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Hitachi Data Systems

MK-99CB2500003-27

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Preface

This document describes how to use the Compute Blade 2500 series.

This preface includes the following information:

Notice: The use of Compute Blade 2500 series and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

- ☐ Safety Information
- ☐ Intended Audience
- ☐ Product Version
- ☐ Release Notes
- ☐ Document Organization
- ☐ Referenced Documents
- ☐ Document Conventions
- ☐ Conventions for storage capacity values
- ☐ Getting help
- ☐ Comments

Safety Information

Safety precautions

When giving safety precautions, this manual uses the headings below. The headings below consist of a safety alert symbol and one of the following heading labels: WARNING, CAUTION, or NOTICE.

This is a safety warning symbol. This draws attention to risks (hidden dangers) to human safety. To avoid injury or death, follow the instructions in the message concerning safety that appears after this symbol.

WARNING

This indicates a risk of death or severe injury.

CAUTION

This indicates a risk of relatively mild or moderate injury.

NOTICE

This indicates a risk of severe damage to the equipment or damage to surrounding property.

Example label 1: Electric Shock Hazard

Icons represented by △ indicate that you need to take care. A graphic that indicates why you need to take care, such as Electric Shock Hazard, is placed inside △.

Example label 2: Disassembly Prohibited

Icons represented by ⃠ indicate prohibited actions. A graphic that indicates the prohibited action, such as Disassembly Prohibited, is placed inside ⃠. Note that if there is no graphic inside ⃠, the icon indicates a general prohibition.

Example label 3: Unplug Power Cable

Icons represented by ● indicate required actions. A graphic that indicates the required action, such as Unplug Power Cable, is placed inside ●. Note that ● indicates a general, required action.

Common precautions concerning safety

Please carefully read through, and fully understand, the following safety instructions:

- When operating the equipment, follow the instructions and procedures in the manual.
- Always follow the notes, cautionary statements, and advice indicated on this product or in the manual.
- When installing options on this product or connecting options to this product, always check the manuals for those options and follow the instructions in those manuals.

Failing to do so might result in injury, fire, or damage to the equipment or other property.

About operations and actions

Do not perform operations or actions that are not described in the manual.

If there is a problem regarding this product, turn off the power, unplug the power cable, and then contact your retailer or maintenance personnel.

The need for each individual to pay attention and take care

The notes, cautionary statements, and advice indicated on this product or in the manual were considered carefully. However, unexpected accidents or incidents might occur. When performing operations, in addition to following the instructions, you need to personally pay attention and take care.

General safety precautions

When handling this product, always follow the precautions below.

Handling power cables

Always use the power cables shipped with the equipment, and follow the instructions below. Inappropriate handling can damage the power cables and expose copper wires. Such damage can cause short circuiting, partial disconnection, and overheating, which in turn can cause electric shocks and fire.

- Do not place any object on the power cables.
- Do not place power cables near devices that become hot.
- Do not heat the power cables.
- Do not collect power cables into bundles.
- Do not continuously subject the power cables to ultraviolet or strong visible light.
- Do not use damaged power cables.
- Do not use the power cables in a high-temperature environment.

- Do not use the power cables above their specified rating.
- Do not use the power cables for other devices.
- Do not touch a power plug with wet hands.

Do not place any objects around the electrical outlets if the objects might prevent users from quickly unplugging a power cable.

Poor contact and arc tracking

Comply with the following instructions when handling a power plug. Otherwise, arc tracking or poor contact might cause overheating and fire.

- Make sure that the power plug is fully and securely inserted into the electrical outlet.
- Before inserting the power plug, make sure that there is no dust or water on the plug.

  If any dust or water is found, wipe it off with a dry cloth, and then insert the plug.

Handling for power outlets

- Use a grounded 2-pin plug-in power outlet. Outlets of any other type might cause an electric shock or fire.
- To prevent electric shock, connect the outlet's grounding electrode to a grounding terminal installed by a qualified electrician. Without a connection to a grounding terminal, an electric shock can occur if the power supply fails.

Plugging in and unplugging

When inserting a power plug into or removing a power plug from an electrical outlet, be sure to hold the plug part. If you pull the cable, the cable might partially break. The break might cause overheating and fire.

Power supply modules

A power supply module contains a high-voltage area. Therefore, do not open the cover. If you do so, an electric shock or equipment failure might occur.

Installing a power supply slot cover

When removing a power supply unit, do not insert your hand or tools inside the power slot. After removing a power supply unit, install a power supply slot cover. Inside the power supply slot, some conductors are exposed. Touching them with your hands or tools might cause electric shock or an equipment failure.

Abnormal heat, smoke, abnormal noise, or abnormal odors

If anything abnormal occurs, turn off the power and unplug all the equipment power cables (a maximum of 6) from the electrical outlets.

Do not repair, remodel, or disassemble

Do not attempt to repair, remodel, or disassemble the equipment on your own, except to perform expansion work in accordance with the instructions in this manual. Attempting to do so might cause electric shock, fire, or burns. In particular, the inside of a power supply unit contains many high-voltage areas. Touching them is dangerous.

Removal of a cover or bracket

Do not remove covers or brackets. Removing them might cause electric shock, burns, or an equipment failure.

High temperature at the cover of a power supply module

When a power supply module is in operation, the cover and handle get hot. Be careful when replacing a failed module. Hot parts can cause burns.

Adding and replacing internal parts of the equipment

The cover and internal parts are hot immediately after the power is turned off. Wait for about 5 minutes before adding or replacing internal parts unless otherwise specified in this manual. Hot parts can cause burns.

Laser beam

- A Class 1 laser product is installed on this product. Do not look directly at the laser beam. Do not look at the laser beam by using an optical instrument.
- Under the laser module cover, a laser beam is being emitted. Do not remove the cover of an unused module.

Handling the product

- Install the product on a fixed rack. Do not lean against the product or stand on it. Do not install the product in a place with weak floors or walls.
- Do not subject the product to excessive vibration. Dropping the product or allowing it to fall over might cause an equipment failure.

Installing the unit in a rack

- To install the system unit in, or remove it from, a rack cabinet, always get help from at least one other person and use tools to avoid strain. If the system unit has to be installed in 31U or higher in the rack cabinet or the system unit has already been installed there, call for

maintenance personnel instead of attempting to install or remove the system unit. Defective installation might cause the system unit to fall, resulting in injury or unit failure.

- When pulling a unit out from a rack cabinet to work on it, attach a stabilizer to the rack cabinet. Excessive force might cause the rack cabinet to fall down, resulting in injury or an equipment failure. If a stabilizer is not attached, call for maintenance personnel.

Using a rack cabinet

When using a rack cabinet, do not place anything on the system unit mounted on the cabinet and do not use the top of the system unit mounted on the cabinet as a work bench. A heavy object placed on top of the system unit on the cabinet might fall, resulting in injury.

Contact with metal edges

When moving the equipment or adding parts, take care not to hurt yourself on the metal or plastic edges. Inappropriate handling can cause injuries.

Improper battery type

There is a risk of explosion if a battery is replaced by an incorrect type.

Dispose of used batteries according to the instructions.

Handling batteries

Maintenance personnel should replace batteries. Do not replace batteries by yourself. Follow the instructions described below. Inappropriate handling can result in injury because a battery can overheat, burst, or catch fire.

- Do not charge a battery.
- Do not short out a battery.
- Do not disassemble a battery.

Storing batteries

When storing batteries, apply adhesive tape to the terminals for insulation. If the batteries are stored without insulation, the terminals can contact each other to cause a short circuit and overheat or burst, leading to injury or fire.

Insertion of foreign objects into the equipment

Do not allow clips, pins, or any other metal items or flammable items to enter the equipment through a vent or by any other means. Using the equipment under such conditions can cause an equipment failure.

Impacts from drops and falls

Do not drop the equipment, let it fall, or hit it against another object. This can cause internal deformation and deterioration. Using the equipment under such conditions can cause an equipment failure.

Vents

Vents are used for preventing rises in temperature inside the equipment. Do not block a vent by placing or leaning an object against it. If you do so, the inside temperature rises, which can cause an equipment failure. Periodically check and clean vents to keep dust from gathering on them.

Contact with connection terminals

Do not touch connection terminals such as a connector with your hand or any metal item. Do not insert any foreign objects such as wire into connection terminals. Do not place the equipment in a place with pieces of metal. If you do so, a short circuit can develop, which can cause an equipment failure.

Moving between two locations with a temperature difference

If you move the equipment from one location to another, a significant temperature gap between the two locations might cause condensation on the surface or inside the equipment. Using the equipment with condensation present can cause an equipment failure. Leave the equipment at a new location for several hours until the temperature of the equipment matches the temperature of the new environment, and then start using the equipment.

For example, if you move the equipment from an environment whose temperature is 5°C to one whose temperature is 25°C, leave the equipment for about two hours.

Adding and connecting to peripheral devices

Use only peripheral devices that are explicitly listed as supported in the manual, and always follow the instructions in the manual. Using devices other than those mentioned above can cause failures in peripheral devices and the equipment due to the difference in connection specifications.

Radio interference

When you install the equipment next to another electronic device, the radio waves might interfere with each other. In particular, noise might be observed in nearby television sets or radios.

Strong magnetism generator

Do not place a device that generates strong magnetism, such as a magnet or a speaker, near the equipment. If you do so, a system unit failure might occur.

Handling of hard disks

A hard disk is a precision instrument. Carefully handle hard disks when you use them. Inappropriate handling can result in hard disk failure.

Failed disks

If you attempt to replace failed disks by using an incorrect procedure or faulty alternative disk, data on the disk might be corrupted. Before replacing faulty disks, back up the data.

Aluminum electrolytic capacitors

An aluminum electrolytic capacitor has a limited service life. Do not use an aluminum electrolytic capacitor past its service life. If you do so, leakage or depletion of the electrolytes might cause smoke or electric shock. To avoid such hazardous situations, replace limited-life parts once they are past their designated service life.

Distribution board

Install a distribution board close to an entrance to protect the devices in your computer system and to serve as an emergency power breaker.

Signal cables

- Route cables so that nobody will trip over them. Tripping over cables can cause injury or failure of devices connected to the equipment. In addition, valuable data might be lost.
- Do not place heavy items on the cables. Do not route cables close to devices that become hot. If you do so, the cable covering might be damaged, which can cause failures in connected devices.

Before turning off the power

- Follow the prescribed procedure for power operation. If you turn on or off the power without following the prescribed procedure, a system unit failure might occur.
- Before turning off the power, make sure that all devices connected to the equipment have stopped. Turning off the power during operation of the equipment might cause an equipment failure or data loss.
- If you are using an OS that requires a shutdown procedure, always finish the shutdown procedure, and then turn off the power. If you turn off the power before the shutdown is complete, data might be lost.

Notes on rack mount safety

- Elevated ambient temperature

  If you install the system unit in a closed or multi-unit rack assembly, the operating ambient temperature of the rack

environment might be greater than that of the ambient room temperature. Be careful not to exceed the rated maximum ambient temperature of the unit.

- Reduced air flow

  When installing equipment in a rack, be careful that the amount of airflow required for safe operation of the equipment is not compromised.

- Mechanical loading

  When mounting the equipment in a rack, be careful to avoid hazardous conditions caused by uneven mechanical loading.

- Circuit overloading

  When power is being supplied to equipment, be careful of excessive current causing circuit interruptions and overheating of power cables. When using the equipment, carefully note the ratings.

- Reliable grounding

  Maintain reliable grounding of rack-mounted equipment. Pay particular attention to non-grounded power connections to branch circuits (for example, in power strips).

Intended Audience

This document is intended for the personnel who are involved in planning, managing, and performing the tasks to prepare your site for Compute Blade installation and to install the same.

This document assumes the following:

- The reader has a background in hardware installation of computer systems.
- The reader is familiar with the location where the Compute Blade will be installed, including knowledge of physical characteristics, power systems and specifications, and environmental specifications.

Product Version

This document revision applies to troubleshooting additions.

Release Notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document.

Document Organization

The table below provides an overview of the contents and organization of this document. Click the chapter title in the left column to go to that chapter. The first page of each chapter provides links to the sections in that chapter.

Chapter	Description
Chapter 1, CB 2500 Overview	Provides an overview of the server chassis that make up the CB 2500 and the various modules to be installed in a CB 2500.
Chapter 2, CB 2500 Appearance	Describes the appearance of the server chassis, server blades, and various modules that make up the CB 2500 system unit. A server blade and some modules have indicators that enable you to check the operating status of the hardware. This chapter also describes the indicators and the meanings of their displayed statues.
Chapter 3, Starting the CB 2500 and Performing Initial Setup	Describes the initial setup that is required from installation of the system unit to powering on the server blades.
Chapter 4, Stopping the CB 2500	Describes how to stop the system unit.
Chapter 5, Functionality and Operation of the Remote Console	Provides an overview of the remote console. The remote console is mainly used for configuring the operating environment of the server blade and creating virtual media that is accessed from the server blade.
Chapter 6, Troubleshooting	Describes troubleshooting procedures for the CB 2500.
Appendix A, System Unit Specifications	Describes specification of the CB 2500.
Appendix B, Taking a Memory Dump of the OS Running on a Server Blade	Describes the settings for taking memory dumps for the various OS types in order to prepare for a failure in the OS on a server blade.
Appendix C, Cleaning the System Unit	Describes how to clean the system unit.
Appendix D, Components that have specified lifetimes	Describes the service life of the hardware components making up the system unit, and the components that have specified lifetimes.
Appendix E, License	Describes the license terms for the CB 2500, including the license terms for products of other vendors.

Referenced Documents

- Hitachi Compute Blade 2500 Series Management Module User Guide, MK-99CB2500004
- Hitachi Compute Blade 2500 Series UEFI Setup Guide, MK-99CB2500005
- Hitachi Compute Blade 2500 Series Logical partitioning manager User Guide, MK-99CB2500006
- Hitachi Compute Blade 2500 Series MIB User Guide, MK-99CB2500007
- Use Restrictions for Hitachi Compute Blade 2500 Series, MK-99CB2500053
- Server installation and monitoring tool OS Setup Guide, MK-99COM061
- Hitachi Compute Blade Series Hitachi Compute Rack Series OS Installation Guide for Windows Server, MK-99COM076
- Hitachi Compute Blade Series OS Installation Guide for Red Hat Enterprise Linux, MK-99COM141

Document Conventions

The term "Compute Blade" refers to all the models of the Compute Blade, unless otherwise noted.

The Hitachi Virtualization Manager (HVM) name has been changed to Hitachi logical partitioning manager (LPAR manager, or LP). If you are using HVM based logical partitioning feature, substitute references to Hitachi logical partitioning manager (LPAR manager, or LP) with HVM.

This document uses the following typographic conventions:

Convention	Description
Regular text bold	In text: keyboard key, parameter name, property name, hardware labels, hardware button, hardware switch In a procedure: user interface item
Italic	Variable, emphasis, reference to document title, called-out term
`Screen text`	Command name and option, drive name, file name, folder name, directory name, code, file content, system and application output, user input
< > (angle brackets)	Variable (used when italic is not enough to identify variable)
[ ] (square brackets)	Optional value
{ } (braces)	Required or expected value
| (vertical bar)	Choice between two or more options or arguments.

This document uses the following icons to draw attention to information:

Icon	Meaning	Description
WARNING	WARNING	This indicates the presence of a potential risk that might cause death or severe injury.
CAUTION	CAUTION	This indicates the presence of a potential risk that might cause relatively mild or moderate injury.
NOTICE	NOTICE	This indicates the presence of a potential risk that might cause severe damage to the equipment and/or damage to surrounding properties.
Note	Note	Calls attention to important or additional information.
Tip	Tip	This indicates advice on how to make the best use of the equipment.

Conventions for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 kilobyte (KB)	1,000 (10^3) bytes
1 megabyte (MB)	1,000 KB or $1,000^2$ bytes
1 gigabyte (GB)	1,000 MB or $1,000^3$ bytes
1 terabyte (TB)	1,000 GB or $1,000^4$ bytes
1 petabyte (PB)	1,000 TB or $1,000^5$ bytes
1 exabyte (EB)	1,000 PB or $1,000^6$ bytes

Logical storage capacity values (for example, logical device capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 KB	1,024 (2^{10}) bytes
1 MB	1,024 KB or $1,024^2$ bytes
1 GB	1,024 MB or $1,024^3$ bytes
1 TB	1,024 GB or $1,024^4$ bytes
1 PB	1,024 TB or $1,024^5$ bytes
1 EB	1,024 PB or $1,024^6$ bytes

Getting help

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, log on to the Hitachi Data Systems Portal for contact information: https://portal.hds.com

Comments

Please send us your comments on this document: doc.comments@hds.com. Include the document title and number including the revision level (for example, -07), and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Data Systems Corporation.

Thank you!

1

CB 2500 Overview

This chapter provides an overview of the server chassis that make up the CB 2500 and the various modules to be installed in the CB 2500.

- ☐ Features of the CB 2500
- ☐ Various consoles that manage the CB 2500
- ☐ General procedure for setup of the CB 2500

Features of the CB 2500

To achieve high performance, the CB 2500 supports the maximum number of memory modules defined by CPU architectures, and supports high-speed I/O by using 10Gb Ethernet or 16Gb Fibre Channel. In addition, four hot-pluggable PCI Express slots are supported and high reliability is achieved by using multipath connections to connect with storage systems. Due to these features, you can build a highly-available system that best suits your business or goals. The following shows the hardware that makes up the CB 2500 system unit.

Hardware that makes up the CB 2500

- Server chassis

  A server chassis is a frame chassis equipped with server blades and various modules. A server chassis can be equipped with a maximum of 8 full-wide blades or a maximum of 14 half-wide blades. In addition, a server chassis can be equipped with a maximum of 2 switch modules.
- Server blade

  A server blade is a device containing a collection of server functionality. Models such as full-wide and half-wide blades are available so that the necessary number of servers can be installed for your operation.
- PCI expansion blade

  A PCI expansion blade is a device that is used to expand I/O adapter slots. PCI expansion blades have a maximum of six I/O adapter slots. One PCI expansion blade is used in combination with one half-wide blade.
- Management module

  A management module manages the entire system unit. You can use a management module to monitor the operating statuses of server blades and various modules, and to set their power control or network information. By installing two management modules in the CB 2500 for redundancy, you can enhance the fault tolerance of the system unit. In addition, the management modules connect to external networks via management LAN modules.
- Switch module

  A switch module provides a network adapter and switch functionality to the system unit. A switch module can be a DCB switch that consolidates LANs and SANs. In the CB 2500, a maximum of two switch modules are installed to secure the network bandwidth needed by the server blades.
- I/O board module

  An I/O board module supports various PCI adapters and provides their I/O interfaces. Supported PCI adapters include LAN adapters, fibre channel adapters, and flash drive adapters.
- Power supply module

  A power supply module supplies power to the system unit. A maximum of 6 power supply modules can be installed in the CB 2500 server chassis.
- Fan module

A fan module cools the system unit. There are two types of fan modules: a system fan module that cools server blades, and a switch fan module that cools switch modules.

By providing redundant management modules, switch modules, power supply modules, and fan modules, fault tolerance for the system unit is ensured. In addition, space is saved by consolidating the power supply required for server blades into the server chassis and by using switching functionality to share external network interfaces among the server blades. All modules are hot-swappable.

Note: If you want to use one of the network booting methods listed below in an SMP configuration, specify a primary server blade as the server blade to be booted. The following booting methods cannot be used to boot non-primary server blades.

- HBA boot (FC, iSCSI, FCoE, etc)
- PXE boot
- Wake on LAN

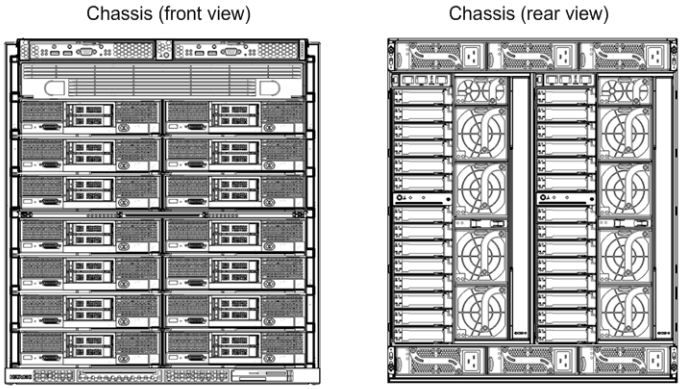


Figure 1-1 CB 2500 system unit

Features of the server chassis

The CB 2500 server chassis connects to each module via a backplane. Therefore, you do not need complicated cable connections. When you add a server blade, you can connect the server blade by just inserting the server blade to a standby slot of the server chassis. The CB 2500 can facilitate integration of traditional rack-mount server systems, such as system integration and data center operations.

The following shows the number of modules that can be installed in the CB 2500 server chassis.

- A maximum of 8 full-wide blades or a maximum of 14 half-wide blades can be installed.
- A maximum of 2 switch modules can be installed.
- 2 management modules and 2 management LAN modules are installed.
- A maximum of 6 power supply modules can be installed.

- 8 fan modules and 2 switch modules are installed. 2 cooling fan control modules that control these fan modules are installed.
- A maximum of 28 I/O board modules can be installed.

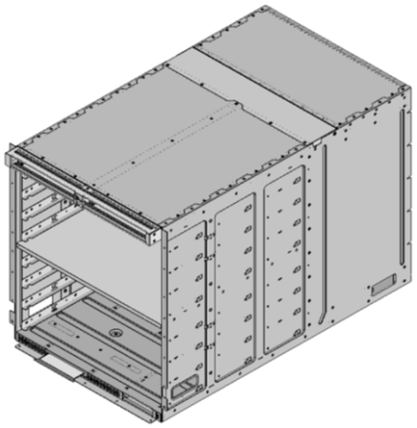


Figure 1-2 Server chassis

Features of server blades

CB 2500 server blades support the following two types of performance expansion to best match your business or goals: scale-up and scale-out. You can use multiple server blades as one server by SMP connections to scale up the server, and then use the server as a database server or application server that requires high performance. In addition, multiple server blades can be scaled out in parallel, and used as a Web server that requires high throughput for a large number of accesses.

CPUs, memory, and HDDs are mounted on a server blade. In addition, In addition, CNA (Converged Network Adapter) and mezzanine cards are also mounted. Onboard CNA and mezzanine cards are connected with switch modules via the backplane of a server chassis.

In addition, a PCI expansion blade can be used in combination with a half-wide blade to expand I/O adapter slots. A PCI expansion blade is an option for a half-wide blade.

The following shows the main features of CB 2500 server blades:

- Equipped with high-performance Intel multicore processors that use QPI technology, which improves throughput and reduces delays.
- Provide high reliability by using CPUs and RAID controllers that have high reliability, availability, and maintainability such as memory scrubbing (self correction of errors), memory mirroring functionality (memory duplication), and hardware RAID1.
- Support high density, high performance optimal for server data centers, virtualization, high-speed computer processing, and flexible I/O capability.
- By installing flash storage in a PCI expansion blade, you can configure a high-speed storage system.

OSs supported by server blades

The following table shows the supported VMware ESX server that can be set up in server blades.

For versions of Windows or Red Hat Enterprise Linux supported by server blades, see the related topics.

Table 1-1 Supported VMware ESX server

Server blade		ESXi 5.1	ESXi 5.5	ESXi 6.0	ESXi 6.5	ESXi 6.7
CB 520X B1	Basic mode	Supported (U2[1], U3[1])	Supported (U3a or earlier, U3b[1])	Supported (U1a or earlier, U1b[1], U2[1], U3[1])	Not supported	Supported[1] (U1, U2 ,U3)
	LP mode	Not supported				
CB 520X B2	Basic mode	Not supported	Supported (U2, U3a, U3b[1])	Supported (U2 or earlier[1], U3)	Supported[1]	Supported[1] (U1, U2 ,U3)
	LP mode	Not supported				
CB 520X B3	Basic mode	Not supported		Supported (U2, U3)	Supported[1]	Supported[1] (U1, U2 ,U3)
	LP mode	Not supported				
CB 520H B3	Basic mode	Supported (U2, U3)	Supported (U2, U3a, U3b)	Supported	Supported	Supported (U1, U2 ,U3)
	LP mode	Not supported				
CB 520H B4	Basic mode	Not supported	Supported (U3a, U3b)	Supported (U1b, U2, U3)	Supported	Supported (U1, U2 ,U3)
	LP mode	Not supported				

Notes:

1. Not supported 4-blade SMP configuration.

Related topics

- Manual *Hitachi Compute Blade Series Hitachi Compute Rack Series OS Installation Guide for Windows Server*
- Manual *Hitachi Compute Blade Series OS Installation Guide for Red Hat Enterprise Linux*

Management module overview

A management module manages the power supply of each module and monitors the status of the system unit. Server blades and various modules create a network within the system unit. A management module supports the management functionality of that network. If two management modules are

installed and the active management module fails, the other standby management module runs to secure fault tolerance of the system unit.

The connection between a management module and an external network is via a management LAN module.

I/O board module

An I/O board module is a module that installs a PCI Express adapter to a server blade. You can mount a maximum of 28 I/O board modules to the rear side of a server chassis.

Switch module overview

A switch module connects the system unit and external networks. An onboard LAN or a network mezzanine card on a server blade and a switch module are connected through the backplane within a server chassis. Therefore, you do not need complicated cable processing. A maximum of 2 switch modules can be installed on the rear side of a server chassis.

We recommend that NIC teaming applied to the server blade.

Power supply module

A power supply module supplies power to the CB 2500 system unit. By installing a maximum of 6 power supply modules on the rear side of a server chassis, you can supply stable power to the system unit.

Fan module

A fan module cools server blades and various modules. There are two types of fan modules: system fan modules that cool server blades and switch fan modules that cool switch modules. Fan modules are mounted on the rear side of a server chassis. Eight system fan modules and two switch fan modules are installed.

The operation status of fan modules are monitored by cooling fan control modules. Two cooling fan control modules are mounted on the rear side of a server chassis.

