

# HP StorageWorks Clustered File System 3.4.0 for Windows setup guide



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# HP Technical Support

Telephone numbers for worldwide technical support are listed on the following HP web site: <http://www.hp.com/support>. From this web site, select the country of origin. For example, the North American technical support number is 800-633-3600.

**NOTE:** For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

## ***HP Storage Web Site***

The HP web site has the latest information on this product, as well as the latest drivers. Access the storage site at:

<http://www.hp.com/country/us/eng/prodserv/storage.html>. From this web site, select the appropriate product or solution.

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## **HP NAS Services Web Site**

The HP NAS Services site allows you to choose from convenient HP Care Pack Services packages or implement a custom support solution delivered by HP ProLiant Storage Server specialists and/or our certified service partners. For more information see us at [http://www.hp.com/hps/storage/ns\\_nas.html](http://www.hp.com/hps/storage/ns_nas.html).

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## Configuration Information

### ***Network Configuration Requirements***

Configure networks used with HP Clustered File System as follows:

- Each network interface card (NIC) must be on a separate physical network. For example, you could use either a separate Ethernet switch for each network or a managed switch that allows network traffic to be isolated.
- Each NIC must be on a separate logical IP network.
- Network interfaces should be multicast-capable. If an interface does not provide this capability, contact HP Technical Support for assistance.
- 802.3x Ethernet flow control cannot be used. Be sure to check the driver settings for your NICs to ensure that this feature is disabled.
- The network topology should be symmetrical; each server in the cluster should be connected to the same set of networks.
- One of the NICs is typically used for a private intra-cluster subnet. This is required for optimal performance.
- The network adapter to which the server's IP address is bound must appear first on the Adapter and Bindings list on the Network and Dial-up Connections window. (Right-click My Network Places and select Properties to display the window. Then select Advanced > Advanced Settings to see the Adapter and Bindings tab.)

- HP Clustered File System supports only one “physical” IP address per subnet per NIC per node. If additional IP addresses are needed on the same subnet, use HP Clustered File System virtual hosts instead of adding additional IP addresses directly to the NIC.
- For iSCSI configurations, we recommend that the storage be on a separate network.

## **Cluster SAN Configuration Guidelines**

Following are guidelines for configuring the cluster SAN to be used with HP Clustered File System:

- When the cluster is configured for fabric fencing, arrays must operate in fabric or switch-attached mode (not arbitrated-loop-only devices). This requirement does not apply for non-fabric fencing configurations. HP recommends using iLO based fencing with Clustered Gateway.
- The FibreChannel fabric used for an HP Clustered File System cluster can be shared with other HP Clustered File System clusters or with non-cluster servers and devices. To protect the cluster SAN devices from other devices on the fabric, particularly devices controlled by Windows platforms, HP recommends that you create a fabric zone for the cluster.
- The FC switches managed by the cluster must be from the same vendor. Switches that will not be managed by HP Clustered File System can be from other vendors only if all of the vendors have approved the configuration.
- Multiple FibreChannel switches are supported; however, they must be configured in a manner that meets the following requirements:
  - Each cluster server must have access to all of the disks to be used by the cluster.
  - Each server must have exactly one path to each of the disks. (This requirement is not necessary if the disks are being managed by third-party MPIO software that can handle multiple paths).



See the *HP Clustered File System Administration Guide* for more information about supported cluster configurations.

**NOTE:** You can attach a cluster server to other SANs that are not under HP Clustered File System control. These SANs can include tape drives and non-PSFS filesystems. You can use Windows utilities or other applications to access these devices and filesystems.

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# Setting Up HP StorageWorks Clustered File System

This chapter describes how to perform a new installation of HP StorageWorks Clustered File System on servers running Microsoft Windows.

## ***HP Clustered File System Distribution***

The HP Clustered File System is pre-installed on an HP ProLiant Storage Server running the Windows Storage Server operating system. The following files are included in the `\Program Files\Hewlett-Packard\HP Clustered File System` folder:

- **mxcheck.exe**—An HP utility that checks the configuration of the server. Run this utility before you install HP Clustered File System. The **mxcheck** folder contains tests used by the utility.

The `\doc` folder contains these documents:

- **license.txt**—The End User License Agreement.
- **mxconsole\_3.4.0.0387.msi**—The management console and **mx** utility for use on hosts outside the cluster. The installer is located in `C:\Program Files\Hewlett-Packard\HP Clustered File System\ManagementConsole\Installer` folder.

## Setup Procedure

Before starting the installation, be sure to review the configuration and hardware requirements specified in Chapter 1.

### Setup Checklist

The setup procedure consists of the following steps, which are described in detail following this checklist.

Action	Description	
Set up iLO.	When booting, press F8 to enter the iLO configuration mode. Set the network information (IP address) and user/password.	<input type="checkbox"/>
Set up the DNS hostname.	Each server must be able to resolve its hostname in DNS.	<input type="checkbox"/>
Configure the server for WINS clients.	This step is needed only if the server will be accessed by WINS clients.	<input type="checkbox"/>
Install a firewall (optional).	If you install a firewall, ensure that the service ports required by HP Clustered File System are open.	<input type="checkbox"/>
Configure the storage array.	Set up the storage array as described in the array product documentation.	<input type="checkbox"/>
Install the iSCSI initiator (iSCSI Storage only)	Install the Microsoft iSCSI initiator on each server according to the product documentation.	<input type="checkbox"/>

Action	Description	
Install MPIO software (optional).	<p>If you have multiple paths to LUNs in your storage fabric, you will need MPIO software. The MPIO DSM software is included with the product. Information about installing and configuring this software is in the “SAN Connection Guide” document on the desktop. Locate the installable MPIO software in:</p> <p><b>C:\hpnas\Components\SANConnect\MPIO.</b></p> <p>The older HP SecurePath software is also supported but is not included with the Clustered Gateway product.</p> <p>If you are using a non-HP array, check with your HP representative and third-party vendor for additional information. To obtain the latest MPIO software, please refer to <a href="http://h18006.www1.hp.com/products/sanworks/softwaredrivers/multipathoptions/windows.html">http://h18006.www1.hp.com/products/sanworks/softwaredrivers/multipathoptions/windows.html</a>.</p>	<input type="checkbox"/>
Configure FC switches.	Configure the FibreChannel switches that will be under cluster control to “SAN” enable cluster operations across the SAN.	<input type="checkbox"/>
Create LUNs or disk partitions for use as membership partitions.	HP Clustered File System uses membership partitions to control access to the SAN. HP recommends that you create three LUNs for the membership partitions. Also make any necessary changes to the partition tables on disks that will contain membership partitions.	<input type="checkbox"/>
Log into the iSCSI targets (iSCSI Storage only).	On each server, log into the iSCSI targets via the iSCSI initiator.	<input type="checkbox"/>

Action	Description	
Run the <b>mxcheck</b> utility.	This HP utility verifies that the server's configuration meets the requirements for running HP Clustered File System.	<input type="checkbox"/>
Set HP Clustered File System parameters for MPIO software.	This step is needed for HP Secure Path and may be needed for other third-party MPIO software.	<input type="checkbox"/>
Configure the cluster.	Create an initial cluster configuration on one server, export that configuration to the other servers, and then start the HP Clustered File System service.	<input type="checkbox"/>
Connect to the cluster.	The cluster now includes all of the servers.	<input type="checkbox"/>

If you plan to use a client PC outside the cluster to administer your cluster, install the stand-alone Management Console package on that PC.

## 1. Set iLO configuration during boot

When booting, press F8 to enter the iLO configuration mode. Set the network information (IP address) and user/password. This will be used for iLO based fencing setup later on.

## 2. Set Up the DNS Hostname

Each server running HP Clustered File System must be able to resolve its hostname in DNS. HP Clustered File System uses the first address returned by DNS as the server's name in the cluster.

If you are using dynamic DNS, HP recommends that you choose one public NIC to set up as a DNS client. Then list the DNS server(s) in the configuration for this NIC.

Do not list any DNS servers for the private (non-routed or non-client reachable) NICs. For the private NICs, uncheck the configuration option to "register this connection's addresses in DNS."

If you are using DHCP, the DNS and hostname will be set up correctly if DHCP has been configured to do this.

If you are not using dynamic DNS or DHCP, you can use static entries to set up DNS. Use one of the following methods to set up the hostname on each server:

- Set up a DNS suffix. Select My Computer > Properties > Network Identification > Properties. On the Identification Changes window, select More.  
Then, on the DNS Suffix and NetBIOS Computer Name window, type the fully qualified domain name as the “Primary DNS suffix of this computer.”
- Add the server to the suffix search list. Select Settings > Control Panel > Network and Dial-Up Connections. Then select any network connection. On the Local Area Connection Properties window, select Internet Protocol (TCP/IP) and click Properties. On the Internet Properties window, click Advanced. Then, on the Advanced TCP/IP Settings window, select the DNS tab. Select “Append these DNS suffixes (in order),” and then select Add to add your suffixes.

You can use **nslookup** to verify that the hostname is set up correctly.

### 3. Configure the Server for WINS Clients

WINS clients may be unable to access multi-homed cluster servers (servers having multiple NICs) if NetBIOS and Microsoft client/server network bindings are enabled on all interfaces. These settings should be enabled only on publicly-reachable (routeable) interfaces.

