Preliminary Release

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Hitachi Freedom Storage™ Lightning 9900™ Prioritized Port Control

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- ECN TW-90RD004 (Technical Writing ECN).
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Preface

This user's guide provides instructions for installing and using the Prioritized Port Control feature on the 9900 Remote Console PC. Please read this manual carefully to understand how to use these products, and maintain a copy that is accessible from your Remote Console PC for reference purposes.

This user's guide assumes that:

- the user has a background in data processing and understands direct-access storage device subsystems and their basic functions,
- the user is familiar with the Hitachi Freedom Storage™ 9900 array subsystem,
- the user is familiar with the Hitachi Freedom Storage™ 9900 Remote Console, and
- the user is familiar with the Windows 95®, Windows 98®, Windows NT® or Windows 2000® operating systems.

For further information on the 9900 subsystem, please refer to the *Hitachi Freedom Storage™ 9900 User and Reference Guide* (MK-90RD008). For further information on the 9900 Remote Console PC, please refer to the *Hitachi Freedom Storage™ 9900 Remote Console User's Guide* (MK-90RD003). You may also contact your Hitachi Data Systems account team or refer to the Hitachi Data Systems worldwide web site (http://www.hds.com) for additional information on the 9900 subsystem and its features and functions.

Note: In this document the term "9900" refers to the entire Hitachi Freedom Storage™ 9900 subsystem family, unless otherwise noted.

Contents

List of Figures

List of Tables

Chapter 1 Overview of Prioritized Port Control

1.1 Port Control Function

The Prioritized Port Control feature allows you to use the 9900 subsystem for both production and development. The assumed system configuration for using the Prioritized Port Control option consists of a single 9900 subsystem that is connected to multiple production servers and development servers. Using the Prioritized Port Control function under this system configuration allows you to optimize the performance of the development servers without adversely affecting the performance of the production servers

1.1.1 Prioritized Ports

The fibre ports used on production servers are called prioritized ports. Prioritized ports can have threshold control set, but are not subject to upper limit control. Threshold control allows the maximum workload of the development server to be set according to the workload of the production server, rather than at an absolute level. To do this, the user specifies whether the current workload of the production server is high or low, so that the value of the threshold control is indexed accordingly.

1.1.2 Non-Prioritized Ports

The fibre ports used on development servers are called non-prioritized ports. Non-prioritized ports are subject to upper limit control, but not threshold control. Upper limit control makes it possible to set the I/O of the non-prioritized port within a range that does not affect the performance of the prioritized port.

1.2 Monitoring Function

Monitoring allows you to collect performance data, so that you can set optimum upper limit and threshold controls. You can collect data on the maximum, minimum and average performance, and select either per port, all prioritized ports, or all non-prioritized ports. The data can be stored for up to one week, and can be displayed in increments ranging from five minutes, one hour, one day, or one week, so the data can be displayed in graph format.

Chapter 2 Preparing for Prioritized Port Control Operations

2.1 Enabling and Disabling Prioritized Port Control

The 9900 Remote Console options can only be enabled by Remote Console PC users with administrator access privileges. To enable Prioritized Port Control, you will need the license key (password).

This section describes the following tasks:

- Enabling Prioritized Port Control (see section 2.1.1).
- Disabling Prioritized Port Control (see section 2.1.2).

Once an option is enabled, modify access to that option is then available to administrators and to users with custom access privileges for that option. Users without either administrator access or custom access privileges for a particular option have view (read-only) access to that option.

The RMCMAIN Option Product panel (see Figure 2.1) and the DKCMAIN Option Product panel (see Figure 2.2) display the RMCMAIN and DKCMAIN options and their current installation status (**Install** or **Not install**).

To access the RMCMAIN Option Product panel, select the **Option…** button on the Remote Console Main panel.

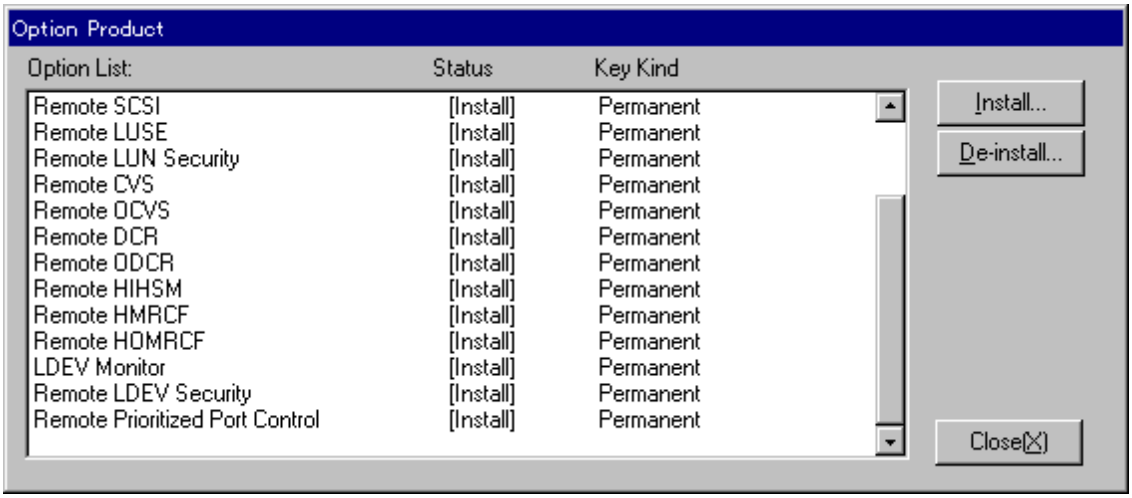

Figure 2.1 RMCMAIN Option Product Panel

The RMCMAIN Option Product panel has the following features:

- The **Option List** displays the available RMCMAIN options.
- The **Status** list shows the current status of each option (**Install** or **Not Install**).
- The **Key Kind** list shows the license type (**Temporary**, **Permanent**, or **Emergency**).
- The **Install…** button opens the Input Key Code panel (see Figure 2.3), which will prompt you for a password to complete the installation process.
- The **De-install…** button allows you to deinstall the selected option.
- The **Close** button closes the Option Product panel.

