



Hitachi Compute Blade 2500 Series

Product Ordering Guide

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Preface

This preface includes the following information:

- ☐ [Intended audience](#)
- ☐ [Release notes](#)
- ☐ [Document revision level](#)
- ☐ [Changes in this revision](#)
- ☐ [Document conventions](#)
- ☐ [Convention for storage capacity values](#)
- ☐ [Getting help](#)
- ☐ [Comments](#)

Note:

The use of Hitachi Compute Blade 2500 (CB 2500) Server Blade and all other Hitachi Data Systems products is governed by the terms of your agreements with Hitachi Data Systems.

Intended audience

This document describes how to configure the CB 2500 server blades for HDS sales-representatives or sales-partners.

Release notes

Release notes contain requirements and more recent product information that may not be fully described in this document. Be sure to review the release notes before configuration.

Document revision level

Revision	Date	Description
ESD-99CB2500001-00	June 2014	Initial release
ESD-99CB2500001-01	Aug. 2014	Revision 1 supersedes and replaces Revision 0.
ESD-99CB2500001-02	Sep. 2014	Revision 2 supersedes and replaces Revision 1.
ESD-99CB2500001-03	Oct. 2014	Revision 3 supersedes and replaces Revision 2.
ESD-99CB2500001-04	Dec. 2014	Revision 4 supersedes and replaces Revision 3.
ESD-99CB2500001-05	Jan. 2015	Revision 5 supersedes and replaces Revision 4.
ESD-99CB2500001-06	Feb. 2015	Revision 6 supersedes and replaces Revision 5.
ESD-99CB2500001-07	Feb. 2015	Revision 7 supersedes and replaces Revision 6.
ESD-99CB2500001-08	Mar. 2015	Revision 8 supersedes and replaces Revision 7.
ESD-99CB2500001-09	Mar. 2015	Revision 9 supersedes and replaces Revision 8.
ESD-99CB2500001-10	Apr. 2015	Revision 10 supersedes and replaces Revision 9.
ESD-99CB2500001-11	Apr. 2015	Revision 11 supersedes and replaces Revision 10.
ESD-99CB2500001-12	May 2015	Revision 12 supersedes and replaces Revision 11.
ESD-99CB2500001-13	June 2015	Revision 13 supersedes and replaces Revision 12.
ESD-99CB2500001-14	July 2015	Revision 14 supersedes and replaces Revision 13.
ESD-99CB2500001-15	Aug. 2015	Revision 15 supersedes and replaces Revision 14.
ESD-99CB2500001-16	Sep. 2015	Revision 16 supersedes and replaces Revision 15.
ESD-99CB2500001-17	Sep. 2015	Revision 17 supersedes and replaces Revision 16.
ESD-99CB2500001-18	Oct. 2015	Revision 18 supersedes and replaces Revision 17.
ESD-99CB2500001-19	Nov. 2015	Revision 19 supersedes and replaces Revision 18.
ESD-99CB2500001-20	Dec. 2015	Revision 20 supersedes and replaces Revision 19.
ESD-99CB2500001-21	Dec. 2015	Revision 21 supersedes and replaces Revision 20.
ESD-99CB2500001-22	Jan. 2016	Revision 22 supersedes and replaces Revision 21.
ESD-99CB2500001-23	Feb. 2016	Revision 23 supersedes and replaces Revision 22.
ESD-99CB2500001-24	Mar. 2016	Revision 24 supersedes and replaces Revision 23.
ESD-99CB2500001-25	Apr. 2016	Revision 25 supersedes and replaces Revision 24.

Changes in this revision

- Updated the Q-Code of the 520H B4 products ([Server blades](#), [Expansion blade](#), [Processors](#), [Memory modules](#)).
- Updated the [restrictions on system configuration](#).
- Corrected errors in the table of [memory installation patterns](#).

Document conventions

This document uses the following typographic conventions:

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click OK .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: copy <i>source-file target-file</i> Note: Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: # pairdisplay -g oradb
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: # pairdisplay -g <group> Note: Italic font is also used to indicate variables.
[] square brackets	Indicates optional values. Example: [a b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a b } indicates that you must choose either a or b.
vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a b] indicates that you can choose a, b, or nothing. { a b } indicates that you must choose either a or b.

Convention 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

Document organization

The following table 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, Product overview	Describes the product overview and the general specifications for CB 2500 series.
Chapter 2, Ordering server chassis	Describes how to configure CB 2500 Server Chassis.
Chapter 3, Ordering server blade	Describes how to configure server blades that are installed in the CB 2500 Server Chassis.
Chapter 4, Ordering LPAR Manager	Describes how to configure LPAR Manager.
Chapter 5, Configuring power supply modules	Describes how to configure Power Supply Modules in the CB 2500 Server Chassis.
Chapter 6, Memory installation pattern	Shows the memory installation patterns available for CB 2500 server blades.
Chapter 7, Specifications	Describes how to configure optional features.
Chapter 8, Product code	Lists the product codes for CB 2500.

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://hdssupport.hds.com>.

Comments

Please send us your comments on this document: doc.comments@hds.com. Include the document title, number, and revision, and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Data Systems.

Thank you!

Product overview

This chapter describes the product overview and the general specifications for the CB 2500 series.

- [Overview](#)
- [Restrictions on system configuration](#)

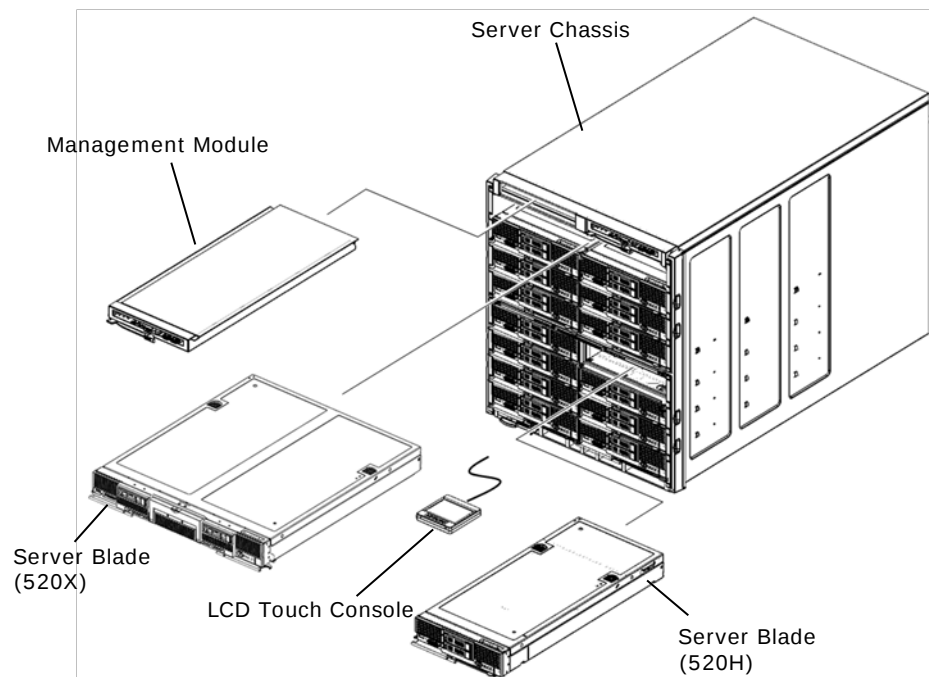
Overview

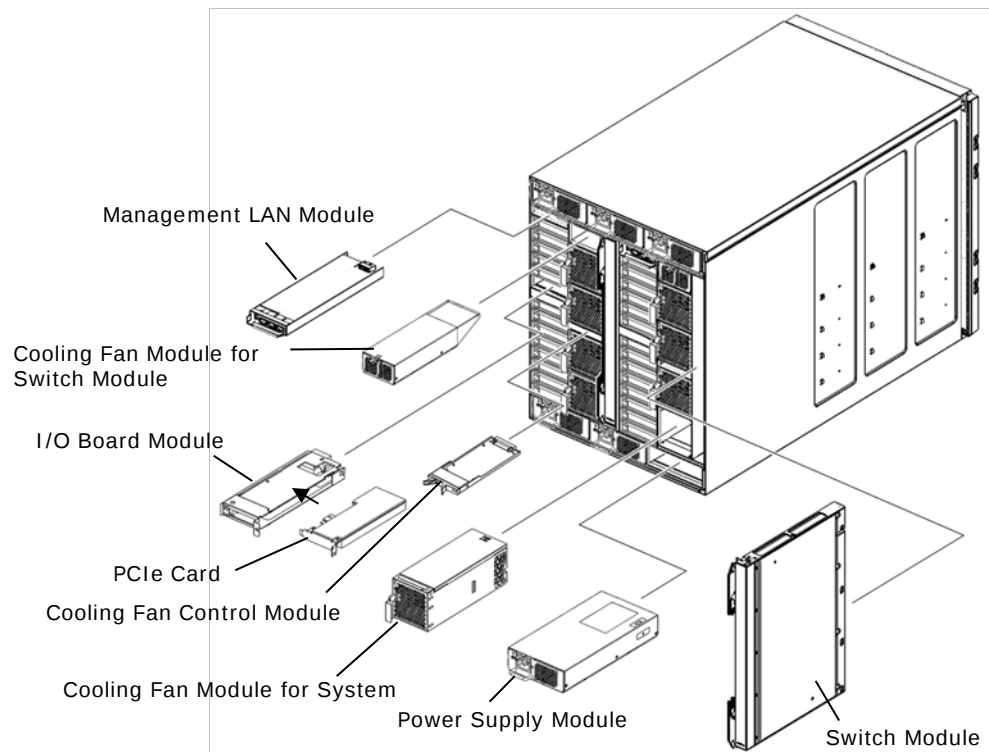
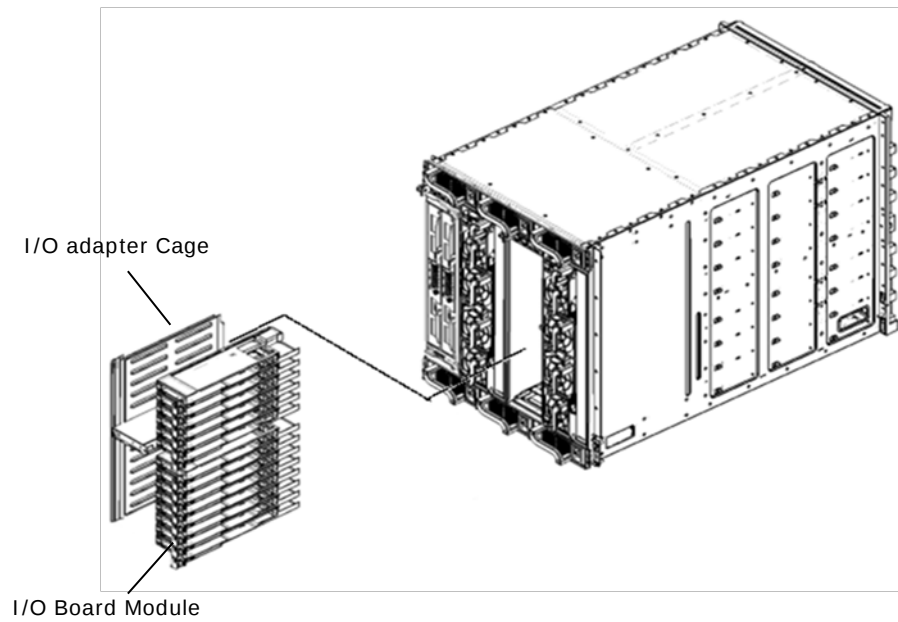
CB 2500

