

# Windows Server® 2008 R2 and Windows Server® 2008 SP2 on HP Integrity Servers Hardware Administrator's Guide

HP Part Number: 5992-5631  
Published: September 2009  
Edition: 2



© Copyright 2009 Hewlett-Packard Development Company, L.P.

### **Legal Notices**

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein

Microsoft and Windows Server are trademarks of the Microsoft group of companies. Intel and Itanium are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Printed in the US

### **EFI Application Toolkit License**

Copyright © 1998-2007 Intel Corporation Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. THIS SOFTWARE IS PROVIDED "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL INTEL BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. THE EFI SPECIFICATION AND ALL OTHER INFORMATION ON THIS WEB SITE ARE PROVIDED "AS IS" WITH NO WARRANTIES, AND ARE SUBJECT TO CHANGE WITHOUT NOTICE. You may not reverse-assemble, reverse-compile, or otherwise reverse-engineer any software provided solely in binary form. The foregoing license terms may be superseded or supplemented by additional specific license terms found in the file headers of files in the EFI Application Toolkit.

---

# Table of Contents

About This Document.....	5
Intended Audience.....	5
Document Organization.....	5
Typographic Conventions.....	5
Related Information.....	5
HP Encourages Your Comments.....	5
1 Performing Hot-Plug Operations.....	7
Before you begin.....	7
Adding a PCI card.....	8
Hardware interface for all HP Integrity servers.....	8
Software interface.....	9
Removing a PCI card.....	9
Software interface for all HP Integrity servers except Superdome.....	9
Software interface for Superdome servers.....	9
Hardware interface for all HP Integrity servers.....	9
Identifying Hardware Location String.....	10
2 Management Processor.....	11
Accessing the MP.....	11
MP Commands.....	11
3 Special Administration Console.....	17
SAC Channel Management Commands.....	19

---

# List of Tables

1-1	PCI cards that do not support hot-plug addition.....	8
3-1	Channel Management commands.....	19

---

# About This Document

This document describes the tasks and interfaces that you can perform after you install Windows Solution 6.5 on your Integrity server.

## Intended Audience

This document is for anyone who administers HP Integrity servers running the Windows Server operating system.

## Document Organization

This document is organized as follows:

Chapter 1 (page 7)	Describes adding and removing PCI cards on HP Integrity servers.
Chapter 2 (page 11)	Describes the Management Processor (MP) tasks and commands.
Chapter 3 (page 17)	Describes the Special Administration Console (SAC), how to connect to it, and its commands.

## Typographic Conventions

This document uses the following typographical conventions:

Command	A command name or qualified command phrase.
Computer output	Text displayed by the computer.
<b>Ctrl+x</b>	A key sequence. A sequence such as <b>Ctrl+x</b> indicates that you must hold down the key labeled <b>Ctrl</b> while you press another key or mouse button.
<b>Key</b>	The name of a keyboard key. <b>Return</b> and <b>Enter</b> both refer to the same key.
<b>User input</b>	Commands and other text that you type.
<i>Variable</i>	The name of a placeholder in a command, function, or other syntax display that you replace with an actual value.
IMPORTANT	This alert provides essential information to explain a concept or to complete a task
NOTE	A note contains additional information to emphasize or supplement important points of the main text.

## Related Information

For additional information on HP Integrity servers with Microsoft Server Windows 2008 and Windows Server 2008 R2, see the following website:

<http://www.hp.com/support/itaniumservers>

For documentation that supports the Windows Server on Integrity solutions, see the following website:

<http://docs.hp.com>

## HP Encourages Your Comments

HP encourages your comments concerning this document. We are committed to providing documentation that meets your needs. Send any errors found, suggestions for improvement, or compliments to:

[feedback@fc.hp.com](mailto:feedback@fc.hp.com)

Include the document title, manufacturing part number, and any comment, error found, or suggestion for improvement you have concerning this document.