To access the DKCMAIN Option Product panel, select the **Controller…** button on the Remote Console Main panel, select the first subsystem on which you want to enable the option on the Connection Control panel (see Figure 2.5), and then select the **Install…** button.

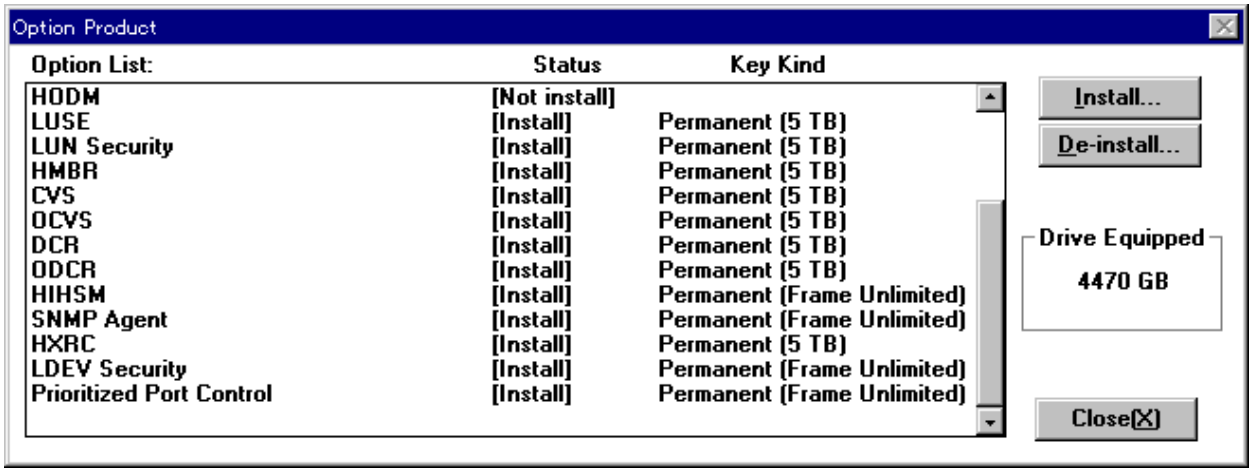

Figure 2.2 DKCMAIN Option Product Panel

The DKCMAIN Option Product panel has the following features:

- The **Option List** displays the available DKCMAIN options.
- The **Status** list shows the current status of each option (**Install** or **Not Install**).
- The **Key Kind** list displays the license type (**Temporary**, **Permanent**, or **Emergency**) and the maximum capacity of the PDEVs (physical devices) that the user is licensed to use. (***Note:*** If **[Free]** is displayed in the **Key Kind** list, this indicates that the capacity can be up to the amount shown in **Drive Equipped** box.)
- The **Install…** button allows you to install the selected option.
- The **De-install…** button deinstalls the selected option.
- The **Drive Equipped** box shows the maximum capacity of the current subsystem.
- The **Close** button closes the Option Product panel.

2.1.1 Enabling Prioritized Port Control

1. Log in as administrator.
2. On the Remote Console Main panel, select **Option…** to open the RMCMAIN Option Product panel (refer to Figure 2.1). This panel shows the current installation status of the RMCMAIN options.
3. To enable Prioritized Port Control on the Remote Console PC, select **Remote Prioritized Port Control**, and then select the **Install…** button.
4. The Input Key Code panel (see Figure 2.3) opens. Enter the license key (password) in the **Key Code** text box, and then select **OK**.
5. If the password is approved, the Program Product Confirmation panel (see Figure 2.4) opens. This panel shows the program product model name, type of key, and effective term. After confirming the content of the Program Product Confirmation panel, select **Install**.
6. When this process is complete, the RMCMAIN Option Product panel reopens and the displayed status of the selected option changes from **Not install** to **Install**.
7. Select **Close** to return to the Remote Console Main panel.
8. To enable Prioritized Port Control on a subsystem, from the Remote Console Main panel, select **Controller…** to open the Connection Control panel (see Figure 2.5).
9. On the Connection Control panel, select the first subsystem on which you want to enable these options, and then select the **Install…** button to open the DKCMAIN Option Product panel (refer to Figure 2.2).
10. Select **Prioritized Port Control**, and then select the **Install…** button.
11. The Input Key Code panel (see Figure 2.3) opens. Enter the license key (password) in the **Key Code** text box, and then select **OK**.
12. If the password is approved, the Program Product Confirmation panel opens. This panel shows the program product model name, key kind, and effective term.
13. To enable Prioritized Port Control on another 9900 subsystem, repeat steps 8 through 12.
14. When you are finished enabling options on the 9900 subsystems, select **Close** to return to the Remote Console Main panel.