The CB 2500 is a high-end blade server developed as a successor to the CB 2000. Besides server consolidation, which the CB 2000 has achieved by gathering multiple servers into a server chassis, the CB 2500 is developed to aim at flexible connections with external switches by decreasing internal switches and expanding the number of slots and the bandwidth for Hot-plug PCIe slots.

The following are the major features developed for the CB 2500:

- The CB 2500 supports the upper limit of the number of DIMMs that the CPU architecture supports.
- The CB 2500 supports high-speed I/O technology, such as 10Gb Ethernet (including CEE and FCoE) and 16Gb Fibre Channel. In addition, by supporting two Hot-plug PCIe slots, the CB 2500 can directly connect with external switches or external storages; and supports multipath I/O, which expands flexibility and redundancy of I/O.
- Management Module Portal simplifies connection and setting up of internal components. On the other hand, LCD Touch Console provides options to operate a system without a remote terminal. In addition, increase of Field Replaceable Units (FRUs) that can be replaced without tools improved serviceability.





Server chassis

The CB 2500 Server Chassis A1 is a 12U server chassis and offers the following features:

- Up to 7 full-width server blades (If an SMP is configured, 8 full-width server blades can be installed) or up to 14 half-width server blades can be contained in a chassis. Full-width server blades and half-width server blades can be mixed in the same chassis.
- Up to 2 switch modules
- Up to 6 power supply modules
- 10 hot-swap fan modules are installed as standard
- 2 management modules are installed as standard

520X B1

The 520X B1 Server Blade is a full-width server blade and offers the following features:

- Supports Intel Ivy Bridge-EX processors
- Supports up to 1,536 GB (32 GB × 48) memory
- Supports up to 2 SAS HDDs
- Supports Onboard 10 Gb LAN ×4 ports
- Supports SMP configuration

520X B2

The 520X B2 Server Blade is a full-width server blade and offers the following features:

- Supports Intel Haswell-EX processors
- Supports up to 3,072 GB (64 GB × 48) memory
- Supports up to 2 SAS HDDs
- Supports Onboard 10 Gb LAN ×4 ports
- Supports SMP configuration

520X B3

The 520X B3 Server Blade is a full-width server blade and offers the following features:

- Supports Intel Broadwell-EX processors
- Supports up to 3,072 GB (64 GB × 48) memory
- Supports up to 2 SAS HDDs

- Supports Onboard 10 Gb LAN ×4 ports
- Supports SMP configuration

520H B3

The 520H B3 Server Blade is a half-width server blade and offers the following features:

- Supports Intel Haswell-EP processors
- Supports up to 1,536 GB (64 GB × 24) memory
- Supports up to 2 SAS HDDs
- Supports Onboard 10 Gb LAN ×4 ports
- Supports PCI Expansion Blade

520H B4

The 520H B4 Server Blade is a half-width server blade and offers the following features:

- Supports Intel Broadwell-EP processors
- Supports up to 1,536 GB (64 GB × 24) memory
- Supports up to 2 SAS HDDs
- Supports Onboard 10 Gb LAN ×4 ports

Restrictions on system configuration

The restrictions described in this section apply to the system configuration temporarily and are planned to be removed.

Server blade

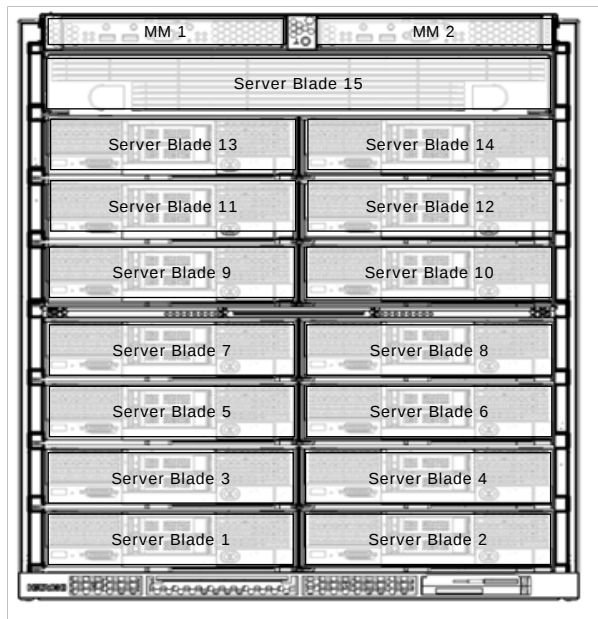
Server blade					Restriction
520X			520H		
B1	B2	B3	B3	B4	
	✓	TB D		TB D	LPAR Manager Advanced License and Enterprise License are inapplicable to a server blade with an active LoM. This restriction is scheduled to be removed in 2016.
✓		TB D	✓	TB D	LPAR Manager Advanced License is inapplicable to a server blade with an active LoM. This restriction is scheduled to be removed in 2016.
✓	✓		✓		RHEL 7.1 does not support iSCSI boot. This restriction is scheduled to be removed in June 2016 .
✓	✓		✓		In a RHEL 6.7 environment, iSCSI connection is unavailable.
✓	✓	✓	✓	✓	RHEL 7.2 does not support FCoE and iSCSI. This restriction is scheduled to be removed in June 2016.

Ordering server chassis

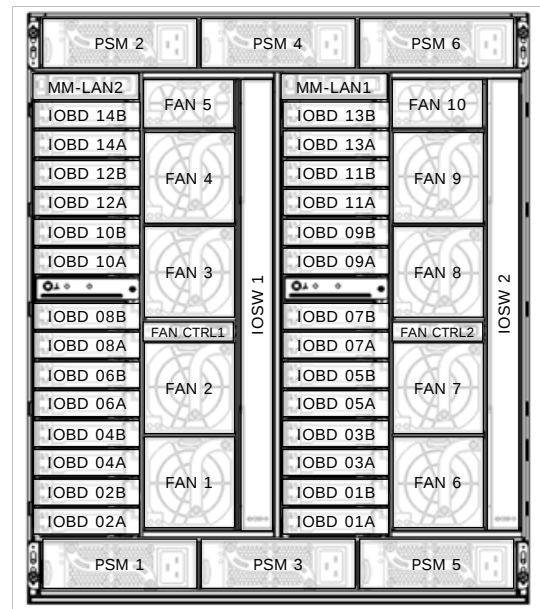
This chapter describes how to configure CB 2500 Server Chassis.

- ☐ [Slots layout](#)
- ☐ [Server chassis](#)
- ☐ [LCD Touch Console](#)
- ☐ [I/O Adapter Cage](#)
- ☐ [Power Supply Module](#)
- ☐ [KVM Cable](#)
- ☐ [Switch modules](#)
- ☐ [Power supply module](#)
- ☐ [Dummy modules](#)

Slot positions in the CB 2500



Front view



Rear view

Server chassis

The following table lists the product code for the CB 2500 Server Chassis.

Product name		Product code
Server chassis	CB 2500 Server Chassis A1 (Contains two Management Modules, two Power Supply Modules, and a Full-width Dummy Server Blade for server blade slot 15)	GG-RE4A1UBX1-Y

LCD Touch Console

An LCD Touch Console works as a Management Module console that supports part of the Management Module functions such as initial setup of a server chassis and identification of a failure part in an early stage of diagnosis. An LCD Touch Console must be connected to a USB port on the Management Module while it is being operated.

Q'ty per chassis	Product name		Product code
0-1	Console	LCD Touch Console	GG-DT3LCD1X1-(Y R)

I/O Adapter Cage

Two I/O Adapter Cages must be installed in a CB 2500 Server Chassis even if the chassis is not to contain any I/O adapter.