---

# 1 Performing Hot-Plug Operations

This chapter describes adding and removing PCI cards on HP Integrity servers. Adding a card to your system is called a hot-plug addition. Removing a card is called a hot-plug deletion.



---

**IMPORTANT:** HP Integrity rx2660, BL860c, and BL870c servers do not support PCI card hot-plug addition or deletion.

---

## Before you begin

Review the following terms before beginning hot-plug operations:

<b>Attention button</b>	Use the attention button to initiate hot-plug operations. The location of the attention button varies, depending on the server. For example, HP Integrity rx7640 and rx8640 servers have a white bell-shaped image button, located at the top rear of the PCI slot. To access, remove the button cover. HP Integrity rx6600, BL860c, and BL870c servers have a maroon-colored button on the top of the PCI slot separator, just below the manual retention latch (MRL). HP Integrity Superdome sx2000 servers have attention buttons.
<b>MRL latch</b>	The MRL sensor is activated by the manual retention latch (MRL). When the MRL is open, the power is turned off to the slot to prevent electrical damage to the card and the system. HP Integrity rx7640 and rx8640 servers have a blue lever at the top rear of the PCI slot. HP Integrity rx3600 and rx6600 servers have a black latch on top of the PCI slot that you must press down then pull upward to activate. HP Integrity Superdome sx2000 servers have MRLs.
<b>Online replacement</b>	Windows does not natively support I/O card online replacement. Such an action requires two steps: first, hot-plug deletion, and then hot-plug addition. Therefore, some applications might notice the loss of an adapter.
<b>Power indicator</b>	The green power indicator LED is located at the top of the slot separator on all HP Integrity servers. When this indicator is on (or flashing), the slot is powered and must not be disturbed. When the indicator is off, you can safely add a PCI card to and remove it from the slot.



---

**TIP:** If you perform hot-plug additions or deletions on the HP Integrity server and you do not achieve the expected results, verify installation of the driver.

---

To verify driver installation on HP Integrity mid-range or high-end servers, follow these steps:

1. Launch the Windows Device Manager and expand the system devices. Right-click **HPCSR OpRegion Driver**. Then click **Properties** and go to the **Driver** tab. The driver is named `hpcsr2.sys`, Version 1.1.0.0, dated 6/13/03. If it is not, you must update the driver.
2. Open the Online Reference page on the desktop.
3. Click **OEM Drivers**.
4. In the Description column, click **HP (Hotplug) Region Driver**. This starts the hot-plug driver update.
5. Click **Yes** to install the driver.

When you activate a PCI slot that is already powered on, its solid orange attention LED light turns on, indicating an error. Also, if you try to activate a slot that is not occupied, it flashes the attention LED to identify that slot. This is expected behavior, and not an error. When the PCI slot is powered off, the power LED for that slot is off, and the attention LED is either off or blinking.



**NOTE:** You cannot perform a hot-plug addition for some cards unless they replace the same type card in the slot. You cannot hot-add them in a new installation. Although no damage to the server occurs if you attempt a hot-plug addition with these cards, they do not function until the next reboot. Table 1-1 lists the PCI cards that do not support hot-plug addition.

**Table 1-1 PCI cards that do not support hot-plug addition**

Hot-Plug Operation Supported	PCI CARD				
		SA6402	SA6404	SA5300	USB and VGA Graphics Combo Cards (A6869A, A6869B, and AD307A)
Hot-plug addition (replace)	Yes	Yes	Yes	No	No
Hot-plug addition (new)	No	No	No	No	No

In addition, rx3600 and rx6600 PCI Express-based Integrity servers have the following limitations in hot-plug functionality:

- Hot-plug operations on PCI Express slots 3 and 4 are currently disabled.
- Regarding hot-plug operations on PCI-X slots 7, 8, 9, and 10: Doorbell functionality can be intermittent. You must press the attention button until the power indicator LED is either on (not blinking) or off.

## Adding a PCI card

This section describes how to add a PCI card (called a hot-plug addition) on HP Integrity servers running Windows Server 2008 aand Windows Server 2008 R2.