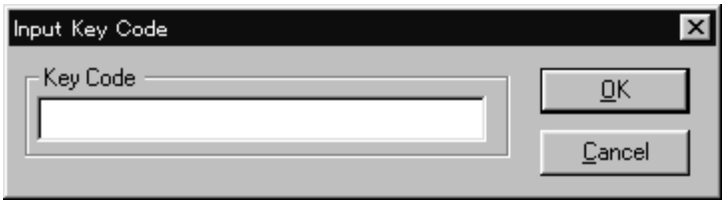

Figure 2.3 Input Key Code Panel

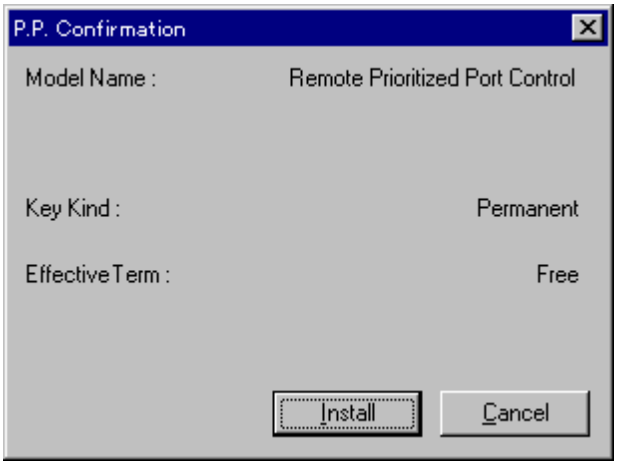

Figure 2.4 Program Product Confirmation Panel

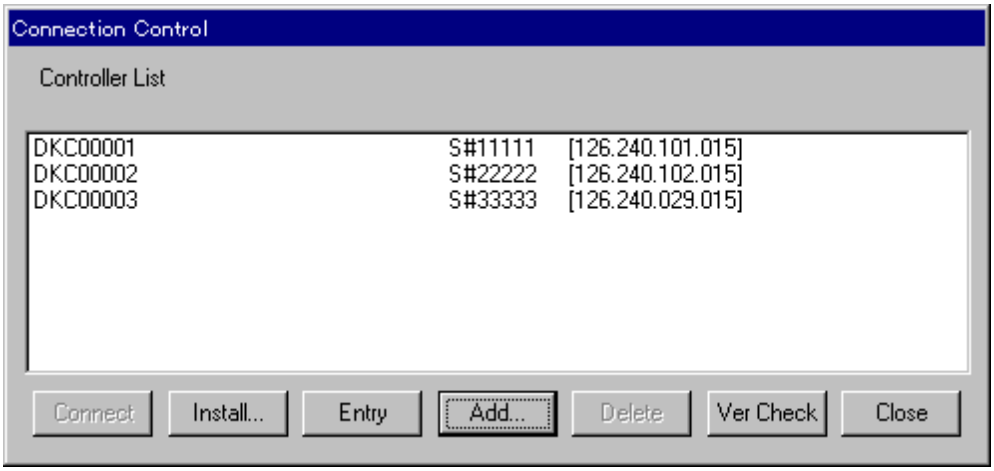

Figure 2.5 Connection Control Panel

2.1.2 Disabling Prioritized Port Control

To disable Prioritized Port Control on the Remote Console PC:

1. Log in as an administrator.
2. On the Remote Console Main panel, select **Option…** to open the RMCMAIN Option Product panel (refer to Figure 2.1).
3. Select **Remote Prioritized Port Control**, then select **Deinstall**….
4. The displayed status of the selected option changes from **Install** to **Not install**, and the option is no longer enabled on the Remote Console PC.

To disable Prioritized Port Control on a subsystem:

1. On the Remote Console Main panel, select **Controller…** to open the Connection Control panel.
2. On the Connection Control panel, select the subsystem on which you want to disable Prioritized Port Control, and then select the **Install…** button to open the DKCMAIN Option Product panel.
3. Select **Prioritized Port Control**, and then select **De-install….** The displayed status changes from Install to Not install.
4. To disable Prioritized Port Control on another 9900 subsystem, repeat steps 1 through 3. If you are finished, select **Close** to return to the Remote Console Main panel.

Note: Once the Prioritized Port Control option has been disabled or the license key code has expired, you cannot set or change the upper limit, threshold, or port type, and you will not be able to use this option to monitor performance data. The 9900 subsystem operates with the settings made before the option is disabled or the license expires. If you want to set or change the upper limit control, threshold control, or port type, you must reinstall the option. If you want to release all the Prioritized Port Control functions without reinstalling the option, select the **Release** button on the Port Control panel.

If the Define Configuration and Install operation is performed on the 9900 subsystem, the settings for the upper limit control, threshold control, and port type will be lost. In this case, you must re-specify each value, after the Install operation is complete.

2.2 Connecting to a Subsystem

The Connection Control panel (refer to Figure 2.5) displays the registered 9900 subsystems and allows you to connect to a 9900 subsystem. To access the connect function, open the Connection Control panel by selecting the **Connect…** button on the Remote Console Main panel. The connect function is available to all users.

Note: A 9900 subsystem can only connect to one Remote Console PC at a time.

