks.

Precautions

None.

Prerequisites

None.

Procedure

Step 1 Run the **lsdev -Cc disk** command to query whether virtual disks exist. If no virtual disk exists, go to step 2.

```
bash-3.00# lsdev -Cc disk
hdisk0 Available 03-08-00-5,0 16 Bit LVD SCSI Disk Drive
hdisk1 Available 00-08-02    Huawei S5500T FC Disk Drive
```

Step 2 Run the **rmdev -dl diskName** command to delete all virtual disks.

The following is an example:

```
bash-3.00# rmdev -dl hdisk1
hdisk1 deleted
```

----End

Verification

Run the **lsdev -Cc disk** command and check that virtual disks do not exist.

```
bash-3.00# lsdev -Cc disk
hdisk0 Available 03-08-00-5,0 16 Bit LVD SCSI Disk Drive
```

Troubleshooting

Step 1 If the **rmdev** command fails to be executed and the **busy** error is displayed, confirm that file systems are uninstalled, VGs are disabled, and DGs are removed. For details, see section 2.2.9 Checking the Environment Before the Upgrade.

Step 2 If virtual disks cannot be deleted after all services are stopped, VGs are disabled, and DGs are removed, run the **fuser -kxuc /dev/hdiskX** command to stop all processes that are operating hdiskX, and then delete all virtual disks again.

Step 3 If other error information is displayed, proceed as prompted.

----End

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2.4.2 Upgrading UltraPath for AIX Offline

Task Description

Upgrade UltraPath for AIX offline.

Precautions

None.

Prerequisites

Services are stopped, service information and multipathing information have been backed up, file systems are uninstalled, all virtual disks have been deleted, and all users have quit the upadm mode.

Procedure

Step 1 Run the **lsdev -Cc disk** command and check that virtual disks do not exist.

Step 2 Copy the UltraPath for AIX upgrade package to any directory.

Do not change the structure of the upgrade package. For example, if the upgrade package is copied to the **/ultrapath** directory, ensure that the directory contains three folders **Docs**, **Packages**, **Tools**, one compressed script **install.tar** and one configuration file **unattend_install.conf**. In addition, ensure that the upgrade package resides in the **Packages** folder.

Figure 2-6 Structure of the UltraPath for AIX upgrade package

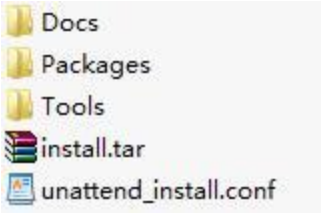
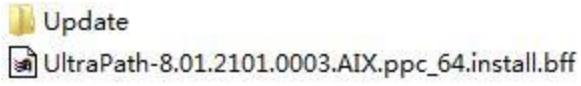


Figure 2-7 Contents in the Packages folder




```
-bash-3.00# ls -l
total 312
drwxr-xr-x   2 root     system          256 Mar 08 07:19 Docs
drwxr-xr-x   3 root     system          256 Mar 08 07:19 Packages
drwxr-xr-x   2 root     system          256 Mar 08 07:19 Tools
-rw-r--r--   1 root     system       153600 Mar 08 07:19 install.tar
-rw-r--r--   1 root     system          899 Mar 08 07:19 unattend_install.conf
```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NOTE
If you use an FTP tool to copy the upgrade package to the target host, set the transmission mode to automatic, not binary transmission.

Step 3 Run the **cd /ultrapath** command to go to the directory where the upgrade package resides.

Step 4 Run the **tar -xvf install.tar** command to decompress the .tar file. The **install.sh** is obtained.

Step 5 Run the **chmod +x install.sh** command to modify the file execution permission.

Step 6 Run the **sh install.sh** command to upgrade UltraPath for AIX.If the upgrade is successful, the following information is displayed:

```
-bash-3.00# sh install.sh
       NOTICE    :For properties of SAN HBA,please set dyntrk to yes and set fc_err_recov
to fast_fail.
                If not,the function of fail over may be invalid.
The os is AIX 5.3

       NOTICE :UltraPath software UltraPath.AIX.ppc_64.rte has already exist in the
system.
       Before uninstall the old version, please make sure storage device disks have been
deleted! Uninstall it(Y/y)or(N/n)? : -->
y
The UltraPath of the old version is being uninstalled. Please wait .........
Uninstallation completed.
The UltraPath of the new version is being installed. Please wait .........
Install UltraPath For AIX Success.
```

Step 7 In a SAN networking scenario, check whether the **fc_err_recov** property of the Fibre Channel HBA is **fast_fail** and the **dyntrk** property of the Fibre Channel HBA is **yes**. If not, delete subdevices on fscsi devices, and change the property values.

1. Run the **lsdev -Cc driver|grep fscsi** command to list existing fscsi devices.

   ```
   -bash-3.00# lsdev -Cc driver|grep fscsi
   fscsi0 Available 06-08-01 FC SCSI I/O Controller Protocol Device
   fscsi1 Available 0B-08-01 FC SCSI I/O Controller Protocol Device
   ```

2. Run the **lsdev -p fscsiX** command to query whether fscsi devices have subdevices.

   ```
   -bash-3.00# lsdev -p fscsi0
   sfwcomm0 Available 06-08-01-FF Fibre Channel Storage Framework Comm
   ```

3. Run the **rmdev -dl subDevice** command to delete subdevices if any.

   ```
   -bash-3.00# rmdev -dl sfwcomm0
   sfwcomm0 deleted
   ```

4. Modify the properties of the Fibre Channel HBA.

   ```
   -bash-3.00# chdev -l fscsi0 -a fc_err_recov=fast_fail
   fscsi0 changed
   -bash-3.00# chdev -l fscsi0 -a dyntrk=yes
   fscsi0 changed
   ```

   Table 2-9 describes the command used to modify the properties of the Fibre Channel HBA.

Table 2-9 Modifying the properties of the Fibre Channel HBA in a SAN networking scenario

Operation	Command	Parameter Description	Example

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Operation	Command	Parameter Description	Example
Modify the properties of the Fibre Channel HBA.	**chdev -l Name -a fc_err_recov=fast_fail** **chdev -l Name -a dyntrk=yes**	**Name**: indicates the logical name of a customized device whose property names or values need to be displayed. **fc_err_recov**: indicates fast error recovery. **dyntrk**: indicates dynamic tracking.	**# chdev -l fscsi0 -a fc_err_recov=fast_fail** **fscsi0 changed** **# chdev -l fscsi0 -a dyntrk=yes** **fscsi0 changed**

NOTE

- Before changing the properties of a Fibre Channel HBA, query and delete subdevices.
- In a direct-connection environment, if the values of **fc_err_recov** and **dyntrk** are **fast_fail** and **yes** respectively, set **fc_err_recov** to **delayed_fail** and **dyntrk** to **no**.
- When the **chdev** command is executed to change properties of a Fibre Channel HBA, some of the **cfgmgr** functions are invoked, and new virtual disk data is generated in the ODM. Therefore, if you change properties of a Fibre Channel HBA before uninstalling the UltraPath, you must also delete the virtual disks.

Table 2-10 Querying and deleting subdevices

Operation	Command	Parameter Description	Example
Query subdevices.	**lsdev -p parent**	**-p**: lists subdevices of a parent device.	**#lsdev -p fscsi0**
Delete subdevices.	**rmdev -dl hdiskX**	**-d**: deletes related information in the ODM library. **-l**: followed by a disk name.	**#rmdev -dl hdisk2**

Step 8 In a cluster environment, run the **cfgmgr** command to scan for disks.

Step 9 Run the **lspv** command and check whether virtual disks are generated.

```
bash-3.00# lspv
hdisk0          0001fa696441ac6d                    None
hdisk1          0001f090dc830ea9                    rootvg          active
hdisk2          0001f0906c346eb8                    vg001
hdisk3          0001f0908c629de6                    vg001
hdisk4          00f6e0743a973991                    datavg
hdisk5          0001f0908d097431                    datavg
```

NOTE

If no virtual disk is generated, run the **lsdev -Cc disk** command and check whether there are disks in the **Defined** state. If yes, delete these disks and run the **cfgmgr** command again.

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Step 10 Run the **chdev -a attr_name=attr_value -l hdiskX** command to restore properties of virtual disks to those saved before the upgrade. In the command, **attr_name** indicates a property name, and **attr_value** indicates the property value to be set.

For example, run the **chdev -a reserve_policy=single_path -l hdiskX** command to restore virtual disk's reservation polices by using the reservation polices saved before the upgrade. Note the mappings between the reservation polices and the PVIDs before the upgrade.

```
bash-3.00# chdev -a reserve_policy=single_path -l hdisk2
hdisk2 changed
```

NOTE

Before changing a virtual disk's reservation policy to **single_path**, change the path selection algorithm to **fail_over** for the virtual disk.

----End

Verification

Run the **lslpp -l U*.*.rte** command to obtain the name of the installed UltraPath for AIX and check that the version is the target version.

Troubleshooting

If the installation fails, proceed as prompted.

- A **bosboot** error occurs, causing the installation to fail. The following information is displayed:

  ```
  0503-497 installp:  An error occurred during bosboot verification processing.
  ```

  For details about the solution, see section 2.7.1 Uninstallation or Installation Fails Because of a bosboot Error.

- Absence of the **bin** user causes the installation to fail. The following information is displayed:

  ```
  sysck: 3001-037 The name bin is not a known user for file /usr/lib/nls/msg/en_US.
  sysck: 3001-003 A value must be specified for owner for entry /usr/lib/nls/msg/en_US.
  sysck: 3001-017 Errors were detected validating the files
  ```

  For details about the solution, see section 2.7.2 Installation Fails Because of Absence of the bin User.

- The upgrade package is damaged. As a result, the installation fails. The following information is displayed:

  ```
  tar: A flag requires a parameter: f  Usage: tar -{c|r|t|u|x} [ -BdDEFhilmopRUsvw ]
  [ -Number ] [ -f TarFile ]          [ -b Blocks ] [ -S [ Feet ] | [ Feet@Density ]
  | [ Blocksb ] ]          [ -L InputList ] [ -X ExcludeFile ] [ -N Blocks ] [ -C Directory ]
  File ...  ERROR:NO corresponding UltraPath for AIX5.3 install package!  Or:  restore:
  0511-119 There is a missing header block.  restore: 0511-137 Trying to find the next
  header. Data may be lost.
  ```

  Set the transmission mode of the FTP tool in use to automatic, delete the damaged upgrade package, and upload an upgrade package again. If the problem persists after the transmission mode is set to automatic, use another FTP tool.

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2.5 Verifying the Upgrade

This section applies to an offline upgrade only.

2.5.1 Verification Check

Table 2-11 UltraPath for AIX verification checklist

No.	Task	Criteria	Expected Result
1	Check the version of UltraPath for AIX.	Whether the version is the target version	The version is the target version.
2	Check whether virtual disks and paths remain the same after the upgrade.	Whether virtual disks and paths remain the same after the upgrade	Virtual disks and paths remain the same after the upgrade.

2.5.2 Version Verification

Task Description

Check whether the version of the upgraded UltraPath for AIX is the target version.

Precautions

None.

Procedure

Step 1 Run the **upadm show version** command.

Step 2 Check that the version displayed in the command output is the target version.

----End

Verification

The returned UltraPath version is the desired one.

Troubleshooting

If version information is not returned, UltraPath for AIX may be installed unsuccessfully. In this case, run the **lslpp -l U*.*.rte** command to query the version.

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2.5.3 Checking Whether Virtual Disks and Paths Remain the Same After the Upgrade

Task Description

Check whether the virtual disk and the path configurations are the same as those before the upgrade, including the number of virtual disks and paths, the queue depth, the path selection algorithm, the reserve policy, and the path priority.

Precautions

Back up service information with the assistance of the customer's service engineers.

Procedure

Step 1 Run the **lspv** command and check whether the number of virtual disks is the same as that before the upgrade and whether VG names are correct.

NOTE

If the drive letter of a virtual disk is **hdisk**, run the **lsdev -Cc disk** command to distinguish between local disks and virtual disks.

Step 2 Run the **lspath** command and check whether the number of paths is the same as that before the upgrade.

Step 3 Run the **chown** and **chmod** commands to restore the disk permission.

Run the **ls -l** command to view the disk permission. If the permission displayed is different from that before the upgrade, run the **chown** and **chmod** commands to restore the disk permission to the status before the upgrade.

For example, run the **chown** command to modify the configuration of a disk user group:

```
bash-3.00# chown grid:asmadmin /dev/rhdisk2
```

For example, run the **chmod** command to modify the configuration of the disk permission:

```
bash-3.00# chmod 660 /dev/rhdisk2
```

Step 4 Run the **chdev** command to restore the disk queue depth.

Run the **lsattr -El** command to view the disk queue depth. If the disk queue depth is different from that before the upgrade, run the **chdev** command to restore the attributes of the disk queue depth to the status before the upgrade.

```
bash-3.00# chdev -l hdisk2 -a queue_depth=32
hdisk2 changed
```

Step 5 Run the **chpath** command to restore the disk path priority.

Run the following command to check the path priority of each disk (see step 4 in section 2.2.8 Backing Up Information About UltraPath for AIX Before the Upgrade). If the path priority displayed is different from that before the upgrade, run the **chpath** command to restore the disk path priority to the status before the upgrade.

```
bash-3.00# chpath -l hdisk2 -p fscsi0 -w 20180022a1073fdd,2000000000000 -a priority=2
path Changed
```


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NOTE

If you have deleted a disk before the upgrade by running the **rmdev -dl** command, the default value of the path priority is **1** when data is flushed to the disk and the upgrade is completed.

Step 6 Run the **set loadbalancemode** command (see the *OceanStor UltraPath for AIX V100R008C50 User Guide 01*) to restore the path selection algorithm of the disk.

Run the **lsattr -El** command to view the path selection algorithm. If the path selection algorithm displayed is different from that before the upgrade, run the **set loadbalancemode** command to restore the path selection algorithm to the status before the upgrade.

NOTE

For V100R008C20 and later versions, you can modify the path selection algorithm only by using the set **loadbalancemode** command provided by the UltraPath (see the *OceanStor UltraPath for AIX V100R008C50 User Guide 01*), but not the **chdev** command.

Step 7 Run the **chdev** command to restore the reserve policy of the disk.

Run the **lsattr -El** command to check the reserve policy. If the reserve policy is different from that before the upgrade, run the **chdev** command to restore it to the status before the upgrade.

----End

Verification

After the upgrade, check the backup items one by one to verify whether they are consistent with those before the upgrade.

Troubleshooting

- If there are fewer virtual disks after the upgrade than before the upgrade, run the **cfgmgr** command to scan for disks. After that, if some virtual disks are still missing, run the **upadm show lun** command, compare the command output with that saved before the upgrade to identity missed LUNs, and notify R&D engineers.
- In the event that drive letters are changed after the upgrade, perform the following operations:
  - If a volume manager is used to manage virtual disks, directly import VGs or DGs. The volume manager prevents the impact of drive letter change. For details about how to import VGs or DGs, see section 2.5.4 Restoring Services.
  - If no volume manager is used, delete virtual disks on the host side and change host LUN IDs of LUNs on the ISM to make the ascending order of host LUN IDs identical to the sequence of LUNs corresponding to the virtual disks before the upgrade. This ensures that the LUN sequence queried by running the **upadm show lun** command before the upgrade and that queried after the upgrade are the same. If host LUN IDs cannot be changed on a storage device, delete mappings on the storage device, add mappings again (when adding a mapping, you are allowed to select a LUN ID), and run the **cfgmgr** command to scan for disks.

2.5.4 Restoring Services

Task Description

After the upgrade is complete, restore services to the status before the upgrade. For example, activate VGs in the LVM, import DGs in the VxVM, and mount file systems.

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Precautions

- Perform operations with the assistance of the customer's service engineers.
- In an active/standby cluster environment, a standby host cannot activate VGs, import DGs, or mount file systems.

Procedure

Step 1 Activate VGs on virtual disks managed by the LVM.

1. If VGs are exported before the upgrade, run the **importvg -y VGName hdiskX** command to import VGs.

```
bash-3.00# importvg -y testvg hdisk2
testvg
```

2. Run the **lspv** command to query activated VGs on the current virtual disks. In the following example, **vg001** and **datavg** are not activated.

```
bash-3.00# lspv
hdisk0      0001fa696441ac6d          None
hdisk1      0001f090dc830ea9          rootvg      active
hdisk2      0001f0906c346eb8          vg001
hdisk3      0001f0908c629de6          vg001
hdisk4      00f6e0743a973991          datavg
hdisk5      0001f0908d097431          datavg
```

3. Run the **varyonvg VgName** command to activate the VGs that are in the **active** state before the upgrade.

```
bash-3.00# varyonvg vg001
```

NOTE

In the preceding example, **datavg** is not in the **active** state before the upgrade. Therefore, it does not need to be activated.

4. Run the **lspv** command and check that activated VGs on the virtual disks are the same as those before the upgrade.

```
bash-3.00# lspv
hdisk0      0001fa696441ac6d          None
hdisk1      0001f090dc830ea9          rootvg      active
hdisk2      0001f0906c346eb8          vg001       active
hdisk3      0001f0908c629de6          vg001       active
hdisk4      00f6e0743a973991          datavg
hdisk5      0001f0908d097431          datavg
```

Step 2 Import DGs on virtual disks managed by the VxVM.

1. Run the **vxdisk -e list** command to query virtual disks managed by the VxVM. In the following example, virtual disks in the **offline** state are not managed by the LVM.

```
bash-3.00# vxdisk -e list
DEVICE    TYPE    DISK    GROUP     STATUS   OS_NATIVE_NAME
Disk_0    auto    -       -         LVM      hdisk0
Disk_1    auto    -       -       offline    hdisk3
Disk_2    auto    -       -       offline    hdisk1
Disk_3    auto    -       -       offline    hdisk2
Disk_4    auto    -       -       offline    hdisk4
Disk_5    auto    -       -         LVM      hdisk5
```


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2. Run the **vxdisk online DeviceName** command to activate the virtual disks managed by the VxVM. Ensure that the activated virtual disks are the same as those before the upgrade.

```
bash-3.00# vxdisk online Disk_1
bash-3.00# vxdisk online Disk_2
bash-3.00# vxdisk online Disk_3
bash-3.00# vxdisk online Disk_4
```

3. Run the **vxdisk -o alldgs list** command to list the DGs that are not imported.

   In the following example, DGs in parentheses in the **GROUP** column are not imported, that is, **DG001**, **DG002**, and **DG003**.

```
bash-3.00# vxdisk -o alldgs list
DEVICE      TYPE          DISK        GROUP       STATUS
Disk_0      auto:LVM        -          -           LVM
Disk 1      auto:cdsdisk    -         (DG001)      online
Disk_2      auto:cdsdisk    -         (DG002)      online
Disk 3      auto:cdsdisk    -         (DG002)      online
Disk_4      auto:cdsdisk    -          -          online
Disk_5      auto:LVM        -          -           LVM
```

4. Run the **vxdg import DgName** command to import DGs. Ensure that the imported DGs are the same as those before the upgrade.

```
bash-3.00# vxdg import DG001
bash-3.00# vxdg import DG002
```

5. Run the **vxvol -g DgName startall** command to enable the logical volumes on the DGs.

```
bash-3.00# vxvol -g DG001 startall
bash-3.00# vxvol -g DG002 startall
```

Step 3 Run the **mount MountPoint** command to mount file systems saved before the upgrade.

```
bash-3.00# mount /home/vxfs001
```

----End

Verification

Services start correctly.

Troubleshooting

None.

2.6 Rolling Back to the Source Version

This section applies to an offline upgrade only.

The rollback procedure of the UltraPath is identical with the upgrade procedure.

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2.6.1 Uninstalling UltraPath for AIX of the Target Version

Task Description

If UltraPath for AIX of the target version fails to work properly, uninstall it and install UltraPath for AIX of the source version.

Procedure

Step 1 Run the **lslpp -l U*.*.rte** command to query the name of the existing UltraPath for AIX.

The following is an example:

```
-bash-3.00# lslpp -l U*.*.rte
  Fileset                  Level  State     Description
  ----------------------------------------------------------------------------
Path: /usr/lib/objrepos
  UltraPath.AIX.ppc_64.rte   8.1.2101.3  COMMITTED  UltraPath for AIX
```

Step 2 Run the **installp -u UltraPath.AIX.ppc_64.rte** command to uninstall UltraPath for AIX.

After UltraPath for AIX is successfully uninstalled, the following information is displayed:

```
+-----------------------------------------------------------------------------+
                        Summaries:
+-----------------------------------------------------------------------------+

Installation Summary
--------------------
Name                    Level    Part    Event     Result
-------------------------------------------------------------------------------
UltraPath.AIX.ppc_64.rte  8.1.2101.3    USR    DEINSTALL   SUCCESS
```

----End

Verification

Run the **lslpp -l U*.*.rte** command and confirm that UltraPath for AIX does not exist.

Troubleshooting

If the uninstallation fails, proceed as prompted.

A **bosboo**t error occurs, causing the installation to fail. The following information is displayed:

```
0503-497 installp:  An error occurred during bosboot verification processing.
```

For details about the solution, see section 2.7.1 Uninstallation or Installation Fails Because of a bosboot Error.

2.6.2 Installing UltraPath for AIX of the Source Version

Task Description

Install UltraPath for AIX of the source version.

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Procedure

According to the *UltraPath for AIX User Guide* of the source version, use the rollback package mentioned in section 2.2.5 Obtaining the Rollback Package to install UltraPath for AIX of the source version.

Verification

UltraPath for AIX of the source version is installed successfully.

Troubleshooting

If the rollback fails, immediately ask the R&D contact to assist in problem analysis and handling.

2.7 Troubleshooting

This section applies to an offline upgrade only.

2.7.1 Uninstallation or Installation Fails Because of a bosboot Error

2.7.1.1 Possible Cause

Possible causes are as follows:

- **/unix** and **/usr/lib/boot/unix** point to different kernel files.
- The **bosboot** command has bugs.

2.7.1.2 Solution

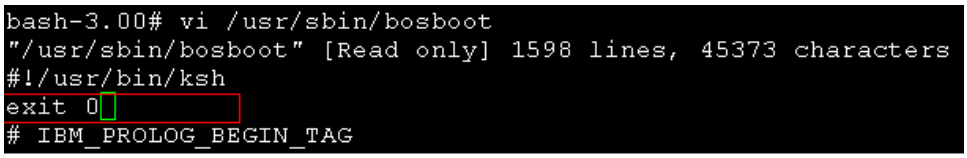
The following solution is applicable to both of the preceding cases.

Step 1 Back up the **bosboot** file.

```
cp /usr/sbin/bosboot /usr/sbin/bosboot.bak
```

Step 2 Skip the bosboot verification.

Add **exit 0** to the second line in the **bosboot** file, as shown in the following figure:



Step 3 Uninstall or install UltraPath for AIX. For details, see the *UltraPath for AIX User Guide*.

Step 4 Restore the **bosboot** file.

```
cp /usr/sbin/bosboot.bak /usr/sbin/bosboot
```

Step 5 Save the device configuration data.

```
bosboot -a
```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NOTE

The **bosboot –a** command is executed to ensure restoration of the **bosboot** file. However, errors may occur because the links to the kernel file are incorrect. You can ignore the errors.

----End

2.7.2 Installation Fails Because of Absence of the bin User

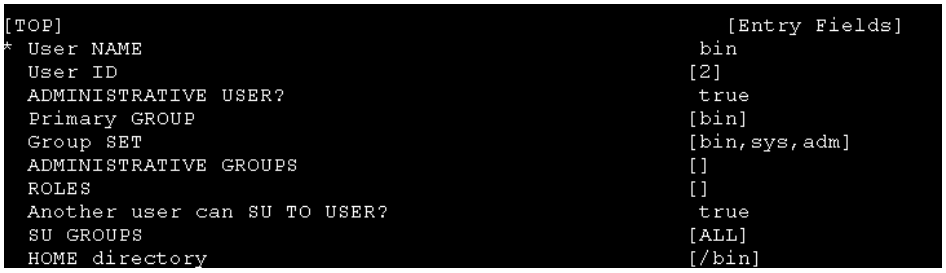
2.7.2.1 Possible Cause

A file needs to be written to the **/usr/lib/nls/msg/en_US** directory during the installation of UltraPath for AIX, and this operation can be performed only by the **bin** user. After the **lsuser bin** command is executed on the host, however, **3004-687 User "bin" does not exist** is displayed.

2.7.2.2 Solution

Step 1 Check the **/etc/passwd** file. If **#bin:*:8:2::/bin:/usr/bin/ksh** is displayed, the **bin** user is shielded. In this case, delete **#**.

Step 2 If the **bin** user does not exist, create a **bin** user, Run the **smit user** command, select **Add a User**, and create a **bin** user as shown in the following figure.Then reinstall UltraPath for AIX.



----End

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3 UltraPath for Windows Upgrade Guide

This section introduces how UltraPath for Windows is upgraded. Different versions vary in upgrade modes. For details, see the corresponding chapters.

3.1 UltraPath for Windows V100R003 Upgrade Guide

3.2 UltraPath for Windows V100R005 and Following Versions Upgrade Guide

3.3 Appendix

3.1 UltraPath for Windows V100R003 Upgrade Guide

3.1.1 Upgrade Process Overview

1.Upgrade flowchart of UltraPath for Windows

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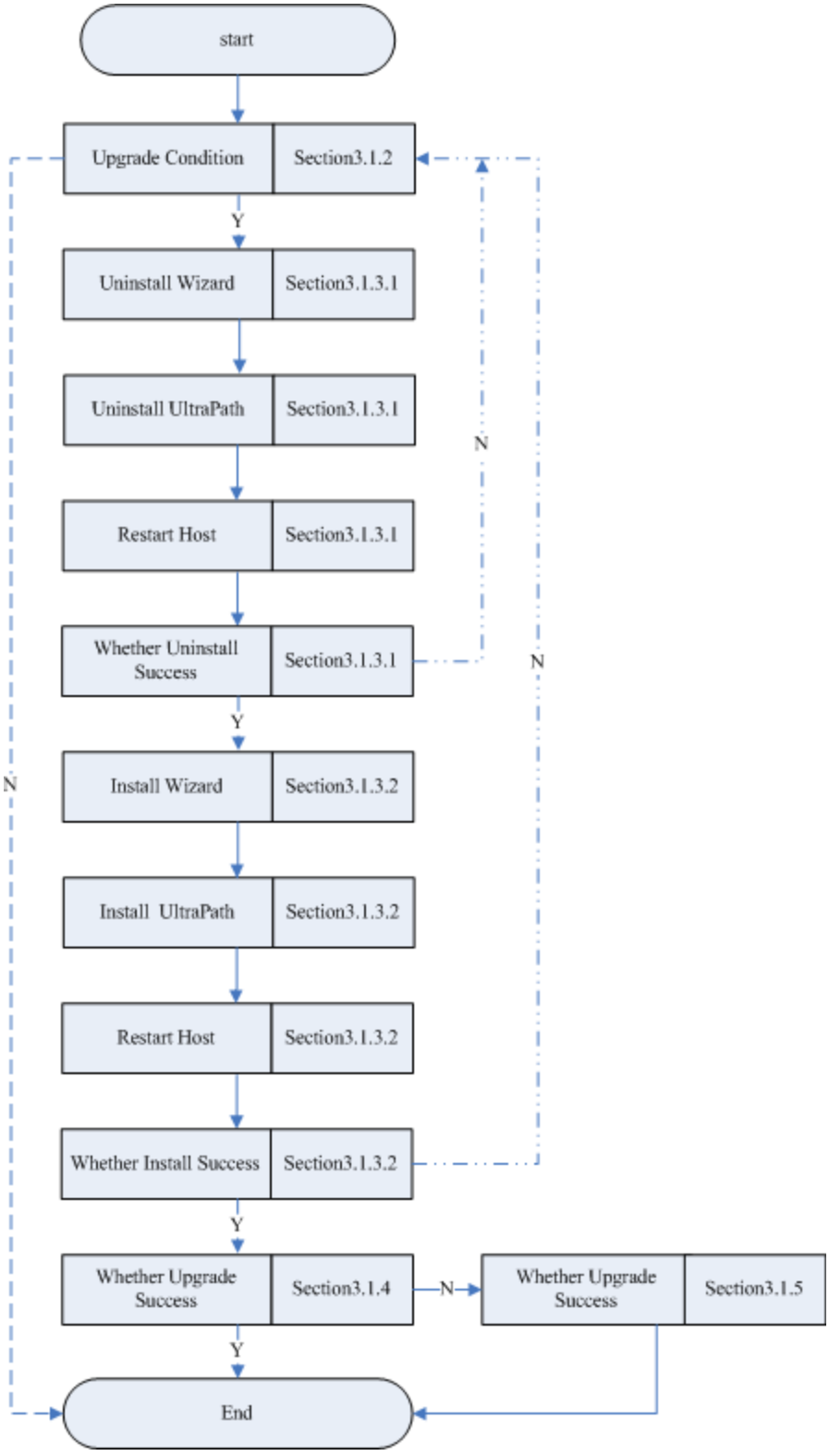
Figure 3-1 Upgrade flowchart of UltraPath for Windows



2.Procedure and required time for upgrading UltraPath for Windows

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Table 3-1 Procedure and required time for upgrading UltraPath for Windows

No.	Upgrade Procedure		Required Time	Impact	Remarks
1	Check whether the upgrade conditions are met.	System services	About 2 minutes	None	Mandatory
		Environment variables	About 1 minute	None	Mandatory
		Running programs	About 1 minute	None	Mandatory
		User account		None	Mandatory
		Installation files		None	Mandatory
		Rollback versions		None	Mandatory
2	Uninstall UltraPath software.		About 3minutes	None	Mandatory
3	Install UltraPath software.		About 3 minutes	None	Mandatory
4	Verify the upgrade.		About 1 minute	None	Mandatory

The upgrade takes about 11 minutes.

3.1.2 Preparing for the Upgrade

3.1.2.1 Prerequisites

- The operator has the Windows operation experience.
- The operator has the administrator account and password of Windows.
- The hardware that runs the server program meets the basic requirements on UltraPath software (128 MB memory and 600 MB available disk space).

3.1.2.2 Obtaining the Installation Package of the UltraPath Software

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

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NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

3.1.2.3 Obtaining the Installation Documents of the UltraPath Software

Table 3-2 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE

You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

3.1.2.4 Preparing the Installation Package for Version Rollback

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

3.1.2.5 System Administrator

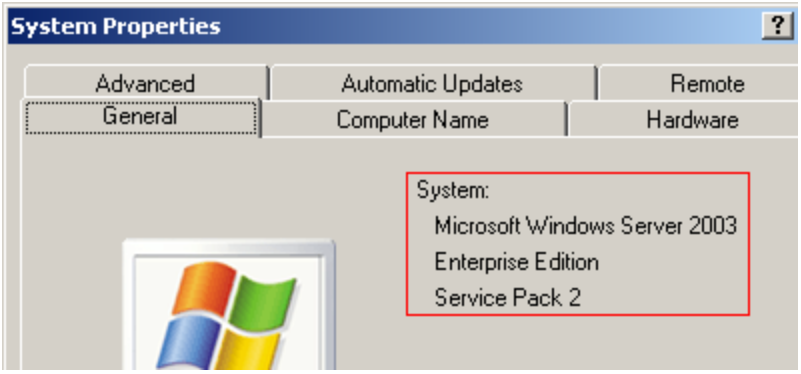
The system administrator must have **administrative** permissions.

3.1.2.6 Checking Windows Service Pack

For Windows Server 2003, Service Pack 2 has been installed.

Right-click **My computer** and choose **Properties** to check whether the system is 2003 SP2.

Figure 3-2 Windows 2003 Service Pack



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You are not required to check Service Pack for other system versions.

3.1.2.7 Checking Environment Variables

Variable name: Path

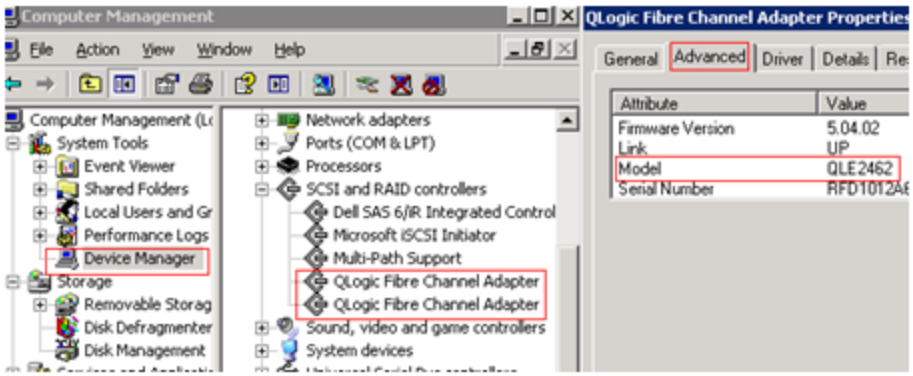
The variable must contain the following: %SystemRoot%\system32 or C:\windows\system32.

3.1.2.8 Checking HBA Models (Only Applicableto FC SAN)

For a Fibre Channel environment, make sure that the HBAs installed on one server are with the same model and are from the same manufacturer.

Choose **Device Manager > SCSI and RAID controllers**, and double-click the corresponding HBA to check its model information:

Figure 3-3 HBA Model



3.1.2.9 Disable HBA's Failover Feature (Only Applicable to FC SAN)

For a Fibre Channel environment, make sure that the functions of failover and failback on HBA are disabled.

Use the management software provided by HBA manufacturer to check the status of the two functions. For example, use SANsurfer to check the QLogic that supports failover function (QLogic downloading link: http://driverdownloads.qlogic.com/QLogicDriverDownloads_UI/DefaultNewSearch.aspx, download the corresponding software based on your operating system), and choose **Fibre Channel Configuration > File** to check the function status. (If the HBA does not support the failover function, the **Enable Failover Configuration** option does not exist.)

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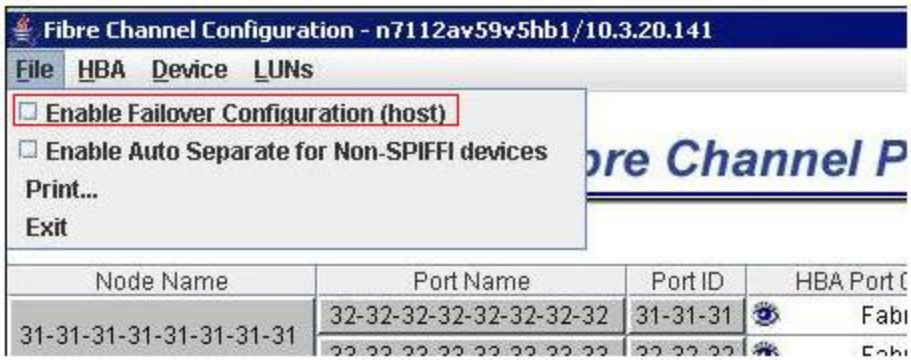
Figure 3-4 Disabling the HBA failover feature

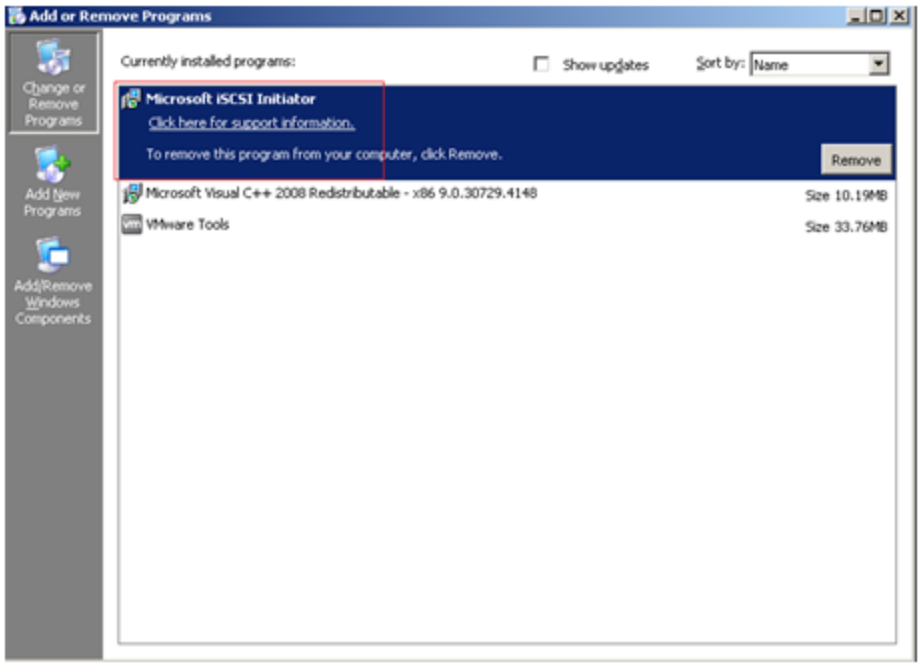


3.1.2.10 Checking iSCSI Initiator (Only Applicable to iSCSI SAN)

For an iSCSI environment and in Windows Server 2003, make sure that the iSCSI initiator is installed. For Windows Server 2008 or later versions, the system is equipped with an iSCSI initiator by default. This check is not necessary.

Choose **Uninstall or Remove Programs** in **Control Panel**.

Figure 3-5 Checking iSCSI Initiator



3.1.2.11 Checking iSCSI Initiator Version (Only Applicable to iSCSI SAN)

For an iSCSI environment, make sure that the version of the iSCSI initiator is 2.08 or later. (Downloading link: http://www.microsoft.com/en-us/download/details.aspx?id=18986, choose the corresponding version based on your operating system.)

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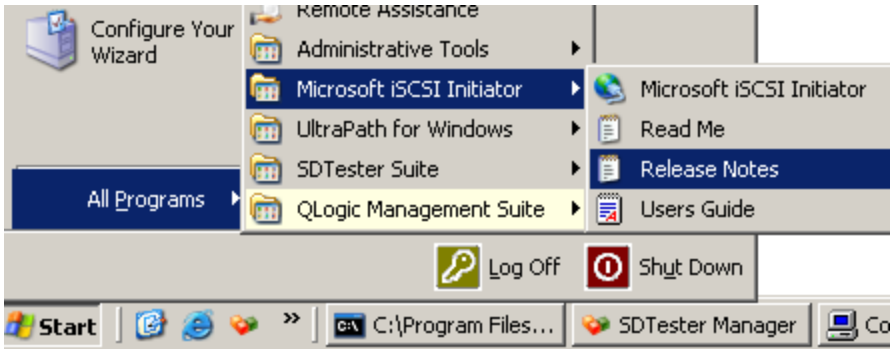
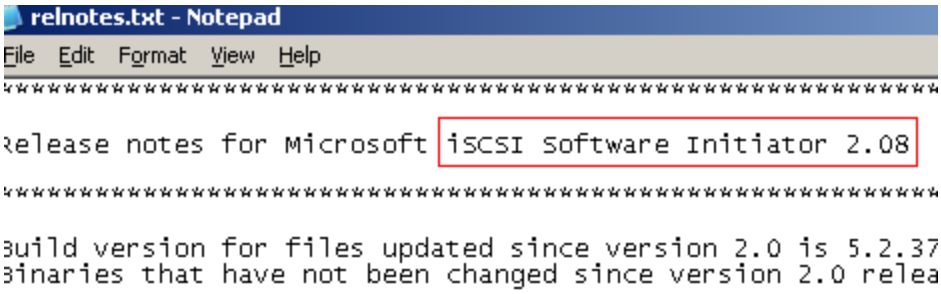
Choose **Start > All Programs > Microsoft iSCSI Initiator > Release Notes**, as shown in the following Figure 3-6.

Figure 3-6 Obtaining the information about the version of the iSCSI initiator



In the text that is displayed, you can check the iSCSI version information, as shown in the following Figure 3-7.

Figure 3-7 Checking iSCSI Initiator Version



If the iSCSI initiator version is not 2.08, the iSCSI initiator must be uninstalled and version 2.08 should be installed. During the installation process, do not select **Microsoft MPIO MultiPathing Support for iSCSI**, as shown in the following Figure 3-8.

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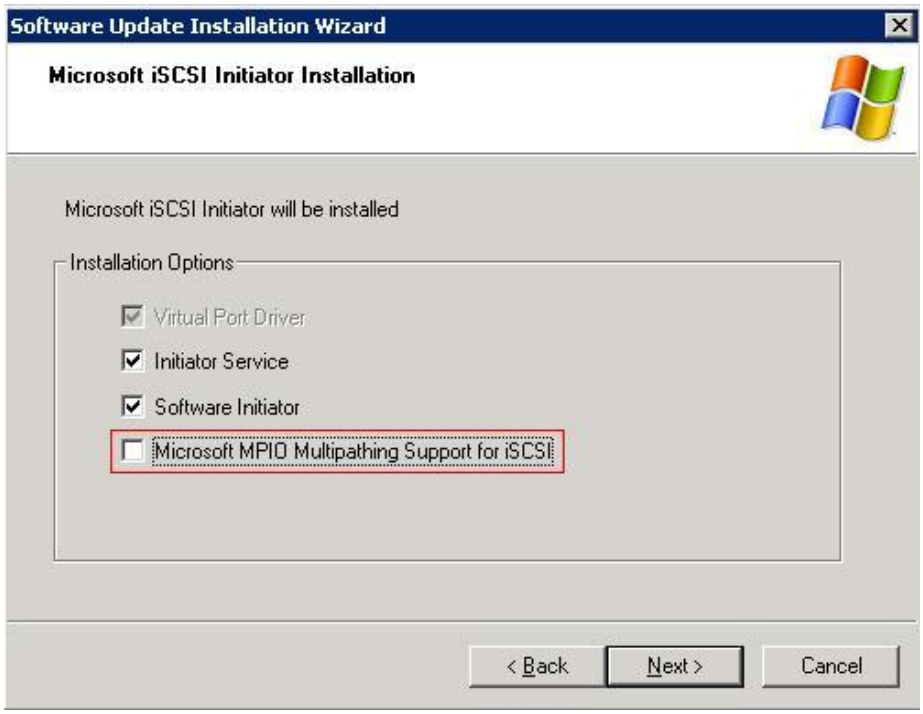
Figure 3-8 Reinstalling New iSCSI Initiator



For Windows Server 2008 (R2) or later versions, the preceding operation is not necessary.

3.1.2.12 Check the iSCSI-resident multipathing software (Only Applicable to iSCSI SAN).

In Windows Server 2003:

Go to **Computer Management**, and click **Device Manager** in the navigation tree. If **iSCSI Multi-Path Device Specific Module** can be found in the system device list on the right, the iSCSI-resident multipathing software has been installed and been enabled, as shown in the following Figure 3-9.

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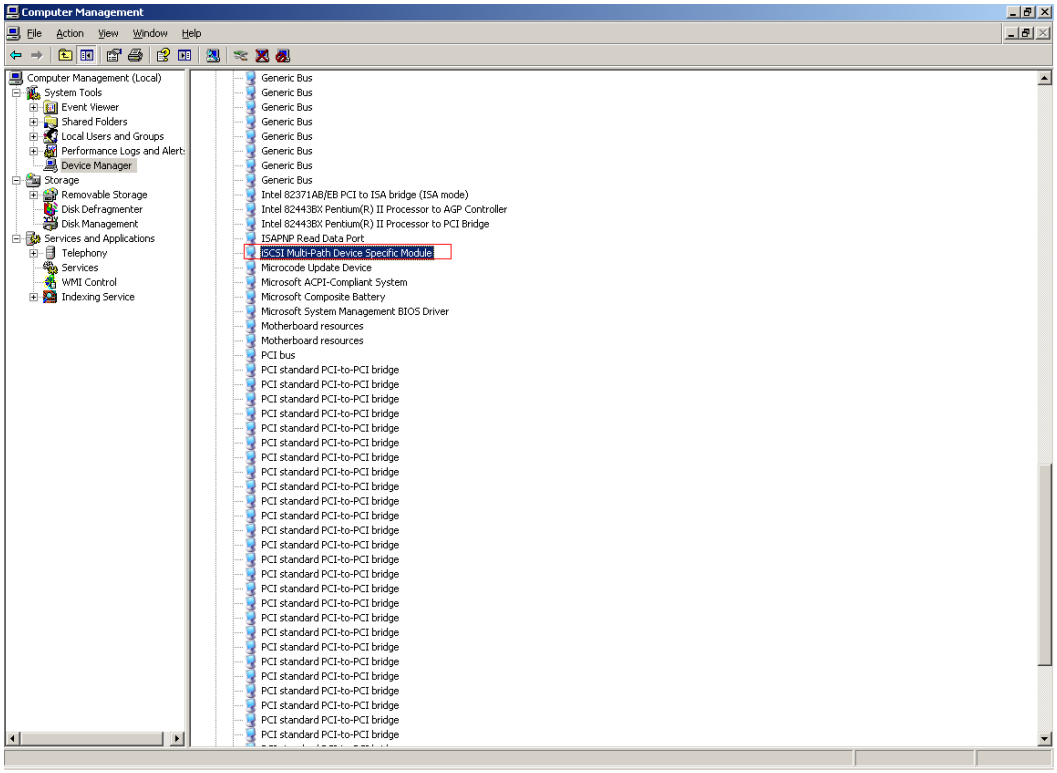
Figure 3-9 Checking iSCSI-resident multipathing software



In this case, choose **Start > Control Panel > Change** or **Remove Programs** to uninstall the iSCSI initiator (make sure the corresponding installation package is available in the local computer, or download the installation package from http://www.microsoft.com/en-us/download/details.aspx?id=18986). Then reinstall the iSCSI Initiator.

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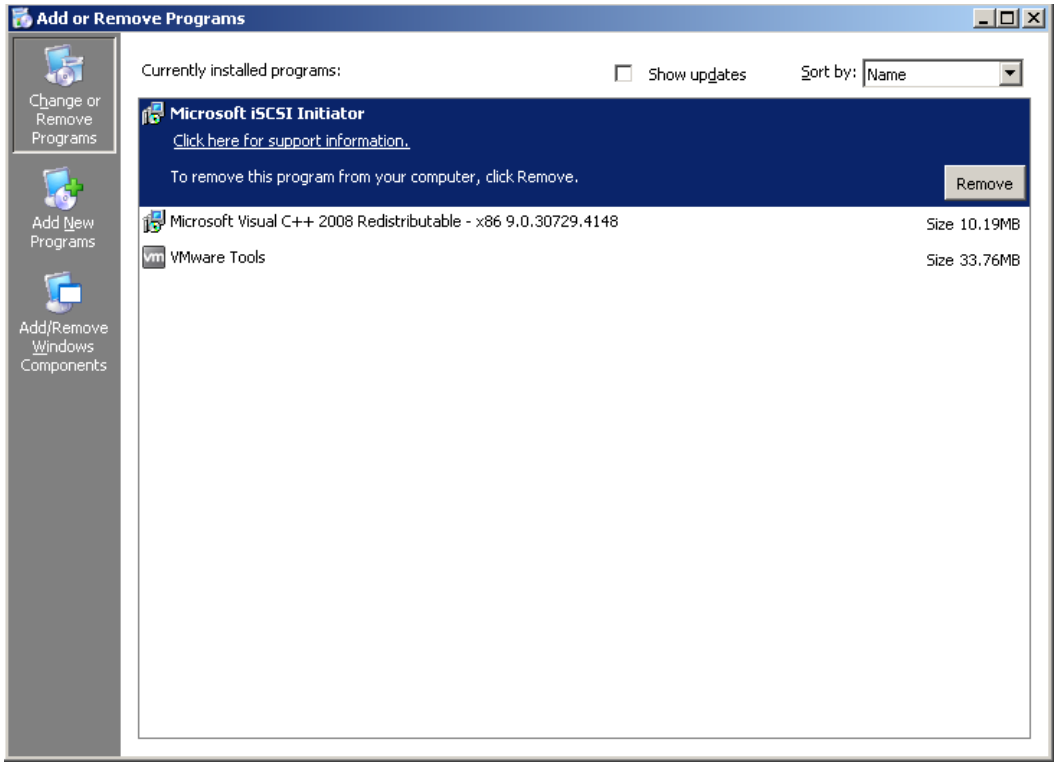
Figure 3-10 Uninstall the iSCSI Initiator



For Windows Server 2008 (R2) or later versions, skip this operation.

3.1.2.13 Stop Applications

Ask the customer engineer to stop all applications (such as database) on the server.

3.1.2.14 Transferring Cluster Resources (Only Applicable to SCSI-2 Cluster)

The Microsoft Clustering Service delivered with Windows Server 2003 is SCSI-2 cluster and that delivered with Windows Server 2008 or later is SCSi-3 cluster. In addition, there are other clusters. For details about cluster types, refer to their respective documents.

In an SCSI-2 cluster environment, before uninstalling UltraPath, transfer the disk resources on the node that you want to upgrade to the peer node in either of the following two fashions:

1. Obtain the customer's approval. Restart the local node (all disk resources on this node will be transferred to the peer node), and upgrade UltraPath on the local node. After that, restart the peer node (all disks resources will be transferred back to the local node), and then upgrade UltraPath on the remote node.
2. Ask the customer's engineers to transfer all the disk resources on the local node to the peer node in the cluster using cluster management software, and then upgrade UltraPath on the local end. Before uninstalling UltraPath on the peer node, transfer all the disk resources on the peer node to the local end. When transferring resources using cluster management software, you are advised to stop the cluster service on the local end first, wait the disk resources to be transferred to the remote peer node, start the cluster service on the local end again, and then upgrade UltraPath. This can ensure that all disk resources including quorum disks can be transferred to the peer node.