Q'ty per chassis	Product name		Product code
2	I/O adapter cage	I/O Adapter Cage	GG-BE4ICG1X1-Y

Power Supply Module

Determine the number of the Power Supply Modules to satisfy the estimated power consumption of the system. For the details of the estimation, see [Configuring power supply modules](#).

Q'ty per chassis	Product name		Product code
2-6	Power supply module	Power Supply Module	GG-BP4PWS1X1-(Y R)

The following table lists the available power supply module configurations. If AC power redundancy is required, divide the power supply modules into two groups and connect them to separate sources. PSM1, PSM3, and PSM5 constitute one group; and PSM2, PSM4, and PSM6 constitute the other group.

Number of power supply modules	Power supply slot					
	PSM1	PSM2	PSM3	PSM4	PSM5	PSM6
2	✓*	✓*				
3	✓*	✓*	✓			
4	✓*	✓*	✓	✓		
5	✓*	✓*	✓	✓	✓	
6	✓*	✓*	✓	✓	✓	✓
*A CB 2500 Server Chassis A1 contains two Power Supply Modules as standard.						

C13 PDU support feature

C13 PDU Support Feature enables the Power Supply Modules to connect to C13 PDUs.

Q'ty per chassis	Product name		Product code
0-1	C13 PDU support feature	C13 PDU Support Feature	GG-AR4PEN1X1-Y

The following table lists the configuration rules for C13 PDU Support Feature.

	Configuration rule
✓	C13 PDU Support Feature reduces the power capacity of the Power Supply Modules. For details, see the Estimating the number of power supply modules .
✓	C13 PDU Support Feature is only applicable to a system that is set in North America.

KVM Cable

A KVM cable enables a CB 2500 server blade to have one VGA port, one serial port, and two USB ports. The USB ports are only recommended to be used for a keyboard and a mouse. Other devices can connect to the USB ports if the total rated current is 500 mA or less. A KVM cable is used by connecting with the KVM port on a server blade but is not required to be provided for each server blade.

Product name		Product code
KVM cable	KVM Cable	GG-LR3KVM1X1-(Y R)

Switch modules

The following table lists the product code for the switch modules.

Q'ty per chassis	Product name		Product code
0-2	Switch module	1/10Gb LAN Switch Module	GG-BE4LSW1X1-(Y R)
0-2		10Gb DCB Switch Module	GG-BE4LSW2X1-(Y R)

The following table lists the options for switch modules.

Q'ty per switch		Product name	Product code
1/10Gb LAN Switch	10Gb DCB Switch		
0-1		Port Upgrade License for LANSW	GG-BE4LSL1X1-(Y R)
0-1		10Gb Activation License for LANSW	GG-BE4LSL2X1-(Y R)
	0-1	Port Upgrade License 14p, DCB	GG-BE4LSL4X1-(Y R) (Targeting Q-Code: TBD)
	0-1	FCoE License for DCBSW	GG-BE4LSL5X1-(Y R) (Targeting Q-Code: Mar. 25, 2016)
	0-1	Port Upgrade License 18p, DCB	GG-BE4LSL6X1-(Y R)
	0-1	40Gb Activation License, DCB	GG-BE4LSL7X1-(Y R)
0-4		Optical Transceiver for LANSW	GG-BE4SFP1X1-(Y R)
	0-14	10Gb Optical Transceiver for DCBSW	GG-BE3SFP2X1-(Y R)
	0-14	RJ-45 Connector for DCB-SW	GG-BE3SFP3X1-(Y R) To be discontinued in May 2016
	0-14	RJ-45 Connector for DCB-SW	XBR-000190.P
	0-2	40Gb Optical Transceiver for DCBSW (Compatible with 10GBASE-SR)	40G-QSFP-SR4-INT.P
0-4		10Gb SFP+ Passive Twinax 3m	GG-LN4TWC1X1-(Y R)
0-4		10Gb SFP+ Passive Twinax 5m	GG-LN4TWC2X1-(Y R)
	0-14	10G SFP+ Twinax Cable 3m	GG-LN3TWC2X1-(Y R)
	0-14	10G SFP+ Twinax Cable 5m	GG-LN3TWC3X1-(Y R)
	0-2	40GB QSFP to QSFP 3m for DCBSW	40G-QSFP-QSFPC0301.P
	0-2	40GB QSFP to QSFP 5m for DCBSW	40G-QSFP-QSFPC0501.P
	0-14	300m Optic Instead of 100m for DCBSW	HD-10G-SFPP-SR.P
	0-2	40GBASE-SR4 QSFP+ (MODULE)-300M	40G-QSFP-ESR4.P
	0-2	4x10Gb SFP+ to 40Gb Active Twinax Cable 3m	40G-QSFP-4SFP-C-0301.P
	0-2	4x10Gb SFP+ to 40Gb Active Twinax Cable 5m	40G-QSFP-4SFP-C-0501.P
0-1	0-1	Management Cable for Switch Module	GG-LR4MNC1X1-(Y R)

Switch module configuration rules

The following table lists the configuration rules for the Switch modules.

Switch		Configuration rule
1/10GB LAN Switch	10Gb DCB Switch	
✓	✓	Up to two switch modules can be installed in a chassis.
✓	✓	Different types of switch modules cannot be installed together in the same chassis.

Switch		Configuration rule																																							
1/10GB LAN Switch	10Gb DCB Switch																																								
✓	✓	When a switch module cannot be set up through the Management Module, a Management Cable for Switch Module is needed. This cable connects a console with the switch module.																																							
✓		The upgrade Licenses expand the number of the ports on a 1/10GB LAN Switch. The following table lists available port combinations and upgrades that are required for each combination.																																							
		<table><tr><th rowspan="2">Supported port combinations</th><th colspan="3">Quantity required</th></tr><tr><th>Base switch</th><th>Port Upgrade License for LANSW</th><th>10Gb Activation License for LANSW</th></tr><tr><td>24× 1 GbE ports*</td><td rowspan="2">1</td><td></td><td></td></tr><tr><td>14× 1 GbE ports* and 1× external 10 GbE SFP+ port</td><td></td><td></td></tr><tr><td>48× 1 GbE ports*</td><td rowspan="2">1</td><td rowspan="2">1</td><td rowspan="2"></td></tr><tr><td>28× 1 GbE ports* and 2× external 10 GbE SFP+ ports</td><td></td></tr><tr><td>14× 1 GbE ports* and 4× external 10 GbE SFP+ ports</td><td rowspan="2">1</td><td></td><td rowspan="2">1</td></tr><tr><td>34× 1 GbE ports* and 2× external 10 GbE SFP+ ports</td><td></td></tr><tr><td>28× 1 GbE internal ports, 20× 1 GbE external ports, and 4× external 10 GbE SFP+ ports</td><td>1</td><td>1</td><td>1</td></tr><tr><td colspan="4">*Total number of the internal ports and external ports</td></tr></table>	Supported port combinations	Quantity required			Base switch	Port Upgrade License for LANSW	10Gb Activation License for LANSW	24× 1 GbE ports*	1			14× 1 GbE ports* and 1× external 10 GbE SFP+ port			48× 1 GbE ports*	1	1		28× 1 GbE ports* and 2× external 10 GbE SFP+ ports		14× 1 GbE ports* and 4× external 10 GbE SFP+ ports	1		1	34× 1 GbE ports* and 2× external 10 GbE SFP+ ports		28× 1 GbE internal ports, 20× 1 GbE external ports, and 4× external 10 GbE SFP+ ports	1	1	1	*Total number of the internal ports and external ports								
		Supported port combinations		Quantity required																																					
			Base switch	Port Upgrade License for LANSW	10Gb Activation License for LANSW																																				
		24× 1 GbE ports*	1																																						
		14× 1 GbE ports* and 1× external 10 GbE SFP+ port																																							
		48× 1 GbE ports*	1	1																																					
		28× 1 GbE ports* and 2× external 10 GbE SFP+ ports																																							
		14× 1 GbE ports* and 4× external 10 GbE SFP+ ports	1		1																																				
		34× 1 GbE ports* and 2× external 10 GbE SFP+ ports																																							
28× 1 GbE internal ports, 20× 1 GbE external ports, and 4× external 10 GbE SFP+ ports	1	1	1																																						
*Total number of the internal ports and external ports																																									
	✓	The upgrade Licenses expand the number of the ports on a 10Gb DCB Switch. The following table lists available port combinations and upgrades that are required for each combination.																																							
		<table><tr><th rowspan="2">Supported port combinations</th><th colspan="4">Quantity required</th></tr><tr><th>Base switch</th><th>Port Upgrade License 18p, DCB</th><th>40Gb Activation License, DCBSW</th><th>Port Upgrade License 14p, DCB</th></tr><tr><td>24× 10 GbE ports*</td><td>1</td><td></td><td></td><td></td></tr><tr><td>42× 10 GbE ports*</td><td>1</td><td>1</td><td></td><td></td></tr><tr><td>42× 10 GbE ports* and 2× external 40 GbE ports</td><td>1</td><td>1</td><td>1</td><td></td></tr><tr><td>24× 10 GbE ports* and 2× 40 GbE external ports</td><td>1</td><td></td><td>1</td><td></td></tr><tr><td>56× 10 GbE ports* and 2× external 40 GbE ports</td><td>1</td><td>1</td><td>1</td><td>1</td></tr><tr><td colspan="5">*Total number of the internal ports and external ports</td></tr></table>	Supported port combinations	Quantity required				Base switch	Port Upgrade License 18p, DCB	40Gb Activation License, DCBSW	Port Upgrade License 14p, DCB	24× 10 GbE ports*	1				42× 10 GbE ports*	1	1			42× 10 GbE ports* and 2× external 40 GbE ports	1	1	1		24× 10 GbE ports* and 2× 40 GbE external ports	1		1		56× 10 GbE ports* and 2× external 40 GbE ports	1	1	1	1	*Total number of the internal ports and external ports				
		Supported port combinations		Quantity required																																					
			Base switch	Port Upgrade License 18p, DCB	40Gb Activation License, DCBSW	Port Upgrade License 14p, DCB																																			
		24× 10 GbE ports*	1																																						
		42× 10 GbE ports*	1	1																																					
		42× 10 GbE ports* and 2× external 40 GbE ports	1	1	1																																				
		24× 10 GbE ports* and 2× 40 GbE external ports	1		1																																				
		56× 10 GbE ports* and 2× external 40 GbE ports	1	1	1	1																																			
		*Total number of the internal ports and external ports																																							

Dummy modules

The following table lists dummy modules that can be installed in the CB 2500 Server Chassis. Dummy modules must be installed in any empty slot because empty slots affect cooling and Electromagnetic compatibility (EMC) of the chassis.