To connect to a 9900 subsystem:

1. On the Remote Console Main panel, select **Connect…** to open the Connection Control panel (refer to Figure 2.5).
2. Select the desired controller in the **Controller List** box. Select the **Connect** button.
3. When the Remote Console PC connects to the selected controller, the Option Select panel opens to provide access to the installed 9900 Remote Console options.
4. To disconnect from the connected controller, exit the Option Select panel by selecting the **Close** button.

2.3 Launching Prioritized Port Control

The Option Select panel (see Figure 2.6) opens automatically when the 9900 Remote Console connects to a selected controller, and provides access to the installed 9900 Remote Console features.

Figure 2.6 Option Select Panel

To launch Prioritized Port Control, select **Prioritized Port Control**. You may also use the **Execute** menu, which displays the installed options and allows you to select and start Prioritized Port Control. (The option buttons and the **Execute** menu commands perform exactly the same functions.)

To exit the Option Select panel, select the **File** menu, then select **Close**. The Remote Console PC automatically disconnects from the connected controller, and you are returned to the Remote Console Main panel.

Chapter 3 Prioritized Port Control Panel Descriptions

3.1 Port Performance Panel

The Port Performance panel displays the monitor information for all ports, and allows you to access either the Port Detail panel (see Figure 3.3) or the Port Control panel (see Figure 3.4). The display of monitoring data begins approximately one minute after the panel is opened. The Port Performance panel (see Figure 3.1) opens after you select the Prioritized Port Control option on the Remote Console Option Select panel (refer to Figure 2.6).

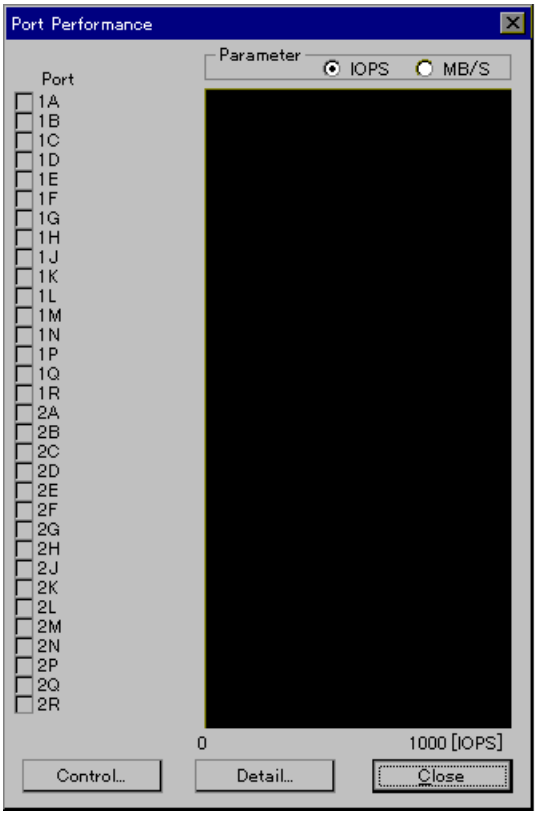

Figure 3.1 Port Performance Panel

The Port Performance panel has the following features:

- The **Parameter** box allows you to select the type of data to be displayed, either **IOPS** or **MB/S**.

  Note: Data in MB/S is rounded down so that a value smaller than one megabyte is discarded and appears as zero. For example, the data may show "2 MB/S" for the maximum, and "0 MB/S" for the average and minimum. If "0 MB/S" appears, you can confirm whether the value indicates that there is no I/O or not by displaying the same data in IOPS.

- The **Port** field shows a checkbox with a port name and a bar graph of the performance data monitored for the corresponding port in IOPS or MB/S. A check mark indicates that the port is a non-prioritized port.
- The **Control...** button opens the Port Control panel.
- The **Detail...** button opens the Port Detail panel.
- The **Close** button closes the Port Performance panel.

3.2 Closing Confirmation Panel

The Closing Confirmation panel appears when you select the **Close** button on the Port Performance panel (refer to Figure 3.1).

Figure 3.2 Closing Confirmation Panel

This panel asks the user whether to stop or continue monitoring the port performance before closing the Port Performance panel.

- The **Yes** button stops the monitoring function and closes the Port Performance panel.
- The **No** button closes the Port Performance panel without stopping the monitoring function. ***Note:*** The monitoring data will be saved on the SVP, even if monitoring is discontinued on the Remote Console PC.

3.3 Port Detail Panel

The Port Detail panel displays a graph of the monitored data regarding the selected port. The Port Detail panel opens when you select the **Detail...** button on the Port Performance panel (refer to Figure 3.1).