HP recommends that you disable the following on the private (non-routed or non-client reachable) interfaces:

- NetBIOS
- Microsoft Client for Microsoft Networks
- File and Print Sharing for Microsoft Networks (the NetBIOS over TCP/IP or NetBT client)

Also leave the DNS and WINS fields blank on the private interfaces.

For more information, see the Microsoft Knowledge Base Article 193890:

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;193890>

#### **4. Install a Firewall (Optional)**

If you will be installing a firewall, ensure that the service ports required by HP Clustered File System are open. Contact HP Technical Support for more information about the service ports used by HP Clustered File System.

Repeat steps 1–4 on each server that will be in the cluster.

#### **5. Configure the Storage Array**

Perform the initial configuration of the storage array as described in the product documentation.

If you are using a non-HP array, check with your HP representative and/or third-party array vendor for additional information.

#### **6. Install the iSCSI Initiator (iSCSI Configurations Only)**

Install the Microsoft iSCSI Initiator on each server according to the product documentation.

#### **7. Install MPIO Software (Optional)**

For information about HP's MPIO software, refer to the *SAN Connection Guide* document on the desktop.

Information about HP's MPIO software for Windows and Windows Storage Server is located at:

<http://h18006.www1.hp.com/products/sanworks/softwaredrivers/multipathoptions/windows.html>

If you are using third-party (non-HP) MPIO software, install it according to the product documentation.

## 8. Configure FC Switches for the Cluster

When certain problems occur on a server (for example, hardware problems or the loss of cluster network communications), and the server ceases to effectively coordinate and communicate with other servers in the cluster, HP Clustered File System must remove the server's access to filesystems to preserve data integrity. This step is called "fencing."

When you configure the cluster in step 13, you can select the fencing method that you want to use (HP recommends iLO fencing):

- FibreChannel Switch-based fencing (also called "fabric fencing"). When a server needs to be fenced, HP Clustered File System disables the server's access in the FibreChannel fabric.
- Web Management-Based Fencing via Server Reset/Shutdown (also called "flexible fencing" or "iLO fencing"). HP Clustered File System uses remote management hardware on the server to remove its access to PSFS filesystems.

For sites using fabric fencing, the FibreChannel switches must be configured as described below to enable cluster operations across the SAN.

Configuring the FibreChannel switches is not required for sites using flexible fencing. However, if the switches are configured as described here, certain HP Clustered File System commands can return more information.

To configure FibreChannel switches:

- Enable server access to the SAN. Each server in the cluster must be able to access the disks in the SAN. You may need to enable server ports on the FC switches or change the zoning configuration to give servers the necessary access to the SAN.
- Modify the SNMP setup. Make the following changes:
  - Enable access to the SNMP agent from each server that will be in the cluster.
  - If you use fabric fencing, configure the switch with read/write access to the private community string. If you use flexible fencing,



read access to the private community string is adequate. (If you need to use a community string other than private, contact HP Technical Support.)

- For QLogic switches only, sites using fabric fencing should change the WriteCommunity attribute to Private. Sites using flexible fencing should change the ReadCommunity attribute to Private. For both fencing methods, set the ProxyEnabled attribute to False.
- On Brocade switches only, run the **snmpMibCapSet** command on the switch. Change the famib setting to yes and accept the default values for the other settings.
- For McDATA switches, place each server in a separate zone with its storage. Disable domain-wide RSCNs.
- For Cisco switches, place each server in a separate zone with its storage.

You typically perform these tasks from the FC switch or from third-party applications. Refer to your FC switch or application documentation for more information.

## 9. Create LUNs for the Membership Partitions and Modify Partition Tables

HP Clustered File System uses a set of membership partitions to control access to the SAN. The membership partitions also store the device naming database, which includes the global device names that HP Clustered File System assigns to the SAN disks placed under its control.

HP Clustered File System can use either one or three membership partitions. To ensure that a membership partition is always available, HP strongly recommends that you use three membership partitions.

If your disk array software can create LUNs, HP recommends that you create three LUNs for the membership partitions. Each LUN should be a minimum of 100 MB in size, or the minimum size the storage array supports.

After creating the LUNs, use the Windows Logical Disk Management (WLDm) utility to create a single partition on each LUN.

**NOTE:** When using WLDM to manage your SAN disks, be sure to set the disk type to Basic. If the disk type is currently set to Dynamic, right-click the disk and select Convert to Basic disk. HP Clustered File System cannot see your SAN disks if the disk type is set to Dynamic.

For Windows Storage Server 2003 SP1, HP Clustered File System supports only MBR basic disks; GPT basic disks are not supported. For MBR basic disks, you can use either primary partitions or extended partitions with logical drives.

When you configure the cluster in step 11, you can create HP Clustered File System membership partitions on the partitions that you just created.

If you are unable to create LUNs on your disk array, you can place the membership partitions on regular disk partitions. You can use the Windows Logical Disk Management utility to create the appropriate partitions.

### **Partitions Containing Windows Filesystems**

If you will be using an existing partition for a membership partition and that partition currently contains a Windows filesystem, then that filesystem must be destroyed. One method for doing this is to delete the partition, and then recreate it. This is best done before multiple servers have access to the disk. If that is not possible, all other servers with access to the disk must be forced to recognize the changes, either by rebooting all those systems, or by manually disabling the ports on the FibreChannel switch that connect those systems to the SAN. If using the second method, disable the ports before making the partition table change, and then reenable the ports afterwards.

### **Changes to the Disk Partition Table**

HP recommends that you do all necessary partitioning on disks that will contain membership partitions *before* assigning the membership partitions. It is best to do the partitioning before multiple servers have access to the disk. If this is not possible, ensure that all servers having access to the disk through the SAN detect the partition table changes before continuing on with membership partition initialization.

This can be done either by rebooting the servers after you make the partition table changes, or by manually disabling the ports on the FibreChannel switch that connect the servers to the SAN. If using the second method, disable the ports before making the partition table changes, and then reenable the ports afterwards.

If you should later need to repartition a disk containing a membership partition, you will need to stop HP Clustered File System before you change the layout. While the cluster is stopped, you will not be able to access other disks in the cluster. You will also need to take one of the above steps to force the servers in the cluster to recognize the changes.

### Partition Sizing

It is important to properly size the partitions that will be used for membership partitions. (16 MB is adequate.) As a best practice, create one partition on the entire LUN used for the membership partition.

When you add membership partitions in the future, the new partitions cannot be smaller than any of the original membership partitions. (There is one exception: if the original partitions are all larger than 950 MB, the new partition can be 950 MB.)

## 10. Log Into iSCSI Targets (iSCSI Configurations Only)

Log into each iSCSI target via the iSCSI initiator and set the iSCSI Initiator Properties. On the Log On to Target dialog, be sure to check “Automatically restore this connection when the system reboots.”

You will need to complete this step on each server.

## 11. Run the mxcheck Utility

Before installing the cluster software, it is important to verify that the server’s configuration meets the requirements for running HP Clustered File System. You can use the HP **mxcheck** utility to do this.

The utility performs the following checks on the server:

- System check: hardware, operating system version, service pack version, available physical memory.

- Network check: IP network and interface assignments, forward and reverse hostname lookup.
- Storage check: Host Bus Adapters, drivers, and settings.
- Miscellaneous check: other checks such as the non-paged pool setting.

To run **mxcheck**, insert the HP Clustered File System CD into the CD drive or go to the directory where you downloaded the product, and then double-click the file **mxcheck.exe**.

Output from the utility is displayed and is written to the Application Log section of the Event Viewer. We recommend that you fix any problems identified by **mxcheck** before you install HP Clustered File System.

## 12. Set Parameters for MPIO Software

Different MPIO software solutions may require specific configuration steps. This section documents known setup for HP's MPIO software in order for it to work with HP Clustered Gateway.

### HP MPIO DSM

No additional setup is required after this software has been installed. Note that there are different MPIO DSM packages for different HP arrays. Also note that there are compatibility restrictions on which MPIO DSM packages can co-exist on the same system. The latest information can be found at:

<http://h18006.www1.hp.com/products/sanworks/softwaredrivers/multipathoptions/windows.html>.

### HP SecurePath

The HP SecurePath product is not included as part of HP Clustered Gateway. HP recommends the use of the newer MPIO DSM software. However, SecurePath software is known to work and is supported.

The HP Clustered File System `allow_any_disk` and `no_permanent_mountpoints` parameters must be set manually on each server. These parameters are located in the `scl.conf` file, which by default is located at `C:\Program Files\Hewlett-Packard\HP Clustered File System\conf\scl.conf`.