Q'ty per chassis	Product name		Product code
0-13	Dummy module	Dummy Server Blade (Half-width)	GG-BE3SVMDX1-Y
0-2		Dummy Switch Module	GG-BE4SWMDX1-Y
0-28		Dummy I/O Adapter	GG-BE4CDMDX1-Y
0-4		Dummy Power Supply Module	GG-BE4PSMDX1-Y

Dummy module configuration rules

The following table lists the configuration rules for dummy modules.

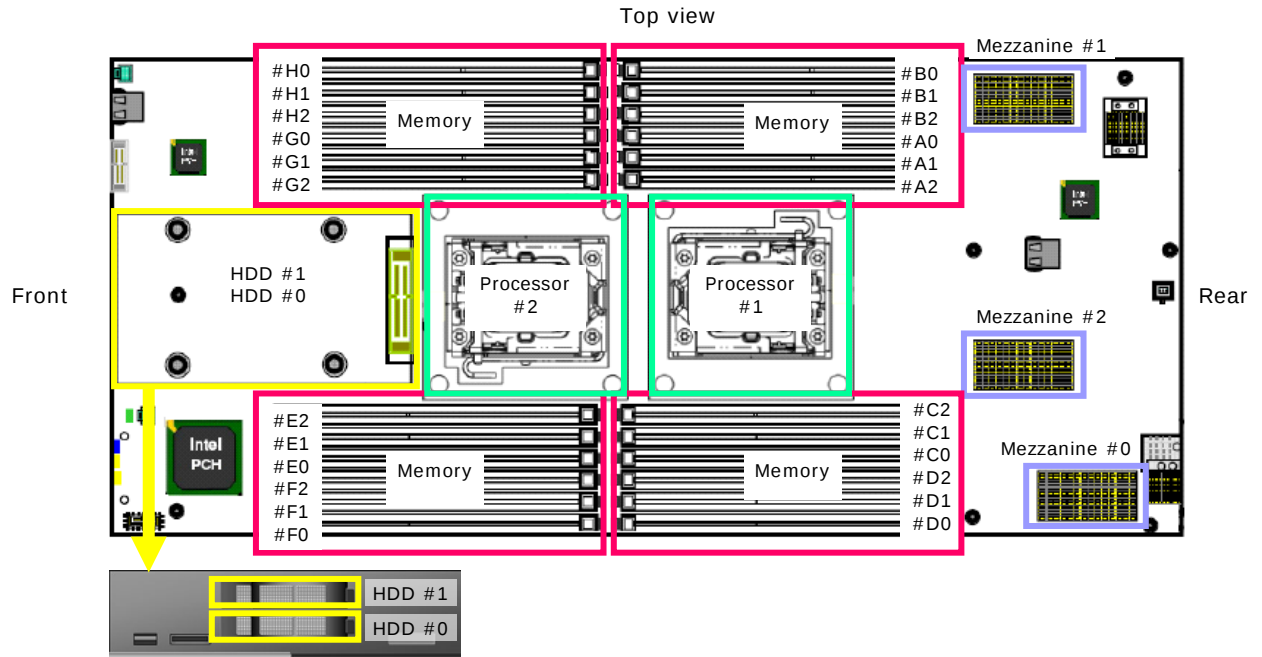
	Configuration rule
✓	Dummy Server Blade (Half-width) must be installed in the server blade slots that do not contain any blade.
✓	Dummy Switch Module must be installed in IOSW slots that do not contain any switch module.
✓	Dummy I/O Adapter must be installed in IOBD slots that do not contain any I/O adapter.
✓	Dummy Power Supply Module must be installed in PSM slots that do not contain any Power Supply Module.

Ordering server blade

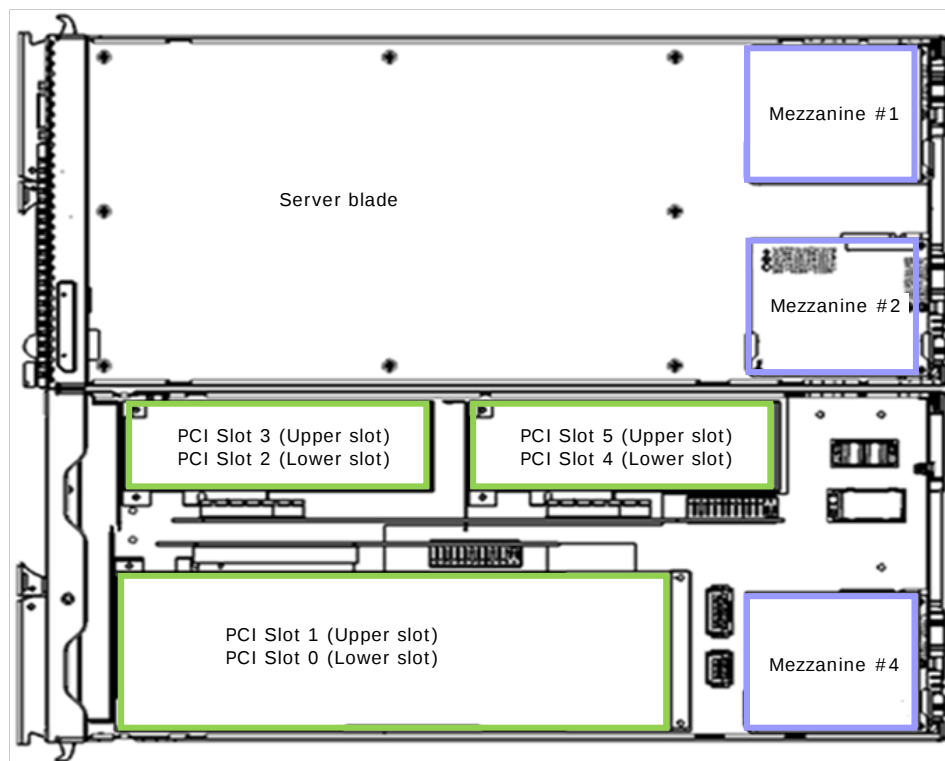
This chapter describes how to configure server blades that are installed in the CB 2500 Server Chassis.

- [Slots layout](#)
- [Server blade](#)
- [Server blade options](#)

520H B3/B4



520H B3/B4 with PCI Expansion Blade



Server blades

A CB 2500 Server Chassis can contain 520X B1/B2/B3 Server Blades and 520H B3/B4 Server Blades. Server slot 15 is only available for a 520X Server Blade that constitutes an SMP.

Q'ty per chassis	Product name		Product code
0-8	Server blade	520X B1 Server Blade	GG-RV3XGE0B1X1-Y
0-8		520X B2 Server Blade	GG-RV3XGE0B2X1-Y
0-8		520X B3 Server Blade	GG-RV3XGE0B3X1-Y (Targeting Q-Code: May 2016)
0-14		520H B3 Server Blade	GG-RV3XGC0B3X1-Y
0-14		520H B4 Server Blade	GG-RV3XGC0B4X1-Y (Targeting Q-Code: May 2016)

Expansion blade

PCI Expansion blade expands the number of PCI slots by attaching itself to 520H B3 Server Blade. The following table lists the product codes for expansion blades. For expansion blade options, see [Expansion blade options](#).

Q'ty per blade						Product name		Product code
520X			520H					
B1	B2	B3	B3	B4				
			0-1	0-1 ²		Expansi on blade	PCI Expansion Blade ¹	GG-ES3PCB1X1-(Y R)
Notes: 1. PCI Expansion Blade does not support N+M Cold Standby. 2. Scheduled to be supported by 520H B4 in Sep. 2016.								

Shelf

Shelves are needed to install half-width blades, expansion blades, and Dummy Server Blades in a CB 2500 Server Chassis.

Q'ty per blade					Product name		Product code
520X			520H				
B1	B2	B3	B3	B4			
			0-1	0-1	Shelf	Shelf for Half-width Blade	GG-BE3SHL1X1-Y
			0-1			Shelf for Expansion Blade	GG-BE3SHL2X1-Y

Shelf configuration rules

The following table lists the configuration rules for shelves.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
			✓	✓	A Shelf for Half-width Blade is needed to install half-width blades and/or Dummy Server Blades in a CB 2500 Server Chassis.
			✓	✓	Install Shelves for Half-width Blade in all slots except for the slots in which full-width blades, which are 520X Server Blade and 520H w/ PCI Expansion Blade, are to be installed.
			✓		A Shelf for Expansion Blade is required for each PCI Expansion Blade.