Before performing hot-plug additions or deletions to HP Integrity servers, ensure the following:

- On HP Integrity rx7640, rx8640, and Superdome servers, you must install the latest version of the OpRegion driver.
- Ensure that the server has the latest version of the system firmware installed.

## Hardware interface for all HP Integrity servers

To perform hot-plug additions using the server hardware interface for all HP Integrity servers, follow these steps:

1. Locate an empty slot.
2. If the power light is on for the slot, press the attention button to start the power-off sequence. (If the power light is not on, do not press the attention button.) The power LED blinks for 5 seconds. While the power LED is flashing, you can cancel the power-off sequence by pressing the attention button again.



**NOTE:** HP Integrity rx7640 and rx8640 servers have a white bell-shaped image button located at the top rear of the PCI slot. To access, remove the button cover. HP Integrity rx3600 and rx6600 servers have a maroon-colored button on the top of the PCI slot separator, just below the manual retention latch (MRL). HP Integrity Superdome servers do not have attention buttons.

3. Wait for the slot to power off (green power LED turns off).
4. Open the MRL.
5. Add the PCI card to the slot.
6. Close the MRL.

7. Press the attention button of the slot. The power LED again blinks for 5 seconds. While the power LED is blinking, you can abort the request by pressing the attention button. Windows loads and starts the drivers for all functions of the device or prompts you to install the drivers for the new card. The system then begins using the device normally.
8. Verify the device is installed by using the Windows Device Manager. If the device is not present, the addition failed.

## Software interface

A software interface is not supported because Windows does not have a native interface for HP hot-plug additions. The Microsoft Add Hardware Wizard and Scan for hardware changes features are not sufficient to power and enable these cards.

## Removing a PCI card

This section describes how to remove a PCI card (called a hot-plug deletion) on HP Integrity servers running Windows Server 2008 and Windows Server 2008 R2.



---

**NOTE:** The Windows software interface is the preferred method for hot-plug deletions. Use this method instead of the hardware interface.

---

## Software interface for all HP Integrity servers except Superdome

To perform hot-plug deletions using the server software interface for all HP Integrity servers except Superdome, follow these steps:

1. Request that Windows remove the hardware by clicking the **Safely Remove Hardware** launch icon in the bottom right corner of the screen. Windows notifies you when it is safe to remove the card.



---

**NOTE:** If you remove the card before notification from Windows that it is safe to do so, a machine check abort (MCA) occurs.

---

2. Open the manual retention latch (MRL).
3. Remove the card.
4. Close the MRL.

## Software interface for Superdome servers

To perform hot-plug deletions using the Superdome software interface, follow these steps:

1. Request that Windows remove the hardware by clicking the **Safely Remove Hardware** launch icon in the bottom right corner of the screen. Windows notifies you when it is safe to remove the card.



---

**NOTE:** If you remove the card before notification from Windows that it is safe to do so, a machine check abort (MCA) occurs.

---

2. Remove the card.

## Hardware interface for all HP Integrity servers

To perform hot-plug deletions using the server hardware interface for all HP Integrity servers, follow these steps:

1. Locate the slot of PCI card to delete.
2. Press the attention button for the slot. The power LED begins flashing. During the 5 seconds that the power LED is flashing, you can abort the request by pressing the attention button. When the green LED stops blinking and is off, it is safe to remove the card.



**NOTE:** Do not open the manual retention latch (MRL) before the LED stops blinking. A fatal machine check alert (MCA) error can occur.

---

3. Open the MRL.
4. Remove the card.
5. Close the MRL.

## Identifying Hardware Location String

The Windows Device Manager reports the hardware location in the following format:

`CBHSS = value`

where *value* is a numeric string that starting from the left indicates the cabinet number, bay number, chassis number, and two-digit slot number. For example, CBHSS = 81107 indicates cabinet 8, bay 1, chassis 1, and slot 07.