LPAR manager functionality

The LPAR manager functionality logically partitions a server blade to create multiple virtual server environments. Each of the partitioned or constructed virtual server environments is called an LPAR. You can share the resources (including CPUs, memory, and PCI devices) in the server blade among partitioned and constructed LPARs. You can construct flexible virtual server environments that suit your purposes. For example, for a high-load LPAR, you can use resources in dedicated mode or share them only among limited LPARs.

Related topics

- Preparing the server blades so that they can operate in LP mode on page 3-11

N+M cold standby

N+M cold standby is functionality that, when an active server blade fails, attempts to reduce the downtime by switching to a standby server blade. The reliability of the system unit is enhanced by multiplexing the system. Note that N+M cold standby can be used by linking Hitachi Compute Systems Manager (HCSM), which is an external server management software, with the CB 2500.

Reducing server blade power consumption

To reduce power consumption, you can set an upper limit for the power consumed by the entire server chassis. This is called power capping.

Power capping changes the power state of processors on a server blade, and reduces power consumption of the server blade. If the CPU workload is low, the CPU automatically enters the power-saving state.

If the LPAR manager functionality is used and no process to be dispatched exists, the server blade enters the waiting state until a process to be dispatched appears. In this state, the power state of the physical processor is lowered to reduce power consumption. The state in which LPAR manager functionality is used and no process to be dispatched exists is called a host idle loop.

Note: If the power capping upper limit is set too low, the CPU performance might become low and affect OS operation. Thoroughly evaluate the value to be set to power capping during the operation test before starting the operation.

Internal LAN and management LAN

Server blades and various modules installed in a server chassis are connected to a network within the system unit. This network is called the internal LAN. A management module uses an internal LAN to monitor the statuses of server blades and various modules, and to communicate control information. The control information of the system unit is managed by using a network to connect an external computer and a management module. This network that manages the system unit is called the management LAN. To use the management LAN to manage server blades and various modules, you need to use a management module to specify various network settings when the system is first set up.

To connect the management LAN and the system unit, you usually use a port of a management module (management LAN module).

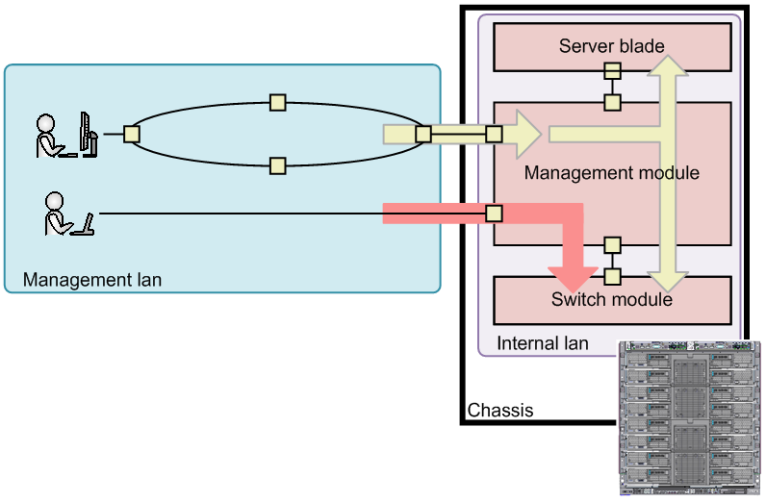


Figure 1-3 Network configuration of the internal LAN and management LAN

When setting up the system unit for the first time, you need to specify the initial settings of the management LAN so that server blades and switch modules can communicate with the management module.

Related topics

- Manual *Hitachi Compute Blade 2500 Series Management Module User Guide*
- Setting the network for the server blades and modules on page 3-5

Various consoles that manage the CB 2500

To manage the CB 2500 system unit, use an external computer that is connected with the system unit through the management LAN. This PC is called the system console. When operating the system unit from the system console, you can select the console appropriate to your goals from some console types: such as a Web console, which enables you to perform operations by using a GUI; and a CLI console, which enables you to perform operations by entering commands. This section describes the types of the consoles used to manage the CB 2500, and the hardware and software conditions required for the system console.

Types of consoles supported by the CB 2500

Interfaces for managing the system unit are: Web console, CLI console, and remote console. These consoles run on the PC of the system console. In addition, the CB 2500 also supports LCD touch consoles, which allow you to operate the system unit without using any system console. The available functionality varies depending on the console. Use the console that best suits your goals.

Web console

The Web console runs on a Web browser or a CB2500 Web Console Client that is set up in the system console. The Web console can manage and set all of the equipment installed in a server chassis. The Web console adopts the GUI design that is common to Hitachi storage systems and their storage management software, and provides operability that is standardized over Hitachi's consolidated service platforms.

CLI console

The CLI console runs on terminal software that is set up in the system console. The CLI console executes CLI commands to manage and specify settings for the system unit. If you create batch programs by combining CLI commands, you can efficiently execute operations for monitoring and managing the system unit.

Remote console

This console is started from the Web console, and manages and specifies settings for a server blade. You can use the remote console to install an OS in a server blade or create virtual media to be referenced by server blades.

LCD touch console

The LCD touch console is hardware that is equipped with an LCD touch panel interface. This LCD touch console is a device that directly connects to the system unit, and therefore does not require a system console. This console is suitable for specifying settings when installing a system, because you can set up a system unit without needing to set up a network.

System console prerequisites

This subsection describes the prerequisites of the hardware and software required to run the system console.

Table 1-2 System console hardware conditions

Item	Specifications	
	Windows	**OS X**
CPU	2 GHz or more operation clock	1.4 GHz Dual Core i5 or higher
Memory	512 MB or more (We recommend 2 GB or more for memory.)[1]	4 GB or more
Display resolution	1024 x 768 or higher (We recommend 1280 x 1024 higher.)	1920 x 1080 or higher
LAN[2]	100Base-TX or faster	1000Base-TX or faster[3]
CD drive and DVD drive	You need one of the following types of CD drive or DVD drive connected to the system console computer: • A CD drive or DVD drive built in to the computer	You need one of the following types of DVD drive connected to the system console computer: • A USB-connected DVD drive

Item	Specifications	
	Windows	OS X
	• A USB-connected CD drive or DVD drive (We recommend devices conforming to USB 2.0.)	
FD drive	You need one of the following types of FD drive connected to the system console computer. • An FD drive built in to the computer • A USB-connected FD drive	Not supported
OS[4, 5]	• Windows Vista Business • Windows 7 Professional • Windows 8 • Windows 8 Professional • Windows 8.1 • Windows 8.1 Professional • Windows 10 Education • Windows 10 Enterprise • Windows 10 Pro • Windows Server 2008 Standard (32 bit) • Windows Server 2008 Enterprise (32 bit) • Windows Server 2008 R2 Standard • Windows Server 2008 R2 Datacenter • Windows Server 2008 R2 Enterprise • Windows Server 2012 Standard • Windows Server 2012 Datacenter • Windows Server 2012 R2 Standard • Windows Server 2012 R2 Datacenter • Windows Server 2016 Standard • Windows Server 2016 Datacenter	• OS X 10.8 (Mountain Lion) • OS X 10.10 (Yosemite)

Notes:

1. When you operate server blades from a remote console, a maximum of 256 MB of memory installed on the system console is used per server blade. To operate multiple server blades at the same time, install a sufficient amount of memory on the system console computer.
2. Use a LAN cable of Category 5 or higher to connect the system console computer and the CB 2500 system unit.
3. If you want to run the remote console in an IPv6 environment, you must disable wireless network connections on the system console and connect to the network over Ethernet. If wireless network connections are enabled, you will not be connected to the IPv6 network environment even if you connect to the network over Ethernet.
4. If the TLS 1.1 or TLS 1.2 protocol is used for communication between the remote console and the system unit, use one of the following OSs: Windows 7 or later or Windows Server 2008 R2 or later.
5. If you are logged in to Windows with a user account name that contains one or more 2-byte characters, the remote console does not run. To use the remote console, log in to Windows with a user account name that does not use any 2-byte characters.

Table 1-3 System console software conditions

Item	Specifications	
	Windows	OS X
Web browser[1]	The system console supports operations with the following browsers: • Internet Explorer 7 or later[2] • Firefox 3.0 or later	Firefox 41.0.1 or later
Java VM[3, 4, 5, 6, 7, 8]	Oracle Java Version 6 (Update 29 or later) Oracle Java Version 7 (Update 2 or later) Oracle Java Version 8 (Update 45 or later) Apply a Java VM whose architecture (32-bit or 64-bit version) is the same as that of the Web browser that displays each type of console. If the security strength of the server blade is "high", use Oracle Java version 8 (Update 45 or later).	Oracle Java 8 version (Update 60 or later)
Flash Player [9]	Adobe Flash Player version 10.2 or later	Adobe Flash Player version 19 or later
Terminal software	Terminal software that supports SSH V2	OS X Terminal.app
CB2500 Web Console Client [10, 11]	Windows desktop application (Included Adobe AIR version 33 or later)	-

Notes:

1. To run the remote console on a web browser installed in the system console, use a web browser that supports server certificates that use the hash function SHA-2.

   If the OS is Windows 10, do not use Microsoft Edge as the browser.

2. To execute consoles, set the Internet Explorer options as follows:
   - In the **Tools** menu, execute the **Internet Options** command. In the displayed **Internet Options** dialog box, select **Advanced** and then clear the **Do not save encrypted pages to disk.** check box.
   - For Internet Explorer 8 or later, disable the SmartScreen Filter function.

     In the **Tools** menu, execute the **Internet Options** command. In the displayed **Internet Options** dialog box, select **Advanced** and **Security**, and then clear the **Turn On SmartScreen Filter** check box.

3. Do not install an unsupported version of Java VM to the system console. If you install an unsupported version of Java VM, the remote console might not operate normally even if a supported version of Java VM is already installed. If the remote console does not operate normally, use the following procedure to check the version of Java VM that is running and then uninstall the unsupported version of Java VM.
   1. Start the Java Control Panel.

      You can start the Java Control Panel by clicking **Java** in the **Windows Control Panel** of the system console.
   2. In the **Advanced** tab, select **Java Console** and then **Show Console**.
   3. Start the remote console. In the displayed **Java console**, check the version of Java VM (JRE).

      After confirming the version, exit the remote console and revert the settings in **Java Console**.

Item	Specifications	
	Windows	OS X

4. If you have installed Oracle Java Version 7 Update 21 or later and startup of the remote console is suppressed, use the following method to resolve the suppression.
   - Use the Java Control Panel to change the security level to Medium.

     You can start the Java Control Panel by clicking Java in the Windows Control Panel of the system console. In the displayed window, set the security level to Medium on the **Security** tab.
5. When connecting via TLSv1.1/1.2, use Oracle Java Version 7 Update 2 or later.
6. When operating the remote console in an IPv6 network, to use the Oracle Java 7 Update 80 or later, or the Oracle Java 8 Update 45 or later.
7. If you have installed OpenJDK or Oracle Java Version 8 Update 161 or later and startup of the remote console is suppressed, use the following method to resolve the suppression.
   - Open the "`lib\security\java.security`" file in the JRE folder of the system console with a text editor such as Notepad.
   - Comment out the description on the "`jdk.tls.disabledAlgorithms`" property of the file and save it.

     the property before modification (example)

     ```
     jdk.tls.disabledAlgorithms=SSLv3, RC4, MD5withRSA, DH keySize < 1024, \
     EC keySize < 224, DES40_CBC, RC4_40, 3DES_EDE_CBC
     ```

     the property after modification (example)

     ```
     #jdk.tls.disabledAlgorithms=SSLv3, RC4, MD5withRSA, DH keySize < 1024, \
     #EC keySize < 224, DES40_CBC, RC4_40, 3DES_EDE_CBC
     ```
8. The remote console was also verified with the following configuration.

Item	Specifications
Open JDK Distribution	AdoptOpenJDK8 with Hotspot (Update 202 or later) - It is available from the following URL. `https://adoptopenjdk.net/` - Uninstall Oracle Java from the system console when using OpenJDK.
OS	- Windows Server 2016 Standard - Windows Server 2016 Datacenter - Windows 10 Pro 64bit - Windows Server 2012 R2 Standard - Windows Server 2012 R2 Datacenter
Web browser	Internet Explorer 10 or later

Other applications	IcedTea-Web version 1.7.1
	- It is available from the following.
	`https://icedtea.classpath.org/wiki/IcedTea-Web`
	`[src downloads] - [icedtea-web-binaries] - [1.7.1] - [windows] - [itw-installer.msi]`

Server blade firmware	- CB 520H B3 : 08-96 or later - CB 520H B4 : 10-27 or later - CB 520X B1 : 07-75 or later

Item	Specifications	
	Windows	OS X

Item	Specifications
	○ CB 520X B2 : 09-64 or later ○ CB 520X B3 : 11-24 or later

9. When using CB2500 Web Console Client, it is not required.
10. If you want to use the CB2500 Web Console Client, please update the management module firmware to A0190 or later.
11. When using the web console without a web browser, it is required.

Note:

- If the security strength for the management module is set to High, use Internet Explorer to connect to the Web console for the management module.
- If you use Firefox to connect to the Web console for the management module, set the security strength for the management module to the default.
- Please be aware that modifying the file described in note 7 affects all Java applications running on the system console.

Tip: The JRE folder is located in the following places, for example. (It depends on where JRE is installed)
`C:\Program Files\Java\jre1.8.0_161`

Web console

The Web console provides a GUI that enables you to manage various settings of the system unit. The Web console can graphically display the operating status of the entire system and failed parts, and list setting information of server blades and switching modules.

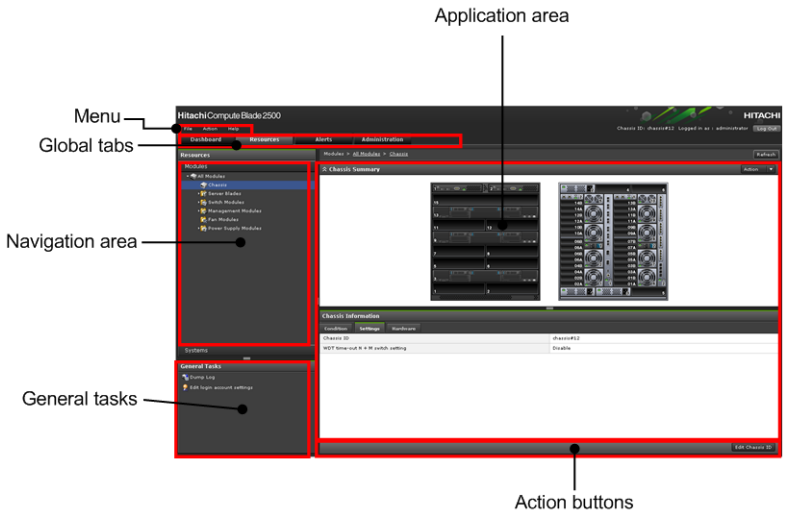


Figure 1-4 Web console window

The Hitachi Compute Blade 2500 Series Getting Started Guide explains the setting procedures that use the Web console, for the basic settings required when installing server blades and switch modules. For other items that can be managed from the Web console or to use a console other than the Web console to specify settings, see the manual *Hitachi Compute Blade 2500 Series Management Module User Guide*.

CLI console

The CLI console allows you to enter CLI commands to operate server modules or switch modules. For example, setting up and executing a task to monitor the system unit consists of several steps. You can efficiently set up and execute the task by combining the corresponding CLI commands to create a batch program.

Remote console

The remote console can control server blades. Use the remote console to install an OS on a server blade or set an UEFI environment. In addition, you can use the remote console to create virtual media accessed from server blades.

- You can remotely operate the windows of the OS or of the EFI running on a server blade. You can use the keyboard or mouse of the system console to operate in the UEFI window or OS window displayed in the remote console.
- From the remote console, you can remotely power on or power off server blades or switch modules. You can also reset the power of server blades.
- The remote console provides virtual media functionality that can be used to access a FD drive, CD or DVD drive, or the USB memory of the system console. You can use the virtual media functionality to install an OS or applications onto a server blade.

Note: If the system console OS is Windows Server 2008 R2 and you want to access a physical drive of the system console, use the built-in user account to log in to the remote console. If you use a different user account to log in, you cannot access the physical drive. Note that all user accounts can be used to access a virtual image file.

LCD touch console

The LCD touch console is hardware whose main body is equipped with an LCD touch panel. The LCD touch console can display system statuses or failed parts, and can be used to set up the system unit without using the system console. This console is suitable for specifying settings when installing a system, because you can set up a system unit without needing to set up a network. To use the LCD touch console, connect it to the USB port of the management module on the front surface of the server chassis.

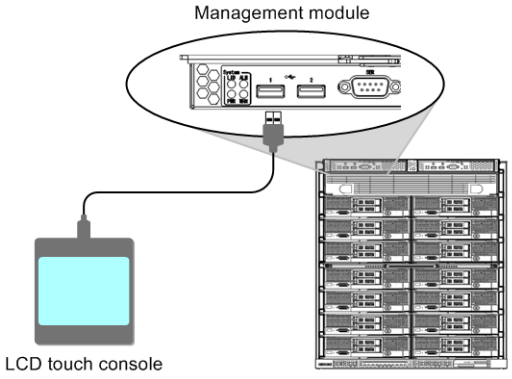


Figure 1-5 LCD touch console connection

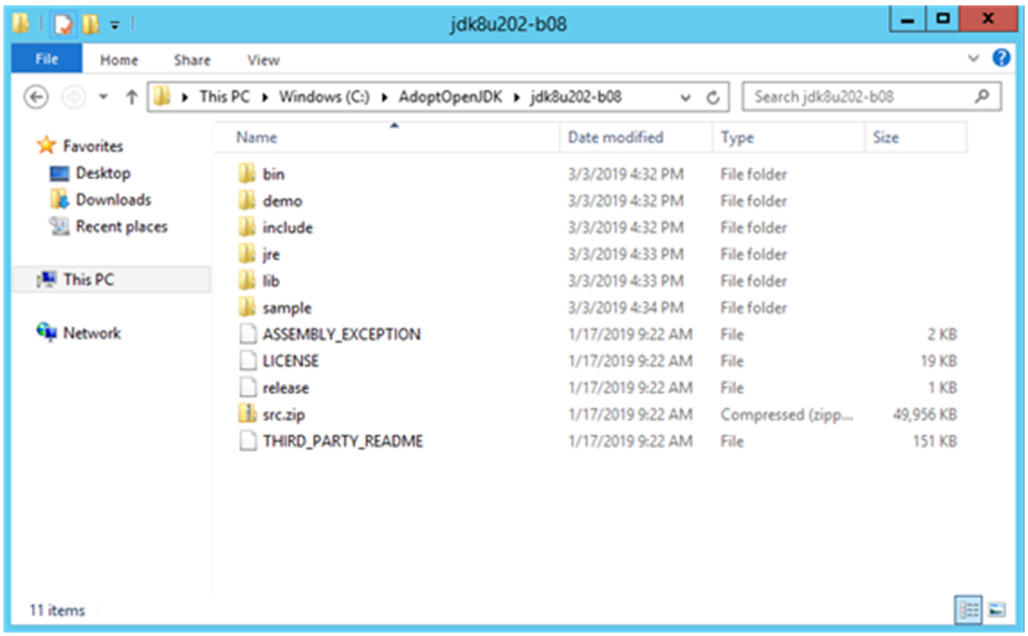
About preconfigure when using OpenJDK

When using OpenJDK, you need to preconfigure the system console. Please do the following with administrator privileges.

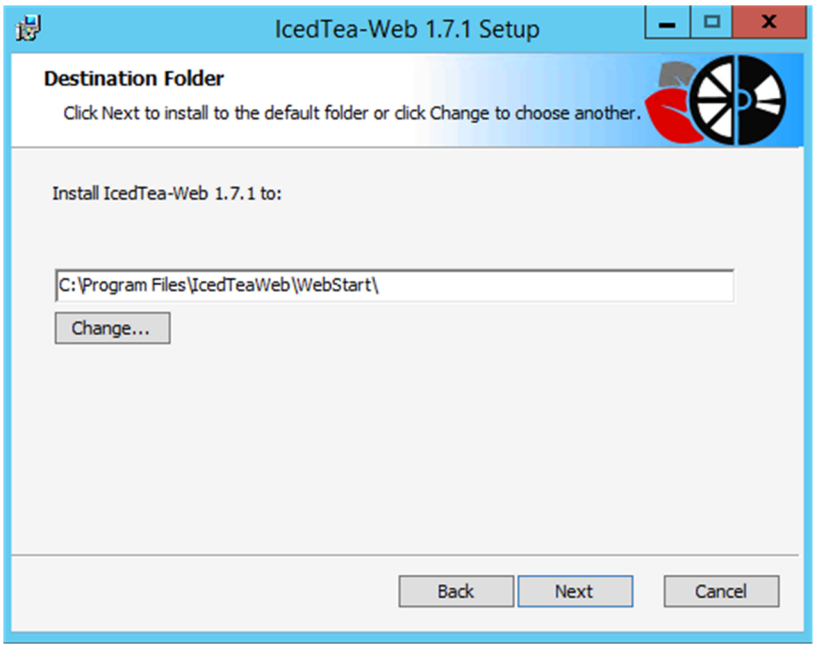
1. Install OpenJDK on the system console.

   The installation folder can be anywhere. This manual assumes that it is installed in the following.

   "C:\AdoptOpenJDK"

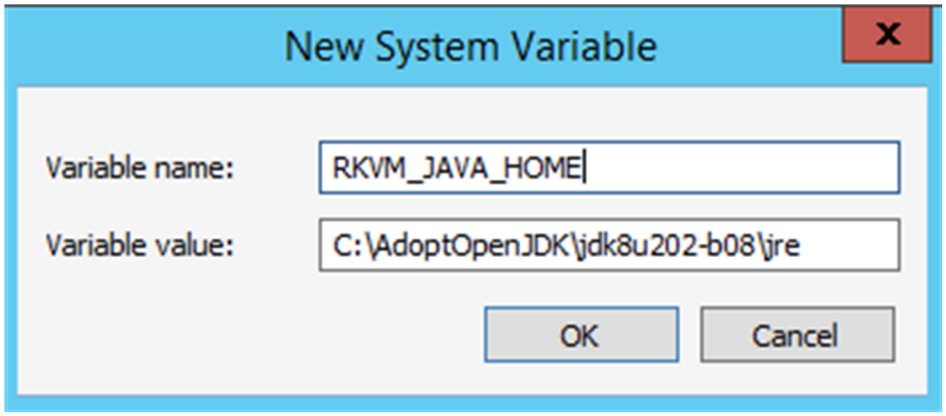


2. Install IcedTea-Web on the system console.
   Do not change the installation folder from the default ("`C:\Program Files\IcedTeaWeb\WebStart\`").

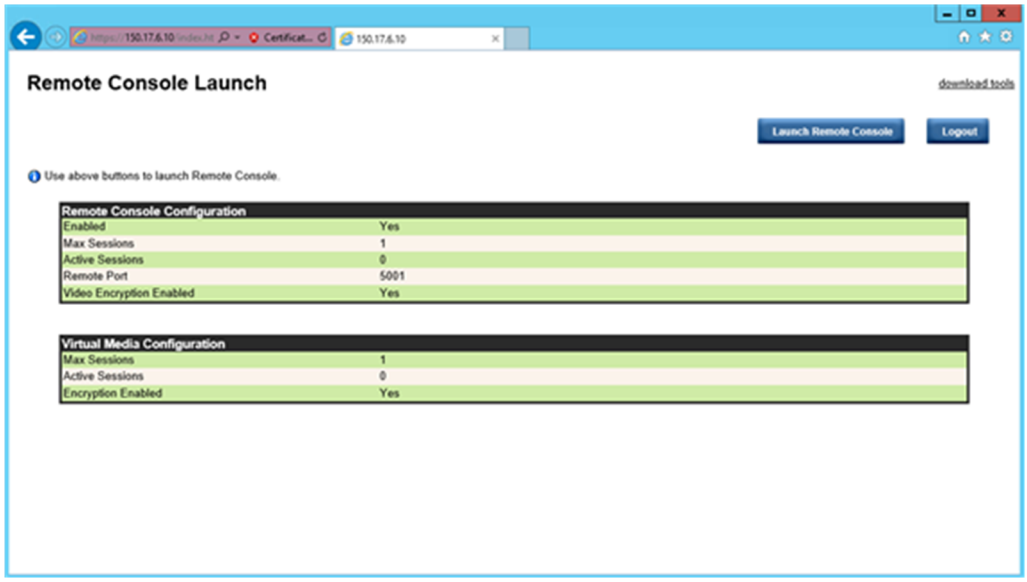


3. Create a new environment variable "`RKVM_JAVA_HOME`" in the system console and specify the OpenJDK JRE path "`C:\AdoptOpenJDK\jdk8u202-b08\jre`".
   - **Setting**
     - **Control Panel** > **System** > **Advanced system settings** > **Environment Variables**, and click **New...**.

- Set "RKVM_JAVA_HOME" to **Variable name**, and set "C:\AdoptOpenJDK\jdk8u202-b08\jre" to **Variable value**. Click **OK**.