To set the `allow_any_disk` parameter, locate these lines in the `scl.conf` file:

```
# allow_any_disk
#Perform no checking to ensure that paths to disks go through
#the managed SAN. Set to 1 to enable, 0 to disable.
#(default behavior is "disabled").
#
#(This parameter should not be set except in very specific cases!)
#
#allow_any_disk          0
```

On the last line, remove the `#` sign preceding `allow_any_disk` and change the value to 1:

```
allow_any_disk          1
```

To set `no_permanent_mountpoints`, locate these lines in the `scl.conf` file:

```
# no_permanent_mountpoints
#(This parameter is only for Windows; it has no affect on Linux)
#Indicates whether scl utilities will create 'permanent' mountpoints
#for all imported device partitions. (They are permanent in that
#they will persist until the disk is deported).
#
#Note that on W2K3 Enterprise, by default, devices cannot be
#accessed without either a driveletter assignment or a mountpoint
#assignment. Hence turning on 'no_permanent_mountpoints' may prevent
#MatrixServer from operating properly.
#
#Set to 1 to disable creation of permanent mountpoints.
#(default behavior is that scl will create permanent mountpoints
#for all imported devices.)
#
#no_permanent_mountpoints    0
```

On the last line, remove the `#` sign preceding `no_permanent_mountpoints` and change the value to 1:

```
no_permanent_mountpoints    1
```

## 13. Configure the Cluster

Provide the following information:

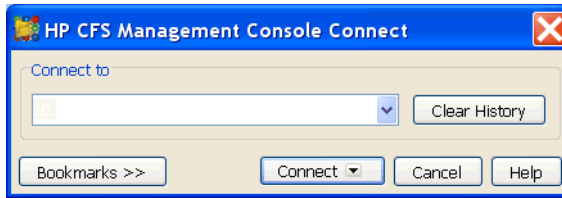
- The IP address or hostname of each server that will be in the cluster.
- The location of your HP Clustered File System license file.
- A secret network key that provides security for network communications among the cluster servers.
- An administrative password for configuring the cluster.
- The fencing method that you want to use (either FibreChannel switch-based fencing or Web Management-based fencing via server reset/shutdown).
- The IP address or hostname of each FibreChannel switch that is included in the SAN. (This step is required for FibreChannel switch-based fencing and optional for Web Management-based fencing via server reset/shutdown.)
- The partitions or LUNs that you want to use for membership partitions.

### Connect to the Management Console

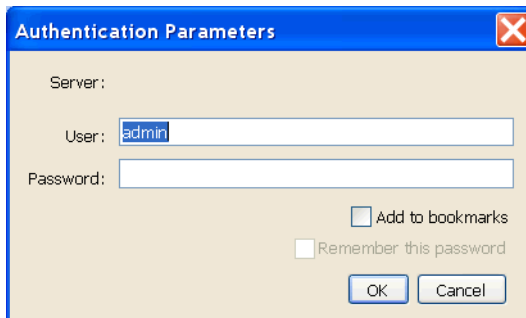
On one server, select Start > Programs > HP Clustered Gateway > CFS Management Console. On the Connection Parameters window that opens next, enter the IP address of the server, type **admin** for the user and **hpinvent** for the password, and then click Configure.

On one server, select Start > Programs > HP Clustered Gateway > CFS Management Console. On the HP Clustered File System Connect window that appears next, type the IP address or host name of the server in the "Connect to" field. Then click on the down-arrow on the Connect

button. You will see two options: Connect and Configure. Click on Configure.



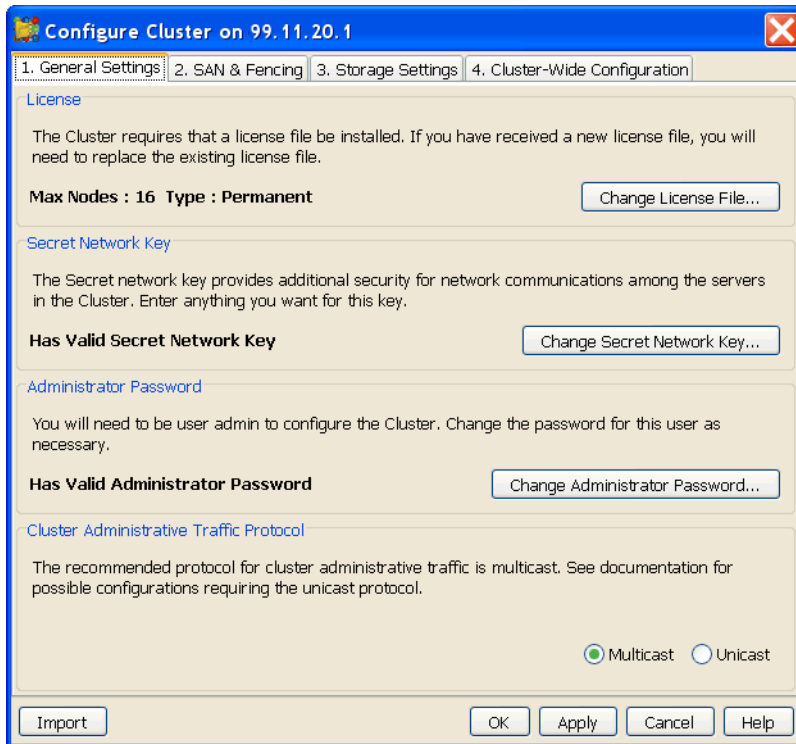
When the Authentication Parameters window dialog appears, type **admin** for both the user and password and then click OK.



The Configure Cluster window now appears. You will need to specify information on the tabs in this order: General Settings, SAN & Fencing, Storage Settings, Cluster Wide Configuration.

### General Settings

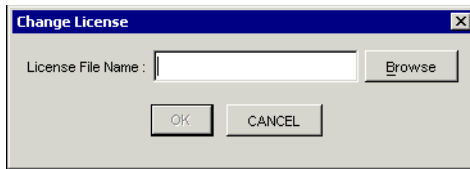
This tab asks for general information needed for cluster operations.



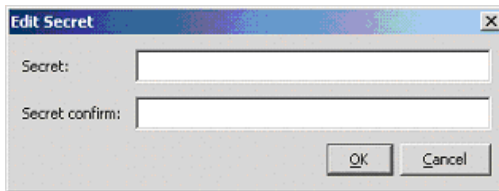
1. **License.** HP Clustered File System is shipped with a permanent license. No action is required to install an additional license. If a new license is provided by HP in the future, use the following procedure to install the new license. (This file must be present on the server that you are using to connect to the Management Console.)

To install the license, click the Change License File button. Type the location of the license file or use the Browse button to locate it. By default, the license file is installed at **C:\Program Files\Hewlett-Packard\HP Clustered File System\conf\licenses\**.



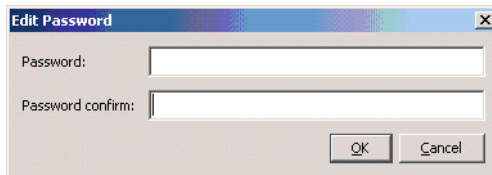


2. **Secret Network Key.** This password is required. It provides additional security for network communications among the cluster servers. To set this key, click the Set Secret Network Key button. You can enter anything you want for this password.



3. **Administrator Password.** You will need to be an HP Clustered File System user **admin** to configure the cluster. By default, the password for this user is set to **hpinvent**. If you want to change the password, click the Change Administrator Password button.

The password can comprise up to 32 characters, with no white space. The allowable characters are ASCII 33–122.



4. **Cluster Administrative Traffic Protocol.** Select either multicast or unicast mode. Multicast mode is recommended; however, if your network configuration does not allow multicast traffic through the network, you will need to use unicast mode.

When you have completed the fields on the General Settings tab, go to the Fencing tab.

### **SAN & Fencing Tab**

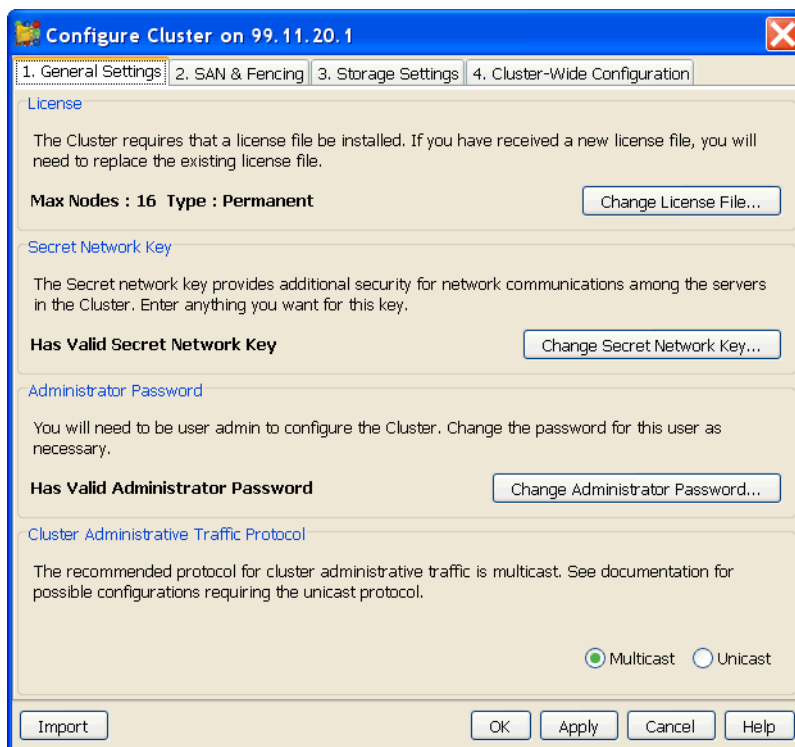
When certain problems occur on a server (for example, hardware problems or the loss of cluster network communications), and the server ceases to effectively coordinate and communicate with other servers in the cluster, HP Clustered File System must remove the server's access to filesystems to preserve data integrity. This step is called *fencing*.