**NOTE:** The Windows OS does not show leading 0s. For example, if CBHSS = 1107 is displayed, it denotes cabinet 0, bay 1, chassis 1, and slot 7.

---

---

## 2 Management Processor

This section describes the management processor (MP). The MP provides access to both the SAC console and EFI Shell, and enables you to configure a machine before installing the operating system and access the MP using the IP address specific to the MP.

The MP does the following:

- Controls power, reset, and Transfer of Control (TOC) capabilities
- Provides console access and displays
- Records system events
- Displays detailed information about the internal subsystems

The MP also provides a Virtual Front Panel you can use to monitor system status and the state of front panel LEDs. All MP functions are available through the LAN and the local and remote RS-232 ports.

From the MP Main Menu, you can select from the following options:

- Enter management processor command mode
- Enter console
- View event logs
- View console history
- Display Virtual Front Panel
- Enter console session
- Connect to another MP

### Accessing the MP

To access the MP, you must know its unique IP address. Enter the IP address for the MP in a terminal emulator such as PuTTY.

Connect to the MP using any of the following methods:

- The local RS-232C port using a local terminal
- The remote RS-232C port using external modem (dial-up) access if remote modem access is configured
- The MP LAN port using the Web Console or telnet if login access through the MP LAN is enabled

### MP Commands

The following commands are available through the MP:

BP	Resets BMC passwords. This command resets BMC passwords (both user and administrator passwords).
CA	Configures local and remote serial port parameters. The local serial port parameters settings are as follows:
TERMINAL TYPE	Vt100 or HPterm.
BAUD RATES	Input and output data rates are the same — 300, 1200, 2400, 4800, 9600, 38400, 115200 bps.
FLOW CONTROL	Hardware uses RTS/CTS; software uses Xon/Xoff.
TRANSMIT CONFIGURATION STRINGS	Disable this setting when using a modem that is not compatible with the supported modem (MT5634ZBA).



---

**IMPORTANT:** Do not mix HP and VT100 terminal types.

---

The remote serial port parameters are as follows:

MODEM PROTOCOL	Bell or CCITT. CCITT is a European standard; RTS/CTS signaling is used as well as the Ring signal. Bell is a U.S. or simple mode.
BAUD RATES	Input and output data rates are the same — 300, 1200, 2400, 4800, 9600, 38400, 115200 bps.
FLOW CONTROL	Hardware uses RTS/CTS; software uses Xon/Xoff.
TRANSMIT CONFIGURATION STRINGS	Disable this setting when using a modem that is not compatible with the supported modem (MT5634ZBA).
MODEM PRESENCE	When the modem is not always connected, set this parameter to not always connected.

- CG Generates an RSA key pair or Self-Signed Certificate. This command generates a new RSA key pair and self-signed certificate.
- CL Console Log. View the history of the console output. This command displays up to 60 KB of logged console data (about 60 pages of display in text mode) sent from the system to the console path.
- CM Command Mode. Enter command mode. This command switches the console terminal from the MP Main Menu to mirrored command interface mode. If the current mux authority is administrator and the new login is as an operator, the command mux is denied (remains in MP Main Menu mode). If a command is in progress, a message is displayed warning the new user of system status.
- CO Console. Leave command mode and enter console mode. This command switches the console terminal from the MP Main Menu to mirrored (redirected) console mode. All mirrored data is displayed. Press **CTRL+B** to return to the MP command interface. For VT100 and HPTERM, verify that the MP setting in the CO command is correct and that all mirrored consoles are of the same terminal type for proper operation.
- CSP Connects to a remote MP over the LAN. This command enables the local or remote port user to connect over the MP LAN to another MP on the network. The user who launches the command is given a private connection to the other MP over the LAN. To return to the original MP, press **CTRL+J** to disconnect the CSP session.
- DATE Displays the current date, as generated in the MP real-time clock.
- DC Default Configuration. Resets all MP parameters to the default configuration. This command sets all MP parameters back to their default values. You can reset all or a subset of the following parameters:
- IP configurations
  - Modem configuration
  - Paging configuration
  - Command interface configuration
  - Disable remote access, security configuration
  - Session configuration, for example, setting the security configuration to default erases all users and passwords

You can reset passwords in the MP in one of the following ways:

- Using the SO command, change individual users.
- Using the DC command, select **Reset Security Configuration**.
- Reset forgotten passwords by pressing the MP reset button on the back panel of the HP server. After the MP reboots, the local console terminal displays a message for 5 seconds. Responding to this message in time allows a local user to reset the password.