Server blade options

LoM Activation License

The following table lists the product codes for LoM Activation License.

Q'ty per blade					Product name		Product code
520X			520H				
B1	B2	B3	B3	B4			
0-1 ¹	0-1 ¹	0-1 ^{1,2}	0-1	0-1 ²	LoM Activation License	LoM Activation License for Type 2	GG-AR3LAL2X1-Y
Notes: 1. Cannot apply to a server blade that is installed in Server Slot 15. 2. LoM is scheduled to be supported by 520X B3 and 520H B4 in May 2016.							

LoM configuration rules

The following table lists the configuration rules for LoM.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
✓	✓	✓	✓	✓	LoM Activation License activates the Onboard LAN.
✓	✓	✓	✓	✓	Onboard LAN supports Wake on LAN, PXE boot, and iSCSI boot.
✓	✓	✓	✓	✓	Onboard LAN supports iSCSI offload by hardware emulation.
✓	✓	✓	✓	✓	Onboard LAN does not support iSCSI boot if it connect at 1Gbps link.
✓	✓	✓	✓	✓	Onboard LAN in iSCSI setting does not support N+M and backup/restore.

TPM Activation License

TPM Activation License activates the TPM, which has several security functions including data encryption. Windows BitLocker supports internal HDD and SSD data encryption by using TPM.

Q'ty per blade					Product name		Product code
520X			520H				
B1	B2	B3	B3	B4			
0-1	0-1	0-1	0-1	0-1	TPM Activation License	TPM Activation License	GG-AR3TPL1X1-Y

Processors

The following table lists the product codes for processors.

Q'ty per blade					Product name	Product code	
520X			520H				
B1	B2	B3	B3	B4			
2					Processor	GG-EC32005X1-(Y R) [‡] (In oracle but no intention to productize)	
2						Processor Xeon E7-4860v2	GG-EC32604X1-(Y R) ¹
2						Processor Xeon E7-4880v2	GG-EC32504X1-(Y R) [‡] (In oracle but no intention to productize)
2						Processor Xeon E7-8880v2	GG-EC32505X1-(Y R) ²
2						Processor Xeon E7-8890v2	GG-EC32802X1-(Y R) ²
2						Processor Xeon E7-8891v2	GG-EC33201X1-(Y R) ²
	2					Processor Xeon E7-8880v3	GG-EC32306X1-(Y R) ²
	2					Processor Xeon E7-8890v3	GG-EC32506X1-(Y R) ²
	2					Processor Xeon E7-8893v3	GG-EC33203X1-(Y R) ²
		2				Processor Xeon E7-8880v4	GG-EC3E804X1-(Y R) (Targeting Q-Code: May 12, 2016)
		2				Processor Xeon E7-8890v4	GG-EC3E904X1-(Y R) (Targeting Q-Code: May 2016)
		2				Processor Xeon E7-8893v4	GG-EC3E934X1-(Y R) (Targeting Q-Code: May 2016)
			1-2			Processor Xeon E5-2603v3	GG-EC31601X1-(Y R) [‡] (In oracle but no intention to productize)
			1-2			Processor Xeon E5-2620v3	GG-EC32405X1-(Y R) [‡] (In oracle but no intention to productize)
			1-2			Processor Xeon E5-2637v3	GG-EC33503X1-(Y R) [‡]

Q'ty per blade					Product name		Product code	
520X			520H					
B1	B2	B3	B3	B4				
			1-2		Processor Xeon E5-2640v3 Processor Xeon E5-2660v3 Processor Xeon E5-2667v3 Processor Xeon E5-2690v3 Processor Xeon E5-2697v3 Processor Xeon E5-2698v3 Processor Xeon E5-2699v3 Processor Xeon E5-2603v4 Processor Xeon E5-2609v4 Processor Xeon E5-2620v4 Processor Xeon E5-2630v4 Processor Xeon E5-2637v4 Processor Xeon E5-2640v4 Processor Xeon E5-2643v4 Processor Xeon E5-2650v4 Processor Xeon E5-2660v4 Processor Xeon E5-2667v4 Processor Xeon E5-2680v4 Processor Xeon E5-2683v4 Processor Xeon E5-2690v4 Processor Xeon E5-2695v4 Processor Xeon E5-2697v4	GG-EC32605X1-(Y R) ³ (In oracle but no intention to productize)		
			1-2			GG-EC32606X1-(Y R) ³		
			1-2			GG-EC33202X1-(Y R) ³		
			1-2			GG-EC32607X1-(Y R)		
			1-2			GG-EC32608X1-(Y R)		
			1-2			GG-EC32303X1-(Y R)		
			1-2			GG-EC32304X1-(Y R)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		GG-EC3C374X1-(Y R) (Targeting Q-Code: May 2016)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		GG-EC3C434X1-(Y R) (Targeting Q-Code: June 2016)		
				1-2		GG-EC3C504X1-(Y R) (Targeting Q-Code: May 2016)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		GG-EC3C674X1-(Y R) (Targeting Q-Code: June 2016)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		GG-EC3C834X1-(Y R) (Targeting Q-Code: June 2016)		
				1-2		GG-EC3C904X1-(Y R) (Targeting Q-Code: June 2016)		
				1-2		TBD (Targeting Q-Code: TBD)		
				1-2		GG-EC3C974X1-(Y R) (Targeting Q-Code: May 2016)		

Q'ty per blade					Product name		Product code
520X			520H				
B1	B2	B3	B3	B4			
				1-2		Processor Xeon E5-2697Av4	TBD (Targeting Q-Code: TBD)
				1-2		Processor Xeon E5-2698v4	GG-EC3C984X1-(Y R) (Targeting Q-Code: May 2016)
				1-2		Processor Xeon E5-2699v4	GG-EC3C994X1-(Y R) (Targeting Q-Code: May 2016)
2	2	2			Heat sink	Heat Sink for Type 2	GG-EC3HSK7X1-(Y R)
			1	1		Heat Sink for 520H B3 1st	GG-EC3HSK8X1-(Y R)
			0-1	0-1		Heat Sink for 520H B3 2nd	GG-EC3HSK9X1-(Y R)
			0-1	0-1	Dummy	Dummy Processor Module	GG-EC3DMM1X1-Y
Notes: 1. Supports 2-blade SMP configuration 2. Supports 2-blade and 4-blade SMP configuration 3. In some cases, Hyper Threading cannot be disabled in a Windows environment.							

CPU configuration rules

The following table lists the configuration rules for CPUs.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
✓	✓	✓			Each 520X Server Blade must contain two CPUs of the same type. Each CPU requires a Heat Sink for Type 2.
✓	✓	✓			All server blades that constitute an SMP must have the same CPU configuration.
			✓	✓	Each 520H Server Blade must contain one or two CPUs. If two CPUs are configured, they must be the same type.
			✓	✓	A CPU in CPU slot 1 requires Heat Sink for 520H B3 1st. A CPU in CPU slot 2 requires Heat Sink for 520H B3 2nd.
			✓	✓	In a single-CPU configuration, a dummy CPU must be installed in CPU slot 2.
			✓		To configure a PCI Expansion Blade, the 520H Server Blade must contain two CPUs.

Memory modules

The following table lists the product codes for memory modules.

Q'ty per blade					Product name		Product code	
520X			520H					
B1	B2	B3	B3	B4				
8-48					RDIMM	DDR3 16GB Memory, 2R, 1333	GG-MJ316G1X1-(Y R)	
8-48						DDR3 8GB Memory, 1R, 1600	GG-MJ3N8G1X3-(Y R)	
8-48						DDR3 16GB Memory, 2R, 1600	GG-MJ316G1X2-(Y R)	
8-48						DDR3 16GB Memory, 2R, 1866	GG-MJ316G1X3-(Y R)	
	8-48		1-24			DDR4 8GB Memory, 1R, 2133	GG-MJ3N8G3X1-(Y R)	
	8-48	8-48	1-24			DDR4 16GB Memory, 2R, 2133	GG-MJ316G3X1-(Y R)	
	8-48		1-24			DDR4 32GB Memory, 2R, 2133	GG-MJ332G3X1-(Y R)	
		8-48		1-24		DDR4 16GB Memory, 1R, 2400	GG-MJ316G5X1-(Y R) (Targeting Q-Code: May 2016)	
		8-48		1-24		DDR4 32GB Memory, 2R, 2400	GG-MJ332G5X1-(Y R) (Targeting Q-Code: May 2016)	
		8-48		1-24		DDR4 64GB Memory, 4R, 2400	TBD (Targeting Q-Code: Sep. 2016)	
		8-48		1-24		DDR4 128GB Memory	TBD (Cancelled)	
8-48					LRDIMM	DDR3 32GB Memory, 4R, 1600	GG-MJ332G2X2-(Y R)	
			1-24			DDR4 32GB Memory, 4R, 2133	GG-MJ332G4X1-(Y R)	
	8-48		1-24			DDR4 64GB Memory, 4R, 2133	GG-MJ364G4X1-(Y R)	
0-40					Dummy	Dummy Memory Module	GG-MJ3DMM1X1-Y	

Memory operation modes

The following table lists the memory operation modes available for CB 2500 server blades. By default, memory modules operate in the Independent mode. Memory configuration varies depending on the memory module type, memory power mode, number of the CPUs, and memory operation mode.