The SAN & Fencing tab allows you to select the method that HP Clustered File System should use to remove access to the SAN.

There are two fencing methods:

- **FibreChannel switch-based fencing.** When a server needs to be fenced, HP Clustered File System will disable the server's access in the FibreChannel fabric. The server must be rebooted to regain access to the SAN.
- **Web management-based fencing.** HP Clustered File System uses remote management hardware on the server to remove its access to PSFS filesystems. (See the HP Clustered File System Quick Specs on the HP web site for a list of supported HP ProLiant servers. The server must support the HP iLO remote management functionality.)

**NOTE:** After HP Clustered File System is configured, you can verify that it has the correct information to fence each server. See "Test the Fencing Configuration" on page 35.

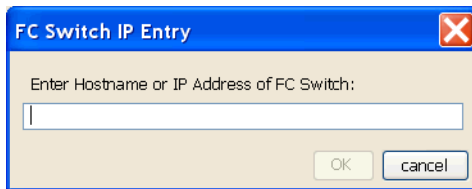


Select your storage type and, for FibreChannel, specify the fencing method that you want to use. (iSCSI storage must use web management-based fencing.)

### *FibreChannel Switch-Based Fencing*

Complete the following on the SAN & Fencing tab:

1. **SAN Switches.** Specify the hostnames or IP addresses of the FibreChannel switches that are directly connected to the nodes in the cluster. Click Add, and then specify the hostname or IP address of the first FC switch. Repeat this procedure to specify the remaining FC switches, including cascading switches.



2. **SNMP Community String.** The default SNMP community string for HP Clustered File System is **private**. If you want to use a custom community string, enter the appropriate value here. The SNMP community string must be set to the same value on HP Clustered File System and on the SAN switches configured above.

When you have completed the information, go to the Storage Settings tab.

### *Web Management-Based Fencing*

When you select either iSCSI storage or FibreChannel storage with Web management-based fencing, the SAN & Fencing tab will refresh and ask you for configuration information. Enter the appropriate information for the Remote Management Controller associated with the server that you used to connect to the Management Console.

**NOTE:** Later in this procedure the complete cluster configuration will be exported to the other servers that will be in the cluster. During the export, HP Clustered File System will, where possible, use the information that you specified on the SAN & Fencing tab to configure Web management-based fencing on the other servers. If a particular entry on the SAN & Fencing tab did not apply to all servers, HP Clustered File System will ask for that information for each of the other servers.

The Remote Management Controller tab asks for information about the controllers associated with your servers.

The screenshot shows a Windows-style dialog box titled "Configure Cluster on 99.11.20.1". It has four tabs: "1. General Settings", "2. SAN & Fencing", "3. Storage Settings", and "4. Cluster-Wide Configuration". The "3. Storage Settings" tab is active. It is divided into two sections: "Storage Type" and "Fencing Method".

- Storage Type:** Radio buttons for "FibreChannel" (selected), "iSCSI", and "Web management-based".
- Fencing Method:** Radio buttons for "FibreChannel switch-based" and "Web management-based" (selected).

Below these is the "Web Management Configuration" section, which has three sub-tabs: "Remote Management Controller" (selected), "Advanced", and "Switch Information (Optional)".

- Remote Management Controller Vendor:** Radio buttons for "Hewlett-Packard" (selected) and "IPMI".
- Remote Management Controller ID:** Radio buttons for "Hostname / IP Address" (selected), "Cluster-wide Pattern", "Hostname Suffix", and "IP Delta". There are input fields for each of these options.
- Remote Management Controller Access:** Fields for "Username:" and "Password:".

At the bottom of the dialog are buttons for "Import", "OK", "Apply", "Cancel", and "Help".

1. **Remote Management Controller Vendor.** Select the Hewlett Packard option.
2. **Remote Management Controller ID.** Specify how HP Clustered File System should identify the Remote Management Controller associated with each server. Use one of the following methods.
  - Enter the hostname or IP address for the Remote Management Controller associated with this cluster server. You will need to use this method if your Remote Management Controllers are from different vendors.

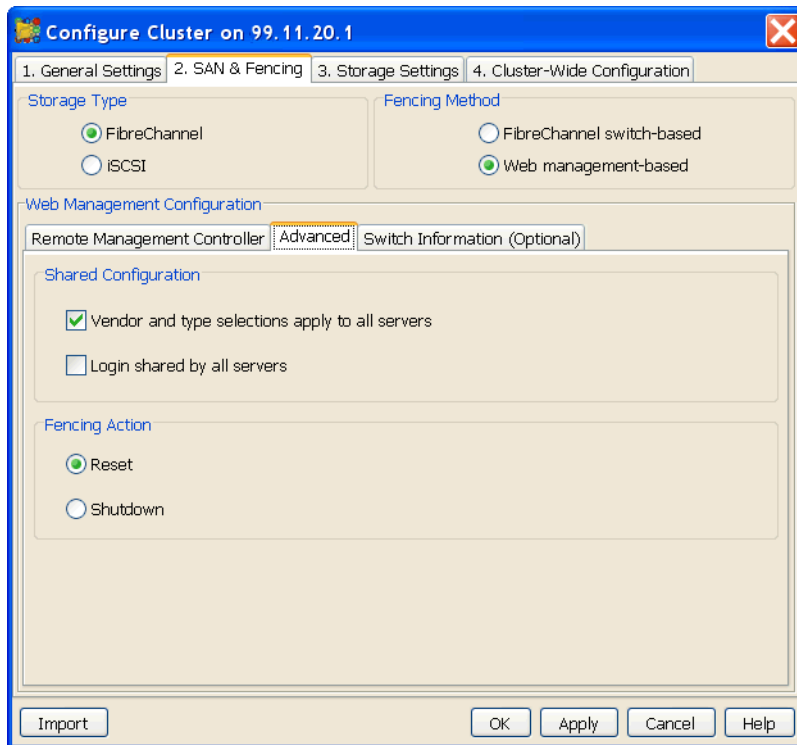
- Select “Cluster-wide Pattern” and then specify the common naming scheme that you are using for the Remote Management Controllers (either a hostname suffix or an IP address delta, as described below).

**Hostname Suffix.** Specify the common suffix to append to each server name to determine the associated Remote Management Controller name. For example, if your server names are server1 and server2 and their Remote Management Controllers are server1-iLO and server2-iLO, enter **-iLO** as the suffix.

**IP Delta.** Specify the delta to add to each server’s IP address to determine the IP addresses of the associated Remote Management Controllers. For example, if your servers are 1.255.200.12 and 1.255.200.15 and their Remote Management Controllers are 1.255.201.112 and 1.255.201.115, enter **0.0.1.100** as the delta.

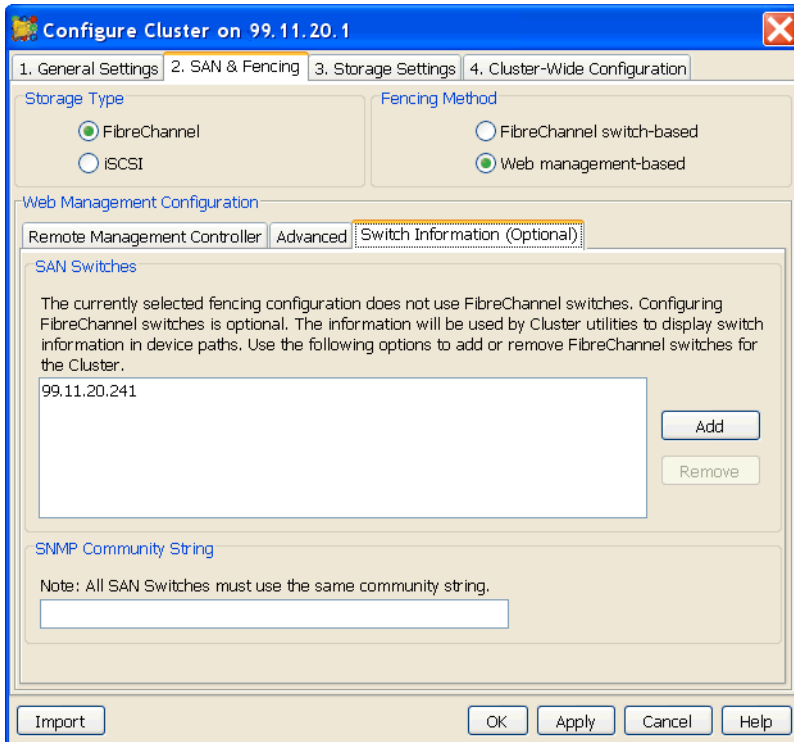
3. **Remote Management Controller Access.** HP Clustered File System needs to log into a user account on the Remote Management Controller in order to fence the server. Specify the user name and password for the account that you want HP Clustered File System to use. The account must currently exist on the Remote Management Controller.