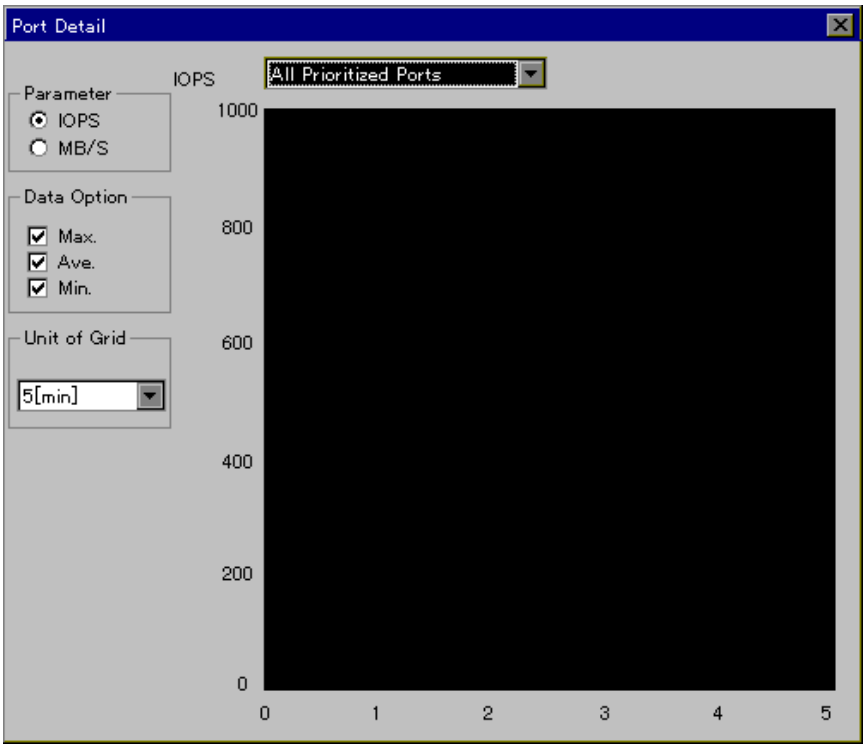

Figure 3.3 Port Detail Panel

The Port Detail panel has the following features:

- The **Port** selection drop-down box provides the following options:
  - All prioritized ports (displays the total data of all prioritized ports)
  - All non-prioritized ports (displays the total data of all non-prioritized ports)
  - Individual ports.

  Note: The graph of an invalid port indicates 0.
- The **Parameter** box allows you to display the data in either IOPS or MB/S. The default is **IOPS**. ***Note***: The MB/s data assumes that 1 MB = 1000 bytes.
- The **Data Option** box allows you to check one or more of the following (the default is to select all):
  - **Max.** displays the maximum value of the data.
  - **Ave.** displays the average value of the data.
  - **Min.** displays the minimum value of the data.
- The **Unit of Grid** drop-down box allows you to select the scale of the graph, as follows:
  - Five minutes (**5[min]**)
  - One hour (**1 [hour]**)
  - One day (**1[day]**)
  - One week (**1[week]**).
- The  icon on the upper right of the screen closes the Port Detail panel.

3.4 Port Control Panel

The Port Control panel allows you to specify whether a selected port is a prioritized port or non-prioritized port. For prioritized ports you can set a threshold limit, and for non-prioritized ports you can select an upper limit. The Port Control panel opens when you select the **Control...** button on the Port Performance panel (refer to Figure 3.1).

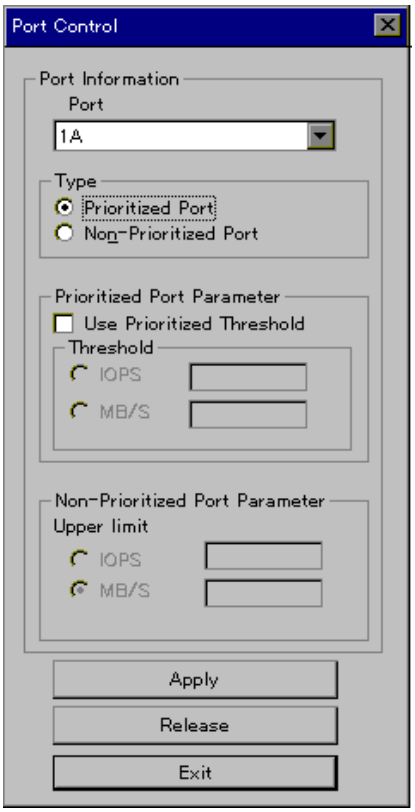

Figure 3.4 Port Control Panel

The Port Control panel has the following features:

- The **Port** selection drop-down box allows you to select either an individual port using the port name, or **All Prioritized Ports**. ***Note:*** Selecting **All Prioritized Ports** allows you to specify a threshold so that the 9900 subsystem will perform the threshold control of prioritized port according to the total data of all prioritized ports. It does *not* mean that you can specify the same threshold for all prioritized ports.
- The **Type** box allows you to select either **Prioritized Port** or **Non-Prioritized Port**. ***Note:*** If no type is specified, the default selection is **Prioritized Port**.
- The **Prioritized Port Parameter** box allows you to use the threshold control. Checking the **Use Prioritized Threshold** checkbox will allow you to set a value in the threshold box.
- The **Threshold** box has the following two radio buttons:

  - The **IOPS** radio button sets an upper limit on the number of I/O per second. If this button is selected, you can enter numbers from 0 to 65535 in the text box.
  - The **MB/S** radio button sets an upper limit on the number of megabytes per second. If this button is selected, you can enter numbers from 0 to 65535 in the text box. ***Note***: these numbers assume that 1 MB = 1,000 bytes.

- The **Non-Prioritized Port Parameter (Upper Limit)** box has the following two radio buttons:
  - The **IOPS** radio button sets an upper limit on the number of I/O per second. If this button is selected, you can enter numbers from 0 to 65535 in the text box.
  - The **MB/S** radio button sets an upper limit on the number of megabytes per second. If this button is selected, you can enter numbers from 0 to 65535 in the text box. ***Note***: these numbers assume that 1 MB = 1,000 bytes.
- The **Apply** button validates the values set on the Control (setting and reference) panel. If the values entered on the display are correct and no communication error occurs, a confirmation message displays (see Figure 3.5).
- The **Release** button resets all Prioritized Port Control functions and the thresholds on all prioritized ports (i.e., The **Use Prioritized Threshold** checkbox is unchecked). When the **Release** button is clicked, a confirmation message displays (see Figure 3.6). Select **Yes** to reset, or select **No** to cancel your request.
- The **Exit** button closes the Port Control panel, and returns you to the Port Performance panel.