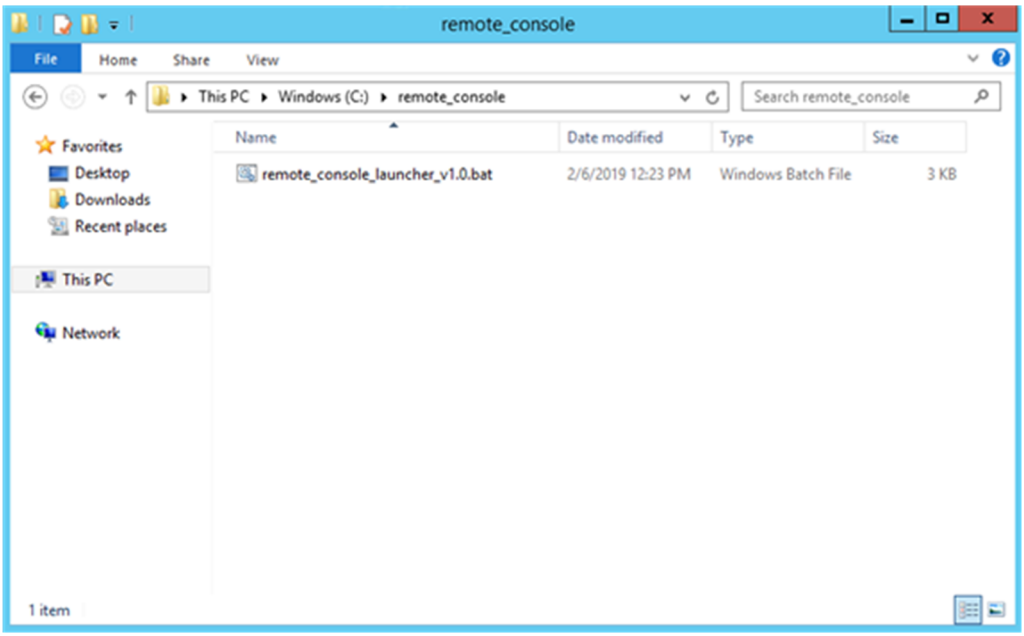


4. Download the tool from the BMC web console and install it on the system console.



Download the tool from **download tools** in the upper right of the screen. Extract **remote_console_launcher_xxx.bat** from the downloaded file, and install it in any folder on the system console. This manual assumes that it is installed in the following.

"C:\remote_console"



Note:

- Close and restart all Web browsers after setting environment variables.
- "**Download tools**" in the BMC Web Console are displayed only when using server blade firmware shown in Table 1-3 System console software conditions on page 1-11 at notes 8.

General procedure for setup of the CB 2500

From installing the system unit to performing the initial settings for a server blade

The following figure shows the general procedure from installing the CB 2500 system unit to performing the initial settings of a server blade.

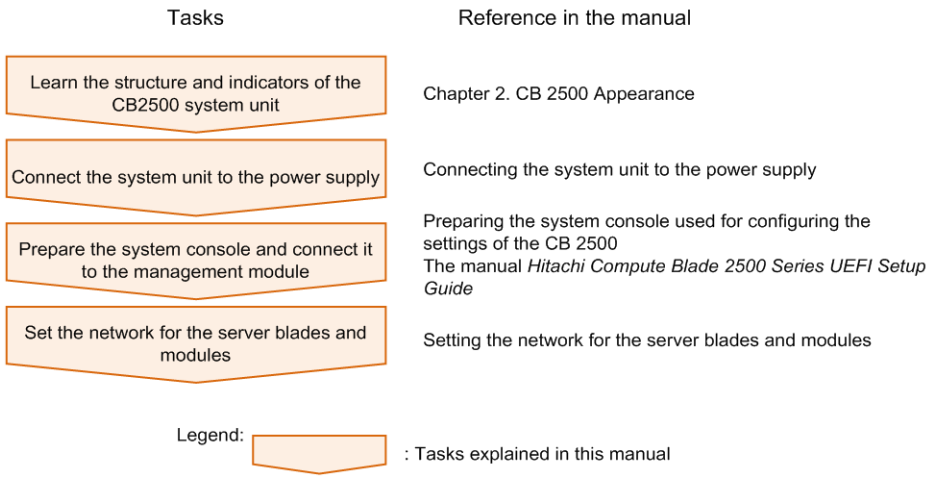


Figure 1-6 General procedure for the initial settings

Powering on a server blade and setting up the OS

The following figure shows the general procedure from powering on a server blade to setting up the OS. For details on the tasks in LP mode, see the *Hitachi Compute Blade 2500 Series Logical partitioning manager User Guide*.

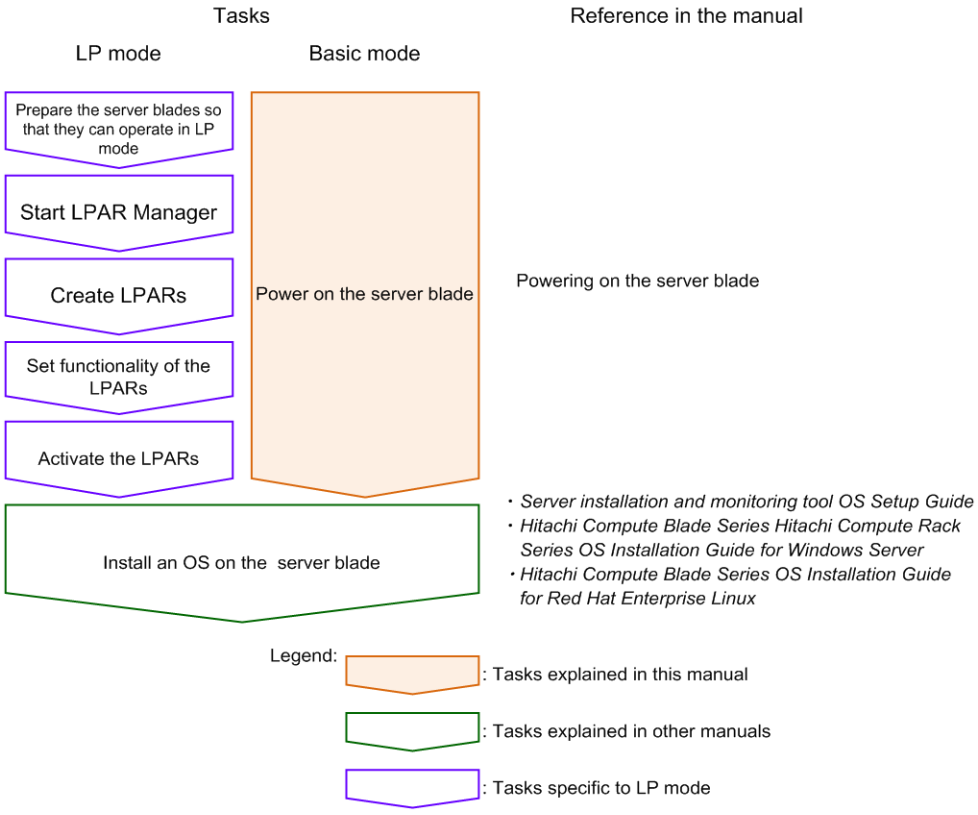


Figure 1-7 General procedure from powering on a server blade to setting up the OS

Stopping the running system unit

The following diagram shows the general procedure for stopping the entire system unit, for example, for a planned power outage or to change the installation location of the system unit. For details on the tasks in LP mode, see the *Hitachi Compute Blade 2500 Series Logical partitioning manager User Guide*.

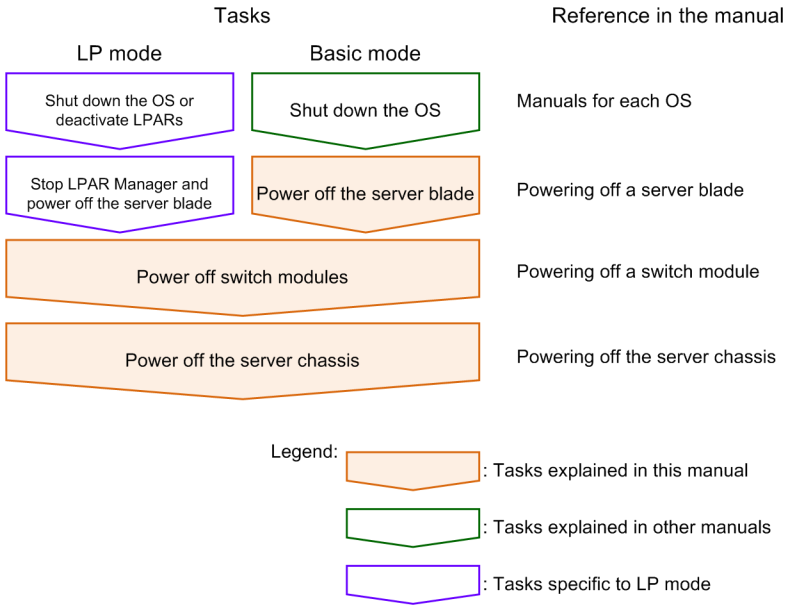


Figure 1-8 General procedure for stopping the system unit

2

CB 2500 Appearance

This chapter describes the appearances of the server chassis, server blades, and modules that make up the CB 2500. Server blades and modules have connectors for connecting external devices and networks and indicators that indicate operation status. This chapter also describes these connectors and indicators.

- ☐ Appearance of the server chassis
- ☐ Appearance of the server blade
- ☐ Appearance of the I/O board module
- ☐ Appearance of the management module
- ☐ Appearance of the management LAN module
- ☐ Appearance of the switch module
- ☐ Appearance of the power supply module
- ☐ Appearance of the fan module

Appearance of the server chassis

The CB 2500 server chassis has slots in which server blades and various modules are installed, and is the core hardware for the system unit. This section provides the appearance of the server chassis and describes the locations and numbers of slots in which server blades and modules are installed. This section also describes the ID tag for identifying the server chassis.

Server chassis and the locations where modules are installed

Install server blades and modules in predetermined slots on the front or rear of the server chassis. The following figures show the locations where server blades and modules are installed, for the front and rear sides of the server chassis.

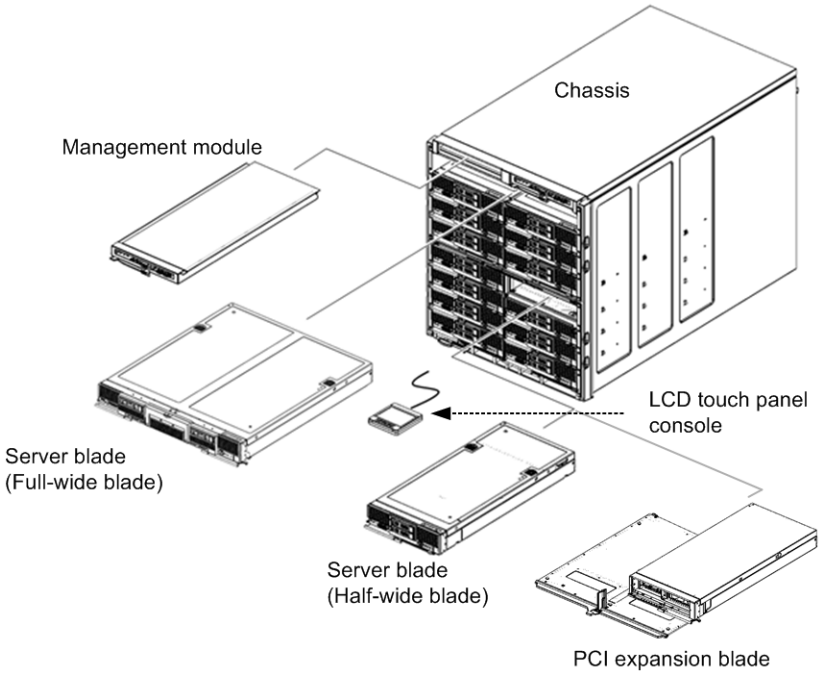


Figure 2-1 Server chassis (front side) and modules

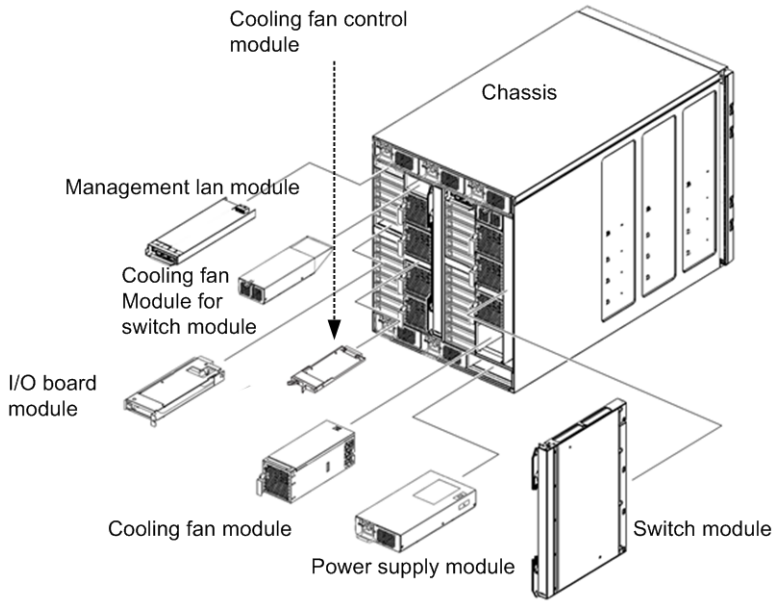


Figure 2-2 Server chassis (rear side) and modules

ID tag of the server chassis

The server chassis has an ID tag for identifying the unit. The ID tag shows the model name, serial number, relevant version, and C13 PDU support feature information.

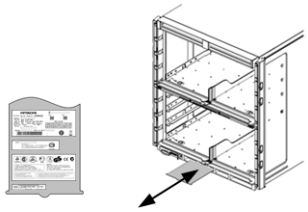


Figure 2-3 ID tag of the server chassis

Slots and location tags of the server chassis

Install server blades and management modules in appropriate slots on the front of the server chassis. Install I/O board modules, switch modules, power supply modules, fan modules, and management LAN modules in appropriate slots on the rear of the server chassis. The server blade chassis has location tags for identifying slots and slot numbers. This section describes the slots in which server blades and modules are installed and the location tags.

The following figure shows slots and their slot numbers on the front of the server chassis.

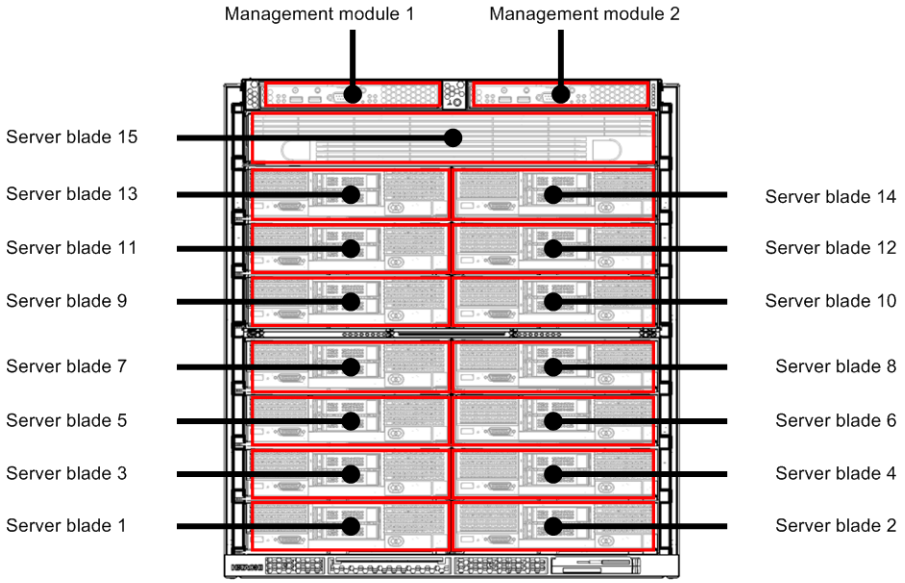


Figure 2-4 Slots on the server chassis (front side)

The following figures show slots and their slot numbers on the rear of the server chassis.

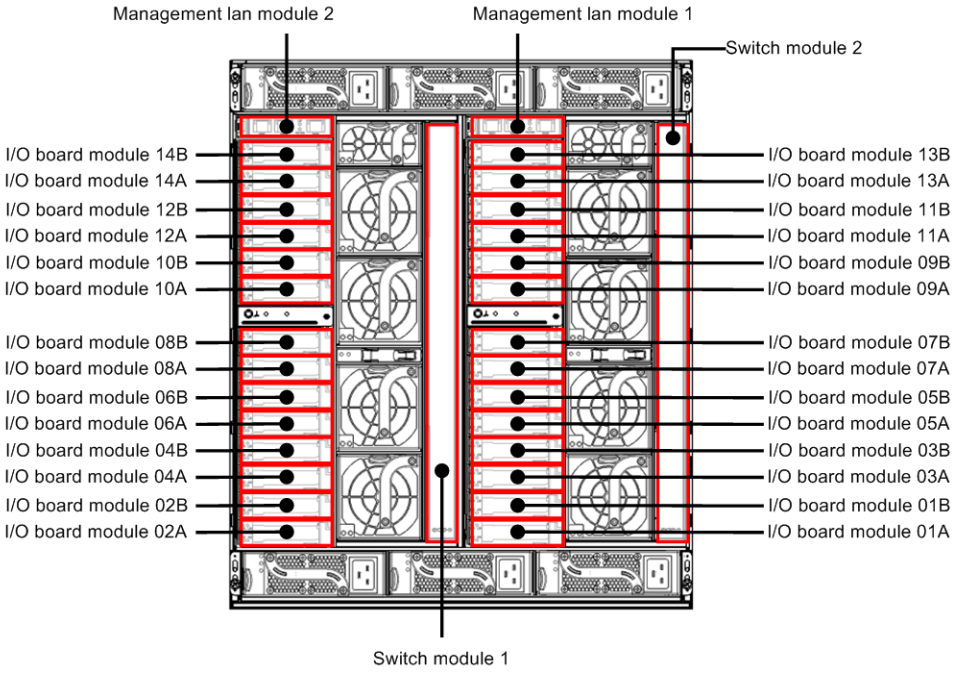


Figure 2-5 Slots on the server chassis (rear side 1)

Tip: One PCI expansion blade is always used in combination with one half-wide blade. Therefore, when a PCI expansion blade is used, half-wide blades are installed in odd-numbered slots, PCI expansion blades are installed in even-numbered slots, and then each blade is connected to a corresponding I/O adapter.

System fan modules are installed in fan module slots 1 to 4 and 6 to 9. Switch fan modules are installed in fan module slots 5 and 10.

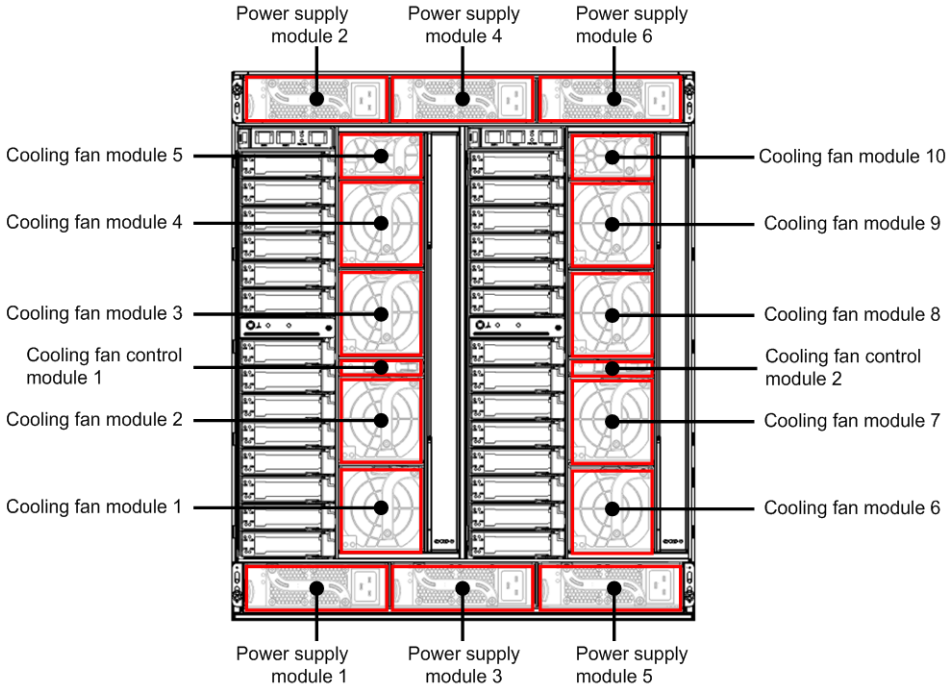


Figure 2-6 Slots on the server chassis (rear side 2)

You can check the relationship between the locations of slots and identification IDs on location tags.

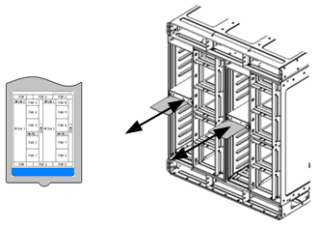


Figure 2-7 Location tag

Appearance of the server blade

The server blades supported by the CB 2500 have an indicator that shows the operational status of connectors and server blades connected to external devices. This section describes the appearance, connectors, and indicators of the server blade.

Appearance of a full-wide blade

A full-wide blade has slots for installing HDDs and SSDs, as well as connectors for connecting external devices. It also has indicators to show the operational status of the server blade. The appearance of a full-wide blade is shown below.

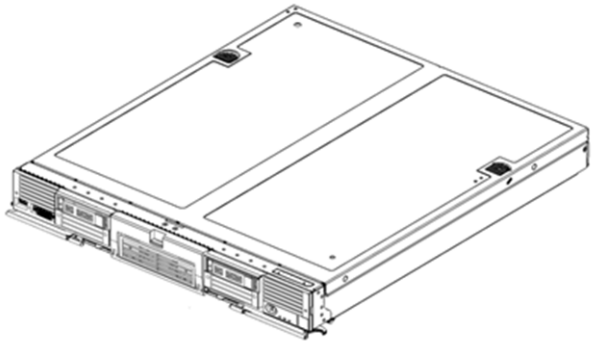


Figure 2-8 Full-wide blade

Each full-wide blade has an ID tag for identifying the unit. The ID tag shows the model name, serial number, and relevant version information.

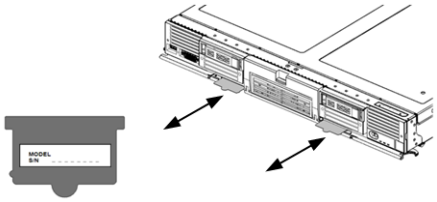


Figure 2-9 ID tag of a full-wide blade

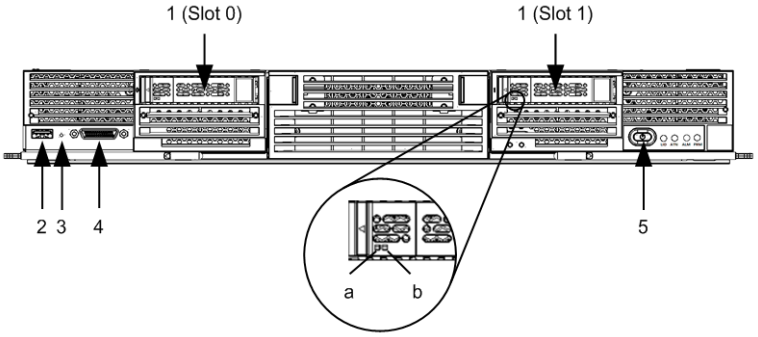


Figure 2-10 Switch and connector of a full-wide blade

1. HDD slot 0, 1
   These are slots for installing HDDs on the server blade.

Table 2-1 When an SAS HDD or SAS SSD is mounted

Symbol	Name	State	Description
1	Active lamp	Green light on	The drive is idle.
		Flashing green	The drive is running or is being accessed. The drive is being rebuilt (source drive).
2	Fault lamp	Orange light on	An error occurred on the drive. [1]

Symbol	Name	State	Description
		Flashing orange	The drive is being rebuilt (target drive).

Notes:

1. After the power is turned on, this lamp might turn on. This state occurs during the initialization process, and does not indicate a problem if the light turns off after about one minute. If the lamp does not turn off, contact your reseller or call maintenance personnel.

2. USB port

   These ports are for mounting USB devices.

3. NMI reset switch

   This switch resets the server blade. An NMI is issued for the operating system running on the server blade.

4. KVM

   A KVM port. By connecting an optional KVM cable, VGA output and a serial port and USB port are available.

5. Power switch

   This is the power switch of the server blade. Use this switch to manually power on or power off the server blade. To force the operating system on the server blade to shut down, press and hold this power switch for more than 4 seconds, which turns the power off. Never press the power switch when the operating system on the server blade is running correctly. If you do so, the operating system might not start or data might be corrupted.

   This power switch has a green LED to indicate the power and operation statuses. The behavior of the LED in relation to the operational status of the server blade is as shown below.

   - Fast flashing

     The server blade was inserted into the server chassis for the first time, and the BMC of the server blade is being initialized.

   - Slow flashing

     The BMC has been initialized and the server blade has been powered off.

   - Light on

     The server blade is powered on.

   - Light off

     The server blade is powered off.

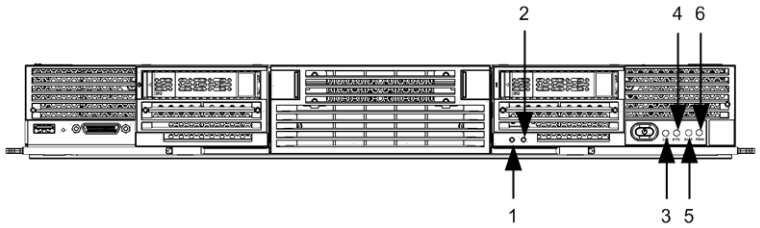


Figure 2-11 Indicators on a full-wide blade (front)

1. ERR SMP LED (yellow LED)
   In an SMP configuration, this LED lights up if an error occurs in a QPI link.
2. LNK SMP LED (green LED)
   In an SMP configuration, this LED lights up if a QPI link is linked up.
3. LID LED (blue LED)
   This LED identifies the server chassis. You can use the management module to control the behavior of this LED. When conducting maintenance on the server blade, you can check this LED to identify the relevant unit. If the BMC of the server blade is being initialized, the LED flashes when the management module commands the LED to light up.
4. ATN LED (yellow LED)
   This LED lights up in the following cases:
   - The PCI Express adapter is not compatible with the bus speed of the server blade.
   - Even though the ON switch was pressed, no power is going to the server blade.
   - The server blade detected another failure with an unknown cause.
5. ARM LED (yellow LED)
   This LED lights up when hardware in the server blade needs to be replaced.
6. PRM LED (white LED)
   This LED lights up when the server blade is set as the primary server blade.