Next, go to the Advanced tab and select the appropriate options.



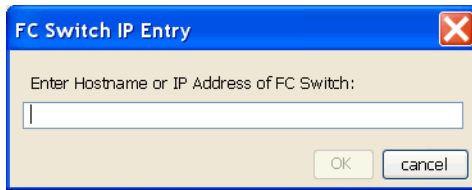
1. **Shared configuration.** Select the appropriate options.
  - **Vendor and type selections apply to all servers.** This option is enabled by default.
  - **Login shared by all servers.** Check this option if all servers in the cluster will be sharing the login account that you specified on the Remote Management Controller tab. If the login is not shared, you will be asked for the appropriate logins when the other servers are added to the cluster.
2. **Fencing Action.** When a server needs to be restricted from the SAN, HP Clustered File System can either power-cycle the server or shut it down. Select the method that you want to use.

If you have FibreChannel-connected storage and want to configure your FibreChannel switches into the cluster, go to the Switch Information tab. (This step is optional; however, if the switches are configured the HP Management Console can display the switch ports used by the SAN.)



1. **SAN Switches.** Specify the hostnames or IP addresses of the FibreChannel switches that are directly connected to the nodes in the cluster. Click Add, and then specify the hostname or IP address of the first FC switch.





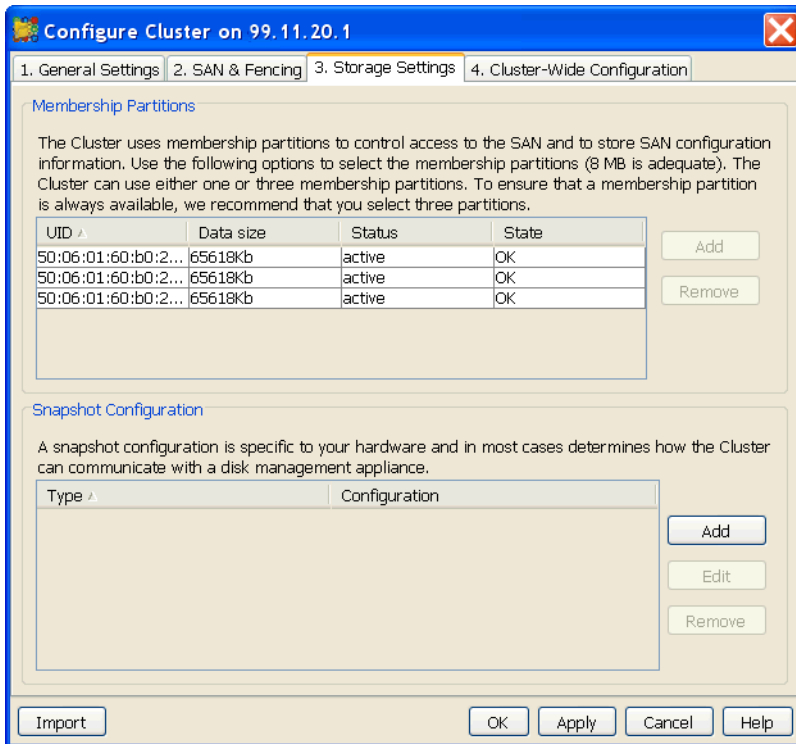
Repeat this procedure to specify the remaining FC switches, including cascading switches.

2. **SNMP Community String.** The default SNMP community string for HP Clustered File System is **private**. If you want to use a custom community string, enter the appropriate value here. The SNMP community string must be set to the same value on HP Clustered File System and on the SAN switches configured above.

When the SAN & Fencing tab is complete, go to the Storage Settings tab.

### Storage Settings Tab

The Storage Settings tab allows you to select membership partitions, which HP Clustered File System uses to control access to the SAN, and to create a snapshot configuration for taking hardware snapshots.



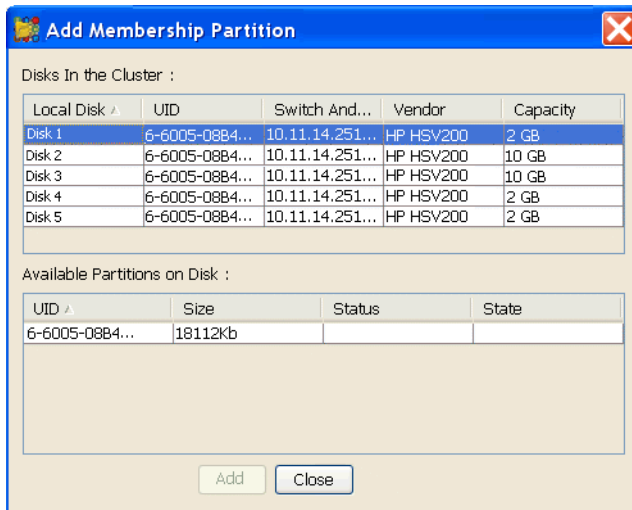
1. **Membership Partitions.** HP Clustered File System uses a set of membership partitions to control access to the SAN and to store the device naming database, which includes the global device names that HP Clustered File System assigns to the SAN disks placed under its control.

You will need to select the LUN or disk partitions that should be used as membership partitions. Note the following:

- LUNs must already be partitioned as described in step “9. Create LUNs for the Membership Partitions and Modify Partition Tables” on page 13.
- Existing partitions used for membership partitions cannot contain Windows filesystems. See “Partitions Containing Windows Filesystems” on page 14.

HP Clustered File System can use either one or three membership partitions. **To ensure that a membership partition is always available, we strongly recommend that you select three partitions.**

To create a membership partition, click Add. The Add Membership Partition window then lists all of the disks or LUNs that it can access. Select a disk or LUN for the first membership partition.



All of the available partitions on that disk or LUN then appear in the bottom of the window. Select one of these partitions and click Add. (The minimum size for a membership partition is 100 MB.) Repeat this procedure to select two more membership partitions. We recommend that the partitions be on different disks.

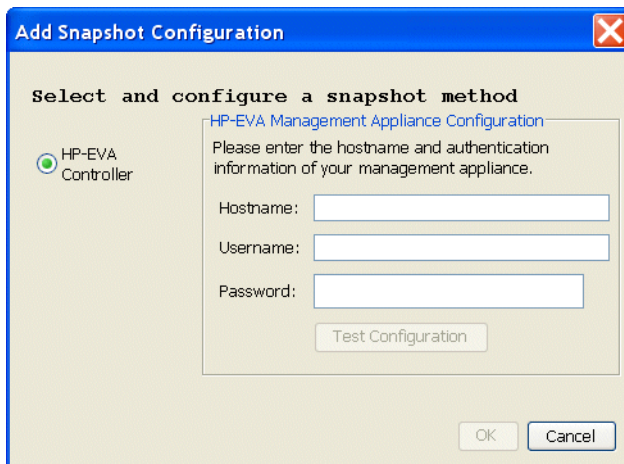
When selecting partitions for use as membership partitions, be sure that they do not contain any needed data. When the membership partitions are created, any existing data will be erased.

2. **Snapshot configuration.** HP Clustered File System provides support for taking hardware snapshots of PSFS filesystems. (The filesystems must be located on storage arrays supported for snapshots.) If you want to use this capability, you will need to configure the snapshot method.

**NOTE:** Hardware snapshots are supported only on Hewlett-Packard StorageWorks Enterprise Virtual Array (EVA) storage arrays. The latest version of the HP StorageWorks Scripting System Utility (SSSU) must be installed on all servers in the cluster in order for HP EVA snapshots to work. To locate this utility, go to [www.hp.com](http://www.hp.com), select Software & Driver Downloads, and search for “HP StorageWorks Command View EVA Software.” Choose the latest media kit version, and select the correct version for your OS. The current media kit version is v4.1. The utility must be renamed to **%Program Files%\Hewlett-Packard\SANworks\Element Manager for StorageWorks HSV\Bridge\sssu.exe**. You will also need to install Microsoft Knowledge Base Hotfix 899415. The hotfix is available at:

<http://support.microsoft.com/default.aspx?scid=kb;en-us;899415>

To configure the snapshot method, click Add, select the appropriate configuration module and then supply the configuration information.