Figure 3.5 Setting Confirmation Panel

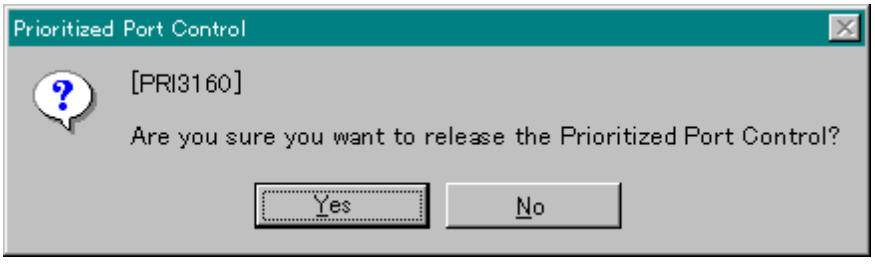

Figure 3.6 Warning Panel

Chapter 4 Using Prioritized Port Control

4.1 Using Prioritized Port Control

The recommended procedure for determining the optimum values for port control is as follows:

1. Collect a baseline of the performance data of the prioritized ports with only the production server operating.
2. Once you have your baseline performance data, set your initial upper limit control on the non-prioritized ports. The initial values should be conservative, because the effect of the development server on the production server is not known.
3. Run both the production and development server(s), then check your performance data. If you have more than one development server, add them one at a time and monitor the performance of the production server after each addition.
4. If the performance of the production server is not adversely affected, you can increase the upper limit of the non-prioritized port, using small increments.
5. Repeat these steps until you have determined the optimum upper limit and threshold controls. (See Figure 4.1.)

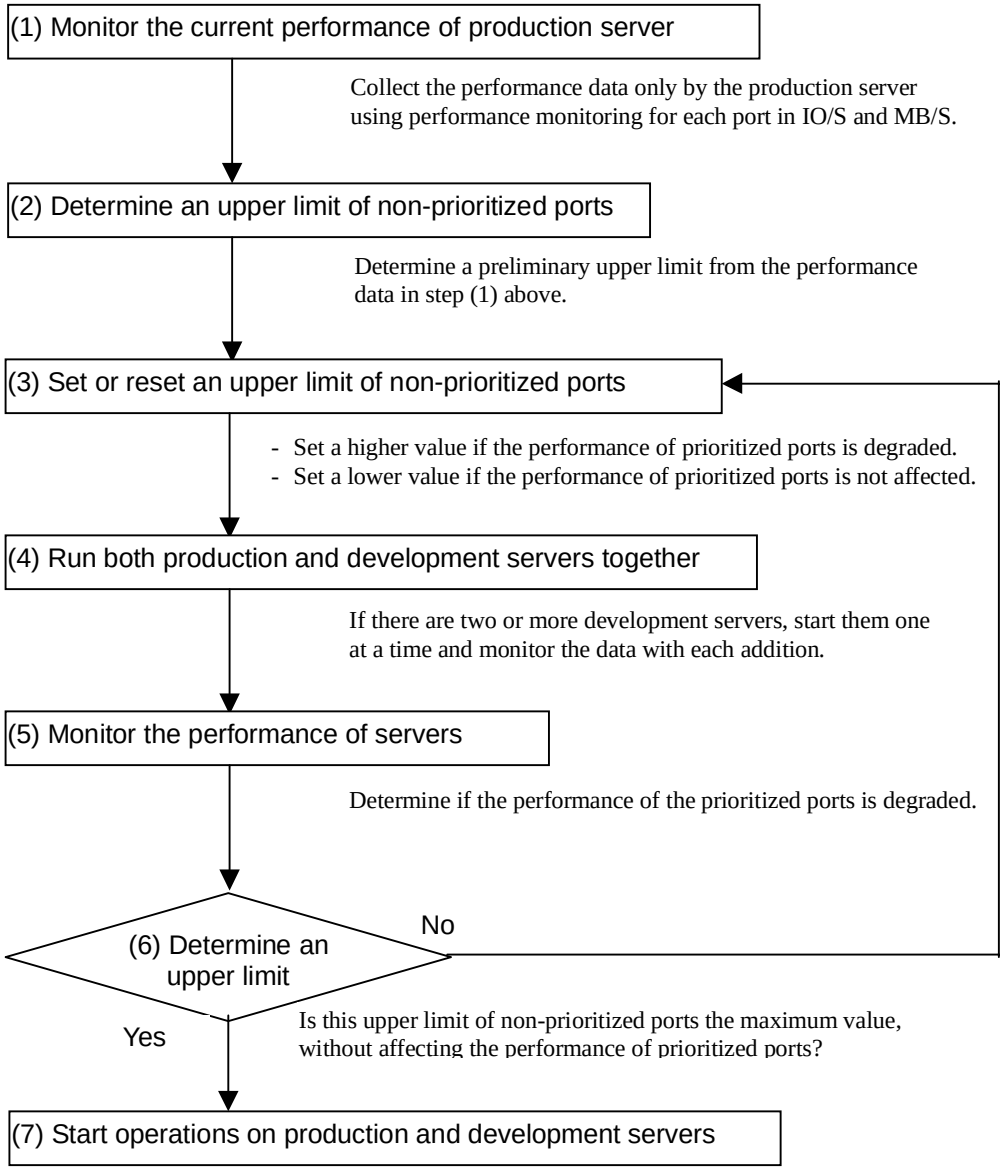

Figure 4.1 Flow Chart for Determining Port Control Values

4.2 Port Control

4.2.1 Upper Limit Control of Non-Prioritized Ports

The upper limit control places a maximum on the performance of the specified non-prioritized port(s). The upper limit control has the following features and restrictions:

- You can specify an upper limit on the performance of non-prioritized ports, using an absolute value of either MB/S (Megabytes per second) or IOPS (I/Os per second.).
- The 9900 subsystem processes the I/O commands up to the specified limit. ***Note:*** The 9900 subsystem applies controls as the target value is approached, but some control results may be above or below the upper limit, particularly if there is a change in either the configuration or the workload of the subsystem.
- Any port with a range that does not exceed the upper limit will have no restrictions.
- If the non-prioritized port has one or more alternate paths, each port must have an upper limit set.
- Upper limit control will be performed even if there are no prioritized ports.

4.2.2 Threshold Control of Prioritized Ports

If a threshold control is set for a prioritized port, the I/O of a non-prioritized port is allowed to exceed a previously specified upper limit control, so long as it does not exceed the threshold value. This function is useful if the workload of the production port is temporarily lowered, such as during nights and holidays. To implement a threshold control, determine whether the workload of the production server is high or low, and use this data to determine the threshold value. Threshold controls are optional, and will not be performed unless they are specifically set. You can specify the value of the threshold in either MB/S* or IOPS. ***Note:*** The MB value is calculated assuming that 1 MB = 1,000 bytes, rather than not 1,024 bytes.

You can specify a threshold value either as a total value for the 9900 subsystem or as a value for each prioritized port. If you specify a value for the entire subsystem, the upper limit control will be performed only if the total performance of all prioritized ports exceeds that value. If you specify a threshold value per port, the upper limit control will be performed if the threshold value of even one of those ports is exceeded. In either case, all previous port settings will be invalidated.

4.3 Performance Monitoring

4.3.1 Performance Data Types

To determine the upper limit of a non-prioritized port or the threshold of a prioritized port, assume the values to operate the system and monitor the activity. With monitoring you can collect the maximum, minimum, and average values for either a particular port, all prioritized ports, or all non-prioritized ports

4.3.2 Display function

The performance data is displayed on the Remote Console PC, as either total prioritized ports, total non-prioritized ports or individual ports (see Section 3.3 and Figure 3.3).

You can choose from the following time scales (the graphs are calculated in minutes, regardless of the scale chosen):

- Five minutes
- One hour
- One day
- One week.

You can choose to display the maximum, minimum and/or average value of the collected data. The screen displays the maximum, minimum or average value in minutes. The default is to display all three values. You can choose to display the data using either (in IOPS or MB/S). The default is to display the data in IOPS.

If you are displaying the data by port, you must refresh the screen because there are so many ports. The screen supports real time data display during operations for up to 32 ports (1A to 2R).

Chapter 5 Troubleshooting

5.1 Troubleshooting

The Hitachi Freedom Storage™ 9900 subsystem provides continuous data availability and is not expected to fail in any way that would interrupt access to user data. For troubleshooting information on the 9900 subsystem, please refer to the *Hitachi Freedom Storage™ 9900 User and Reference Guide* (MK-90RD008). For further information on the Hitachi Freedom 9900 Remote Console, please refer to the *Hitachi Freedom Storage™ 9900 Remote Console User's Guide* (MK-90RD003).

The user is responsible for the operation and normal maintenance of the Remote Console PC. Here are some guidelines for troubleshooting the Remote Console PC:

- **Check the cabling and the LAN.** Make sure that both the computer and LAN cabling are firmly attached, and that the LAN is operating properly.
- **Reboot the PC**. Close any programs that are not responding. If necessary, reboot the PC and restart the Remote Console program. (If possible, first close all open programs before rebooting.) ***WARNING:*** The R-SIMs reported by the 9900 subsystems cannot be logged on the Remote Console PC when the PC is powered off. Reconnect to the same disk controller(s) and verify the status of the data.
- **Check for any Error Codes.** Table 5.1 describes some general error conditions, along with the recommended resolution for each item. For a compete list of Remote Console error codes, see *Hitachi Freedom Storage™ Lightning 9900™ Remote Console Error Codes* MK-90RD029. If you are unable to resolve an error condition, please call the Hitachi Data Systems Technical Support Center (see section 5.2).