---

**NOTE:** All user information (for example, logins and passwords) is erased in methods 2 and 3.

---

- DF Displays FRUID information. This command displays FRUID information from the BMC for FRU devices. Information provided includes serial number, part number, model designation, name and version number, and manufacturer.
- DI Disconnects remote/modem or LAN/WEB console. This command disconnects (hangs up) the remote/modem or LAN/WEB users from the MP. It does not disable the ports. The remote console is no longer mirrored.
- FW Activates MP firmware upgrade mode. This command is available from either the LAN or a local serial port. This command activates firmware upgrade mode, which loads new firmware through the MP LAN by FTP (which must be operational). An MP reset is generated after the upgrade is complete.
- HE Displays help for menu or command. This command displays the MP hardware and firmware version identity, and the date and time of firmware generation. If executed from the MP Main Menu, this command displays general information about the MP and those commands displayed in the MP Main Menu. If executed in command mode, this command displays a list of command interface commands available to you. It also displays detailed help information in response to a topic or command at the help prompt.
- ID Displays and modifies the following system information:
- SNMP contact information
  - SNMP server information
  - SPU host name
- IT Inactivity Timeout settings. The maximum session inactivity timeout is 1,440 minutes. The default is 60 minutes. This timeout prevents sessions from being inadvertently left open. You can start a session with the SE command. An open session can prevent users from logging into the MP through a port and can also prevent system applications from initiating an outbound connection.
- The maximum MP inactivity timeout is 1,440 minutes. The default is 5 minutes. This timeout prevents a user from inadvertently keeping the MP locked in an MP command interface mode, and preventing other users from looking at the console output. You cannot deactivate the MP command interface inactivity timeout
- The flow control timeout is 0 to 60 minutes. If set to 0, no timeout is applied. This timeout prevents mirrored flow control from blocking other ports when inactive.
- LC LAN configuration (IP address and so on). This command displays and allows modification of the following LAN configuration parameters:
- MP IP address
  - MP host name
  - Subnet mask
  - Gateway address

- Web console port number
- Link state

The MP host name set in this command is displayed at the MP command interface prompt. Typically, you enter the DNS name for the LAN IP. You can program this field to any useful name or phrase. For clarity, it is useful to enter MP-on-SYSTEM as the MP host name, so both names show up in the prompt (limit 19 characters, no spaces allowed.) Use this command to also set the web access port number.

LA	LAN Status. This command displays all parameters and the current status of the MP LAN connections. The LAN parameters are not modified by the execution of this command.
LOC	Locator LED Status. This command displays the current status of the locator LED.
MA	Returns to the MP Main Menu. This command makes the MP return to the non-mirrored MP Main Menu. This is the same as entering <b>CTRL+B</b> .
MR	Modem Reset. This command makes the MP send an AT Z command to the modem, which resets it. Any modem connections are lost. You can view the initialization results using the MS command.
MS	Modem Status. Displays modem status. The MS command displays the state of the modem lines connected to the remote/modem serial port. Update the display by pressing <b>Enter</b> . This command displays the current state of the DCD, CTS, DSR, and RI status signals and the last state of the DTR and RTS control signals set by the firmware.
PC	Power Control. Turns system power on and off. For proper system shut down, shut down the operating system before issuing this command or use the graceful shutdown option. Use this command to switch the system power on or off. You can have the action take place immediately or after a specified delay.
PG	Paging parameter setup. Configures pagers. Use this command to configure the pagers and set triggering events. A string description of the triggering event is sent with the page.
PS	Power status. Displays the status of the power management module. This command displays on the console the status of the power management module.
RB	Resets BMC. This command resets the BMC by toggling a GPIO pin.
RS	Resets system through RST signal




---

**IMPORTANT:** Under normal operation, shut down the operating system before issuing the RS command.

---

This command causes the system (except the MP) to be reset through the RST signal. Execution of this command irrecoverably halts all system processing and I/O activity and restarts the computer system. The effect of this command is similar to cycling the system power. For example, the operating system is not notified and no dump is taken on the way down.