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NOTE

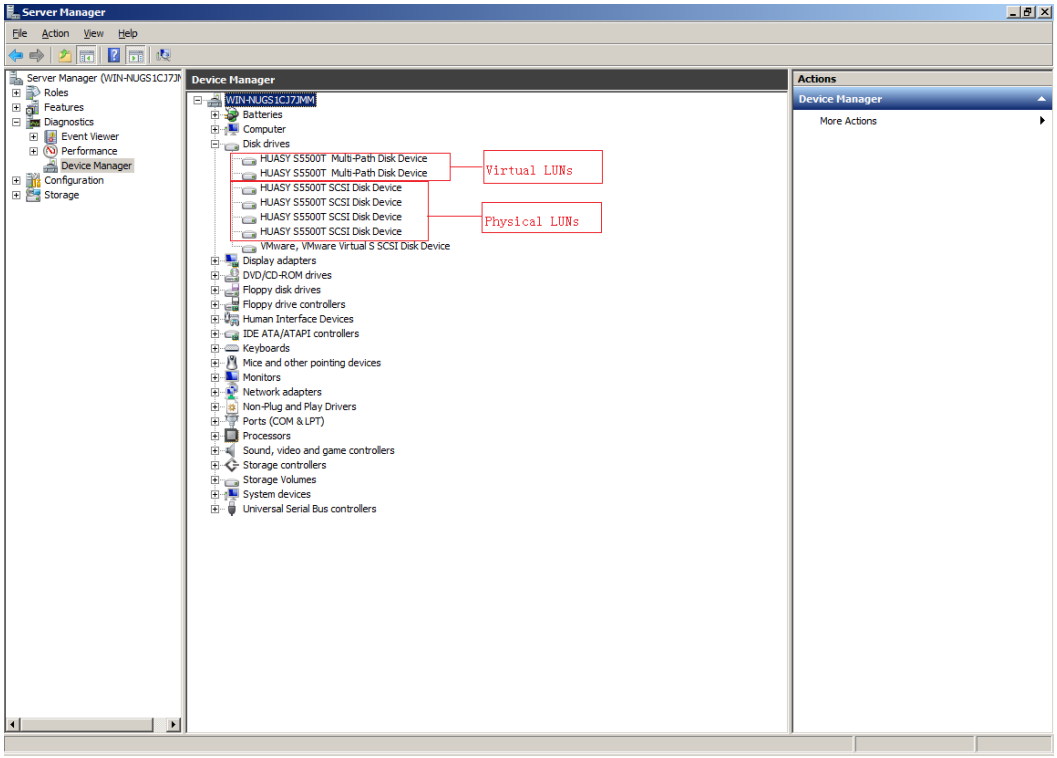
In an SCSI-2 cluster environment, if you uninstall UltraPath without transferring cluster resources first, after uninstalling UltraPath, you need to run the **clear persistent reserve** command on the storage device so that the cluster service can work normally.

3.1.2.15 Recording LUN Information

1. Record the quantity of LUNs in the disk drive**.**

   Click the **Server Manager** icon on the taskbar, and click **Device Manager** in the navigation tree. In the **View** menu, click **Show hidden devices**, and record the quantity of virtual disks and physical disks in **Disk Drives**. (Disks with the word **Multi-Path** in their names are virtual disks.).

Figure 3-11 LUNs in Device Manager



2. **Record the quantity of LUNs in the UltraPath.**

   Double-click the

   icon on the desktop to start UPManager, and the following dialog box is displayed. Record the quantity of virtual disks and the quantity of their corresponding paths on the **MPIOList** tab page.

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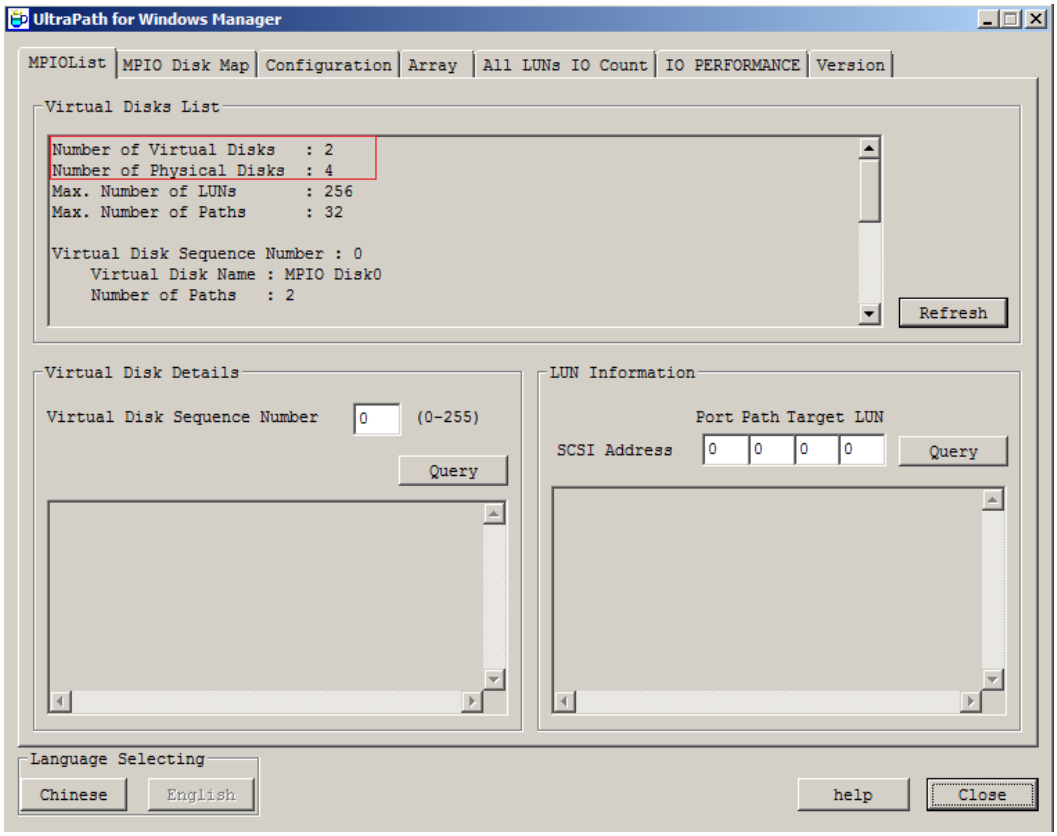
Figure 3-12 LUNs in UltraPath Console



3.1.2.16 Closing Running Programs

Close all related programs before uninstall the UltraPath.

3.1.2.17 Recording CHAP Information (Only Applicable to iSCSI SAN)

In Windows Server 2003, start the ISCSI initiator, go to the **ISCSI Initiator Property** window, select a target connection, click the **LogOn** button, go to the **Log On to Target** window, and click the **Advanced** button. The following window is displayed. If **CHAP logon information** is selected, record the CHAP user name.

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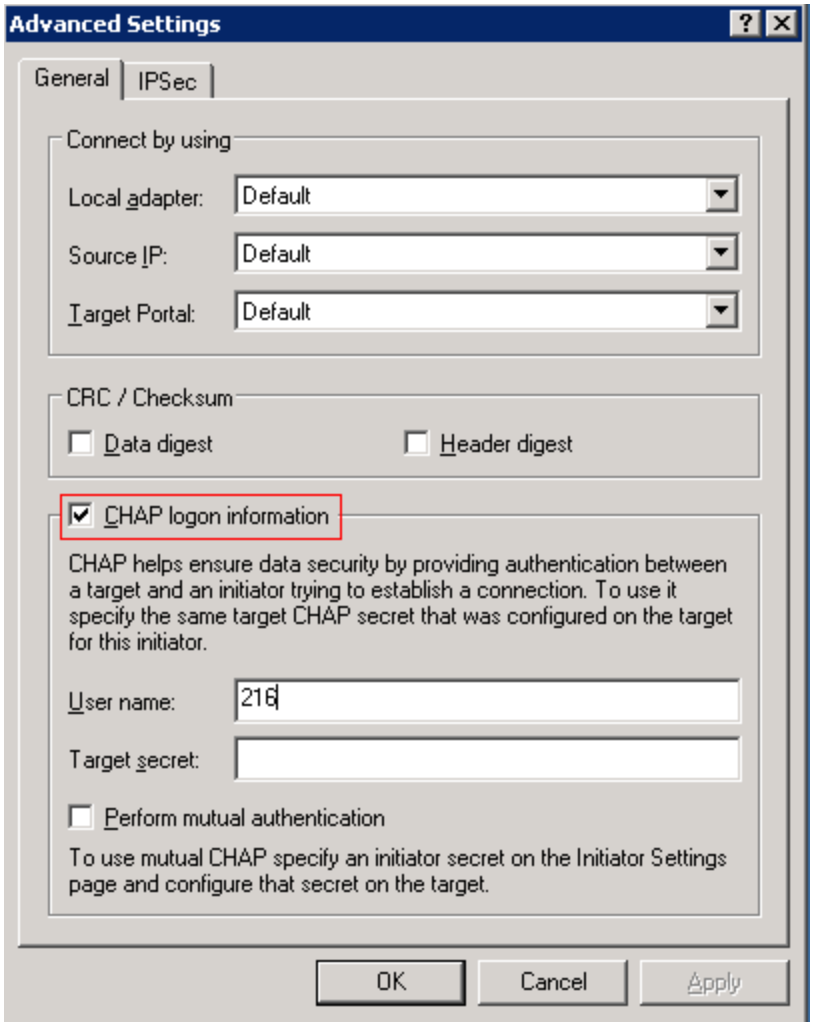
Figure 3-13 CHAP information on Windows Server 2003



Operate in Windows Server 2008 R2 or later versions. Start the iSCSI initiator, go to the **iSCSI Initiator Property** window, select a target connection, click the **Connect** button, go to the **Connect to Target** window, and click the **Advanced** button. The following window is displayed. If **Enable CHAP log on** is selected, record the CHAP user name.

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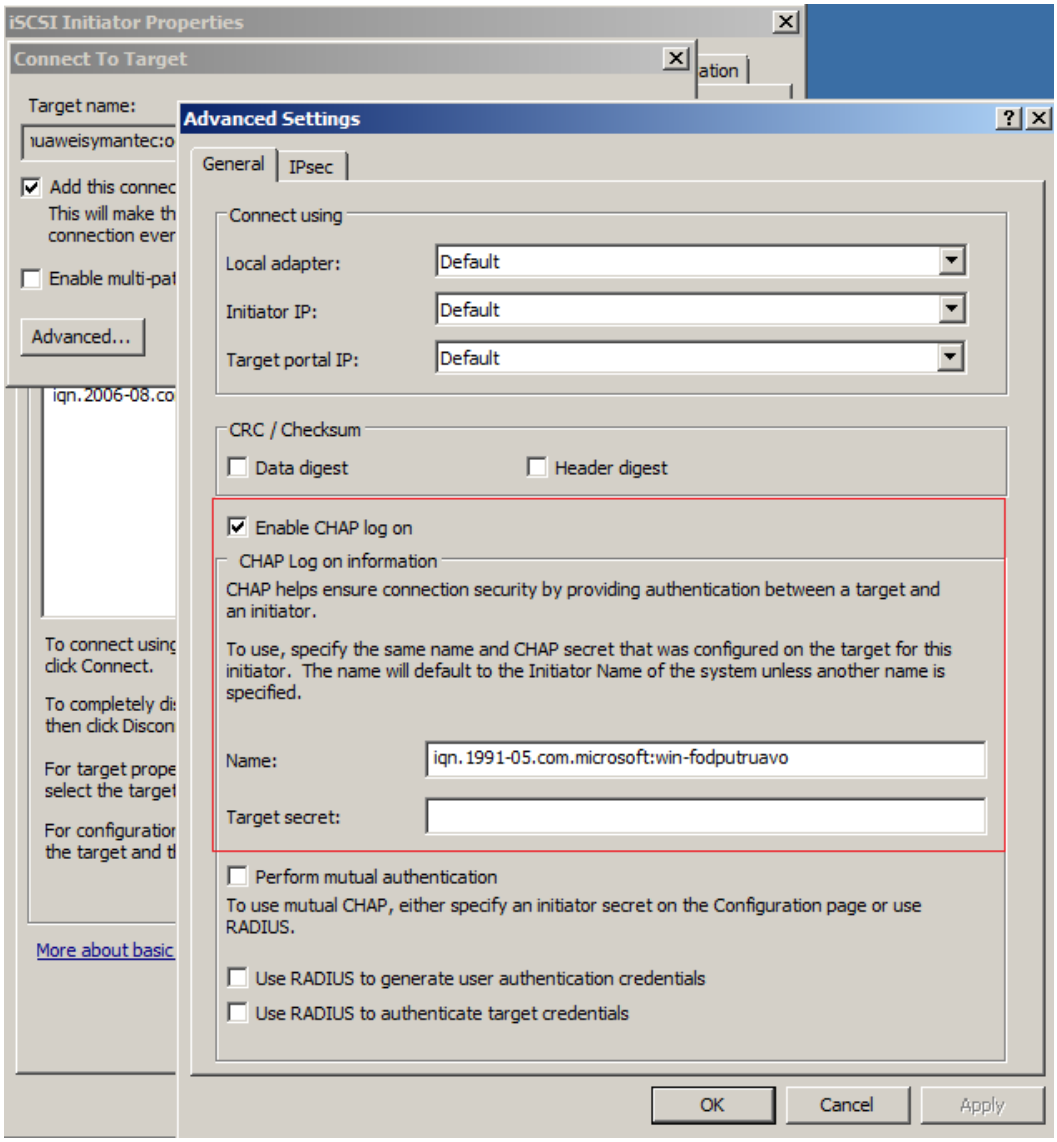
Figure 3-14 CHAP information on Windows Server 2008 R2 or later



3.1.2.18 Deleting and Record iSCSI Configurations (Only Applicable to iSCSI SAN)

Start the iSCSI initiator and go to the configuration GUI.

1. On the **Persistent Targets** tab page, select the target that you want delete and click **Remove**.

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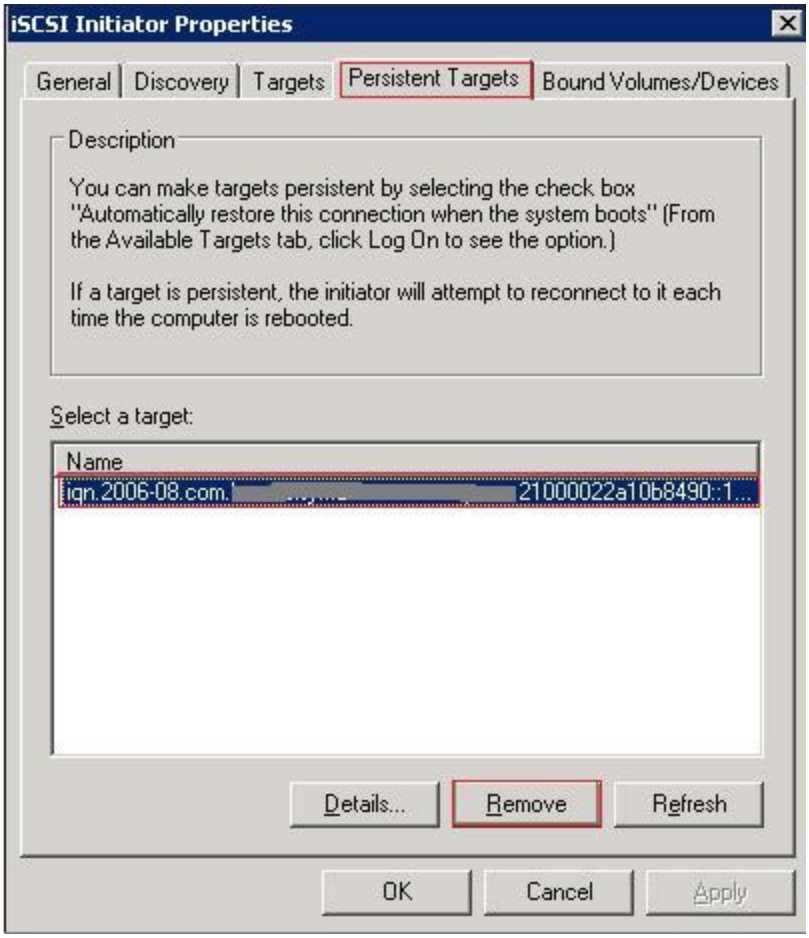
Figure 3-15 Removing Persistent Targets



2. On the **Discovery** tab page, select **Target Portals**.

NOTE

- Record all IP addresses and port information in **Target Portals**, which will be used in restoring IP address and port information after the upgrade is complete**.**
- Click **Remove** to remove all connections.

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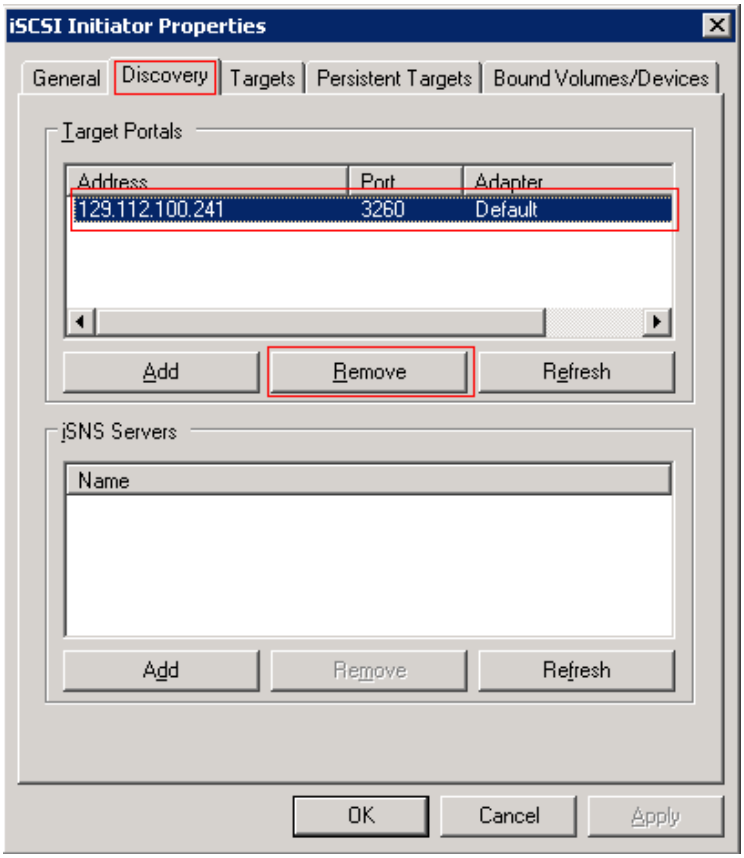
Figure 3-16 Removing Target Portals



3. Click the **Targets** tab, select the target portal that you want to view and click **Detail**. In the dialog box that is displayed, select all sessions and click **Log off**.

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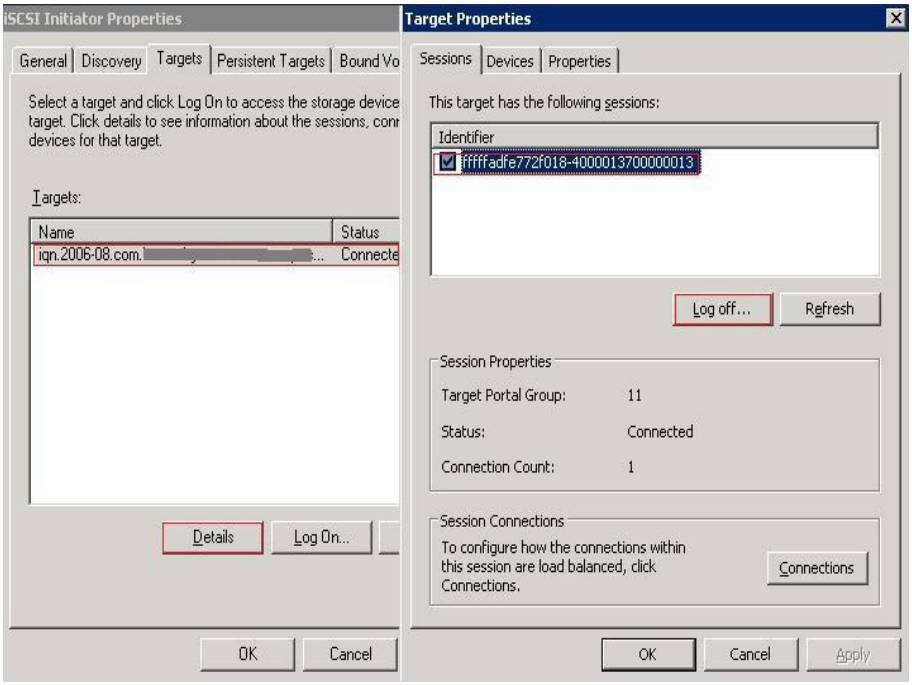
Figure 3-17 Logging off Target



NOTE

- In Windows Server 2003, the initiator may fail to be disconnected. In this case, you need to manually stop the iSCSI initiator service. Choose **Start** > **Management Tool** > **Services**, and go to the **Services** Page. Find **Microsoft iSCSI Initiator Service**, right-click it and choose **Stop**, as shown in the following figure. Disconnection is not necessary after the initiator service is stopped. Note that after the system is rebooted, check whether iSCSI initiator service automatically starts. If not, right-click it and choose **Start.**

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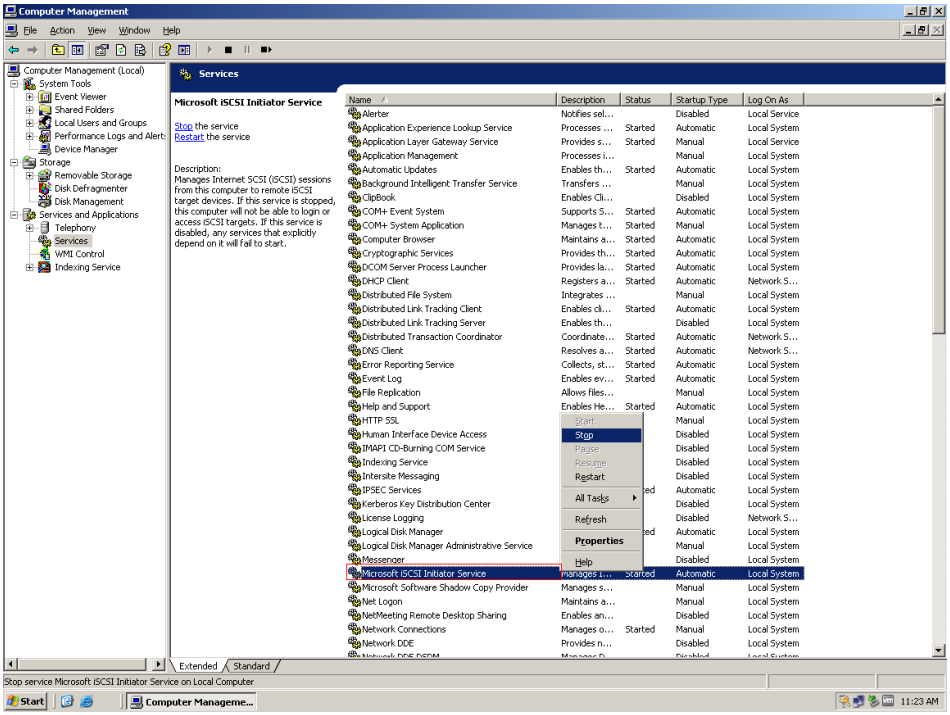
Figure 3-18 Stopping iSCSI Initiator Service



3.1.3 Upgrade Scheme

3.1.3.1 Uninstalling the UltraPath Software

Description

To upgrade UltraPath software, you must first uninstall the earlier version to make the new version take effect.

Precautions

Check all items specified in section 3.1.2 Preparing for the Upgrade. In an SCSI-2 cluster environment, you must transfer cluster resources before uninstalling UltraPath. Do not open related programs during the uninstallation, and restart the host after the uninstallation is complete.

Prerequisites

Make sure that UltraPath software is installed on the host. If UltraPath software is not installed on the host, go to section 3.1.3.2 Installing the UltraPath Software.

Procedure

Step 1 Uninstall UltraPath software of the earlier version. Click **Add or Remove Programs** on the control panel. Click UltraPath software to be removed, and click **Remove,** as shown in the following Figure 3-19.

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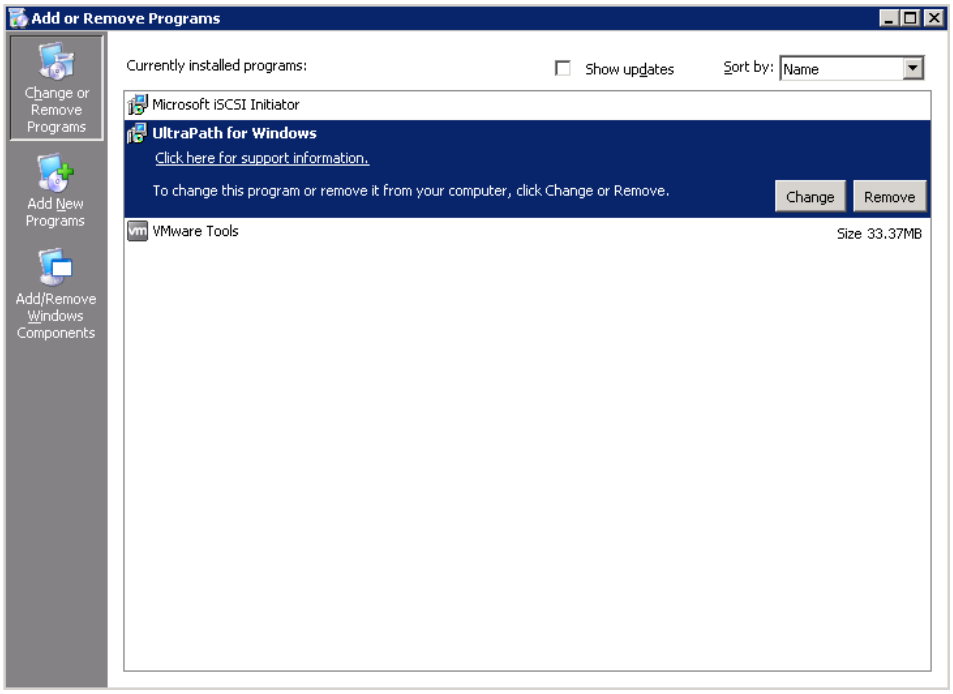
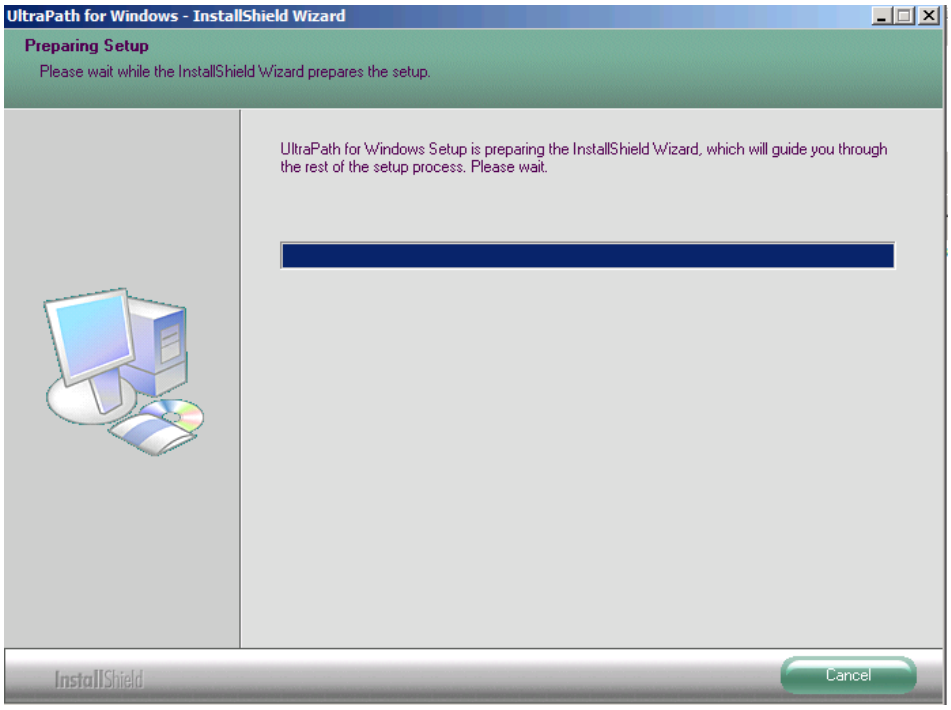
Figure 3-19 Uninstalling the UltraPath on the control panel



Step 2 As the uninstalling process begins, execute the InstallShield Wizard first, as shown in the following Figure 3-20.

Figure 3-20 Wizard for uninstalling UltraPath for Windows



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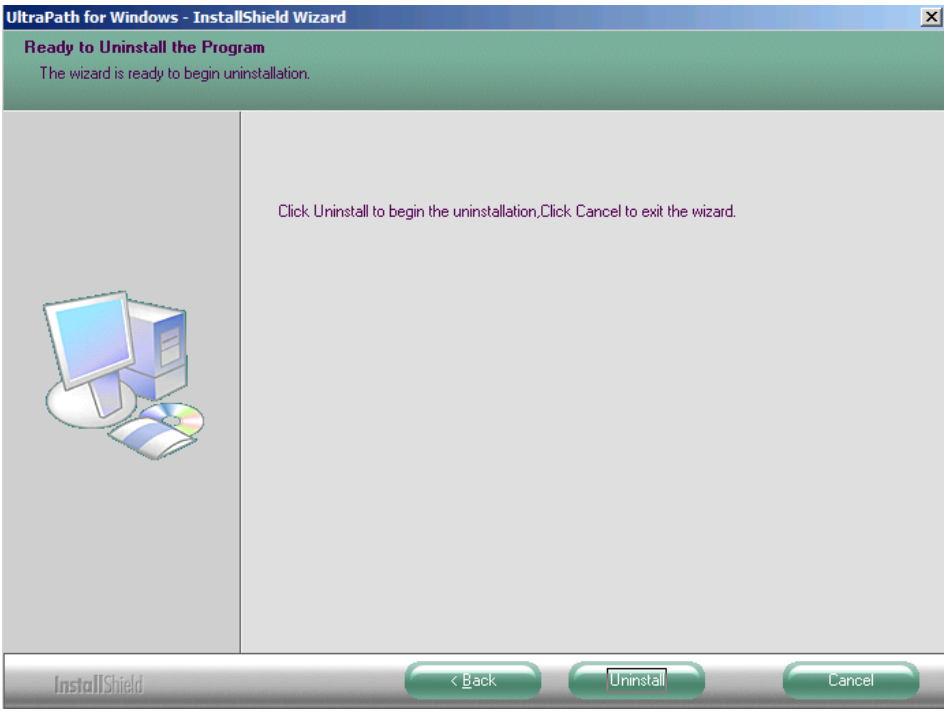
Step 3 **Ready to Uninstall the Program** page is displayed. Click **Uninstall**, as shown in the following Figure 3-21.

Figure 3-21 Prompt for uninstalling



Step 4 **Uninstalling drivers and files** begins. The uninstalling progress is displayed, as shown in the following Figure 3-22.

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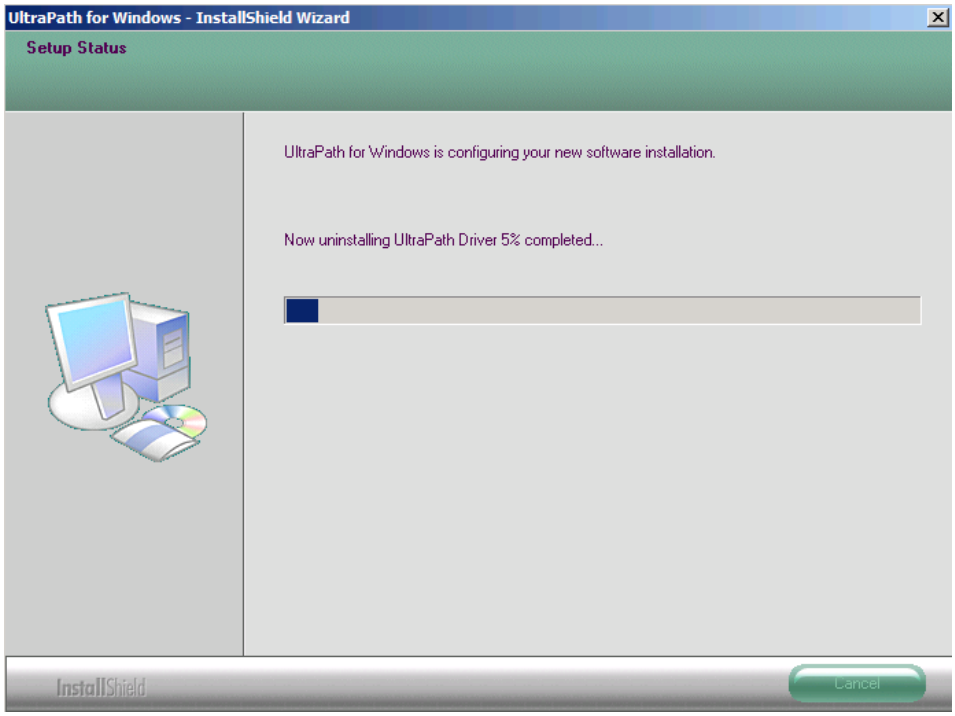
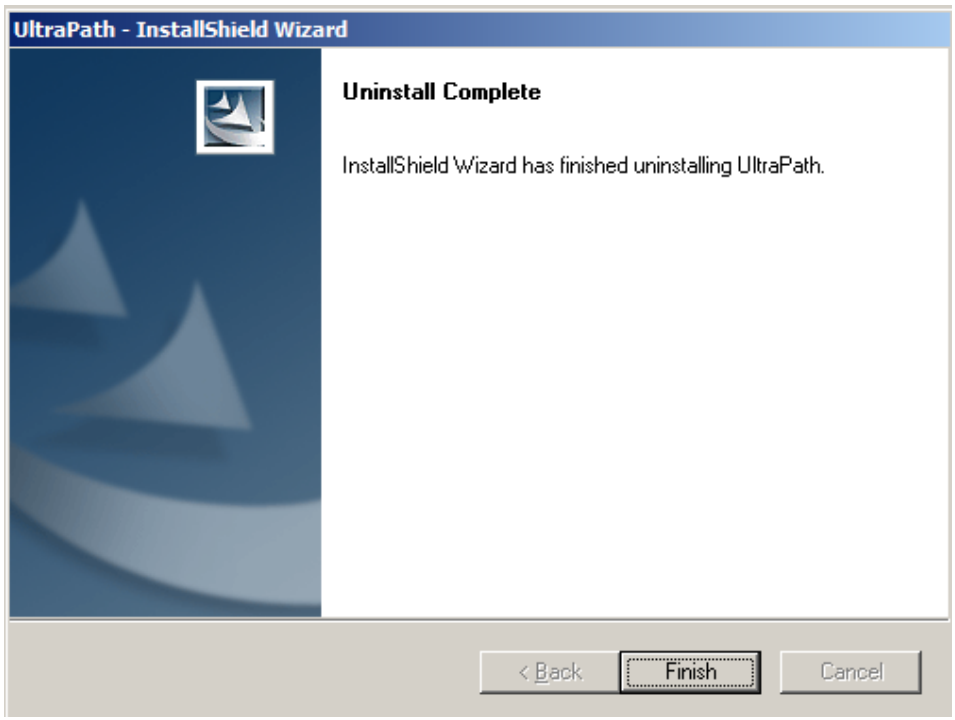
Figure 3-22 Progress of uninstalling UltraPath for Windows





Step 5 A message is displayed indicating you need to restart host. Choose **Yes, I want to restart my computer now** and click **Finish**, as shown in the following Figure 3-23.

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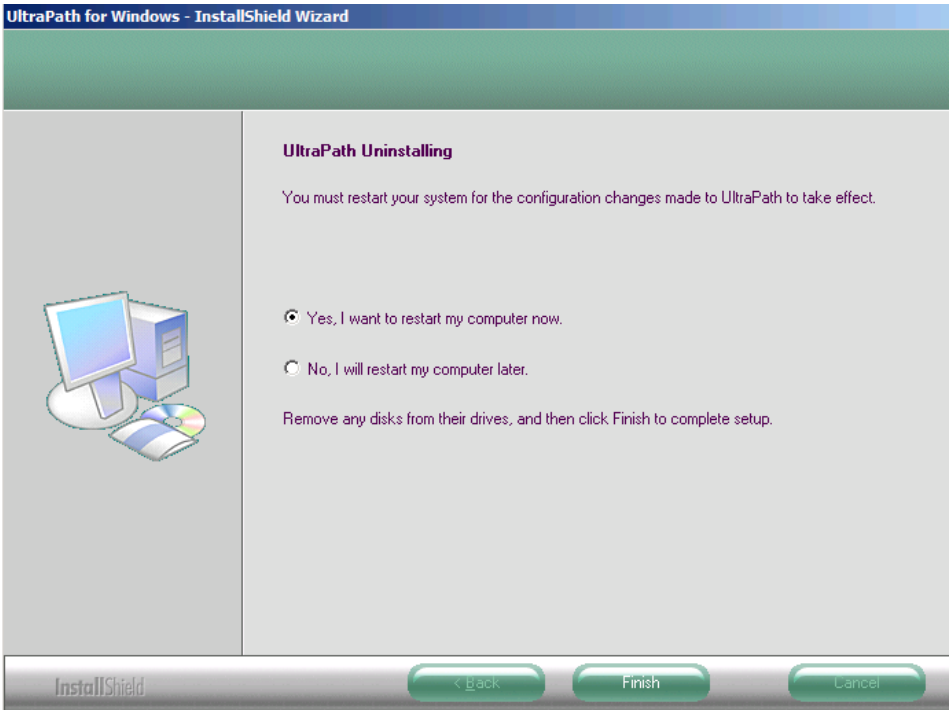
Figure 3-23 Prompt for restarting



Step 6 If multiple users have logged in to the host, the host does not restart after you click the **Restart** button. In this case, you must manually restart the host. You can check whether multiple users have logged in to the host in the Windows task manager.

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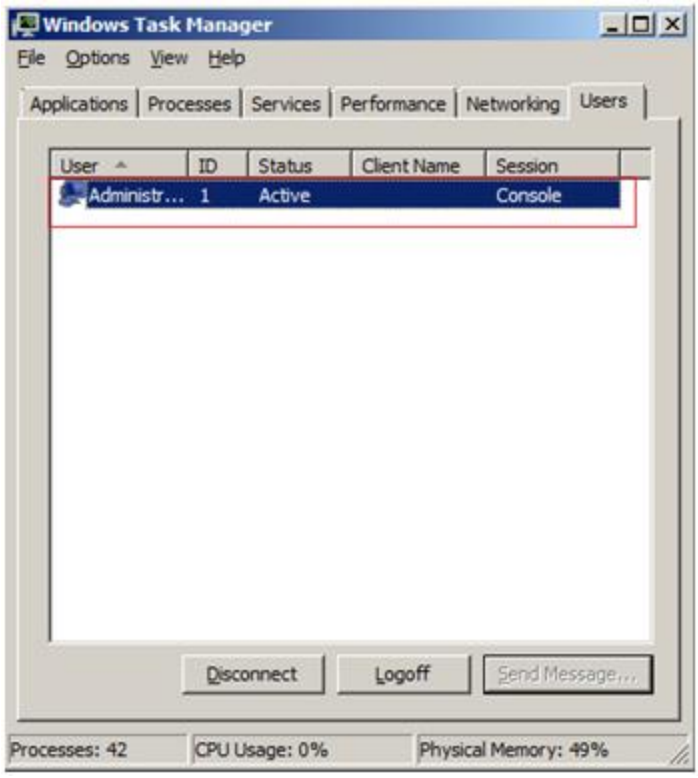
Figure 3-24 Viewing multiple users



----End

Verification

After the host restarts, the shortcut of UltraPath is not displayed on the desktop and **UltraPath** disappeared from **Add or Remove Programs** in the control panel.

Troubleshooting

In case that the system fails to start after the host restarts, restart the system again manually and press **F8** repeatedly during the restart process to enter the system startup options list. Select **Last Known Good Configuration** from the list to access the system.

3.1.3.2 Installing the UltraPath Software

Task Description

Install the new version of UltraPath software.

Precautions

Check all items specified in section 3.1.2 Preparing for the Upgrade. Do not perform other operations during the installation. Restart the host after the installation is complete.

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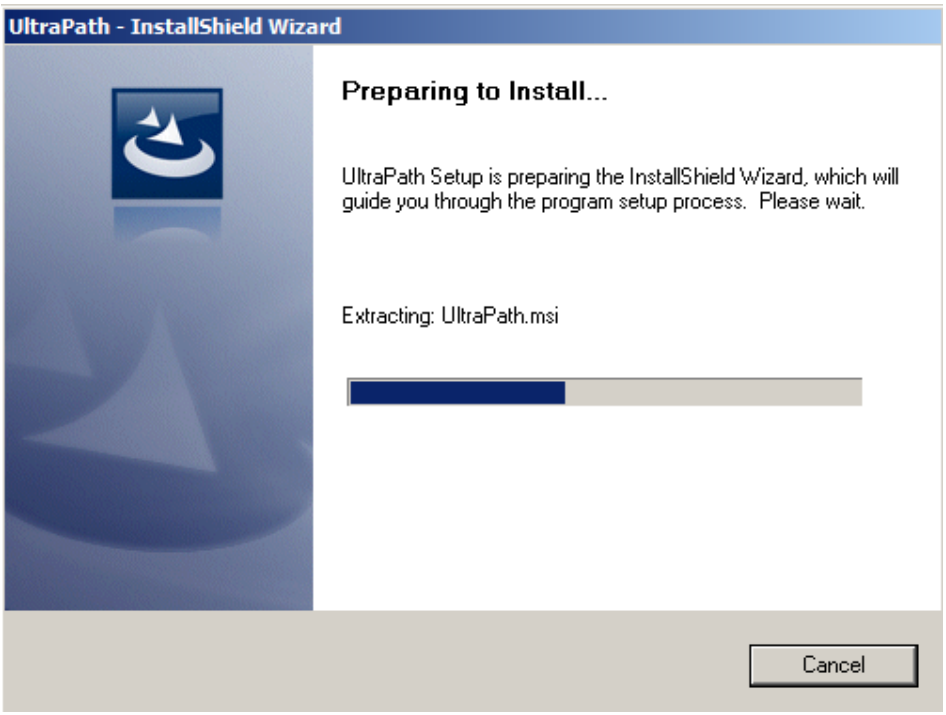
Operation Procedure

Step 1 Double-click the installation package to start the installation. Execute the InstallShield Wizard first, as shown in the following Figure 3-25.

Figure 3-25 Wizard for installing UltraPath for Windows



Step 2 Click **Next,** as shown in the following Figure 3-26.

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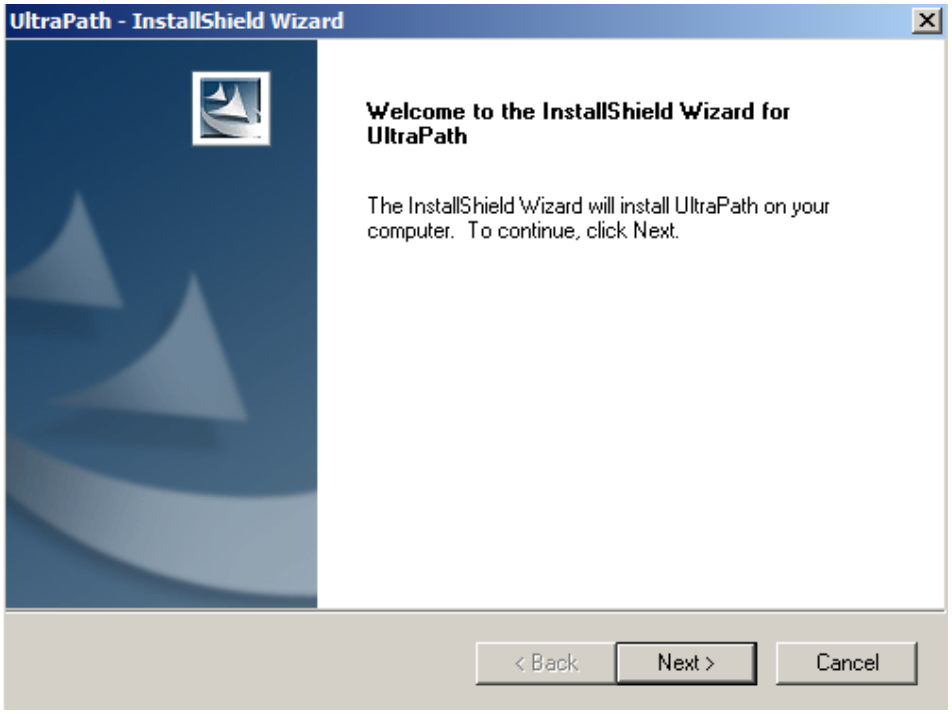
Figure 3-26 Welcome page of UltraPath for Windows installation wizard



Step 3 Enter your user name and company name and click **Next**, as shown in the following Figure 3-27.

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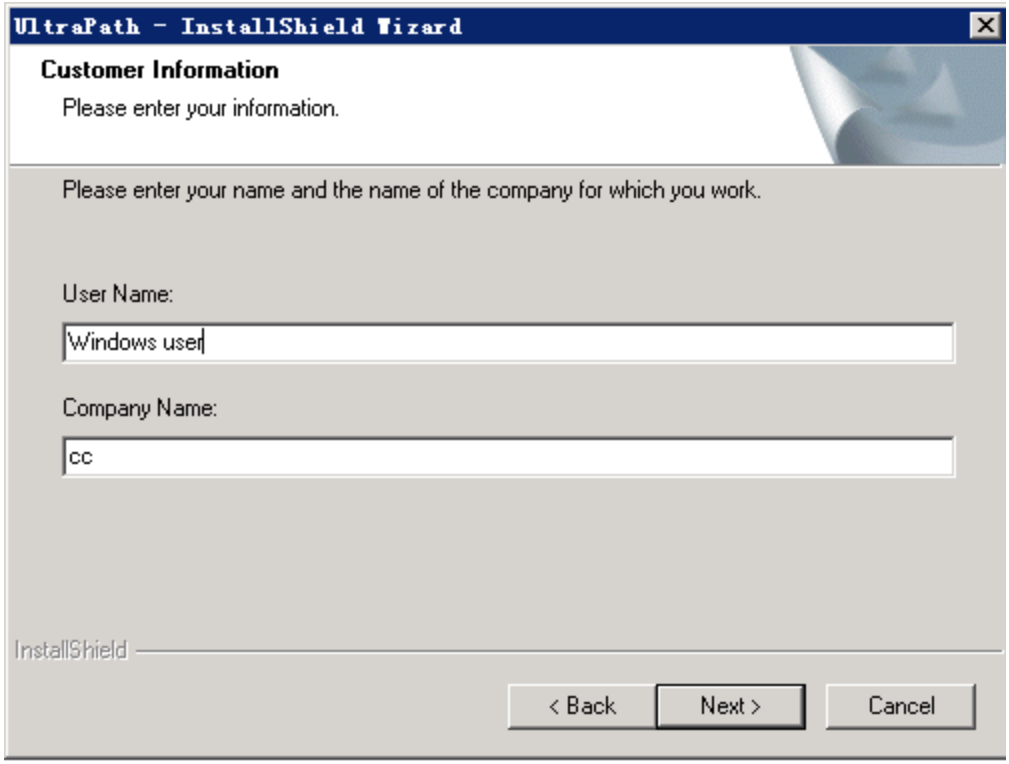
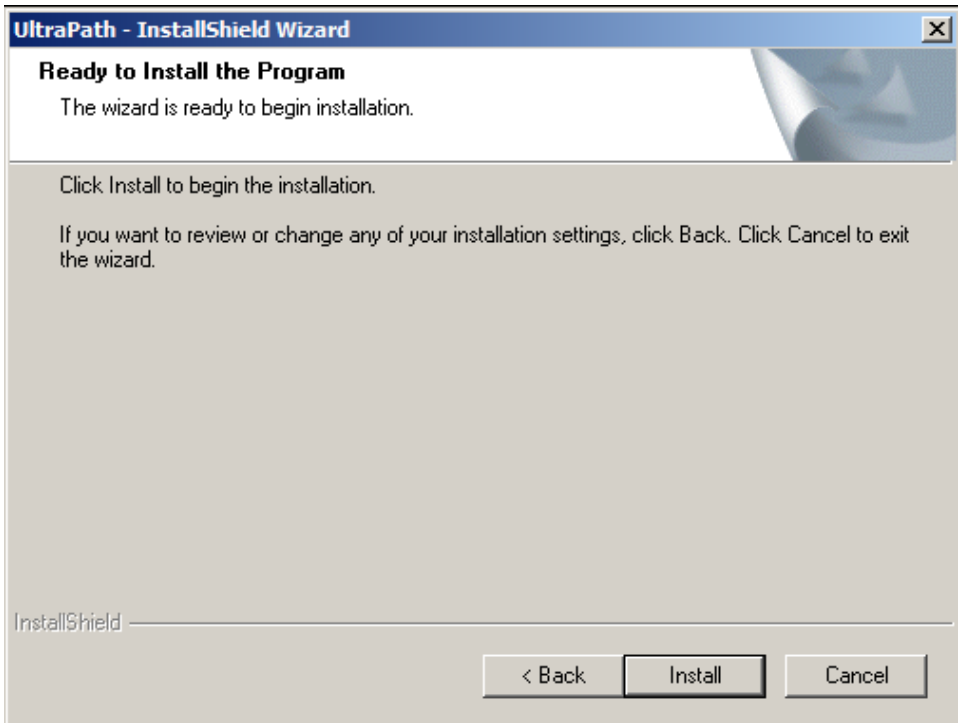
Figure 3-27 Prompt for input of user information



Step 4 Click **Install** to start the installation, as shown in the following Figure 3-28.

Figure 3-28 Starting installation of UltraPath for Windows



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Step 5 The installing progress is displayed, as shown in the following Figure 3-29.