Model					Memory operation mode	Description	Cost performance	Reliability
520X			520H					
B1	B2	B3	B3	B4				
✓	✓	✓	✓	✓	Independent mode	The whole memory is available to the system. This mode is most generally used.	High	Low
✓	✓	✓			Lockstep mode	Enables the system to detect 2 × 8-bit error and correct 8-bit error in a DRAM by installing the same memory in the two channels of a memory buffer (Jordan creek).	Mid	High
✓	✓	✓	✓	✓	Rank sparing mode	One rank of the memory channel is reserved as a spare for the other ranks on the same channel. The effective memory available to the system decreases by the amount of one rank of memory.	Mid	Mid
✓	✓	✓	✓	✓	Mirrored channel mode	Each of the two memory channels stores the same data. The effective memory available to the system is half of the memory installed in the server blade.	Low	High

Memory configuration rules

The following table lists the configuration rules for memory modules.

The following table lists the configuration rules for memory modules.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
✓	✓	✓			DIMMs must be added in sets of eight.
			✓	✓	To operate the server blade in rank sparing mode or mirrored channel mode, DIMMs must be added in sets of four if the server blade contains one CPU and must be added in sets of eight if the server blade contains two CPUs.
✓					Two memory power modes, which can be selected with EFI, are supported. One is normal voltage of 1.5 V and the other one is low voltage of 1.35 V.
✓	✓		✓		RDIMMs and LRDIMMs cannot be installed together in the same server blade.
✓	✓	✓	✓	✓	If DIMMs of different frequencies are installed in a server blade, the whole DIMM operates at the same frequency as the lowest frequency among the installed DIMMs.
✓					If one or more RDIMMs are installed in the DIMM group 2, the whole DIMM operates at 1066 or 1333 MHz.
			✓	✓	If one or more DIMMs are installed in the DIMM group 2, the whole DIMM operates at 1600 MHz.
	✓	✓			In independent mode, the whole DIMM operates at 1600 MHz.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
	✓	✓			In lockstep mode, the whole DIMM operates at 1866 MHz unless the DIMM group 2 is populated with DIMMs. If the DIMM group 2 is populated, the whole DIMM operates at 1600 MHz.
✓	✓	✓	✓	✓	The memory configurations for processor #1 and processor #2 must be identical.
	✓	✓	✓	✓	All the DIMMs in a DIMM group must be the same product code.
✓					All the DIMMs in a DIMM group must be the same product code. This rule does not apply to 16GB RDIMM. Different frequency 16GB RDIMMs (1333MHz, 1600MHz, and 1866MHz) can be mixed in the same DIMM group
✓	✓	✓	✓	✓	Populate DIMM slots in ascending order of DIMM group number. If different capacity DIMMs are configured, install the larger capacity DIMMs before installing the smaller capacity DIMMs.
✓					If the power mode is 1.35V, the DIMM group 2 is unavailable.
✓					DDR3 16GB Memory 2R 1866MHz does not support 1.35V mode.
✓	✓	✓			All server blades that constitute an SMP must have the same memory configuration.
✓	✓	✓	✓	✓	To operate the server blade in rank sparing mode, the total rank of installed DIMMs of each channel must be two or higher.
			✓	✓	To operate the server blade in rank sparing mode, only quad rank DIMMs are available for the configuration that only DIMM group 0 is populated.
✓					If a server blade is configured with LRDIMMs, all empty slots must be filled with dummy memory modules.

Memory installation patterns

The operating frequency of the memory in a server blade varies depending on the power mode and installation pattern, and it is independent of the processor type. The whole DIMM in a server blade operates at the same clock frequency.

The following table lists the memory installation pattern tables, which list the available memory installation patterns. Select an installation pattern table that satisfies the conditions for the memory module type, power mode, frequency, and memory operation mode. Then select a memory pattern which meets the requirements for the total memory capacity, operation frequency, and future upgradability from the selected table.

Model	Type of memory	Power mode	Frequency	Memory operation mode	Q'ty of CPUs	Installation pattern table No.
520X B1	RDIMM	1.5V	1333 MHz	Independent mode	2	See Table 6-1
				Independent mode + Rank sparing mode	2	
				Independent mode + Mirrored channel mode	2	

Model	Type of memory	Power mode	Frequency	Memory operation mode	Q'ty of CPUs	Installation pattern table No.
		1.35V	1333 MHz	Lockstep mode	2	See Table 6-2
				Lockstep mode + Rank sparing mode	2	
				Lockstep mode + Mirrored channel mode	2	
		1.35V	1333 MHz	Independent mode	2	See Table 6-3
				Independent mode + Rank sparing mode	2	
				Independent mode + Mirrored channel mode	2	
		1.35V	1333 MHz	Lockstep mode	2	See Table 6-4
				Lockstep mode + Rank sparing mode	2	
				Lockstep mode + Mirrored channel mode	2	
	LRDIMM	1.5V	1333 MHz	Independent mode	2	See Table 6-5
				Independent mode + Rank sparing mode	2	
				Independent mode + Mirrored channel mode	2	
		1.5V	1600 MHz	Lockstep mode	2	See Table 6-6
				Lockstep mode + Rank sparing mode	2	
				Lockstep mode + Mirrored channel mode	2	
		1.35V	1333 MHz	Independent mode	2	See Table 6-7
				Independent mode + Rank sparing mode	2	
				Independent mode + Mirrored channel mode	2	
		1.35V	1333 MHz	Lockstep mode	2	See Table 6-8
				Lockstep mode + Rank sparing mode	2	
				Lockstep mode + Mirrored channel mode	2	
520X B2	RDIMM	1.2V	1600 MHz	Independent mode	2	See Table 6-13
				Independent mode + Rank sparing mode	2	
				Independent mode + Mirrored channel mode	2	
			1866 MHz	Lockstep mode	2	See Table 6-14
				Lockstep mode + Rank sparing mode	2	
				Lockstep mode + Mirrored channel mode	2	

Model	Type of memory	Power mode	Frequency	Memory operation mode	Q'ty of CPUs	Installation pattern table No.
	LRDIMM	1.2V	1600 MHz	Independent mode	2	See Table 6-15
				Independent mode + Rank sparing mode	2	
				Independent mode + Mirrored channel mode	2	
			1866 MHz	Lockstep mode	2	See Table 6-16
				Lockstep mode + Rank sparing mode	2	
				Lockstep mode + Mirrored channel mode	2	
520X B3	RDIMM	1.2V	1600 MHz	Independent mode	2	See Table 6-19
				Independent mode + Rank sparing mode	2	
				Independent mode + Mirrored channel mode	2	
			1866 MHz	Lockstep mode	2	See Table 6-20
				Lockstep mode + Rank sparing mode	2	
				Lockstep mode + Mirrored channel mode	2	
520H B3	RDIMM	1.2V	2133 MHz	Independent channel mode	1	See Table 6-9
					2	See Table 6-10
				Rank sparing mode	1	See Table 6-9
					2	See Table 6-10
				Mirrored channel mode	1	See Table 6-9
					2	See Table 6-10
	LRDIMM	1.2V	2133 MHz	Independent channel mode	1	See Table 6-11
					2	See Table 6-12
				Rank sparing mode	1	See Table 6-11
					2	See Table 6-12
				Mirrored channel mode	1	See Table 6-11
					2	See Table 6-12
520H B4	RDIMM	1.2V	2400 MHz	Independent channel mode	1	See Table 6-17
					2	See Table 6-18
				Rank sparing mode	1	See Table 6-17
					2	See Table 6-18
				Mirrored channel mode	1	See Table 6-17
					2	See Table 6-18

Internal HDDs/SSDs

The following table lists the product codes for HDDs, SSDs, HDD kits, and Dummy HDD module.

Q'ty per blade					Product name		Product code	
520X			520H					
B1	B2	B3	B3	B4				
0-2	0-2		0-2		HDD	SAS HDD, 147 GB, 15 krpm, for Type 2 ¹	GG-UH31472X6-(Y R)	
0-2	0-2		0-2			SAS HDD, 147 GB, 15 krpm, for Type 2 w/o BNST	GG-UH31472X6C-(Y R)	
0-2	0-2		0-2			SAS HDD, 300 GB, 15 krpm, for Type 2 ¹	GG-UH33002X6-(Y R)	
0-2	0-2		0-2			SAS HDD, 300 GB, 15 krpm, for Type 2 w/o BNST	GG-UH33002X6C-(Y R)	
		0-2		0-2		SAS HDD, 300 GB, 15 krpm, 12Gbps, for Type 2	GG-UH33002X8-(Y R) (Targeting Q-Code: May 2016)	
0-2	0-2		0-2			SAS HDD, 600 GB, 10 krpm, for Type 2 ¹	GG-UH36001X6-(Y R)	
0-2	0-2		0-2			SAS HDD, 600 GB, 10 krpm, for Type 2 w/o BNST	GG-UH36001X6C-(Y R)	
	0-2	0-2	0-2	0-2		SAS HDD, 600 GB, 15 krpm, for Type 2 w/o BNST	GG-UH36002X6-(Y R) (Targeting Q-Code: May 2016)	
		0-2		0-2		SAS HDD, 600 GB, 10 krpm, 12Gbps, for Type 2	GG-UH36001X8-(Y R) (Targeting Q-Code: May 2016)	
0-2	0-2		0-2			SAS HDD, 900 GB, 10 krpm, for Type 2 ¹	GG-UH39001X6-(Y R)	
0-2	0-2		0-2			SAS HDD, 900 GB, 10 krpm, for Type 2 w/o BNST	GG-UH39001X6C-(Y R)	
0-2	0-2		0-2			SAS HDD, 1.2 TB, 10 krpm, for Type 2 ¹	GG-UH31T21X6-(Y R)	
0-2	0-2		0-2			SAS HDD, 1.2 TB, 10 krpm, for Type 2 w/o BNST	GG-UH31T21X6C-(Y R)	
	0-2	0-2	0-2	0-2		SAS HDD, 1.8 TB, 10 krpm, for Type 2 w/o BNST ²	GG-UH31T81X6-(Y R)	
0-2	0-2		0-2		SSD	SAS SSD, 200 GB, for Type 2	GG-UH32003X6-(Y R)	
0-2	0-2	0-2	0-2	0-2		SAS SSD, 400 GB, for Type 2	GG-UH34003X6-(Y R)	
	0-2	0-2	0-2	0-2		SAS SSD, 800 GB	GG-UH38003X6-(Y R)	
0-2	0-2	0-2			HDD kit	SAS HDD Kit for Type 2	GG-UH3HDK5X1-(Y R)	
			0-1	0-1		SAS HDD Kit for 520H B3	GG-UH3HDK6X1-(Y R)	
0-2	0-2	0-2	0-2	0-2	Dummy	Dummy HDD Module for Type 2	GG-UH3DMM2X1-Y	

Q'ty per blade					Product name	Product code
520X			520H			
B1	B2	B3	B3	B4		
Note: 1. Incompliant with the Canadian regulation “Prohibition of Certain Toxic Substances Regulations, 2012” because of containing Benzenamine, N-phenyl-, reaction products with Styrene and 2,4,4-Trimethylpentene (BNST). 2. VMware 6.0 does not support HDD 1.8TB.						