Table 5.1 Troubleshooting

Error Condition	Recommended Action
Error message displayed during RMCMAIN installation.	If the error message **Setup file error for Windows x.xx (ee = y)** appears, make sure the correct version of Windows is installed. If **ee = 2** is displayed, make sure the installation diskette is not write-protected and is properly inserted in the floppy disk drive. Restart the setup program. If the error message **File I/O Error** appears, make sure the installation diskette is not write-protected and is inserted in the floppy disk drive properly, and restart the setup program. If the error message **Resource Error (Err=xxxx)** or **Internal Error (Err=xxxx)** appears, reboot the Remote Console PC, and restart the setup program.
RMCMAIN will not add or connect with a subsystem.	Make sure that the S/N is correct. If not, delete the subsystem, and then add the subsystem again using the correct S/N. If RMCMAIN still cannot connect, check the settings on the Windows network control panel, and use PING to test the LAN connection (see section 2.4). If RMCMAIN still cannot connect, exit RMCMAIN, restart the PC, start RMCMAIN, and try again. If RMCMAIN still cannot connect, reinstall the RMCMAIN software. If the problem persists, call the Hitachi Data Systems Support Center.
The Remote Console PC experiences an error.	Exit RMCMAIN, close all other applications, and then restart the PC. If the problem persists, make sure the PC's operating system and LAN hardware and software are properly configured (see Chapter 2), and reinstall the RMCMAIN software. The user is responsible for maintaining the Remote Console PC.
Any problem with a 9900 subsystem.	Open the R-SIM panel, and sort the R-SIMs by name to view the R-SIMs by subsystem. If there are any serious- or acute-level R-SIMs, call the Hitachi Data Systems Support Center. Also refer to the *Hitachi Freedom 9900 Subsystem User Guide and Reference* (BO-98DD845) for troubleshooting information on the 9900.

5.2 Contacting the Hitachi Data Systems Technical Support Center

If you need to call the Hitachi Data Systems Technical Support Center, be sure to provide as much information about the problem as possible. Include the circumstances surrounding the error or failure, the exact content of any messages displayed on the Remote Console PC, and the severity levels and reference codes of the R-SIMs on the R-SIM panel.

The worldwide Hitachi Data Systems Technical Support Centers are:

- Hitachi Data Systems North America/Latin America
  San Diego, California, USA
  1-800-348-4357
- Hitachi Data Systems Europe
  Contact Hitachi Data Systems Local Support
- Hitachi Data Systems Asia Pacific
  North Ryde, Australia
  011-61-2-9325-3300

Appendix: Glossary, Acronyms, and Abbreviations

Cache extents	Areas used for FlashAccess (also known as Dynamic Cache Residency)
CU	control unit
Custom access	A feature that allows a non-administrator to be assigned update access to one or more of the restricted Remote Console functions.
CV	custom-sized volume, also called customized volume
CVS	custom volume size (also called Virtual LVI or Virtual LUN). This function divides a logical volume into two or more smaller volumes, called custom-sized volumes.
DASD	direct access storage device
DCR	dynamic cache residency (also called FlashAccess)
DKCMAIN	disk controller main
ESCON®	Enterprise System Connection
FD	floppy disk
FD Copy	floppy disk copy. This function downloads the 9900 Remote Console configuration information onto a floppy diskette or a hard disk drive, and is generally used for troubleshooting purposes.
FlashAccess	dynamic cache residency, or DCR.
GB	gigabyte(s)
HIHSM	Hitachi Internal Hierarchical Storage Manager
HMBR	Hitachi Multiplatform Backup/Restore
HMRCF	Hitachi Multi-RAID Coupling Feature (also called ShadowImage)
HODM	Hitachi Online Data Migration
HORC	Hitachi Remote Copy (open).
HOMRCF	Hitachi Open Multi-RAID Coupling Feature (also called ShadowImage)
HRC	Hitachi Remote Copy – Synchronous. This feature must be installed before you can install either HORC or HRCA.
HRCA	Hitachi Remote Copy - Asynchronous
kB	kilobyte(s)
LAN	local-area network
LBA	logical block address
LDEV	logical device
LU	logical unit
LUN	logical unit number
LUN Manager	remote console software option, also called Remote SCSI. This option must be installed before you can install either LUSE or LUN Security.
LUSE	Logical Unit Size Expansion
LVI	logical volume image (also called device emulation)
MB	megabyte(s)
MIB	message information block

Parity group	a set of hard disk drives that have the same capacity and are treated as one group. A parity group contains both user data and parity information, which allows the user data to be accessed in the event that one or more of the drives within the group are not available.
Remote SCSI	A Remote Console software option, also called LUN Manager
RMCMAIN	Remote console main software
R-SIM	remote service information message (generated by the 9900 when it detects an error or service requirement).
SCSI	small computer system interface
ShadowImage	Hitachi Multi-RAID Coupling Feature (HMRCF) and/or Hitachi Open Multi-RAID Coupling Feature (HOMRCF)
SIM	service information message (generated by a disk controller when it detects an error or service requirement).
SSID	storage subsystem ID. The 9900 is configured with one SSID for each 64 devices, and up to four SSIDs for each CU image.
SVP	service processor (PC component of the 9900)
TCP/IP	transmission control protocol/internet protocol
TID	target ID
Trap	An SNMP agent initiates trap operations when R-SIMs occur, in order to send the R-SIMs to the SNMP manager (see Figure 4.1). An SNMP agent can be configured to deliver traps to more than one SNMP manager.
UCB	unit control block
VLUN	Virtual LUN (also called custom volume size, CVS)
VLVI	Virtual LVI (also called custom volume size, CVS)
Volser	volume serial number (mainframe volume identifier, not related to the LDEV ID)
WWN	World Wide Name, which is a unique identifier for a particular open-system host, consisting of a 64-bit physical address (the IEEE 48-bit format with 12-bit extension and 4-bit prefix).
WWN Group	A WWN group gives every host in the specified WWN group access to a specified LU or group of LUs. This is part of the LUN Security feature.

Index

U

W