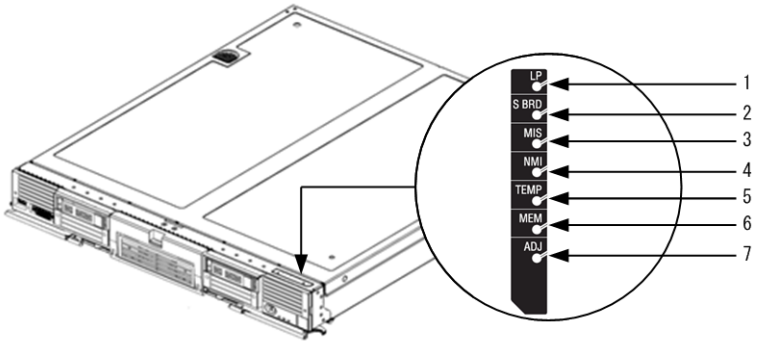


Figure 2-12 Indicators on a full-wide blade (top)

These LEDs are the Diagnostic Panel, which provides notification of failures on the server blade.

1. LP LED (green LED)
   This LED lights up when the Diagnostic Panel is enabled.
2. S BRD LED (orange LED)
   This LED lights up when the motherboard needs to be replaced.
3. MIS LED (orange LED)
   This LED lights up when an unsupported combination is detected among the mounted CPU, DIMM, and HDD.
4. NMI LED (orange LED)
   This LED lights up when an NMI is issued.
5. TEMP LED (orange LED)
   This LED turns up when the temperature of the server blade exceeds the limit.
6. MEM LED (orange LED)
   This LED lights up when a memory failure is detected.
7. ADJ LED (orange LED)
   This LED lights up when a failure is detected on the server blade.

Appearance of a half-wide blade

A half-wide blade has slots for installing HDDs and SSDs, as well as connectors for connecting external devices. It also has indicators to show the operational status of the server blade. The appearance of a half-wide blade is shown below.

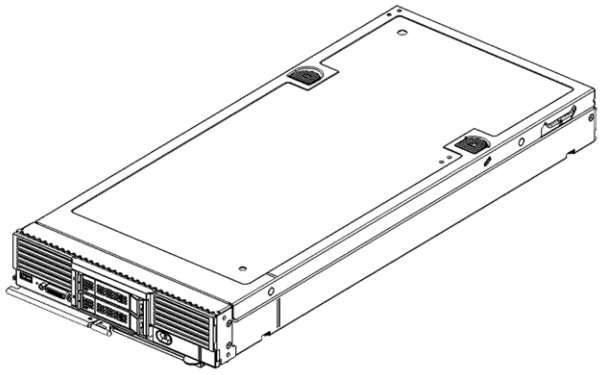


Figure 2-13 Half-wide blade

Each half-wide blade has an ID tag for identifying the unit. The ID tag shows the model name, serial number, and relevant version information.

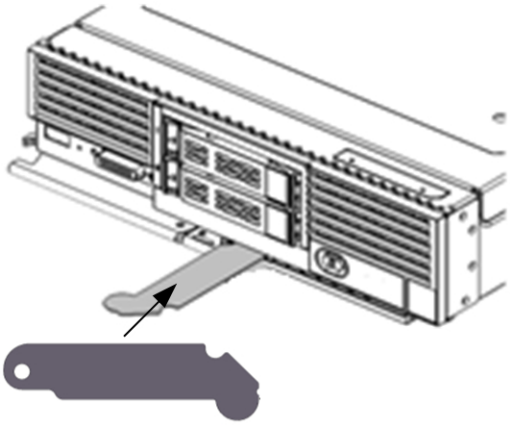


Figure 2-14 ID tags of half-wide blades

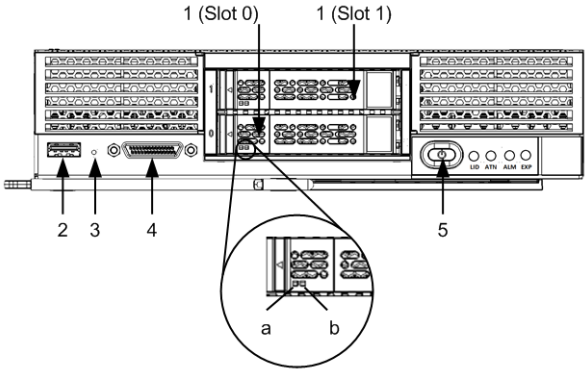


Figure 2-15 Switch and connector of a half-wide

1. HDD slots 0 and 1
   These are slots for installing HDDs on the server blade.

Table 2-2 When an SAS HDD or SAS SSD is mounted

Symbol	Name	Status	Description
1	Active lamp	Green light on	The drive is idle.
		Flashing green	The drive is running or is being accessed. The drive is being rebuilt (source drive).
2	Fault lamp	Orange light on	An error occurred on the drive. [1]
		Flashing orange	The drive is being rebuilt (target drive).

Notes:

1. After the power is turned on, this lamp might turn on. This state occurs during the initialization process, and does not indicate a problem if the light turns off after about one minute. If the lamp does not turn off, contact your reseller or call maintenance personnel.

2. USB port

   These ports are for mounting USB devices.

3. NMI reset switch

   This switch resets the server blade. An NMI is issued for the operating system running on the server blade.

4. KVM

   A KVM port. By connecting an optional KVM cable, VGA output and a serial port and USB port are available.

5. Power switch

   This is the power switch of the server blade. Use this switch to manually power on or power off the server blade. To force the operating system on the server blade to shut down, press and hold this power switch for more than 4 seconds, which turns the power off. Never press the power switch when the operating system on the server blade is running correctly. Executing this command might cause the operating system to not start or result in corrupted data.

   This power switch has a green LED to indicate the power and operation statuses. The behavior of the LED in relation to the operational status of the server blade is as shown below.

   - Fast flashing

     The server blade was inserted into the server chassis for the first time, and the BMC of the server blade is being initialized.

   - Slow flashing

     The BMC has been initialized and the server blade has been powered off.

   - Light on

     The server blade is powered on.

   - Light off

     The server blade is powered off.

   Release the button when the state of the power switch LED changes from solid to flashing. If you press the power switch for six seconds or longer, the server blade might be powered on after the forced termination.

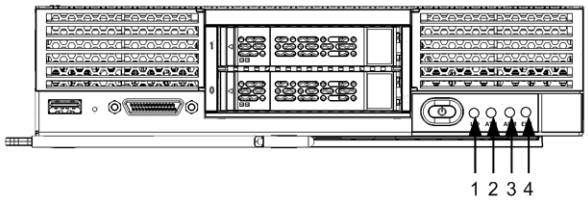


Figure 2-16 Indicators on a half-wide blade (front)

1. LID LED (blue LED)

   This LED identifies the server chassis. You can turn this LED on or off from the management module. When conducting maintenance on the server blade, you can check this LED to identify the relevant unit. If the BMC of the server blade is being initialized, the LED flashes when the management module commands the LED to light up.

2. ATN LED (orange LED)
   This LED lights up in the following cases:
   - The mezzanine card is not compatible with the switch module.
   - The PCI Express adapter is not compatible with the bus speed of the server blade.
   - Even though the ON switch was pressed, no power is going to the server blade.
   - The server blade detected another failure with an unknown cause.
3. ARM LED (orange LED)
   This LED lights up when hardware in the server blade needs to be replaced.
4. EXP LED (orange LED)
   This LED lights up when optional parts in the server blade need to be replaced.

Appearance of a PCI expansion blade

A PCI expansion blade has slots that are used to install one or more I/O adapters. The following figure shows the appearance of a PCI expansion blade.

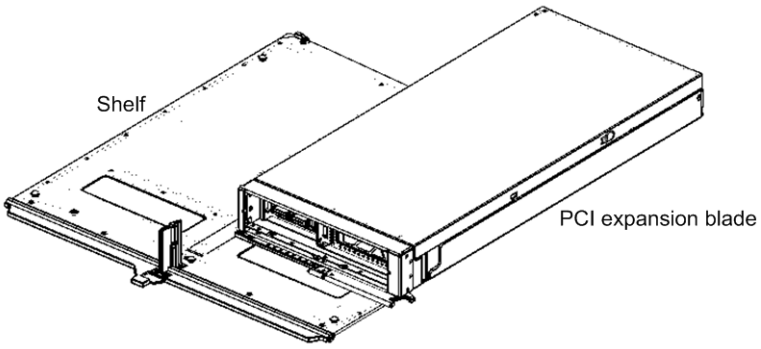


Figure 2-17 PCI expansion blade

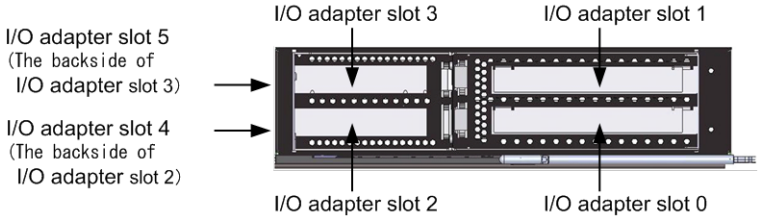


Figure 2-18 Slots of a PCI expansion blade

Depending on the model, you can install one I/O adapter (x16) or two I/O adapters (x8) in I/O adapter slots 0 and 1. In addition, in I/O adapter slots 2 to 5, two I/O adapters (x8) or four I/O adapters (x4) can be installed.

About network devices installed in a server blade

This section describes the connections between onboard LANs or mezzanine cards installed on the server blade, and switch modules or I/O board modules.

Network device ports and connection-destination switch modules

The table below lists network devices mounted on the server blade and connected switch module ports. Note that you cannot connect a server blade installed in slot 15 to a switch module.

Table 2-3 Onboard LAN or mezzanine card and 1/10Gb LAN switch module or Brocade 10Gb DCB switch module(CB 520X B1/CB 520H B3/B4)

Network devices mounted on the server blade and installation locations[1]	Physical port number[2]	PCI bus number	Function	Switch module of the connection destination
Broadcom 1Gb 4-port Mezzanine card slot 1	1	8(08h)[3]	0	Switch module 1
	2		1	Switch module 2
	3		2	Switch module 1
	4		3	Switch module 2
Onboard LAN	1	CB 520X B1: 133(85h)[4] CB 520H B3/B4: 7(07h)	0	Switch module 1
	2		1	Switch module 2
	3		2	Switch module 1
	4		3	Switch module 2

Notes:

1. Mezzanine card slot 3 is not supported.
2. A physical port number that actually exists in the system
3. In an SMP configuration, the PCI bus number changes as shown below. Note that SMP configurations support only CB 520X B1 server blades.
   - 2-blade SMP configuration
     Node #1: 8(08h)
     Node #2: 136(88h)
   - 4-blade SMP configuration
     Node #1: 8(08h)
     Node #2: 72(48h)
     Node #3: 136(88h)
     Node #4: 200(C8h)
4. In an SMP configuration, the PCI bus number changes as shown below. Note that SMP configurations support only CB 520X B1 server blades.
   - 2-blade SMP configuration
     Node #1: 69(45h)
     Node #2: 197(C5h)

Network devices mounted on the server blade and installation locations[1]	Physical port number[2]	PCI bus number	Function	Switch module of the connection destination
∘ 4-blade SMP configuration Node #1: 37(25h) Node #2: 101(65h) Node #3: 165(A5h) Node #4: 229(E5h)				

Table 2-4 Onboard LAN or mezzanine card and 1/10Gb LAN switch module or Brocade 10Gb DCB switch module (CB 520X B2/B3)

Network devices mounted on the server blade and installation locations	Physical port number[1]	PCI bus number	Function	Switch module of the connection destination
Broadcom 1Gb 4-port Mezzanine card slot 1	1	8(08h)[2]	0	Switch module 1
	2		1	Switch module 2
	3		2	Switch module 1
	4		3	Switch module 2
Broadcom 1Gb 4-port Mezzanine card slot 3	1	129(81h)[2]	0	Switch module 1
	2		1	Switch module 2
	3		2	Switch module 1
	4		3	Switch module 2
Onboard LAN	1	9(09h)[3]	0	Switch module 1
	2		1	Switch module 2
	3		2	Switch module 1
	4		3	Switch module 2

Notes:

1. A physical port number that actually exists in the system
2. In an SMP configuration, the PCI bus number changes as shown below. Note that SMP configurations support only CB 520X B2/B3 server blades.
   - ∘ 2-blade SMP configuration

     Node #1

     Mezzanine card slot #1: 8(08h)

     Mezzanine card slot #3: 65(41h)

     Node #2

     Mezzanine card slot #1: 136(88h)

Network devices mounted on the server blade and installation locations	Physical port number[1]	PCI bus number	Function	Switch module of the connection destination
Mezzanine card slot #3: 193(C1h) ◦ 4-blade SMP configuration Node #1 Mezzanine card slot #1: 8(08h) Mezzanine card slot #3: 33(21h) Node #2 Mezzanine card slot #1: 72(48h) Mezzanine card slot #3: 97(61h) Node #3 Mezzanine card slot #1: 136(88h) Mezzanine card slot #3: 161(A1h) Node #4 Mezzanine card slot #1: 200(C8h) Mezzanine card slot #3: 225(E1h) 3. In an SMP configuration, the PCI bus number changes as shown below. Note that SMP configurations support only CB 520X B2/B3 server blades. ◦ 2-blade SMP configuration Node #1: 9(09h) Node #2: 137(89h) ◦ 4-blade SMP configuration Node #1: 9(09h) Node #2: 73(49h) Node #3: 137(89h) Node #4: 201(C9h)				

Appearance of the I/O board module

An I/O board module has a slot for mounting a PCI Express adapter. The I/O board module also has an indicator to show the operational status of the module. If you wish to mount a PCI Express adapter on the I/O board module, the expansion board must support the Low Profile form factor. The appearance of the I/O board module is shown below.

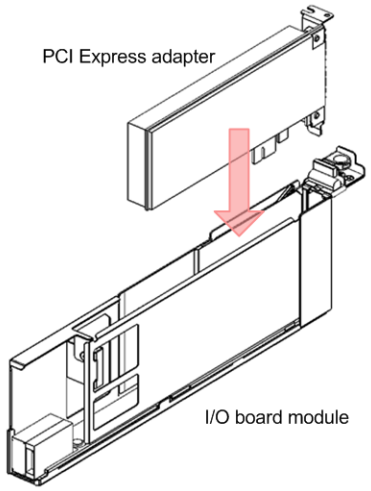


Figure 2-19 I/O board module and PCI Express adapter appearance

The I/O board module has some indicators. The indicators on the I/O board module are as described below.

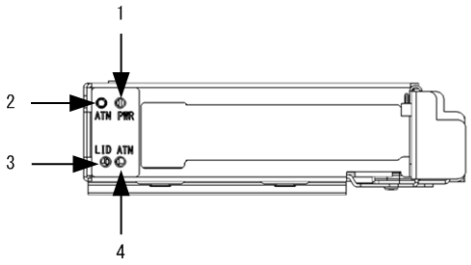


Figure 2-20 I/O board module indicators

1. PWR LED

   This LED lights up when the PCI Express adapter mounted on the I/O board module is live.

2. ATN switch

   Use this switch to power on the PCI Express adapter mounted on the I/O board module.

3. LID LED

   This LED identifies the I/O board module. You can turn this LED on or off from the management module. You can use this LED to easily identify the location of the target I/O board module.

4. ATN LED

   This LED lights up if a failure occurs in the I/O board module or on the mounted PCI Express adapter.

Mezzanine card installation locations and corresponding I/O board modules

- PCI Express path-through mezzanine cards installed in mezzanine card slots 2 and 4 of a full-wide blade correspond to the PCI Express adapters mounted on an I/O board module.
- The table below lists the slot numbers of a full-wide blade, and the corresponding slot numbers of an I/O module.

Table 2-5 Full-wide blade slot numbers and corresponding I/O board module slot numbers

Full-wide blade slot number	Installation number of mezzanine cards	Corresponding I/O board module slot number
1	2	01A, 01B
	4	02A, 02B
3	2	03A, 03B
	4	04A, 04B
5	2	05A, 05B
	4	06A, 06B
7	2	07A, 07B
	4	08A, 08B
9	2	09A, 09B
	4	10A, 10B
11	2	11A, 11B
	4	12A, 12B
13	2	13A, 13B
	4	14A, 14B
15	This slot location cannot be connected to an I/O board module.	

- A PCI Express path-through mezzanine card installed in mezzanine card slot 2 of a half-wide blade corresponds to the PCI Express adapters mounted on slot numbers *xx*A and *xx*B of an I/O board module. *xx* in *xx*A and *xx*B corresponds to the slot number on which the half-wide blade is mounted.

Appearance of the management module

The management module has a serial connector for directly connecting it to the system console, as well as USB ports for connecting USB devices. The management module also has an indicator to show its operational status. The appearance of the management module is shown below.

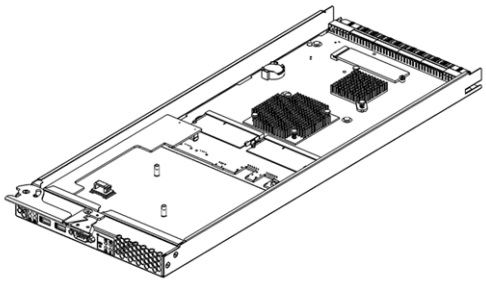


Figure 2-21 Management module

The switches, indicators, and connectors of the management module are described below.

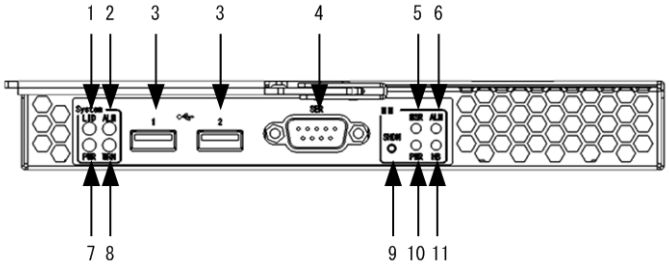


Figure 2-22 Switches, indicators, and connectors on the management module

1. System LID LED

   This LED identifies the management module. You can turn this LED on or off from the Web console or HCSM. You can use the LED to easily identify the location of the target management module.

2. System ALM LED

   This LED provides notification of failures on the server chassis. The LED lights up when a failure occurs on the server chassis. On the standby management module, this LED is always off.

3. USB port 1, 2

   These ports connect USB devices to the management module. You can connect an LCD touch console, USB memory, or a DVD drive. Other USB devices are not supported. USB ports 1 & 2 provide up to 2A of current. With these ports, you must use a USB memory device or DVD drive that draws 2A or less.

4. Serial port

   This port connects the management module to the system console via a serial cable. When the management LAN is unavailable, this port can be used as an alternative connection.

5. MM MSR LED

   This LED lights up when the management module is running as the Active system. The standby management module remains switched off.

6. MM ALM LED

   This LED lights up when a failure occurs on the management module.

7. System PWR LED

   The lights of this LED signify the following statuses:

   - Green light ON: One or more server blades are powered on.
   - Flashing green: All server blades are shutting down.
   - Yellow light ON: All server blades have been powered off.
   - Flashing yellow: The system unit is initializing: for example, after the server chassis has been powered on.
   - OFF: The server chassis is powered off.

   On the standby management module, this LED is always off.

8. System WRN LED

   This LED lights up when an error occurs on a server blade or module in the system unit. On the standby management module, this LED is always off.

9. MM SHDN switch

   Use this switch to power off the management module. To power off the management module, press and hold this switch for at least four seconds.

10. MM PWR LED

    The lights of this LED signify the following statuses:

    - Green light ON: The management module is powered on.
    - Flashing green: The management module is being started or shut down.
    - OFF: The management module is powered off.

11. MM HB LED

    This LED flashes green when the management module is running.

Appearance of the management LAN module

The management LAN module has connectors for connecting with the management LAN and indicators to show the status of the management LAN module itself. The management LAN module and the management module are connected via the backplane.

The appearance of the management LAN module is shown below.

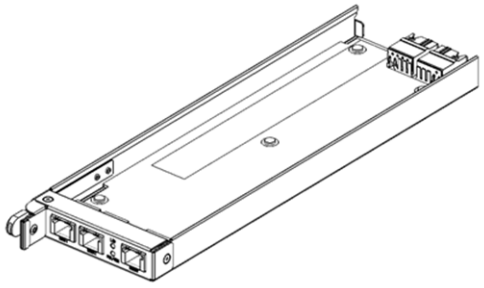


Figure 2-23 Management LAN module

The connectors and indicators on the management LAN module are described below.

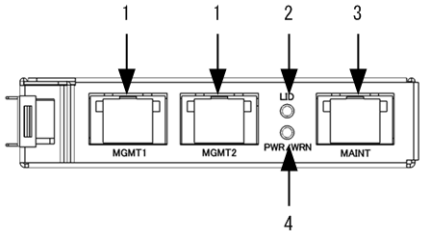


Figure 2-24 Management LAN module connectors and indicators

1. MGMT1 port, MGMT2 port#

   LAN port for connecting to the management LAN. There are two LEDs next to the port.

   - The LED on the left lights up when a link to the network is established.
   - The LED on the right flashes when the module is communicating via the network.

   #

   The MGMT2 port cannot be used.

2. LID LED

   This LED identifies the management LAN module. You can turn this LED on or off from the Web console. You can use this LED to easily identify the location of the target management LAN module.

3. MAINT port

   This port is used exclusively by maintenance personnel when maintaining the system unit. Users cannot use this port.

4. PWR/WRN LED

   The lights of this LED signify the following statuses:

   - Green light ON: The management LAN module is running correctly.
   - Flashing green: A failure has occurred on the management LAN module.
   - OFF: The management LAN module is powered off.

Appearance of the switch module

The switch module has connectors for connecting the system unit to external networks and indicators to show the status of the switch module itself. This section describes the appearance, connectors, and indicators for each switch module supported by the CB 2500.

1/10Gb LAN switch module

The appearance of the 1/10Gb LAN switch module is shown below.

Figure 2-25 1/10Gb LAN switch module

The connectors and indicators of the 1/10Gb LAN switch module are described below.

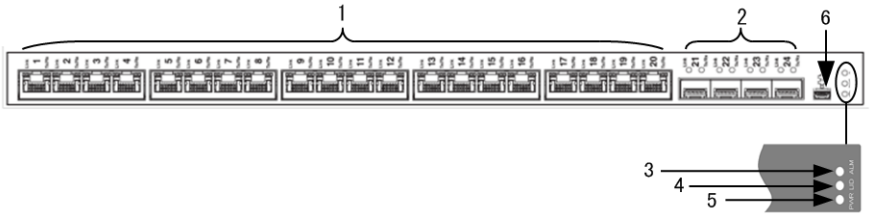


Figure 2-26 Connectors and indicators of the 1/10Gb LAN switch module

1. 1 Gb uplink ports 1 to 20

   These LAN ports connect to external networks. There are two LEDs next to each port.

   - The LED on the left(Link) lights up when a link to the network is established.
   - The LED on the right(Tx/Rx) flashes when the module is communicating via the network.

2. 10 Gb uplink ports 21 to 24

   These LAN ports connect to external networks. There are two LEDs next to each port.

   - The LED on the left(Link) lights up when a link to the network is established.
   - The LED on the right(Tx/Rx) flashes when the module is communicating via the network.

3. ALM LED

   This LED lights up when a failure occurs on the switch module.

4. LID LED

   This LED identifies the switch module. You can turn this LED on or off from the Web console. You can use this LED to easily identify the location of the target switch module.

5. PWR LED

   This LED lights up when the switch module is powered on. This LED is off when the switch module is powered off.

6. Mini USB port

This port connects USB devices used for management. This port only accepts devices that are exclusive to this switch module.

Appearance of the Brocade 10Gb DCB switch module

The appearance of the Brocade 10Gb DCB switch module is shown below.

Figure 2-27 Brocade 10 Gb DCB switch module

The connectors and indicators of the Brocade 10Gb DCB switch module are described below.

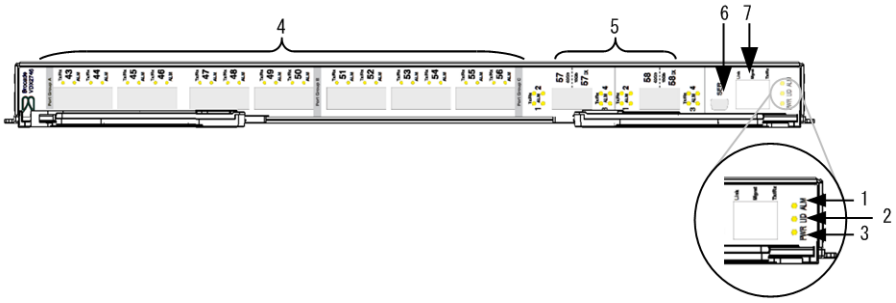


Figure 2-28 Connectors and indicators of the Brocade 10Gb DCB switch module

1. ALM LED

   This LED lights up when a failure occurs on the switch module.

2. LID LED

   This LED identifies the switch module. You can turn this LED on or off from the Web console. You can use this LED to easily identify the location of the target switch module.

3. PWR LED

   This LED lights up when the switch module is powered on. This LED is off when the switch module is powered off.

4. SFP+ port (Trunk group A/B)

   These are optical transceiver ports for connecting to an external network. Ports that support SFP+ are classified into two Trunk groups. SFP+ ports 43 to 50 belong to Trunk group A and SFP+ ports 51 to 56 belong to Trunk group B.

   There are two LEDs next to each port.

   - The LED on the upper left(TX/RX) lights up green when a link to the network is established.

The LED flashes green when the port is communicating via the network.

- The LED on the upper right(ALM) lights up yellow when a failure occurs on the port.

5. QSFP port (Trunk group C)

   These optical transceiver ports connect to an external network. QSFP ports 57 to 58 belong to Trunk group C.

   There are two LEDs beside the connector slot.

   - The LED on the upper left(TX/RX) lights up green when a link to the network is established.

     The LED flashes green when the port is communicating via the network.

   - The LED on the upper right(ALM) lights up yellow when a failure occurs on the port.

6. Mini USB port

   This port connects USB devices used for management. This port accepts external PC via cables, which can control this switch module.

7. Ethernet port

   This port is LAN port for Ethernet.