HDD configuration rules

The following table lists the configuration rules for HDDs.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
✓	✓	✓	✓	✓	If you configure HDD or SSD with RAID0 or RAID1 functionality, select two HDDs or SSDs of the same type.
✓	✓	✓	✓	✓	If you configure HDD or SSD without RAID functionality, a single HDD or SSD, as well as mix of HDD and SSD can be configured in a server blade. If you configure two HDDs, select two HDDs or SSDs of the same product code.
✓	✓	✓			If HDDs or SSDs are configured, a SAS HDD Kit for Type 2 is required for each drive.
			✓	✓	If HDDs or SSDs are configured, a SAS HDD Kit for 520H B3 is required for the server blade.
✓	✓	✓	✓	✓	Install Dummy HDD Modules in any empty slot.
✓	✓	✓			If internal drives are installed, internal drives must be used as boot device. Therefore, OS must be installed on the internal drives.
✓	✓	✓	✓	✓	HDDs that contain BNST are inapplicable for a system that ships to Canada.

Mezzanine cards

The following table lists the product codes for mezzanine cards.

Q'ty per blade						Product name	Product code
520X			520H				
			w/o PCI Exp. Blade		w/ PCI Exp. Blade		
B1	B2	B3	B3	B4	B3		
0-1	0-2	0-2*	0-1	0-1	0-1	LAN	GG-CN3M1G2X1-(Y R)
0-2	0-2	0-2	0-1	0-1	0-1	Pass Through	GG-CB4MPS1X1-(Y R)
*1Gb 4-port LAN Mezzanine is scheduled to be supported by 520X B3 in June 2016.							

The following tables list available slots for each mezzanine card.

520X B1/B2/B3

Product name	Mezzanine slot							
	520X B1				520X B2/B3			
	1	2	3	4	1	2	3	4
1Gb 4-port LAN Mezzanine	✓	N/A	N/A	N/A	✓	N/A	✓	N/A
PCIe Adapter Connection Mezzanine	N/A	✓	N/A	✓	N/A	✓	N/A	✓

520H B3/B4

Product name	Mezzanine slot						
	520H B3					520H B4	
	w/o PCI Exp. Blade		w/ PCI Exp. Blade			w/o PCI Exp. Blade	
	1	2	1	2*	4	1	2
1Gb 4-port LAN Mezzanine	✓	N/A	✓	N/A	N/A	✓	N/A
PCIe Adapter Connection Mezzanine	N/A	✓	N/A	N/A	✓	N/A	✓
*Occupied by a PCI Blade Connection Kit F/H, which includes all the PCIe Adapter Connection Mezzanine functionality, as a requisite option for configuring the PCI Expansion Blade.							

Mezzanine card configuration rules

The following table lists the configuration rules for mezzanine cards.

Model						Configuration rule
520X			520H			
			w/o PCI Exp. Blade		w/ PCI Exp. Blade	
B1	B2	B3	B3	B4	B3	
✓	✓	✓				Up to four mezzanine cards can be installed in a blade unless the blade is installed in server slot #15.
			✓	✓		Up to two mezzanine cards can be installed in a blade.
					✓	Up to three mezzanine cards can be installed in a blade.
✓	✓	✓				If the Onboard LAN is active, mezzanine slot 1 and 3 are unavailable for mezzanine cards.
			✓	✓	✓	If the Onboard LAN is active, mezzanine slot 1 is unavailable for mezzanine cards.
✓	✓	✓				Mezzanine slot 1 must be populated before installing a mezzanine card in mezzanine slot 3. A card that is installed in mezzanine slot 3 must be the same type as the card in mezzanine slot 1.

Model						Configuration rule
520X			520H			
			w/o PCI Exp. Blade		w/ PCI Exp. Blade	
B1	B2	B3	B3	B4	B3	
✓	✓	✓				Mezzanine slot 2 must be populated before installing a mezzanine card in mezzanine slot 4. A mezzanine card that is installed in mezzanine slot 4 must be the same type as the card in mezzanine slot 2.
✓	✓	✓	✓	✓	✓	1Gb 4-port LAN Mezzanines do not support iSCSI boot. iSCSI data is supported if the system is not N+M Cold Standby configuration.
✓	✓	✓	✓	✓		PCIe Adapter Connection Mezzanines must be installed in the blade to connect with I/O adapters. For details, see I/O adapters .
					✓	To install I/O adapters in I/O adapter slots that has an even slot number, a PCIe Adapter Connection Mezzanine must be installed in the blade. When installing I/O adapters in I/O adapter slots that has an odd slot number, a PCIe Adapter Connection Mezzanine is not required for the I/O adapters because a PCI Blade Connection Kit F/H, which enables the blade to connect with the I/O adapters, is installed in the mezzanine slot 2. For details, see I/O adapters .
					✓	When adding a PCI Expansion Blade to an existing server blade whose mezzanine slot 2 is occupied by a PCIe Adapter Connection Mezzanine, the mezzanine must be removed from the mezzanine slot. The removed mezzanine can be installed in the mezzanine slot 4 on the PCI Expansion Blade.
	✓	✓				The number of 1Gb 4-port LAN Mezzanines that a 4-blade SMP can contain is limited to seven or fewer. The mezzanine slot 3 in a blade that is installed in the largest blade slot number among a SMP cannot hold a 1Gb 4-port LAN Mezzanine.
	✓	✓				If a server blade runs Windows, the number of 1Gb 4-port LAN Mezzanines that the server blade can contain is limited to five or fewer.

Combination of mezzanine card and switch module

The following table lists supported combinations of mezzanine cards and switch modules.

Mezzanine Card	Switch Module	Bandwidth
1Gb 4-port LAN Mezzanine	1/10Gb LAN Switch Module	1Gb
	10Gb DCB Switch Module	1Gb
Onboard LAN (520X/520H Server Blade)	1/10Gb LAN Switch Module	1Gb
	10Gb DCB Switch Module	10Gb

I/O adapters

The following table lists the product codes for I/O adapters. When installing I/O adapters in the I/O Adapter Cages, one I/O Board Module is required for each I/O adapter.

Q'ty per blade						Product name		Product code
520X			520H					
			w/o PCI Exp. Blade		w/ PCI Exp. Blade			
B1	B2	B3	B3	B4	B3			
0-4	0-4	0-4 *	0-2	0-2	0-4	LAN	1Gb 4-port LAN Adapter	GG-CN4N1G2X1-(Y R)
0-4	0-4	0-4	0-2	0-2	0-4		Intel 10GBASE-SR 2-port LAN Adapter	GG-CN4NXG1X1-(Y R)
0-4	0-4	0-4 *	0-2	0-2	0-4		Intel 10GBASE-T 2-port Adapter	GG-CN4NXG2X1-(Y R)
0-4	0-4	0-4 *	0-2	0-2	0-4	CNA	10Gb 2-port CNA Adapter	GG-CN4NXG3X1-(Y R)
0-4	0-4	0-4 *	0-2	0-2	0-4	FC	Hitachi 8Gb 2-port FC Adapter	GG-CC4N8G2X1-(Y R)
0-4	0-4	0-4 *	0-2	0-2	0-4		Emulex 8Gb 2-port FC Adapter	GG-CC4N8G3X1-(Y R)
0-4	0-4	0-4	0-2	0-2	0-4		Hitachi 16Gb 2-port FC Adapter	GG-CC4N162X1-(Y R)
0-4	0-4	0-4 *	0-2	0-2	0-4		Emulex 16Gb 2-port FC Adapter	GG-CC4N163X1-(Y R)
See Configuration rules for PCIe flash drives						PCIe flash drive	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 1.1TB	GG-CG4VFD1X1-(Y R)
							HGST PCIe MLC Flash Drive Adapter (FlashMax3) 2.2TB	GG-CG4VFD2X1-(Y R)
							HGST PCIe MLC Flash Drive Adapter (FlashMax2) 4.8TB	GG-CG4VFD3X1-(Y R) (HDS will not productize)
					0-1	GPU	NVIDIA Grid K2 GPU Adapter	GG-CV3GPU2X1-(Y R)
0-4	0-4	0-4	0-2	0-2	0-4	I/O adapter module	I/O Board Module	GG-BE4CDM1X1-(Y R)
0-4	0-4	0-4	0-2	0-2	0-4		PCI Filler Panel for I/O Board Module	36-9230-ND.P
*1Gb 4-port LAN Adapter, Intel 10GBASE-T 2-port Adapter, 10Gb 2-port CNA Adapter, Hitachi 8Gb 2-port FC Adapter, Emulex 8Gb 2-port FC Adapter, and Emulex 16Gb 2-port FC Adapter are scheduled to be supported by 520X B3 in Sep. 2016.								