SA	Sets access options. Configures access for LAN and remote/modem ports. This command disconnects modem, LAN, and web users if access is disabled.
SE	Logs in to the system on local or remote port.  This command is valid only from the local or remote/modem port. Use this command to leave the MP command interface and enter a system session. Other mirrored MP users are placed in console mode. The session user returns to the mirrored MP session on exit. The MP regularly checks the activity of the session, closes the connection with the system, and, if the timeout period has elapsed, returns the port to mirroring. Set the timeout period with the IT command. The modem type (CCITT or Bell) must

agree with the remote port settings for the remote session port and always be Bell mode for the local session port.

If the system and the MP command interface local or remote ports are configured with different port speeds, the baud rate changes to the rate specified by the operating system for the duration of the session.

SL	Displays the contents of the following event logs that are stored in nonvolatile memory:	
	System Event Log (SEL)	Events (filtered by alert level) and errors
	Forward progress	All events
	Current boot log	All events between start of boot and boot complete
	Previous boot log	The events from the previous boot

Reading the system event log turns off the system LED. Accessing this log is the only way to turn off the system LED when it is flashing and alerts have not been acknowledged at the alert display level.

Events are encoded data that provide system information to you. Some well-known names for similar data would be chassis codes or post codes. Events are produced by intelligent hardware modules, the operating system, and system firmware. Use the SL command to view the event log.

Navigate within the logs as follows:

<b>+</b>	View the next block (forward in time)
<b>-</b>	View the previous block (backward in time)
<b>Enter</b> (<CR>)	View the next block in the previously selected direction (forward or backward in time)
<b>D</b>	Dump the entire log for capture or analysis
<b>F</b>	First entry
<b>L</b>	Last entry
<b>J</b>	Jump to entry number
<b>V</b>	View mode configuration (text, keyword, hex)
<b>?</b>	Display the help menu
<b>Q</b>	Quit

SMCLP Server Management Command Line Protocol (rx2660, rx3600, rx6600, BL860c, and BL870c only). This command switches the console terminal from the MP Main Menu to the Server Management Command Line Protocol (SMASH) SM CLP interface.

CLP offers the following features:

- A user-friendly method to view and manage server information
- An addition to the existing MP command-line interface (CLI)
- Availability from any text user interface (serial, telnet, and SSH)
- Creates CLP sessions that are independent from each other and are not mirrored
- Provides a subset of MP CLI commands
- Provides access to the MP Main Menu interface and the system console interface

For detailed information about SMASH CLP use, see:

<http://docs.hp.com/en/5971-4292/ch11.html>

SO	<p>Configures security options and access control (for example, users and passwords). This command modifies the security parameters of the MP, which include login timeouts and allowed password faults.</p> <p>If configured, when you access the MP through the modem port, the MP hangs up and dials you back. This does not work if Modem Presence is set to not always connected with the CA command. If the mode is single, the state is changed to disabled after the first login. A user whose login is disabled is not accepted.</p>
SS	Displays the status of the system processors and identifies the monarch processor.
SYSREV	Displays the revision status of firmware in the system.
TC	<p>System resets through INIT or Transfer of Control (TOC) signal. Shut down the operating system before issuing this command.</p> <p>This command causes the system to be reset through the INIT or TOC signal. Execution of this command irrecoverably halts all system processing and I/O activity and restarts the computer system. It is different from the RS command in that the processors are signaled to dump state on the way down.</p>
TE	Tell. Sends a message to other terminals. You can enter up to 80 characters. The message is broadcast to the other mirrored clients. Users in a session or CSP are not shown the message.
UC	User Configuration. Controls user access. Use this command to add, modify, re-enable, or delete user logins. You can also enable or disable security warnings and change passwords.
VFP	Displays Virtual Front Panel. The VFP command presents a summary of the system by using direct console addressing. If the terminal is not recognized by the MP, VFP mode is rejected. Each individual user gets this summary to avoid issues related to terminal type and screen display mode.
WHO	<p>Displays a list of MP connected users. This command displays the login name and operating mode (Main Menu, command, and so on) of the connected console client users, and the port on which they are connected. For the LAN and WEB console clients, the command also displays the remote IP address.</p> <p>If the local console client user did not originate the MP command interface session, there is always one default user listed for the local serial port: local user i. If the local console operator enters <b>CTRL+B</b>, the login name that the local operator used displays instead.</p>
X	Exits MP command interface and disconnect from the system. This command disconnects the executing user from the system. This command is available from the local port.
XD	<p>Diagnostics or Reset of MP. Use this command to perform some simple checks to confirm the health and connectivity status of the MP. The following tests are available:</p> <ul style="list-style-type: none"> <li>• MP Parameter Checksum</li> <li>• Verify I2C connection (get BMC Device ID)</li> <li>• LAN connectivity test using ping</li> <li>• Modem self-tests</li> </ul> <p>Also, you can reset the MP safely using this command, without affecting the operation of the server.</p>

---

## 3 Special Administration Console

Special Administration Console (SAC) is the primary Emergency Management Services (EMS) command-line environment hosted by Windows Server 2008 and Windows Server 2008 R2. It is separate from the command-line environment and provides different functionality.

SAC runs on top of the EMS. The SAC prompt provides a basic set of commands to manage the setup, installation, and repair of the operating system. Use these commands to examine logs, shut down or reboot, kill processes, change process priority, and set network parameters. Access the SAC prompt through the Integrity iLo console menu.

The connection for the SAC is directly into the kernel and is not dependent on the health of any user code or of any device driver. This means you have more tools available to repair an unhealthy system that might be unresponsive from the GUI. This direct-to-kernel path is similar to the kernel debugger and is always available.

From the SAC prompt, you can create and use a standard Windows command line. During setup, the SAC also automatically starts three setup channels so you can monitor installation progress. A subset of commands is available for use when the system is in distress. This is known as the !SAC prompt. This change from SAC to !SAC mode is automatic.

The SAC and !SAC prompts are primarily used for setup or to bring a distressed system back to health so that you can use in-band tools such as Remote Desktop.

Because SAC is available early in the boot process, you can use it to manage the server during normal system operation and initiation. You can also use it when the system is in safe mode and during GUI-mode setup. When EMS is enabled, SAC remains active as long as the kernel is running. Access SAC through the MP.

When a server is running normally, you can connect to it over the network and administer it using the following tools:

Windows Management Instrumentation (WMI)	A management infrastructure in Windows that supports monitoring and controlling system resources through a common set of interfaces. WMI provides a logically organized, consistent model of Windows operation, configuration, and status.
Terminal Services Remote Desktop for Administration	The underlying technology that enables Remote Desktop, Remote Assistance, and Terminal Server.
Microsoft Management Console (MMC)	A framework for hosting administrative tools called snap-ins. A console can contain tools, folders or other containers, World Wide Web pages, and other administrative items.
Telnet	A protocol that enables Internet users to log in to and enter commands on a headless computer linked to the Internet, as if you were using a text-based terminal directly attached to that computer. Telnet is part of the TCP/IP suite of protocols. The term telnet also refers to the software (client or server component) that implements this protocol.

In addition, you can also use Microsoft Script Host and other third-party tools.

When a server is not functioning normally, you need to access the server without relying on the network. You must establish a secure connection through a phone line or serial port, or through an additional network connection (possibly on a secondary network).

