

application notes

hp StorageWorks network storage router implementation issues

Third Edition (November 2002)

Part Number: 284231-003

This document provides information on configuration issues and options not discussed in the *hp StorageWorks Network Storage Router User Guide*.

For the latest version of these Application Notes and other StorageWorks documentation, access the HP storage website at: <http://www.hp.com>.



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Intended Audience

This document is intended for users and technicians of all models of the HP StorageWorks Network Storage Router.

Other Network Storage Router Documentation

Additional documentation, including white papers and best practices documents, are available at the HP website: <http://www.hp.com>.

Microsoft Windows 2000 Device Driver

The router supports a set of SCSI-3 commands that can be received as FCP commands over the Fibre Channel bus. A requirement for support of these commands is the presence of a controller LUN or LUNs in the Fibre Channel LUN map. By default, the router enables controller LUNs and places a controller device at FC LUN 0.

In Windows 2000 environments, the Hardware Discovery Wizard detects the presence of the controller LUN, identifies it to the user as Compaq StorageWorks Modular Router Array Controller Device, and prompts for installation of a device driver. The router does not require a device driver and is fully functional without the device driver. However, until a device entry is created in the System Registry, the Windows 2000 operating system (OS) will classify it as an Unknown Device. Each time the server is booted, the hardware Discovery Wizard will prompt for installation of a driver file.

Device information files (inf files) are available that install a null device driver and create a device entry in the System Registry. The inf files are located on the Network Storage Router Documentation CD in the `\pdfs\cpqnsr` directory and on the StorageWorks page of the HP website at: <http://www.hp.com>.

Each router model uses a unique device driver file:

Model M2402: *cpqnsr.inf*

Model E1200: *cpqnsr_e1200.inf*

Model N1200: *cpqnsr_n1200.inf*

After the null device driver is installed, a new listing is displayed under System Devices in the Windows 2000 Device Manager called *HP Network Storage Router*.

Each of the following methods can be used to install the null device driver and populate the System Registry with the necessary device information:

- When the Hardware Discovery Wizard prompts for installation of the device driver, browse the Network Storage Router Documentation CD and locate the appropriate *.inf* file. Regardless of the number of routers in the fiber network, this procedure has to be performed only once.
- From the Windows 2000 Device Manager, right-click the Unknown Device and select Properties. In the Properties page, select Driver and then select Update Driver. When prompted for the location of the driver file, navigate the browser to the location of the applicable inf file.
- Copy the applicable inf file to the `C:\WINNT\INF` directory and reboot the server. The hardware Discovery Wizard scans this directory at each startup, and automatically installs the device entry in the System Registry.

Backup Exec and Microsoft Cluster Support

In a Microsoft Cluster Server configuration, Backup Exec can be installed as a virtual server application to provide failover support for backup jobs. If a cluster failover occurs during a backup operation, Backup Exec services will resume on the secondary cluster node and will reschedule the currently running backup job. However, the secondary node will be unable to access the tape drive and media that was being used by the primary cluster node at the time of the failure due to a SCSI device reservation that is still in effect by the primary node.

Previous Fibre Channel-to-SCSI routers had the ability to break this device reservation by performing a Fibre Channel LUN reset. The initial release of this router does not support FC LUN resets. Therefore, if a cluster failover occurs during a backup operation, the tape drive and media owned by the primary cluster node will be unavailable until that node is brought back on-line or until the router and tape library are power-cycled.

The FC LUN reset functionality is currently under development for the router and should be available by the summer of 2002. The updated firmware will be available as a downloadable SoftPaq from <http://www.hp.com>.

NetWare Environment Considerations

Currently, NetWare servers are supported only with Compaq Fibre Channel Host Bus Adapters (HBA). Due to interoperability issues between the current Fibre Channel Protocol (FCP) specification and the Compaq HBA, the **Force FCP Response Code** setting on the router must be **enabled** for NetWare configurations. Without this setting, the HBA cannot detect tape or robotic devices behind the router.

For details, refer to the Fibre Channel Module Configuration sections in the User Interface chapters of the *hp StorageWorks Network Storage Router User Guide* for details.

Heterogeneous Windows and NetWare Environment Limitations

Environments that mix Windows and NetWare products experience the following limitations:

- Heterogeneous Windows/NetWare ARCserve configurations are not supported
- Heterogeneous Windows/NetWare Backup Exec configurations have limited support

Each of these limitations is discussed in the following paragraphs.

Heterogeneous Windows/NetWare ARCserve Configurations are not Supported

VERITAS Backup Exec and Computer Associates ARCserve support heterogeneous Windows NT/2000 and NetWare configurations. As discussed in the previous section, the HBA in the NetWare servers requires the use of the **Force FCP Response Code** setting. This setting is incompatible with the KGPSA-BC and KGPSA-CB Fibre Channel HBA supported in Windows NT and Windows 2000 systems.

Heterogeneous Windows/NetWare Backup Exec Configurations Have Limited Support

If the router is being installed into a heterogeneous Windows NT or Windows 2000 and NetWare Backup Exec environment, the Fibre Channel LUN maps need to be created to ensure the two environments do not share a common Fibre Channel port.

If both Fibre Channel ports are required to support tape devices behind the router, then a second dual-port Fibre Channel module is required for the router. One dual-port module will be used for the Windows systems and one dual-port module will be used for the NetWare systems.