Figure 3-29 Progress of installing UltraPath for Windows 1

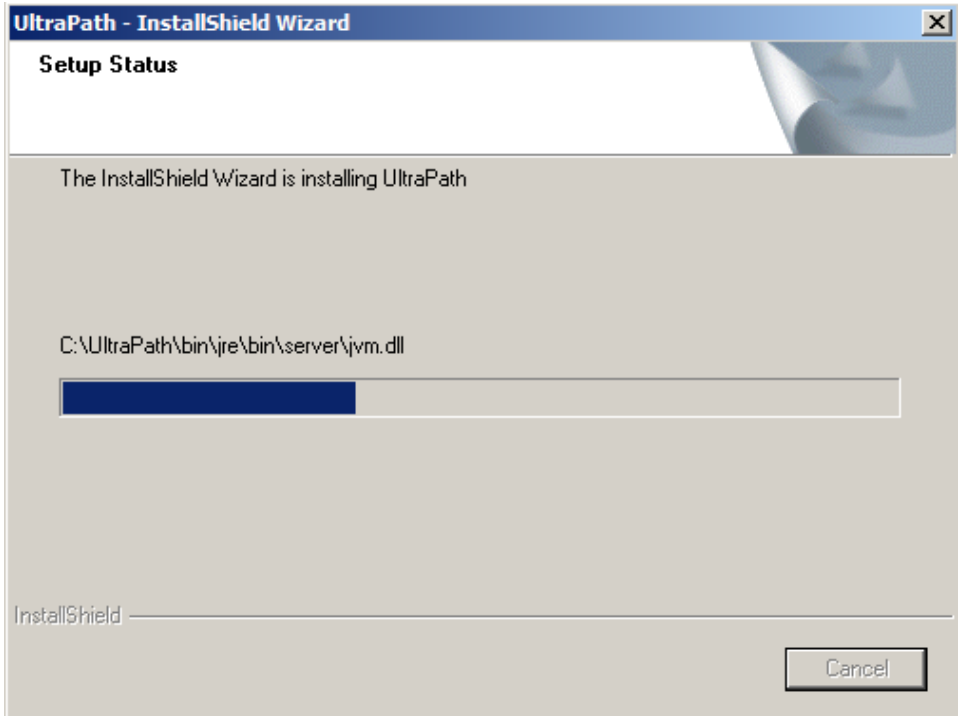
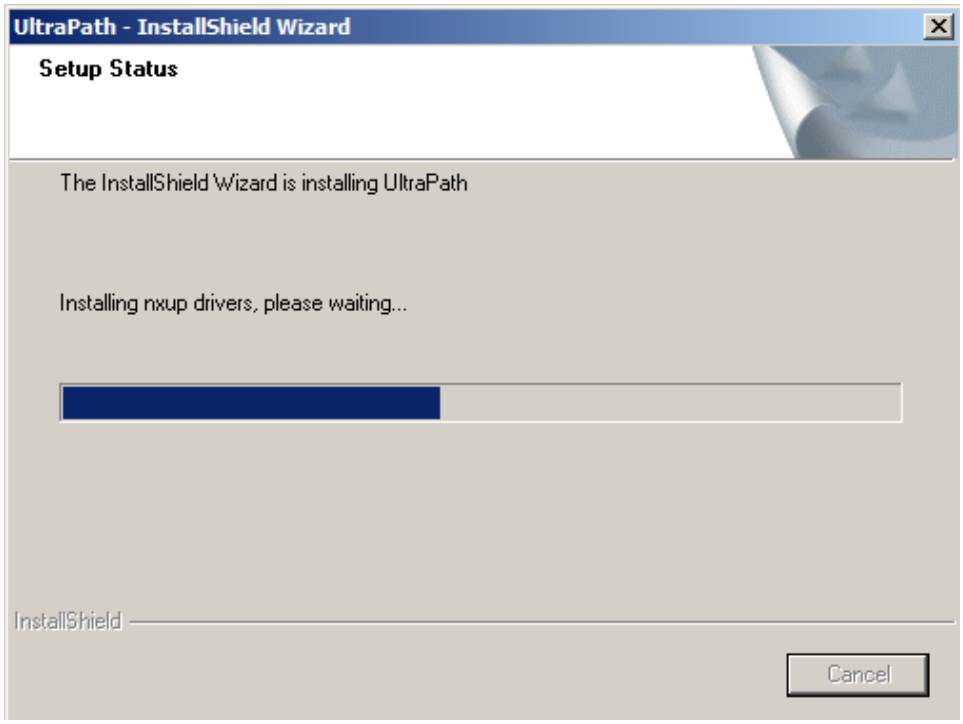


Figure 3-30 Progress of installing UltraPath for Windows 2



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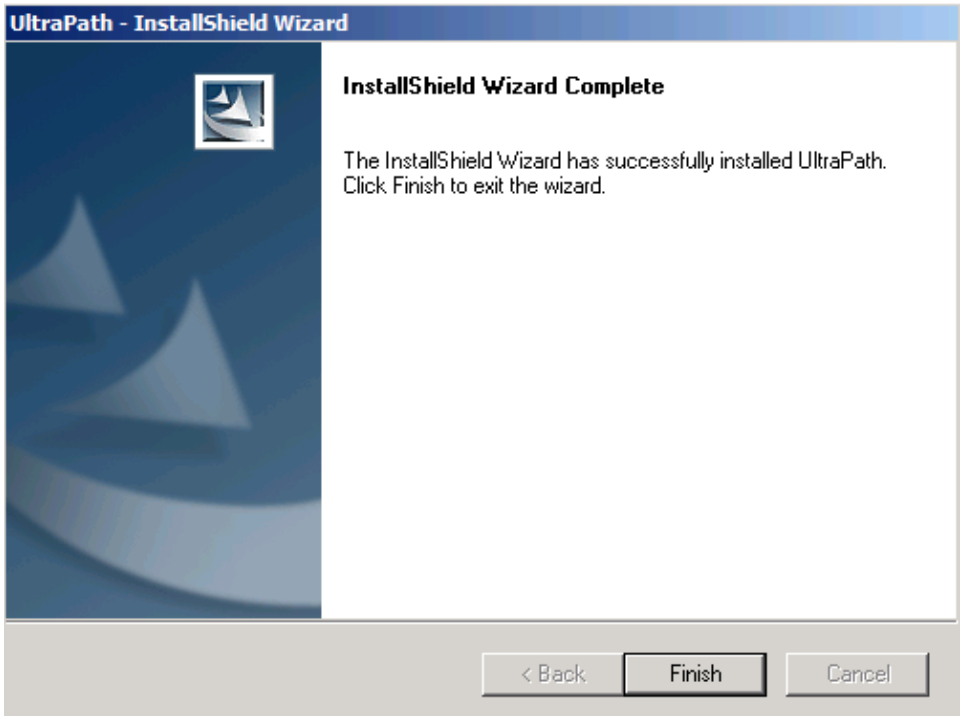
Step 6 Click **Finish** to complete the installation, as shown in the following Figure 3-31.

Figure 3-31 Completing the installation of UltraPath for Windows



Step 7 Click **Next**, and the system restarts automatically, as shown in the following Figure 3-32.

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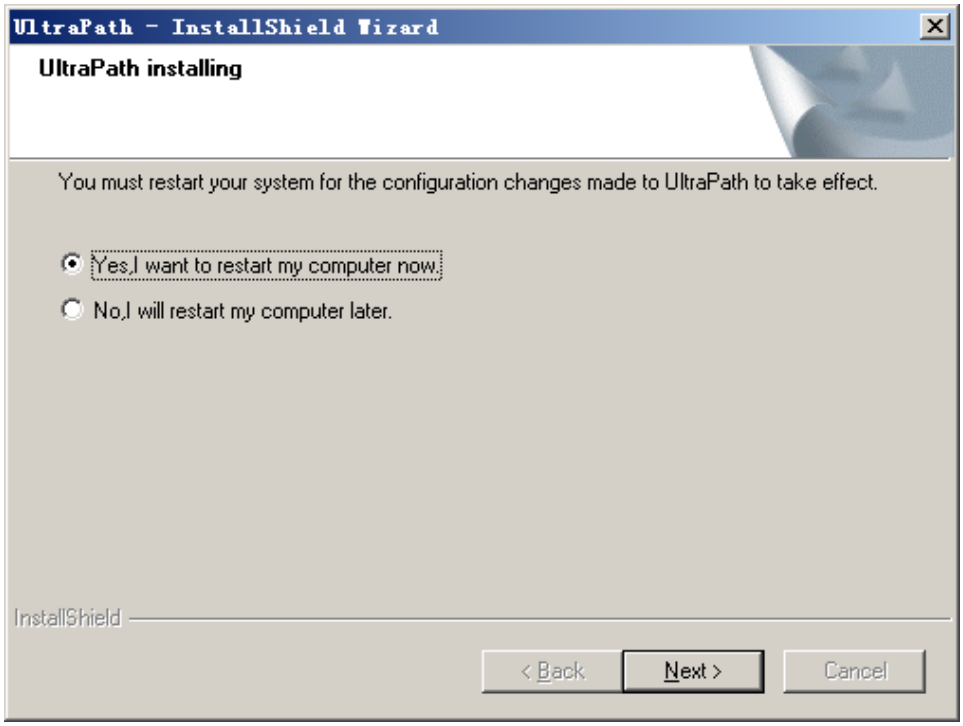
Figure 3-32 Prompt for restart



----End

Result Verification

The shortcut of UltraPath software is displayed on the desktop. Double-click the icon and the UltraPath management interface is displayed without an anomaly prompt. Check the version in CLI which matches the current version.

Troubleshooting

In case that the system fails to start after the host restarts, restart the system again manually and press **F8** repeatedly during the restart process to enter the system startup options list. Select **Disable Driver Signature Enforcement** to access the system. Uninstall UltraPath software and install the earlier version.

3.1.4 Verification and Restoring After the Upgrade

3.1.4.1 Verification Checklist

Table 3-3 Verification checklist for UltraPath for Windows

No.	Item	Operation Command	Standard
1	Check the version.	Open **UltraPath Console,** choose **Help ->about UltraPath Console**, and the version information of the UltraPath is displayed; or, run the **upadm show**	The returned version information matches the upgrade target version.

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No.	Item	Operation Command	Standard
		version command on the CLI.	
2	Restore iSCSI Initiator Configurations.	Start the iSCSI initiator and go to the configuration page. Click the **Discovery** tab. On the tab page, click **Add**. In the dialog box that is displayed, enter the IP address of the iSCSI port recorded before the upgrade. Click the **Targets** page. In the **Targets:** area, select the target recorded before the upgrade. Click **Log On…**. In the dialog box that is displayed, click **OK**.	The configurations of iSCSI Initiators are restored according to the records.
3	Properly generate physical and virtual disks.	Right-click **My Computer** and choose **Manage** from the shortcut menu. The **Computer Management** page is displayed. Choose **Device Manager** > **Disk drives**, and right-click on the page and choose **scan for hardware changes** from the shortcut menu.	The number of physical disks equals the number of virtual disks multiplied by the number of paths.
4	Check that the cluster can work.	Ask the customer engineer to check whether the Cluster can run normally.	The cluster function works.
5	Check that services that are stopped before the upgrade are running.	Check that the system services, whose states are manually changed before upgrade, are recovered.	The system services state manually changed before the upgrade are recovered.
6	Check that applications are normally running.	Ask the customer engineer to check whether the applications (such as database) can run normally on the server.	The applications (such as database) can run normally.

3.1.4.2 Checking the Version

Description

Check whether the current version is consistent with the one described in the release notes.

Precautions

The version information is available only after the installation is successfully complete.

Procedure

Step 1 Run the **upadm show version** command.

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Step 2 Confirm that the version number displayed in step 1 is the same as the target version number.

----End

Result Verification

The returned UltraPath version is the desired one.

Troubleshooting

If failure occurs when querying the version, it indicates that the driver does not function. In this case, uninstall UltraPath software and install it again.

3.1.4.3 Restoring iSCSI Initiator Configurations (Only Applicable to iSCSI SAN)

Description

If the host iSCSI initiator configurations are deleted before the upgrade, perform the following operations to restore iSCSI configurations and to establish service connection between the host and the storage system. If the host iSCSI initiator configurations are not deleted, skip this section.

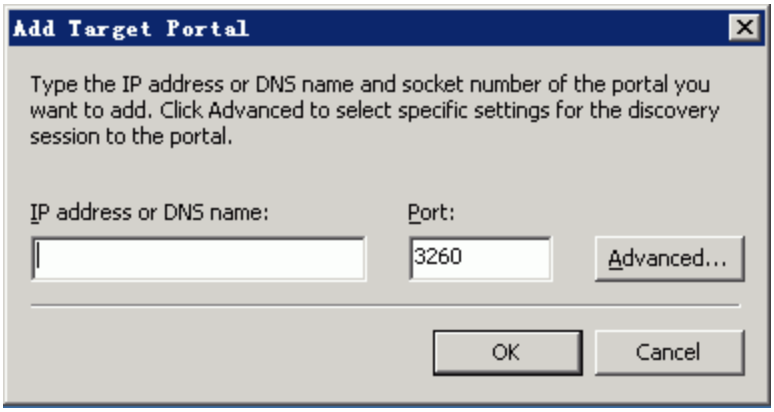
Precautions

The host iSCSI initiator configurations are deleted before the upgrade.

Procedure

1. Start the iSCSI initiator and go to the configuration GUI. Click the **Discovery** tab, click **Add**.The **Add Target Portal** dialog box is displayed.

   Figure 3-33 Adding Target Portal 1

2. Enter the iSCSI IP address recorded before the upgrade in the **IP address or DNS name** text box.
3. After confirming that the settings are correct, click **OK**. The information about the added target port can be viewed in the **Target Portals** group box.

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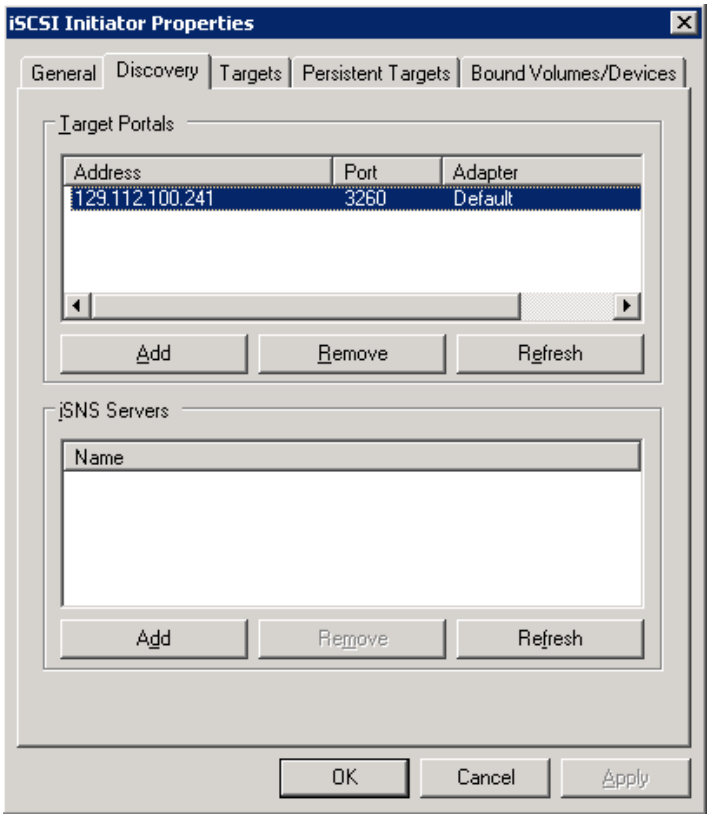
Figure 3-34 Adding Target Portal 2



4. Click the **Targets** tab, and the **Status** for the target added in the preceding step is **Inactive**.

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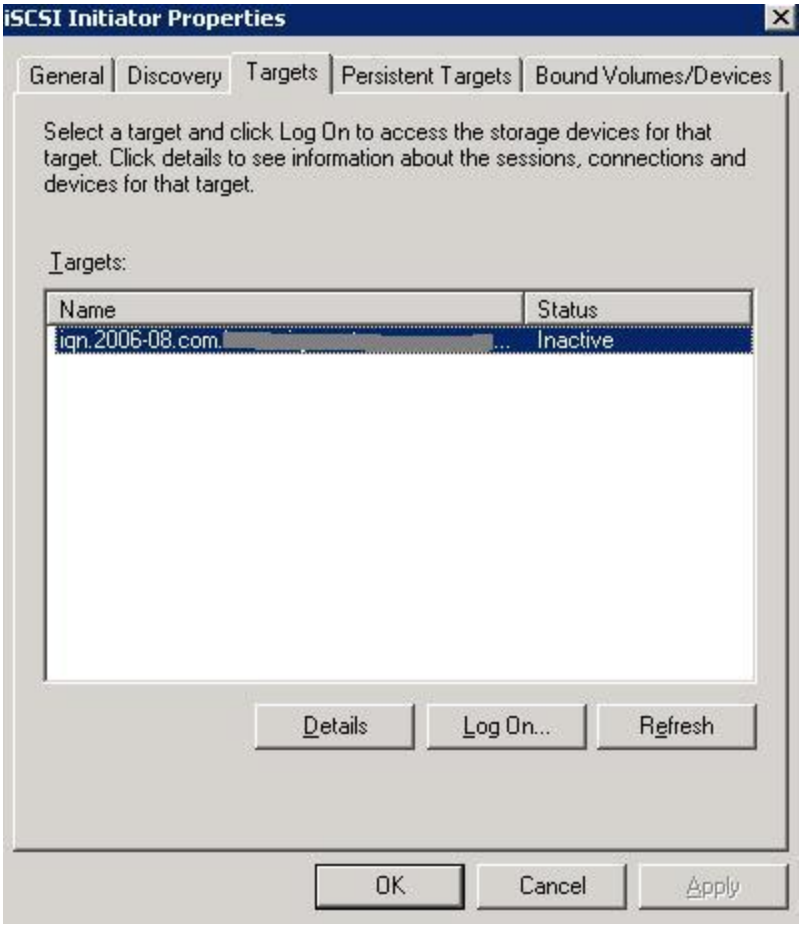
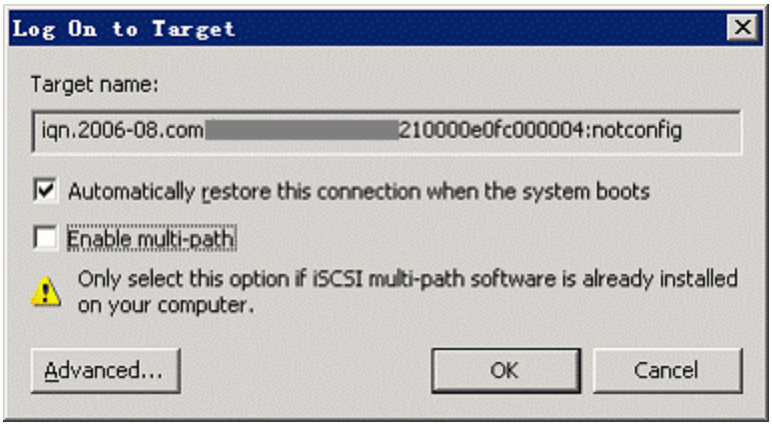
Figure 3-35 Logging in to Target 1



5. In the **Targets** group box, select the target that is recorded before the upgrade and click **Log On...** The **Log On to Target** dialog box is displayed.

Figure 3-36 Logging in to Target 2



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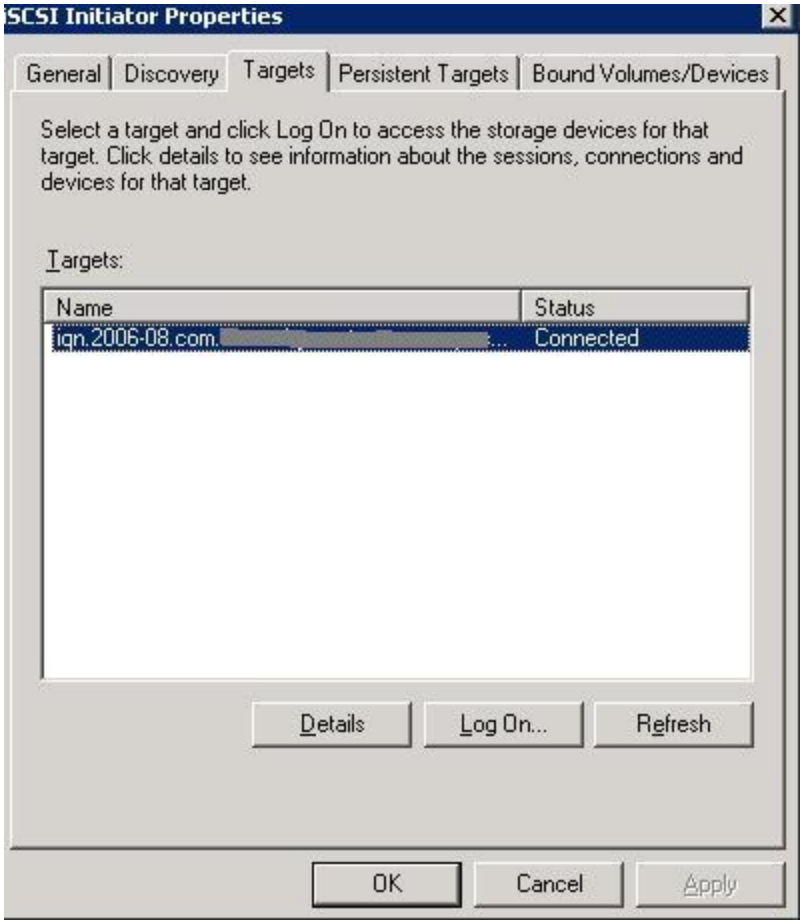
NOTE

To enable the application server to continually access the storage system through this target port, select **Automatically restore this connection when the system boots**. Because once UltraPath is installed, **Enable multi-path** cannot be selected.

6. If CHAP information needs to be configured, go to the **CHAP** dialog box by following the steps in pre-upgrade preparations, enter the recorded **CHAP** user name and password, and click **OK** to go back to the **Log On to Target** dialog box.
7. Click **OK** to go back to the **iSCSI Initiator Properties** dialog box.
8. Click the **Targets** tab, and check whether **Connected** is displayed in **Status.** (If the connection is not successful, check whether the service cables are correctly connected, and repeat step 5 and step 7.)

Figure 3-37 Logging in to Target 3



Verification

The configurations of iSCSI Initiators are restored according to the records.

Troubleshooting

If the iSCSI Initiator service is stopped before the upgrade, start this service.

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3.1.4.4 LUNs Are Normally Presented

Description

Check whether the current UltraPath software can manage the disks to which the storage device maps.

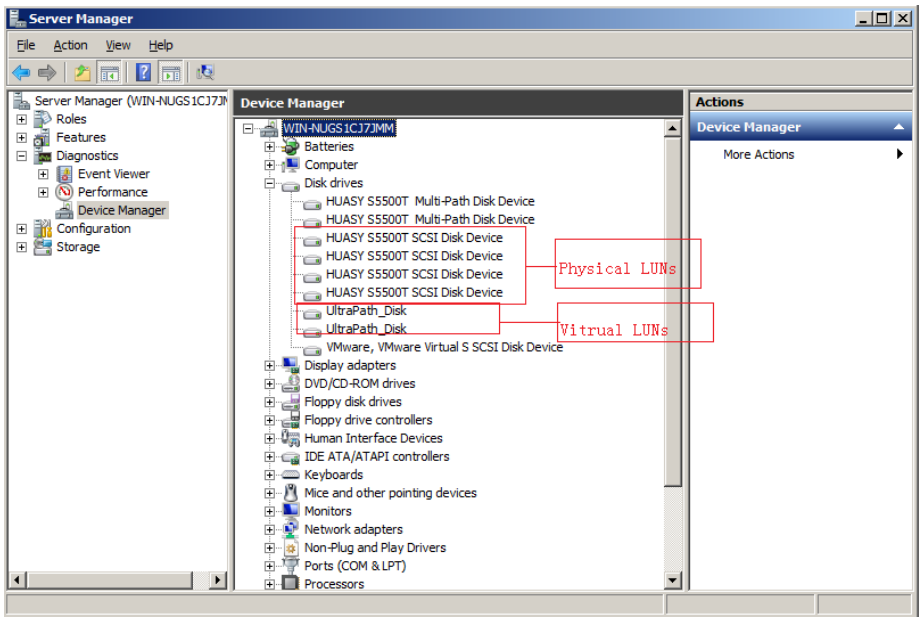
Precautions

Recover all links and ensure that all links are normal.

Procedure

Step 1 In **Device Manager,** check whether the quantity of virtual disks and physical disks are the same with the quantity recorded before. (The following figure is used as an example only.)

Figure 3-38 Checking LUNs in Device Manager



Step 2 Click **LUN** in UltraPath Console to check whether the quantity of virtual disks and the number of corresponding paths are the same with those recorded before upgrade.

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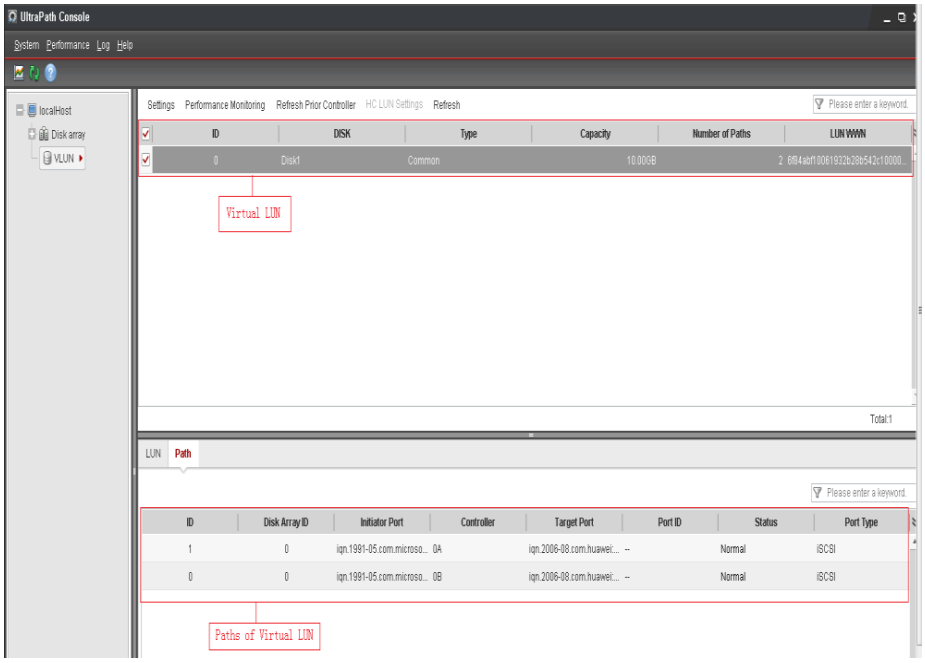
Figure 3-39 Checking LUNs in UltraPath Console



----End

Result Verification

Virtual disks are successfully generated. The quantity and capacity of virtual disks are consistent with those of LUNs mapped by storage devices.

Troubleshooting

If the quantity of virtual disks is incorrect or the status is abnormal, remove cables connecting the host and storage devices. Manually scan for disk drives. After all virtual disks are deleted, plug the cables and check the reported information.

3.1.4.5 Cluster Running Normally (Only Applicable to Cluster)

Ask the customer engineer to check whether the Cluster can run normally.

3.1.4.6 SystemServices' States Are Restored

Check whether the system services' states, which are manually changed before the upgrade, are restored.

3.1.4.7 Applications (such as Database) Are Running Normally

Ask the customer engineer to check whether the applications (such as database) can run normally on the server.

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3.1.5 Rolling Back to the Source Version

3.1.5.1 Uninstalling the UltraPath Software

Description

In case that the newly-installed UltraPath software is unusable because of anomalies, uninstall it and install the earlier version.

Precautions

For details, see section 3.1.3.1 Uninstalling the UltraPath Software.

Operation Procedure

For details, see section 3.1.3.1 Uninstalling the UltraPath Software.

Result Verification

For details, see section 3.1.3.1 Uninstalling the UltraPath Software.

Troubleshooting

For details, see section 3.1.3.1 Uninstalling the UltraPath Software.

3.1.5.2 Installing the UltraPath Software of the Earlier Version

Description

Install UltraPath software of the earlier version.

Precautions

For details, see section 3.1.3.2 Installing the UltraPath Software.

Operation Procedure

For details, see section 3.1.3.2 Installing the UltraPath Software.

Result Verification

For details, see section 3.1.3.2 Installing the UltraPath Software.

Troubleshooting

For details, see section 3.1.3.2 Installing the UltraPath Software.

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3.2 UltraPath for Windows V100R005 and Following Versions Upgrade Guide

3.2.1 Upgrade Process Overview

3.2.1.1 Upgrade Scheme 1 : Offline Upgrade

3.2.1.1.1 Indirect upgrade : Uninstall First, and then Install

Figure 3-40 Upgrade flowchart of UltraPath for Windows

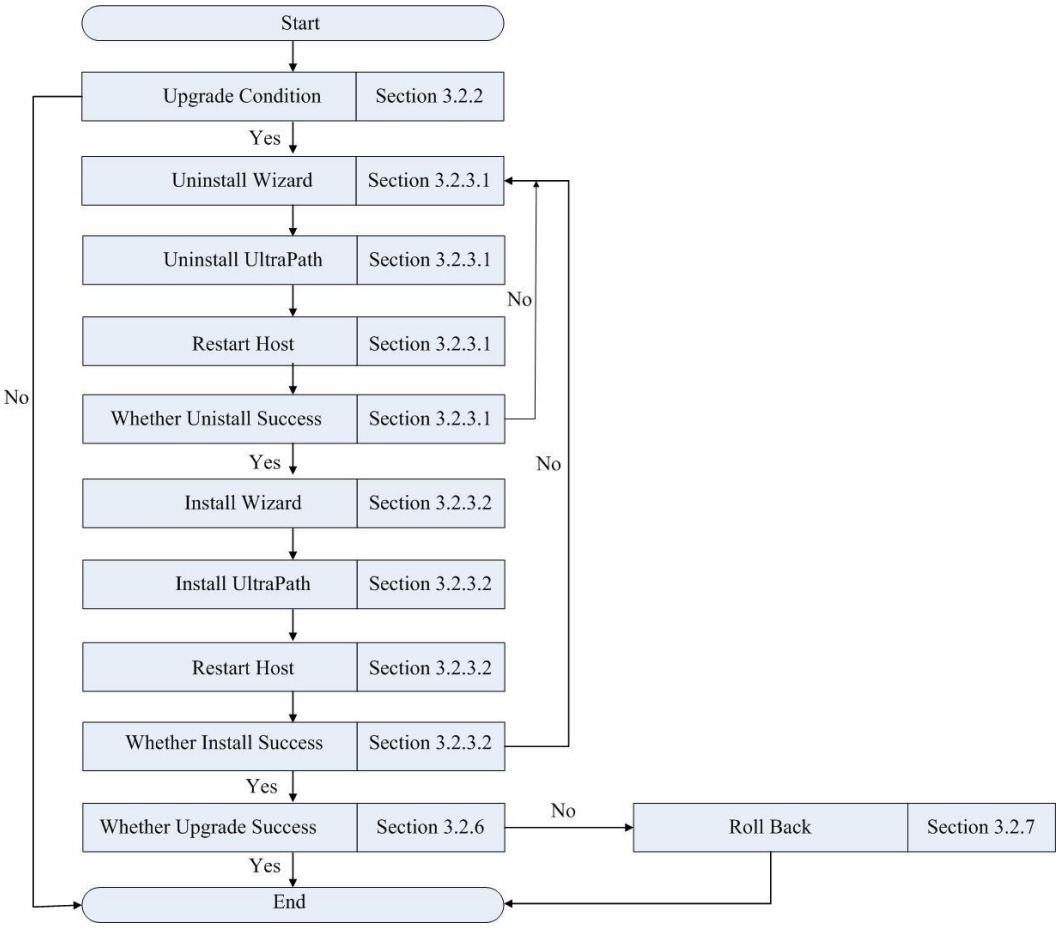

Table 3-4 Procedure and required time for upgrading UltraPath for Windows

No.	Upgrade Procedure		Required Time	Impact	Remarks
1	Check whether the upgrade conditions	System services.	About 2 minutes	None	Mandatory
		Environment variables.	About 1 minute	None	Mandatory

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No.	Upgrade Procedure		Required Time	Impact	Remarks
	are met.	Running programs.	About 1 minute	None	Mandatory
		User account.		None	Mandatory
		Installation files.		None	Mandatory
		Rollback versions.		None	Mandatory
2	Uninstall UltraPath software.		About 3minutes	None	Mandatory
3	Install UltraPath software.		About 3 minutes	None	Mandatory
4	Verify the upgrade.		About 1 minute	None	Mandatory

The upgrade takes about 11 minutes.

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3.2.1.1.2 Direct upgrade : Upgrade the software using the installation package

Figure 3-41 Upgrade flowchart of UltraPath for Windows

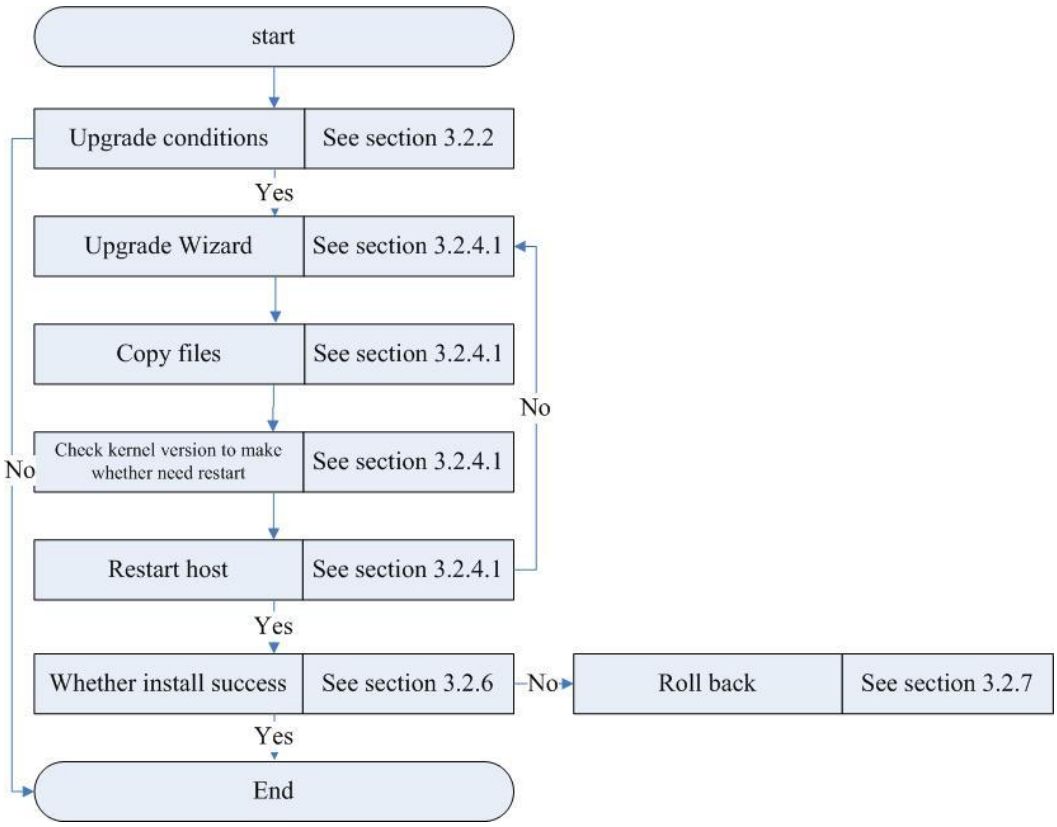

Table 3-5 Procedure and required time for upgrading UltraPath for Windows

No.	Upgrade Procedure		Required Time	Impact	Remarks
1	Check whether the upgrade conditions are met.	System services.	About 2 minutes	None	Mandatory
		Running programs.	About 1 minute	None	Mandatory
		User account.		None	Mandatory
		Installation files.		None	Mandatory
		Rollback versions.		None	Mandatory
2	Upgrade the UltraPath.		About 2 minutes	None	Mandatory
3	Verify the upgrade.		About 1	None	Mandatory

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No.	Upgrade Procedure	Required Time	Impact	Remarks
		minute		

The upgrade takes about 6 minutes.

3.2.1.2 Upgrade Scheme 2 : Online Upgrade

Figure 3-42 Upgrade flowchart of the UltraPath using the new version

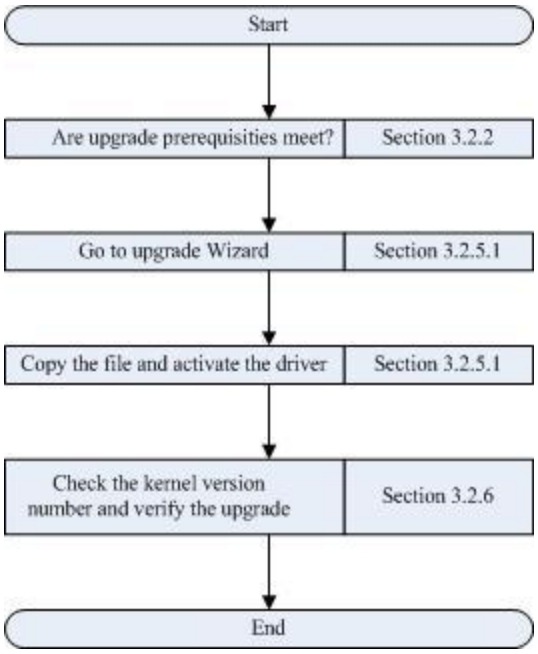

Table 3-6 Procedure and required time for upgrading UltraPath for Windows

No.	Upgrade Procedure		Required Time	Impact	Mandatory or Not
1	Check whether the upgrade conditions are met.	System services.	About 2 minutes	Yes	Mandatory
		Running programs.	About 1 minute	None	Mandatory
		User account.		None	Mandatory
		Installation files.		None	Mandatory
		Rollback versions.		None	Mandatory
2	Upgrade the UltraPath.		About 2	None	Mandatory

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No.	Upgrade Procedure	Required Time	Impact	Mandatory or Not
		minutes		
3	Activate the new version	About 1-10 minutes	Yes	Mandatory
4	Verify the upgrade.	About 1 minute	None	Mandatory

The whole upgrade process takes about 7 to 16 minutes.

NOTE

Online upgrade can only be performed for upgrading a previous version of UltraPath for Windows V100R008C00 or V100R008C20 or V100R008C30 to the latest version of UltraPath for Windows V100R008C30,or Windows V100R008C00 or V100R008C20 or V100R008C30 or V100R008C50 or 21.0.1 or 21.1.0 to the latest version of UltraPath for Windows 21.1.0.

3.2.2 Preparing for the Upgrade

3.2.2.1 Prerequisites

- The operator has the Windows operation experience.
- The operator has the administrator account and password of Windows.
- The hardware that runs the server program meets the basic requirements on UltraPath software (128 MB memory and 600 MB available disk space).
- The target 21.1.0 version supports the online upgrade from the current V100R008C00/V100R008C20/V100R008C30/V100R008C50/21.0.1/21.1.0 version.
- All links are normal before the upgrade, and faulty or degraded paths do not exist.
- Upgrade the software at off-peak hours.
- Do not perform online upgrade when the CPU is running with full load.
- Do not perfrom online upgrade when the host has the single controller alarm.
- The takeover-online environment cannot support the online upgrade.

3.2.2.2 Obtaining the Installation Package of the UltraPath Software

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

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3.2.2.3 Obtaining the Installation Documents of the UltraPath Software

Table 3-7 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE

You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

3.2.2.4 Preparing the Installation Package for Version Rollback

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

3.2.2.5 System Administrator

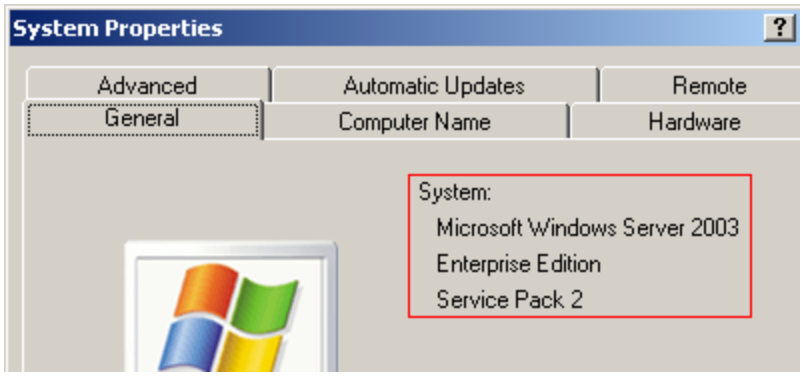
The system administrator must have **administrative** permissions.

3.2.2.6 Checking Windows Service Pack

For Windows Server 2003, Service Pack 2 has been installed.

Right-click **My computer** and choose **Properties** to check whether the system is 2003 SP2.

Figure 3-43 Windows 2003 Service Pack



For Windows 7, Service Pack 1 has been installed.

Right-click **My computer** and choose **Properties** to check whether the system is Windows 7 SP1.

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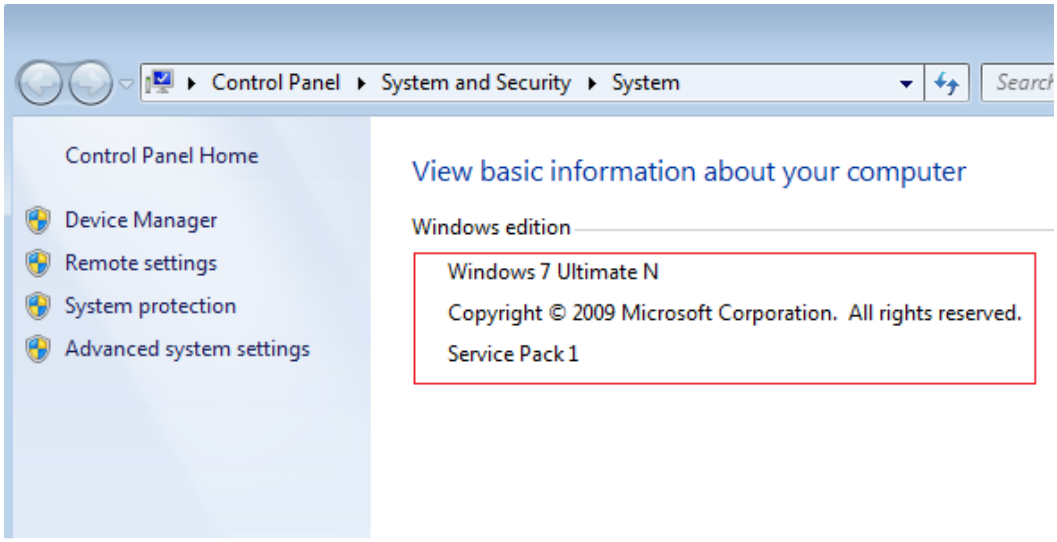
Figure 3-44 Windows 7 Service Pack



You are not required to check Service Pack for other system versions.

3.2.2.7 Checking Environment Variables

Variable name: Path

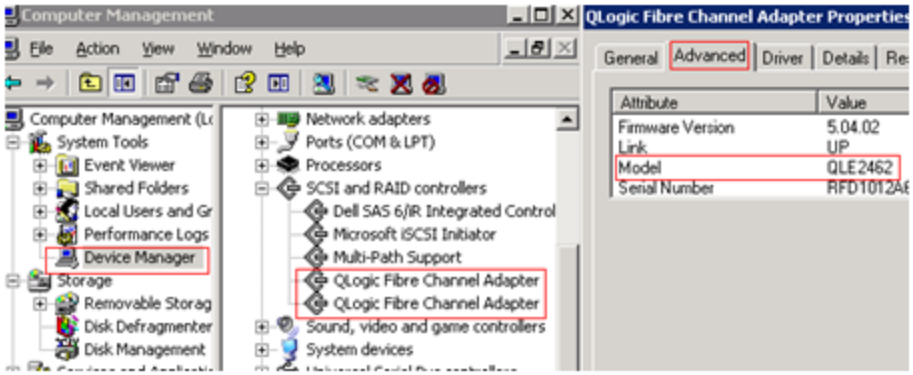
The variable must contain the following: **%SystemRoot%\system32** or **C:\windows\system32**.

3.2.2.8 Checking HBA Models (Only Applicable to FC SAN)

For a Fibre Channel environment, make sure that the HBAs installed on one server are with the same model and are from the same manufacturer.

Choose **Device Manager** > **SCSI and RAID controllers**, and double-click the corresponding HBA to check its model information:

Figure 3-45 HBA Model



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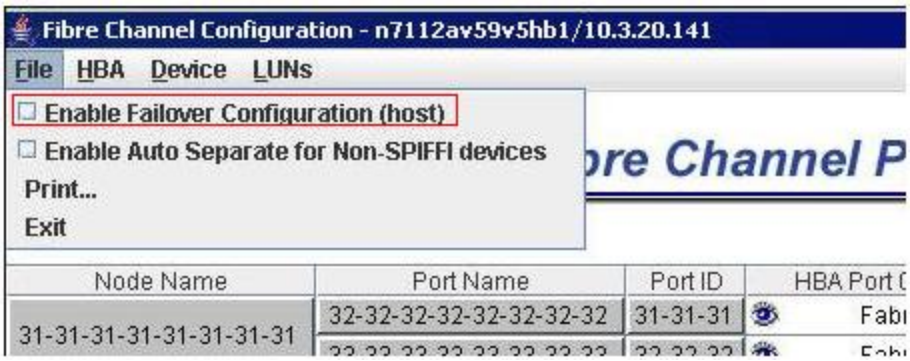
3.2.2.9 Disable HBA's Failover Feature (Only Applicable to FC SAN)

For a Fibre Channel environment, make sure that the functions of failover and failback on HBA are disabled.

Use the management software provided by HBA manufacturer to check the status of the two functions. For example, use SANsurfer to check the QLogic that supports failover function (QLogic downloading link: http://driverdownloads.qlogic.com/QLogicDriverDownloads_UI/DefaultNewSearch.aspx, download the corresponding software based on your operating system), and choose **Fibre Channel Configuration** > **File** to check the function status. (If the HBA does not support the failover function, the Enable Failover Configuration option does not exist.)

Figure 3-46 Disabling the HBA failover feature



3.2.2.10 Checking iSCSI Initiator (Only Applicable to iSCSI SAN)

For an iSCSI environment and in Windows Server 2003, make sure that the iSCSI initiator is installed. For Windows Server 2008 (R2) or later versions, the system is equipped with an iSCSI initiator by default. This check is not necessary.

Choose **Uninstall or Remove Programs** in **Control Panel**.

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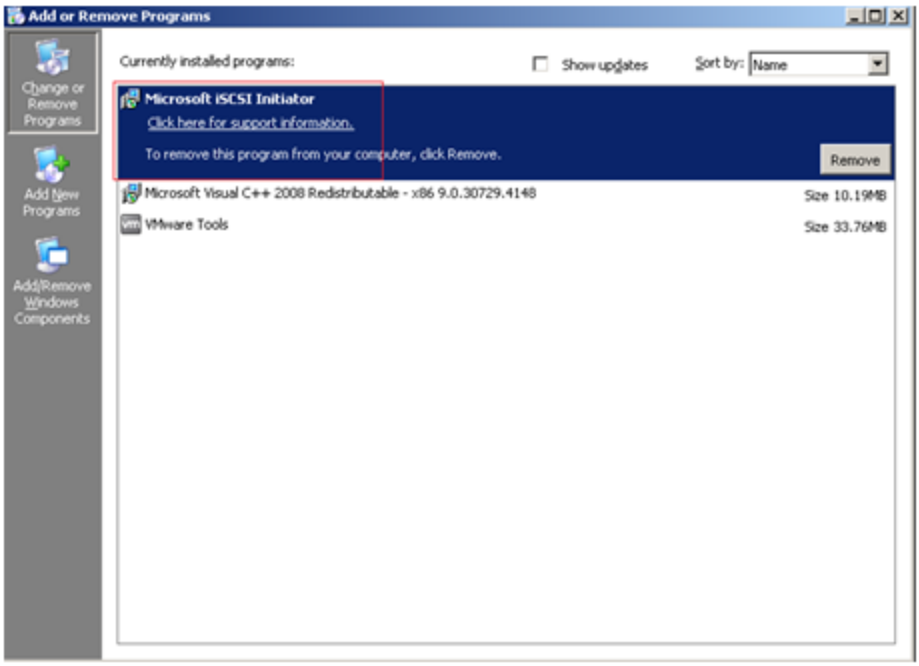
Figure 3-47 Checking iSCSI Initiator

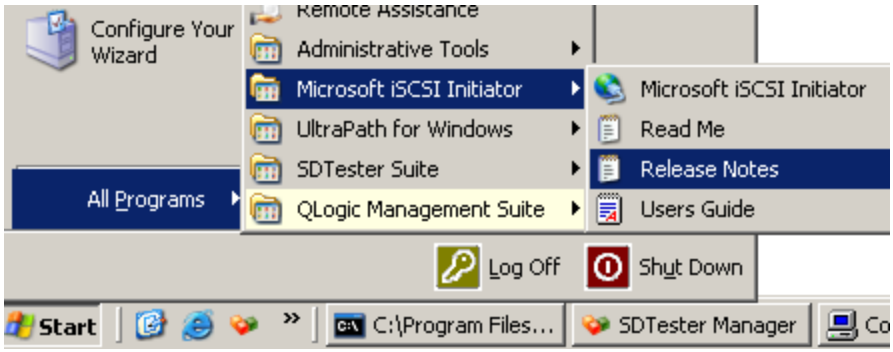


3.2.2.11 Checking iSCSI Initiator Version (Only Applicable to iSCSI SAN)

For an iSCSI environment, make sure that the version of the iSCSI initiator is 2.08 or later. (Downloading link: http://www.microsoft.com/en-us/download/details.aspx?id=18986, choose the corresponding version based on your operating system.)

Choose **Start** > **All Programs** > **Microsoft iSCSI Initiator** > **Release Notes**.

Figure 3-48 Obtaining the information about the version of the iSCSI initiator



In the text that is displayed, you can check the iSCSI version information.

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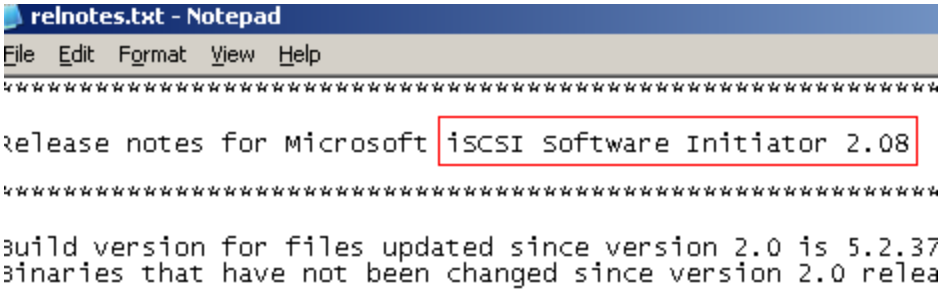
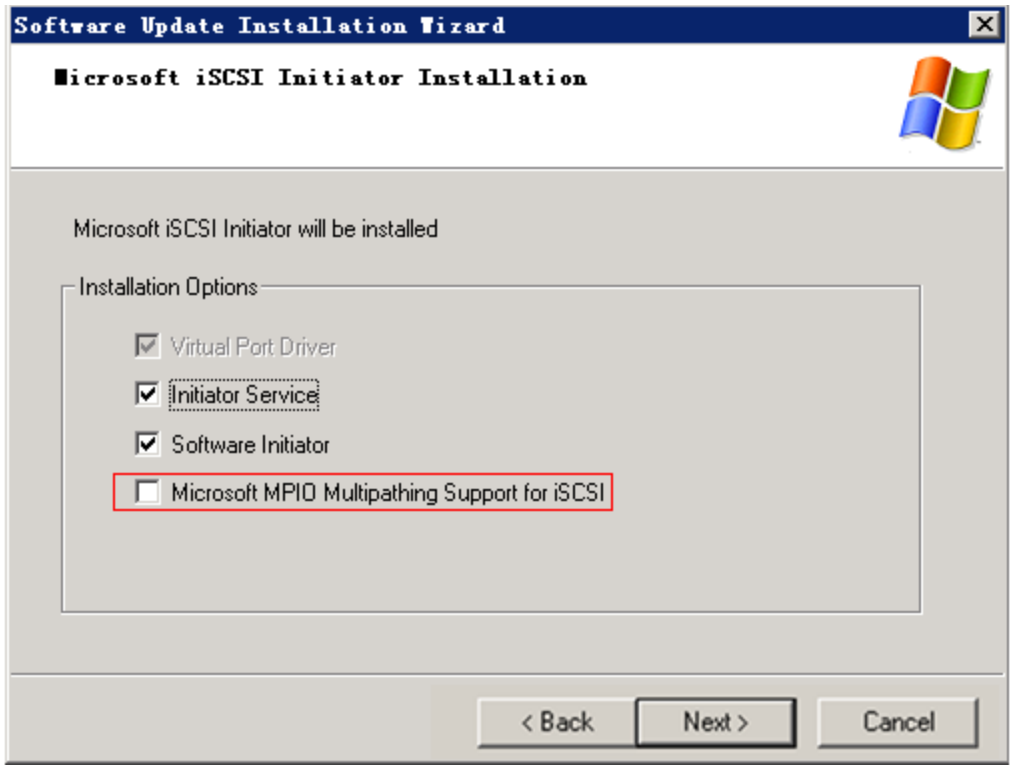
Figure 3-49 Checking iSCSI Initiator Version



If the iSCSI initiator version is not 2.08, the iSCSI initiator must be uninstalled and version 2.08 should be installed. During the installation process, do not select **Microsoft MPIO MultiPathing Support for iSCSI**.