For servers equipped with the proper firmware, EMS provides functionality that you can use to administer a server using a headless console. Except for hardware maintenance and replacement, all administrative functions that you can accomplish using the GUI console are also available

using the headless console. This includes starting the system and performing system-recovery tasks.

EMS consists of components that are standard features of Windows Server 2008 and Windows Server 2008 R2, and to which console redirection functionality has been added. EMS also includes the Special Administration Console (SAC), which is unique to it. You access this console from a headless system using terminal emulation software such as telnet and PuTTY.

When SAC is active, it displays the SAC prompt (`SAC>`). SAC provides the following commands you can use to perform a number of management tasks that help return the system to a normally functioning state:

<code>ch</code>	Lists all channels.
<code>cmd</code>	Creates Windows command-prompt channels. To use a command-prompt channel, you must provide valid login credentials. You must log in to each command-prompt instance. Press <b>ESC+TAB</b> to switch back and forth between the command prompt channels and SAC. If a command prompt channel becomes unresponsive, use the <code>K</code> (end) command to close it. You can then open another command-prompt channel.
<code>crashdump</code>	Manually generates a stop error message and forces a memory dump file to be created. A stop error is a serious error that affects the operating system and that could place data at risk. The operating system generates an obvious message, a screen with the stop error, rather than continuing on and possibly corrupting data. Also called a fatal system error.
<code>D</code>	Dumps the kernel log.
<code>F</code>	Switches between showing processes only or processes and threads in output from the <code>t-list</code> command.
<code>I</code>	Sets or views the IP address of the server. If no parameters are passed, this command lists IP information. You can display or set the IP address, subnet mask, and gateway of a given network interface device by providing the network number, IP address, and subnet information. To do so, use the following format:  <i>I network# IPaddress subnet</i>
<code>KPID</code>	Ends the given process. <i>PID</i> is the process identification number you specify.
<code>LPID</code>	Lowers the priority of a process (and any associated child processes) to the lowest possible level.
<code>lock</code>	Restricts access to EMS command-prompt channels.
<code>MPID MB-allow</code>	Limits the memory usage of a process (and any associated child processes) to a specified number of megabytes. <i>MB</i> is the number of megabytes you specify.
<code>P</code>	Switches paging on and off for the <code>t</code> command output.
<code>RPID</code>	Raises the priority of a process and associated child processes.
<code>reg_add</code>	Allows registry edits from the SAC.
<code>restart</code>	Restarts the server.
<code>shutdown</code>	Shuts down the server. Do not use this command unless you can be physically present at the computer when you are ready to restart it.
<code>T</code>	Lists the processes and threads that are currently running.



**TIP:** To list all available SAC commands, enter `?` or `help` at the SAC prompt.

To list the subset of SAC commands available for managing command channels, enter: `SAC> ch -?`

SAC also provides access to the setup logs during GUI-mode setup. Press **ESC+TAB** to switch between the setup logs and SAC. When accessing the setup logs from EMS, you can see which portions have completed and whether any errors have occurred. This is a useful way to check the progress of your setup and to diagnose setup failures.

The setup log channels are as follows:

`setuplog.txt` Monitors setup progress.

`setupact.log` Displays any warnings during setup.

`setuperr.log` Displays any errors that might occur during setup.

## SAC Channel Management Commands

Table 3-1 lists the channel management commands.

**Table 3-1 Channel Management commands**

Command	Function
<code>ch</code>	Lists all channels.
<code>ch -si n</code>	Changes to the channel with the number, <i>n</i> , which you specify.
<code>ch -sn name</code>	Changes to the channel with the name you specify.
<code>ch -ci n</code>	Closes the channel with the number, <i>n</i> , which you specify.
<code>ch -cn name</code>	Closes the channel with the name you specify.
<b>Esc + Tab</b>	Switches channels.
<b>Esc + Tab + 0</b>	Returns to the SAC channel.
<code>ch -?</code>	Displays the channel-management commands Help.