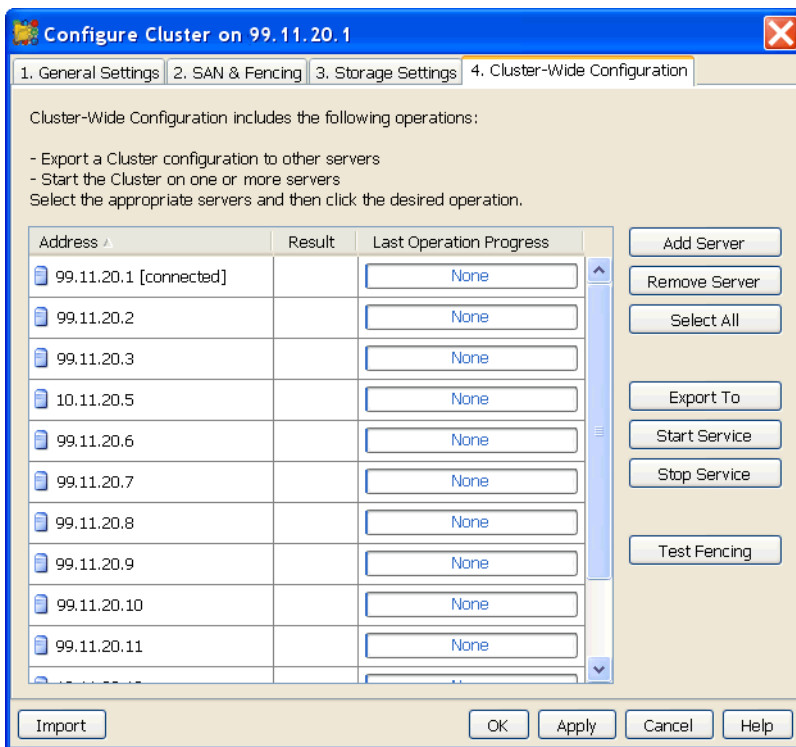
3. **Apply the configuration.** When you have completed the Storage Settings tab, click Apply (at the bottom of the Cluster Configuration window).

The configuration is then installed on the server that you are using to connect to the Management Console. You will then be asked whether you want to start the cluster on that server. If you configured Web management-based fencing, answer No. Otherwise, answer Yes.

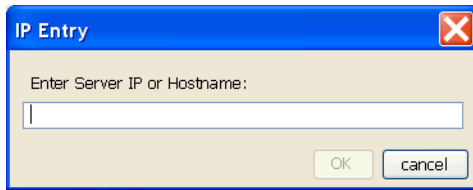
Go to the Cluster-Wide Configuration tab.

### Cluster Wide Configuration Tab

This tab is used to export the cluster configuration to the other servers that will be in the cluster. It can also be used to start or stop HP Clustered File System on specific servers.



1. **Add servers to the cluster.** To specify the first server, click Add Server and type the IP address or hostname of the server on the Input form. Then click OK to add the server to the Address column.



Repeat this procedure to add the remaining servers to the Address column.

2. **Export the configuration.** Click Select All to select all of the servers in the Address column. Then click Export. The Last Operation Progress column will display status messages as the configuration is exported to each server.

If you are using Web Management-based fencing, you may be asked for additional information about each server. Based on the entries you made on the Fencing tab, the information can include any or all of the following: the vendor/type for the Remote Management Controller, the IP address/hostname of the Remote Management Controller, the username and password for the Remote Management Controller.

**NOTE:** If you are using Web management-based fencing, you should now verify that the remote management controller is configured correctly. See “Test the Fencing Configuration” on page 35 for more information. Do not start HP Clustered File System until you have completed the verification.

3. **Start HP Clustered File System on the remaining servers.** The servers to which you exported the configuration will still be selected in the Address column. Click Start Service to start HP Clustered File System on those servers. As each server is started, a status message will appear in the Last Operation Progress column. (If you are using Web management-based fencing, also start HP Clustered File System on the first server.)

When HP Clustered File System is running on all of the servers, you can close the Server Configuration window.

The installation is now complete. See the *HP StorageWorks Clustered File System Administration Guide* or the HP Management Console online help for information about configuring the cluster components.

## **Test the Fencing Configuration**

The Test Fencing button on the Cluster Wide Configuration tab can be used to verify that the fencing configuration is correct for each server. This feature is particularly useful for Web Management Based Fencing via Server Reset/Shutdown.

On the Cluster Wide Configuration tab, select one or more servers to test and click the Test Fencing button. (You cannot select the server being used to connect to the Management Console.)

HP Clustered File System then fences the servers in accordance with the method you specified on the Fencing tab. If the correct server is not fenced, you will need to check the configuration. For example, if you specified a pattern for the Remote Management Controller, the server may not be configured to use that pattern.

If an incorrect hostname or IP address was specified for the Remote Management Controller associated with the server, export the cluster configuration to that server again, and then supply the correct information.

## **Install the Stand-Alone Management Console**

For convenience, the cluster can be managed from a separate administrative station rather than from a server in the cluster. To allow you to do this, the Management Console and **mx** utility are provided in a separate package (**mxconsole\_3.4.0.0387.msi**) that can be installed on PCs outside the cluster.

## **System Requirements**

Systems must meet these requirements:

- Pentium-compatible processor or later

- 64 MB memory
- Windows 2000, Windows XP, or Windows 2003

## **Install and Start the Management Console**

To install the stand-alone Management Console, copy the installer file **mxconsole-3.4.0.0387.msi** available under **C:\Program Files\Hewlett-Packard\HP Clustered File System\ManagementConsole\Installer** on the cluster nodes, onto the host from where cluster will be managed. Double-click the file, and then run the Installation Wizard. To start the stand-alone Management Console, select Start > Programs > HP Clustered Gateway > CFS Management Console.





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# 4

## Upgrade HP Clustered File System

### **Overview**

This chapter describes how to upgrade to HP Clustered File System 3.4.0. Upgrades are supported from HP Clustered File System 2.7.2 and 3.2.1.

It is not necessary to upgrade the stand-alone Management Console, which is used to connect to the cluster from hosts not running the cluster software. When you use the stand-alone Management Console to connect to a cluster running version 3.4.0, the latest version of the Management Console will be downloaded to the host.

### **Back Up the Existing Cluster**

Before starting the upgrade, we strongly recommend that you back up your existing cluster on each server.

- The default location for HP Clustered File System 3.2.1 is **C:\Program Files\Hewlett-Packard\HP Clustered File System**, and the default location for HP Clustered File System 2.7.2 is **C:\Program Files\HPCFS\Matrix Server**. Be sure to back up the `\conf` directory, and the cluster configuration files it contains, from that location. If HP Clustered File System was installed in a location other than the default, the `\conf` directory and corresponding files can be found in that location.

- It is important to preserve the original cluster configuration in case you need to back out of the upgrade.
- Back up all PSFS filesystems for disaster recovery purposes.

## Custom Installations of HP Clustered File System

When you upgrade HP Clustered File System, the Installer looks for the cluster configuration files in the location where HP Clustered File System is currently installed, and then applies the configuration files to the new installation.

If you perform a custom installation of HP Clustered File System 3.4.0 and specify a new location for the cluster software, the Installer will not be able to locate the existing configuration files. To avoid this problem, take one of these steps:

- If HP Clustered File System is currently installed in a custom location, install HP Clustered File System 3.4.0 in the same location.
- The default installed location for the HP Clustered File System 3.2.1 is **C:\Program Files\Hewlett-Packard\HP Clustered File System**, and in the case of HP Clustered File System 2.7.2 the default installed location is **C:\Program Files\HPCFS\Matrix Server**. When upgrading from HP Clustered File System 2.7.2, select the root directory of installation as **C:\Program Files\HPCFS\MatrixServer**. For upgrades from 3.2.1, select the root directory of installation as **C:\Program Files\Hewlett-Packard\HP Clustered File System**.
- If you need to install the 3.4.0 release in a different location, copy the backup configuration files (saved in the previous step) to that location before installing HP Clustered File System 3.4.0.

## Upgrade Considerations

- **The server with the numerically highest primary IP address must be upgraded first.** Then continue to upgrade the servers in descending order of IP address, with the server with the lowest primary IP address being upgraded last.

- If a server is temporarily out of the cluster during the upgrade (for example, for maintenance), you will need to upgrade it to 3.4.0 before returning it to the cluster.

## **Upgrade HP Clustered File System**

There are three ways to perform the upgrade to HP Clustered File System 3.4.0:

- Perform a rolling upgrade. In this procedure, servers are removed from the cluster, upgraded, and returned to the cluster one-at-a-time. No downtime is required.
- Upgrade all servers at once. This procedure requires that the cluster be completely shut down during the upgrade.
- Upgrade the servers in two groups. This method minimizes overall downtime.

### **Perform a Rolling Upgrade**

This procedure does not require any cluster downtime. Each server is removed from the cluster, upgraded, and then returned to the cluster.

#### **Rolling Upgrade Considerations**

You should be aware of the following when upgrading HP Clustered File System to the 3.4.0 release:

- Servers can be upgraded one-at-a-time during the rolling upgrade. The server with the numerically highest primary IP address must be upgraded first. Then continue to upgrade the servers in descending order of IP address, with the server with the lowest primary IP address being upgraded last.
- During the rolling upgrade, the cluster will include a mix of servers running 3.4.0 and the older version. Although HP Clustered File System supports this mix of versions during the rolling upgrade, on-going operation of a mixed-version cluster is not supported. All servers should be upgraded to 3.4.0 as quickly as possible.
- During the upgrade, the CFS Management Console will show the version of HP Clustered File System that is currently running on the

server to which you are connected. Each server will show the currently installed version of the operating system.

- If you are upgrading from 3.2.1, the HP Clustered File System upgrade package will include a new license file. You will need to install this file during the upgrade. If the new file is not in place when you start HP Clustered File System, license violations will be reported on the Management Console and in the cluster log, and the product will shut down after one hour and 45 minutes.

### Upgrade Procedure

Complete the following steps to upgrade the cluster to the 3.4.0 release.

**NOTE:** Upgrade the server with the highest IP address first. Then continue to upgrade the servers in descending order of IP address.