Figure 3-50 Reinstalling the new iSCSI Initiator



For Windows Server 2008 (R2) or later versions, the preceding operation is not necessary.

3.2.2.12 Stop Applications

Ask the customer engineer to stop all applications (such as database) on the server.

NOTE

This procedure is applicable to two service upgrade modes requiring service interruption in solution 1, not applicable to solution 2 that requires online upgrade and no service interruption.

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3.2.2.13 Transferring Cluster Resources (Only Applicable to SCSI-2 Cluster)

The Microsoft Clustering Service delivered with Windows Server 2003 is SCSI-2 cluster and that delivered with Windows Server 2008 or later is SCSi-3 cluster. In addition, there are other clusters. For details about cluster types, refer to their respective documents.

In an SCSI-2 cluster environment, before uninstalling UltraPath, transfer the disk resources on the node that you want to upgrade to the peer node in either of the following two fashions:

1. Obtain the customer's approval. Restart the local node (all disk resources on this node will be transferred to the peer node), and upgrade UltraPath on the local node. After that, restart the peer node (all disks resources will be transferred back to the local node), and then upgrade UltraPath on the remote node.
2. Ask the customer's engineers to transfer all the disk resources on the local node to the peer node in the cluster using cluster management software, and then upgrade UltraPath on the local end. Before uninstalling UltraPath on the peer node, transfer all the disk resources on the peer node to the local end. When transferring resources using cluster management software, you are advised to stop the cluster service on the local end first, wait the disk resources to be transferred to the remote peer node, start the cluster service on the local end again, and then upgrade UltraPath. This can ensure that all disk resources including quorum disks can be transferred to the peer node.

NOTE

In an SCSI-2 cluster environment, if you uninstall UltraPath without transferring cluster resources first, after uninstalling UltraPath, you need to run the **clear persistent reserve** command on the storage device so that the cluster service can work normally.

3.2.2.14 Recording LUN Information

1. Record the quantity of LUNs in the disk drive**.**

   Right-click **My Computer** and choose **Manage.** The **Computer Management** window is displayed. Enable **Device manager** on the **View** menu, click **Show hidden devices**, and record the quantity of virtual disks and physical disks. **UltraPath_Disk** is the virtual disk for V100R008 UltraPath management, and disks with the word **Multi_Path** in their names are MPIO management virtual disks, whose quantity is the same with that of **UltraPath_Disk.**

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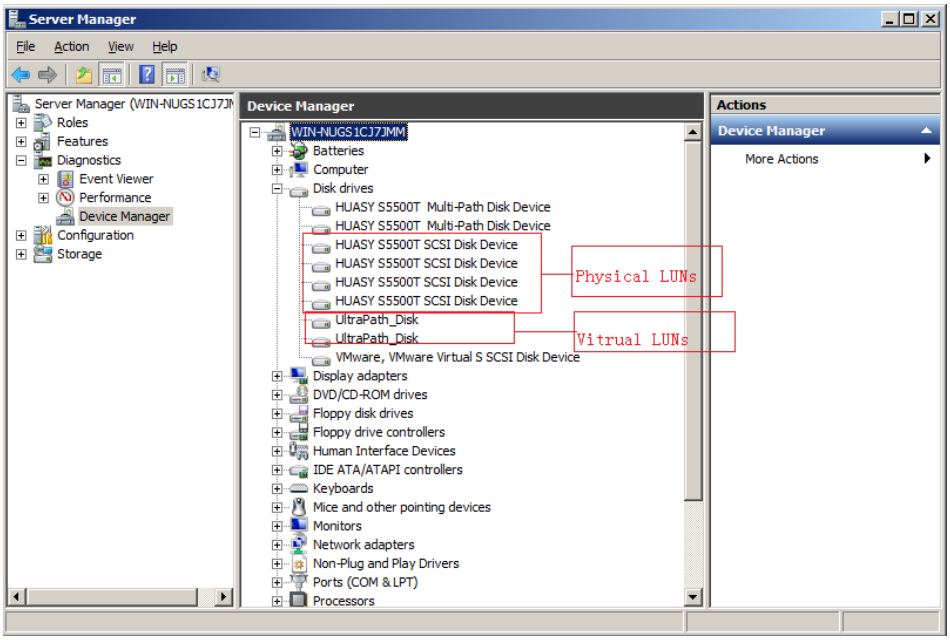
Figure 3-51 LUNs in Device Manager



2. **Record the number of LUNs in UltraPath**

Double-click the icon

to enable **UltraPath Console**. The following dialog box is displayed. Click **LUN** in the navigation tree on the left, and record the quantity of active virtual disks and the quantity of corresponding paths.

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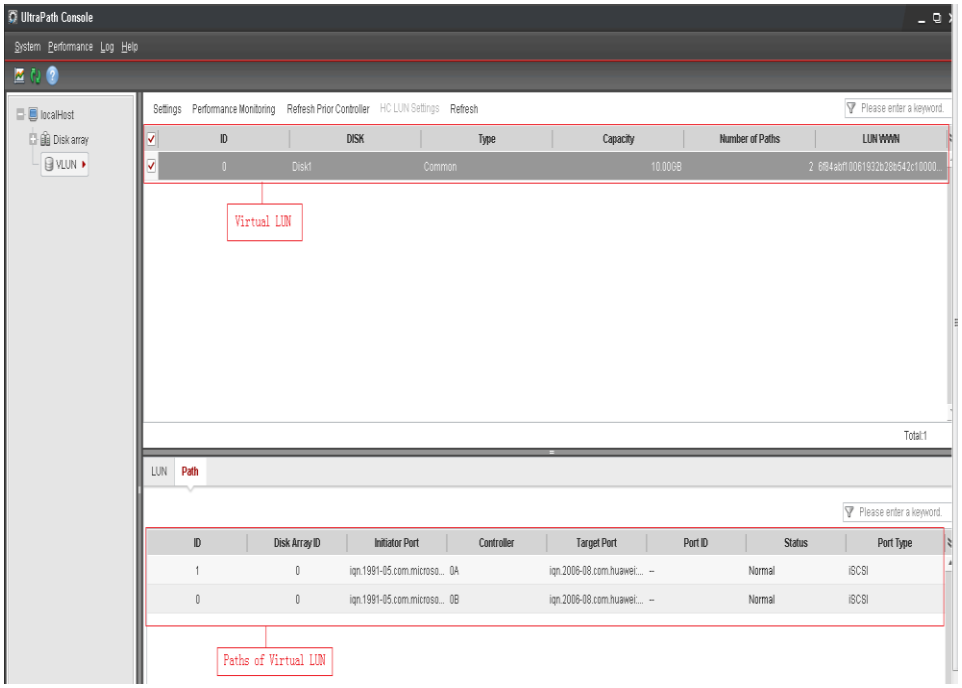
Figure 3-52 LUNs in UltraPath Console



3.2.2.15 Closing Running Programs

You need to stop the services related to UltraPath before the uninstallation or upgrade, for example, the UltraPath management page.

3.2.2.16 Recording CHAP Information (Only Applicable to iSCSI SAN)

In Windows Server 2003, start the ISCSI initiator, go to the **ISCSI Initiator Property** window, select a target connection, click the **LogOn** button, go to the **Log On to Target** window, and click the **Advanced** button. The following window is displayed. If **CHAP logon information** is selected, record the CHAP user name.

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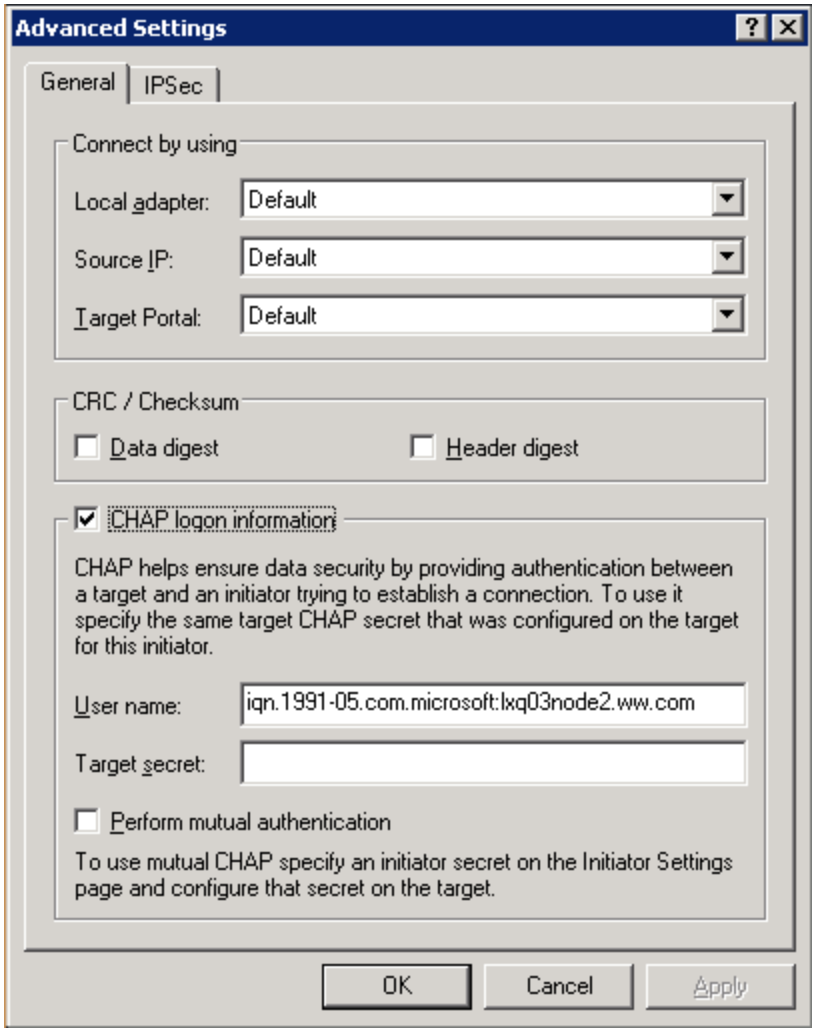
Figure 3-53 CHAP information on WIndows Server 2003



Operate in Windows Server 2008 R2 or later versions. Start the iSCSI initiator, go to the **iSCSI Initiator Property** window, select a target connection, click the **Connect** button, go to the **Connect to Target** window, and click the **Advanced** button. The following window is displayed. If **Enable CHAP log on** is selected, record the CHAP user name.

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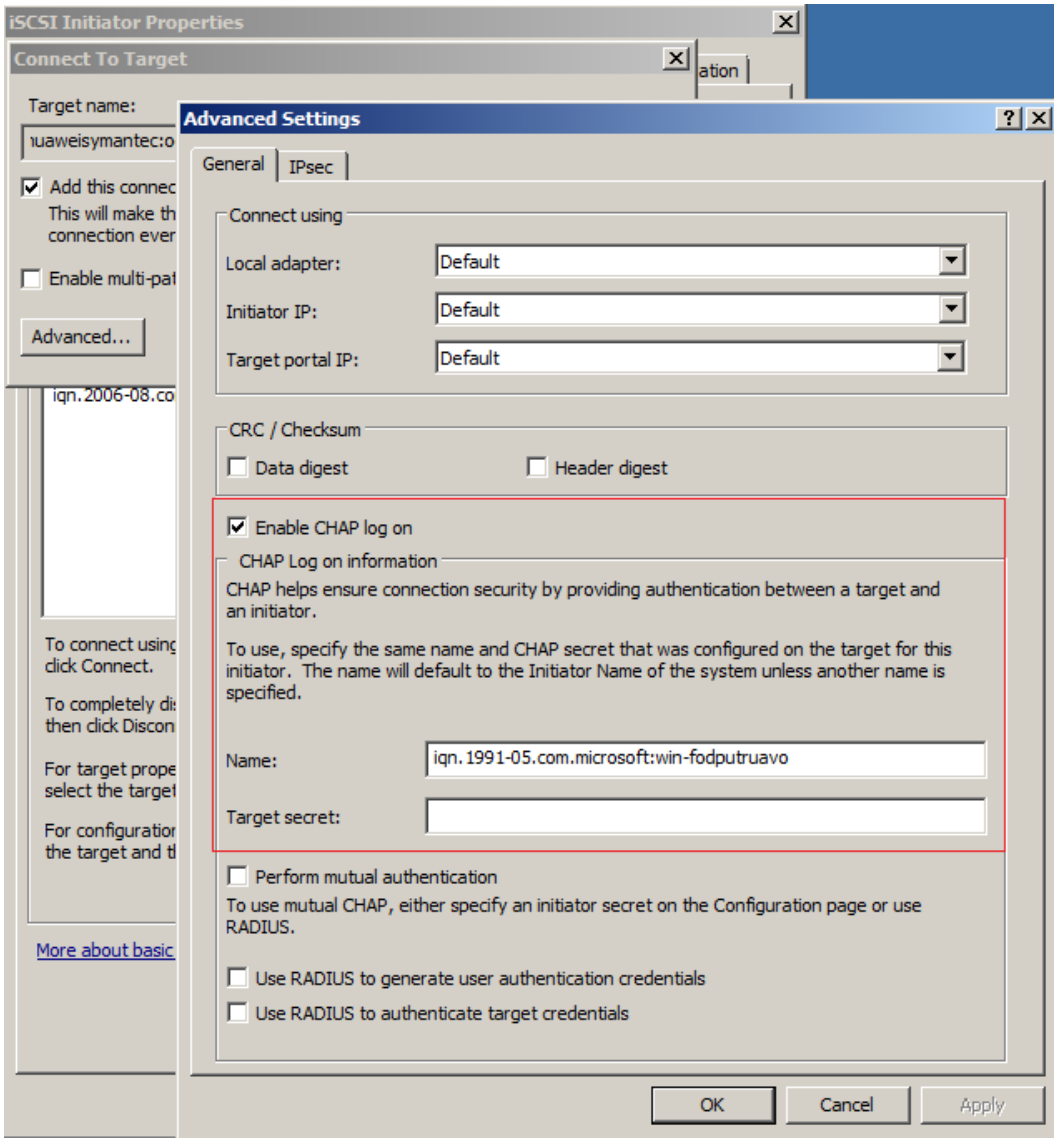
Figure 3-54 CHAP information on WIndows Server 2008 R2 or later



3.2.3 Upgrade Scheme 1 : Offline Upgrade

3.2.3.1 Indirect upgrade : Uninstall First, and then Install

3.2.3.1.1 Uninstalling the UltraPath Software

Description

To upgrade UltraPath software, you must first uninstall the earlier version to make the new version take effect.

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Precautions

Check all items specified in section 3.2.2 Preparing for the Upgrade. In an SCSI-2 cluster environment, you must transfer cluster resources before uninstalling UltraPath. Do not open related programs during the uninstallation, and restart the host after the uninstallation is complete.

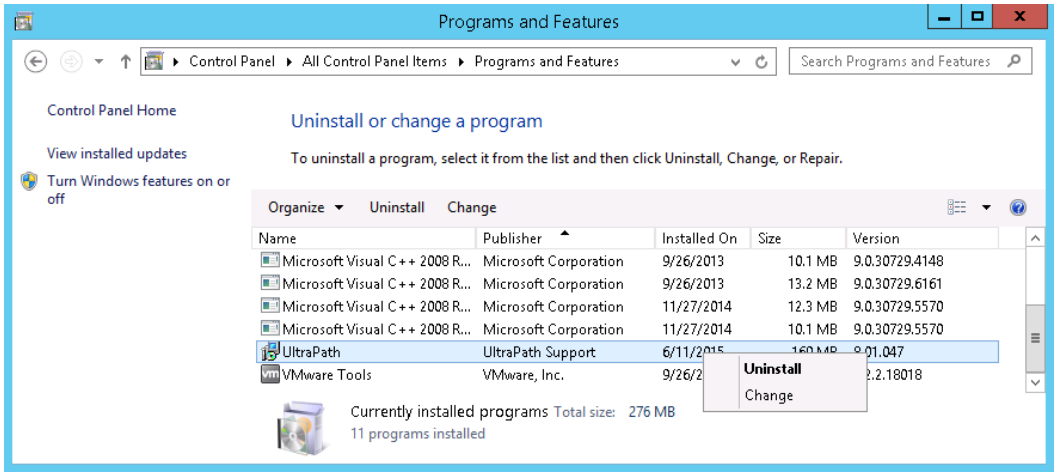
Prerequisites

Make sure that UltraPath software is installed on the host. If UltraPath software is not installed on the host, go to section 3.2.3.1.2 Installing the UltraPath Software.

Operation Procedure

Step 1 Uninstall UltraPath software of the earlier version. Click **Add or Remove Programs** on the control panel. Click UltraPath software to be removed, and click **Remove**.

Figure 3-55 Uninstalling the UltraPath on the control panel



Step 2 As the uninstalling process begins, execute the InstallShield Wizard first.

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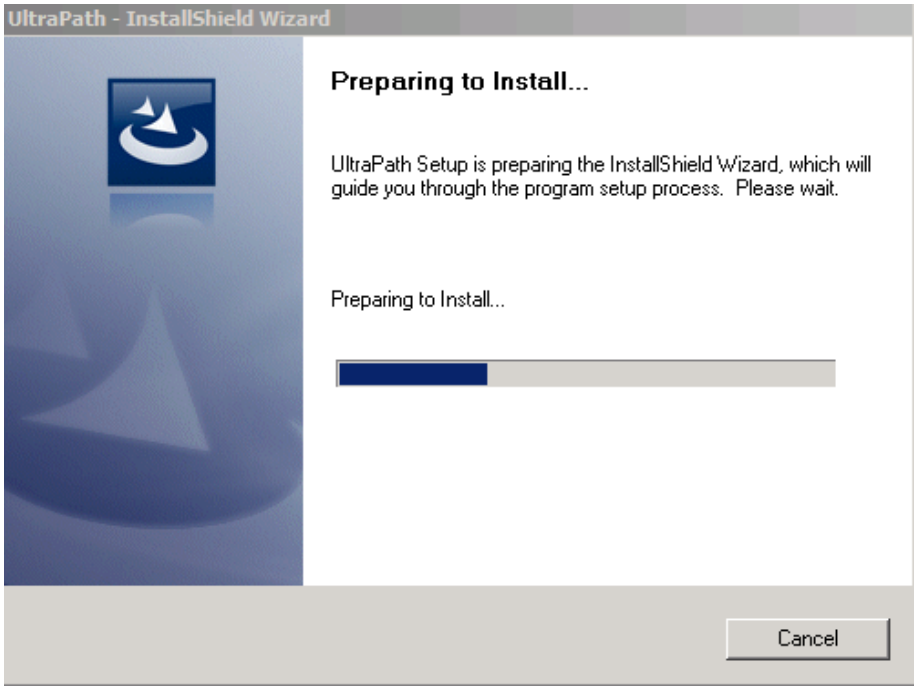
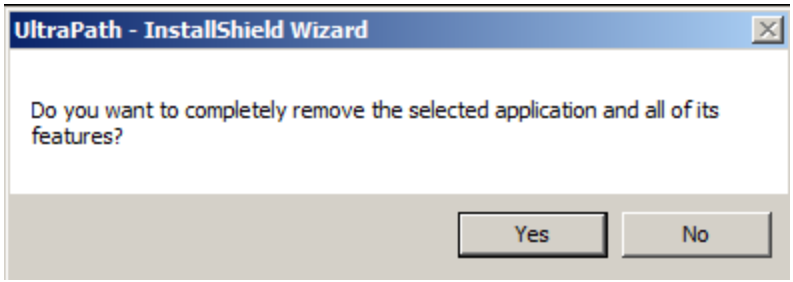
Figure 3-56 Wizard for uninstalling UltraPath for Windows



Step 3 A message is displayed stating "Do you want to completely remove the selected application and all of its features?" Click **"Yes."**

Figure 3-57 Prompt for uninstalling



Step 4 Uninstall drivers and files. The uninstalling progress is displayed.

Figure 3-58 Progress of uninstalling UltraPath for Windows 1

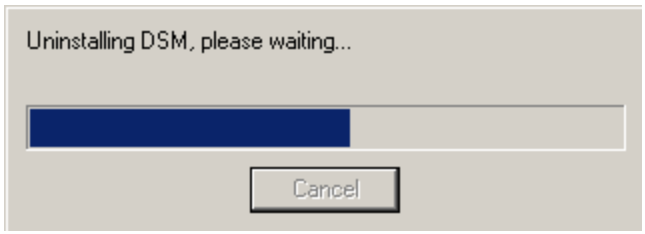


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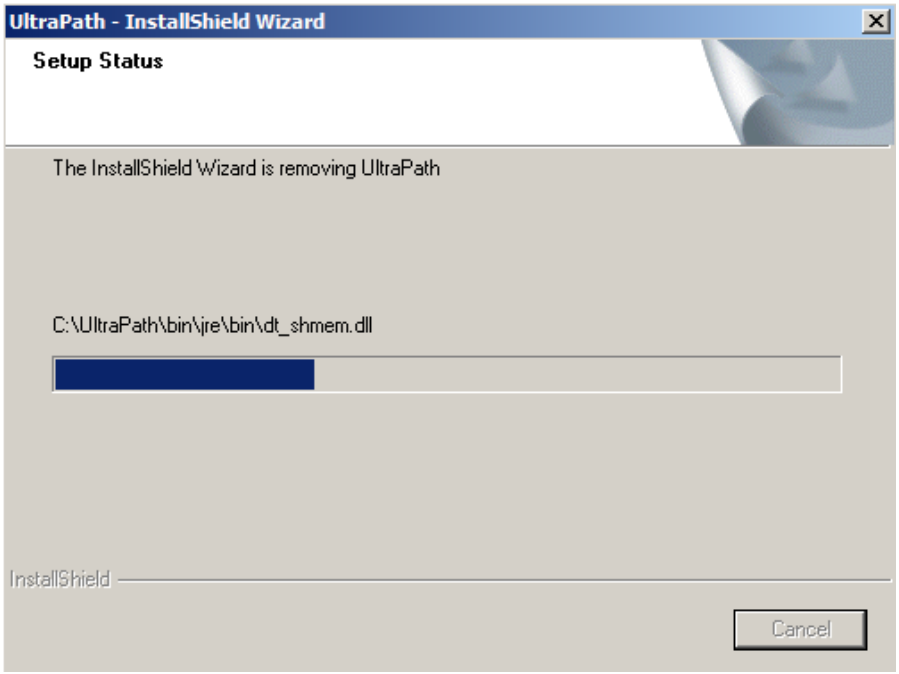
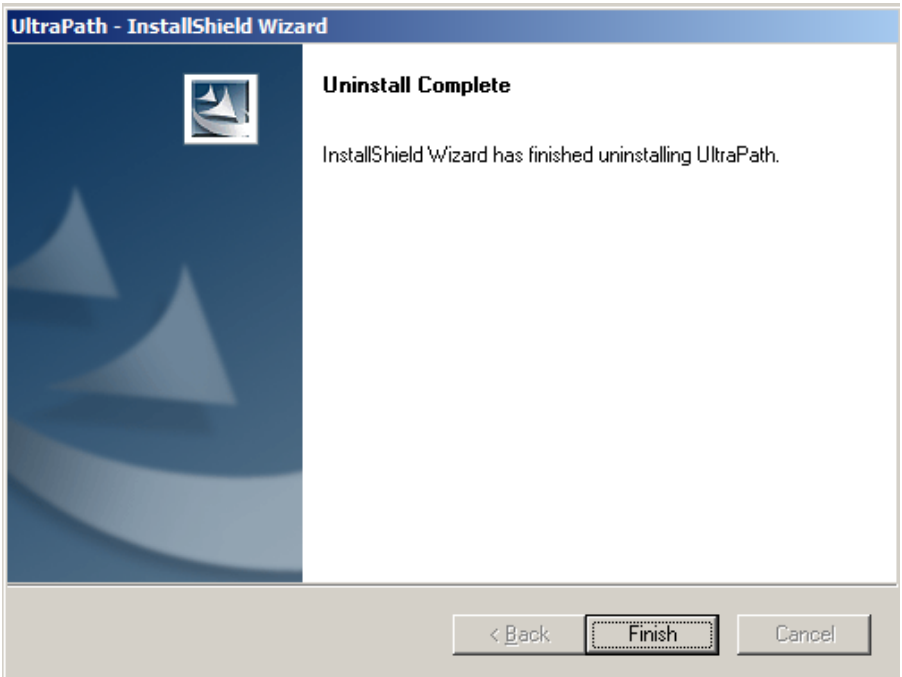
Figure 3-59 Progress of uninstalling UltraPath for Windows 2



Step 5 After InstallShield Wizard has finished uninstalling the UltraPath, click **Finish**.

Figure 3-60 Uninstalling complete



Step 6 A message is displayed indicating the host needs to be restarted. Select **Yes, I want to restart my computer now.** and click **Next**.

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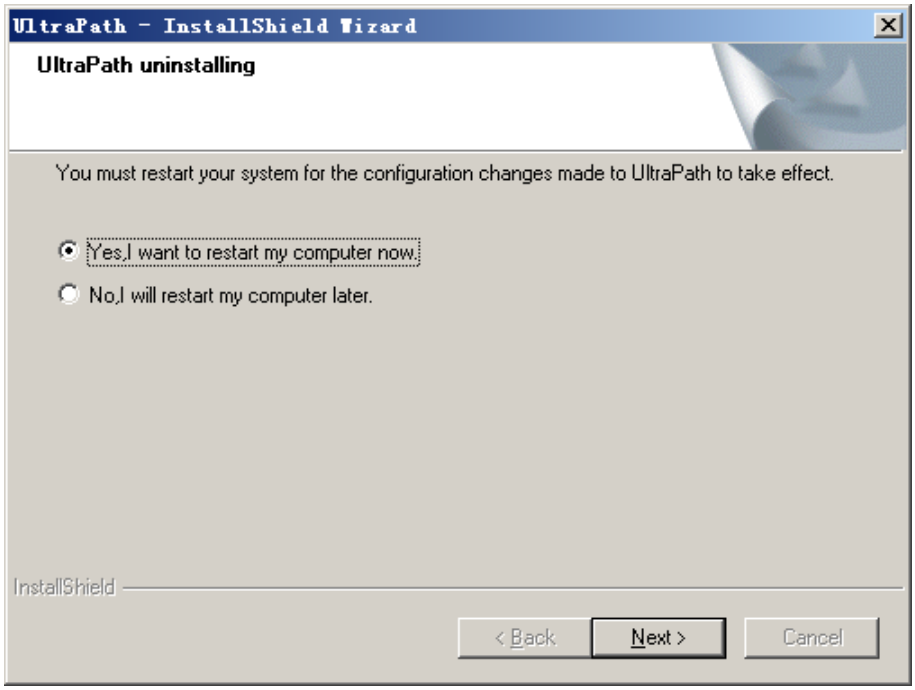
Figure 3-61 Prompt for restarting



Step 7 If multiple users have logged in to the host, the host does not restart after you click the **Restart** button. In this case, you must manually restart the host. You can check whether multiple users have logged in to the host in the Windows task manager.

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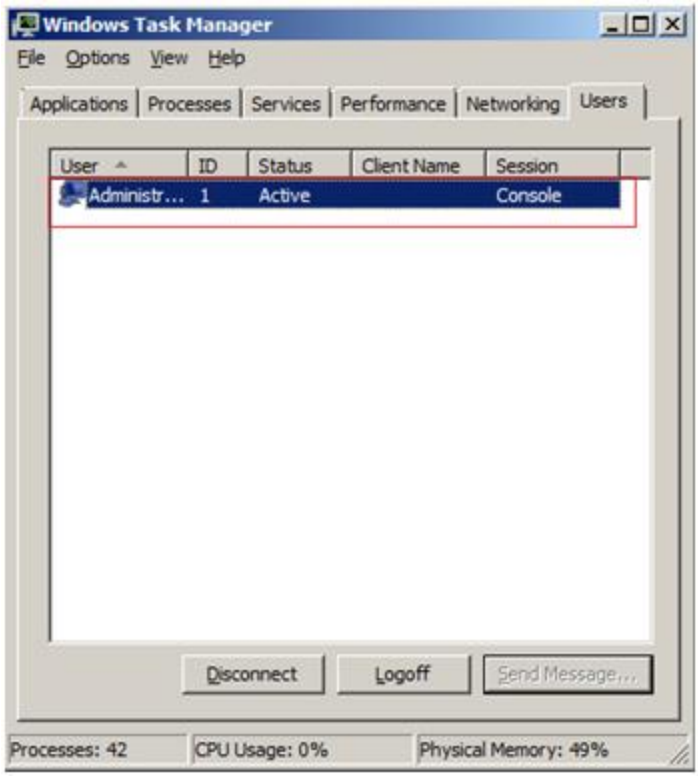
Figure 3-62 Multiple Users



----End

Verification

After the host restarts, the shortcut of UltraPath is not displayed on the desktop and **UltraPath** disappeared from **Add or Remove Programs** in the control panel.

Troubleshooting

In case that the system fails to start after the host restarts, restart the system again manually and press **F8** repeatedly during the restart process to enter the system startup options list. Select **Last Known Good Configuration** from the list to access the system.

3.2.3.1.2 Installing the UltraPath Software

Description

Install the new version of UltraPath software.

Precautions

Check all items specified in section 3.2.2 Preparing for the Upgrade. Do not do other operations during the installation. Restart the host after the installation is complete.

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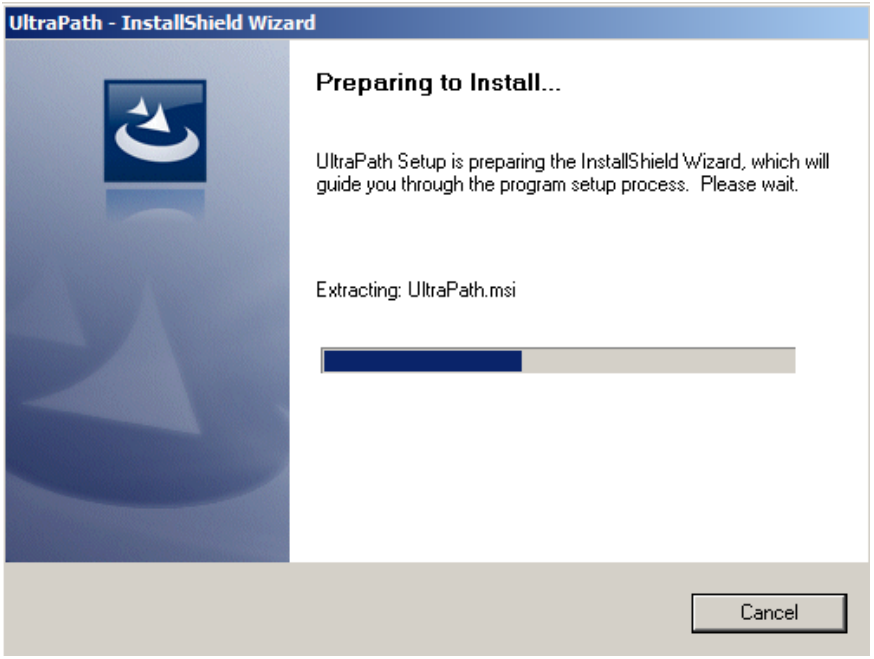
Procedure

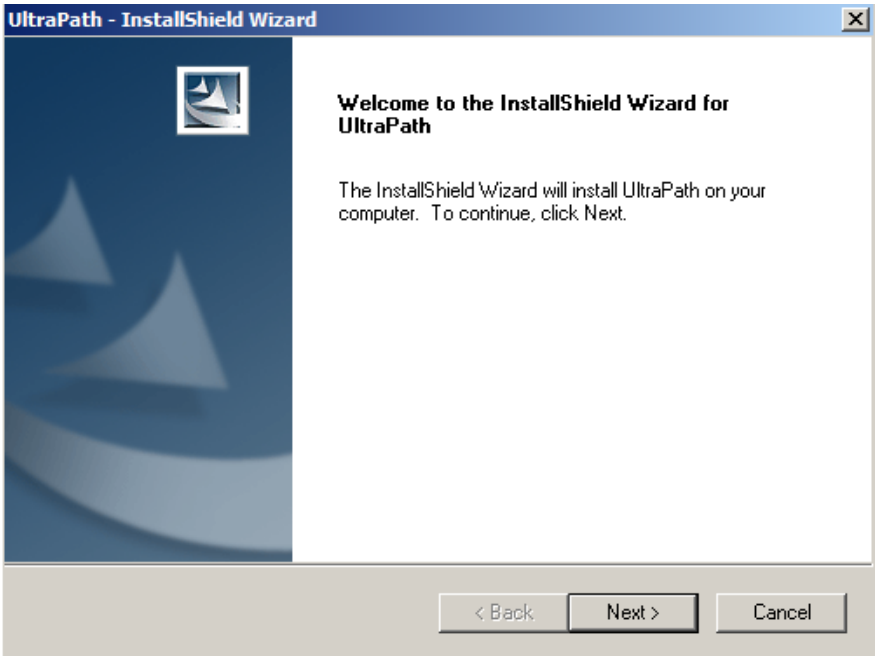
Step 1 Double-click the installation package to start the installation. Execute the InstallShield Wizard first.

Figure 3-63 Wizard for installing UltraPath for Windows



Step 2 Click **Next**.

Figure 3-64 Welcome page of UltraPath for Windows installation wizard



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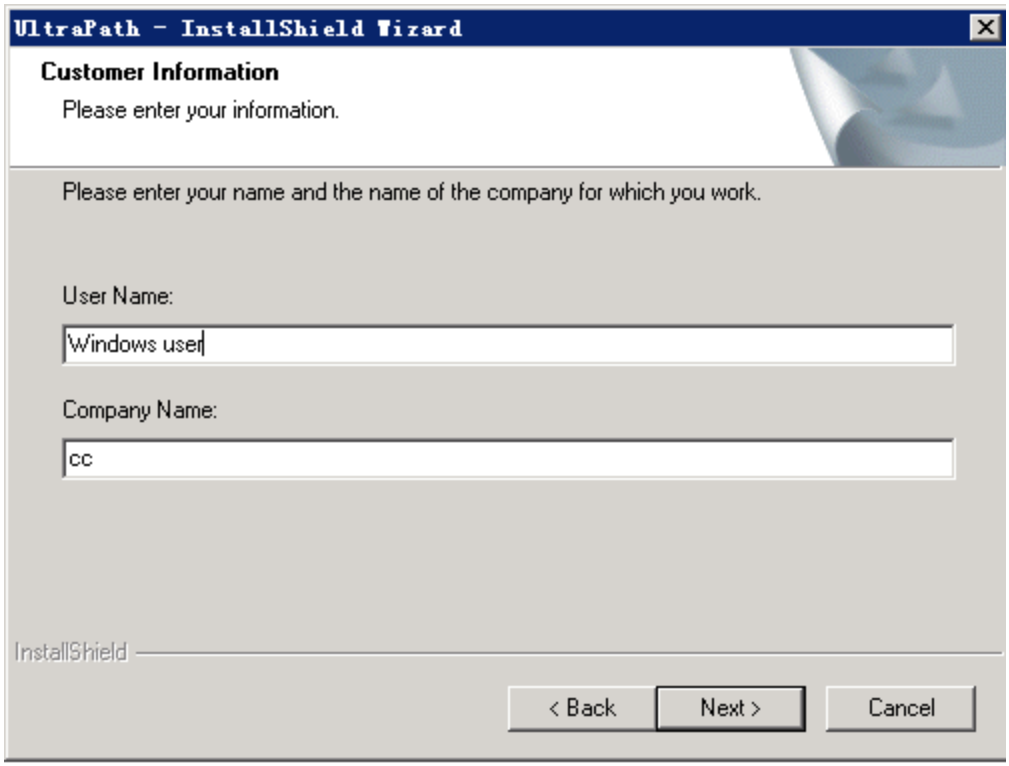
Step 3 Enter your user name and company name and click **Next**.

Figure 3-65 Prompt for input of user information



Step 4 Click Install.

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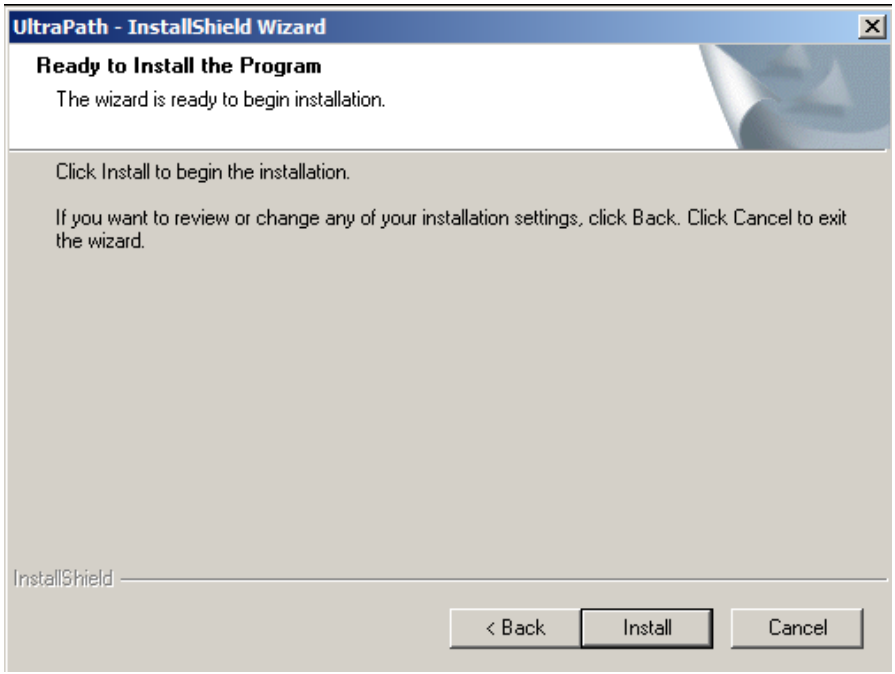
Figure 3-66 Starting installation of UltraPath for Windows



Step 5 The installing progress is displayed.

Figure 3-67 Progress of installing UltraPath for Windows 1

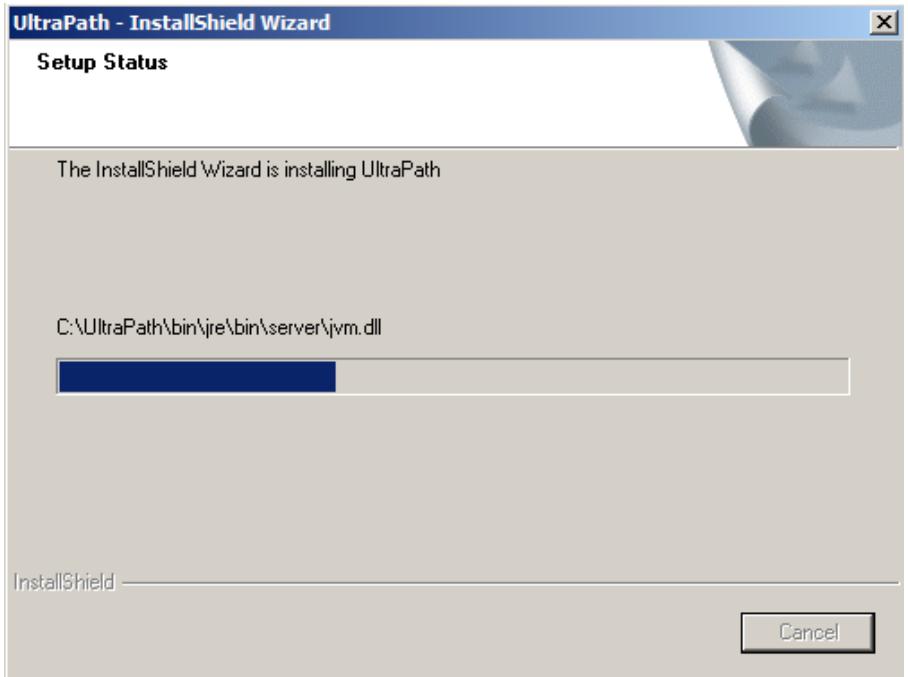


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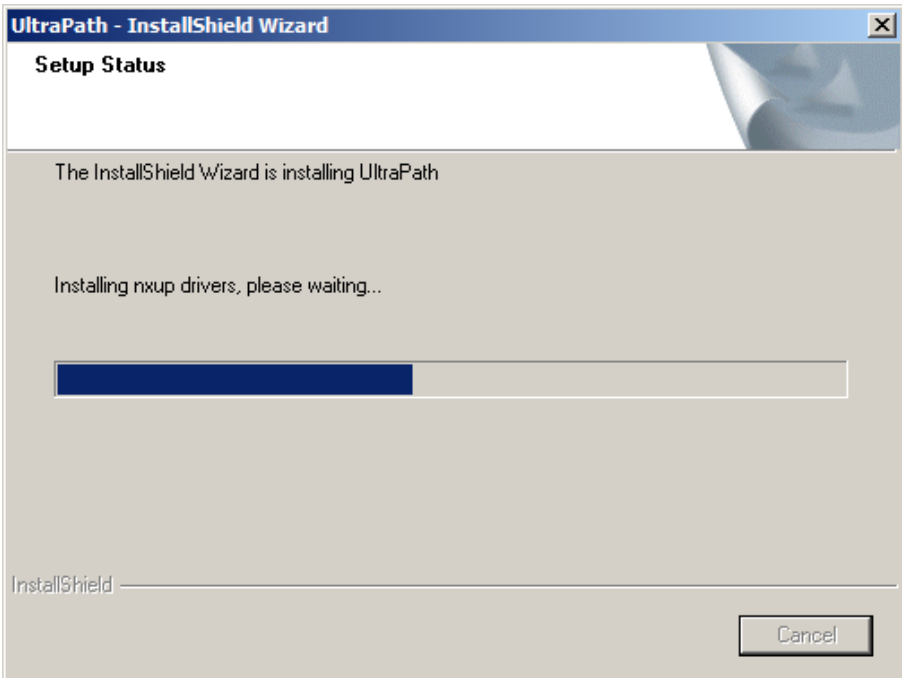
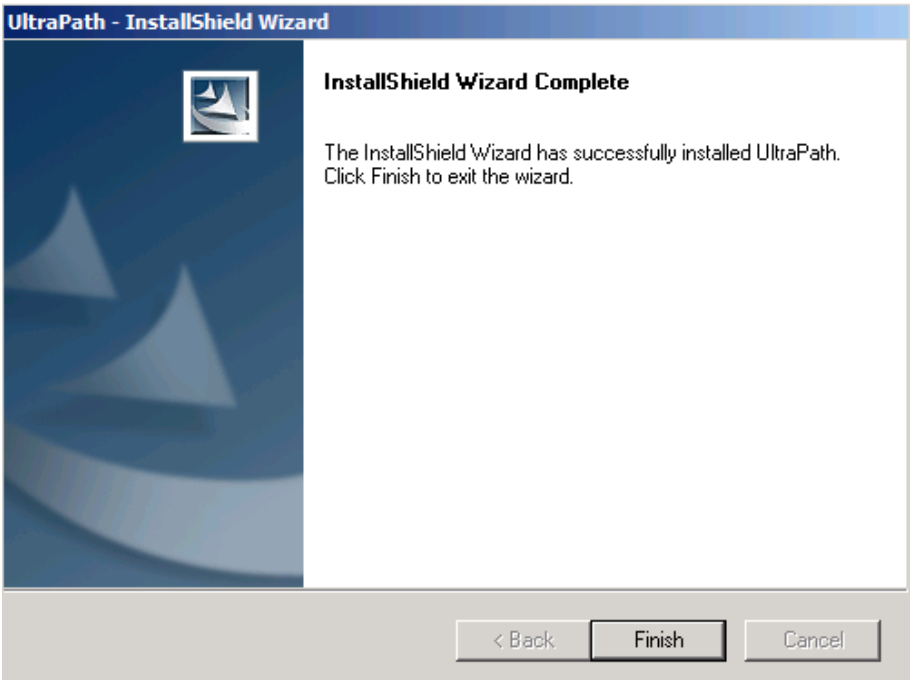
Figure 3-68 Progress of installing UltraPath for Windows 2



Step 6 Click **Finish** to complete the installation.

Figure 3-69 Completing the installation of UltraPath for Windows



Step 7 Click **Next**. The system restarts automatically.

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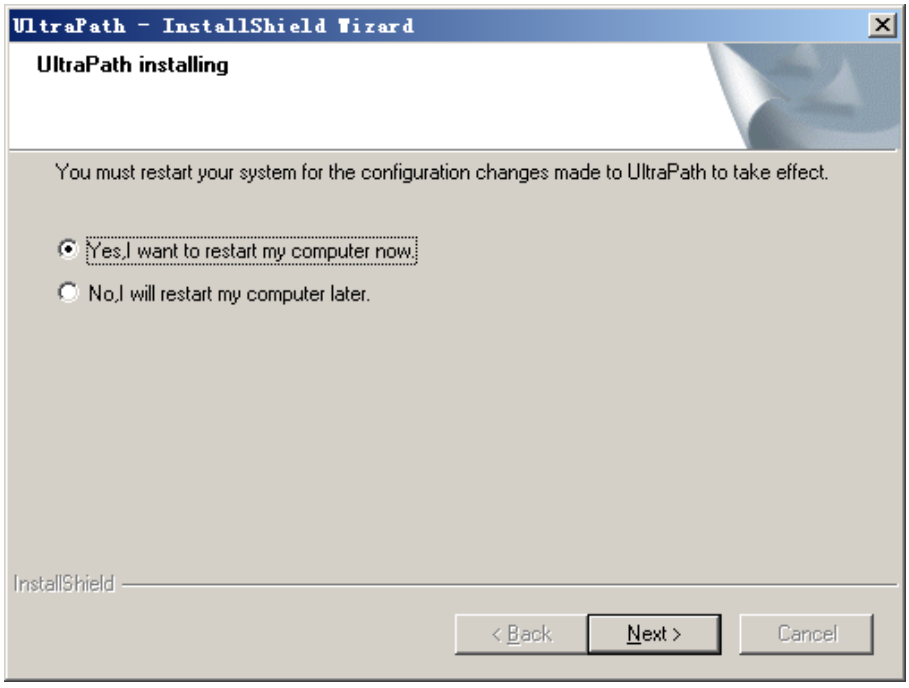
Figure 3-70 Prompt for restarting



----End

Verification

The shortcut of UltraPath software is displayed on the desktop. Double-click the icon. The UltraPath management interface is displayed without an anomaly prompt. Check the version in CLI which matches the current version.

Troubleshooting

In case that the system fails to start after the host restarts, restart the system again manually and press **F8** repeatedly during the restart process to enter the system startup options list. Select **Disable Driver Signature Enforcement** to access the system. Uninstall UltraPath software and install the earlier version.

3.2.3.2 Direct upgrade : Upgrade the software using the installation package

3.2.3.2.1 Upgrading the UltraPath Software from V100R008C00 or V100R008C20 or V100R008C30 or V100R008C50 or 21.0.1 or 21.1.0 Lower Version to this version

Description

The major assignment to upgrade the UltraPath is to replace previous files and make the new files take effect.

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Precautions

Check all items specified in section 3.2.2 Preparing for the Upgrade. In an SCSI-2 cluster environment, you must transfer cluster resources before upgrading UltraPath. Do not open related programs during the upgrade. Restart the host as prompted.

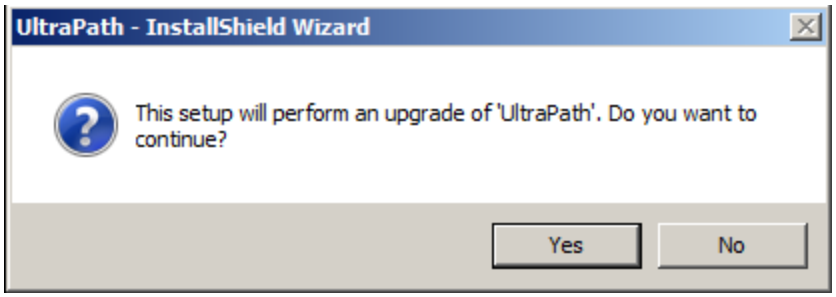
Prerequisites

Make sure that UltraPath software is installed on the host. If UltraPath software is not installed on the host, go to section 3.2.3.1.2 Installing the UltraPath Software.

Operation Procedure

Step 1 Double-click the package andclick **Yes**.

Figure 3-71 Setup will perform an upgrade of 'UltraPath'



Step 2 As the upgrading process begins, execute the InstallShield Wizard first.