   There are two LEDs beside the connector slot.

   - The LED on the upper left(TX/RX) lights up green when a link to the network is established.

     The LED flashes green when the port is communicating via the network.

   - The LED on the upper right(ALM) lights up green when the communication speed of the port is 100 Mbps or 1000 Mbps. This LED stays off when the communication speed of the port is 10 Mbps.

Appearance of the power supply module

The power supply module has a connector for connecting the AC power cable, as well as indicators to show the status of the power supply module itself. The appearance of the power supply module is shown below.

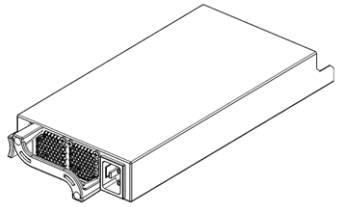


Figure 2-29 Power supply module

The connectors and indicators of the power supply module are described below.

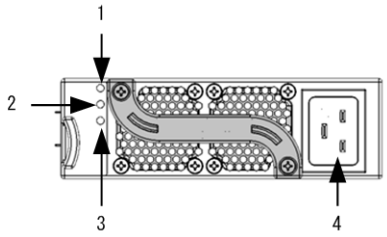


Figure 2-30 Power supply module connector and indicators

1. ALM LED

   The lights of this LED signify the following statuses:

   - Orange light ON: The power supply module is in one of the following states:
     - The voltage exceeded the prescribed level.
     - There is insufficient voltage due to a reason other than an overcurrent.
     - The module has reached an abnormally high temperature.
     - A fan in the power module failed.
     - A failure occurred in the power module due to a reason other than the above.
   - Flashing orange: A command from the system unit is being executed.
   - OFF: The power supply module is running correctly.

2. OUT LED

   The lights of this LED signify the following statuses:

   - Green light ON: The prescribed power is being correctly supplied from the power supply module to the system unit.
   - Fast flashing green: The firmware is being updated.
   - Slow flashing green: The power of the server chassis is being turned off.
   - OFF: Power is not being supplied to the system unit.

3. IN LED

   This LED lights up when the module is supplying sufficient power to run the system unit. The LED is off if the power supply module is not receiving any power, for example, when the module is not connected to an AC power supply.

4. IEC60320/C20 inlet

   This is an IEC60320/C20-compliant connector.

Appearance of the fan module

Fan modules have indicators to show their operational statuses. The connectors and indicators of the fan module are described below.

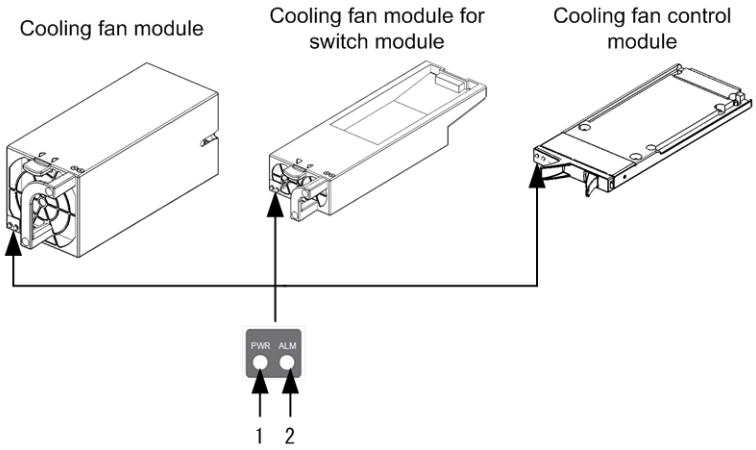


Figure 2-31 Fan module indicators

The indicators of the fan module are described below.

1. PWR LED
   This LED lights up when the fan module is powered on.
2. ARM LED
   This LED lights up when a failure occurs on the fan module.

3

Starting the CB 2500 and Performing Initial Setup

This chapter describes the initial setup that is required from installation of the system unit to powering on the server blades.

- ☐ Connecting the system unit to the power supply
- ☐ Preparing the system console used for configuring the settings of the CB 2500
- ☐ Setting the network for the server blades and modules
- ☐ Preparing the server blades so that they can operate in LP mode
- ☐ Powering on the server blade
- ☐ Resetting the power of the server blade
- ☐ Restarting the BMC of a server blade
- ☐ Setting the UEFI of a server blade

Connecting the system unit to the power supply

In the basic configuration, connect the power cable of the server chassis to the power outlet on the receptacle box. The system unit of the CB 2500 requires a normal rated power supply of 20 A/200-240 V. Each power module requires a single power cable.

CAUTION:

- For safety, always ask maintenance personnel to plug the power cable into the power outlet or to unplug it.
- Do not connect the C19 - C14 power cable to the server chassis without the C13 PDU support feature.

Workflow for connecting the system unit to the power supply

The procedure from supplying electricity to the system unit to powering it on is as follows:

1. Connect the server chassis to the power supply.
   For safety, always ask maintenance personnel to plug the power cable into the power outlet or to unplug it.
   The management module automatically starts first, followed by the switch module.
2. Ensure the management module and switch module start normally.
   The indicators on the management module and the switch module show the startup status of each module.
3. Press the power switch for the server blades.
   Electricity is supplied to the server blades and they power on. Check the indicators of the server blades to make sure electricity is being supplied to them normally.

Related topics

- Appearance of the server blade on page 2-5
- Appearance of the management module on page 2-17
- Appearance of the switch module on page 2-20

Preparing the system console used for configuring the settings of the CB 2500

To use the system console to manage the system unit, you must configure the Web browser that is used to display the consoles and configure the network that is used to connect to the management LAN. This section describes the preparation for using the system console to manage the system unit.

Setting the Web browser used to display the Web console

This section describes the settings of the web browser when using the web console from the web browser. When using CB2500 Web Console Client, this operation is not necessary.

The console window of the Web console is displayed via the Web browser installed on the system console. Ensure the following options are set in the environmental settings of the Web browser that is used to display the console window.

- Disable the pop-up blocker so that the pop-ups used by the Web console will not be blocked by the Web browser.

  The Web console will not function correctly if the pop-up blocker is enabled.
- Enable cookies.

  Cookies are used when you log in to the management module via the Web console. If cookies are disabled, you will not be able to log in to the management module.
- Add the destination module IP address to **Trusted site**. Otherwise, the connection may be refused.

For details on how to set the options of your web browser, see the manual or the online Help of the Web browser.

Connecting the system console to the management module

To connect the system unit to the management LAN, you must first change the network information of the management module from the initial settings (the settings at shipping time). Before changing the settings of the management module, connect the system console to the management module. Use either of the following methods to connect the system console and the management module.

The procedure differs depending on IPv4 address assign mode which determines whether IP address is assigned manually or via DHCP. With management module firmware earlier than A0165, IPv4 address assign mode is Static (which means IP address is set manually). With management module firmware A0165 or later, you can set IPv4 address assign mode to Static or DHCP. (The default setting is Static and it can be changed to DHCP when the system unit is shipped if specified by a customer.)

You can check and modify IPv4 address assign mode by using `show mgmt-module mgmt-lan` and `set mgmt-module mgmt-lan` commands. You can use the serial port of the management module to log in to CLI console. For more information of those commands, see the manual *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Connecting using a LAN cable

- If IPv4 address assign mode is Static, do the following:

Use a LAN cable to directly connect the LAN port of the system console to the MGMT1 port of the management LAN module. If you use the LPAR manager functionality, specific network cabling that connects the system unit to the management LAN is required.

When connecting the system console to the MGMT1 port of the management LAN module, of the two management modules, connect to the one that is operating as the active system. You can identify the management module that is operating as the active system by the MM MSR LED on the management modules.

For the connection, use a LAN cable of category 5 or higher. You can use either a straight-through cable or a crossover cable. The communication rate of the LAN port for the system console is selected automatically.

- If IPv4 address assign mode is DHCP, do the following:

  Use a LAN cable to connect MGMT1 port of the management LAN module to the external management LAN. The active management module and server blade BMCs will request IP address and subnet mask via DHCP. You can check the IP addresses assigned to the management module and server blade BMCs by either the following means.

  - When the management module and server blade BMC requests IP address, they send their hostnames to the DHCP server. You can check the hostnames in the logs of the DHCP server to know which IP address is assigned to those modules. The default hostname is a string like the following.

    Management module:

    323GG-RE4xxxxxx-Yxxxxxxxx

    Server blade BMC:

    323GG-RV3xxxxxxxx-Yxxxxxxxx

  - Use the serial port of the management module to log in to CLI console and run `show mgmt-module mgmt-lan` and `show blade mgmt-lan` commands to show the IP addresses.

Connecting by using an RS232C cable

Use a generic RS232C cable to connect the serial port of the management module to that of the system console.

Management LAN when LPAR manager is used

If you use LPAR manager, you need to configure the setting so that the management module and LPAR manager can communicate through the management LAN. This section describes the management LAN when the LPAR manager functionality is used.

- Connect the MGMT1 port of the management LAN module to the management LAN.
- Connect the MGMT1 port of the standby management LAN module to the management LAN in case a failure occurs in the active management module or management LAN module.

- Connect the network device used by LPAR manager for management communications, to the management LAN. See the related topics for more information.

Related topics

- The manual *Hitachi Compute Blade 2500 Series Logical partitioning manager User Guide*

Setting the network information of the system console

Normally, the system console is connected to the system unit via the management LAN network. Before using the system console to manage the system unit, you must configure the IP address, subnet mask, default gateway, and other settings to enable communication with the management LAN.

The network settings for the system console differ depending on the OS of the PC that is used as the system console. See the manual of the OS for information on configuring the network settings.

Setting the network for the server blades and modules

After connecting the system console and system unit, configure the network environment of the management module, server blades, and switch modules that constitute the system unit.

To configure the network environment of the server blades and modules, connect to the management module web console from the system console. The workflow for the configuration is as follows:

1. Log in to the management module.
2. Change the login password of the management module.
3. Set the chassis ID of the server chassis.
4. Change the network addresses of the management module, server blades, and switch modules.

After completing these settings, connect the system unit and the system console to the management LAN, and start operation.

This manual describes only the minimum settings required for the system unit when installing it for the first time. For detailed information on configuring other settings and operations via the management module, see the manual *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Related topics

- The manual *Hitachi Compute Blade 2500 Series Management Module User Guide*

Logging in to the management module

The procedure for logging in to the management module is described below.

The URL, user ID, and password used for logging in to the management module in the following procedure are the initial setting values (the values at shipping time). If you have changed the initial settings (the settings at shipping time), use the new values to log in.

1. When using the web console from the web browser, start a browser on the system console, and access the following URL.

   If IPv4 address assign mode is Static:

   https://192.168.0.1/

   If IPv4 address assign mode is DHCP:

   https://<IPv4 address assigned via DHCP>/

   When using the web console client, enter the following management module IP address and the port number to connect with https ("443") in the CB2500 Web Console Client, and click the connect button.

   If IPv4 address assign mode is Static:

   192.168.0.1

   If IPv4 address assign mode is DHCP:

   <IPv4 address assigned via DHCP>

   The management module opens and the login window of the Web console is displayed. If you have changed the IP address of the management module, enter the new IP address. Note that the port numbers used for communication with the management module are 80 for http and 443 for https. Both of these are the initial settings (the settings at shipping time).
2. In the login window of the Web console, enter the following values in the **User ID** and **Password** fields respectively, and then click the **Login** button.
   - **User ID**: administrator
   - **Password**: password

   When you have successfully logged in, the menu window of the Web console is displayed.

Changing the password used to log in to the management module

To ensure security, change the login password of the login user "administrator" from the initial settings (the settings at shipping time).

To do this, you must be logged in to the management module as "administrator".

1. In the global tab of the Web console, select the **Administration** tab.

   In the application area, the **User Account** view is displayed.
2. In the **User Account** view, select "administrator" and click the **Edit** button.

The **Edit Account** dialog box is displayed.

3. In the **Edit Account** dialog box, enter the new password in the **Password** field, and then enter the same password again in the **Retype Password** field.
4. In the **Edit Account** dialog box, click the **OK** button to change the password.

Setting the chassis ID of the server chassis

Set the chassis ID used to identify the server chassis. If you have installed more than one system unit, setting chassis IDs will help you to identify the system units easily.

To do this, you must be logged in to the management module as a user with Administrator privileges, such as "administrator".

1. In the global tab of the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. In the **Modules** tree view, select the **Chassis** icon.
   In the application area, the **Chassis Information** view is displayed.
3. In the **Chassis Information** view, select the **Settings** tab, and click the **Set the Chassis ID** button.
   The **Chassis Settings** dialog box is displayed.
4. In the **Chassis ID** field, type a chassis ID of your choice, and click the **OK** button.
   The chassis ID you entered is now set.

Changing the network addresses of the management module, server blades, and switch modules

If IPv4 address assign mode is Static, you need to change the network addresses of the management module, server blades, and switch modules from the initial settings (the settings at shipping time) to ones that comply with the network of the management LAN.

To do this, you must be logged in to the management module as a user with Administrator privileges, such as "administrator".

If IPv4 address assign mode is DHCP, IP address and subnet mask (and default gateway if configured) of management module and server blades are assigned via DHCP and you do not need to change those settings. You need to change the settings of switch modules manually.

1. In the global tab of the Web console, select the **Resources** tab.
   In the navigation area, the **System** tree view is displayed.
2. In the **System** tree view, click the **Management LAN** icon.
   In the application area, the **Management LAN** view is displayed.
3. In the **Management LAN** view, select the **IP Address** tab and click the **Edit** button.

The Set IP Address dialog box is displayed.

4. In the Set IP Address dialog box, enter the IP addresses for the management module and server blade in their respective fields.

   Complete the **IP Address**, **Subnet Mask**, and **Default Gateway** fields. Ensure that the IP addresses that you have entered will not conflict with the resources that you will connect to the management LAN network later.

5. In the Set IP Address dialog box, from the **Connection Type** drop-down list under the switch module field, select **Connect Directly from the Management LAN**.

   Now you can enter the IP address, subnet mask, and default gateway for the switch modules.

6. In the Set IP Address dialog box, enter the IP addresses in the fields of the switch modules.

   Complete the **IP Address**, **Subnet Mask**, and **Default Gateway** fields. Ensure that the IP addresses that you have entered will not conflict with the resources that you will connect to the management LAN network later.

   Repeat steps 5 and 6 for each of the switch modules installed on the system unit.

7. In the Set IP Address dialog box, click the **Confirm** button.

   A dialog box is displayed, prompting you to confirm the content of the settings. If the settings are correct, click the **OK** button.

Setting a user account for the LAN switch module

To manage the LAN switch module, it is recommended that you reset the default password for the user account of the switch (default ID is "admin") to ensure the security for the switch. To do this, follow the procedure described below.

1. Log in to the switch module.
2. Reset the password for the initial "admin" account.
3. Log out from the switch module.

To reset the default password for the switch, use the terminal software to access the management functionality of the LAN switch module.

Logging in to the switch module.

1. From the system console, open the terminal software.
2. In the terminal software, specify the IP address of the desired switch module and connect to the switch module.

   You use telnet or SSH (version2) for a connection protocol by default.

3. From the terminal software, access the management functionality of the switch module.
4. When the terminal software displays the prompt `login:` type `admin` and press **Enter**.

The following response is displayed:
`password:`

5. Type `admin` and press **Enter**.
   You are now successfully logged in.

Changing the password of the "admin" account

To ensure security, change the login password of the "admin" account from the initial settings (the settings at shipping time).

To do this, you must be connected and logged in to the switch module using the "admin" account via the terminal software.

1. At the prompt of the terminal software, type `enable` and press **Enter**.
   The prompt changes from `>` to `#`, indicating that the mode has been changed to administrator mode.
2. At the prompt of the terminal software, type `configure terminal` and press **Enter**.
   The mode is changed to the global configuration mode.
3. Type `access user administrator-password` and press **Enter**.
   The following response is displayed:
   `Enter current local admin password:`
4. Type `admin` and press **Enter**.
   The following response is displayed to prompt you to set a new password.
   `Enter new admin password (max 128 characters):`
5. Enter a string of your choice to be set as the password and press **Enter**.
   The following response is displayed to prompt you to retype the password for confirmation.
   `Re-enter new admin password:`
6. Retype the string that you entered in step 5 and press **Enter**.
   The following response is displayed:
   `New admin password accepted`
   When the confirmation is displayed, setting of the password is complete.
7. Type `disable` and press **Enter**.
   The prompt changes from `#` to `>`, indicating that the mode has changed back to general user mode.

Logging out from the switch module.

At the prompt of the terminal software, type `exit` and press **Enter**.

Setting a user account for the Brocade 10Gb DCB switch module

To manage the Brocade 10Gb DCB switch module, it is recommended that you reset the default password for the user account of the switch (default ID is "admin") to ensure the security for the switch. To do this, follow the procedure described below.

1. Log in to the switch module.
2. Reset the password for the initial "admin" account.
3. Log out from the switch module.

To reset the default password for the switch, use the terminal software to access the management functionality of the Brocade 10Gb DCB switch module.

Logging in to the switch module

1. From the system console, open the terminal software.
2. In the terminal software, specify the IP address of the desired switch module and connect to the switch module.
   You use telnet or SSH (version2) for a connection protocol by default.
3. From the terminal software, access the management functionality of the switch module.
4. When the terminal software displays the prompt `login:` type `admin` and press **Enter**.
   The following response is displayed:
   `Password:`
5. Type `password` and press **Enter**.
   You are now successfully logged in.

Changing the password of the "admin" account

To ensure security, change the login password of the "admin" account from the initial settings (the settings at shipping time).

To do this, you must be connected and logged in to the switch module using the "admin" account via the terminal software.

1. At the prompt of the terminal software, type `configure terminal` and press **Enter**.
   The mode is changed to the global configuration mode.
2. Type `username admin password ******** role admin enable true` and press **Enter**.
   The string ******** represents the new password. Enter a string of your choice.
   When the confirmation is displayed, the setting of the password is complete.

Logging out from the switch module

At the prompt of the terminal software, type `exit` and press **Enter**.

Connecting the system console and the system unit to the management LAN

After you have finished configuring the network settings within the system unit so that it can connect to the external management LAN, connect the system unit and the system console to the management LAN. Once they are connected, you can manage the system unit remotely via the management LAN network.

1. Connect the LAN port of the system console to the management LAN.
2. Connect the MGMT1 port of the management LAN module to the management LAN.

   Note that two management LAN modules are implemented. Connect the MGMT1 port of each management LAN module to the management LAN.

Tip: Note that two management modules are implemented: the active and standby modules. The standby management module does not operate until an abnormality occurs on the active management module.
Therefore, if you connect both the active and standby management modules to the management LAN at the same time, no network conflict occurs.

Preparing the server blades so that they can operate in LP mode

Server blades have two operation modes: Basic mode, in which the LPAR manager functionality is not applied, and LP mode, in which the LPAR manager functionality is applied.

For more information on the settings and operating methods for applying the LPAR manager functionality, see the manual *Hitachi Compute Blade 2500 Series Logical partitioning manager User Guide*.

Related topics

- The manual *Hitachi Compute Blade 2500 Series Logical partitioning manager User Guide*

Powering on the server blade

To power on the server blade, access the management module via the system module. You can power on the server blade from the Web console, CLI console, or remote console.

During the initial configuration of the server blade after powering it on, you will configure the UEFI and set up the OS. We therefore recommend using the remote console, which enables you to perform the full series of operations from powering on to setting up the OS. You can also power on the server blade by using Hitachi Compute Systems Manager.

Using the Web console to power on a server blade

Log in to the web console of the management module from a system console in advance.

1. From the global task bar of the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. In the **Modules** tree view, select the desired server blade.
   In the application area, the **Server Blade *n* Information** view is displayed. The variable *n* represents a unique number identifying a server blade.
3. In **Server blade *n* information** view, select the **State** tab and click the **Power On** button.

Using the CLI console to power on a server blade

Execute the `poweron blade` command. For more information about the `poweron blade` command, see the *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Using the remote console to power on a server blade

1. Start the remote console and log in to the desired server blade.
2. In the **Power** menu, click **Power on**.

Tip: To enter the Setup Menu window for setting up the UEFI of the server blade, press the **F1** key while the server blade is starting.

- While the server blade is starting, when <F1> Setup is displayed on the remote screen of the remote console, press the **F1** key.
- If you press the key too late and the OS on the server blade starts, shut down the OS and restart the server blade.

Related topics

- The section on the `poweron blade` command, in the *Hitachi Compute Blade 2500 Series Management Module User Guide*
- Starting the remote console on page 5-4
- Functionality of the remote console on page 5-8
- The manual *Hitachi Compute Blade 2500 UEFI Setup Guide*

Resetting the power of the server blade

To reset the power of the server blade, use the system console to access the management module. Resetting the power of the server blade means forcibly powering off the server blade and powering it on again. You can reset the power of the server blade from the Web console or CLI console.

You can also reset the power of the server blade by using Hitachi Compute Systems Manager.

Using the Web console to reset the power of the server blade

Log in to the web console of the management module from a system console in advance.

1. From the global task bar of the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. In the **Modules** tree view, select the desired server blade.
   In the application area, the **Server Blade *n* Information** view is displayed. The variable *n* represents a unique number identifying a server blade.
3. In the **Server Blade *n* Information** view, click the **State** tab, and from the **Server Blade Operation** menu, select **Reset**.

Using the CLI console to reset the power of a server blade

Execute the `reset blade` command. For more information about the `reset blade` command, see the *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Using the remote console to reset the power of a server blade

1. Start the remote console and log in to the desired server blade.
2. In the **Power** menu, click **Hard Reset**.

Related topics

- The section on the `reset blade` command in the manual *Hitachi Compute Blade 2500 Series Management Module User Guide*
- Functionality of the remote console on page 5-8

Restarting the BMC of a server blade

If a failure occurs in the server blade, restart the BMC of the server blade. You can restart the BMC from the Web console or CLI console. Restart the BMC only if a failure has occurred in the server blade.

Restarting the BMC from the Web console

Log in to the web console of the management module from a system console in advance.

1. From the global task bar of the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. In the **Modules** tree view, select the desired server blade.

In the application area, the **Server Blade *n* Information** view is displayed. The variable *n* represents a unique number identifying a server blade.

3. In the **Server Blade *n* Information** view, select the **BMC** tab and click the **Restart BMC** button.

Restarting the BMC from the CLI console

Execute the `bmc-reset blade` command. For more information on the `bmc-reset blade` command, see the manual *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Related topics

- The section on the `bmc-reset blade` command in the manual *Hitachi Compute Blade 2500 Series Management Module User Guide*

Setting the UEFI of a server blade

Before installing the OS on the server blade, configure the CPU, the memory, and the functionality of the on-board devices installed on the server blade. These settings are configured using the functionality of the UEFI firmware interface. The following are among the functionality that can be configured with UEFI.

- Set the type and operational functionality of the CPU installed on the server blade.
- Set the type and operational functionality of the DIMM installed on the server blade.
- Set the options for storage, network devices, and the power supply unit installed on the server blade.
- Set the RAID configuration of the storage installed on the server blade.
- Set up the PXE boot environment or iSCSI boot environment.

For more information on using UEFI to configure these environmental settings on the server blade, see the manual *Hitachi Compute Blade 2500 Series UEFI Setup Guide*.

The setup menu for configuring UEFI on the server blade can be opened from the remote console while the server blade is starting.

Related topics

- The manual *Hitachi Compute Blade 2500 UEFI Setup Guide*
- Powering on the server blade on page 3-11
- Starting the remote console on page 5-4

4

Stopping the CB 2500

This chapter explains how to stop the system unit.

- Powering off a server blade
- Forcibly powering off a server blade
- Powering off a switch module
- Powering off the server chassis

Powering off a server blade

To stop the system unit, power off the server blade that is running. Shutting down the running OS also powers off the server blade. You can also use the management module or remote console to power off the server blade. This operation also shuts down the OS at the same time. You can power off the server blade from the Web console or CLI console.

This section describes the procedure for powering off a server blade that is running in the Basic mode. For details on how to power off a server blade that is running in LP mode, see the *Hitachi Compute Blade 2500 Series Logical partitioning manager User Guide*.

Using the Web console to power off a server blade

Log in to the web console of the management module from a system console in advance.

1. From the global task bar of the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. In the **Modules** tree view, select the desired server blade.
   In the application area, the **Server Blade *n* Information** view is displayed. The variable *n* represents a unique number that identifies the server blade.
3. In **Server blade *n* information** view, select the **State** tab, and click the **Power Off** button.

Using the CLI console to power off a server blade

Execute the `poweroff blade` command. For more information about the `poweroff blade` command, see the *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Tip:

- Depending on the type of OS and the operating status, you might be unable to power off the server blade via the management module. In such a case, shut down from the OS or use external server management software to power the blade off.
- If the OS is not operating normally, you might be unable to power off the server blade via the management module. In such a case, use the power switch on the server blade to power it off.

Related topics

- The section on the `poweroff blade` command, in the *Hitachi Compute Blade 2500 Series Management Module User Guide*

Forcibly powering off a server blade

If an abnormality occurs in the OS running on a server blade and you cannot shut down the OS, you can forcibly power off the server blade. You can forcibly power off the server blade from the Web console or CLI console.

Using the Web console to forcibly power off a server blade

Log in to the web console of the management module from a system console in advance.

1. From the global task bar of the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. In the **Modules** tree view, select the desired server blade.
   In the application area, the **Server Blade *n* Information** view is displayed. The variable *n* represents a unique number that identifies the server blade.
3. In the **Server Blade *n* Information** view, click the **State** tab, and from the **Server Blade Operation** menu, select **Forced Power off**.

Using the CLI console to forcibly power off a server blade

Execute the `poweroff blade -h` command. For more information about the `poweroff blade` command, see the *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Using the remote console to forcibly power off a server blade

1. Start the remote console and log in to the desired server blade.
2. In the **Power** menu, click **Forced Power off**.

Related topics

- The section on the `poweroff blade` command, in the *Hitachi Compute Blade 2500 Series Management Module User Guide*
- Functionality of the remote console on page 5-8

Powering off a switch module

You can power off a switch module from the Web console.