1. Stop HP Clustered File System on the server to be upgraded. (Either issue the command **net stop matrixserver** from the Command Prompt, or stop the product via Microsoft Management Console services snap-in, and locate the service named Polyserve Matrix Server.)
2. Remove all HP Clustered File System and Solution Pack hot fixes, if any, that have been applied to your system. You can use the Control Panel Add/Remove Programs interface to do this.
3. Uninstall the HP Clustered File System for CIFS Solution Pack, if it is installed on the server. Use the Control Panel Add/Remove Programs interface to do this.
4. Uninstall HP Clustered File System. Use Start > Programs > HP Clustered File System > Uninstall HP CFS. Select the checkbox to “Keep the existing MatrixServer configuration.” Reboot the server when the “reboot” popup message displays.

**NOTE:** Do not use the Add/Remove Programs option on the Control Panel to remove HP Clustered File System. This method will remove your cluster configuration.

5. Upgrade the HBA driver to Storport driver 9.1.0.18 - Scsiport drivers are no longer supported.

6. If you installed a new HBA driver in step 6, reboot the server.
7. To run **mxcheck**, insert the HP Clustered File System CD into the CD drive.
8. Install HP Clustered File System 3.4.0. Locate the file **MxS\_3.4.0.0387.msi** on the product CD or in the directory where you downloaded the software. Double-click the **MxS\_3.4.0.0387.msi** file and run the Installation Wizard. To complete the installation, reboot the server as directed by the popup message.
9. Reinstall the HP Clustered File System Solution Pack removed in step 3.
  - For HP Clustered File System for CIFS, insert the Solution Pack CD into the CD drive or go to the location where you have downloaded the software. Then double-click the file **MxFS\_CIFS\_3.4.0.0387.msi** and run the Installation Wizard.
10. Open the HP Management Console Login window, enter the login credentials for the server that you are upgrading, and click the Configure button on the Login window.
11. A new license is required for 3.4.0. The license file is part of the upgrade kit. On the CD, go to the License folder and double-click "Install\_License.exe" to install the new license.
12. Click Apply (on the bottom of the Cluster Configuration window) to save the HP Clustered File System configuration.

**NOTE:** If the Apply fails, verify that the FC switch ports are enabled for all of the servers. If the switch ports are enabled, check the Windows Disk Management MMC snap-in to determine whether the node can see the disks on the SAN. Also check the HBA driver.
13. When asked if you want to start the HP Clustered File System service, answer yes. If you are not prompted to start the service, go to the Cluster Wide Configuration tab and start HP Clustered File System on the upgraded server.

The upgraded server will now rejoin the cluster. Repeat this procedure on each remaining server in the cluster.

## Upgrade Servers in Groups or at Once

If you are not performing a rolling upgrade, you can use one of the following methods to upgrade the cluster:

- To minimize overall downtime, divide your servers into two groups, and then upgrade one group at a time while the other group runs the cluster. The following procedure assumes that the servers are divided into group A and group B.
- Upgrade all servers at once. In the following procedure, complete the steps for group A on all of the servers.

To perform the upgrade, complete the following steps.

**NOTE:** Upgrade the server with the highest IP address first. Then continue to upgrade the servers in descending order of IP address, with the lowest numbered server being upgraded last.

1. Stop HP Clustered File System on each server in group A. (Either issue the command **net stop matrixserver** from the Command Prompt, or stop the product via the Microsoft Management Console Services snap-in.) Also disable the Polyserve Matrix Server service on the Microsoft Management Console Services snap-in.
2. After the service has stopped, uninstall any HP Clustered File System hot fixes that have been applied to the servers in group A. You can use the Control Panel Add/Remove Programs interface to do this.
3. Uninstall the previous version of HP Clustered File System from each server in group A. Use Start > Programs > HP Clustered Gateway > Uninstall HP CFS. Select the checkbox to “Keep the existing MatrixServer configuration.” Reboot the server when the “reboot” popup message is displayed.

**NOTE:** Do not use the Add/Remove Programs option on the Control Panel to remove HP Clustered File System. This method will remove your cluster configuration.

4. On each server in group A, uninstall the HP Clustered File System for CIFS Solution Pack, if it is installed on the server. Use the Control Panel Add/Remove Programs interface to do this.
5. If you will be adding third-party MPIO software to the cluster, install it on each server in group A according to the product documentation.
6. On each server in group A, upgrade HBA drivers if necessary.
7. If necessary, reboot the servers in group A. (You will need to reboot the servers, if you installed a new HBA driver in step 6.)
8. On each server in group A, install HP Clustered File System 3.4.0. Locate the file `MxS_3.4.0.0387.msi` on the product CD or in the directory where you downloaded the software. Double-click the `MxFS_CIFS_3.4.0.0387.msi` file and run the Installation Wizard. To complete the installation, reboot the servers when directed by the popup message.

**NOTE:** You will see a security warning stating that the publisher could not be verified. You can ignore this warning; software from HP, Inc. is safe to install.

9. On each server in group A, install any HP Solution Packs.
  - For HP Clustered File System for CIFS, insert the Solution Pack CD into the CD drive or go to the location where you have downloaded the software. Then double-click the file `MxFS_CIFS_3.4.0.0387.msi` and run the Installation Wizard.
10. Start the Management Console. On the Connection Parameters window that opens next, enter the IP address of a server in group A. Type **admin** for both the user and the password, and then click the Configure button. (The upgrade does not retain your Administrator password; you will need to set it again in step 14.)
11. On the General Settings window, select Change License File and install the new license (A new license is required for 3.4.0. The license file is part of the upgrade kit). Next, set the Administrator password if you are using a value other than the default.



12. Click Apply on the bottom of the Cluster Configuration window. (You may be prompted to reenter the Administrative password. You can click Apply again if necessary to redisplay the password prompt.) Answer No when you are asked whether you want to start the cluster.

**NOTE:** If the Apply fails, verify that the FC switch ports are enabled for all of the servers. If the switch ports are enabled, check the Windows Disk Management MMC snap-in to determine whether the node can see the disks on the SAN. Also check the HBA driver.

13. Go to the Cluster Wide Configuration tab and export the updated configuration to all other servers in group A. (You may be asked for the password on each server. Enter **admin**, which is the default password.)

**NOTE:** If the export fails, verify that the FC switch ports are enabled for all of the servers. If the switch ports are enabled, check the Windows Disk Management MMC snap-in to determine whether the node can see the disks on the SAN. Also check the HBA driver.

14. On the Cluster Wide Configuration tab, stop Clustered File System ( type **net stop MatrixServer** from the command window or go the Microsoft Management Console Services snap-in and locate PolyServe Matrix Server and stop the service) on each server in group B. Also disable the Polyserve Matrix Server service on the Microsoft Management Console Services snap-in.

15. On the Cluster Wide Configuration tab, start HP Clustered File System on all of the servers in group A.

**NOTE:** If you are not using the default cluster password, you will see a message stating that an attempt to login to the Management Console failed because of a bad password. You can ignore this message. Simply close the Configure Cluster window, and then reconnect to the node using Start > Programs > HP Clustered Gateway > CFS Management Console.

The servers in group A are now operational.

16. On each server in group B, uninstall any HP Clustered File System hot fixes that have been applied to the system. You can use the Control Panel Add/Remove Programs interface to do this.
17. On each server in group B, uninstall the previous version of HP Clustered File System.  
Use Start > Programs > HP Clustered Gateway > Uninstall HP CFS. Select the checkbox to “Keep the existing MatrixServer configuration.”  
Reboot the server when the “reboot” popup message is displayed.  
**NOTE:** Do not use the Add/Remove Programs option on the Control Panel to remove HP Clustered File System. This method will remove your cluster configuration.
18. On each server in group B, uninstall the HP Clustered File System for CIFS Solution Pack, if it is installed on the server. Use the Control Panel Add/Remove Programs interface to do this.
19. On each server in group B, upgrade the operating system and/or service pack if necessary.
20. If you will be adding third-party MPIO software to the cluster, install it on each server in group B according to the product documentation.
21. On each server in group B, upgrade HBA drivers if necessary.
22. If necessary, reboot the servers in group B. (You will need to reboot the servers if this step is required by an operating system upgrade or if you installed a new HBA driver in step 24.)
23. On each server in group B, install HP Clustered File System 3.4.0.  
Locate the file MxS\_3.4.0.0387.msi on the product CD or in the directory where you downloaded the software. Double-click the MxS\_3.4.0.0387.msi file and run the Installation Wizard. To complete the installation, reboot the servers as directed by the popup message.
24. On each server in group B, install any HP Solution Packs.
  - For HP Clustered File System for CIFS, insert the Solution Pack CD into the CD drive or go to the location where you have downloaded the software. Then double-click the file MxFS\_CIFS\_3.4.0.0387.msi and run the Installation Wizard.

25. Start the CFS Management Console (if you are not already connected) and connect to one of the servers in group A (a server that has already been upgraded). Verify that all of the servers in group B have rebooted, and then export the configuration from the group A server to the servers in group B.

**NOTE:** If an export fails, verify that the FC switch ports are enabled for all of the servers.

26. On the Cluster Wide Configuration tab, start HP Clustered File System on all of the servers in group B.

All servers in the cluster are now operational.