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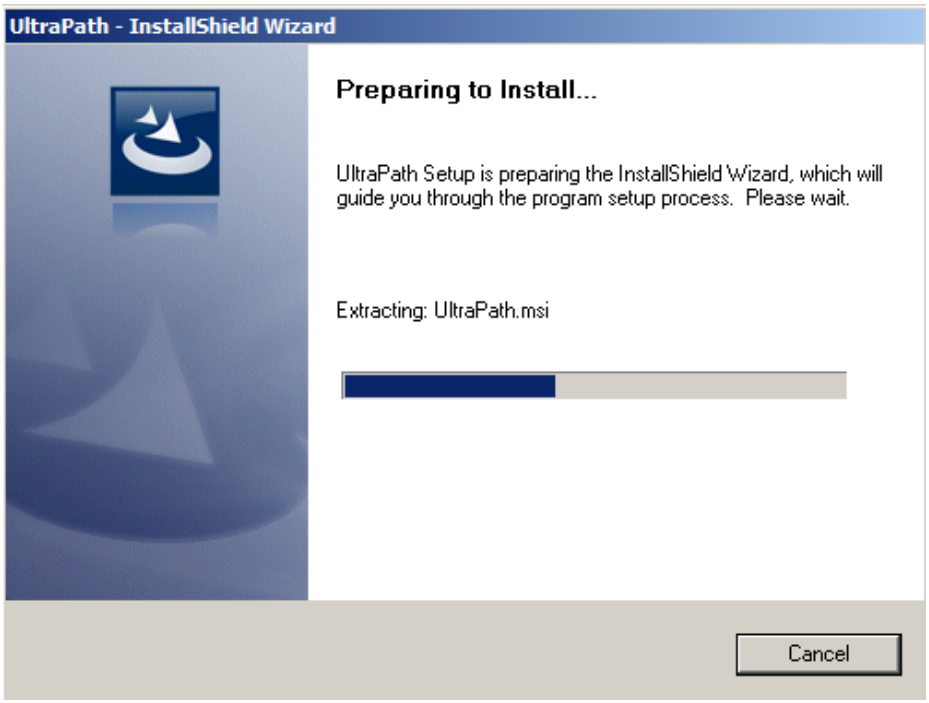
Figure 3-72 Wizard for upgrading UltraPath for Windows



Step 3 Click **Next**.

Figure 3-73 Starting the upgrade of UltraPath

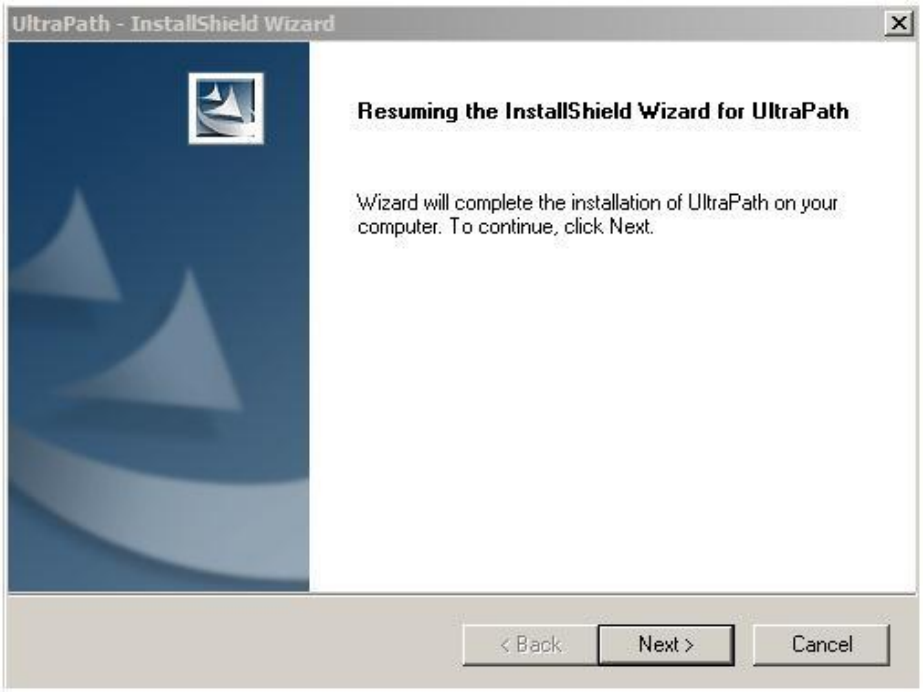


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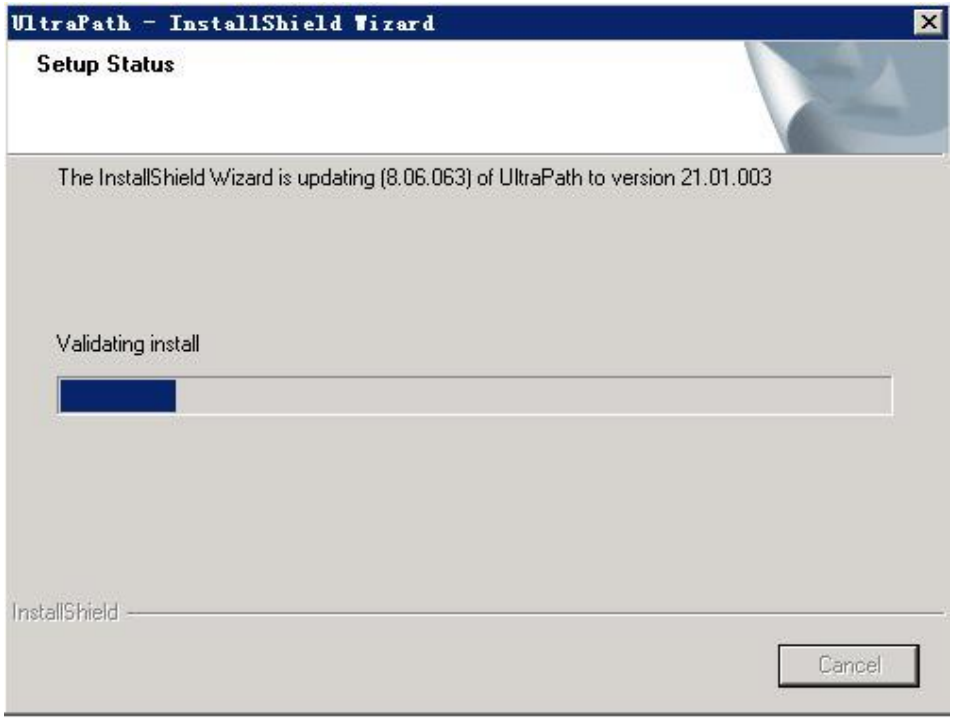
Figure 3-74 Progress of upgrading UltraPath



Step 4 Setup will perform **offline upgrade** and click **Yes**, as shown in Figure 3-75. (This step is necessary only when you need to upgrade from a V100R008, 21.0.1 version or an old 21.1.0 version to a new 21.1.0 version.)

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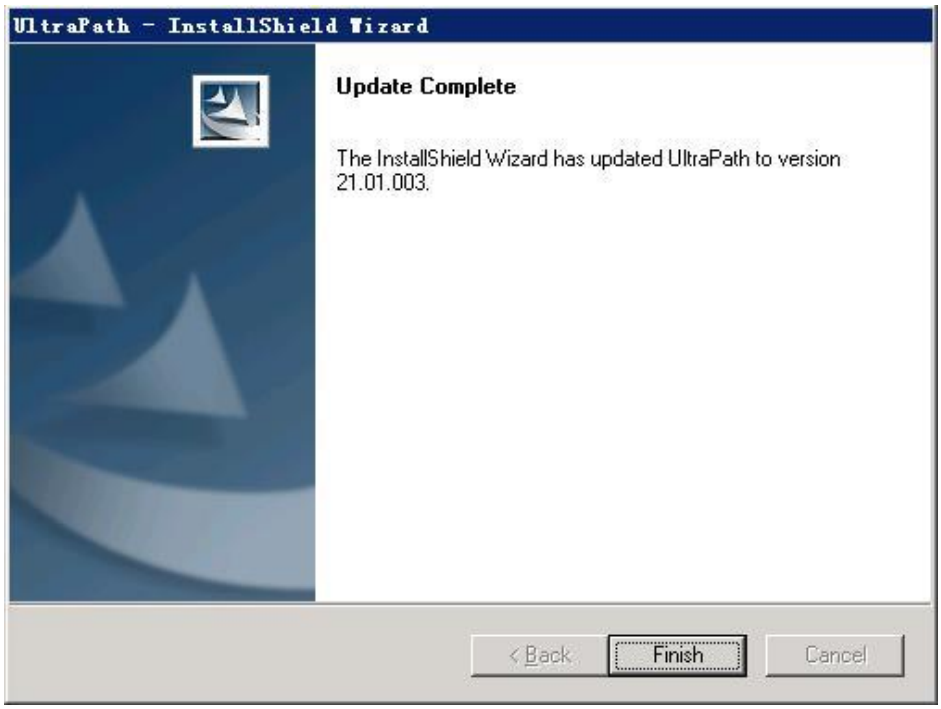
Figure 3-75 Upgrading step 3 for Windows UltraPath

Step 5 After the upgrade is complete, click **Finish**.

Figure 3-76 Upgrading complete



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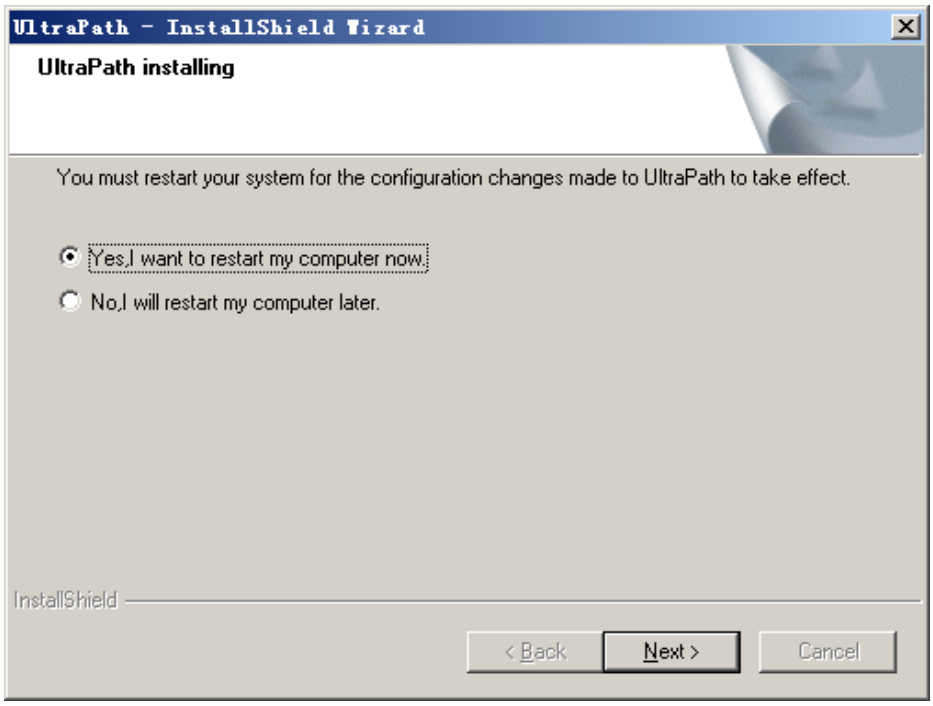
Step 6 If drivers need to be upgraded, you are prompted to restart the host. Choose **Yes, I want to restart my computer now** and click **Next**.

Figure 3-77 Prompt for restarting



----End

Verification

After the upgrade, the shortcut of UltraPath is not displayed on the desktop and **UltraPath** disappeared from **Add or Remove Programs** in the control panel.

Troubleshooting

In case that the system fails to start after the host restarts, restart the system again manually and press **F8** repeatedly during the restart process to enter the system startup options list. Select **Last Known Good Configuration** from the list to access the system.

3.2.3.2.2 Upgrading the UltraPath Software from V100R005/V100R006 Version to this Version

Description

The major assignment to upgrade the UltraPath is to replace previous files and make the new files take effect. This section introduces the function to upgrade from V100R005/V100R006 version to this version.

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Precautions

Check all items specified in section 3.2.2 Preparing for the Upgrade. Do not open related programs during the upgrade. Restart the host as prompted.

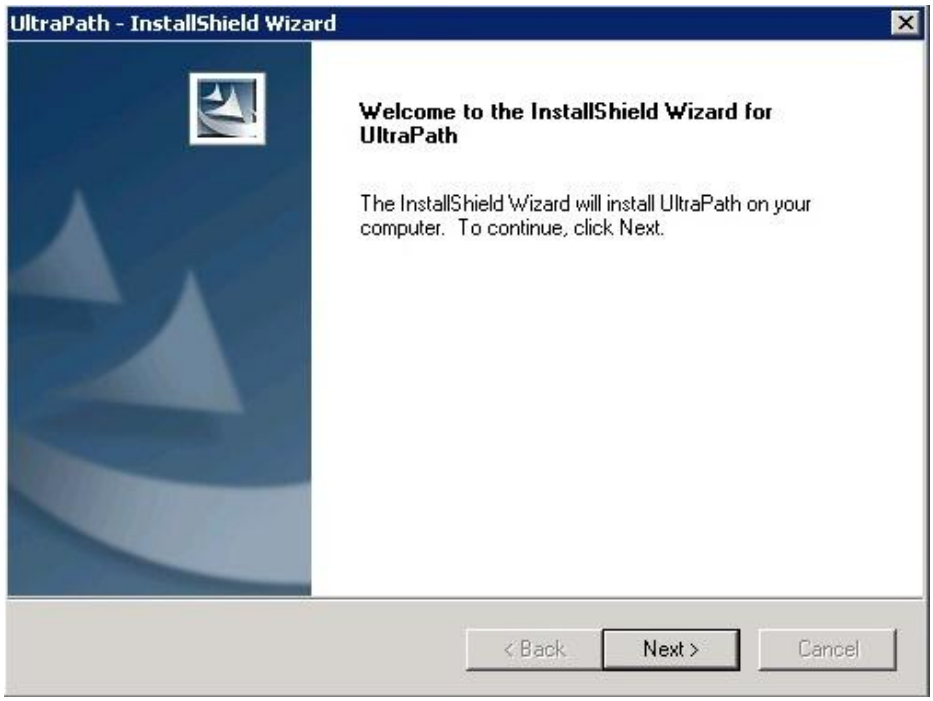
Prerequisites

Make sure that UltraPath software is installed on the host. If UltraPath software is not installed on the host, go to "Installing the UltraPath Software" of the section 3.2.3.1.2 Installing the UltraPath Software.

Procedure

Step 1 Double-click package and click **Next**.

Figure 3-78 Installing InstallShield Wizard



Step 2 Enter the company name and click **Next**.

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Figure 3-79 Entering the company name

Step 3 Click **Install**.

Figure 3-80 Starting the upgrade of UltraPath

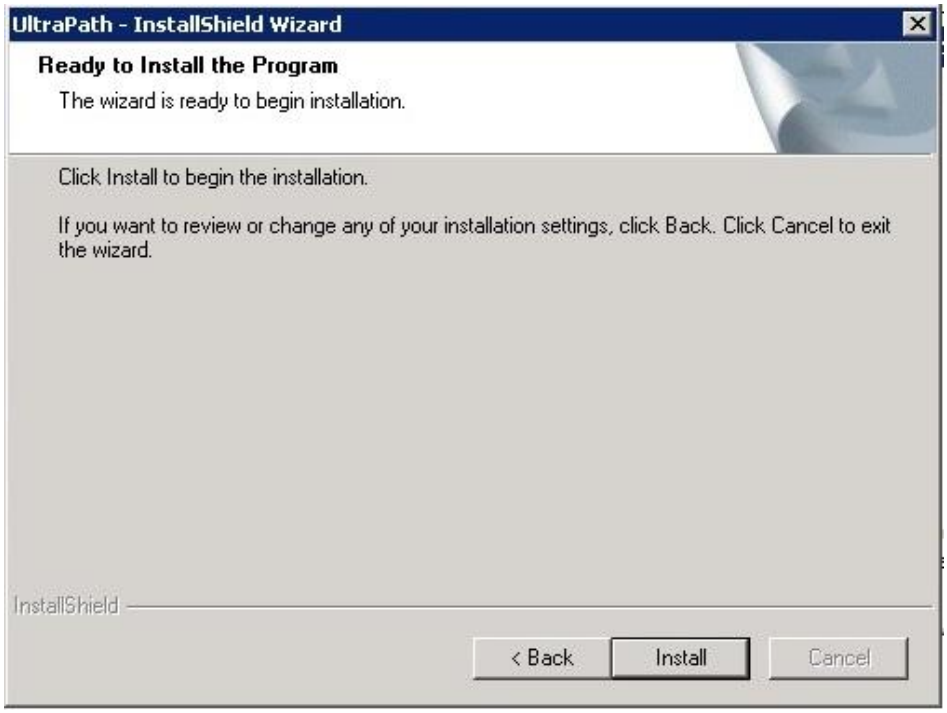

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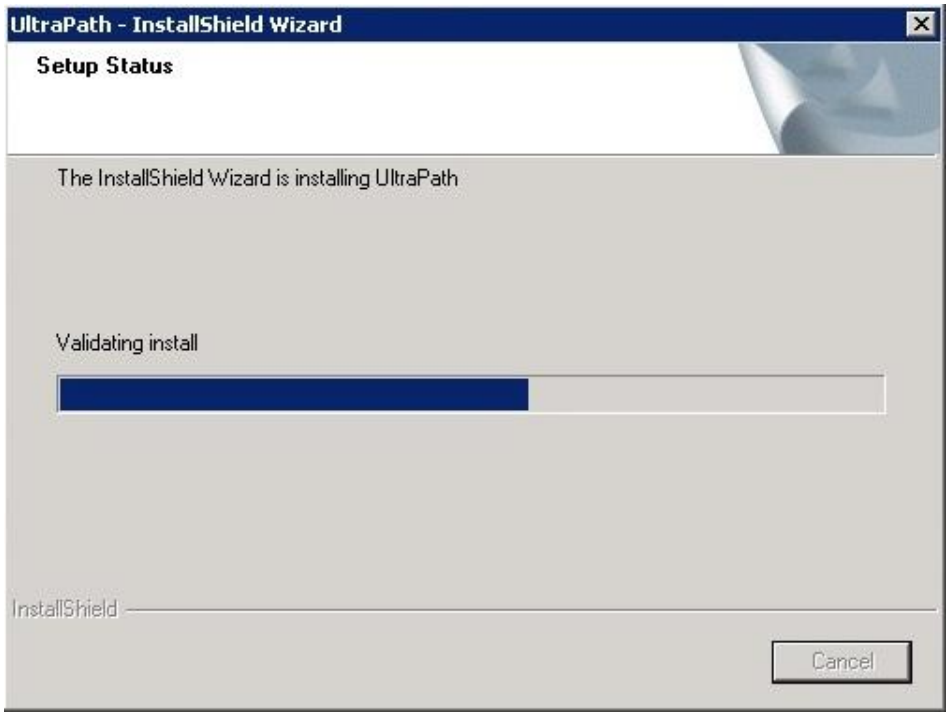
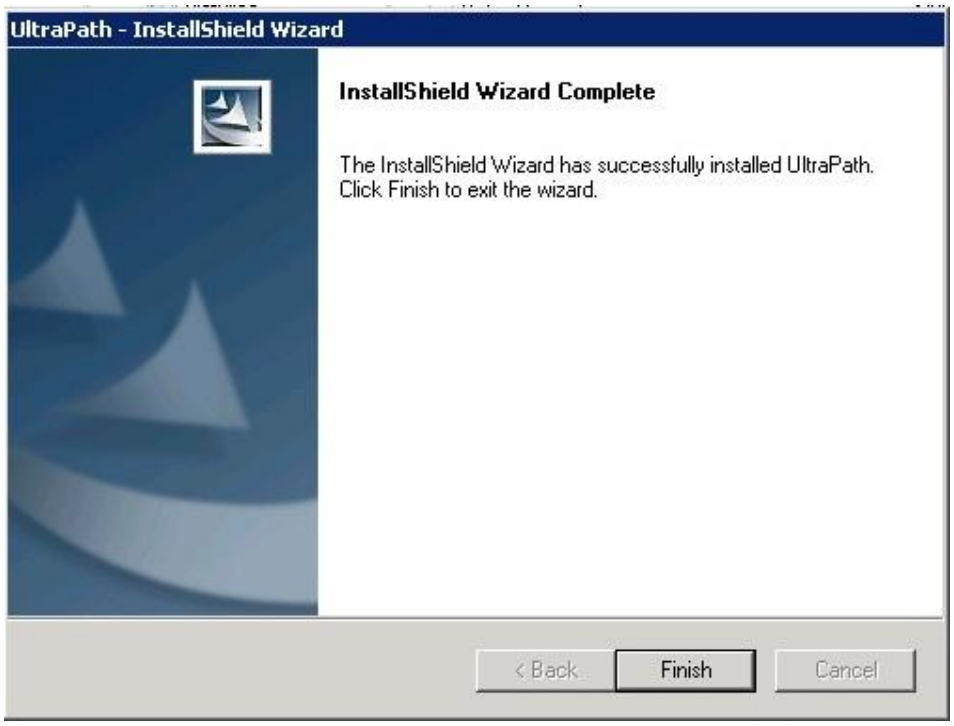
Figure 3-81 Progress of upgrading UltraPath



Step 4 After the upgrade is complete, click **Finish**.

Figure 3-82 Upgrading complete



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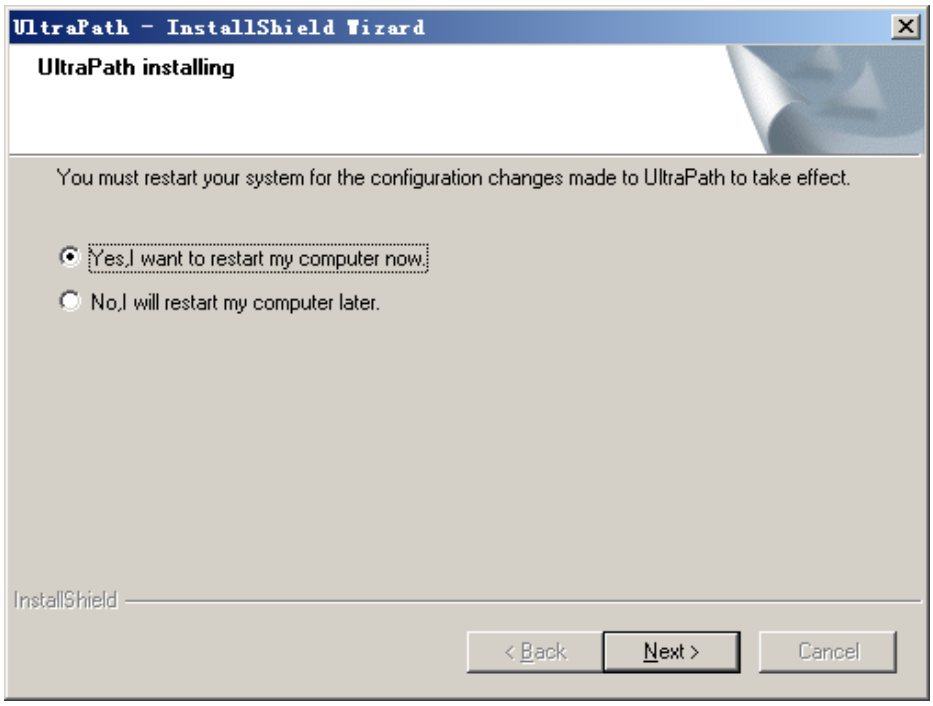
Step 5 If drivers need to be upgraded, you are prompted to restart the host. Choose **Yes, I want to restart my computer now** and click **Next**.

Figure 3-83 Prompt for restarting



----End

Verification

After the upgrade, the shortcut of UltraPath is not displayed on the desktop and **UltraPath** disappeared from **Add or Remove Programs** in the control panel.

Troubleshooting

In case that the system fails to start after the host restarts, restart the system again manually and press **F8** repeatedly during the restart process to enter the system startup options list. Select **Last Known Good Configuration** from the list to access the system.

3.2.4 Upgrade Scheme 2 : Online Upgrade

3.2.4.1 Upgrading the UltraPath Software

Description

If a non-disruptive upgrade is performed, new files replace existing files and take effect. Besides, the original UltraPath configuration is inherited.

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Precautions

Check all items specified in section 3.2.2 Preparing for the Upgrade. Do not open related programs during the upgrade. Only V100R008C00 and V100R008C20 and V100R008C30 and V100R008C50 and 21.0.1 and earlier 21.1.0 can be upgraded to this version non-disruptively. Ensure that the installation package and the **Upgrade** folder are under the same directory.

Prerequisites

Make sure that UltraPath software is installed on the host. If UltraPath software is not installed on the host, go to "Installing the UltraPath Software" of the section 3.2.3.1.2 Installing the UltraPath Software.

Procedure

Step 1 Check whether there are physical disks that UltraPath does not take control of. If there is a physical disk that UltraPath does not take control of, refer to section 3.3.1 UltraPath for Windows Support List to check whether the disk is in the UltraPath support list. If the disk is in the list, stop its services, remove its mapping relationship with the host, and then perform online upgrade. The following provides a detailed method:

1 Right-click **My Computer** and choose **Manage.** The **Computer Management** window is displayed. Open **Device Manager**. In the **Disk drives** list, check whether there are physical disks that UltraPath does not take control of. (**UltraPath_Disk** indicates a virtual disk that UltraPath manages. See Figure 3-84. If there is no **UltraPath_Disk**, right-click a physical disk, choose **Properties**, and click the **Details** tab. Select **Device Instance Path** and check whether the value contains **UPIO** before the first slash (\) and **ULTRAPATH** before the second slash. If the value contains these two key words, the disk is an UltraPath virtual disk; otherwise, the disk is not the virtual disk. See Figure 3-85. If UltraPath takes control of all physical disks, go to step 2 to perform online upgrade.

NOTE

*Before checking for the physical disks, right-click **My Computer** and choose **Manage**. The **Computer Management Window** is displayed. Open **Device Manager**, and in the **View** menu, check whether the **Show hidden devices** option is selected. If it is selected, deselect it.*

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Figure 3-84 Checking for UltraPath physical disks

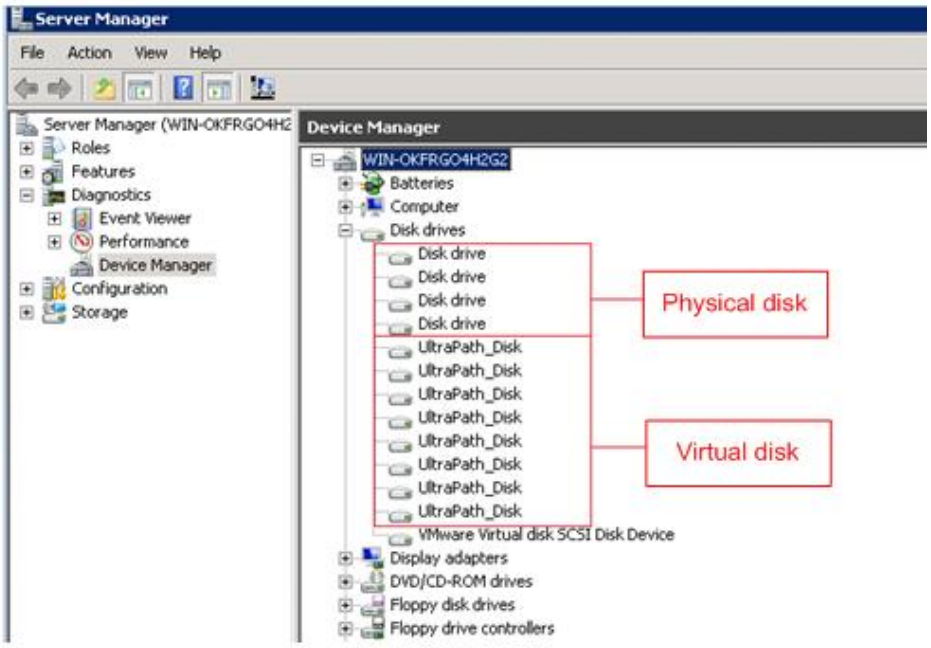
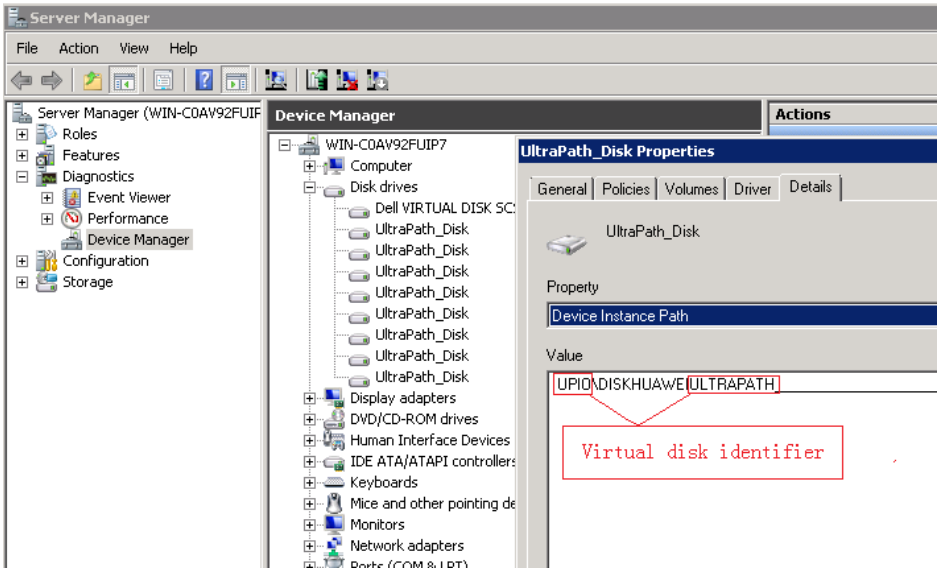


Figure 3-85 Checking for UltraPath virtual disks



2 If there is a physical disk that UltraPath does not take control of, right-click the disk and choose **Properties**. On the **Details** tab page, select **Device Instance Path**,and record the **Vendor ID** and **Product ID** of the disk. (**Vendor ID** is the parameter after **VEN_** and **Product ID** is the parameter after **PROD_**. In Figure 3-86, **Vendor ID** is **HUAWEI** and **Product ID** is **S2600T**.

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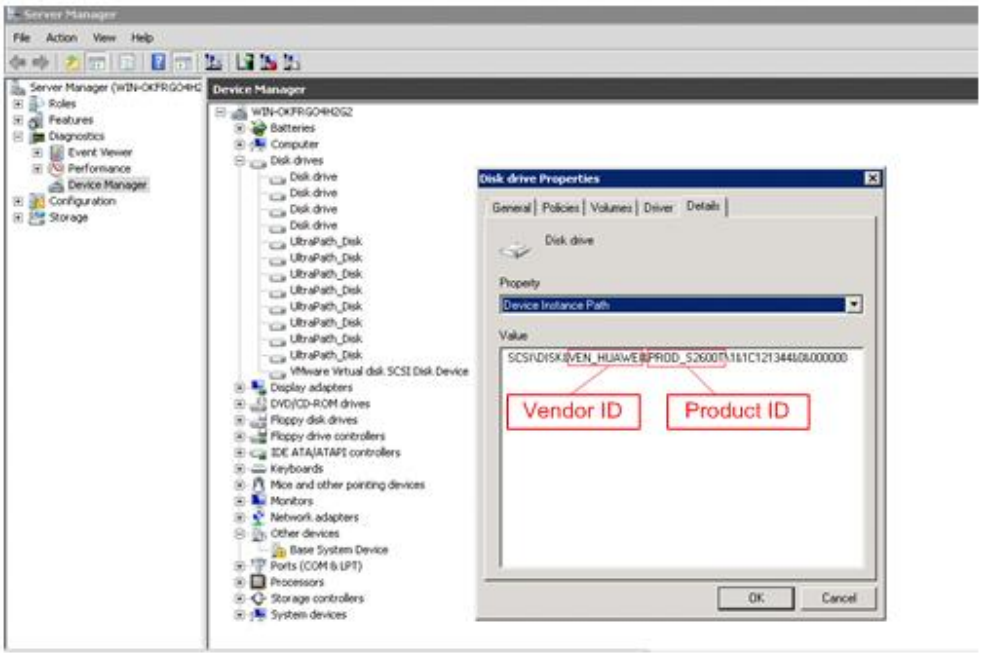
Figure 3-86 Vendor ID and product ID of physical disk



3 Refer to section 3.3.1 UltraPath for Windows Support List to check whether **Vendor ID** and **Product ID** are in the UltraPath support list If they are in the support list, stop the services between the host and physical disk, disconnect the link between them, and then perform online upgrade.

Step 2 Run package in cmd with parameter of online upgrade. For example, run package in cmd:

UltraPath-21.01.003.exe /z"UPMODE:NDU | *CPU:cpuvalue* | *MEMORY:memoryvalue* | *SPACE:spacevalue*"

Table 3-8 Parameters that can be specified by users during the online upgrade

Optional Parameter Name	Parameter Function	Description
UPMODE:NDU	Enables the online upgrade mode.	None.
CPU:cpuvalue	Set the maximum CPU usage for an online upgrade.	The value ranges from 0 to 100. Default value:80
MEMORY:memoryvalue	Set the minimum system memory for an online upgrade.	Unit: MB. Default value:200
SPACE:spacevalue	Set the minimum system disk capacity for an online upgrade.	Unit: MB. Default value:1024

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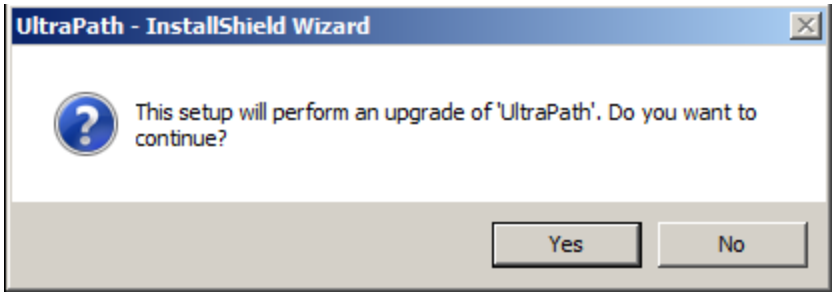
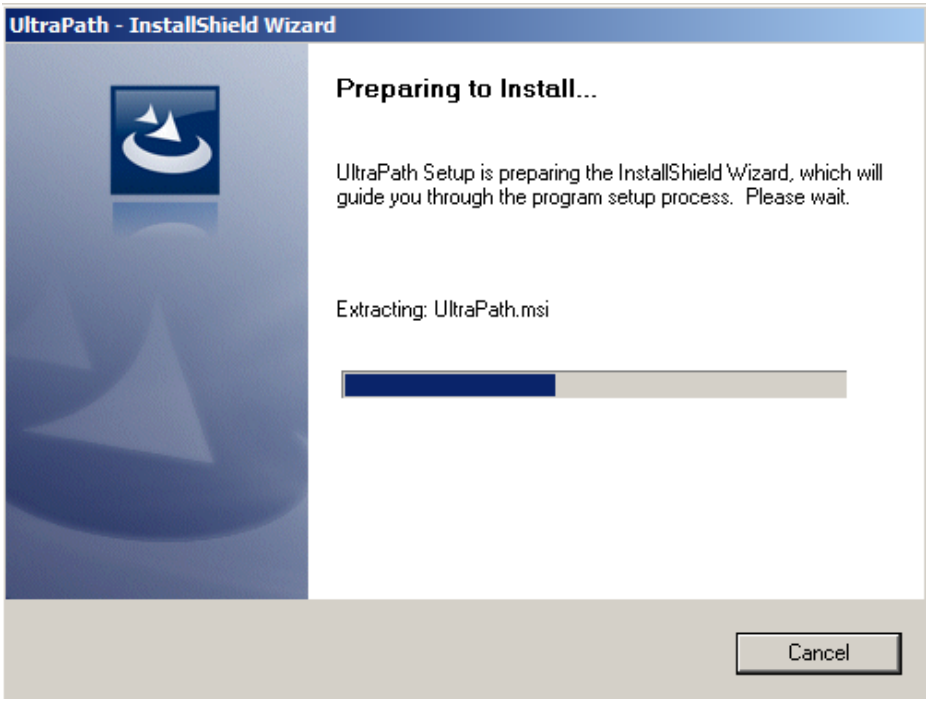
Step 3 Double-click package and click **Yes**, as shown in the following Figure 3-87.

Figure 3-87 Setup will perform an upgrade of 'UltraPath'



Step 4 As the upgrading process begins, execute the InstallShield Wizard first, as shown in the following .Figure 3-88

Figure 3-88 Wizard for upgrading UltraPath for Windows



Step 5 Click Yes to confirm the upgrade, as shown in the following Figure 3-89.

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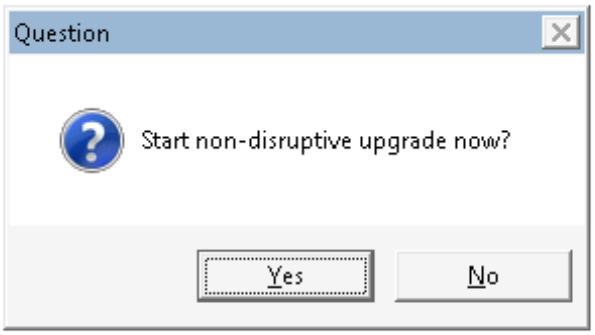
Figure 3-89 Setup will perform a non-disruptive upgrade of 'UltraPath'



Step 6 Click **Next**.

Figure 3-90 Start the upgrading of UltraPath

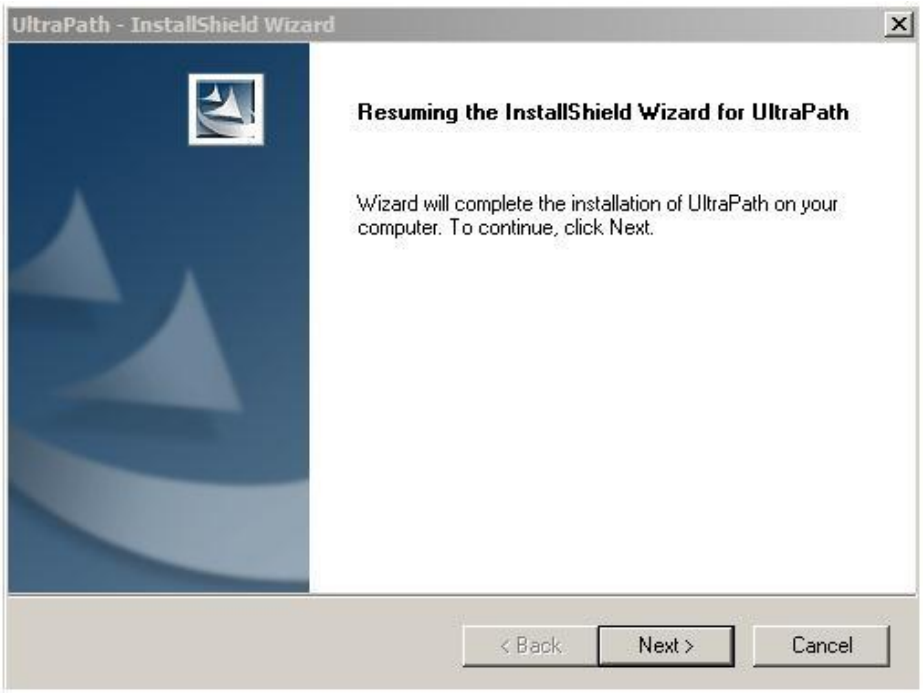


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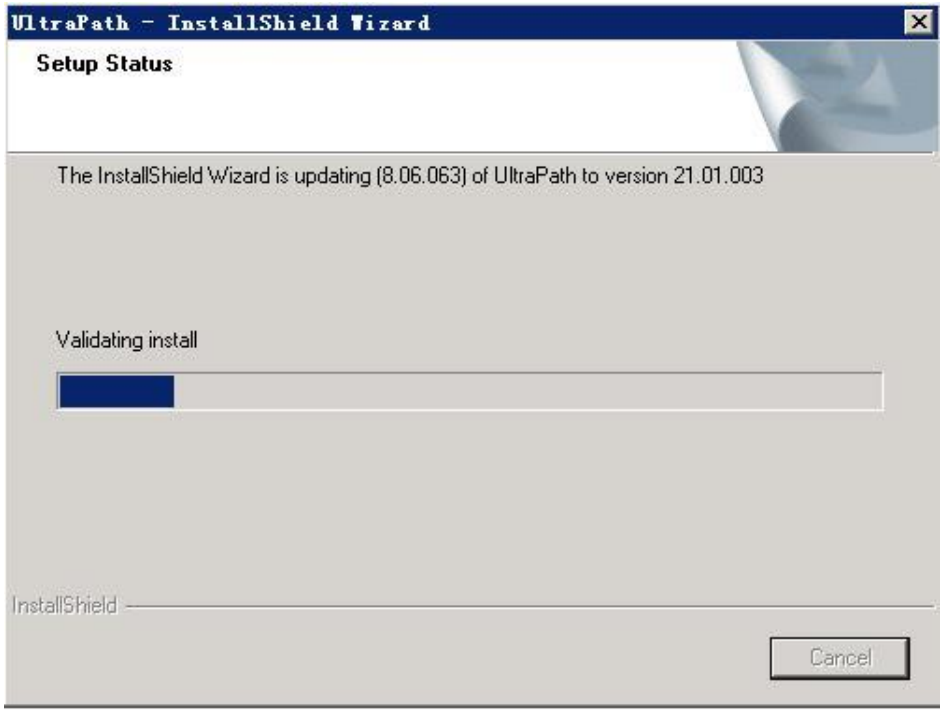
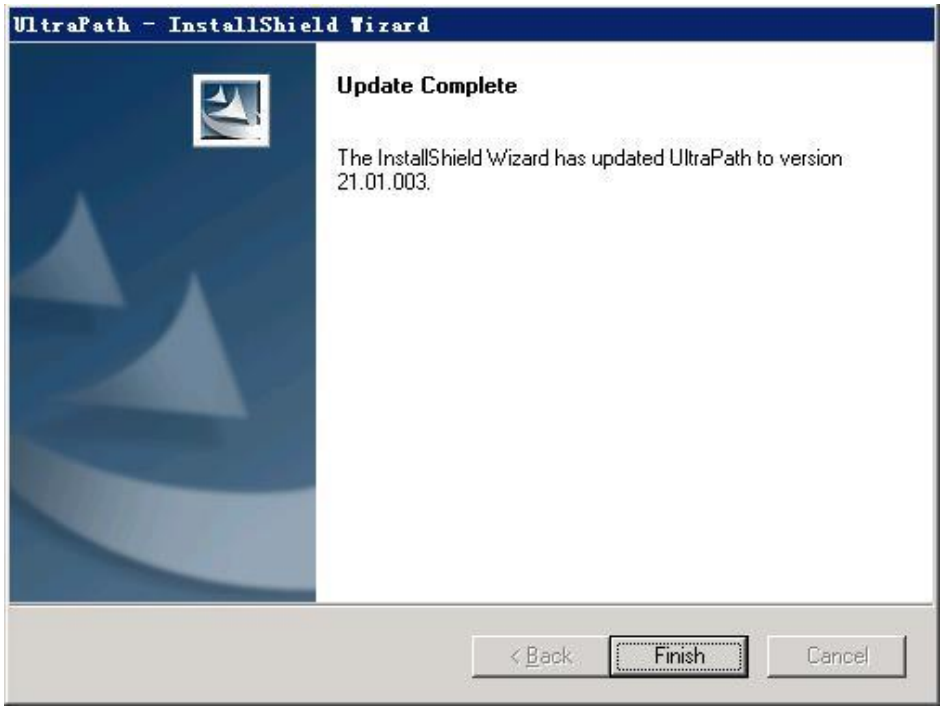
Figure 3-91 Progress of upgrading UltraPath



Step 7 Click **Finish** to complete the upgrade, as shown in Figure 3-92. By this step, the whole online upgrade process is complete.

Figure 3-92 Upgrading complete



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Step 8 If there is a physical disk that UltraPath does not take control of, and the disk is in the UltraPath support list (see section 3.3.1 UltraPath for Windows Support List), add the physical device that has been disconnected from the host in step 1 to the host again.

----End

Verification

After the upgrade, the shortcut of UltraPath is not displayed on the desktop and **UltraPath** disappeared from **Add or Remove Programs** in the control panel.

Troubleshooting

In case that the system fails to start after the host restarts, restart the system again manually and press **F8** repeatedly during the restart process to enter the system startup options list. Select **Last Known Good Configuration** from the list to access the system.

3.2.5 Verifying and Restoring after Upgrade

3.2.5.1 Verification Checklist

Table 3-9 Verification checklist for UltraPath for Windows

No.	Item	Operation Command	Standard
1	Check the version.	Open **UltraPath Console**,choose **Help ->about UltraPath Console**, and the version information of the UltraPath is displayed; or, run the **upadm show version** command on the CLI.	The returned version information matches the upgrade target version.
2	Properly generate physical and virtual disks.	Right-click **My Computer** and choose **Manage** from the shortcut menu. The **Computer Management** page is displayed. Choose **Device Manager** > **Disk drives**, and right-click on the page and choose **scan for hardware changes** from the shortcut menu.	The number of physical disks equals the number of virtual disks multiplied by the number of paths.
3	Check that the Cluster can work properly.	Ask the customer engineer to check whether the Cluster can run normally.	The Cluster Function Works.
4	Check that system services are running.	Checking whether the system services, whose states are manually changed before upgrade, are restored.	The system services state manually changed before upgrade are restored.
5	Check that applications are normally running.	Ask the customer engineer to check whether the applications (such as database) can run normally on the server.	The applications (such as database) can run normally.

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3.2.5.2 Checking the Version

Description

Check whether the current version is consistent with the one described in the release notes.

Precautions

The version information can be viewed only after the installation succeeds.

Procedure

Step 1 Run the **upadm show version** command.

Step 2 Confirm that the version number displayed in step 1 is the same as the target version number.

----End

Verification

The returned UltraPath version is the desired one.

Troubleshooting

If failure occurs when querying the version, it indicates that the driver does not function. In this case, uninstall UltraPath software and install it again.

3.2.5.3 LUNs Are Normally Presented

Description

Check whether the current UltraPath software can manage the disks to which the storage device maps.

Precautions

Recover all links and ensure that all links are normal.

Procedure

Step 1 In **Device Manager,** check whether the quantity of virtual disks and physical disks are the same with the quantity recorded before. (The following Figure 3-93 is used as an example only.)

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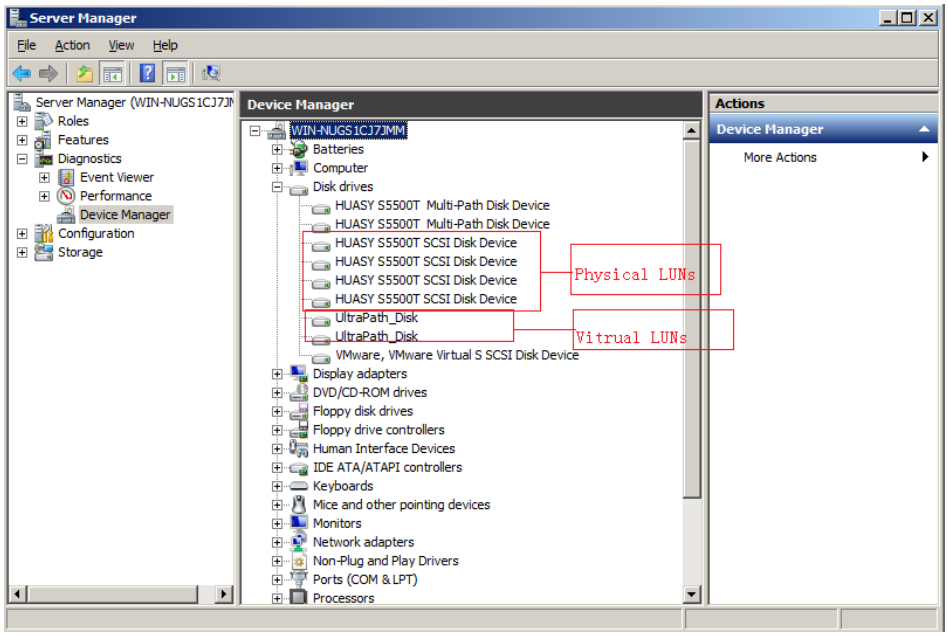
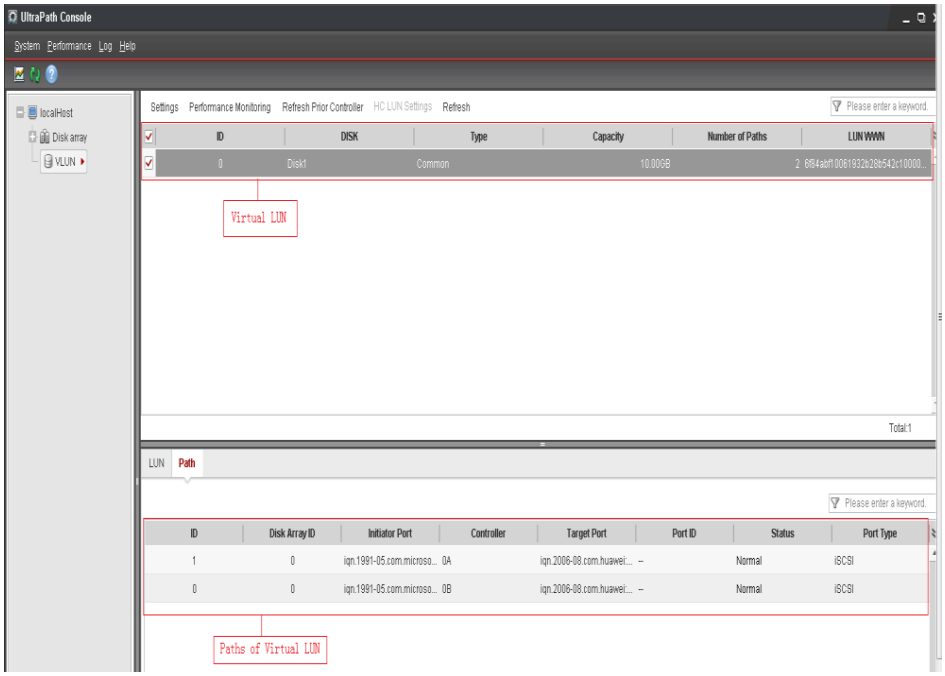
Figure 3-93 Checking LUNs in Device Manager



Step 2 Click **LUN** in UltraPath Console to check whether the quantity of virtual disks and the number of corresponding paths are the same with those recorded before upgrade.

Figure 3-94 Checking LUNs in UltraPath Console



----End

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Verification

Virtual disks are successfully generated. The quantity and capacity of virtual disks are consistent with those of LUNs mapped by storage devices.

Troubleshooting

If the quantity of virtual disks is incorrect or the status is abnormal, remove cables connecting the host and storage devices. Manually scan for disk drives. After all virtual disks are deleted, plug the cables and check the reported information.