Log in to the web console of the management module from a system console in advance.

1. From the global task bar of the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. In the **Modules** tree view, select the desired switch module.

In the application area, the **Switch Module *n* Information** view is displayed. The variable *n* represents a unique number that identifies the switch module.

3. In the **Switch module *n* information** view, select the **State** tab, and click the **Power Off** button.

   The switch module is powered on when electricity is applied to the server chassis. To power on the switch module again after turning it off manually, click the **Power on** button, using the procedure described in this section.

Powering off the server chassis

Powering off the server chassis. You can power off the server chassis from the Web console, CLI console, or LCD touch console.

CAUTION: Even after powering off the server chassis, do not remove or re-connect the power cable yourself. For safety, always ask the maintenance personnel to plug the power cable into the power outlet or to unplug it.

Using the Web console to power off the server chassis

Log in to the web console of the management module from a system console in advance.

1. From the global task bar of the Web console, select the **Resources** tab.

   In the navigation area, the **Modules** tree view is displayed.

2. In the **Modules** tree view, select **Chassis**.

   In the navigation area, the **Chassis Summary** tree view is displayed.

3. In the **Chassis Summary** view, click the **Action** drop down list and select **Shut down**.

   When you respond to the confirmation window, the server chassis shuts down. You can confirm that the entire system unit has powered off by checking the System PWR LED on the management module.

Using the CLI console to power off the server chassis

Execute the `shutdown chassis` command. For more information about the `shutdown chassis` command, see the *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Using the LCD touch console to power off the server chassis

First, ensure that the LCD touch console is connected to the USB port of the management module for the active system.

1. In the Home window of the LCD touch console, touch the **Maintenance Menu** button.
2. In the **Maintenance menu**, touch the **Server Chassis (SC)** button.

3. In the **Server Chassis** window, from the pulldown menu, select **Shut Down Chassis**, and then touch the **Operate** button.
4. The **Shutting Down Server Chassis** window is displayed.

Related topics

- The section on the `shutdown chassis` command, in the *Hitachi Compute Blade 2500 Series Management Module User Guide*
- Appearance of the management module on page 2-17

5

Functionality and Operation of the Remote Console

This chapter provides an overview of the remote console. The remote console is mainly used for configuring the operating environment of the server blade and creating virtual media that is accessed from the server blade.

- ☐ Notes on using the remote console
- ☐ Server blade image signals that can be displayed on the remote console
- ☐ Starting the remote console
- ☐ Remote console window
- ☐ Functionality of the remote console
- ☐ Creating a disk image for access from the server blade
- ☐ Exiting the remote console
- ☐ Screen messages displayed by the remote console

Notes on using the remote console

Notes on using the remote console are described below.

Software for starting the remote console

The remote console needs to be started by using general-purpose terminal software. Never use the remote functionality of any external server management software to start the remote console. If you start the remote console using the remote functionality of server management software, the console will not operate correctly.

Simultaneous connections from remote consoles to a single server blade

A server blade can only communicate with one remote console. A single server blade cannot be connected to multiple remote consoles at the same time.

Collecting memory dumps

Collection of memory dump files from an operating system running on a server blade must be performed from the management module. If you use the remote console, certain key operations cannot be used when collecting memory dumps from Windows Server 2008.

FD media and USB memory sizes and formats

Although you can connect the server blade to some devices via the system console, such as FD and USB memory, you cannot format these devices or media from the server blade. Formatting must be performed from the operating system of the system console. In addition, FD or USB memory devices that are remotely connected to the server blade must be formatted using the following settings:

Remote FD

The media must be a 3.5 inch 2HD disk.

- Capacity: 1.44 MB, 512 bytes/sector
- File system: FAT
- Allocation unit size: Standard allocation size
- Format options: Do not select "Enable Compression" or "Create an MS-DOS startup disk".

Remote USB memory

The maximum supported capacity is 16 GB.

- File system: FAT32
- Allocation unit size: Standard allocation size

Operation of the server blade when it is disconnected from the remote console

When the server blade is connected remotely to virtual media, FD, or USB memory, ensure that the connection between the server blade and the remote console is not terminated. If the connection with the remote console is terminated, it might become impossible to read or write the

data correctly or to eject media from the CD/DVD drive of the system console.

Note that performing the following operations will terminate the connection between the remote console and server blade.

- Detaching the server blade from the server chassis
- Restoring server blade settings information from a backup
- Updating firmware
- Restarting the BMC
- Changing the IP address of the server blade

Before performing these operations, always exit the virtual media console.

If the server blade window stays displayed after the blade is powered off

If the server blade window stays displayed after you turn off the server blade or shut down the operating system, check whether the server blade has been powered off. To check the power status of the server blade, look at the bottom right corner of the remote console window.

Taking a screen capture of the server blade window

When the remote console window is active, if you press **Print Screen** or **Alt**+**Print Screen**, the instruction is sent to the server blade and the operating system of the system console becomes inoperable.

In this case, make the remote console window inactive# and press **Print Screen** to capture the whole screen.

#

If you click anywhere other than the window of the software displaying the remote console (for example, if you click the Windows Taskbar), the remote console window becomes inactive.

Related topics

- Appendix B, Taking a Memory Dump of the OS Running on a Server Blade
- Troubleshooting on the remote console on page 6-2

Server blade image signals that can be displayed on the remote console

The VGA signal that is sent from the server blade to the remote console must be set to be displayed on the remote console. To enable display on the remote console, VGA settings are required on the server blade side. These settings are as follows.

Operating system of the server	VGA driver	Display resolution	Number of colors
Windows	• Display driver in Server installation and monitoring tool (recommended) • Standard SVGA driver	800 x 600	16 bits
			32 bits
		1024 x 768 (recommended)	16 bits
			32 bits
		1280 x1024	16 bits
			32 bits
		1600 x 1200	16 bits
			32 bits
Linux	VESA driver	640 x 480	16 bits
			32 bits
		800 x 600	16 bits
			32 bits
		1024 x 768 (recommended)	16 bits
			32 bits

Starting the remote console

This section describes how to start the remote console. You can start the remote console from a Web console that is logged in to the management module or a server blade.

When you use the CB2500 Web Console Client, start the remote console using server blade Web console.

If the system console is running on OS X, you must install the certificate file and enable Java accessibility in advance.

Set up the System console that OS X is running

If you want to use a PC running OS X as the system console, you must set up the environment as follows in advance:

- Install the certificate file.
- Enable Java accessibility.

Installing the certificate file

1. In **Finder**, from the **Go** menu, execute the **Utilities** command.
   The **Utilities** window opens.
2. In the **Utilities** window, execute the **Terminal** icon.

The **Terminal** window opens.

3. In the **Terminal** window, enter the following commands:

```
$ mkdir -p ~/.java/deployment/security/
$ cp /Library/Internet\ Plug-Ins/JavaAppletPlugin.plugin/Contents/Home/lib/
security/cacerts  ~/.java/deployment/security/trusted.certs
```

Enabling Java accessibility

1. In **Finder**, click the **Apple logo** and execute the **System Preferences** command.

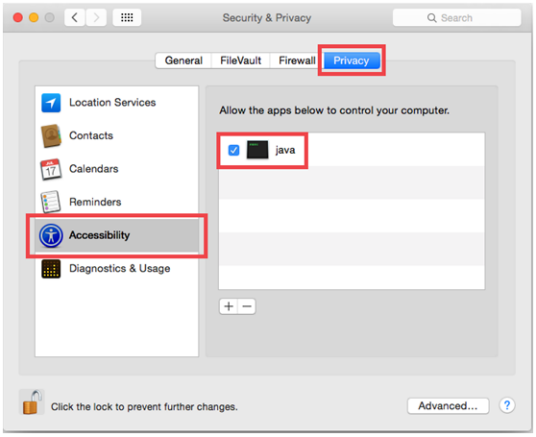
   The **System Preferences** window opens.

2. In the **System Preferences** window, execute the **Security & Privacy** icon.

   The **Security & Privacy** window opens.

3. In the **Security & Privacy** window, select the **Privacy** tab and then select **Accessibility** from the list.

4. In the list of applications in **Allow the apps below to control your computer.**, select **java** to enable Java accessibility.



Starting the remote console from the management module via a Web console

This section describes how to start the remote console from a Web console that is logged in to the management module. First log in to the management module.

1. From the global taskbar in the Web console, select the **Resources** tab.

   In the navigation area, the **Modules** tree view is displayed.

2. In the **Modules** tree view, select the target server blade.

   In the application area, the **Server Blade *n* Information** view is displayed. The variable *n* represents a unique number that identifies the server blade.

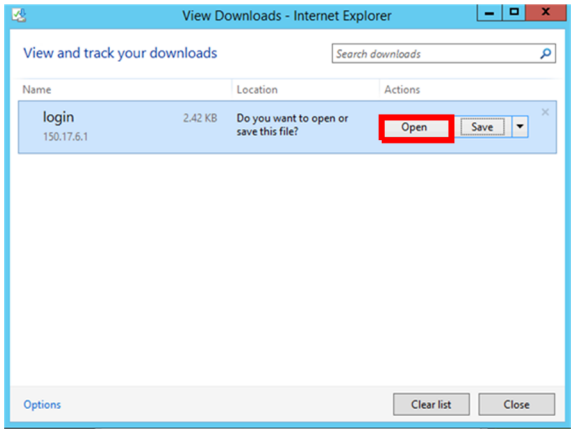
3. In the **Server Blade *n* Information** view, select the **Status** tab, and then from the **Server Blade Operation** drop-down list, select **Start Remote Console**.

Tip:

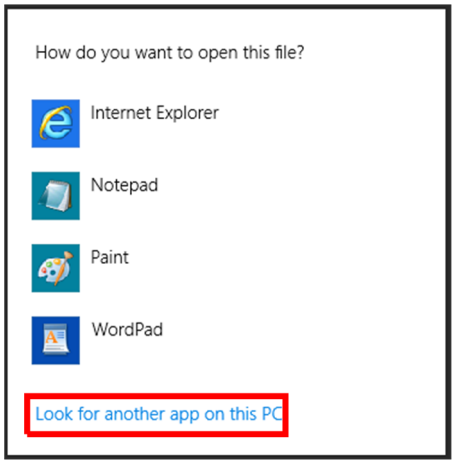
- When you start the remote console, a confirmation dialog box regarding the digital signature for Java might be displayed. This does not indicate a problem.
- If the server blade is powered on, the VGA window of the server blade is displayed when you start the remote console.
- If the server blade is powered off and no VGA signal is output, the remote console displays "No Signal".

Tip:

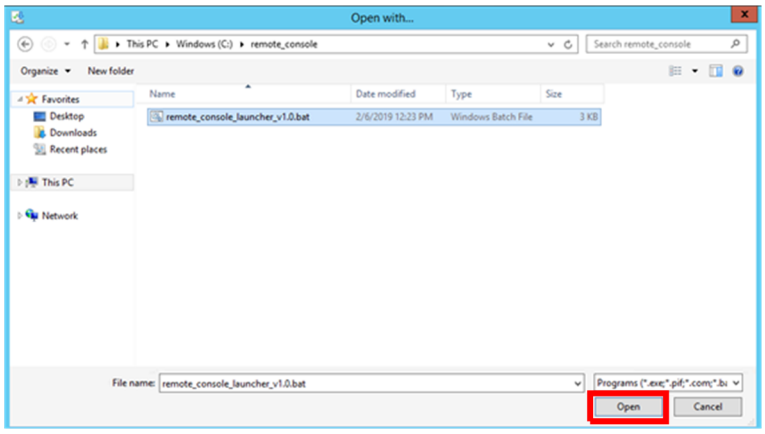
- When using OpenJDK, open the "`login.jnlp`" file with the "`remote_console_launcher_xxx.bat`" file after clicking **Start Remote Console**.
    - **Details**
        - In **View and track your downloads** window, click **Open**.



        - In **How do you want to open this file** window, click **Look for another app on this PC**.



        - In **Open with...** window, select **remote_console_launcher_xxx.bat** and click **Open**.



Related topics

- About preconfigure when using OpenJDK on page 1-15
- Logging in to the management module on page 3-6

Starting the remote console from the Web console on a server blade

This section describes how to start the remote console by using a Web console that is logged in to a server blade.

1. Start the web browser for the system console and enter the URL "https://*IP-address-of-server-blade*/".

   The Web console starts, and the **login** window to the server blade is displayed.
2. In the **Username** field, enter "`user01`". In the **Password** field, enter "`pass01`".

   This user name and password combination is the initial setting (the setting at shipping time). If you have modified the settings, enter the modified user name and password as necessary.
3. Click **OK** to log in.

   The **Remote Console Launch** window is displayed.
4. In the **Remote Console Launch** window, click **Launch Remote Console**.

Tip: When using OpenJDK, open "`viewer.jnlp(xxxxxx)`" file with **remote_console_launcher_xxx.bat** after click **Launch Remote Console** button.

Related topics

- *Hitachi Compute Blade 2500 Series Management Module User Guide* manual

Remote console window

This section describes the remote console window and the information displayed in the window.

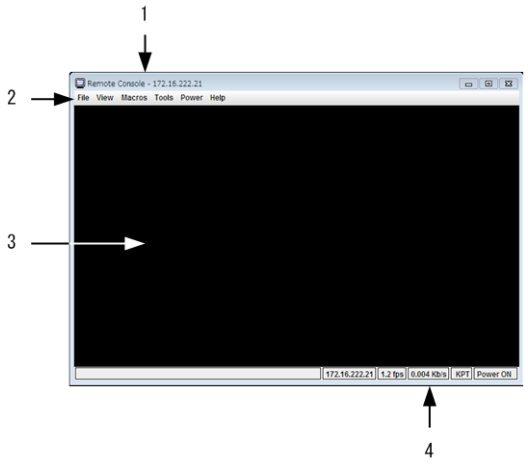


Figure 5-1 Remote console window

1. Title bar

   The title bar displays the name of the remote console window and the IP address of the destination server blade.

2. Menu bar

   The menu bar displays menus of commands that can be sent from the remote console to the destination server blade.

3. Remote screen

   This screen displays the VGA window of the destination server blade.

4. Status bar

   The status bar displays the IP address and the power status of the destination server blade.

Related topics

- Functionality of the remote console on page 5-8

Functionality of the remote console

This section describes the functionality available on the remote console, and the corresponding menu commands.

Table 5-1 List of remote console functionality

Available functionality		Menu	Command
Functionality related to the remote screen	Refresh the remote screen.	View menu	Refresh command

Available functionality		Menu	Command
	Maximize the remote console window.[1]	View menu	Full Screen command
	Restore the maximized remote console down to a window.	View menu	Windowed command
Functionality related to specific key entries	These key entries are sent to the window displayed in the remote screen.	Macro menu	**Ctrl-Alt-Del** command **Alt-Tab** command **Alt-Esc** command **Ctrl-Esc** command **Alt-Space** command **Alt-Enter** command **Alt-Hyphen** command **Alt-F4** command **PrtScn** command **Alt-PrtScn** command **F1** command **Pause** command **Tab** command **Ctrl-Enter** command **SysRq** command **Alt-SysRq** command **Alt-LShift-RShift-Esc** command **Ctrl-Alt-Backspace** command **Alt-F?** submenu - **Alt-F1** subcommand - **Alt-F12** subcommand **Ctrl-Alt-F?** submenu - **Ctrl-Alt-F1** subcommand - **Ctrl-Alt-F12** subcommand
Functionality related to keyboard operation mode	Keyboard operations conducted in the remote screen are linked to the operation of the keyboard on the system console.	Tools menu	Session Options command When you execute this command, the Session Options dialog box is displayed. If the Pass all keystrokes to target. check box is selected in the **General** tab in the dialog box, keyboard pass-through mode is enabled and keystrokes entered on the keyboard of the system console are directly sent to the destination remote console.[2]
Functionality related to mouse operation mode	Mouse operations conducted in the remote screen are	Tools menu	Single Cursor command Set "single cursor state" to use the mouse device of the system

Available functionality		Menu	Command
	linked to the operation of the mouse on the system console.		console to control the cursor in the screen of the remote console.
	Set the key for canceling the single cursor state.	Tools menu	Session Options command When you execute this command, the Session Options dialog box is displayed. Select the **Mouse** tab, and from the Single Cursor-Termination Key drop-down list, specify the key for canceling the single cursor state.
	Set the mouse mode according to the operating system on the server blade displayed in the remote console.	Tools menu	Session Options command In the dialog box, select the **Mouse** tab, and from the Mouse Acceleration options, select the appropriate mouse mode[3] for the operating system running on the server blade. If the operating system of the server blade is Windows or Red Hat Enterprise Linux 6 or later Select the Absolute radio button. If the operating system of the server blade is Red Hat Enterprise Linux 5 or older, or any version of Linux other than Red Hat Enterprise Select the Relative (Linux Acceleration) radio button.
Functionality related to virtual media	Start the virtual media console.	Tools menu	Launch Virtual Media command
Functionality related to the power operation of the server blade[4]	Power on the server blade.	Power menu	Power On command
	Power off the server blade.	Power menu	Forced Power Off command If the operating system is running correctly, never execute this command. Executing this command might cause the operating system to not start or result in corrupted data.
	Reset the server blade.	Power menu	Hard Reset command
Other functionality	Display version information on the remote console.	Help menu	About command

Available functionality		Menu	Command
	Exit the remote console.	File menu	Exit command

Notes:

1. If the resolution setting for the VGA window of the server blade exceeds that of the system console window, the Full Screen command cannot be executed.
2. When the remote console is displayed in full screen mode, the keyboard pass-through mode is always enabled.
3. If the appropriate mouse mode is not specified, the mouse does not function correctly.
4. Use the Web console to control the power supply of server blades that are running in LP mode. You cannot use a remote console to control the power supply.

Creating a disk image for access from the server blade

To install an operating system or applications stored on CD/DVD media on a server blade without a CD/DVD drive, you can use either of the following methods.

- Connect the server blade remotely to the CD/DVD drive of the system console.
- Create a virtual disk image of the CD or DVD media on the system console, and connect to the console remotely from the server blade.

We recommend creating a virtual disk image. This is because the data can be read faster from a disk image than from a CD or DVD, and a disk image can be handled more flexibly. This chapter describes how to create a virtual disk by using the remote console functionality.

Starting the Virtual Media console

For creating disk images from virtual media, the CB 2500 supports the Virtual Media console. To start the Virtual Media console, use the Launch Virtual Media command from the remote console.

1. From the **Tools** menu of the remote console, execute the **Launch Virtual Media** command.

Items in the Virtual Media console

This section describes the window and functionality of the Virtual Media console.

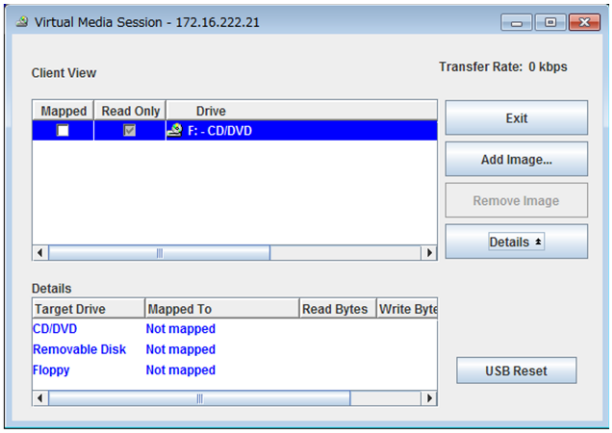


Figure 5-2 Virtual Media console

Items in the Virtual Media console

Client View list box

The window displays the devices connected to the system console, such as CD/DVD drives, removable disks, and FD drives. From this list box, specify the device to which you wish to connect remotely from the server blade.

Mapped column

If this check box is selected, the device can be connected to remotely from the server blade.

Read Only column

If this check box is selected, the device is recognized by the server blade as a read-only device.

Drive column

This column displays the devices as the names recognized by the system console.

Details list box

This box displays the list of virtual media that are set to be available for remote connections from the server blade.

Target Drive column

This column displays the types of devices that are recognized by the server blade when connected remotely.

Mapped To column

This column displays the bus names of virtual media recognized by the operating system of the system console.

Read Bytes column

This column displays the amount of data that the server blade has read from the virtual media.

Write Bytes column

This column displays the amount of data that the server blade has written into the virtual media.

Duration column

This column displays the length of time that the server blade has been remotely connected to the virtual media.

Transfer Rate label

Displays the speed of data transfer between the virtual media console and the server blade.

Exit button

Exits the virtual media console. If you are connecting remotely to virtual media from the server blade, the connection is terminated.

Add Image button

Adds the virtual media to the Client View list box.

Remove Image button

Removes the selected virtual media from the Client View list box.

Details button

Shows or hides the Details list box in the virtual media console window.

USB Reset button

The server blade and the virtual media are disconnected once, and then connected again.

Notes on creating disk images

This section describes notes creating disk images from virtual media.

Compliance with license agreements

- Disk images of media subject to license agreements, such as operating system installation media, are subject to the same license agreement as the original media. Take care not to violate any license agreements.
- Disk images created using the image creation tools (`FDDUMP.exe` and `MakeCDImg.exe`) can only be used for the virtual media functionality of the remote console. If you use a disk image for any other purpose and any problem arises as a result, Hitachi will accept no responsibility or liability.
- The CD/DVD media used to create a disk image must satisfy all of the following conditions:
  - It must be in ISO9660 format
  - It must not be multisession media
  - It must not have any special protection applied to it

  Note that even if the media satisfies all of these conditions, you might be unable to create a disk image, depending on the compatibility between

the media and the CD/DVD drive. In particular, if you use CD or DVD media created with any writing method other than Disk At Once mode, you will be unable to create a disk image.

Disk image creation tool

Disk images of virtual media can be created by using the image creation tools (`FDDUMP.exe` or `MakeCDImg.exe`). These tools are stored in the flash memory mounted on the server chassis. To use the tools, download them onto the system console. Hitachi cannot guarantee that image files created using other tools will function correctly with the virtual media functionality.

System console settings for using a remote CD/DVD drive

If you are connecting the server blade remotely to the CD/DVD drive of the system console, use the operating system settings on the system console to disable the Auto Run functionality for CD and DVD media. If the operating system of the system console is Windows, use the following procedures to disable the Auto Run functionality.

- For Windows Server 2008 R2, Windows 7 Professional, and Windows Vista Business:
  a. In the **Start** menu, click **Control Panel** to display the **Control Panel**. If the items are displayed by Category, select **Hardware and Sound**.
  b. Select **AutoPlay**.
  c. Deselect the **Use AutoPlay for all media and devices** check box and click the **Save** button.
- For Windows Server 2012, Windows Server 2012 R2, and Windows 8:
  a. Type `AutoPlay` in the Windows search box, click the **Settings** button, and then select **AutoPlay** .
  b. Deselect the **Use AutoPlay for all media and devices** check box and click the **Save** button.
- For Windows Server 2016 and Windows 10:
  a. Type **Device** in the Windows search box and select **Device** from lists of **Best match**.
  b. Select **AutoPlay** from the device list and deselect **Use AutoPlay for all media and devices**.

Precautions for sharing devices or disk images on the system console among multiple server blades

You cannot connect multiple server blades remotely to devices, including CD/DVD drives, FD drives, and USB memory devices, on the system console. However, you can connect multiple server blades to an ISO image of a CD or DVD.

Changing media on a system console device

When a server blade is connected to a device on the system console, you cannot change the media in the connected device. If you want to change the media, terminate the remote connection from the server blade temporarily.

Creating a disk image from CD/DVD media

Use the CD/DVD image creation tool (MakeCDImg.exe)to create a disk image CD or DVD media.

1. Start the CD/DVD disk image creation tool.
2. Insert the CD or DVD media from which you wish to create the disk image into the CD/DVD drive of the system console.
3. Under **CD/DVD drive** in the CD/DVD disk image creation tool, select the CD/DVD drive where you inserted the media.
4. Click the **Browse** button.

   The **Save As** dialog box is displayed.
5. Specify a name and destination folder for the disk image file, and then click the **Save** button.

   The **Save As** dialog box closes, and the specified file name and path are displayed in the **Save CD/DVD image file to** field in the CD/DVD image creation tool.
6. Click the **Start** button.

   A disk image file is created from the CD or DVD media. Once the disk image file has been created, a confirmation message appears.

Creating a disk image from FD media

Use the FD image creation tool (FDDUMP.exe) to create a disk image from FD media.

1. Start the FD disk image creation tool.
2. Insert the FD media from which you wish to create the disk image into the FD drive of the system console.
3. Under **Drive** in the FD image creation tool, select the FD drive where you inserted the media.
4. Click the **Browse** button.

   The **Save As** dialog box is displayed.
5. Specify a name and destination folder for the disk image file, and then click the **Save** button.

   The **Save As** dialog box closes, and the specified file name and path are displayed in the **File** field in the FD image creation tool.
6. Click the **Start** button.

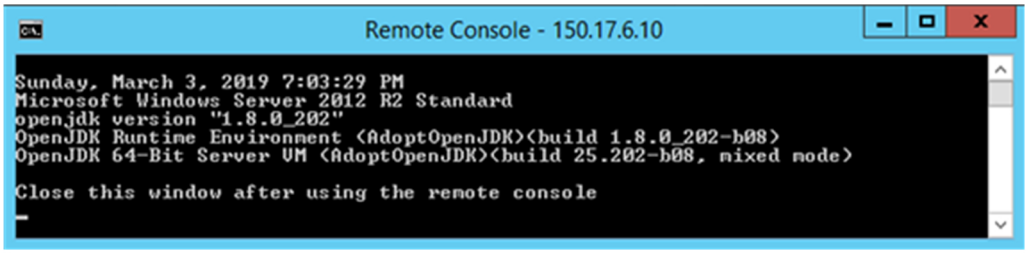
   A disk image file is created from the FD media. When the progress bar reaches 100%, the image file has been created.

Exiting the remote console

Exit the remote console.

1. In the **File** menu of the remote console, click **Exit**.
2. The remote console window is closed.

Tip: When using OpenJDK, close the remote console window and then press any key on the following screen to close it.