## ***Change the Fencing Method***

If you are upgrading to HP Clustered File System 3.4.0 and also want to change the fencing method, complete these steps:

1. Use the procedure described earlier to upgrade to the 3.4.0 release.
2. Stop HP Clustered File System on all servers in the cluster.
3. Connect to one server in the cluster via the CFS Management Console. On the Connection Parameters window, enter the IP address of the server, enter the user and the password, and then click the Configure button.
4. On the Configure Cluster window, select the Fencing tab, and then configure the appropriate fencing method. See “SAN & Fencing Tab” on page 22 for more information.
5. Click Apply (on the bottom of the Configure Cluster window) to install the new configuration on the server and answer Yes when you are asked if you want to start the cluster service.
6. Go to the Cluster Wide Configuration tab and export the new configuration to the other servers. See “Storage Settings Tab” on page 29.
7. Start HP Clustered File System on the remaining servers.

---

# 5

## Other Procedures

This chapter describes how to perform the following procedures:

- Configure the XIOtech MAGNITUDE Storage Array
- Add a new server to a cluster.
- Move a server from one cluster to another.
- Upgrade the HP Clustered File System license file.
- Uninstall HP Clustered File System and the stand-alone Management Console.

Hewlett-Packard supports Clustered File System with a host of storage arrays from various vendors; however, XIOtech MAGNITUDE storage array needs a few variations described below.

### ***Configure the XIOtech MAGNITUDE Storage Array***

Configure the XIOtech MAGNITUDE storage array before you install HP Clustered File System.

This storage array supports a secure LUN masking capability. There are two primary modes of operation: No Mapping/Masking and New Server See Nothing. The configuration you will need to perform depends on which mode you are using.

## **“No Mapping/Masking” Mode**

All servers that can target the MAGNITUDE device can also see all of the LUNs on the device. HP Clustered File System can be installed normally with this configuration. However, you will need to set up the LUNs that will be used with HP Clustered File System before you begin the HP Clustered File System installation. See section “9. Create LUNs for the Membership Partitions and Modify Partition Tables” on page 13 for information about the LUNs required for HP Clustered File System operations.

## **“New Server See Nothing” Mode**

Only those servers that have been identified by the MAGNITUDE storage array are allowed to see specifically mapped LUNs. The storage array uses the WWID of the FC Host Bus Adapter to manage this mode of operation.

Before installing HP Clustered File System, you will need to perform the following procedure, which ensures that the LUNs are available when you configure HP Clustered File System.

Complete the following steps:

1. Set up the LUNs that are going to be used by HP Clustered File System. (See section “9. Create LUNs for the Membership Partitions and Modify Partition Tables” on page 13 for information about the LUNs required for HP Clustered File System operations.)
2. When booting each server, press Ctrl-Q to enter the QLogic Setup Program.
3. Select “Scan for Fibre Devices” from the menu.
4. Page through the results until you see the MAGNITUDE device.
5. On the MAGNITUDE device, map the LUNs to the WWIDs.

Exit the QLogic Setup Program. The server will reboot automatically.

## Set the Array to Fabric Mode

HP Clustered File System requires that storage arrays be configured in fabric mode. You can check the mode setting on the Easy Storage Setup window. For each HAB used for the cluster, the Loop ID must be set to FPort. If you need to change the mode, click the HAB, select the FPort setting, and press Enter.

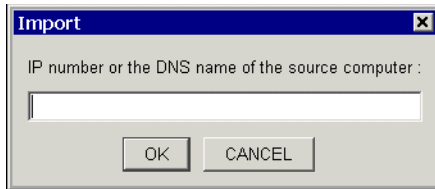
## Add a New Server to a Cluster

Use the following procedure to add a new server to an existing cluster.

**NOTE:** If the server was previously used in a different HP Clustered File System cluster, remove the contents of the directory **C:\Program Files\Hewlett-Packard\HP Clustered File System\conf** (if HP CFS 3.2.1 is installed), or of the directory **%SystemDrive%\Program Files\HPCFS\Matrix Server\conf** (for HP Clustered File System 2.7.2,) before you perform the following procedure.

1. **Ensure that the iLO network configuration as well as a username and password are set on the iLO card.** This assumes iLO based fencing is being used and not fabric based fencing. This may require a reboot of the server.
2. **Install MPIO Software (Optional).** If MPIO software is being used on the other cluster nodes, ensure that the same software is installed and configured on the new node before attaching the node to the SAN.
3. **Check the DNS hostname.** Ensure that the DNS hostname is set up properly on the new server. See section “2. Set Up the DNS Hostname” on page 9.
4. **Import the existing cluster configuration.** You can import the configuration from any server in the cluster. Complete these steps:
  - a. On the new server, select Start > Programs > HP Clustered File System > Management Console. On the Connection Parameters window that opens next, type the IP address of the server. Then type **admin** for both the user and the password and click Configure.

- b. When the Configure Cluster window opens, click Import. On the Import window, type the IP address or DNS name of the server from which you want to import the configuration.



5. **Add the new server to the cluster.** Go to the Cluster Wide Configuration tab. The Address list shows the servers currently in the cluster. Click the Add button to add the new server to this list. You will be asked for the IP address or hostname of the new server. When the operation is complete, the new server is displayed in the Address list.
6. **Start HP Clustered File System on the new server.** Select the new server from the Address list, and click Start Service to start the HP Clustered File System service on that server. When HP Clustered File System is running on the server, click OK to close the Server Configuration window.
7. **Connect to the cluster.** Select Start > Programs > HP Clustered File System > Management Console, and then specify any server in the cluster on the Connection Parameters window. The new server is now in the cluster.

8. **Check the drive mappings.** When you add a server, the operating system may assign drive letters that do not match the assignments you have made for your shared filesystems on the other nodes. There are several ways to correct this situation:
- Use the **mx fs unassign** command to remove the incorrect drive assignments and the **mx fs assign** command to establish the correct assignments.
  - Use the HP Management Console to change drive letter assignments. Note that the change will take place on all nodes and may affect applications.
  - Use Windows Disk Manager to change the assignments.

If you are using Windows 2000 Terminal Services to make the change, you must log out and then log back in before you can use the reassigned drive letters. The log out/log in step is not necessary for Windows 2003 Terminal Services or for Windows 2000/2003 local console use.

## ***Move a Server to Another Cluster***

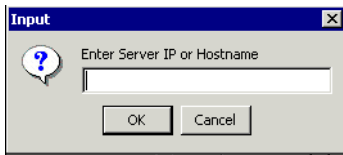
Before moving a server from one cluster to another, you will need to remove the previous cluster configuration from the server. To do this, delete the contents of the **C:\Program Files\Hewlett-Packard\HP Clustered File System\conf** directory.

You can then either import the new cluster configuration to the server, as described in the previous procedure, or you can export the configuration from an existing server in the cluster.

To export the configuration, complete these steps:

1. On an existing server in the new cluster, select **File > Configure** on the Management Console to display the **Configure Cluster** window.
2. Go to the **Cluster Wide Configuration** tab, click **Add Server**, and type the hostname or IP address of the server on the **Input** form. Click **OK** to add the server to the **Address** column.





3. Select the server in the Address column, and then click Export. The Last Operation Progress column displays status messages as the configuration is exported to the server.
4. Start HP Clustered File System on the server. The server is still selected in the Address column. Click Start Service to start HP Clustered File System. A status message is displayed in the Last Operation Progress column.

When HP Clustered File System is running on the server, you can close the Server Configuration window.

When you connect to the cluster, the new server is displayed on the HP Management Console.

## ***Upgrade the HP Clustered File System License File***

A permanent license file is pre-installed on the system. If a new license is required, use one of the following procedures to upgrade the license file on all servers in the cluster.

### **Upgrade Servers One-at-a-Time**

In Windows Explorer, go to the CD and locate the License folder. Double-click the **Install\_License.exe** file, which installs the license.

Alternatively, you can copy the license file located on CD\License folder to any location on C:\ and the procedure documented below can be followed.

1. On the HP Management Console, select File > Configure.
2. On the General Settings tab, select Change License File.
3. Type the path to the new license file or browse to it.
4. Click Apply.

**NOTE:** This procedure does not require any down time. Repeat this procedure on each server in the cluster.

## Upgrade One Server and Export

This procedure requires that HP Clustered File System be stopped on all servers. Execute the procedure on one server in the cluster.

1. On one server, select Start > Programs > HP Clustered File System > Management Console. On the Connection Parameters window that opens next, enter the IP address of the server, type the user and password, and then click the Configure button.

**NOTE:** If there is a `.matrixrc` file on the system running `mxconsole`, you will see a Disconnect dialog instead of the Connection Parameters window. Select “Logon to another cluster server” and then click Configure.

2. Select the Cluster Wide Configuration tab, and then stop the service on all nodes.
3. Return to the General Settings tab and select Change License File.
4. Type the path to the new license file or browse to it.
5. Click Apply.
6. Start the cluster service when prompted. (This starts the service on the connected node.)
7. Export the configuration to all other servers.
8. Start the HP Clustered File System service on all other nodes.



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