3.2.5.4 Cluster Running Normally (Only Applicable to Cluster)

Ask the customer engineer to check whether the Cluster can run normally.

3.2.5.5 SystemServices' States Are Restored

Check whether the system services' states, which are manually changed before the upgrade, are restored.

3.2.5.6 Applications (such as Database) Are Normally Running

Ask the customer engineer to check whether the applications (such as database) can run normally on the server.

3.2.6 Rolling Back to the Source Version

3.2.6.1 Uninstalling the UltraPath Software

Description

In case that the newly-installed UltraPath software is unusable because of anomalies, uninstall it and install the earlier version.

Precautions

For details, see section 3.2.3.1.1 Uninstalling the UltraPath Software.

Operation Procedure

For details, see section 3.2.3.1.1 Uninstalling the UltraPath Software.

Result Verification

For details, see section 3.2.3.1.1 Uninstalling the UltraPath Software.

Troubleshooting

For details, see section 3.2.3.1.1 Uninstalling the UltraPath Software.

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3.2.6.2 Installing the UltraPath Software of the Earlier Version

Description

Install UltraPath software of the earlier version.

Precautions

For details, see section 3.2.3.1.2 Installing the UltraPath Software.

Operation Procedure

For details, see section 3.2.3.1.2 Installing the UltraPath Software.

Result Verification

For details, see section 3.2.3.1.2 Installing the UltraPath Software.

Troubleshooting

For details, see section 3.2.3.1.2 Installing the UltraPath Software.

3.3 Appendix

3.3.1 UltraPath for Windows Support List

Vendor ID	Product ID
HUAWEI	S6800E
	V1500
	V1500N
	V1800
	S2100
	S2300
	S2300E
	S2600
	S2900
	S5300
	S5100
	S5500
	S5600

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Vendor ID	Product ID
	S8000-I
	V1600N
	S3900
	S6900
	S2200T
	S2600T
	S5500T
	S5600T
	S5800T
	S6800T
	S3900-M200
	S3900-M300
	S5900-M100
	S5900-M200
	S6900-M100
	Dorado2100
	Dorado5100
	VIS6000
	VIS6000T
	S8000
	Dorado2100 G2
	HVS85T
	HVS88T
	XSG1
HUASY	S2600T
	S3900
	S5300
	S2200T
	S6900
	S5500T
	S5600T

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Vendor ID	Product ID
	S5800T
	S6800T
	S3900-M200
	S3900-M300
	S5900-M100
	S5900-M200
	S6900-M100
	S8000-I
	Dorado2100
	Dorado5100
HS	VIS6000
	VIS6000T
	V1500
	V1500N
	V1800
	S2100
	S2300
	S2300E
	S2600
	S2600T
	S5100
	S5300
	S5500
	S5600
	S6800E
	V1600N
	S8000-I
	S8000
UDsafe	XSG1
Marstor	XSG1
SanM	XSG1

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Vendor ID	Product ID
AnyStor	XSG1
SUGON	XSG1
NETPOSA	XSG1

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4 UltraPath for Solaris Upgrade Guide

UltraPath for Solaris only supports offline upgrade. Offline upgrade includes two schemes: indirect upgrade and direct upgrade.

4.1 Upgrade Scheme 1 : Indirect upgrade

4.2 Upgrade Scheme 2 : Direct upgrade

4.1 Upgrade Scheme 1 : Indirect upgrade

Uninstall the UltraPath in the operating system first, restart the server, and then install UltraPath of the new version.

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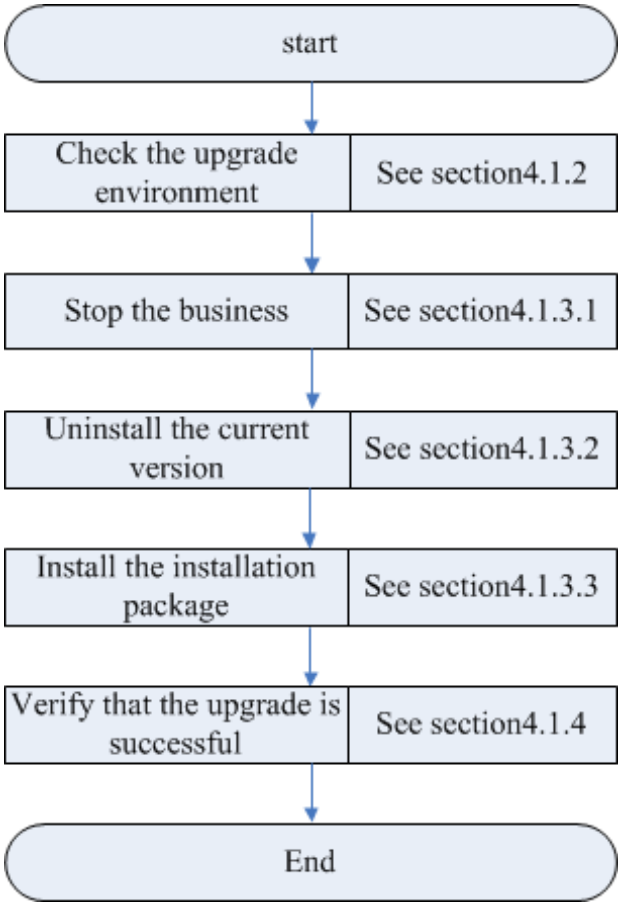
4.1.1 Upgrade Process Overview

4.1.1.1 Flowchart

Figure 4-1 Flowchart of upgrading UltraPath for Solaris



4.1.1.2 Upgrade Procedure and Required Time

Table 4-1 Upgrade procedure and required time

No.	Operation	Required Time	Impact	Remarks
1	Uninstall the current version of UltraPath software.	About 3 minutes	The system services are interrupted.	Mandatory
2	Install the new version of UltraPath software.	About 3 minutes	The upgrade takes effect only after the system is restarted.	Mandatory
3	Verify that the upgrade is	About 3 minutes	None.	Mandatory

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No.	Operation	Required Time	Impact	Remarks
	successful.			

4.1.2 Preparing for the Upgrade

4.1.2.1 Prerequisites

- The operator has experience in handling the SUN Solaris operating system.
- The operator has the super user (root) permission on the Solaris operating system.
- The operating system is the Solaris 10 or Solaris11 based on the SPARC architecture.

4.1.2.2 Obtaining Upgrade Tools

The following table lists the tools required for upgrading UltraPath.

Table 4-2

Name	Download Address	Remarks
Secure Shell (SSH)	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	You can use this tool to remotely log in to the server on which you want to upgrade UltraPath.
Secure File Transfer Protocol (SFTP) tool	http://www.coreftp.com/server/download/msftpsrvr.exe	You can use this tool to upload the UltraPath software package.

NOTE
If copyright is involved, obtain tools by yourself. For details, contact Huawei technical support engineers.

4.1.2.3 Obtaining Reference Documents for the Upgrade

Table 4-3 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE
You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

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4.1.2.4 Obtaining Upgrade Software

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

4.1.2.5 Preparing the Installation Package for Version Rollback

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

4.1.2.6 System Administrator

The system administrator must be the one predefined in the system instead of being created by users.

4.1.2.7 Checking the Environment Before the Upgrade

Purpose

Verify that the environment meets the requirement before the upgrade.

Precautions

None.

Procedure

Step 1 Verify that the current operating system is UltraPath for Solaris and its functions work properly.

Step 2 Verify that the **/opt** directory on the server has 200 MB free space at least.

```
#df -h
Filesystem    MB blocks   Free %Used   Iused %Iused Mounted on  /dev/hd10opt    2048.00
1852.50   10%  2333   1%   /opt
```

NOTE

If the free space is insufficient, run the **chfs -a size=+10M /opt** command to expand the capacity of the **/opt** directory.

----End

4.1.3 Performing the Upgrade

This section provides the procedure for upgrading UltraPath for Solaris.

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4.1.3.1 Stopping Services

Task Description

The upgrade process needs to restart the host. This interrupts the services. In order to prevent the loss of service data, upgrade the UltraPath at off-peak hours or migrate services to other servers before the upgrade.

Precautions

If you run the database, stop the database services. If the host link exists to the storage device, and unloading multipathing software will cause drive letter changes, which may affect the upper application, it is recommended that all links are disconnected in the process of upgrading . After the uninstallation and before the new UltraPath is installed, do not install any other drives. Otherwise, the UltraPath drive number may be occupied and drive letters may change.

Prerequisites

Upgrade the UltraPath when no service data available or customers agree to temporarily interrupt the service data.

Procedure

Step 1 Stop host services.

Step 2 Close the database.

----End

Verification

No anomalies occur during the service interruption.

Troubleshooting

Close all windows related to the services and stop the services again.

4.1.3.2 Uninstalling the UltraPath Software

Task Description

Before the upgrade, you need to uninstall the current version of UltraPath for Solaris.

Precautions

You need to uninstall the current version of UltraPath for Solaris and restart the system before you upgrade UltraPath for Solaris.

Prerequisites

The current operating system is UltraPath for Solaris and its functions work properly.

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Procedure

Step 1 Log in to the system as user **root**.

Step 2 Run the **pkgrm UltraPath** command to uninstall the current UltraPath for Solaris installation package.

Step 3 Run the ***reboot*** command to restart the system.

----End

Troubleshooting

None.

4.1.3.3 Installing the UltraPath Software

Task Description

Install the new version of UltraPath for Solaris.

Precautions

You need to uninstall the current version of UltraPath for Solaris and restart the system before you upgrade UltraPath for Solaris.

Prerequisites

- The original UltraPath for Solaris has been uninstalled and the system has been restarted.
- Run the **pkginfo UltraPath** command to check whether the original UltraPath for Solaris has been uninstalled.

Procedure

Step 1 Log in to the system as user **root**.

Step 2 Run the **sh install.sh** command to install the new UltraPath for Solaris installation package at the directory of package.

Step 3 Run the **reboot** command to restart the system.

----End

Troubleshooting

None.

4.1.4 Verifying the Upgrade

After UltraPath for Solaris is upgraded and the system is restarted, check whether the software version is correct and the software functions work properly.

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4.1.4.1 Verification Checklist

Table 4-4 Checklist for verification

No.	Verification Item	Expected Result	Operation Command
1	Query the version of UltraPath for Solaris.	The queried version is correct.	On the CLI of UltraPath, run the **show version** command.
2	Check whether the functions work properly after the upgrade.	All functions work properly.	None.

4.1.4.2 Verification Task 1

Task Description

Verify that UltraPath for Solaris is upgraded to the correct version.

Precautions

To perform any operations, ensure that you have restarted the system after the upgrade.

Procedure

Step 1 Log in to the system as user **root**. Run the **upadm** command to enter the UltraPath command mode.

Step 2 Run the **show version** command to query the version of UltraPath for Solaris.

----End

Result Verification

The returned UltraPath version is the desired one.

Troubleshooting

None.

4.1.4.3 Verification Task 2

Task Description

Verify that all functions of UltraPath for Solaris work properly after the upgrade.

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Precautions

To verify the functions, ensure that you have restarted the system after the upgrade.

Procedure

Perform the same operations as those before the upgrade to verify that all functions work properly.

Result Verification

All functions work properly.

Troubleshooting

None.

4.1.5 Rolling Back to the Source Version

4.1.5.1 Uninstalling the UltraPath Software

For details, see section 4.1.3.2 Uninstalling the UltraPath Software "Uninstalling the UltraPath Software."

4.1.5.2 Installing the UltraPath Software of the Earlier Version

For details, see section 4.1.3.3 Installing the UltraPath Software "Installing the UltraPath Software."

4.2 Upgrade Scheme 2 : Direct upgrade

You do not need to uninstall the UltraPath in the operating system. Use the install.sh script of UltraPath to perform an upgrade.

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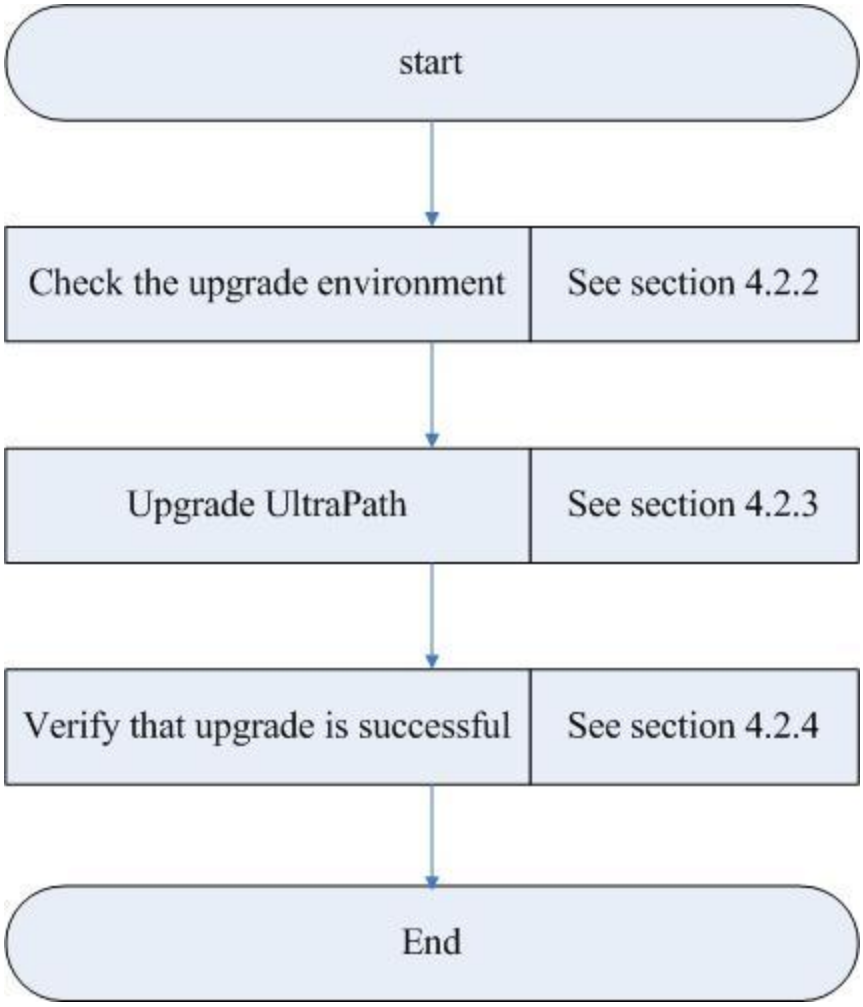
4.2.1 Upgrade Process Overview

4.2.1.1 Flowchart

Figure 4-2 Flowchart of upgrading UltraPath for Solaris



4.2.1.2 Upgrade Procedure and Required Time

Table 4-5 Upgrade procedure and required time

No.	Procedure	Required Time	Impact	Mandatory or Not
1	Uninstall the current version of UltraPath software.	About 3 minutes	The system services are interrupted.	Mandatory
2	Install the new version of UltraPath software.	About 3 minutes	The upgrade takes effect only after the system is restarted.	Mandatory

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No.	Procedure	Required Time	Impact	Mandatory or Not
3	Verify that the upgrade is successful.	About 3 minutes	None.	Mandatory

4.2.2 Preparing for the Upgrade

4.2.2.1 Prerequisites

- The operator has experience in handling the SUN Solaris operating system.
- The operator has the super user (root) permission on the Solaris operating system.
- The operating system is the Solaris 10 or Solaris 11 based on the SPARC architecture.

4.2.2.2 Obtaining Upgrade Tools

The following table lists the tools required for upgrading UltraPath.

Table 4-6

Name	Download Address	Remarks
Secure Shell (SSH)	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	You can use this tool to remotely log in to the server on which you want to upgrade UltraPath.
Secure File Transfer Protocol (SFTP) tool	http://www.coreftp.com/server/download/msftpsrvr.exe	You can use this tool to upload the UltraPath software package.

NOTE
If copyright is involved, obtain tools by yourself. For details, contact Huawei technical support engineers.

4.2.2.3 Obtaining Reference Documents for the Upgrade

Table 4-7

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document from the CD-ROM or by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

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NOTE

You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

4.2.2.4 Obtaining Upgrade Software

- Obtain the UltraPath installation package from the CD-ROM.
- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

4.2.2.5 Preparing the Installation Package for Version Rollback

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

4.2.2.6 System Administrator

The system administrator must be the one predefined in the system instead of being created by users.

4.2.2.7 Checking the Environment Before the Upgrade

Purpose

Verify that the environment meets the requirement before the upgrade.

Precautions

None.

Procedure

Step 1 Verify that the current operating system is UltraPath for Solaris and its functions work properly.

Step 2 Verify that the **/opt** directory on the server has 200 MB free space at least.

```
#df -h
Filesystem    MB blocks   Free %Used   Iused %Iused Mounted on  /dev/hd10opt    2048.00
1852.50   10%  2333   1%   /opt
```

NOTE

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If the free space is insufficient, run the **chfs -a size=+10M /opt** command to expand the capacity of the **/opt** directory.

----End

4.2.3 Upgrade Procedure

Task Description

Before the upgrade, you need to uninstall the current version of UltraPath for Solaris.

Precautions

Check all items specified in section 4.2.2 Preparing for the Upgrade. Do not open related programs during the upgrade. Restart the host as prompted.

Prerequisites

Make sure that the UltraPath software is installed on the host. If the UltraPath software is not installed on the host, go to "Installing the UltraPath Software" of the section 4.1.3.3 Installing the UltraPath Software.

Procedure

Step 1 Run **install.sh** installation script:

```
-bash-3.2# sh install.sh
Checking free space of /opt ...
Transferring <UltraPath> package instance
UltraPath upgrade may affect business. Please stop the business before upgrading the
UltraPath.
* Are you sure you want to continue the UltraPath upgrade? [y,n,?]: y
```

Stop services as prompted and enter **y.**

NOTE

At this point enter **n** to cancel the upgrade.

Step 2 Enter **y** as prompted to continue:

```
Install nxup core service  ...
Install CLI ...
Install upservice ...
updating /platform/sun4v/boot_archive
* Succeeded in upgrading the UltraPath.
* You must restart your system for the configuration
* changes made to OceanStor UltraPath to take effect.
* do you want to reboot now? (y or n):y
```

Step 3 Enter **y** to restart the system. The kernel takes effect after the upgrade:

NOTE

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1. If you enter **n**, the system is not restarted after the upgrade. However, the UltraPath does not take effect so that it cannot be used.
2. If only the user mode is upgraded, you can use the UltraPath without restarting the system.

----End

Result Verification

The queried version is correct.

Troubleshooting

None.

4.2.4 Verifying the Upgrade

After UltraPath for Solaris is upgraded and the system is restarted, check whether the software version is correct and the software functions work properly.

4.2.4.1 Verification Checklist

Table 4-8 Checklist for verification

No.	Verification Item	Expected Result	Operation Command
1	Query the version of UltraPath for Solaris.	The queried version is correct.	On the CLI of UltraPath, run the **show version** command.
2	Check whether the functions work properly after the upgrade.	All functions work properly.	None.

4.2.4.2 Verification Task 1

Purpose

Verify that UltraPath for Solaris is upgraded to the correct version.

Precautions

To perform any operations, ensure that you have restarted the system after the upgrade.

Procedure

Step 1 Log in to the system as user **root**. Run the **upadm** command to enter the UltraPath command mode.

Step 2 Run the **show version** command to query the version of UltraPath for Solaris.

----End

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Result Verification

The queried version is correct.

Troubleshooting

None.

4.2.4.3 Verification Task 2

Purpose

Verify that all functions of UltraPath for Solaris work properly after the upgrade.

Precautions

To verify the functions, ensure that you have restarted the system after the upgrade.

Procedure

Perform the same operations as those before the upgrade to verify that all functions work properly.

Result Verification

All functions work properly.

Troubleshooting

None.

4.2.5 Rolling Back to the Source Version

UltraPath for Solaris of the target version needs to be uninstalled and the source version needs to be installed because the target version cannot be used.

4.2.5.1 Uninstalling the UltraPath Software

For details, see section 4.1.3.2 Uninstalling the UltraPath Software "Uninstalling the UltraPath Software."

4.2.5.2 Installing the UltraPath Software of the Earlier Version

For details, see section 4.1.3.3 Installing the UltraPath Software "Installing the UltraPath Software."

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5 UltraPath for Linux Upgrade Guide

5.1 Upgrade Process
5.2 Preparing for the Upgrade
5.3 Offline Upgrade Procedure
5.4 Online Upgrade Procedure
5.5 Verifying the Upgrade
5.6 Rolling Back to the Source Version
5.7 Appendix1
5.8 Appendix2

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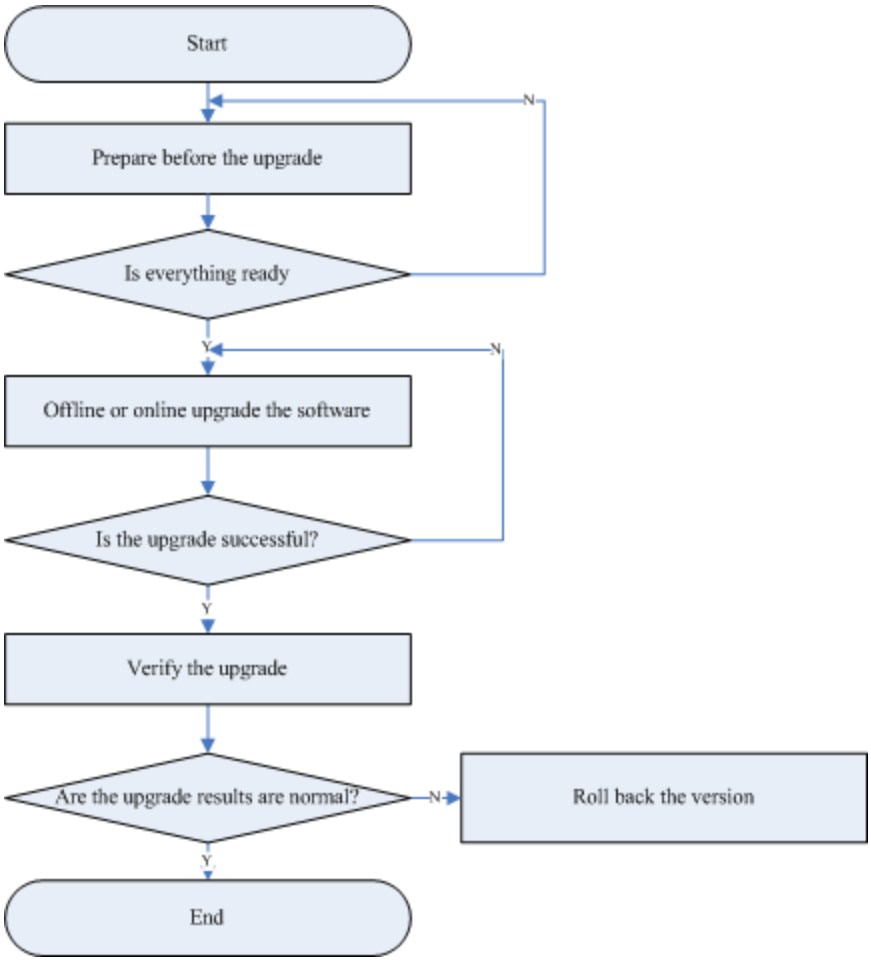
5.1 Upgrade Process

5.1.1 Upgrade Flowchart

Figure 5-1 Flowchart for upgrading UltraPath for Linux



5.1.2 Required Steps and Their Durations

Table 5-1 Required steps and their durations

No.	Step	Duration	Impact	Remarks
1	Check the installation package and the information about the operating system.	About 3 minutes	None	Mandatory
2	Offline upgrade or online	About 5 minute	None	Mandatory

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No.	Step	Duration	Impact	Remarks
	upgrade the new UltraPath.			
3	Verify the upgrade.	About 4 minutes	None	Mandatory

The upgrade takes about 12 minutes.

5.2 Preparing for the Upgrade

5.2.1 Prerequisites

The following conditions must be met for the upgrade:

- The operator has the Linux operation experience.
- The operator has the super user (root) permission on the Linux operating system..
- The hardware that runs the server program meets the basic requirements on UltraPath software (128 MB memory and 200 MB available disk space).

Besides the basic requirements, online upgrade must meet the following requirements:

- The target 21.1.0 version supports the online upgrade from the current V100R008C00/V100R008C20/V100R008C30/V100R008C50/21.0.1/21.1.0 version.
- All links are normal before the upgrade, and faulty or degraded paths do not exist.
- Upgrade the software at off-peak hours.
- Do not perform online upgrade when the CPU is running with full load.
- Do not perform online upgrade when the host has the single controller alarm.

5.2.2 Obtaining Upgrade Tools

The following table lists the tools required for upgrading UltraPath.

Table 5-2

Name	Download Address	Remarks
Secure Shell (SSH)	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	You can use this tool to remotely log in to the server on which you want to upgrade UltraPath.
Secure File Transfer Protocol (SFTP) tool	http://www.coreftp.com/server/download/msftpsrvr.exe	You can use this tool to upload the UltraPath software package.

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NOTE
If copyright is involved, obtain tools by yourself. For details, contact Huawei technical support engineers.

5.2.3 Obtaining Upgrade Reference

Table 5-3 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE
You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

5.2.4 Obtaining Upgrade Software

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE
Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

NOTE
To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

Table 5-4 Installation packages of UltraPath for Linux

No.	File Name	Description
1	RHEL	UltraPath installation package document
2	SLES	UltraPath installation package document
3	LinuxOther	UltraPath installation package document

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5.2.5 Obtaining the Rollback Installation Package

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

5.2.6 Obtaining the Current UltraPath Version

Task Description

Obtain the current UltraPath version to determine whether an upgrade is necessary.

Procedure

On the command line interface (CLI), run the **upadmin show version** command and view the returned UltraPath version.

NOTE

- The **upadmin show version** command is inapplicable to certain earlier versions of UltraPath. As a compensation, run the **upTools -V** or **rpm -qa | grep ^U** command for them.
- You can run **upadmin show version verbose** to query product version about V100R008C50 and later versions.
- If no output appears after running the **rpm -qa | grep ^U** command, the UltraPath is not yet installed.
- If multiple version numbers appear after running the **rpm -qa | grep ^U** command, different versions of UltraPath are already installed.

Verification

Example 1

```
129-41-213:~ # upTools -V
Linux UltraPath Driver Version:11.01.11
```

Example 2

```
linux-a6n4:~ # upTools -V
Version: V100R002
UltraPath for Linux: 2.02.005
```

Example 3

```
Linux-a6n4:~ # rpm -qa | grep ^U
UltraPath-2.02.005-1
```

Example 4

```
linux-fh5t:/ # upTools -V
Version: V100R003
UltraPath for Linux: 3.01.037
```

Example 5

```
linux:~ # upadmin show version
Software Version : 5.01.046
Driver Version : 5.01.046
```

Example 6

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```
linux:~ # upadmin show version
Software Version   : 6.01.001
Driver   Version   : 6.01.001
```

Example 7

```
linux:~ # upadmin show version
Software Version   : 8.01.007
Driver   Version   : 8.01.007
```

Example 8

```
linux:~ # upadmin show version
Software Version   : 8.03.028
Driver   Version   : 8.03.028
```

Example 9

```
linux:~ # upadmin show version
Software Version   : 8.05.008
Driver   Version   : 8.05.008
```

Example 10

```
linux:~ # upadmin show version verbose
Software Version   : 8.06.063
Driver   Version   : 8.06.063
Product  Version   : V100R008C50SPC500
```

5.2.7 Checking the Upgrade Environment

Task Description

Obtain the information about the host for post-upgrade verification.

Precaution

The **lsscsi** command is not applicable to certain operating systems such as RedHat. For such systems, obtain the command installation packages on their respective installation CD-ROMs.

Procedure

Back up the current information about the host for post-upgrade verification by logging in to the host, running the **lsscsi** command, and recording the output (Figure 5-2). The virtual disk information will be checked after the upgrade.

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Figure 5-2 Disk letter mapping list

5.3 Offline Upgrade Procedure

Task Description

The system or UltraPath service will be restarted after the offline upgrade of UltraPath. Therefore, you must stop services or migrate them to another server before performing the offline upgrade.

5.3.1 Upgrading the UltraPath in a boot-from-SAN Setup

To upgrade the UltraPath in a boot-from-SAN setup, go through this section. To upgrade the UltraPath in a boot-from-local setup, see section 5.3.2 Upgrading the UltraPath in a boot-from-local Setup "Upgrading the UltraPath in a boot-from-local Setup" in this document.

NOTE

- UltraPath V100R005C01 and later versions, Perform command as follows.

```
cat /etc/UltraPath.packages.info | grep "SanBoot"
```

If g30s_isSanBoot=1, then UltraPath in a boot-from-SAN Setup; else if g30s_isSanBoot=0, then UltraPath in a boot-from-local Setup.

- Others before V100R005C01: boot-from-SAN.

5.3.1.1 Stopping Host Services

Task Description

The upgrade requires restarting the host, and this interrupts services.

Precautions

To prevent service data loss, perform the upgrade when no service is running or after migrating services to other hosts.

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Procedure

Step 1 Stop host services.

Step 2 (Optional) Stop database services, if any.

----End

Verification

No exception occurs during the service termination.

Troubleshooting

Try to stop those services again.

5.3.1.2 Performing the Pre-Upgrade Check

Task Description

Check that the working kernel is consistent with the **default** value in the **bootloader** (**/boot/grub/menu.lst** in grub startup mode) file.

Procedure

The following example explains how to view the content of **bootloader** file (**/boot/grub/menu.lst)** in grub startup mode.

Assume that the content of **/boot/grub/menu.lst** is:

```
default 0
...
title SUSE(default)
 root (hd0,1)
 kernel /boot/vmlinuz-2.6.27.19-5-default ...
 initrd /boot/initrd-2.6.27.19-5-default
title SUSE(XEN)
 root (hd0,1)
 kernel /boot/vmlinuz-2.6.27.19-5-xen ...
 initrd /boot/initrd-2.6.27.19-5-xen
...
```

NOTE

- The host has two kernels: **2.6.27.19-5-default** and **2.6.27.19-5-xen**.
- The **default** system kernel is **2.6.27.19-5-default**.
- Check whether the working kernel is **2.6.27.19-5-default** by running the **uname -r** command. If yes, proceed with the UltraPath upgrading. If no, change the **default** value in **/boot/grub/menu.lst** to be consistent with the working kernel.
- If host is grub2, Check that the working kernel is consistent with the **default** value (the saved_entry value in **/boot/grub2/grubenv** file)in the **bootloader** (**/boot/grub2/grub.cfg** in grub startup mode) file

Verification

The working kernel is consistent with the **default** value in bootloader (**/boot/grub/menu.lst** in grub startup mode) file.

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Troubleshooting

If the working kernel is inconsistent with the default value, change the value for consistency.

5.3.1.3 Upgrading UltraPath for Linux

Task Description

Upgrade the UltraPath. This section exemplifies how to upgrade the UltraPath from V100R003 to this version.

Precaution

1. Do not copy the UltraPath installation package to a directory whose path contains a space, for example **/home/Bad Dir/**. Otherwise, you may not be able to execute the **install.sh** script correctly.
2. Do not copy the UltraPath installation package to the directory for an earlier version of UltraPath that was installed on the host.

Procedure

Step 1 Copy the UltraPath installation package to the host.

Figure 5-3 UltraPath for Linux installation package directories

Step 2 Run the following commands one by one:

```
chmod +x install.sh
./install.sh
```

The following output appears:

```
complete iscsi checking.
complete FC checking.
Verify the UltraPath existence.
[WARNING] An old UltraPath version lower than R5 has been detected.
Do you want to remove it now?
<Y|N>:y
The UltraPath uninstallation starts
The UltraPath startup guide items are deleted successfully.
Preparing to uninstall UltraPath driver...
UltraPath driver package has been successfully removed from your system.
[Note]: It's highly recommended to reboot your system.
UltraPath driver uninstalled successfully
Modify system configuration.[file:/etc/iscsi/iscsid.conf,item:node.startup ,value:
automatic]
Modify system
```


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```
configuration.[file:/etc/iscsi/iscsid.conf,item:node.session.timeo.replacement_tim
eout ,value:  1]
Modify system
configuration.[file:/etc/modprobe.conf,module:qla2xxx,item:qlport_down_retry,value
:5]
Modify system
configuration.[file:/etc/modprobe.conf,module:lpfc,item:lpfc_nodev_tmo,value:5]
If the operating system is installed on a local drive of the server, you are advised
to choose boot from local; if the operating system is installed on a SAN storage
system, you must choose boot from san. Please choose the boot type of your system:
<1>--boot-from-Local
<2>--boot-from-SAN
please input your select:2
Preparing...              ##################################################
UltraPath                ##################################################
User configuration is saved successfully.
The UltraPath start items are added successfully.
The mirror is updated successfully.
append UltraPath title to bootloader successfully.[/boot/grub/menu.lst]
The running service is installed successfully.
********************************************************************************
* UltraPath will use the system hostname for alarm generation and automatic host*
* registration. Make sure that the system hostname is correctly configured. .   *
********************************************************************************
The installation is complete. Whether to restart the system now?
<Y|N>:
```

Step 3 After the command is run, UltraPath is uninstalled. Restart the system to enable the latest UltraPath to take effect.

----End

Verification

Restart the system to make the upgraded UltraPath effective. Then, run the **lsmod | grep nxup** command to check whether the **nxup** module has been loaded.

Figure 5-4 Multipathing module information

Troubleshooting

If you encounter exceptions during the installation or cannot correctly restart the system after the installation is complete, contact Huawei R&D engineers for troubleshooting.

5.3.2 Upgrading the UltraPath in a boot-from-local Setup

To upgrade the UltraPath in a boot-from-local setup, go through this section. To upgrade the UltraPath in a boot-from-SAN setup, see section 5.3.1 Upgrading the UltraPath in a boot-from-SAN Setup "Upgrading the UltraPath in a boot-from-SAN Setup" in this document.

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NOTE

- UltraPath V100R005C01 and later versions, Perform command as follows:

  ```
  cat /etc/UltraPath.packages.info | grep "SanBoot"
  ```

  If g30s_isSanBoot=0, then UltraPath in a boot-from-local Setup; else if g30s_isSanBoot=1, then UltraPath in a boot-from-SAN Setup.
- Others before V100R005C01: boot-from-SAN.

5.3.2.1 Stopping Host Services

Task Description

The upgrade requires restarting the host or UltraPath service, and this interrupts services.

Precautions

To prevent service data loss, perform the upgrade when no service is running or after migrating services to other hosts.

Procedure

Step 1 Stop host services.

Step 2 (Optional) Stop database services, if any.

Step 3 Unmount all the volumes and file systems from the storage system.

Step 4 Disconnect all the service cables between the storage system and the host.

Step 5 Run the **service nxup stop** or **/etc/init.d/nxup stop** command to stop the UltraPath service.

- In the following example, the **service nxup stop** command is used. If the following command output is displayed for UltraPath V100R005C01 and UltraPath V100R006C00, the UltraPath service is stopped successfully. Otherwise, the UltraPath service fails to be stopped.

  ```
  [root@localhost ~]# service nxup stop
  stop Ultrapath successfully.
  ```

- In the following example, the **service nxup stop** command is used. If the following command output is displayed for UltraPath V100R008C00 and later versions, the UltraPath service is stopped successfully. Otherwise, the UltraPath service fails to be stopped.

  ```
  linux:~ # service nxup stop
  The UltraPath service is stopped successfully.
  ```

NOTE

For UltraPath V100R008C50 in SUSE 12 series and deepin operating systems, run the **/etc/init.d/nxup stop** command

----End

Verification

No exception occurs during the service termination.

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Troubleshooting

If the UltraPath service fails to be stopped in step 5 and the retry fails, restart the operating system to enable UltraPath to take effect after upgrading UltraPath in offline mode.

5.3.2.2 Upgrading the UltraPath

Task Description

Upgrade the UltraPath. This section exemplifies how to upgrade the UltraPath from V100R006 to this version.

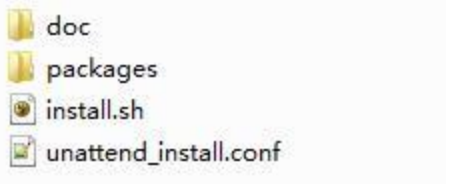
Precaution

1. Do not copy the UltraPath installation package to a directory whose path contains a space, for example **/home/Bad Dir/**. Otherwise, you may not be able to execute the **install.sh** script correctly.
2. Do not copy the UltraPath installation package to the directory for an earlier version of UltraPath that was installed on the host.

Procedure

Step 1 Copy the UltraPath installation package to the host.

Figure 5-5 UltraPath for Linux installation package directories



Step 2 Run the following commands one by one:

```
chmod +x install.sh
./install.sh
```

The following output appears:

```
complete iscsi checking.
complete FC checking.
Verify the UltraPath existence.
[WARNING] The UltraPath driver has been detected.
Do you want to uninstall it now?
<Y|N>:y
The UltraPath uninstallation starts.
remove run-service successfully.
remove boot-service successfully.
remove UltraPath files
UltraPath driver package has been sucessfully removed from your system.
Modify system
configuration.[file:/etc/iscsi/iscsid.conf,item:node.startup ,value:automatic]
Modify system
```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```
configuration.[file:/etc/iscsi/iscsid.conf,item:node.session.timeo.replacement_tim
eout ,value:1]
Modify system
configuration.[file:/etc/modprobe.d/nxupmodules.conf,module:qla2xxx,item:qlport_do
wn_retry,value:5]
Modify system
configuration.[file:/etc/modprobe.d/nxupmodules.conf,module:lpfc,item:lpfc_nodev_t
mo,value:5]
If the operating system is installed on a local drive of the server, you are advised
to choose boot from local; if the operating system is installed on a SAN storage
system, you must choose boot from san. Please choose the boot type of your system:
<1>--boot-from-Local
<2>--boot-from-SAN
please input your select:1
Preparing...              ##################################################
UltraPath                ##################################################
User configuration is saved successfully.
The boot service is installed successfully.
The running service is installed successfully.
**********************************Attention***********************************
* UltraPath would modify some parameters of HBA cards for better performace. If *
* UltraPath is installed for the first time, you may need to update the initrd*
* image before system reboot to make the modification take effect.*
*******************************************************************************
*******************************************************************************
* UltraPath will use the system hostname for alarm generation and automatic host*
* registration. Make sure that the system hostname is correctly configured..*
*******************************************************************************
The installation is complete. Whether to restart the system now?

<Y|N>:
```

After the command is run, UltraPath is uninstalled. Select **N**. The host is not restarted temporarily.

Step 3 Enable the UltraPath software to take effect in either of the following ways:

- Method one:

  If the UltraPath service is stopped successfully in section 5.3.2.1 Stopping Host Services, run the **service nxup start** or **/etc/init.d/nxup start** command to start the UltraPath service to enable it to take effect.

  The **service nxup start** command is used as an example.

```
#service nxup start
this kernel is 2.6.39-200.24.1.el6uek.x86_64
begin load nxup
Begin to delete LUNs whose mappings do not exist
Begin to delete LUNs whose mappings are changed.
begin scan host0
begin scan host1
begin scan host2
begin scan host3
begin scan host4
begin scan host5
begin scan host6
The device scanning is complete.
```


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```
start upservice
The UltraPath starts successfully.
```

NOTE

For UltraPath in SUSE 12 series and deepin operating systems, run the **/etc/init.d/nxup start** command.

- Method two:

  Restart the host to enable UltraPath to take effect.

----End

Verification

On the CLI, run the **lsmod | grep nxup** command to check whether the nxup module exists.

Figure 5-6 Multipathing module information

Troubleshooting

If you encounter exceptions during the installation or cannot correctly restart the system after the installation is complete, contact Huawei R&D engineers for troubleshooting.

5.4 Online Upgrade Procedure

5.4.1 Upgrading UltraPath Online

Task Description

Install a new version of UltraPath after uninstalling the early version and activate the UltraPath service module without interrupting services.

Precautions

1. The current V100R008C00/V100R008C20/V100R008C30/V100R008C50/21.0.1/21.1.0 version can be online upgraded to the target 21.1.0 version.
2. An online upgrade cannot be performed when the CPU usage is high.
3. The device where the server program is running meets the minimum hardware requirements of the UltraPath upgrade (200 MB of memory, 200 MB of remaining disk space).
4. An online upgrade cannot be performed if there is an alarm indicating a single controller.
5. Do not copy the UltraPath installation package to a directory that contains a space in its name, such as **/home/Dad Dir/**. Otherwise, the **install.sh** script may not be executed properly.
6. If the UltraPath has been installed on the host and its installation package directory is still in the host, do not copy the installation package of the new UltraPath to the directory of the previous UltraPath.

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7. Check the UltraPath information before the upgrade.
8. The UVP can not support the online upgrade.
9. The takeover-online environment cannot support the online upgrade.
10. Contact Huawei R&D engineers for help when you upgrade UltraPath from V100R008C00/V100R008C20/V100R008C30/V100R008C50/V100R008C50SPC100.

Procedure

Step 1 Copy the UltraPath installation package to the host (with the example of the **RHEL** directory)

Figure 5-7 UltraPath for Linux installation package directories

Step 2 Run the following commands one by one:

```
chmod +x install.sh
./install.sh -ndu [ndu_free_mem_size=xxx] [ndu_used_cpu_percent=yyy]
[ndu_free_disk_space=zzz]
```

Table 5-5 Parameters that can be specified by users during the online upgrade

Optional Parameter Name	Parameter Function	Description
ndu_free_mem_size	Check the minimum memory capacity required by UltraPath before online upgrade.	Unit:MB. Default value:200
ndu_idle_cpu_percent	Check the percentage of used CPU before online upgrade.	The value ranges between 0 and 100. Default value:80
ndu_free_disk_space	Check the free capacity of the root directory before online upgrade.	Unit:MB. Default value:200

The following output appears:

```
The non-disruptive upgrade starts
Check environment successfully
The UltraPath uninstallation starts.
The running service is deleted successfully.
The boot service is removed successfully.
The UltraPath files are deleted successfully.
UltraPath driver package has been successfully removed from your system.
```


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```
Modify system configuration.[file:/etc/iscsi/iscsid.conf,item:node.startup ,value:
automatic]
Modify system
configuration.[file:/etc/iscsi/iscsid.conf,item:node.session.timeo.replacement_tim
eout ,value:  1]
Modify system
configuration.[file:/etc/modprobe.conf,module:qla2xxx,item:qlport_down_retry,value
:5]
Modify system
configuration.[file:/etc/modprobe.conf,module:lpfc,item:lpfc_nodev_tmo,value:5]
Preparing...              ##################################################
UltraPath                ##################################################
User configuration is saved successfully.
The boot service is installed successfully.
The running service is installed successfully.
The non-disruptive upgrade succeeded
```

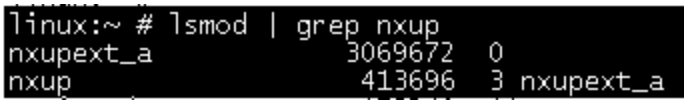
----End

Verification

1. Run the **upadmin show version** command to check whether the version is new.
2. Run the **lsmod** command to check that the nxup module is loaded properly.

   For example, the following figure shows the pre-upgrade module information:

   Figure 5-8 Pre-upgrade module information



The following figure shows the post-upgrade module information:

Figure 5-9 Post-upgrade module information

Troubleshooting

If you encounter exceptions during the installation, contact Huawei R&D engineers for troubleshooting.

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5.5 Verifying the Upgrade

5.5.1 Completing the Verification Checklist

Table 5-6 UltraPath for Linux verification checklist

No.	Item	Criterion	Expected Result
1	Check the version of the current UltraPath.	The returned version is the desired one.	The returned version is the same as the expected one.
2	Check whether the startup file has been correctly updated in a boot-from-SAN setup.	1. The **Linux with ultrapath** startup item has been added. 2. The **initrd** boot file under the startup item has been changed to a file whose name starts with **ultrapath**, and the file is in the **/boot/** directory. 3. The **default** value is the ID of the added startup item.	The startup file has been updated successfully.
3	Check whether the multipathing service exists in a boot-from-local setup.	Run the **chkconfig --list | grep nxup** command to check.	The **nxup** service exists.
4	Check whether the mapping of drive letters is the same as that before the upgrade.	The returned disk letters and LUN mapping are the same as those before the upgrade.	The pre- and post-upgrade drive letters are identical.
5	Check whether failover is unavailable for the QLogic driver.	The failover function of the QLogic driver is unavailable.	The failover function of the QLogic driver is disabled.
6	Check with the customer whether the services are working correctly after the upgrade.	All the services are running correctly.	Each service is working correctly.

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5.5.2 Verifying UltraPath Version Information

Task Description

Check that the upgraded UltraPath version is the expected one.

Procedure

Run the **upadmin show version** command to check.

Verification

The returned UltraPath version is the desired one.

Troubleshooting

If the returned UltraPath version is not the target version, check whether the used UltraPath upgrade package is correct.

5.5.3 Verifying UltraPath Information

5.5.3.1 Verifying UltraPath Information in a boot-from-SAN Setup

If you have upgraded the UltraPath in a boot-from-SAN setup, go through this section. If you have upgraded the UltraPath in a boot-from-local setup, see section 5.5.3.2 Verifying UltraPath Information in a boot-from-Local Setup Verifying UltraPath Information in a boot-from-Local Setup" in this document.

Task Description

Check that the **default** value is the ID of the UltraPath startup item.

Precaution

This section exemplifies how to verify the **/boot/grub/menu.lst** configuration file on a server using the grub boot program. For information about verify the **/etc/lilo.conf** or **/boot/grub2/grub.cfg** configuration file on a server using the Lilo boot, see 5.8 "Appendix" in this document.

Procedure

Step 1 Check that the **/boot/grub/menu.lst** file exists.

Step 2 Check that the startup configuration file **cat /boot/grub/menu.lst** has been correctly updated.

Step 3 Check that a file whose name starts with **ultrapath** exists in the /**boot**/ directory.

----End

Verification

Step 1 Check that the **/boot/grub/menu.lst** file exists.

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Step 2 Check that the **title Linux with ultrapath** startup item has been added into the **/boot/grub/menu.lst** file.

Step 3 Check that the **initrd** boot file under the **title Linux with ultrapath** item in the **/boot/grub/menu.lst** file has been changed to another file whose name starts with **ultrapath**.

Step 4 Check that the **default** value in the **/boot/grub/menu.lst** file is the ID of the **title Linux with ultrapath** item.

Step 5 Check that a file whose name starts with **ultrapath** exists in the **/boot/** directory.

----End

Troubleshooting

If any of the preceding steps fails, contact Huawei R&D engineers for troubleshooting.

5.5.3.2 Verifying UltraPath Information in a boot-from-Local Setup

If you have upgraded the UltraPath in a boot-from-Local setup, go through this section. If you have upgraded the UltraPath in a boot-from-SAN setup, see section 5.5.3.1 Verifying UltraPath Information in a boot-from-SAN Setup Verifying UltraPath Information in a boot-from-SAN Setup" in this document.

Task Description

Check whether the upgraded UltraPath service exists.

Precautions

The name of the UltraPath service is **nxup**. This section describes how to check whether the UltraPath service exists with the example of system **SUSE.**

Procedure

Step 1 In the **/etc/init.d** directory, check whether the **nxup** file exists.

Step 2 Check whether the **chkconfig --list | grep nxup** service exists.

----End

Verification

Step 1 Check that the **/etc/init.d/nxup** file exists.

Step 2 Check that the **chkconfig --list | grep nxup** service exists.

----End

Troubleshooting

If any step failed, contact Huawei R&D engineers for troubleshooting.

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5.5.4 Checking the Consistency Between the Pre- and Post-Upgrade Disk Letter Mapping Lists

Task Description

To ensure service health, check that the pre- and post-upgrade disk letter mapping lists are consistent.

Procedure

Run the **lsscsi** command to check.

Verification

The returned disk letters and LUN mapping are the same as those before the upgrade.

Troubleshooting

If inconsistency occurs, contact Huawei R&D engineers for troubleshooting.

5.5.5 Checking that the Failover Function of the QLogic Driver is Disabled

Task Description

To ensure system stability, the failover function of the QLogic driver must be disabled to allow the UltraPath to implement this function by itself.

Precaution

Skip this section if you are not using a QLogic driver.

Procedure

The files that are available for checking the failover status vary depending on the operating system version. Currently, you can check the failover status using the following files:

1. /sys/module/qla2xxx/parameters/qla2xfailover
2. /proc/scsi/qla2xxx/*x*, where *x* stands for a numeral which can be queried by running the **ls /proc/scsi/qla2xxx/** command.

Verification

1. If you check the failover status using the **/sys/module/qla2xxx/parameters/ql2xfailover** file, view its content by running the **cat** command. If you can see **1** in the output, the failover function has been enabled.
2. If you check the failover status using the **/proc/scsi/qla2xxx/x** file, view its content by running the **cat** command as well. If you can see **fo** in the **Driver version** field, the failover function has been enabled.

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Troubleshooting

Step 1 If the QLogic driver has enabled failover, append a line saying **options qla2xxx ql2xfailover=0** to the **/etc/modprobe.conf.local** (for SUSE), **/etc/modprobe.conf**, or **/etc/modprobe.d/nxupmodules.conf** file to disable that function.

Step 2 Update **initrd** by running the **upadm start updateimage** command.

Step 3 Restart the system.

----End

5.5.6 Checking Service Running

Task Description

Check that no post-upgrade impact occurs on the services running on the system.

Verification

All the services are running correctly after the upgrade.

Troubleshooting

If the services are not working properly, contact Huawei R&D engineers for troubleshooting.

5.6 Rolling Back to the Source Version

5.6.1 Uninstalling the Upgraded UltraPath

Purpose

If the upgraded UltraPath cannot work correctly, uninstall it to roll back to the source version.

Procedure

Uninstall the UltraPath by running the **rpm -e UltraPath** or **dpkg -r UltraPath** command.

Verification

Step 1 The command of uninstallation is executed successfully.

Step 2 Reboot the host.

----End

Troubleshooting

If you encounter exceptions during the uninstallation, contact Huawei R&D engineers for troubleshooting.

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5.6.2 Installing the Source UltraPath

Task Description

Reinstall the source version of UltraPath if the latest version cannot work properly.

Procedure

Obtain the rollback package described in section 5.2.5 Obtaining the Rollback Installation Package "Obtaining the Rollback Installation Package" and install the source UltraPath by referring to its user guide.

Verification

You can correctly reinstall and operate the source version of UltraPath.

Troubleshooting

If you encounter exceptions during the rollback, contact Huawei R&D engineers for troubleshooting.

5.7 Appendix1

This section describes how to check the /etc/lilo.conf file on a server using the Lilo Boot Program.

Performing the Pre-Installation Check

Step 1 Check that the **lilo.conf** configuration file exists in the **/etc/** directory.

Step 2 Check that the **/etc/lilo.conf** file does not contain an **ultrapath** item.

Step 3 Check that the working system is consistent with the **default** value in the **/etc/lilo.conf** file.

The content of the **/etc/lilo.conf** file before the UltraPath installation is:

```
default = linux
image = /boot/vmlinuz-2.6.16.60-0.54.5-default
###Don't change this comment - YaST2 identifier: Original name: linux###
label = linux
append = "splash=silent "
description = Linux
initrd = /boot/initrd-2.6.16.60-0.54.5-default
root = /dev/disk/by-id/scsi-35000c50012afd6cf-part6
image = /boot/vmlinuz-2.6.16.60-0.54.5-default
###Don't change this comment - YaST2 identifier: Original name: failsafe###
label = failsafe
append = "ide=nodma nohalt noresume 3 "
description = Failsafe
initrd = /boot/initrd-2.6.16.60-0.54.5-default
root = /dev/disk/by-id/scsi-35000c50012afd6cf-part6
```

NOTE

- The **default** system kernel is **initrd-2.6.16.60-0.54.5-default**.

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- Verify that the working kernel is **initrd-2.6.16.60-0.54.5-default** by running the **uname -r** command. If this is false, change the **default** value to be consistent with the working kernel in the **/etc/lilo.conf** file.

----End

Verifying the Installation Procedure

Step 1 Check that the **/etc/lilo.conf** file exists.

Step 2 Check that the **ultrapath** startup item has been added into the **/etc/lilo.conf** file.

Step 3 Check that the **initrd** boot file under the **ultrapath** item in the **/etc/lilo.conf** file has been changed to a file whose name starts with **ultrapath**.

Step 4 Check that the **default** value is the ID of the **ultrapath** item in the **/etc/lilo.conf** file.

The content of the **/etc/lilo.conf** file after the UltraPath installation is:

```
default = ultrapath
image = /boot/vmlinuz-2.6.16.60-0.54.5-default
###Don't change this comment - YaST2 identifier: Original name: linux###
 label = linux
 append = "splash=silent "
 description = Linux
 initrd = /boot/initrd-2.6.16.60-0.54.5-default
 root = /dev/disk/by-id/scsi-35000c50012afd6cf-part6
image = /boot/vmlinuz-2.6.16.60-0.54.5-default
###Don't change this comment - YaST2 identifier: Original name: failsafe###
 label = failsafe
 append = "ide=nodma nohalt noresume 3 "
 description = Failsafe
 initrd = /boot/initrd-2.6.16.60-0.54.5-default
 root = /dev/disk/by-id/scsi-35000c50012afd6cf-part6
image = /boot/vmlinuz-2.6.16.60-0.54.5-default
 label = ultrapath
 append = "splash=silent "
 initrd = /boot/ultrapath-2.6.16.60-0.54.5-default.img
root = /dev/disk/by-id/scsi-35000c50012afd6cf-part6
```

----End

5.8 Appendix2

This section describes how to check the /boot/grub2/grub.cfg file on a server using the Lilo Boot Program.

Performing the Pre-Installation Check

Step 1 Check that the **grub.cfg** configuration file exists in the **/boot/grub2** directory.

Step 2 Check that the **/boot/grub2/grub.cfg** file does not contain an **ultrapath** item.

Step 3 Check that the working system is consistent with the **default** value in the **/boot/grub2/grub.cfg** file.

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The content of the **/boot/grub2/grubenv** file before the UltraPath installation is:

```
# GRUB Environment Block
# WARNING: Do not edit this file other than by grub2-editenv
env_block=512+1
saved_entry=0
```

The content of the **/boot/grub2/grub.cfg** file before the UltraPath installation is:

```
menuentry 'SLES12, with Linux 3.12.28-4-default' --hotkey=2 --class sles12 --class
gnu-linux --class gnu --class os $menuentry_id_option
'gnulinux-3.12.28-4-default-advanced-e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85' {
  load_video
  set gfxpayload=keep
  insmod gzio
  insmod part msdos
  insmod btrfs
  set root='hd0,msdos2'

  echo?'Loading Linux 3.12.28-4-default ...'
  linux?/boot/vmlinuz-3.12.28-4-default
root=UUID=e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85  ${extra_cmdline}  resume=/dev/sda1
splash=silent quiet crashkernel=216M-:108M  showopts
  echo?'Loading initial ramdisk ...'
  initrd?/boot/initrd-3.12.28-4-default
}
menuentry 'SLES12, with Linux 3.12.28-4-default (recovery mode)' --hotkey=3 --class
sles12 --class gnu-linux --class gnu --class os $menuentry id option
'gnulinux-3.12.28-4-default-recovery-e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85' {
  load_video
  set gfxpayload=keep
  insmod gzio
  insmod part_msdos
  insmod btrfs
  set root='hd0,msdos2'
  echo?'Loading Linux 3.12.28-4-default ...
  linux?/boot/vmlinuz-3.12.28-4-default
root=UUID=e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85  ${extra_cmdline} showopts apm=off
noresume edd=off powersaved=off nohz=off highres=off processor.max_cstate=1 nomodeset
x11failsafe crashkernel=216M-:108M
  echo?'Loading initial ramdisk ...'
  initrd?/boot/initrd-3.12.28-4-default
}
```

NOTE

- The **default** system kernel is **initrd-3.12.28-4-default**.
- Verify that the working kernel is **initrd-3.12.28-4--default** by running the **uname -r** command. If this is false, change the **default** value to be consistent with the working kernel in the **/boot/grub2/grub.cfg** file.

----End

Verifying the Installation Procedure

Step 1 Check that the **/boot/grub2/grub.cfg** file exists.

Step 2 Check that the **ultrapath** startup item has been added into the **/boot/grub2/grub.cfg** file.

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Step 3 Check that the **initrd** boot file under the **ultrapath** item in the **/boot/grub2/grub.cfg** file has been changed to a file whose name starts with **ultrapath**.

Step 4 Check that the **default** value is the ID of the **ultrapath** item in the **/boot/grub2/grub.cfg** file.

The content of the **/boot/grub2/grubenv** file after the UltraPath installation is:

```
# GRUB Environment Block
# WARNING: Do not edit this file other than by grub2-editenv
env_block=512+1
saved_entry=2
```

The content of the **/boot/grub2/grub.cfg** file after the UltraPath installation is:

```
menuentry 'SLES12, with Linux 3.12.28-4-default' --hotkey=2 --class sles12 --class
gnu-linux --class gnu --class os $menuentry_id_option
'gnulinux-3.12.28-4-default-advanced-e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85' {
  load_video
  set gfxpayload=keep
  insmod gzio
  insmod part msdos
  insmod btrfs
  set root='hd0,msdos2'

  echo?'Loading Linux 3.12.28-4-default ...'
  linux?/boot/vmlinuz-3.12.28-4-default
root=UUID=e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85  ${extra_cmdline}  resume=/dev/sda1
splash=silent quiet crashkernel=216M-:108M  showopts
  echo?'Loading initial ramdisk ...'
  initrd?/boot/initrd-3.12.28-4-default
}
menuentry 'SLES12, with Linux 3.12.28-4-default (recovery mode)' --hotkey=3 --class
sles12 --class gnu-linux --class gnu --class os $menuentry_id_option
'gnulinux-3.12.28-4-default-recovery-e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85' {
  load_video
  set gfxpayload=keep
  insmod gzio
  insmod part_msdos
  insmod btrfs
  set root='hd0,msdos2'
  echo?'Loading Linux 3.12.28-4-default ...
  linux?/boot/vmlinuz-3.12.28-4-default
root=UUID=e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85  ${extra_cmdline} showopts apm=off
noresume edd=off powersaved=off nohz=off highres=off processor.max_cstate=1 nomodeset
x11failsafe crashkernel=216M-:108M
  echo?'Loading initial ramdisk ...'
  initrd?/boot/initrd-3.12.28-4-default
}
###ultrapath-t51s begin,don't change this!###
menuentry 'title Linux with ultrapath' {
load_video
set gfxpayload=keep
insmod gzio
insmod part_msdos
insmod btrfs
set root='hd0,msdos2'
if [ x$feature_platform_search_hint = xy ]; then
```


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```
search --no-floppy --fs-uuid --set=root --hint-bios=hd0,msdos2 --hint-efi=hd0,msdos2
--hint-baremetal=ahci0,msdos2 --hint='hd0,msdos2'
e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85
else
search --no-floppy --fs-uuid --set=root e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85
fi
echo 'Loading Linux 3.12.28-4-default ...'
linux /boot/vmlinuz-3.12.28-4-default
root=UUID=e3c54bf7-9d85-4f25-9d12-1e07fd9b5b85 ${extra_cmdline} resume=/dev/sda1
splash=silent quiet crashkernel=216M-:108M showopts
echo 'Loading initial ramdisk ...'
initrd /boot/ultrapath-3.12.28-4-default.img
}
###ultrapath-t51s end,don't change this!###
```

----End

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6 UltraPath for vSphere Upgrade Guide

6.1 Upgrade Process
6.2 Preparing for the Upgrade
6.3 Procedure of Upgrading UltraPath for ESXi
6.4 Procedure of Upgrading UltraPath for vCenter Plug-In
6.5 Verifying Upgrade Result
6.6 Version Rollback

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6.1 Upgrade Process

6.1.1 Upgrade Flowchart

Figure 6-1 Flowchart of upgrading UltraPath for ESXi offline

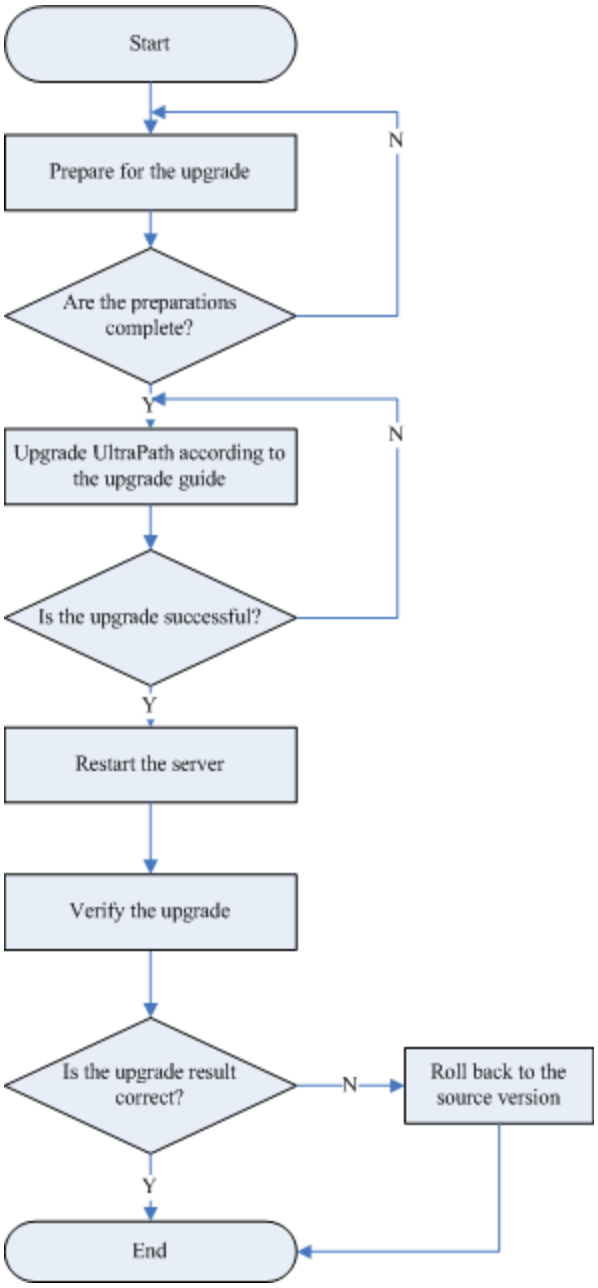

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Figure 6-2 Flowchart of upgrading UltraPath for ESXi online

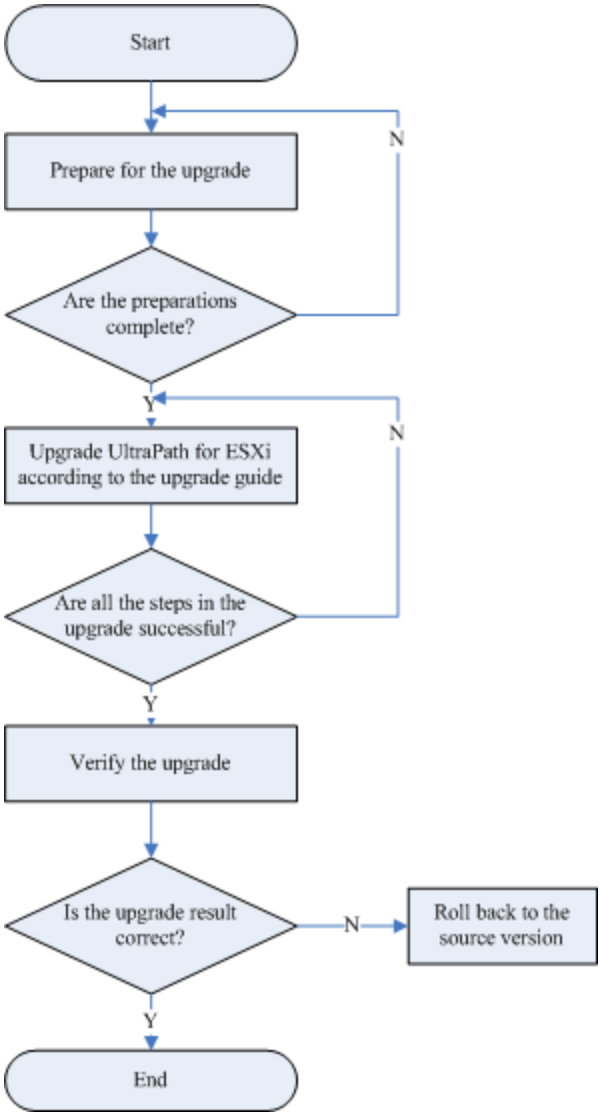

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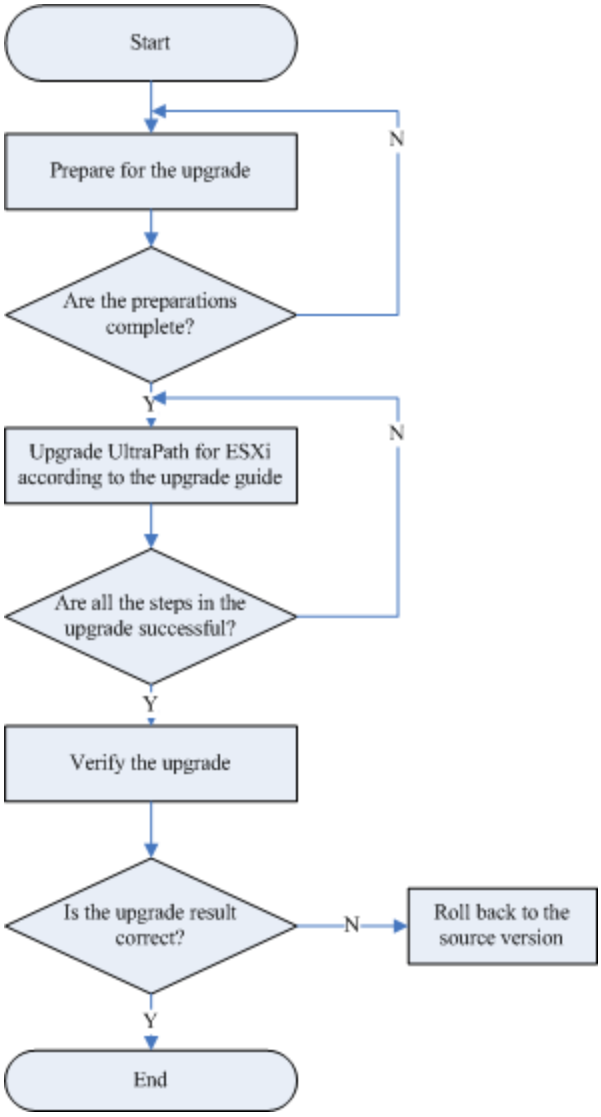
Figure 6-3 Flowchart for upgrading the UltraPath for vCenter plug-in



6.1.2 Upgrade Steps and Required Time

Table 6-1 Upgrade UltraPath for ESXi steps and required time

No.	Procedure	Time Required	Impact	Remarks
1	Check the system information and installation package before the upgrade.	About 3 minutes	None	Mandatory
2	Upgrade UltraPath for ESXi online using the new version.	About 2 minutes	None	Mandatory
3	Upgrade UltraPath for ESXi offline using the new version.	About 3 minutes	None	Mandatory

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No.	Procedure	Time Required	Impact	Remarks
4	Verify the upgrade result.	About 4 minutes	None	Mandatory

The online upgrade and offline upgrade each takes about 10 minutes .

Table 6-2 Upgrade UltraPath for vCenter 5.x steps and required time

No.	Procedure	Time Required	Impact	Remarks
1	Check the system information and installation package before the upgrade.	About 3 minutes	None	Mandatory
2	Upgrade UltraPath for ESXi offline using the new version.	About 5 minutes	None	Mandatory
3	Verify the upgrade result.	About 2 minutes	None	Mandatory

The offline upgrade takes about 10 minutes about UltraPath for vCenter 5.x.

Table 6-3 Upgrade UltraPath for vCenter 6.0 steps and required time

No.	Procedure	Time Required	Impact	Remarks
1	Check the system information and installation package before the upgrade.	About 3 minutes	None	Mandatory
2	Upgrade UltraPath for ESXi offline using the new version.	About 8 minutes	None	Mandatory
3	Verify the upgrade result.	About 2 minutes	None	Mandatory

The offline upgrade takes about 13 minutes about UltraPath for vCenter 6.0.

.

6.2 Preparing for the Upgrade

6.2.1 Prerequisites

Prerequisites for upgrading UltraPath for ESXi:

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- The upgrade operator has the permission to operate the ESXi operating system.
- The operator has the super user (**root**) permission on the ESXi operating system.
- The hardware of the host meets the minimum requirements of UltraPath (memory: 1GB, free disk space: 200 MB).
- Before performing an offline upgrade, you must close all VMs on the ESXi host.
- Before the upgrade, there must be a minimum of 50 MB, 10 MB, and 10 MB free space in the **tmp**, **root**, and **etc** directories on the server respectively.

During the upgrade, the hostd service on ESXi hosts will be restarted and vCenter will be disconnected temporarily. This will affect the services (clone, migration, or snapshot) running on vCenter. To avoid this situation, users will be prompted to check whether there are services running on vCenter during the upgrade.

- To upgrade a script offline, you must disable the performance report exporting function.

Prerequisites for upgrading the UltraPath for vCenter plug-in:

- The upgrade operator has the permission to operate the vCenter operating system.
- The upgrade operator has the super user (**Administrator**) permission on the vCenter operating systemthe (root permission for VCSA6.x).
- The hardware of the host meets the minimum requirements of the UltraPath for vCenter plug-in (free disk space: 200 MB).
- The VMware VirtualCenter Management Webservices in the server of vCenter 5.x
- The VMware vSphere Web Client in vCenter 6.x can be restarted if the UltraPath for vCenter is downgrade to an older version.
- For scenarios where platform service controllers (PSCs) are configured externally and manage multiple vCenter servers. For vCenter 6.0, the VMware vSphere Web Client in vCenter 6.x can be restarted.

6.2.2 Obtaining Upgrade Tools

The following table lists the tools required for upgrading UltraPath.

Table 6-4

Name	Download Address	Remarks
Secure Shell (SSH)	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	You can use this tool to remotely log in to the server on which you want to upgrade UltraPath.
Secure File Transfer Protocol (SFTP) tool	http://www.coreftp.com/server/download/msftpsrvr.exe	You can use this tool to upload the UltraPath software package.

NOTE

If copyright is involved, obtain tools by yourself. For details, contact Huawei technical support engineers.

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6.2.3 Obtaining Upgrade Reference Documents

Table 6-5 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** >**IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE

You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

6.2.4 Obtaining Upgrade Software

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

6.2.5 Obtaining the Rollback Package

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

6.2.6 Obtaining the UltraPath Version Number

Task Description

Obtain the version number of UltraPath for ESXi in use and determine whether an upgrade is needed.

Procedure

Check the version number of UltraPath for ESXi:

On the CLI, run the **esxcli upadm show version** command and collect the version number of the UltraPath displayed in command output. You can run **upadm show version verbose** to query product version about V100R008C50 and later versions. If no information is displayed after you run the **esxcli software vib list |grep ultrapath** command, UltraPath is not installed.

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Check the version number of UltraPath for the vCenter plug-in:

Log in to the UltraPath for vCenter plug-in and click **Version Information** on the **About** page.

Verification

Version number of UltraPath for ESXi:

Example 1:

```
~ # esxcli upadm show version
Software Version   : 21.01.003
Driver   Version   : 21.01.003
```

Example 2:

```
~ # esxcli upadm show version -v
Software Version   : 8.06.063
Driver   Version   : 8.06.063
Product  Version   : V100R008C50SPC500
```

Example 3:

```
~ # esxcli software vib list |grep ultrapath
ultrapath.cim  21.01.003-00    HUAWEI   VMwareAccepted   2017-01-23
ultrapath.cli  21.01.003-00    HUAWEI   VMwareAccepted   2017-01-23
ultrapath.mpp  21.01.003-00    HUAWEI   VMwareAccepted   2017-01-23
```

Version number of UltraPath for vCenter plug-in:

6.2.7 Checking the Pre-upgrade Environment

Task Description

Obtain host information for upgrade verification.

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Precautions

- Use vmware -v to check that the versions of the operating system are ESXi 5.0, ESXi 5.1, ESXi 5.5,ESXi 6.0 and ESXi 6.5.
- Use VMware vSphere Client to check that the versions of vCenter Server are 5.0, 5.1, 5.5, 6.0 and 6.5.
- In an active-active VIS environment where the version of UltraPath is V100R008C00 and local and remote controllers have been successfully configured, if you need to enable the conversion of APD into PDL after the version of UltraPath is upgraded to this version, you need to run **esxcli upadm set apdtopdl -m on -t value** on the UltraPath CLI to enable the conversion of APD into PDL and set the timeout of the conversion.
- If the operating system version of the ESXi host is ESXi 5.5, check whether **ESXi 5.5 Patch 1 (Patch Release ESXi550-201312001 (2063795))**is installed. If the patch is not installed, vCenter VM console may fail to be accessed after the hostd service is restarted due to known issues of ESXi 5.5 in **PR 1119481** of VMware KB 2063788. An error "Unable to connect to the MKS : the operation is not allowed in the current state" is displayed.

  Note: Run the **vmware -v** command to check the ESXi version. If the version is earlier than VMware ESXi 5.5.0 build-1474528, ESXi 5.5 Patch 1 is not installed on the ESXi 5.5 host.

Procedure

Check the information about the operating system of the ESXi host.

Log in to the ESXi host and run the **vmware -v** command to display the version information.

~ # vmware -v

VMware ESXi 5.0.0 build-469512

Check vCenter Server.

Log in to vCenter using VMware vSphere Client and click **About VMware vSphere** on the **Help** menu to display the vCenter version number,as shown in the following figure:

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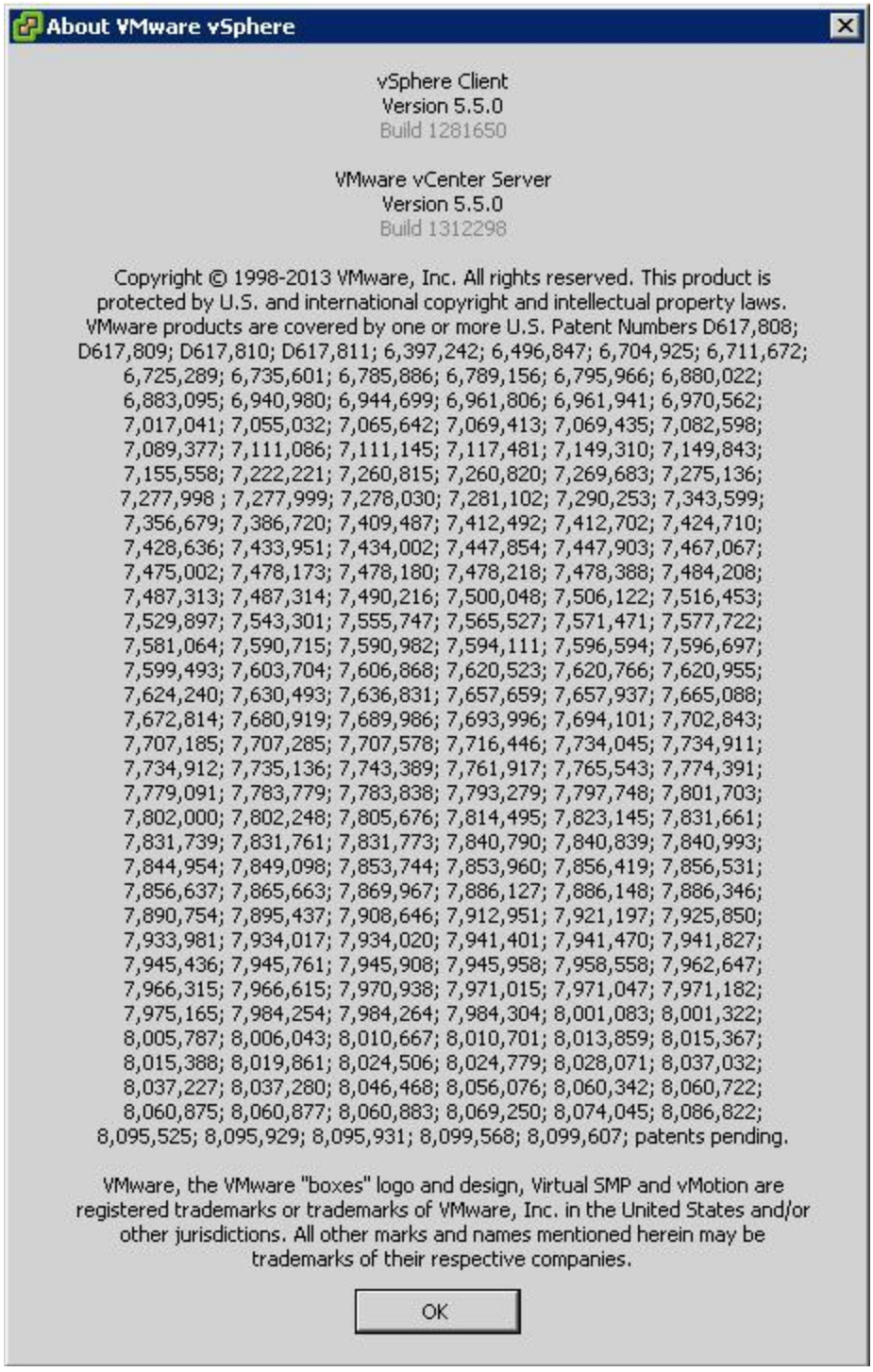

6.2.8 Pre-upgrade Module Check

Check the module before upgrading UltraPath for ESXi:

- Before performing the upgrade, run the **vmkload_mod -l |grep nxup** command to check the kernel module loaded by the current kernel.

For example, the module before the upgrade is **nxup-ext-a**:

~ # vmkload_mod -l |grep nxup

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nxup-ext-a 32 1420

6.3 Procedure of Upgrading UltraPath for ESXi

For details about upgrading UltraPath for EXSi offline, see section 6.3.1 Upgrading UltraPath for ESXi Offline "Upgrading UltraPath for ESXi Offline."

For details about upgrading UltraPath for EXSi online, see section 6.3.2 Procedure for Upgrading UltraPath for ESXi Online "Procedure for Upgrading UltraPath for ESXi Online."

6.3.1 Upgrading UltraPath for ESXi Offline

6.3.1.1 Stopping Services Running in the Host

Task Description

During the scripts-based upgrade, disks are discovered again. For the CLI-based upgrade, you must restart the host.

Precautions

- To avoid service data loss, upgrade the software when there is no service running or when services have been migrated to other servers.
- If the database service is running, stop it first.
- After upgrading UltraPath for ESXi, upgrade UltraPath for vCenter.

Prerequisites

After obtaining the customer's approval for interrupting services, shut down all the virtual machines on the ESXi host, enter the maintenance mode, and perform the offline upgrade.

Procedure

Step 1 In a cluster environment, migrate the virtual machines to other nodes. In a non-cluster environment, stop the services running on the virtual machines and shut down the virtual machines.

Step 2 Enter the maintenance mode.

In the vCenter list, right-click an ESXi host and choose **Enter Maintenance Mode**.

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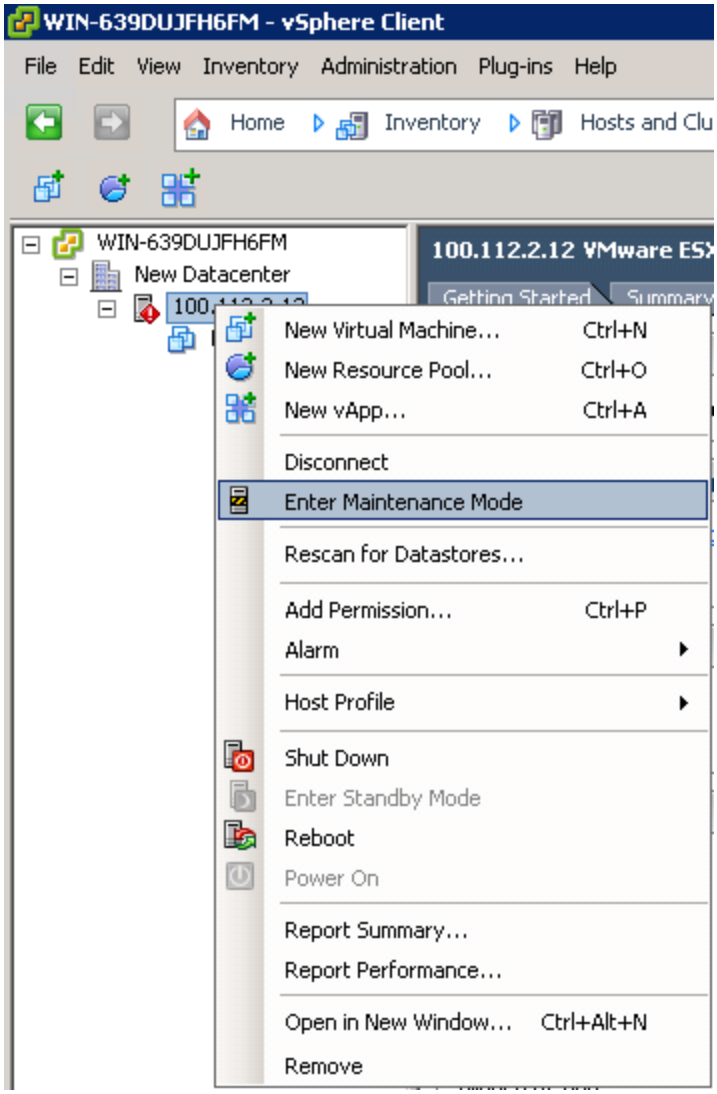
Figure 6-4 Entering the maintenance mode



In the dialog box that is displayed, click **Yes**.

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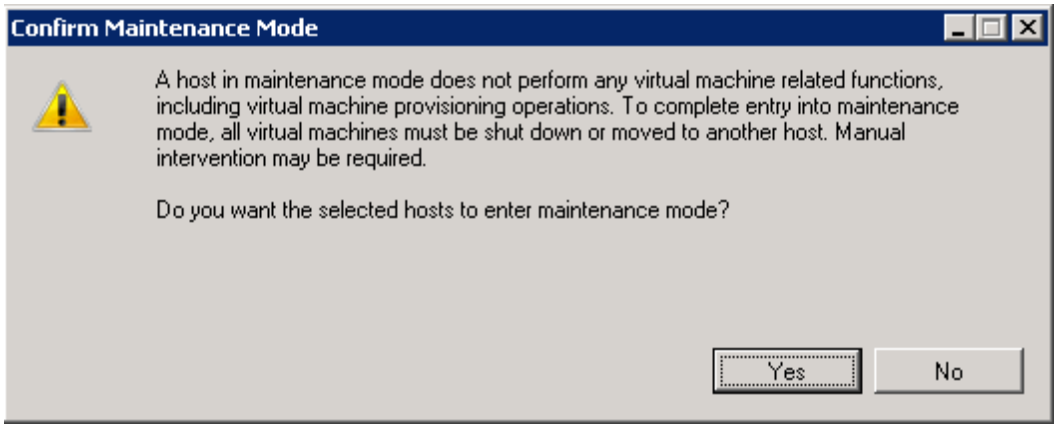
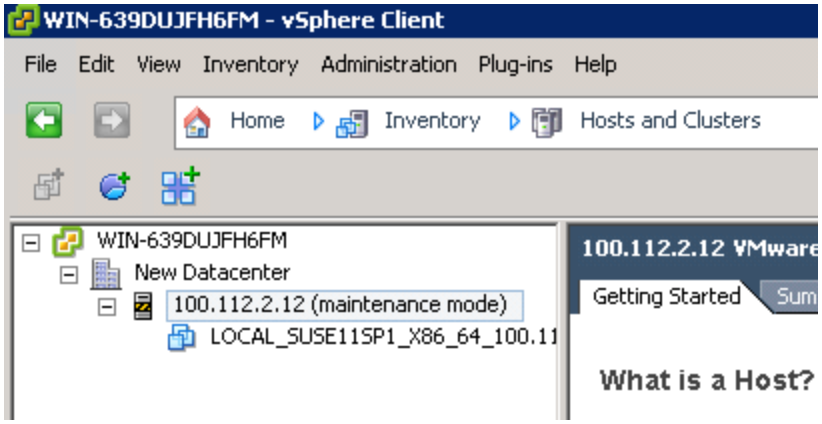
Figure 6-5 Confirming the maintenance mode



Verify that the ESXi host has entered the maintenance mode.

Figure 6-6 Verifying the maintenance mode the ESXi host has entered



----End

Result Verification

No errors occur when the host was entering the maintenance mode.

Troubleshooting

Close all service-related windows and enter the maintenance mode again.

6.3.1.2 Upgrading UltraPath on the CLI

Task Description

Upgrade the UltraPath on the CLI.

Users need to perform either CLI- or script-based upgrade.

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Precautions

Make sure that the version in use is earlier than the target one. Otherwise, an error message will be displayed and the upgrade will fail.

The host must be restarted after the CLI-based upgrade so that UltraPath can take effect.

Prerequisites

None.

Procedure

Step 1 Log in to the system as user **administrator**.

Step 2 Run the following commands:

~ # esxcli software vib install -d /opt/UltraPath-XX.XX.XXX-ESXi6.x-offline-bundle.zip

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_ultrapath.cim_XX.XX.XXX-00, HUAWEI_bootbank_ultrapath.cli_XX.XX.XXX-00, HUAWEI_bootbank_ultrapath.mpp_XX.XX.XXX-00

VIBs Removed: HUAWEI_bootbank_ultrapath.cim_XX.XX.XXX-00, HUAWEI_bootbank_ultrapath.cli_XX.XX.XXX-00, HUAWEI_bootbank_ultrapath.mpp_XX.XX.XXX-00

VIBs Skipped:

NOTE

1./opt is the path in which the installation package is saved.

2.VMware stops providing signature authentication for the software packages of ESXi 5.0 and 5.1 operating systems, so the software packages are not authenticated with signatures. Therefore, run the esxcli software vib install -d /opt/UltraPath-XX.XX.XXX-ESXi5.0-offline-bundle.zip --no-sig-check command when the ESXi version is 5.0 or 5.1.

Step 3 Restart the system.

Run the **reboot** command to restart the system.

----End

Troubleshooting

None.

6.3.1.3 Upgrading the Script

Task Description

Upgrade the UltraPath on the CLI.

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Users need to perform either CLI- or script-based upgrade.

Precautions

Make sure that the version in use is earlier than the target one. Otherwise, an error message will be displayed and the upgrade will fail.

You need to restart the host upon the scripts-based upgrade in SAN Boot or PE LUNs token by UltraPath, but do not need to restart the host in non-SAN Boot.

Prerequisites

The upgrade script and the installation package are saved in the same directory.

Procedure

Step 1 Log in to the system as user **administrator**.

Step 2 Save the upgrade package and the installation script in a directory.

Run the following command:

~ # sh /opt/install.sh

NOTE

/opt is the path in which the installation package is saved.

Step 3 If the upgrade is performed successfully, the following output will be displayed. Otherwise, the upgrade fails. Perform operations as instructed in the prompt information.

UltraPath upgrade may affect business. Please stop the business before upgrading the UltraPath.

** Are you sure that you want to continue the UltraPath upgrade? [y,n,?] : y*

Note:During the upgrade, the hostd service on ESXi hosts will be restarted and vCenter will be disconnected temporarily. This will affect the services (clone,migration, or snapshot) running on vCenter.

To avoid this situation, do not perform any management task during the upgrade, and you will be prompted to check whether there are services running on vCenter during the upgrade.

Are there no services running on vCenter?If yes, continue with the upgrade. If no, exit the upgrade. [y,n,?]: y

Host is rescanning, please wait.....

The update completed successfully.

Note:The output of the esxcli software vib list command shows that the UltraPath version is the pre-upgrade one. Run the esxcli upadm show version command to check the version of the current UltraPath.

NOTE

VMware stops providing signature authentication for the software packages of ESXi 5.0 and 5.1 operating systems, so the software packages are not authenticated with signatures. Therefore, when the ESXi version is 5.0 or 5.1, the following prompt information will be displayed at the beginning of command output after command execution:

Because VMware stops providing signature authentication for the software package

of the ESXi 5.0/ESXi 5.1 system, the software package is not certified and signed

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by VMware. An alarm will be reported in vCenter if an unsigned package is used.

----End

Troubleshooting

Proceed as prompted.

6.3.2 Procedure for Upgrading UltraPath for ESXi Online

6.3.2.1 Upgrading UltraPath for ESXi Online

Task Description

The online upgrade installs the new version after the old version is uninstalled and activates the UltraPath module without interrupting services.

Precautions

1.Do not copy the UltraPath installation package to a directory that contains a space in its name, such as **/home/Dad Dir/**. Otherwise, the **install.sh** may not be executed properly.

2.Before the upgrade, there must be a minimum of 50 MB, 10 MB, and 10 MB free space in the **tmp**, **root**, and **etc** directories on the server respectively.

3.If UltraPath was installed on the host and the old UltraPath installation package directory still exists, do not copy the new UltraPath installation package to this directory, or you may find it difficult to distinguish the two packages.

4.Before performing the upgrade, check that information about the paths is correct.

5.During the upgrade, the hostd service on ESXi hosts will be restarted and vCenter will be disconnected temporarily. This will affect the services (clone, migration, or snapshot) running on vCenter. To avoid this situation, do not perform any management task during the upgrade, and you will be prompted to check whether there are services running on vCenter during the upgrade.

6.After the online upgrade is complete, the latest UltraPath takes effect immediately. Run the **esxcli upadm show version** command to check whether the new version is correct. Output of the **esxcli software vib list** command still displays the old vib version number. The new version will be displayed in the output after the host restarts.

7.After the online upgrade is complete, manually upgrade UltraPath for vCenter offline to the latest version to manage UltraPath for ESXi.

8.If the operating system is ESXi 6.0, UltraPath V100R008C20 cannot be upgraded online to the UltraPath for this version.

9.The SSD property of a disk cannot be updated after an online upgrade. Reclaim the disk or restart the host to update the SSD property.

The procedure of reclaiming the disk:

Step1. Stop services running on the disk, and power off VMs using the disk.

Step2. Run the **esxcli storage core claiming reclaim --device device_name** command to reclaim the disk.

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Step3. Run the **esxcli storage core device list -d device_name** command to check whether the SSD property is updated.

Procedure

Step1.Copy the UltraPath installation package and installation script to the host.

Step2.Run the following command:

```
~ # sh install.sh -ndu [ndu_free_disk_space=xxx]
```

Table 6-6 Parameters that can be specified by users during the online upgrade

Parameter	Function	Description
ndu_free_disk_space	Free root directory space required by the online upgrade check.	Unit: MB. Default value:10

After the online upgrade is complete, the following messages are displayed:

```
~ # sh /opt/install.sh -ndu
Start the online upgrade.
Step 1: Perform the pre-upgrade check.
Note: The SSD property of a disk cannot be updated after an online upgrade. Reclaim the disk or restart the host to update the SSD property.
Note: During the upgrade, the hostd service on ESXi hosts will be restarted and vCenter will be disconnected temporarily. This will affect the services (clone, migration, or snapshot) running on vCenter.
     To avoid this situation, do not perform any management task during the upgrade, and you will be prompted to check whether there are services running on vCenter during the upgrade.
     Are there no services running on vCenter? If yes, continue with the upgrade. If no, exit the upgrade. [y,n,?] : y
Step 2: Update install UltraPath 8.06.002.
Step 3: Activate UltraPath 8.06.002 online.
The online upgrade is complete.
Note: The output of the esxcli software vib list command shows that the UltraPath version is the pre-upgrade one. Run the esxcli upadm show version command to check the version of the current UltraPath.
```

NOTE

VMware stops providing signature authentication for the software packages of ESXi 5.0 and 5.1 operating systems, so the software packages are not authenticated with signatures. Therefore, when the ESXi version is 5.0 or 5.1, the following prompt information will be displayed at the beginning of command output after command execution:

Because VMware stops providing signature authentication for the software package of the ESXi 5.0/ESXi 5.1 system, the software package is not certified and signed by VMware. An alarm will be reported in vCenter if an unsigned package is used.

----End

Verification

1. Run the **esxcli upadm show version** command to check whether the UltraPath version is the latest.

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```
~ # esxcli upadm show version
Software Version      : 21.01.003
Driver      Version   : 21.01.003
```

2. Run the **vmkload_mod -l** command to check whether the nxup module has been replaced.

For example, the module before the upgrade is **nxup-ext-a**:

```
~ # vmkload_mod -l |grep nxup
nxup-ext-a                32     1420
```

The module after the upgrade is **nxup-ext-b**.