Screen messages displayed by the remote console

This section describes the messages displayed on the remote screen when an error occurs (for example, "No images can be displayed on the remote console") and their meanings.

Table 5-2 Message displayed on the remote screen

Message	Description
No Signal	For some reason (for example, because the operating system of the server blade has not started), the remote console is not receiving any VGA signal from the server blade.
VideoStopped_OutOfRange	The VGA signal sent from the server blade was interrupted or the VGA signal became unavailable for display on the remote console.

6

Troubleshooting

This chapter describes troubleshooting procedures for the CB 2500.

- Troubleshooting on the remote console
- Issuing an NMI for the operating system running on the server blade

Troubleshooting on the remote console

This section describes procedures for troubleshooting problems that occur when using the remote console.

Item No.	Problem	Action to take
1	The remote console cannot be started.	• Verify that the supported Java VM is installed on the system console. • Verify that HTTP communication via TCP port 80 and HTTPS communication via TCP port 443 is available between the system console and the server blade. Verify that communication via TCP port 5001 is available. • If you are using Oracle Java Version 7 Update 21 or later, check the Java security settings. • If you are using OpenJDK or Oracle Java Version 8 Update 161 or later, see note 7 of Table 1-3 System console software conditions on page 1-11. • When the CD/DVD disk image creation tool starts, JRE checks whether the certificate is expired. If startup of the CD/DVD image creation tool takes a long time, omit this certificate invalidation check. Omitting the check can shorten the startup time of this tool. Note that this will omit the certificate invalidation check for all Java programs on the PC that executes this tool. To omit the certificate invalidation check, click the **Details** tab on the Java Control Panel and then select Not check for the certificate invalidation check item. • If the security strength of the server blade is "high", use Oracle Java version 8 Update 45 or later.
2	The statuses of the following keys do not match between the server blade and the system console. • **Caps Lock** key • **Num Lock** key • **Scroll Lock** key	You can only change the key statuses of the system console by deactivating the remote console window and performing the key operation on the system console. By doing this, you can match the key statuses on the system console with those on the server blade.
3	If the FD is changed when remotely connected to the FD drive on the system console, the data from the newly-inserted FD cannot be read correctly.	Replacing media during a remote connection is not supported. If you want to change the media, you must terminate the remote connection, change the media, and then resume the remote connection to the drive again.
4	If multiple server blades are connected remotely to the FD	Multiple server blades cannot be connected remotely to the same FD drive, CD/DVD drive,

Item No.	Problem	Action to take
	drive on the system console, the data from the FD cannot be read correctly.	USB memory device, or image file at the same time. Only one server blade can be connected remotely to each device at any given time.
5	After powering off the server blade, the VGA window of the server blades is still displayed.	The remote screen might not display "No Signal", even after the server blade is powered off. In this case, check the status bar of the remote console to see if "Power OFF" is displayed.
6	The remote console or virtual media console will not start when using Internet Explorer 8 or later.	If you are using Internet Explorer 8 or later, disable the SmartScreen filter functionality.
7	When multiple remote consoles and virtual media consoles are started, the operation of the system console becomes slow. Also, memory usage is too high.	Use a maximum of 256 MB of memory for each process when running the remote console or virtual media console. Review the memory capacity of the system console.
8	When displaying the UEFI window from a remote console, the screen flashes and UEFI does not start.	Perform the following procedure: • Press the **Enter** key. • Restart the remote console.
9	When operating the Web console, the display is distorted.	Refresh the Web browser.
10	The message "xxxx cannot be downloaded" is displayed and the remote console cannot be started.	In Internet Explorer, click **Tools**, and from the menu, select **Internet Options**. In the dialog box, click the **Advanced** tab and ensure that the **Do not save encrypted pages to disk** check box is not selected.
11	The message "This application cannot be started" is displayed and the remote console cannot be started.	In the Java control panel, click the **General** tab, and then under Temporary Internet Files, click the **Settings** button. In the displayed dialog box, verify that the **Keep temporary files on my computer.** check box is selected.
12	When using the remote console, keystrokes continue to be entered without stopping. Alternatively, keystrokes are not entered.	Use the mouse to deactivate the remote console window, and then re-activate the window. If the problem persists, exit and restart the remote console.
13	A Java VM startup error message is displayed and the remote console cannot be started. Alternatively, an older version of the remote console is started.	In the Java control panel, click the **General** tab, and then under Temporary Internet Files, click the **View** button to display the temporarily saved applications. Delete these files. If the "`icedtea-web`" folder exists under the "`%homepath%\.cache\`" folder, delete it as well.
14	Keystrokes are not recognized by the operating system of the remotely connected server blade.	Verify whether there is a setting on the operating system of the server blade that means it will reject key operations (for example, Scroll Lock).

Item No.	Problem	Action to take
		Cancel the status if necessary. If the problem persists, restart the remote console.
15	The cursor on the operating system of a remotely connected server blade does not respond to mouse input.	Verify that the mouse mode setting is supported by the operating system of the server blade. If the problem persists, switch to a different mouse mode and then revert to the correct mode. If the problem still persists, restart the remote console.
16	A remote connection cannot be established to a device connected to the system console, such as CD/DVD drive, FD drive, or USB memory device.	Restart the remote console and virtual media console.
17	The **Caps Lock** key does not work on the operating system of a remotely connected server blade.	Press **Shift** + **Caps Lock** together.
18	When the operating system of the system console is Windows Server 2008 R2, a remote connection to the CD/DVD drive, FD drive, or USB memory device cannot be established, and FDDUMP cannot be executed.	To start the remote console or to perform FDDUMP, you must log in with your Windows user account. You can also perform FDDUMP using the "Run as administrator" functionality of Windows.
19	When ejecting a remotely connected FD, CD/DVD, or USB memory device, the Windows "Safely Remove Hardware" operation does not work on the server blade.	Wait a few minutes and then try again. If you try to perform the "Safely Remove Hardware" operation immediately after terminating a remote connection, the operation might fail.
20	After using a remotely connected CD/DVD drive, the media cannot be ejected even when the eject button on the drive is pressed.	For an external CD/DVD drive connected via USB, remove the drive from the system console, connect it again, and then perform the operation to safely remove hardware. For a built-in CD/DVD drive, perform the following operations, and then perform the operation to safely remove hardware. • In Device Manager, disable the CD/DVD drive and then enable it again. • Restart the operating system of the system console.
21	The message "The max number of session has been reached" is displayed on the remote screen and a connection cannot be established with the server blade.	This message is displayed when the server blade is connected to another system console. Wait until the other connection is finished. If you can safely terminate the connection forcefully, execute the `disconnect blade bmc session` command.

Item No.	Problem	Action to take
22	After removing a virtual drive by using the operating system on the server blade, the operating system no longer recognizes the virtual drive after it is reconnected.	Press the USB Reset button on the virtual media console to reset the virtual drive.
23	A USB device (keyboard, mouse, or memory) cannot be used on the remote console.	Press the USB Reset button on the virtual media console to reset the virtual drive. If you cannot use the USB device even after resetting the virtual drive, restart the operating system running on the server blade.
24	The Network Error dialog box is displayed during an attempt to use the console, and the virtual media console cannot be used.	Exit the virtual media console. In the Java Control Panel, click **Security**, and from Manage Certificates or Certificates, delete the following certificates: Issued to: *IP-address-for-server-blade* Issued by: *IP-address-for-server-blade* After deleting the certificates, restart the remote console, and start the virtual media console. After exiting the remote console, if the "`icedtea-web`" folder exists under the "`%homepath%\.cache\`" folder, delete it as well.
25	When the remote console is accessed by using IPv6 addresses, it cannot be started.	If you want to use the remote console in an IPv6 environment, use Oracle Java Version 7 Update 80 or later, or Oracle Java Version 8 Update 45 or later.
26	You cannot delete an imported certificate from the Java keystore, because a password is required.	Enter changeit, which is the default Java keystore password, and then delete the certificate.
27	In case, using remote console on OS X, you cannot delete the imported certificate from the Java keystore because you are prompted to enter a password.	Enter `changeit`, which is the default Java keystore password, and then delete the certificate.
28	In case, using remote console on OS X, you cannot connect to the remote console. The OS X console window displays `Connection failed`.	In "CA certificate in user-level trusted store", there is no certificate file for the Java program for OS X. Follow the procedure in Set up the System console that OS X is running on page 5-4 and then install the certificate file for the Java program from "CA certificate in system-level trusted store" to "CA certificate in user-level trusted store".
29	In case, using remote console on OS X, you cannot change the mouse cursor to a single cursor. The OS X console	In OS X, Java VM does not permit the use of the mouse and keyboard by default.

Item No.	Problem	Action to take
	window displays `The Native library for keyboard and mouse support failed to load!`.	Follow the procedure in Set up the System console that OS X is running on page 5-4 and then enable Java accessibility in the OS X environment settings.
30	You have downloaded and executed the `jnlp` file on the OS X system console. However, you cannot connect to the remote console because **Java Web Start** is not running.	Select **Open with** and then the **Choose** button to associate the `jnlp` file with Java Web Start. Next, in the Web browser, access the Java Web Start application, which is located in the following path: `Macintosh HD\System\Library\CoreServices \Java Web Start.app`
31	In the OS X system console, you cannot use the remote FD or USB flash memory of the Virtual Media console.	The Virtual Media console for OS X does not support the remote FD and USB flash memory.
32	You cannot connect to the remote console from the OS X system console over the IPv6 network.	Disable wireless connections on the system console and then connect to the network over Ethernet.
33	When using OpenJDK, an error message is displayed and the remote console cannot be started.	Check the setting of the system console referring to About preconfigure when using OpenJDK on page 1-15.
34	When the virtual media console is started, "`The Virtual Media program will close. Reason: The Virtual Media native library cannot be loaded`" is displayed and the console cannot be used.	You may be able to launch the Virtual Media Console by deleting temporary files by doing the following: 1. Close all open your browser screens. 2. Select Java Control Panel > General tab > Temporary Internet File Items > Settings > Delete File. 3. Check all the check boxes and click [OK].

Tip: If the problem is not resolved by executing the recovery procedure described in Troubleshooting problem, restarting BMC may solve the problem. See Restarting the BMC of a server blade on page 3-13.

Related topic

- System console prerequisites on page 1-9
- Notes on using the remote console on page 5-2

Issuing an NMI for the operating system running on the server blade

You can issue an interrupt instruction (NMI) to the operating system of a server blade. This functionality can be used when the operating system of the

server blade is not running correctly. To issue an NMI, use the management module.

If any failure occurs on an operating system running on a server blade, issue an NMI from the Web console or CLI console.

Issuing an NMI from the Web console

1. In the global taskbar in the Web console, select the **Resources** tab.
   In the navigation area, the **Modules** tree view is displayed.
2. From the **Modules** tree view, select the target server blade.
   In the application area, the **Server Blade *n* Information** view is displayed. The variable *n* represents a unique number that identifies the server blade.
3. In **Server blade *n* information** view, select the **Status** tab, and then click the **Issue NMI** button.

Issuing an NMI from the CLI console

Execute the `reset blade -s` command. For more information about the `reset blade` command, see the *Hitachi Compute Blade 2500 Series Management Module User Guide*.

Related topic

- *Hitachi Compute Blade 2500 Series Management Module User Guide*, `reset blade`

A

System Unit Specifications

This appendix describes the specifications of the system unit components.

- Specifications of the server chassis
- Specifications of server blades
- Specifications of switch modules
- Specifications of the power supply module
- Specifications of fan modules

Specifications of the server chassis

The following table shows the specifications of the server chassis.

Table A-1 Specifications of the server chassis

Item		Specifications
Appearance information	Type	19-inch rack-mount (EIA standards)
	Height	12 U (EIA standards)
Number of slots	Server blade	15
	Switch module	2
	Management module	2 (redundancy)
	Management LAN module	2 (redundancy)
	I/O board module	28
	Power supply module	2 (at shipping time). A maximum of 6 modules can be installed (redundancy).
	Fan module	10 (redundancy)
	Cooling fan control module	2 (redundancy)
Chassis size	Height	527 mm (excluding projections)
	Width	447 mm (excluding projections)
	Depth	830 mm (excluding projections)
Front panel		Embedded in the management module
Weight		Maximum: 250 kg (This is the value when all modules are installed, and includes the weight of the rack rails.)
Temperature		5 to 40 °C (When not operating: -10 to 43 °C)
Humidity		8 to 80% (When not operating: 8 to 90%)
Vibration		Maximum of 2.45m/s5 (When not operating: 9.80 m/s5 max.)
Cooling	method	Air cooling by fans Air suction port: Front side Air exhaust port: Rear side
	Flow rate	14.4 m3 / min

Specifications of server blades

The following table shows the specifications of server blades.

Table A-2 CB 520X B1 - CPU specifications

Item	Specifications			
Supported CPU	E7-4860v2	E7-8880v2	E7-8890v2	E7-8891v2
Number of cores	12C	15C	15C	10C
CPU operating frequency	2.6GHz	2.5GHz	2.8 GHz	3.2 GHz
QPI frequency	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s
L3 cache	30MB	37.5MB	37.5MB	37.5MB
TDP	130W	130W	155W	155W
Number of CPUs	Maximum: 2			

Table A-3 CB 520X B1 - blade specifications

Item			Specifications
Memory	DIMM type (per one slot)		DDR3 RDIMM 8GB / 16GB, LR-DIMM 32GB
	Operation mode		Independent Mode (initial setting value), Lockstep Mode, Rank Sparing Mode, Mirrored Memory Mode
	Number of slots		48
	Memory capacity		Maximum: 1536 GB (LR-DIMM 32 GB x 48)
	Memory frequency		1066 MT/s, 1333 MT/s, 1600 MT/s
SMP connection			2-blade SMP connection, 4-blade SMP connection
HDD/SSD	Number of HDDs and SSDs		Maximum: 2
	Capacity [1]		Maximum: 2.4 TB
I/O	Internal disk interface	Controller	LSI SAS 3004
		Interface	SAS
		Number of interfaces	Maximum: 2
		RAID	RAID 0, 1
	VGA	Display resolution	640 x 400 to 1,680 x 1,050
		Refresh rate	60 Hz to 85 Hz
		Color depth	8 bpp, 16 bpp, 32 bpp
	Internal USB port		USB 2.0 x 2 ports (for LPAR manager)

Item			Specifications
	Onboard LAN	Midplane I/F	10Gbps 4 port converged network adapter
		Function	Wake on LAN, PXE boot, iSCSI
	Mezzanine card slot[2]	Number of slots	4
Management functionality	Remote console		Supported
	COM		Serial redirection
	DCMI		Not supported
DC input power voltage			+12 V DC
Front interface	USB		USB 3.0 x 1 port[3]
	KVM connector		1 (VGA, COM, USB 2.0 x 2 ports)[3]
Power consumption			Maximum: 898 W (including HDDs and mezzanine cards)
External dimensions (width x depth x height)			435.3 mm x 492.7 mm x 55.5 mm (2S)
Weight			Maximum: 13.8 kg[4]

Notes:

1. For the hard disk drive capacity, 1 GB is calculated as 10^9 bytes.
2. The mezzanine card slot 1 and slot 3 are used exclusively with an onboard LAN. Mezzanine card slot 3 is not supported.
3. In SMP configuration between blades, VGA and COM are not available and only USB port is available on non-primary server blades.
4. This is the maximum weight including the weights of SMP connection boards.

Table A-4 CB 520X B2 - CPU specifications

Items	Specifications		
Supported CPUs	E7-8880 v3	E7-8890 v3	E7-8893 v3
Number of cores	18 C	18 C	4 C
CPU frequency	2.3 GHz	2.5 GHz	3.2 GHz
QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s
L3 Cache	45 M	45 M	45 M
TDP	150 W	165 W	140 W
Number of CPUs	Maximum: 2		

Table A-5 CB 520X B2 - blade specifications

Items			Specifications
Main Memory	DIMM type (per slot)		DDR4 RDIMM: 8 GB, 16 GB, 32 GB DDR4 LR-DIMM: 64 GB
	Operating mode		Independent Mode (Default), Lockstep Mode, Rank Sparing Mode, Mirrored Memory Mode
	Number of slots		48
	Memory capacity		Maximum: 1,536GB (RDIMM 32 GB x 48) 3,072 GB (LR-DIMM 64 GB x 48)
	Memory frequency		1600 / 1866 MT/s
Inter-blade SMP (Symmetric MultiProcessing)			2-blade SMP / 4-blade SMP
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 3.6 TB
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS
		Number of I/F	Maximum: 2
		RAID function	RAID 0, 1
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal USB port		USB2.0 x 2port (For LPAR manager)
	Onboard LAN[2]	Midplane I/F	10Gbps 4 port converged network adapter
		Functions	Wake on LAN, PXE boot, iSCSI, FCoE
	Mezzanine card slot[2]	Number of slots	4
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB 3.0)[3]

Items		Specifications
	KVM connector	1 (VGA / COM / USB2.0 / 2port)[3]
DCMI (Data Center Management Interface)		Supported
Power consumption		Maximum: 855 W(including HDDs and mezzanine cards)
External dimensions (width x depth x height)		435.3 mm x 492.7 mm x 55.5 mm (2S)
Weight		Maximum: 13.8kg[4]
Notes: 1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes. 2. The mezzanine card slot 1 and slot 3 are used exclusively with an onboard LAN. 3. In SMP configuration between blades, VGA and COM are not available and only USB port is available on non-primary server blades. 4. The Weight of a server blade includes that of SMP connection board.		

Table A-6 CB 520X B3 - CPU specifications

Items	Specifications		
Supported CPUs	E7-8880 v4	E7-8890v4	E7-8893v4
Number of cores	22 C	24C	4C
CPU frequency	2.2 GHz	2.2 GHz	3.2 GHz
QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s
L3 Cache	55 M	60 M	60 M
TDP	150 W	165 W	140 W
Number of CPUs	Maximum: 2		

Table A-7 CB 520X B3 - blade specifications

Items		Specifications
Main Memory	DIMM type (per slot)	DDR4 RDIMM: 16 GB, 32 GB, 64 GB
	Operating mode	Independent Mode (Default), Lockstep Mode, Rank Sparing Mode, Mirrored Memory Mode
	Number of slots	48
	Memory capacity	Maximum: 1,536 GB (32 GB x 48) 3,072 GB (64 GB x 48)

Items			Specifications
	Memory frequency		1600 / 1866 MT/s
Inter-blade SMP (Symmetric MultiProcessing)			2-blade SMP / 4-blade SMP
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 3.6 TB
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS
		Number of I/F	Maximum: 2
		RAID function	RAID 0, 1
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal USB port		USB2.0 x 2port (For LPAR manager)
	Onboard LAN[2]	Midplane I/F	10Gbps 4 port converged network adapter
		Functions	Wake on LAN, PXE boot, iSCSI, FCoE
	Mezzanine card slot[2]	Number of slots	4
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB 3.0)[3]
	KVM connector		1 (VGA / COM / USB2.0 / 2port)[3]
DCMI (Data Center Management Interface)			Supported
Power consumption			Maximum: 770 W (including HDDs and mezzanine cards)
External dimensions (width x depth x height)			435.3 mm x 492.7 mm x 55.5 mm (2S)
Weight			Maximum: 13.8kg[4]

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. The mezzanine card slot 1 and slot 3 are used exclusively with an onboard LAN.
3. In SMP configuration between blades, VGA and COM are not available and only USB port is available on non-primary server blades.
4. The Weight of a server blade includes that of SMP connection board.

Table A-8 CB 520H B3 - CPU specifications (1)

Items	Specifications				
Supported CPUs	E5-2603 v3	E5-2620 v3	E5-2637 v3	E5-2640 v3	E5-2660 v3
Number of cores	6 C	6 C	4 C	8 C	10 C
CPU frequency	1.6 GHz	2.4 GHz	3.5 GHz	2.6 GHz	2.6 GHz
QPI frequency	6.4 GT/s	8.0 GT/s	9.6 GT/s	8.0 GT/s	9.6 GT/s
L3 Cache	15 MB	15 MB	15 MB	20 MB	25 MB
TDP	85 W	85 W	135 W	90 W	105 W
Number of CPUs	Maximum: 2				

Table A-9 CB 520H B3 - CPU specifications (2)

Items	Specifications				
Supported CPUs	E5-2667 v3	E5-2690 v3	E5-2697 v3	E5-2698 v3	E5-2699 v3
Number of cores	8 C	12 C	14 C	16 C	18 C
CPU frequency	3.2 GHz	2.6 GHz	2.6 GHz	2.3 GHz	2.3 GHz
QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s
L3 Cache	20 MB	30 MB	35 MB	40 MB	45 MB
TDP	135 W	135 W	145 W	135 W	145 W
Number of CPUs	Maximum: 2				

Table A-10 CB 520H B3 - blade specifications

Items		Specifications
Main Memory	DIMM type (per slot)	DDR4 RDIMM 8, 16, 32 GB LR-DIMM 32, 64 GB
	Operating mode	Independent Channel Mode, Rank Sparing Mode, Mirrored Channel Mode
	Number of slots	24
	Memory capacity	Maximum: 768 GB(RDIMM 32GB x24) 1536 GB(LR-DIMM 64 GB x 24)
	Memory frequency	2133, 1866, 1600 MT/s
HDD/SSD	Number of HDDs	Maximum: 2
	Capacity[1]	Maximum: 3.6 TB

Items			Specifications
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS (SATA is not supported)
		Number of I/F	Maximum: 2 (2.5 inch SAS HDD, SSD)
		RAID function	RAID 0, 1
	VGA	Resolution	640 x 400 - 1680 x 1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal SD card on Daughter card		1 (SD card slots per Daughter card : 2)
	Onboard LAN	Midplane I/F	10Gbps 4 port converged network adapter
		Functions	Wake on LAN, PXE boot, iSCSI
	Mezzanine card slot[2]	Number of slots	2
Management functionality	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			+12V DC
Front interface	USB		1 (USB 3.0)
	KVM connector		1 (VGA, COM, 2-port USB 2.0)
DCMI (Data Center Management Interface)			Supported
Power consumption			498 W
External dimensions (width x depth x height)			215.4 mm x 500.6 mm x 51.1 mm
Weight			6.7 kg

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. The mezzanine card slot 1 is used exclusively with an onboard LAN.

Table A-11 CB 520H B4 - CPU specifications(1)

Items	Specifications				
Supported CPUs	E5-2637v4[1]	E5-2643v4[1]	E5-2650v4	E5-2667v4[1]	E5-2683v4
Number of cores	4 C	6 C	12 C	8 C	16 C
CPU frequency	3.5 GHz	3.4 GHz	2.2 GHz	3.2 GHz	2.1 GHz
QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s

Items	Specifications				
L3 Cache	15 MB	20 MB	30 MB	25 MB	40 MB
TDP	135 W	135 W	105 W	135 W	120 W
Number of CPUs	Maximum: 2				
Notes: 1. Inlet air temperature is restricted to 5 to 35°C [Non-operating: -10 to 43°C].					

Table A-12 CB 520H B4 - CPU specifications(2)

Items	Specifications				
Supported CPUs	E5-2690v4	E5-2697v4[1]	E5-2697Av4[1]	E5-2698v4	E5-2699v4[1]
Number of cores	14 C	18 C	16 C	20 C	22 C
CPU frequency	2.6 GHz	2.3 GHz	2.6 GHz	2.2 GHz	2.2 GHz
QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s
L3 Cache	35 MB	45 MB	40 MB	50 MB	55 MB
TDP	135 W	145 W	145 W	135 W	145 W
Number of CPUs	Maximum: 2				
Notes: 1. Inlet air temperature is restricted to 5 to 35°C [Non-operating: -10 to 43°C].					

Table A-13 CB 520H B4 - blade specifications

Items			Specifications
Main Memory	DIMM type (per slot)		DDR4 RDIMM 16, 32, 64 GB
	Operating mode		Independent Channel Mode, Rank Sparing Mode, Mirrored Channel Mode
	Number of slots		24
	Memory capacity		Maximum: 1536 GB(64 GB x 24)
	Memory frequency		2400, 2133, 1866, 1600 MT/s
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 3.6 TB
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS (SATA is not supported)
		Number of I/F	Maximum: 2 (2.5 inch SAS HDD, SSD)

Items			Specifications
		RAID function	RAID 0, 1
	VGA	Resolution	640 x 400 - 1680 x 1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal SD card on Daughter card		Maximum: 2 (Required SD card enablement kit)
	Onboard LAN	Midplane I/F	10Gbps 4 port converged network adapter
		Functions	Wake on LAN, PXE boot, iSCSI, FCoE
	Mezzanine card slot[2]	Number of slots	2
Management functionality	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC +12V
Front interface	USB		1 (USB 3.0)
	KVM connector		1 (VGA, COM, 2-port USB 2.0)
DCMI (Data Center Management Interface)			Supported
Power consumption			510 W
External dimensions (width x depth x height)			215.4 mm x 500.6 mm x 51.1 mm
Weight			6.7 kg

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. The mezzanine card slot 1 is used exclusively with an onboard LAN.

Table A-14 PCI expansion blade specification

Items			Specifications
I/O	I/O adapter slot	Interface	PCI Express
		Number of slots	Maximum: 6 slots - Full height, Full length slots: 2 (I/O adapter slot 0/1) - Low profile (MD2) slots: 4 (I/O adapter slot 2/3/4/5)
		I/O adapter slot 0	Electrical x8/Physical x8; Maximum: 25 W
		I/O adapter slot 1	- Electrical x16/Physical x16; Maximum: 225W (PCI expansion blade ((x16 FH 1slot)))

Items			Specifications
			- Electrical x8/Physical x8 Maximum: 25 W (PCI expansion blade ((x8 FH 2slot)))
		I/O adapter slot 2/ slot 3	- Electrical x8/Physical x8; Maximum: 25 W (PCI blade card adapter x8 L/P) - Electrical x4/Physical x8; Maximum: 25 W (PCI blade card adapter x4 L/P)
		I/O adapter slot 4/ slot 5	Electrical x4/Physical x8; Maximum: 25 W
	Mezzanine card slot	Number of slots	1
DC input supply voltage			DC + 12 V
Power consumption			294 W[1]
External dimensions (width x depth x height)			215.4 mm x 492.7 mm x 51.1 mm[2]
Weight			Maximum: 9.54 kg[3]
Notes: 1. This value is for a single PCI expansion blade. 2. The shelf is not included in external dimensions. 3. This value includes the shelf for a PCI expansion blade.			