KGPSA HBA Error Recovery Settings

The ResetTPRLO driver parameter for *cpqkgpsa.sys* Fibre Channel driver versions 4.53 and later is set to a default value of 0. HP recommends changing the ResetTPRLO parameter setting to 1.

With a setting of 0, if the HBA experiences a command timeout due to a transmission error or similar problem, the driver will send the router a Target Reset instead of a TPRLO (Third Party Process Logout). The Target Reset will cause the router to abort all outstanding I/O commands, clear device reservations, and cause the jobs in progress to fail.

Most backup applications that support Fibre Channel shared device configurations contain error recovery logic that handles bit error conditions and allows the job in progress to recover and run to successful completion. In most cases, the Target Reset command circumvents this logic and causes all active jobs to fail. (Some applications, such as VERITAS NetBackup, have the ability to recover from this condition.) To correct this situation, the ResetTPRLO parameter needs to be modified from the default setting of 0 to a setting of 1.

The *lputilnt.exe* utility for modifying default driver parameters is provided with the *cpqkgpsa.sys* driver. As part of the driver installation, this utility is copied to the *C:\WINNT\System32* directory. To modify the ResetTPRLO parameter:

1. Navigate to the *C:\WINNT\System32* directory.
2. Start the utility by double-clicking the *lputilnt.exe* file.
3. In the drop-down box within the utility, select **Driver Parameters**.
4. Scroll through the list of available parameters to locate **ResetTPRLO**.
5. Double-click the **ResetTPRLO** parameter and enter a new value of 1.
6. Select the checkbox to make the change **Permanent and Global** and click **Save**.

The new parameter setting is effective immediately. A reboot of the server is not required.

KGPSA HBA Host/Device Zoning Considerations

HP SAN Switches support Soft and Hard host/device zoning.

Routing Issues

Soft zoning allows wwpn and alias zoning to be used. In these cases, traffic is routed by the fabric OS.

Hard zoning allows port maps to be built. This routing is done through the hardware, or ASIC.

Fabric Configuration Change Issues

In soft zoning, when a current fabric configuration is changed and implemented using the *cfgenable* command, a Registered State Change Notification is broadcast to all hosts that subscribe to the service.

Currently, the KGPSA HBA will re-establish an exchange link with all targets in its zone with a process login (PRLI) link establish bit of "1." When the link establish bit is "1," a Power On/SCSI Bus Reset condition is returned and all outstanding I/O is aborted.

A less destructive method of discovery (ADISC) for the KGPSA HBA should be available by mid-2002.

Host/Device Zoning Best Practices

HP recommends using hard zoning.

With hard zoning, when changes to the fabric are made, only the affected ports are notified of the changes. By hiding the changes from unaffected ports, the unaffected ports are not forced to re-establish links with their targets.

If soft zoning is necessary, be aware that any change to the fabric may result in a failed backup job or a re-try of other current jobs, which will extend the time needed to perform backups.

Custom Indexed Maps

In the process of configuring an EBS environment, it may be necessary to present different tape devices to different servers, even within the same library. To accomplish this, custom indexed maps must be created and assigned to the servers.

The following instructions describe how to create custom indexed maps using the Visual Manager user interface (VM) of the router. To see VM screen illustrations or for additional information on maps, refer to the “Visual Manager User Interface” chapter of the *hp StorageWorks Network Storage Router User Guide*.

1. Access the VM home page.

2. Select **Mapping**.

If prompted, enter the username and password in the Login dialog box.

The map settings for FC Module 0, Port 0 are displayed.

To change to a different port, select the desired module and port from the listing on the left-pane of the screen.

3. Create the map.

a. In the **Add Map** field, enter a name for the new map and click **Add**.

b. In the **Select Map** field, select this new map and then click **Edit/View**.

The **FC Map** dialog box is displayed.

c. In the Fill Map section of the FC Map dialog box, expand the **Fill Map Priority** drop-down box and change the setting to **Target/Bus**.

d. Click **Fill Map** to populate the new map with the LUNs known to the router.

The controller LUN should be at LUN 0 at the top of the list. Verify the entry in the **Type** column is **CTLR**.

e. To delete devices that should not be presented with this map, enter the appropriate LUN number in the **Delete Map Item(s)** boxes and then click **Delete Entry**.

f. If there are gaps between the LUNs, click **Remove Gaps** to reassign the LUNs in order.

g. To add new devices to the map after its initial creation, use the **Discovered Device Entry** or the **Manual Device Entry** options.

h. Close the **FC Map** dialog box.

4. Assign the map to the intended hosts.
 - a. In the **Select Host** field, choose the desired host and click **Edit/View**.
The **FC Host Name** dialog box is displayed.
 - b. In the **FC Host Name** dialog box, expand the **Map Name** drop-down menu and select the new map.
 - c. If desired for easier recognition, edit the **Host Name** to include the name of the server. HP recommends adding the server name in parenthesis after the World Wide Name.
 - d. Click **Modify** to record the changes.
 - e. Close the **FC Host Name** dialog box.
5. Reboot the router.

After the router comes back online, the assigned hosts see only the devices listed in the map for that port.

Note: The router allows only 11 maps - three default maps and eight additional custom maps.