```
~ # vmkload_mod -l |grep nxup
nxup-ext-b                32     1420
```

Troubleshooting

If faults occur during the upgrade, contact Huawei R&D engineers for troubleshooting.

6.4 Procedure of Upgrading UltraPath for vCenter Plug-In

6.4.1 Upgrading UltraPath for vCenter Plug-In 5.x

Task Description

Run the **.exe** file of the new version to upgrade UltraPath for vCenter.

Precautions

During the upgrade, the VMware VirtualCenter Management Webservices service must be restarted. When the VMware VirtualCenter Management Webservice service is being restarted, none of the vCenter plug-ins can be used.

Prerequisites

- Confirm that the current version is not the latest.
- Restart the VMware VirtualCenter Management Webservices service.

The vCenter Server version is 5.0, 5.1, 5.5.

Procedure

Step 1 If you have opened vCenter installation directories or the files in the directory, close all vCenter installation directories and files.

Step 2 Double-click the new version of UltraPath for vCenter to start the upgrade.

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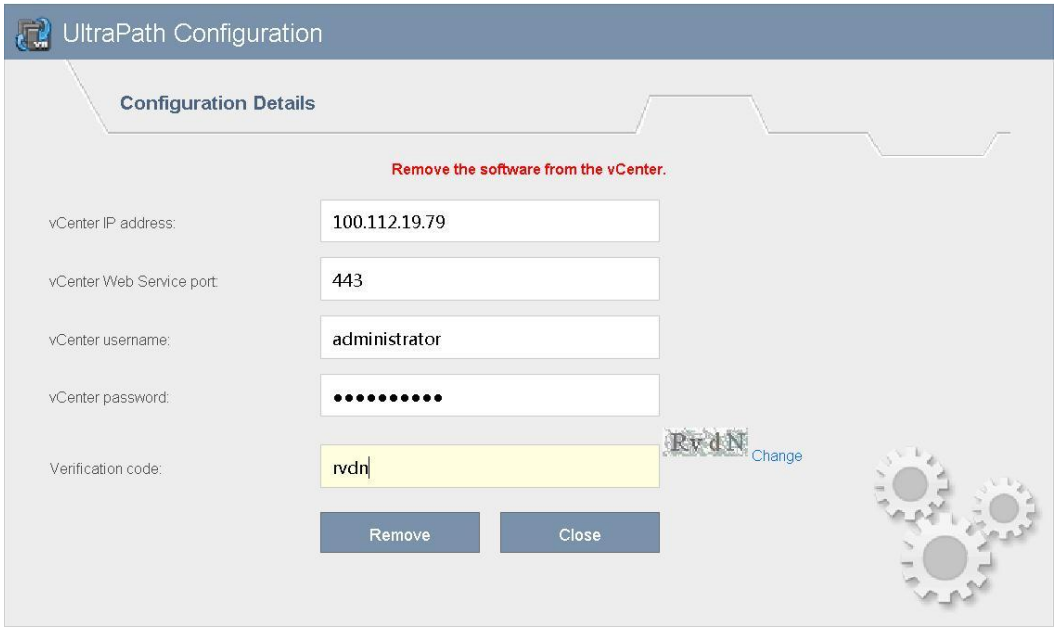
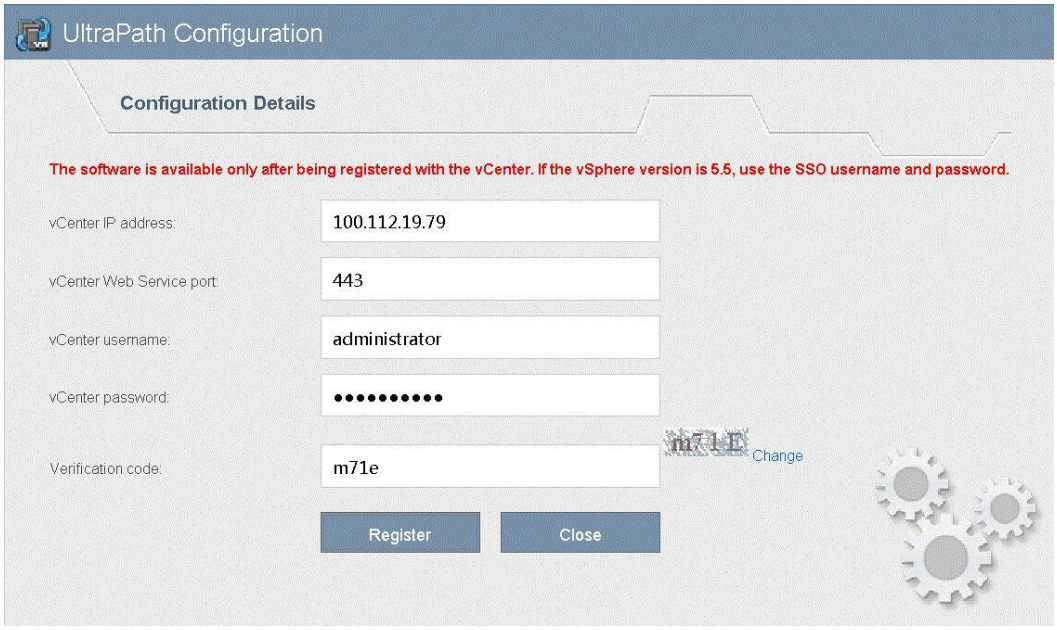
Step 3 Remove UltraPath for vCenter.



Step 4 Register UltraPath for vCenter.



----End

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Troubleshooting

Check whether you can log in to UltraPath for vCenter properly and whether the version information is correct.

6.4.2 Upgrading UltraPath for vCenter Plug-In 6.x

Task Description

Install the new version to upgrade UltraPath for vCenter.

Precautions

vCenter 6.x:

During the upgrade, If the UltraPath for vCenter is downgrade to an older version,the VMware vSphere Web Client service must be restarted. When the VMware vSphere Web Client service is being restarted, the vCenter can not be used.

vCenter 6.5:

After the upgrade, the VMware vSphere Web Client service must be restarted. When the VMware vSphere Web Client service is being restarted, the vCenter can not be used.

For scenarios where platform service controllers (PSCs) are configured externally and manage multiple vCenter servers. For vCenter 6.0, restart VMware vSphere Web Client service after UltraPath for vCenter is upgraded.

Prerequisites

- Confirm that the current version is not the latest.
- Restart the VMware vSphere Web Client service if the UltraPath for vCenter is downgrade to an older version.
- Restart the VMware vSphere Web Client service if the vCenter Server version is 6.5.

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- For scenarios where platform service controllers (PSCs) are configured externally and manage multiple vCenter servers. For vCenter 6.0, restart VMware vSphere Web Client service after UltraPath for vCenter is upgraded.

The vCenter Server version is 6.x.

Procedure

Method 1: Uninstalling the old version,then installing the new version of UltraPath for vCenter

Step 1 Uninstalling the old version of UltraPath for vCenter 6.x.

For details about how to Uninstalling UltraPath for vCenter 6.x,

see "3.3.2.2.1 Uninstalling UltraPath for vCenter (for vCenter 6.X deployed on Windows)" or "3.3.2.2.2 Uninstalling UltraPath for vCenter (Applicable to vCenter 6.X on VCSA 6.X)" in OceanStor UltraPath for vSphere 21.1.0 User Guide.pdf.

Step 2 Installing the new version of UltraPath for vCenter 6.0.

For details about how to Installing UltraPath for vCenter 6.0,

see "2.4.2 Installing UltraPath for vCenter (for vCenter 6.0)" in OceanStor UltraPath for vSphere 21.1.0 User Guide.pdf.

----End

Method 2: Deregister the old version,upgrade the new version of UltraPath for vCenter,then register the new version of UltraPath for vCenter.

Step 1 Deregister the old version of UltraPath for vCenter 6.x.

For details about how to deregister the UltraPath for vCenter 6.x,

see "3.3.2.2.1 Uninstalling UltraPath for vCenter (for vCenter 6.X deployed on Windows) step 2" or "3.3.2.2.2 Uninstalling UltraPath for vCenter (Applicable to vCenter 6.X on VCSA 6.X) step 2" in OceanStor UltraPath for vSphere 21.1.0 User Guide.pdf.

Step 2 Upgrade the new version of UltraPath for vCenter 6.0.

1. for vCenter 6.X deployed on Windows:

(1).Decompress the UltraPath installation package and copy Windows under /VMware_vSphere/Packages/vCenter-Plugin/VMware_vSphere_6.X to any directory of the vCenter server.

Log in to the vCenter server.

Open the Windows file folder and double-click the UltraPath-XX.XX.XXX-vCenter6.exe icon. The UltraPath for vCenter upgrade dialog box are displayed.

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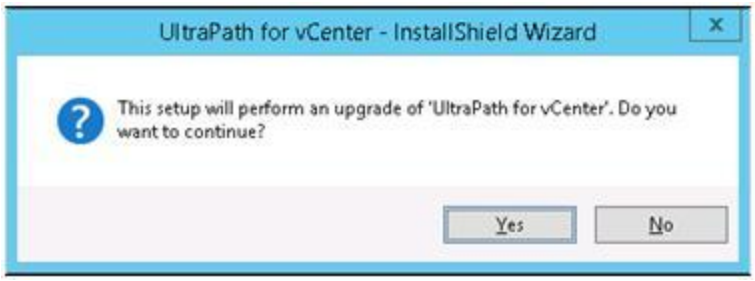
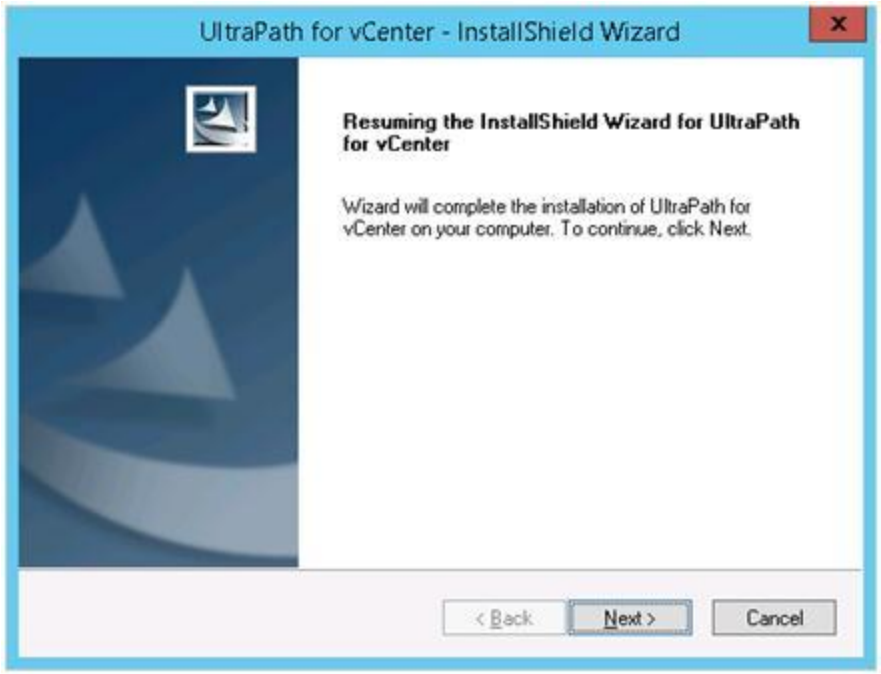


(2).Click Yes. The UltraPath for vCenter installation page is displayed.



(3).Click next to start the upgrade.

The installation is complete, as shown:

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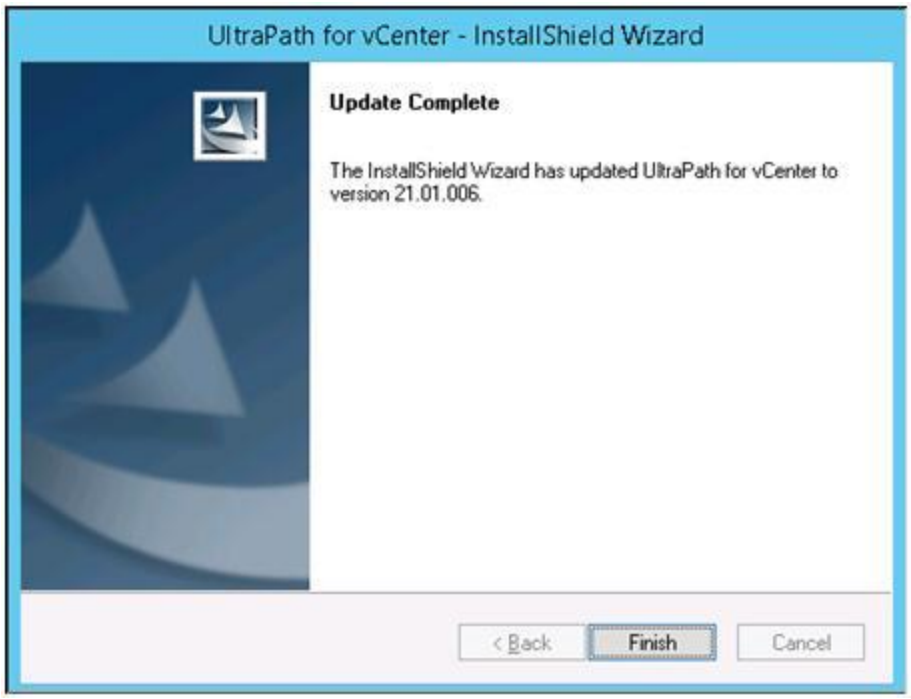
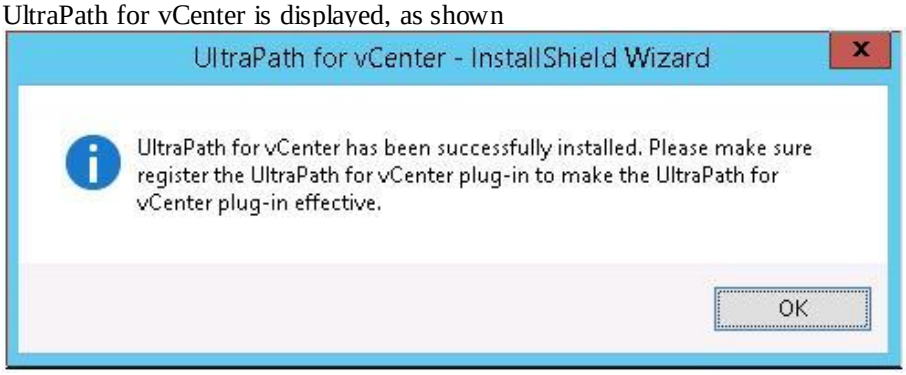


(4).Click Finish.After UltraPath for vCenter is installed, the dialog box for registering UltraPath for vCenter is displayed, as shown



2.Applicable to vCenter 6.X on VCSA 6.X:

For details about how to upgrade UltraPath for vCenter 6.0,

see "2.4.2.2 Installing UltraPath for vCenter (Applicable to vCenter 6.X on VCSA 6.X)" in OceanStor UltraPath for vSphere 21.1.0 User Guide.pdf.

The only difference lies the following command output after sh install.sh is executed in step 3:

root@vcsa163 [/VCSA6.x]# chmod +x install.sh

root@vcsa163 [/VCSA6.x]# sh install.sh

[WARNING] An earlier UltraPath version has been detected.

----------begin----------YES or NO box----------

Do you want to remove it now?

----------end----------YES or NO box----------

<Y|N>:Y

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The UltraPath for vCenter uninstallation starts.

Uninstalling UltraPath for vCenter of an earlier version succeeded.

Preparing... ##

Updating / installing...

UltraPath-for-vCenter-21.1.6-2 ##

UltraPath for vCenter has been successfully installed.Please make sure register the

UltraPath for vCenter plug-in to make the UltraPath for vCenter plug-in effective.

Step 3 Register the new version of UltraPath for vCenter 6.x.

For details about how to register UltraPath for vCenter 6.x,

see "2.4.2.1 Installing UltraPath for vCenter (for vCenter 6.X deployed on Windows) step 8" or "2.4.2.2 Installing UltraPath for vCenter (Applicable to vCenter 6.X on VCSA 6.X) step 4" in OceanStor UltraPath for vSphere 21.1.0 User Guide.pdf.

----End

Note:If the UltraPath for vCenter is downgrade to an older version:

Step 1 Uninstalling the old version of UltraPath for vCenter 6.0.

For details about how to Uninstalling UltraPath for vCenter 6.0,

see "3.3.2.2 Uninstalling UltraPath for vCenter (for vCenter 6.0)" in OceanStor UltraPath for vSphere 21.1.0 User Guide.pdf.

Restart VMware vSphere Web Client service.

Step 2 Installing the new version of UltraPath for vCenter 6.0.

For details about how to Uninstalling UltraPath for vCenter 6.0,

see "2.4.2 Installing UltraPath for vCenter (for vCenter 6.0)" in OceanStor UltraPath for vSphere 21.1.0 User Guide.pdf.

----End

Troubleshooting

Check whether you can log in to UltraPath for vCenter properly and whether the version information is correct.

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6.5 Verifying Upgrade Result

6.5.1 Verification Checklist

Table 6-7 UltraPath for ESXi verification checklist

No.	Verification Item	Criterion	Command
1	Check the version of UltraPath for ESXi.	The displayed version is the target one.	Run **esxcli upadm show version** on the ESXi CLI.
2	Query disk devices.	Disk devices are generated successfully.	After running the **esxcfg-rescan -A** and **esxcli storage core device list** commands, disk devices can be queried successfully.
3	Restore UltraPath configurations.	On the UltraPath Console, restore the work mode and global configuration based on the values recorded before the upgrade.	On UltraPath Console, verify the work mode and global configuration according to the values recorded before the upgrade.
4	Check that services on the server are running properly.	Ask the customer's engineer to confirm that services are running properly.	Services on the server are running properly.
5	Check the version	The displayed version is the	Click **Version**

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No.	Verification Item	Criterion	Command
	number of UltraPath for vCenter.	target one.	**Information** on the **About** page.

6.5.2 Verifying UltraPath for ESXi Version Information

Task Description

Make sure that the post-upgrade UltraPath version is consistent with the target version.

Procedure

On the CLI, run the **esxcli upadm show version** command.

~ # esxcli upadm show version

Software Version : 21.01.003

Driver Version : 21.01.003

Result Verification

Verify that the output version number is consistent with the target version number.

Troubleshooting

If the output version number is inconsistent with the target version number, check whether the UltraPath upgrade package is correct.

6.5.3 Generating Disk Information Normally

Task Description

Check that the UltraPath in use can manage the disks that are mapped to the storage system.

Precautions

All links have been restored and are working properly.

Procedure

Run the following command on the CLI to check disk information:

```
~ # esxcli storage core device list
naa.600e0fc1000000504d9df5d000000021
   Display Name: HUAWEI Fibre Channel Disk (naa.600e0fc1000000504d9df5d000000021)
   Has Settable Display Name: true
   Size: 100
   Device Type: Direct-Access
   Multipath Plugin: MP_PLUGIN_ULTRAPATH
   Devfs Path: /vmfs/devices/disks/naa.600e0fc1000000504d9df5d000000021
```


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```
Vendor: HUAWEI
Model: S5500
Revision: 1
SCSI Level: 4
Is Pseudo: false
Status: on
Is RDM Capable: true
Is Local: false
Is Removable: false
Is SSD: false
Is Offline: false
Is Perennially Reserved: false
Queue Full Sample Size: 0
Queue Full Threshold: 0
Thin Provisioning Status: unknown
Attached Filters:
VAAI Status: unknown
Other UIDs: vml.0200020000600e0fc1000000504d9df5d000000021533535303020
Is Local SAS Device: false
Is Boot USB Device: false
No of outstanding IOs with competing worlds: 32
```

----End

Verification

Disks are successfully detected by the server. The number of disks is the same with that of the LUNs that are mapped to the storage system, and the disk capacity is consistent with LUN capacity.

Troubleshooting

If the disk quantity is incorrect or the status is abnormal, delete the mappings and add the mappings again.

6.5.4 Verifying UltraPath for vSphere Configuration

Task Description

Verify the UltraPath for vSphere configuration according to the configuration information recorded before the upgrade.

Precautions

UltraPath for vSphere has been installed successfully.

Procedure

Verify the UltraPath for vSphere configuration according to the configuration information recorded before the upgrade.

Verification

Configuration of UltraPath for vSphere is the same as that recorded before the upgrade.

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Troubleshooting

If you fail to run UltraPath for vCenter, check whether the UltraPath for vCenter plug-in is installed successfully.

6.5.5 Checking that Services on the Server Are Running Properly

Task Description

Check that all services can run properly after UltraPath for vSphere is upgraded.

Precautions

After the upgrade, you need to restart the system to verify the service functions.

Procedure

1. Perform the same operations before and after the upgrade to check that all services can be processed in the same way.

Verification

All services can be processed properly before and after the upgrade in the same way.

Troubleshooting

None

6.5.6 Verifying UltraPath for vCenter Version Information

Task Description

Make sure that the post-upgrade plug-in version is consistent with the target one.

Procedure

Log in to UltraPath for vCenter and click **Version Information** on the **About** page to check the client version number.

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Result Verification

Verify that the output version number is consistent with the target version number.

Troubleshooting

If the post upgrade version number is inconsistent with the target version number, check whether the upgrade package is correct.

6.6 Version Rollback

6.6.1 Uninstalling the New UltraPath

Task Description

If the new version does not work properly, uninstall it before installing the previous version.

Procedure

Step 1 Run the following commands to uninstall UltraPath for ESXi.

esxcli software vib remove -n ultrapath.cli;

esxcli software vib remove -n ultrapath.cim;

esxcli software vib remove -n ultrapath.mpp

After the uninstallation is complete, need to restart the host for install the UltraPath with the early version.

```
~ # esxcli software vib remove -n ultrapath.cli
Removal Result
   Message: The update completed successfully, but the system needs to be rebooted for the changes to be effective.
   Reboot Required: true
```


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```
   VIBs Installed:
   VIBs Removed: HUAWEI_bootbank_ultrapath.cli_21.01.003-00
   VIBs Skipped:
~ # esxcli software vib remove -n ultrapath.cim
Removal Result
   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_ultrapath.cim_21.01.003-00
   VIBs Skipped:
~ # esxcli software vib remove -n ultrapath.mpp
Removal Result
   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_ultrapath.mpp_21.01.003-00
   VIBs Skipped:
```

Step 2 Uninstall the UltraPath for vCenter plug-in.

----End

Result Verification

Run the **esxcli software vib list | grep ultrapath** command. No UltraPath version information is displayed.

UltraPath for vCenter Plug-In 5.x,Refresh the control panel to see whether UltraPath for vCenter is still there.UltraPath for vCenter Plug-In 6.x,should check the plugin in the vsphere vCenter's plugin manage.

Troubleshooting

If the UltraPath uninstallation is unsuccessful, ask Huawei R&D contact for help.

6.6.2 Installing the Original UltraPath

Task Description

Install the original UltraPath.

Procedure

Based on the *User Guide* of the original UltraPath, use the rollback packages provided in section 6.2.5 Obtaining the Rollback Package "Obtaining the Rollback Package" to install the original UltraPath.

Result Verification

The original UltraPath is installed successfully.

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Troubleshooting

If anomalies occur in the rollback process, ask Huawei R&D contact for help.

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7 UltraPath for FusionSphere Upgrade Guide

7.1 Upgrade UltraPath offline on a single node in the FusionSphere environment
7.2 Upgrade UltraPath in batch in the FusionSphere OpenStack environment

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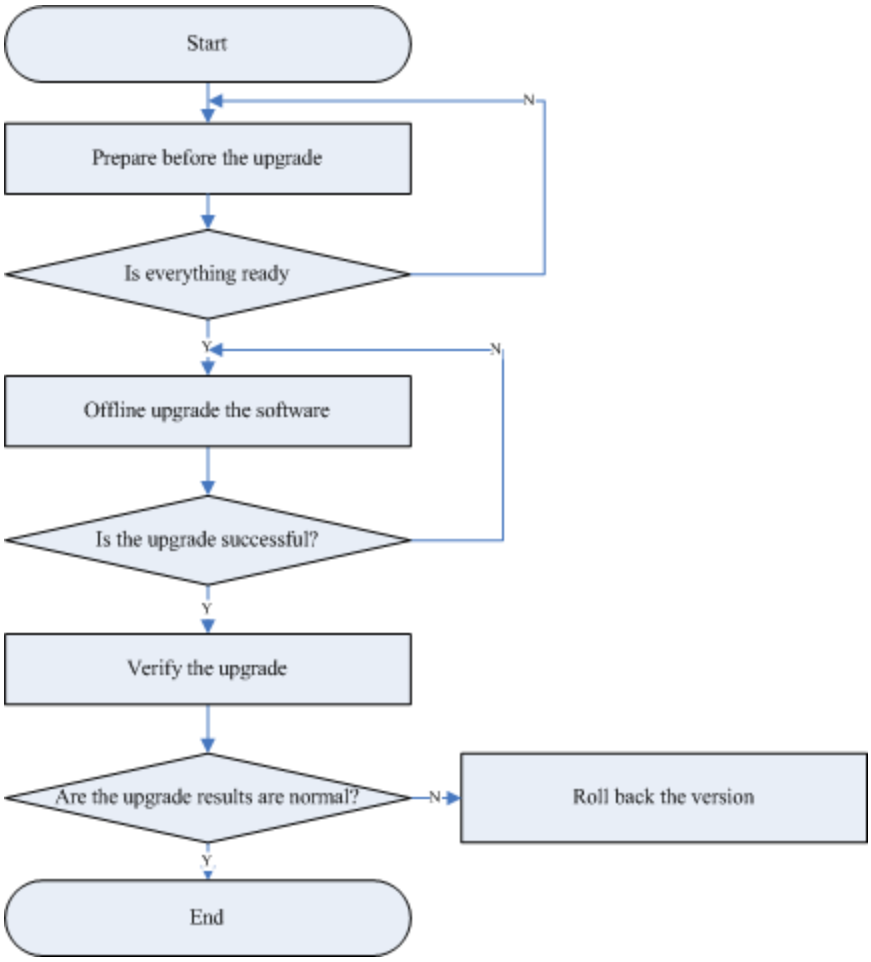
7.1 Upgrade UltraPath offline on a single node in the FusionSphere environment

7.1.1 Upgrade Process Overview

7.1.1.1 Upgrade Flowchart

Figure 7-1 Flowchart for upgrading UltraPath



7.1.1.2 Upgrade Procedure and Required Time

Table 7-1 Upgrade procedure and required time

No.	Operation	Required Time	Impact	Remarks
1	Check the installation package and the information about the operating system.	About 3 minutes	None	Mandatory

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No.	Operation	Required Time	Impact	Remarks
2	Offline upgrade the new UltraPath.	About 5 minute	None	Mandatory
3	Verify the upgrade.	About 4 minutes	None	Mandatory

The upgrade takes about 12 minutes.

7.1.2 Preparing for the Upgrade

7.1.2.1 Prerequisites

The following conditions must be met for the upgrade:

- The operator has the Linux operation experience.
- The operator has the super user (root) permission on the Linux operating system..
- The hardware that runs the server program meets the basic requirements on UltraPath software (128 MB memory and 200 MB available disk space).

7.1.2.2 Obtaining Upgrade Tools

The following table lists the tools required for upgrading UltraPath.

Table 7-2

Name	Download Address	Remarks
Secure Shell (SSH)	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	You can use this tool to remotely log in to the server on which you want to upgrade UltraPath.
Secure File Transfer Protocol (SFTP) tool	http://www.coreftp.com/server/download/msftpsrvr.exe	You can use this tool to upload the UltraPath software package.

NOTE

If copyright is involved, obtain tools by yourself. For details, contact Huawei technical support engineers.

7.1.2.3 Obtaining Reference Documents for the Upgrade

Table 7-3 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

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You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE

You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

7.1.2.4 Obtaining Upgrade Software

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

Table 7-4 Installation packages of UltraPath

No.	File Name	Description
1	FusionSphere	UltraPath installation package document

7.1.2.5 Preparing the Installation Package for Version Rollback

Prepare the installation package of the UltraPath that has been installed before the upgrade. If the upgrade fails, roll back to the previous version and quickly recover services.

7.1.2.6 Obtaining the Current UltraPath Version

Task Description

Obtain the current UltraPath version to determine whether an upgrade is necessary.

Procedure

On the command line interface (CLI), run the **upadmin show version** command and view the returned UltraPath version.

Verification

Example 1

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```
linux:~ # upadmin show version
Software Version: 5.01.074
DriverVersion: 5.01.074
```

Example 2

```
linux:~ # upadmin show version
Software Version: 6.01.001
DriverVersion: 6.01.001
```

Example 3

```
linux:~ # upadmin show version
Software Version: 8.01.007
DriverVersion: 8.01.007
```

Example 4

```
linux:~ # upadmin show version
Software Version: 8.03.028
DriverVersion: 8.03.028
```

Example 5

```
linux:~ # upadmin show version
Software Version: 8.05.008
DriverVersion: 8.05.008
```

7.1.3 Performing the Upgrade

7.1.3.1 Stopping Services

Task Description

The upgrade process needs to restart the host. This interrupts the services.

Precautions

In order to prevent the loss of service data, upgrade the UltraPath at off-peak hours or migrate services to other servers before the upgrade.

Procedure

Step 1 Confirm with FusionSphere service engineers that services on the node are stopped. For example, VMs are stopped or migrated.

Step 2 Run the **service nxup stop** or **/etc/init.d/nxup stop** command to stop the UltraPath service.

- In the following example, the **service nxup stop** command is used. If the following command output is displayed for UltraPath V100R005C01 and UltraPath V100R006C00, the UltraPath service is stopped successfully. Otherwise, the UltraPath service fails to be stopped.

  ```
  [root@localhost ~]# service nxup stop
  stop Ultrapath successfully.
  ```

- In the following example, the **service nxup stop** command is used. If the following command output is displayed for UltraPath V100R008C00 and later versions, the

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UltraPath service is stopped successfully. Otherwise, the UltraPath service fails to be stopped.

```
linux:~ # service nxup stop
The UltraPath service is stopped successfully.
```

----End

Verification

No anomalies occur during the service interruption.

Troubleshooting

If the UltraPath service fails to be stopped in step 2 and the retry fails, restart the operating system to enable UltraPath to take effect after upgrading UltraPath in offline mode.

7.1.3.2 Upgrading UltraPath

Task Description

Upgrade the UltraPath. This section exemplifies how to upgrade the UltraPath from V100R008C00 to this version.

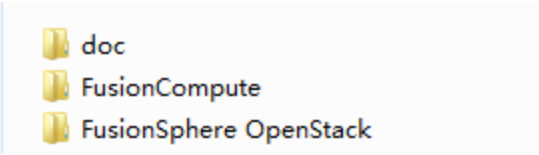
Precautions

None.

Procedure

Step 1 Obtain the **rpm** package from the FusionSphere installation package of UltraPath and use an SSH tool to upload the **rpm** package to a FusionCompute or FusionSpere OpenStack node.

Figure 7-2 UltraPath for Linux installation package directories



Step 2 Run the **rpm –Uvh** command to upgrade UltraPath. In the following figure, FusionSphere OpenStack environment is used as an example.

```
# rpm -Uvh UltraPath-21.01.001-UVPSP3_default.x86_64.rpm
Preparing...########################################### [100%]
begin upgrade/install(force).
1:UltraPath################################################ [100%]
UltraPath driver package has been successfully upgraded.
Please restart nxup service to enable the change.
```

Step 3 Enable the UltraPath software to take effect in either of the following ways:

- Method one:

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If the UltraPath service is stopped successfully in section 7.1.3.1 Stopping Services, run the **service nxup start** or **/etc/init.d/nxup start** command to start the UltraPath service to enable it to take effect.

The **service nxup start** command is used as an example.

```
# service nxup start
this kernel is 3.0.93-0.8-default
begin load nxup
Begin to delete LUNs whose mappings do not exist
Begin to delete LUNs whose mappings are changed.
begin scan host0
begin scan host1
begin scan host2
begin scan host3
begin scan host4
begin scan host5
begin scan host6
The device scanning is complete.
start upservice
The UltraPath starts successfully.
```

- Method two:

  Restart the host to enable UltraPath to take effect.

----End

Verification

On the CLI, run the **lsmod | grep nxup** command to check whether the nxup module exists.

Figure 7-3 Multipathing module information

Troubleshooting

If you encounter exceptions during the installation or cannot correctly restart the system after the installation is complete, contact Huawei R&D engineers for troubleshooting.

7.1.4 Verifying the Upgrade

7.1.4.1 Completing the Verification Checklist

Table 7-5 Checklist for verification

No.	Verification Item	Expected Result	Verification Result
1	Check the version of the current UltraPath.	The returned version is the desired one.	The returned version is the same as the expected one.

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No.	Verification Item	Expected Result	Verification Result
2	Check whether the multipathing service	Run the **chkconfig --list | grep nxup** command to check.	The **nxup** service exists.
3	Check with the customer whether the services are working correctly after the upgrade.	All the services are running correctly.	Each service is working correctly.

7.1.4.2 Verifying UltraPath Version Information

Task Description

Check that the upgraded UltraPath version is the expected one.

Procedure

Run the **upadmin show version** command to check.

Verification

The returned UltraPath version is the desired one.

Troubleshooting

If the returned UltraPath version is not the target version, check whether the used UltraPath upgrade package is correct.

7.1.4.3 Verifying UltraPath Information

Task Description

Check whether the upgraded UltraPath service exists.

Precautions

The name of the UltraPath service is **nxup**. This section describes how to check whether the UltraPath service exists with the example of system **SUSE**.

Procedure

Step 1 In the **/etc/init.d** directory, check whether the **nxup** file exists.

Step 2 Check whether the **chkconfig --list | grep nxup** service exists.

----End

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Verification

Step 1 Check that the **/etc/init.d/nxup** file exists.

Step 2 Check that the **chkconfig --list | grep nxup** service exists.

----End

Troubleshooting

If any step failed, contact Huawei R&D engineers for troubleshooting.

7.1.4.4 Checking Service Running

Task Description

Check that no post-upgrade impact occurs on the services running on the system.

Verification

All the services are running correctly after the upgrade.

Troubleshooting

If the services are not working properly, contact Huawei R&D engineers for troubleshooting.

7.1.5 Rolling Back to the Source Version

7.1.5.1 Uninstalling the Upgraded UltraPath

Purpose

If the upgraded UltraPath cannot work correctly, uninstall it to roll back to the source version.

Procedure

Uninstall the UltraPath by running the **rpm -e UltraPath** command.

Verification

Step 1 No UltraPath version information appears after you run the **rpm -qa | grep UltraPath** command.

Step 2 Check whether the UltraPath V100R008C50 module exists by running the **lsmod | grep nxup** command. If the module exists, run the **rmmod nxup** command to uninstall it.

----End

Troubleshooting

If you encounter exceptions during the uninstallation, contact Huawei R&D engineers for troubleshooting.

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7.1.5.2 Installing the Source UltraPath

Task Description

Reinstall the source version of UltraPath if the latest version cannot work properly.

Procedure

Obtain the rollback package described in section7.1.2.5 Preparing the Installation Package for Version Rollback and run the **rpm -ivh** command to install UltraPath of the original version.

Verification

You can correctly reinstall and operate the source version of UltraPath.

Troubleshooting

If you encounter exceptions during the rollback, contact Huawei R&D engineers for troubleshooting.

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7.2 Upgrade UltraPath in batch in the FusionSphere OpenStack environment

7.2.1 Upgrade Process Overview

7.2.1.1 Upgrade Flowchart

Figure 7-4 Upgrade flowchart

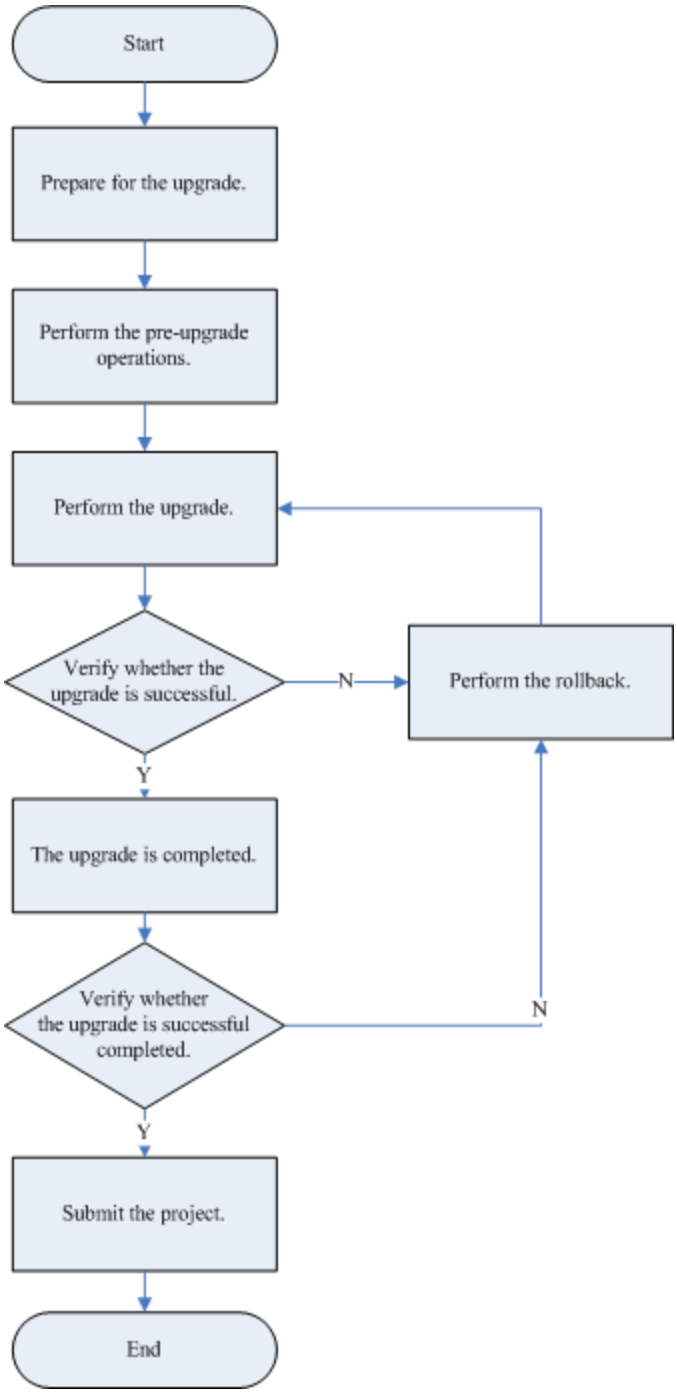

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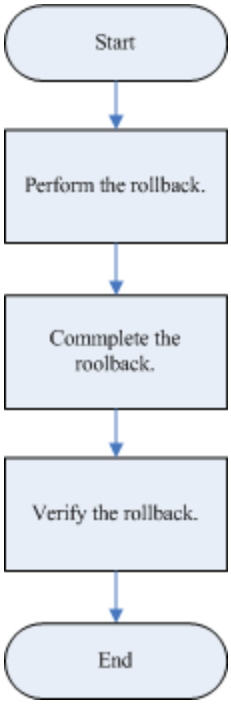
Figure 7-5 Rollback flowchart



7.2.1.2 Upgrade Procedure and Required Time

Table 7-6 and Table 7-7shows the operation steps. For time required and upgrade impact, see the FusionSphere OpenStack upgrade guide.

Table 7-6 Upgrade process

S/N	Step	Optional or Mandatory
1	Prepare for the upgrade.	Mandatory
2	Perform pre-upgrade operations.	Mandatory
3	Perform the upgrade.	Mandatory
4	Verify the upgrade.	Mandatory
5	Submit the project.	Mandatory

Table 7-7 Rollback process

S/N	Step	Optional or Mandatory
1	Perform the rollback.	Mandatory

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S/N	Step	Optional or Mandatory
2	Complete the rollback.	Mandatory
3	Verify the rollback.	Mandatory

7.2.2 Preparing for the Upgrade

Prepare tools and documents for upgrading FusionSphere OpenStack. For details, the FusionSphere OpenStack upgrade guide.

CAUTION

Use the FusionTool upgrade tool of the latest version.

7.2.2.1 Preparing Upgrade Documents

Table 7-8 Reference document

Document	Description
OceanStor UltraPath 21.1.0 Release Notes	Adjust the document based on site condition and deliver the document to the customer.

You can obtain the document by logging in to http://support.huawei.com/enterprise/ and choosing **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Documentation**.

NOTE

You must apply for the permission to obtain documentation from the website. If you are using http://support.huawei.com/enterprise/ for the first time, first register with the website. For details, see the website and FAQs.

7.2.2.2 Preparing the UltraPath Software Package

- Log in to http://support.huawei.com/enterprise/ to obtain the UltraPath installation package.

NOTE

Log in to http://support.huawei.com/enterprise/ and choose **Support** > **Document Center** > **IT** > **Cloud Storage** > **Tools and Platform** > **UltraPath** > **Downloads** to obtain the installation package.

- Use a digital signature verification tool to verify the integrity of the installation package.

NOTE

To ensure the integrity of the software you obtained, use a software digital signature (OpenPGP) validation tool to verify it. To obtain OpenPGP, log in to http://support.huawei.com/enterprise and choose **Support** > **Tools**. Search for software digital signature (OpenPGP) validation tool. Download OpenPGP and start the verification. For details about how to verify software, see the *OpenPGP Signature Verification Guide* released with the tool.

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Table 7-9 Installation packages of UltraPath

No.	File Name	Description
1	FusionSphere	UltraPath installation package document

The upgrade software package that is used in batch upgrading UltraPath in the FusionSphere OpenStack environment is placed under the directory of FusionSphere/FusionSphere OpenStack. For details, see the following table:

Table 7-10 UltraPath upgrade software package that supports FusionSphere OpenStack batch upgrade

S/N	Document Name	Description
1	ULTRAPATH_V100R008BASE_FSOV1R6C00.tar.gz	A base package used to import the UltraPath to the FusionSphere OpenStack V100R006C00 if UltraPath is notinstalled
2	ULTRAPATH_21-1-0_FSO6U0.tar.gz	FusionSphereOpenStack V100R006C00 upgrade package
3	ULTRAPATH_V100R008BASE_FSOV1R6C10.tar.gz	A base package used to import the UltraPath to the FusionSphere OpenStack V100R006C10 if UltraPath is notinstalled
4	ULTRAPATH_21.1.0_FSOV1R6C10.tar.gz	FusionSphereOpenStack V100R006C10 upgrade package

7.2.3 Performing Pre-upgrade Operations

7.2.3.1 Pre-upgrading the UltraPath

Step 1 Log in to the first host in the Available Zone. For details, see the FusionSphere OpenStack upgrade guide.

Step 2 Run **cps service-pkg-list**. Check whether the service package whose **service-package** contains **ultrapath-driver** exists. If such a package exists, end this operation. If such a package does not exist, go to step 3 to import a base package.

The following information is displayed if the UltraPath exists.

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp#cps service-pkg-list | grep
ultrapath-driver
| ultrapath-driver| ultrapath| ULTRAPATH V100R008C50| UnUsed |
| ultrapath-driver| ultrapath| ULTRAPATH V100R008C00| Using|
```


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CAUTION

If you cannot run cps service-pkg-list, disable the authentication mode or import environment variables. For details about the operations, see the FusionSphere OpenStack upgrade guide of an applicable version.

Step 3 Import the base package.

See section 7.2.8.1 Importing the UltraPath Base Package for FusionSphere OpenStack for the operations.

----End

7.2.3.2 Performing FusionSphere OpenStack Pre-upgrade Operations

Select OpenStack Service-Package for the upgrade node when creating an upgrade project and import the UltraPath package. For details about the operations, see sections about pre-upgrade operations in the FusionSphere OpenStack upgrade guide.

FusionTool V100R005SPC530 is used as an example.

Configure a local PC.

NOTE

Establish a Windows OS that can be interconnected with the external API network of the target environment. That is, the PC and external API network communicate with each other properly.

Step 1 Edit the **hosts** file on the local PC and add the mapping information.

10.175.29.87 is used as an example HAProxy reverse proxy IP address.

```
10.175.29.87 identity.az1.dc1.domainname.com10.175.29.87
cps.az1.dc1.domainname.com10.175.29.87 upgrade.az1.dc1.domainname.com10.175.29.87
compute.az1.dc1.domainname.com
```

hosts file path: C:\Windows\System32\drivers\etc\hosts

NOTE

- The domain name must be set the actual domain name used on the site.
- If the system has a firewall enabled, enable port 22 and port 443 to allow TCP packets to pass through.
- You can run the **keystone endpoint-list** command to query the domain name of each service.

Create an upgrade project.

Step 2 On the local PC, double-click **FusionTool V100R005C00SPC530 UpdateTool.zip** to obtain the UpdateTool folder.

Step 3 In the **UpdateTool** folder, double-click **start.bat** as an administrator.

After the console window disappears, the system automatically opens Internet Explorer, and the UpdateTool interface is displayed. The address is **http://localhost:7236/pages/index.html**. Enter the username and password (**admin** and **Huawei@CLOUD8!** by default).

You need to change the password upon your first login.

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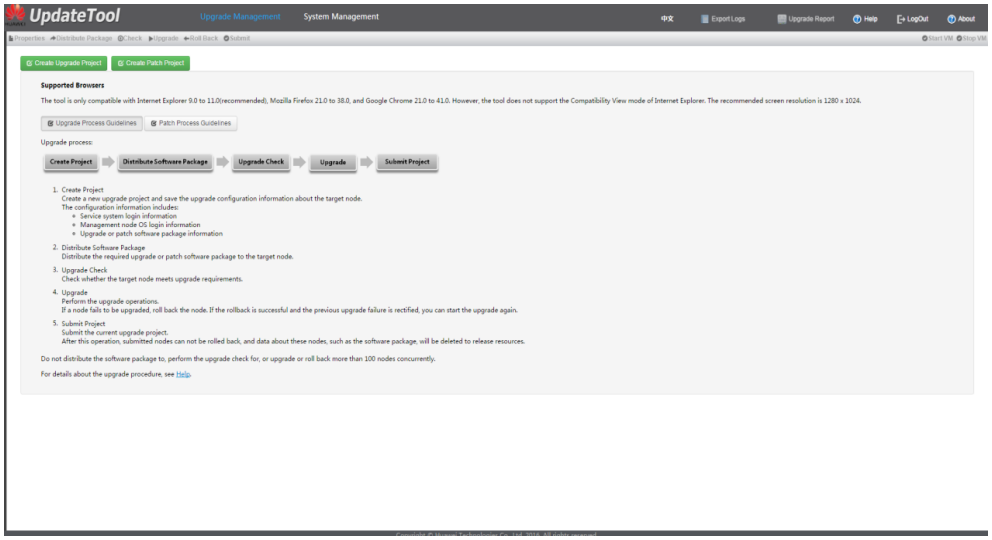
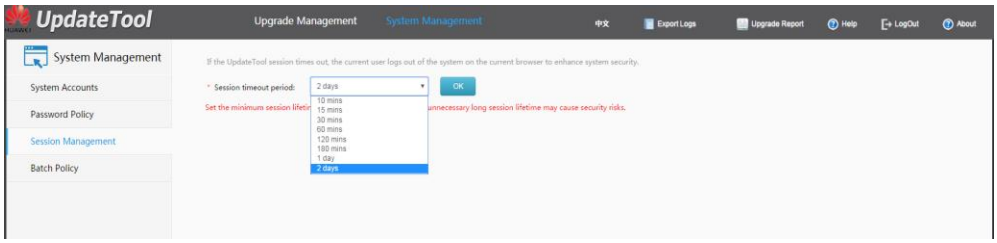


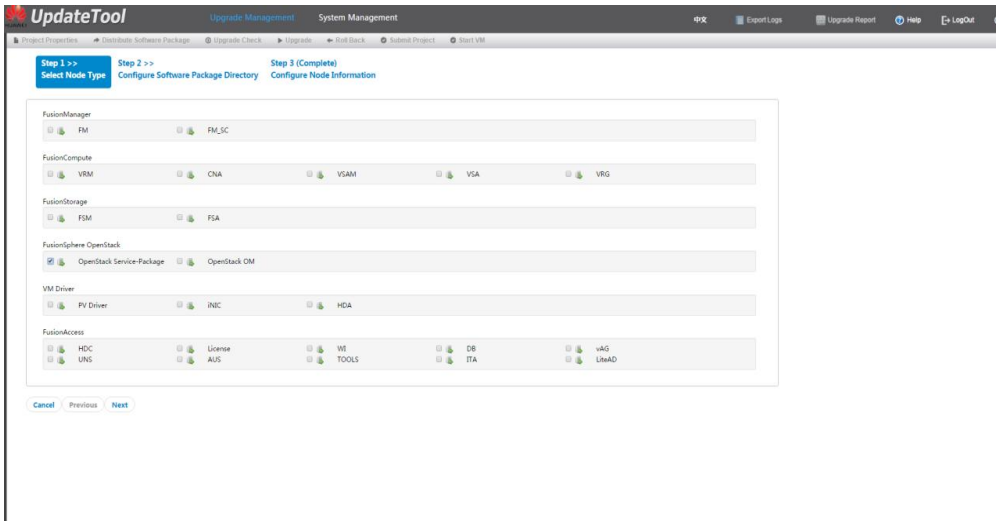
Step 4 On the system management page, choose **System Management** and set **Session timeout period** to **2 days** because package import consumes long time and may exceed the session timeout.



Step 5 Click Create Upgrade Project.

The **Step 1 >> Select Node Type** page is displayed.

Step 6 Select **OpenStack Service-Package** on the **Select Node Type** page and click **Next**.



Step 7 The **Step 2 >> Configure Software Package Directory** page is displayed.

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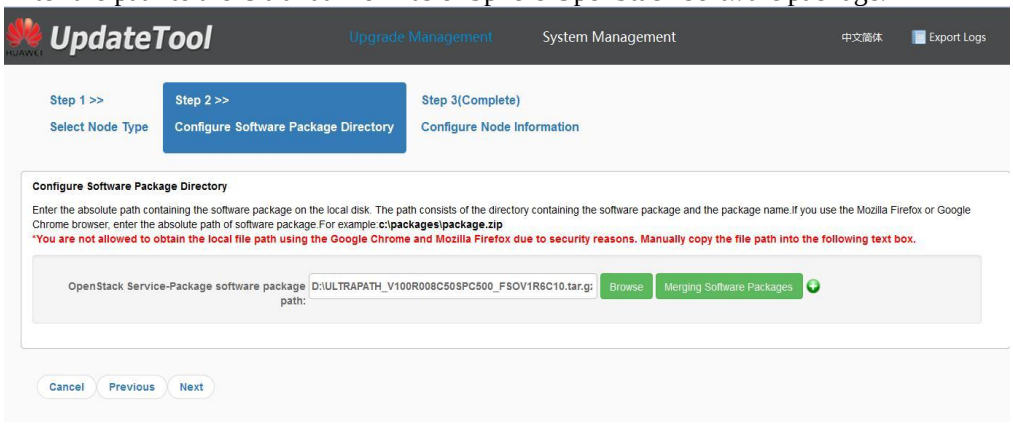
Step 8 Enter the path to the UltraPath for FusionSphere OpenStack software package.



----End

7.2.4 Procedure

7.2.4.1 Performing the Upgrade

Refer to upgrade operations in FusionSphere OpenStack upgrade guide of a required version. You need to select a different software package path when creating a upgrade task.

For details, visit Huawei website:

http://support.huawei.com/enterprise/.

In the search bar, enter **FusionSphere OpenStack**. Select the populated path. and go to the FusionSphere OpenStack documentation path. Search, view, and download the **FusionSphere OpenStack** upgrade guide of a required version.

7.2.4.2 Completing the Upgrade

Complete the upgrade. For details, see the FusionSphere OpenStack upgrade guide.

CAUTION

The host will be restarted after this step is implemented. *Disable or migrate virtual machines before performing this operation.*

7.2.5 Verifying the Upgrade

Step 1 Log in to the first host in the Available Zone. For details, see the FusionSphere OpenStack upgrade guide.

Step 2 Run **cps service-pkg-list**. Check whether the service package whose **service-package** contains **ultrapath-driver** is in a later version.

The following command output is displayed:

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp#cps service-pkg-list
+------------------------------+----------------+------------------------------
```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```
-----------+--------+
| template| service-package | version| status |
+-----------------------------+----------------+-----------------------------
-----------+--------+
| ultrapath-driver| ultrapath| ULTRAPATH V100R008C00| UnUsed |
| ultrapath-driver| ultrapath| ULTRAPATH V100R008C50| Using  |
+-----------------------------+----------------+-----------------------------
-----------+--------+
```

version indicates version number. **Using** corresponding to **status** means the version is in use. **ULTRAPATH V100R008C50** is in use.

Step 3 Run **rpm -qa | grep UltraPath** to check whether the UltraPath is in a later version.

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp# rpm -qa | grep UltraPath
UltraPath-8.06.003-3
```

Step 4 Run **upadmin show version** to check whether UltraPath services can run normally and is in a later version.

The following output is displayed when services are running:

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp# upadmin show version
Software Version : 8.06.003
DriverVersion : 8.06.003
```

The following output is displayed when services are not running. Go to step 5.

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp# upadmin show version
Unable to detect UltraPath device node, exit
```

Step 5 (Optional): If UltraPath services are not running, run **service nxup start** to enable the services. Check whether the UltraPath is in a later version and then run **service nxup stop** to disable UltraPath services.

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp#service nxup start
this kernel is 3.0.93-0.0-default
begin load nxup
Begin to delete LUNs whose mappings do not exist
Begin to delete LUNs whose mappings are changed.
begin scan host0
begin scan host1
The device scanning is complete.
start upservice
The UltraPath starts successfully. F8FA0414-D21D-B211-9630-000000821800:/home/fsp#
upadmin show version
Software Version : 8.06.003
DriverVersion : 8.06.003 F8FA0414-D21D-B211-9630-000000821800:/home/fsp# service nxup
stop
The UltraPath service is stopped successfully.
```

Step 6 Verify whether related FusionSphere OpenStack functions are normal. For details, see the FusionSphere OpenStack upgrade guide.

----End

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7.2.6 Submitting the Project

Submit the project. For details, see the FusionSphere OpenStack upgrade guide.

7.2.7 Performing Version Rollback

7.2.7.1 Performing the Rollback

Perform the rollback. For details, see the FusionSphere OpenStack upgrade guide.

7.2.7.2 Completing the Rollback

Complete the rollback. For details, see sections about the rollback in the FusionSphere OpenStack upgrade guide.

7.2.7.3 Verifying the Rollback

Step 1 Log in to the first host in the Available Zone. For details, see the FusionSphere OpenStack upgrade guide.

Step 2 Run **cps service-pkg-list**. Check whether the service package whose **service-package** contains **ultrapath-driver** is in an earlier version.

The following command output is displayed:

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp#cps service-pkg-list
+------------------------------+----------------+------------------------------
-----------+--------+
| template| service-package | version| status |
+------------------------------+----------------+------------------------------
-----------+--------+
| ultrapath-driver| ultrapath| ULTRAPATH V100R008C00| Using |
| ultrapath-driver| ultrapath| ULTRAPATH V100R008C50| UnUsed |
+------------------------------+----------------+------------------------------
-----------+--------+
```

version indicates version number. **Using** corresponding to **status** means the version is in use. **ULTRAPATH V100R008C00** is in use.

Step 3 Run **rpm -qa | grep UltraPath** to check whether the UltraPath is in an earlier version.

The command output is as follows:

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp# rpm -qa | grep UltraPath
UltraPath-8.03.028-2
```

Step 4 Run **upadmin show version** to check whether UltraPath services can run normally and whether the UltraPath is in an earlier version.

The following output is displayed when services are running:

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp# upadmin show version
Software Version : 8.03.028
DriverVersion : 8.03.028
```

The following output is displayed when services are not running. Go to step 5.

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp# upadmin show version
Unable to detect UltraPath device node, exit
```


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Step 5 (Optional): If UltraPath services are not running, run **service nxup start** to enable the services. Check whether the UltraPath is in the earlier version and then run **service nxup stop** to disable UltraPath services.

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp#service nxup start
this kernel is 3.0.93-0.0-default
begin load nxup
Begin to delete LUNs whose mappings do not exist
Begin to delete LUNs whose mappings are changed.
begin scan host0
begin scan host1
The device scanning is complete.
start upservice
The UltraPath starts successfully. F8FA0414-D21D-B211-9630-000000821800:/home/fsp#
upadmin show version
Software Version : 8.03.028
DriverVersion : 8.03.028 F8FA0414-D21D-B211-9630-000000821800:/home/fsp# service nxup
stop
The UltraPath service is stopped successfully.
```

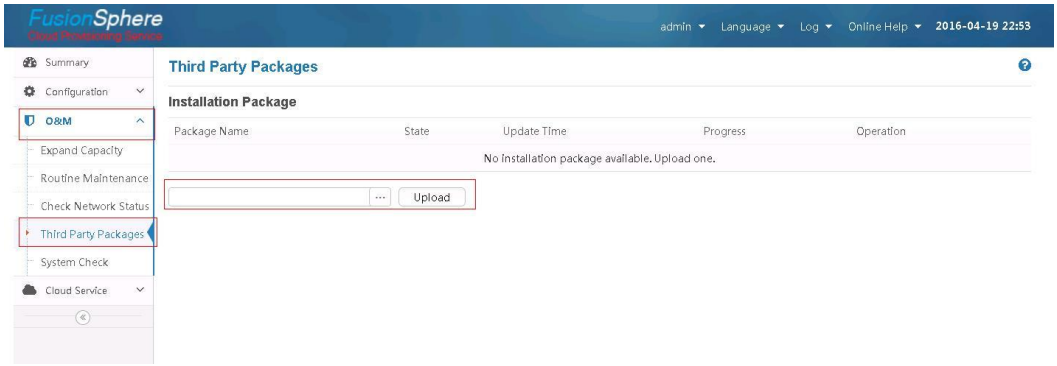
Step 6 Verify whether related FusionSphere OpenStack functions are normal. For details, see the FusionSphere OpenStack upgrade guide.

----End

7.2.8 Appendix

7.2.8.1 Importing the UltraPath Base Package for FusionSphere OpenStack

Step 1 Log in to the FusionSphere OpenStack installation page. Import the base package in third-party package management. V100R006C00RC1 is used as an example.



Step 2 Log in to the first host in the Available Zone. For details, see the FusionSphere OpenStack upgrade guide.

Step 3 Run the following commands.Check whether the base service package whose **service-package** contains **ultrapath-driver**is in use.

```
F8FA0414-D21D-B211-9630-000000821800:/home/fsp#cps service-pkg-list
+------------------------------+----------------+------------------------------
-----------+--------+
| template| service-package | version| status |
+------------------------------+----------------+------------------------------
-----------+--------+
```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```
| ultrapath-driver| ultrapath| ULTRAPATH V100R008C00| Using|
+-----------------------------+----------------+-----------------------------
-----------+--------+
```

version indicates version number. **Using** corresponding to **status** means the version is in use. **ULTRAPATH V100R008C00** is in use.

----End

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