Specifications of switch modules

The following table shows the specifications of switch modules.

Table A-15 Specifications of the 1/10Gb LAN switch module

Item		Specifications
Interfaces	Internal port	SerDes 1000Base-X×28 port (default:14 port)
	External port	• RJ-45 10Base-T/100Base-Tx/1000Base-T×20 port (default:10 port) • 10GBASE-SR (SFP+)×4 port (default:0 port)
	Management LAN port	• SerDes 1000Base-X×2 port (for connecting management modules) • RS232C Serial port×1port (Connector: mini-USB)[1]
Layer 2 functionality	VLAN	• VLAN(IEEE802.1Q) • Private VLAN
	Spanning Tree Protocol (STP)	• STP(IEEE802.1D) • RSTP(IEEE802.1w)

Item		Specifications
		• PVST+/PVRST+ • MSTP(IEEE802.1s)
	Link Aggregation	IEEE 802.3ad Link Aggregation Control Protocol
	Other Layer 2 functionality	Support for IGMP snooping and IGMP relay
Layer 3 functionality	IPv4 Layer 3 functionality	• Host management • IPv4 forwarding • Support for up to 128 static routes • Routing protocol support (RIP v1, RIP v2, OSPF v2, BGP-4), up to 2048 entries in a routing table • IP filtering with ACLs • Support for DHCP Relay • Support for IGMP snooping and IGMP relay • Support for Protocol Independent Multicast (PIM) in Sparse Mode (PIM-SM) and Dense Mode (PIM-DM)
	IPv6 Layer 3 functionality	• Ipv6 Host management • IPv6 forwarding • Support for up to 128 static routes • Routing protocol support (OSPF v3 routing protocol) • IPv6 filtering with ACLs
Network functionality		• IEEE 802.1p Class of Service (CoS) prioritization • Traffic shaping and re-marking based on defined policies • Eight Weighted Round Robin (WRR) priority queues per port • Layer 2 Trunk Failover to support active/ standby configurations of network adapter teaming • Virtual Router Redundancy Protocol (VRRP)
Security		• VLAN-based, MAC-based, and IP-based ACLs • IEEE 802.1x port-based authentication • Radius, TACACS+ and LDAP authentication and authorization
Operability, management functionality, and monitoring functionality		• Simple Network Management Protocol (SNMP v1/v2/v3) • Telnet interface for CLI • SSH and SSH v2 for CLI • Serial interface for CLI • HTTP browser for GUI

Item	Specifications
	• Firmware image update (TFTP and FTP) • Remote Monitoring (RMON) agent • sFLOW agent for monitoring traffic in data networks • Port mirroring • POST diagnostics
Supported standards	• IEEE 802.1p Class of Service (CoS) prioritization • IEEE 802.1Q Tagged VLAN (frame tagging on all ports when VLANs are enabled) • IEEE 802.1x port-based authentication • IEEE 802.2 Logical Link Control • IEEE 802.3 10BASE-T Ethernet • IEEE 802.3u 100BASE-TX Fast Ethernet • IEEE 802.3ab 1000BASE-T copper twisted pair Gigabit Ethernet • IEEE 802.3ad Link Aggregation Control Protocol • IEEE 802.3x Full-duplex Flow Control • IEEE 802.3ae 10GBASE-SR short range fiber optics 10 Gb Ethernet
External dimensions (width x depth x height)	401 mm x 317 mm x 30 mm
Weight	3.7 kg
Notes: 1. Using this port requires a dedicated serial management cable.	

Table A-16 Specifications of the Brocade 10Gb DCB switch module

Item		Specifications
Interfaces	DCB switch component	VDX2746
	Internal port	SerDes 10GBaseKR×428 port [1]
	External port	• 10GBASE-SR (SFP+)×14 port (1000BASE-T RJ-45 transceiver support)[1] • 40GBASE-SR4 (QSFP+)×2 port (default:0 port)
	Management LAN port	• SerDes 1000Base-X×2 port (for connecting management modules) • RS232C Serial port×1port (Connector: mini-USB)[2]
Layer 2 functionality	VLAN	• VLAN(IEEE802.1Q) • Private VLAN

Item		Specifications
	Spanning Tree Protocol (STP)	• STP(IEEE802.1D) • RSTP(IEEE802.1w) • PVST+/PVRST+ • MSTP(IEEE802.1s)
	Link Aggregation	IEEE 802.3ad Link Aggregation Control Protocol
	Other Layer 2 functionality	IGMP v1/v2 snooping
Layer 3 functionality	IPv4 Layer 3 functionality	• Host management • IPv4 forwarding • Static Routes • Open Shortest Path First(OSPF) • Border Gateway Protocol(BGP) • Virtual Router Redundancy Protocol(VRRP) and VRRP-E
	IPv6 Layer 3 functionality (NOS 5.x or later version is required to use these feature)	• IPv6 addressing • IPv6 Neighbor Discovery Protocol (NDP) • IPv6 Router Advertisement (RA) • IPv6 Static Route • MLD (Multicast Listener Discovery) Snooping • VRRP/VRRP-E v3 • OSPF v3 • BGP4+ • IPv6 ACL • Dynamic Route Leak (IPv4/IPv6)
Network functionality	VCS functionality	• Automatic Fabric Formation • Distributed Fabric Services • Transparent LAN services • Virtual Ling Aggregation Group(vLAG) spanning multiple physical switches • Switch Beaconing • Distributed Configuration Management • Transparent Interconnection of Lots of Links(TRILL) • Equal Cost Multi-Path(ECMP) • Automatic Migration of Port Profiles(AMPP) • VMware-aware Network Automation
	Other network functionality	• IEEE802.1p Class of Service(CoS) • Eight queues per port • Per-port QoS configuration • Scheduling:Strict Priority(SP), Deficit Weighted Round-Robin(DWRR)

Item	Specifications
Security	• Management access ACLs • IEEE 802.1x port-based authentication • Radius and TACACS+
Operability, management functionality, and monitoring functionality	• Simple Network Management Protocol (SNMP v1/v2/v3) • Telnet interface for CLI • SSH and SSH v2 for CLI • Serial interface for CLI • POST diagnostics
Supported standards	• IEEE 802.1AB Data Center Bridging Capability Exchange Protocol (DCBX) • IEEE 802.1p Class of Service (CoS) prioritization • IEEE 802.1Q Tagged VLAN (frame tagging on all ports when VLANs are enabled) • IEEE 802.1Qbb Priority-Based Flow Control (PFC) • IEEE 802.1Qaz Enhanced Transmission Selection (ETS) • IEEE 802.3 Ethernet • IEEE 802.3ab 1000BASE-T copper twisted pair Gigabit Ethernet • IEEE 802.3ad Link Aggregation Control Protocol • IEEE 802.3ae 10GBASE-SR short range fiber optics 10 Gb Ethernet • IEEE 802.3ap 10GBASE-KR backplane 10 Gb Ethernet • IEEE 802.3ba 40GBASE-SR4 short range fiber optics 40 Gb Ethernet • IEEE 802.3x Full-duplex Flow Control
External dimensions (width x depth x height)	401 mm x 317 mm x 30 mm
Weight	3.58 kg
Notes: 1. You can use 24 ports (total number of 10 Gbps internal and external ports) in the initial settings (the settings at shipping time). 2. Using this port requires a dedicated serial management cable.	

Specifications of the power supply module

The following table shows the specifications of the power supply module.

Table A-17 Specifications of the power supply module

Item	2500W PSM Specification
Frequency (acceptable range)	50Hz/60Hz (from 47Hz to 63Hz)
Input electric current	13.8 A 41.4 A (3+3 redundant configuration) 69 A (5+1 redundant configuration)
Breaking current	20 A
Inrush current	Maximum of 40 A
Leakage current	3.5 mA per server chassis or none
Retention time	20 ms or more (for N+N redundancy setting), 12 ms or more (for N+1 redundancy setting)
Number of mounted modules	Minimum: 2. Maximum: 6
Redundancy	Support for N+1 and N+N redundant configurations
Power inlet standard	IEC60320-C20

Specifications of fan modules

The following table shows the specifications of fan modules.

Table A-18 Specifications of fan modules

Item	Specifications
Cooling unit	Mounted per module
Cooling type	Forced cooling by cooling fans
Air flow	Cooling from the front side towards the rear side of the server chassis (to prevent exhaust from re-entering)
Maintainability	Maintenance can be performed even when the system unit is operating.
Redundancy	Support for N+1 redundant configuration
Fan control type	Fan speed is controlled by the thermal sensor and the power supply.
Fan speed detection	Install a detector for each fan.
Air filter	Optional

B

Taking a Memory Dump of the OS Running on a Server Blade

This appendix describes the settings for taking memory dumps for the various OS types in order to prepare for a failure in the OS on a server blade.

A memory dump is a copy of the data in the physical memory on the hard drive. It is saved to a file when a failure occurs in the OS that operates on a server blade. The memory dump can then be used to investigate the state of the system or application that is deadlocked.

- Taking a memory dump in Windows
- Taking a memory dump in Linux
- Taking a memory dump with VMware

Taking a memory dump in Windows

This section describes the settings for taking a memory dump in Windows.

Setting the Windows system environment

This section describes how to configure the system environment in Windows Server 2008 R2. For Windows Server 2012 or later, the system environment does not need to be configured.

If you have purchased a pre-installed edition or bundled installation service edition, or have installed the OS by using the OS setup functionality (Installation Assistant) of Hitachi Server Navigator, which is bundled with the system unit, the settings for taking a memory dump are configured automatically. In these cases, you do not have to configure the settings.

Registry settings for taking an NMI dump

Use Registry Editor to edit the key as follows:

- `HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\CrashControl`
- Name: `NMICrashDump`
- Type: `REG_DWORD`
- Value: `1`

Virtual memory (pagefile.sys) settings

Set the virtual memory as follows:

1. In the **Start** menu, right-click **Computer**, and then select **Properties**.
2. Select **Advanced System Settings**.
3. In the **System Properties** window, select the **Advanced** tab.
4. In **Performance**, click the **Settings** button.
5. Select the **Advanced** tab.
6. In **Virtual memory**, click the **Change** button.
7. Select the drive for pagefile.sys, and make sure that the values configured for **Initial size** and **Maximum size** are both equal to at least the physical memory size plus 400 MB.
8. Click the **OK** button to close the **System Properties** window, and then restart Windows.

Tip: The settings described above are given as an example, you might not be able to take an NMI dump in some environments. See the following technical information provided by Microsoft.
http://support.microsoft.com/kb/969028/ja

Checking the amount of free space in the memory dump output destination

Ensure that the output destination of the MEMORY.DMP file has free space equal to at least the physical memory size plus 400 MB.

Configuring the settings for taking a complete memory dump

A complete memory dump collects information including the user mode. This is why a complete memory dump provides more possibilities for identifying the cause when analyzing a failure. Note, however, that a complete memory dump requires more free space in the output destination according to the installed physical memory size. If you can ensure sufficient free space for storing the memory dump file, we recommend taking a complete memory dump.

Before performing the following procedure, also ensure that the content of Setting the Windows system environment on page B-2 is also configured in advance.

Registry settings for taking a complete memory dump

Use the registry editor to edit the key as follows: Execute this operation only in Windows Server 2008 R2. This operation is not necessary in Windows Server 2012 or later.

- `HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\CrashControl`
- Name: `CrashDumpEnabled`
- Type: `REG_DWORD`
- Value: `1`

Settings for taking a complete memory dump

Complete the following steps to set the Complete memory dump type.

1. In the **Start** menu, right-click **Computer**, and then select **Properties**.
2. Select **Advanced System Settings**.
3. In the **System Properties** window, select the **Advanced** tab.
4. In **Startup and Recovery**, click the **Settings** button.
5. In the **Write debugging information** drop-down list, select **Complete memory dump**.
6. Close the **Startup and Recovery** window and the **System Properties** window, and then restart Windows.

Related topics

- Setting the Windows system environment on page B-2

Taking a memory dump in Windows

This section describes how to take a memory dump when a failure occurs in Windows.

Triggers for taking a memory dump

When a STOP (error message displayed on a blue screen) error occurs, a memory dump is taken automatically. Also, when Windows becomes unresponsive, the management module issues an NMI to take a memory dump.

While a memory dump is being taken

- In Windows Server 2012 or later, when the percentage displayed in the upper right corner of the screen reaches "100% complete", the memory dump is complete.
- In Windows Server 2008 R2, when the figure in the lower part of the screen reaches "100", the memory dump is complete.

Tip: While a memory dump is being taken, do not issue an NMI. Doing so may cause Windows to become unresponsive.

When the memory dump is complete, if Windows does not restart automatically, restart Windows manually.

After a memory dump is taken

After the system restarts, the memory dump that was taken is copied to the specified output destination. The output destination of the memory dump is `%SystemRoot%\MEMORY.DMP` (initial setting#). When the output of the memory dump is complete, the following event is output to the system event log.

Event ID: 1001

Source: BugCheck

Until the above-mentioned event is output to the system event log, do not conduct any operations on the memory dump file.

#

After a memory dump has been taken, if there is no memory dump file in the above-mentioned output destination, the output destination has been changed from the initial setting. See the following registry information to check the current output destination.

Key: `HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\CrashControl`

Name: `DumpFile`

Taking a memory dump in Linux

This section describes how to take a memory dump in Linux.

Failure detection in Red Hat Enterprise Linux

The standard settings of Red Hat Enterprise Linux prevent the OS from stopping even if an NMI occurs. Therefore, configure the settings of Red Hat Enterprise Linux so that a kernel panic occurs when an NMI is issued. For details, see Help or the documentation for the OS.

Note: In Red Hat Enterprise Linux, if "Function to stop the system immediately when an NMI is received" is enabled, the CPU hang-up detection functionality and kernel profile functionality cannot be used at the same time.

Taking a memory dump in Red Hat Enterprise Linux

To use the kdump memory dump functionality of Red Hat Enterprise Linux to take a memory dump, perform the following procedure. If you use the reliable memory dump functionality Linux Tough Dump, see the documentation for Linux Tough Dump.

Triggers for taking a memory dump

When an OS failure (such as kernel panic) occurs, a memory dump is taken automatically. Also, when the system is hung up, the management module issues an NMI to take a memory dump.

While a memory dump is being taken

The progress is displayed on the screen as a percentage while a memory dump is being taken. When the percentage reaches "100%", the memory dump is complete. When the memory dump is complete, if the OS does not restart automatically, restart it manually.

After a memory dump is taken

After the system is restarted, make sure that the memory dump was taken. The output destination of the memory dump is `/var/crash/`*`date-time`*`/` (initial setting#). *date* and *time* show the date and time when the memory dump was taken.

#

If the output destination of the memory dump file has been changed from the default setting, you can check it in the OS setting file `/etc/kdump.conf`.

Taking a memory dump with VMware

This section describes the procedure to take a memory dump with VMware.

Configuring the settings to stop VMware when a failure occurs

The standard settings of VMware ESX 4.0 or later prevent VMware from stopping even if an NMI is issued. In VMware ESX 4.0 or later, perform the following procedure to set the parameters to stop the system when an NMI is issued.

1. Log in to VMware with the vSphere client.
2. In the **Configuration** tab of the host, in **Software**, select **Advanced Settings**.
3. Select **VMkernel** and then change the value of **VMkernel.Boot.nmiAction** to 2.
4. Click the **OK** button to close the window of the vSphere client.
5. Restart ESX/ESXi.

If you used the VMware Installation Service, the necessary settings were already set at shipping time.

Taking a memory dump with VMware

Use the following procedure to take a memory dump with VMware.

Triggers for taking a memory dump

When a purple diagnostic screen (error message displayed on a purple screen) is displayed on the local console, a memory dump is taken automatically. Also, when VMware becomes unresponsive, the management module issues an NMI to take a memory dump. Perform the following procedure to issue an NMI.

1. Write down the information in the **VMware console** window.
2. Use another computer to check via the network whether the VMware virtual machine is operating. If the VMware virtual machine is operating, shut it down.
3. Issue an NMI from the management module.

While a memory dump is being taken

When the memory dump is complete, the message `"Escape" for local debugger` is displayed in the lower part of the VMware console window.

After a memory dump is taken

- For ESXi 5.0 Update 1 or later
  a. Press the **Esc** key.
  b. In vmkernel debugger, type "`reboot`" and then press the **Enter** key.
- For ESXi 5.0 or earlier
  a. Press the **Esc** key.

b. In vmkernel debugger, type "`r`" and then press the **Enter** key.

c. After the system is restarted, use the local console to log in to the ESXi host as root user.

d. Execute the `esxcfg-dumppart -l` command.

e. In the command execution result, take note of the **Console Name** entries where both **Is Active** and **Is Configured** are "**yes**".

f. Execute the following command.

```
# esxcfg-dumppart -C -D [Console Name] noted down in Step 5
-n
```

After the system is restarted, verify that the memory dump was taken. The output destination of the memory dump is `/var/core/vmkernel-zdump.`*X* (initial setting). *X* indicates a number.

There might be more than one `vmkernel-zdump.`*X* file. Use the `ls` command to check the dates of the files, and then look for the file that has the time stamp of the system restart. This will be the dump file generated this time. If you want to start the virtual machine after the system is restarted, start the system according to normal operation procedures. If you do not plan to start the virtual machine, start the system in maintenance mode.

C

Cleaning the System Unit

This appendix describes how to clean the system unit.

- ☐ Rough guide for cleaning intervals
- ☐ Removing the dust from the ventilation holes

Rough guide for cleaning intervals

The system unit must be cleaned on a regular basis. The table below shows the required tasks for cleaning the system unit and the interval at which each task should be performed.

Task	Interval
Removing the dust from the ventilation holes	6 months (rough guide)
Checking for abnormal fan sounds in the fan module	
Checking for abnormal fan sounds in the power module	

If you find any abnormality during or after cleaning, contact your reseller or call maintenance personnel.

CAUTION: Before cleaning the system unit, turn off the power supply and disconnect the power cable. Failure to do so may lead to an electric shock or an equipment failure.

Removing the dust from the ventilation holes

Use a dry cloth to wipe the ventilation holes in the locations shown below, or use a vacuum cleaner to vacuum the dust.

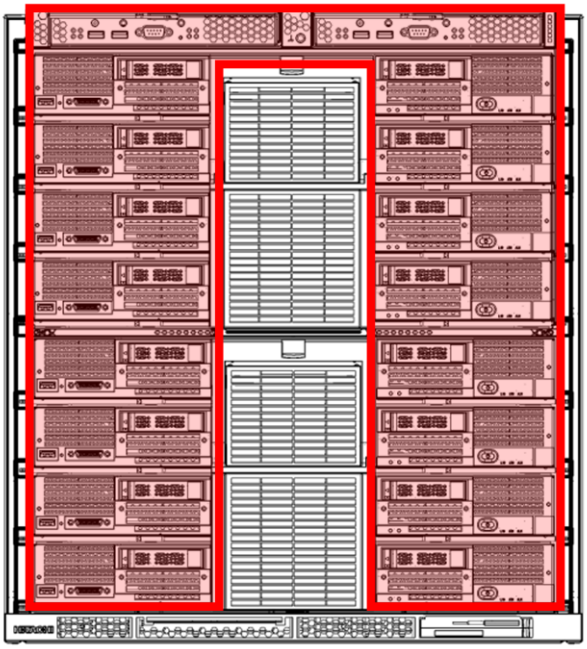


Figure C-1 Ventilation holes to be cleaned

D

Components that have specified lifetimes

This appendix describes the service life of the hardware components making up the system unit, and the components that have specified lifetimes.

☐ Components that have specified lifetimes

Components that have specified lifetimes

The CB 2500 is designed to have a service life of five years (where 1 month equals 30 days, and 1 day equals 24 hours). Some components of the system unit have specified lifetimes and degrade or wear out as the system unit is used. The following are the major components that have specified lifetimes:

Preventive replacement of components that have specified lifetimes is a paid service. Contact your maintenance company or the store where you purchased the product.

Component name	Applicable product type	Remarks
Not applicable		

Note: The service life periods described here are only rough guides and do not guarantee that failures will not occur during these periods.

E

License

This appendix describes the license terms for the CB 2500, including the license terms for products of other vendors.

- End user license

End user license

The firmware (BMC) for the server blades uses code developed by Avocent Corporation. We request that you the customer (end user) use the product within the scope of the following End User License of Avocent Corporation.

End User License

(i) each end user is granted a non-transferable, non-exclusive, non-sublicensable license to use a single copy except a copy for back up purpose of the Licensed Products in connection with the end user's use of the Customer Products with which the Licensed Products is distributed, (ii) all right, title and ownership, including all proprietary rights, including trademarks, copyrights, and patents, shall remain with Avocent, (iii) the end user shall safeguard the confidentiality of the Licensed Products, and (iv) that neither Avocent nor Distributor shall be liable for any special, indirect, incidental, or consequential damages.

Glossary

This section explains the terminology you need to know when using the CB 2500.

A

active blade
When using the N+M cold standby function, the active blade is the server blade that is actively running your applications.

APC (Accurate Power Control)
A function that uses power capping to limit the power consumption of the system unit. The APC function reduces power consumption by controlling the CPU clock rate of the system unit when power consumption exceeds a predetermined level.

B

BMC
Baseboard Management Controller
A controller that monitors and controls the status of server blades. The BMC monitors and controls server blades by connecting to the system console and the management module.

C

CLI
Command Line Interface

CNA
Converged Network Adapter

| # | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

D

DCB
Data Center Bridging

DCMI
Data Center Manageability Interface

DDE
Dynamic Data Exchange

DDR3
Double-Data-Rate3

Deployment Manager
Software provided as part of Hitachi Compute Systems Manager. Deployment Manager is a function that allows you to back up and restore the disk data of a server blade as an image file. You can also use a backed up image file to replicate the environment of a managed resource on another managed resource.

DIMM
Dual Inline Memory Module

E

EFI
Extensible Firmware Interface

ETS
Enhanced Transmission Selection

F

FC
Fibre Channel

G

GUI
Graphical User Interface

H

HBA
Host Bus Adapter

HCSM
Hitachi Compute Systems Manager

HCS
Hitachi Command Suite

HVM
Hitachi Virtualization Manager

I

I/O
Input/Output

IEEE
The Institute of Electrical and Electronics Engineers, Inc.

IPv4
Internet Protocol version 4

IPv6
Internet Protocol version 6

iSCSI
Internet Small Computer System Interface

J

JRE
Java Runtime Environment

K

KVM
Keyboard, Video and Mouse

L

LDAP
Lightweight Directory Access Protocol

LED
Light Emitting Diode

LID (Location IDentifier lamp)
An LED lamp that you can use to identify the location of server chassis and modules. By controlling the LIDs of a server blade or server chassis remotely from the system console or Hitachi Compute Systems Manager, you can easily identify a managed resource in the system unit.

logical partitioning
A function that uses Hitachi's server logical partitioning framework to logically partition a blade server composed of one or several server blades. Each logical partition can then be used to create a discrete server environment.

LPAR (Logical PARtition)
When using logical partitioning, an LPAR is the term for each logical partition that can accommodate a discrete server environment.

LPAR manager (Logical PARtitioning manager)
A function of logical partitioning. A component that manages LPARs on a blade server.

LR-DIMM
Load Reduced DIMM

M

MAC
Media Access Control

management module
A module that monitors and configures the system unit as a whole. The management module allows you to centrally manage the server blades and modules in the system unit.

memory dump
A file containing the memory contents of a server at a particular time. When a failure occurs in the OS, you can use a memory dump to diagnose the nature of the failure.

MIB
Management Information Base

MR-IOV
Multi Root I/O Virtualization

MSR
Model Specific Register

N

N+M cold standby
When a failure occurs in a server, the N+M cold standby function allows the server to failover to a machine that is in standby with power off. When a failure occurs in an active server blade, failover to the standby blade takes place automatically. The server that is actively running applications is called the "active blade". The server blade that is in standby is called the "standby blade".

NIC
Network Interface Card

NMI (Non-Maskable Interrupt)
A hardware interrupt issued to the CPU from an external device. An NMI can be used, for example, to collect OS dump files.

NTP
Network Time Protocol

P

PCI
Peripheral Component Interconnect

PCIe
PCI Express

PFC
Priority Flow Control

PXE
Preboot eXecution Environment

Q

QPI
QuickPath Interconnect

| # | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

R

RAID
Redundant Arrays of Inexpensive Disks

RDIMM
Registered DIMM

remote console
Software provided with the CB 2500. You can use the remote console to remotely control the server OS and LPARs on a server blade.

S

SAN
Storage Area Network

SAS
Serial Attached SCSI

SATA
Serial Advanced Technology Attachment

server chassis
A frame in which server blades and modules are mounted.

SMP
Symmetric Multi Processor

SNMP
Simple Network Management Protocol

SSH
Secure SHell

SSL
Secure Sockets Layer

standby blade
When using the N+M cold standby function, the standby blade remains in standby with its power off until a failover occurs from a failed active blade.

system console
A computer from which a user monitors and configures the CB 2500 system unit.

| # | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

switch module
A module that connects the system unit to LANs, SANs, and other networks.

T

TDP
Thermal Design Power

terminal software
Software that allows a user to operate a remote host computer from a terminal computer. The CB 2500 remote console can be operated using generic terminal software.

U

UEFI
Unified Extensible Firmware Interface

USB
Universal Serial Bus

V

VGA
Video Graphics Array

virtual media
An image file that contains the data recorded on media such as a CD or DVD. By converting the installation media for the OS and other software to virtual media, you can make the software available for installation on a server blade.

VLAN
Virtual Local Area Network

W

Web console
A console that operates by using a GUI of the system console. You can use the Web console to view hardware information for a server chassis or server blade, or to control the hardware remotely.

WoL
Wake-on LAN

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