The following table lists the relation between mezzanine slots and I/O adapter slots. A PCIe Adapter Connection Mezzanine or PCI Blade Connection Kit F/H must be installed in the mezzanine slot that is corresponding to the I/O adapter slot in which an I/O adapter is installed. The needed connection cards and their quantity vary depending on the blade type and I/O adapter slots in which I/O adapters are installed.

Server blade slot	I/O adapter slot					
	520X, 520H w/ PCI Expansion Blade				520H	
	Mezzanine slot 2		Mezzanine slot 4		Mezzanine slot 2	
Server Blade 1	IOBD 01A	IOBD 01B	IOBD 02A	IOBD 02B	IOBD 01A	IOBD 01B
Server Blade 2					IOBD 02A	IOBD 02B
Server Blade 3	IOBD 03A	IOBD 03B	IOBD 04A	IOBD 04B	IOBD 03A	IOBD 03B
Server Blade 4					IOBD 04A	IOBD 04B
Server Blade 5	IOBD 05A	IOBD 05B	IOBD 06A	IOBD 06B	IOBD 05A	IOBD 05B
Server Blade 6					IOBD 06A	IOBD 06B
Server Blade 7	IOBD 07A	IOBD 07B	IOBD 08A	IOBD 08B	IOBD 07A	IOBD 07B
Server Blade 8					IOBD 08A	IOBD 08B
Server Blade 9	IOBD 09A	IOBD 09B	IOBD 10A	IOBD 10B	IOBD 09A	IOBD 09B
Server Blade 10					IOBD 10A	IOBD 10B
Server Blade 11	IOBD 11A	IOBD 11B	IOBD 12A	IOBD 12B	IOBD 11A	IOBD 11B
Server Blade 12					IOBD 12A	IOBD 12B
Server Blade 13	IOBD 13A	IOBD 13B	IOBD 14A	IOBD 14B	IOBD 13A	IOBD 13B
Server Blade 14					IOBD 14A	IOBD 14B
Server Blade 15	N/A	N/A	N/A	N/A	N/A	N/A

I/O adapter configuration rules

The following table lists the configuration rules for I/O adapters.

No.	Model						Configuration rule
	520X			520H			
				w/o PCI Exp. Blade	w/ PCI Exp. Blade		
	B1	B2	B3		B3	B4	
1	✓	✓	✓				Up to four I/O adapters can be installed in a blade unless the blade is installed in server slot #15.
2				✓	✓		Each 520H Server Blade can configure up to two I/O adapters.
3						✓	Each 520H Server Blade with PCI Expansion Blade can configure up to four I/O adapters in I/O adapter slots and up to six PCI adapters in PCI Expansion Blade.
4	✓	✓	✓	✓	✓	✓	If an internal RAID is configured, the RAID is used as the boot device, and SAN boot is unavailable.

No.	Model						Configuration rule								
	520X			520H											
				w/o PCI Exp. Blade		w/ PCI Exp. Blade									
	B1	B2	B3	B3	B4	B3									
5	✓	✓	✓	✓	✓	✓	Different types of HBAs cannot be mixed in the same partition. The following table lists the HBA types. <table><tr><th>HBA type</th><th>Product name</th></tr><tr><td>FIVE Group</td><td>Hitachi 8Gb 2-port FC Adapter Hitachi 16Gb 2-port FC Adapter</td></tr><tr><td>Emulex Group</td><td>Emulex 8Gb 2-port FC Adapter Emulex 16Gb 2-port FC Adapter Emulex 10Gb 2-port CNA Adapter* Onboard LAN*</td></tr><tr><td colspan="2">*When the personality setting is iSCSI or FCoE. If the personality setting is NIC, different types of HBAs can be mixed in the same partition.</td></tr></table>	HBA type	Product name	FIVE Group	Hitachi 8Gb 2-port FC Adapter Hitachi 16Gb 2-port FC Adapter	Emulex Group	Emulex 8Gb 2-port FC Adapter Emulex 16Gb 2-port FC Adapter Emulex 10Gb 2-port CNA Adapter* Onboard LAN*	*When the personality setting is iSCSI or FCoE. If the personality setting is NIC, different types of HBAs can be mixed in the same partition.	
HBA type	Product name														
FIVE Group	Hitachi 8Gb 2-port FC Adapter Hitachi 16Gb 2-port FC Adapter														
Emulex Group	Emulex 8Gb 2-port FC Adapter Emulex 16Gb 2-port FC Adapter Emulex 10Gb 2-port CNA Adapter* Onboard LAN*														
*When the personality setting is iSCSI or FCoE. If the personality setting is NIC, different types of HBAs can be mixed in the same partition.															
6	✓	✓	✓	✓	✓	✓	Boot devices must be installed in the I/O board module slots that are assigned to the primary blade. Each partition can contain up to two boot devices.								
7	✓	✓	✓	✓	✓	✓	Adapters except boot devices must be added in the sequence that the system recognizes the devices during its booting up. The sequence is described in Device recognition .								
8	✓	✓	✓	✓	✓	✓	When adding an adapter to an existing system, the adapter must be installed in the empty slot that the system recognizes first during its booting up.								
9	✓	✓	✓	✓	✓	✓	When configuring multi-path or teaming on a device, non-primary devices are not required to comply with rule 7 and rule 8. When configuring a redundant path, an active PCI adapter and a standby PCI adapter must be installed in the slots that connect with separate PCIe Adapter Connection Mezzanines.								
10	✓	✓	✓	✓	✓	✓	In an LPAR Manager environment, each group of devices assigned to guests must comply with rule 6 through rule 9. Therefore, the device that has the lowest number among the devices that are assigned to a Guest OS is the primary boot device. When adding an HBA to an existing system, the HBA must be installed in the empty slot that the system recognizes first during its booting up.								
11	✓	✓	✓	✓	✓	✓	Dummy I/O Adapters must be installed in any empty slot in I/O Adapter Cages. For the product code for Dummy I/O Adapter, see Dummy modules .								
12	✓	✓	✓	✓	✓	✓	A PCI Filler Panel for I/O Board Module must be installed in I/O Board Modules that do not contain any I/O adapter, or the server chassis does not satisfy the requirements for cooling and EMC.								
13				✓		✓	If a server blade is one E5-2637v3 configuration and runs Windows OS, Emulex 16Gb 2-port FC Adapters or 1Gb 4-port LAN Adapters is unavailable.								

No.	Model						Configuration rule																										
	520X			520H																													
				w/o PCI Exp. Blade		w/ PCI Exp. Blade																											
	B1	B2	B3	B3	B4	B3																											
14	✓			✓	✓	✓	If a server blade that corresponds to any of the following configurations runs Windows OS, 10Gb 2-port CNA Adapter is unavailable.<table><thead><tr><th>Model</th><th>Server blade</th><th>Variable Port Partitioning</th><th>Personality</th></tr></thead><tbody><tr><td rowspan="6">520X B1</td><td rowspan="2">1-blade</td><td>Enabled (×4)</td><td>NIC only</td></tr><tr><td>Enabled (×4)</td><td>NIC + FCoE/iSCSI</td></tr><tr><td rowspan="3">2-blade SMP</td><td>Disabled</td><td>NIC + FCoE/iSCSI</td></tr><tr><td>Enabled (×2)</td><td>NIC only</td></tr><tr><td>Enabled (×2)</td><td>NIC + FCoE/iSCSI</td></tr><tr><td>4-blade SMP</td><td>Disabled</td><td>NIC only</td></tr><tr><td rowspan="2">520H B3/B4</td><td rowspan="2"></td><td>Enabled (×4)</td><td>NIC only</td></tr><tr><td>Enabled (×4)</td><td>NIC + FCoE/iSCSI</td></tr></tbody></table>	Model	Server blade	Variable Port Partitioning	Personality	520X B1	1-blade	Enabled (×4)	NIC only	Enabled (×4)	NIC + FCoE/iSCSI	2-blade SMP	Disabled	NIC + FCoE/iSCSI	Enabled (×2)	NIC only	Enabled (×2)	NIC + FCoE/iSCSI	4-blade SMP	Disabled	NIC only	520H B3/B4		Enabled (×4)	NIC only	Enabled (×4)	NIC + FCoE/iSCSI
Model	Server blade	Variable Port Partitioning	Personality																														
520X B1	1-blade	Enabled (×4)	NIC only																														
		Enabled (×4)	NIC + FCoE/iSCSI																														
	2-blade SMP	Disabled	NIC + FCoE/iSCSI																														
		Enabled (×2)	NIC only																														
		Enabled (×2)	NIC + FCoE/iSCSI																														
	4-blade SMP	Disabled	NIC only																														
520H B3/B4		Enabled (×4)	NIC only																														
		Enabled (×4)	NIC + FCoE/iSCSI																														
15	✓	✓					HGST PCIe MLC Flash Drive can be installed only in I/O adapter slots whose slot number ends with B.																										
16	✓	✓	✓	✓	✓	✓	A Hitachi 8Gb FC adapter and a HGST PCIe MLC Flash Drive Adapter cannot connect to the same PCIe Adapter Connection Mezzanine, so that they cannot be installed in IOBD slots of the same slot number excluding the last digit.																										
17						✓	If a server blade runs VMware 5.x, the blade can contain only four 10Gb LAN ports, which include ports on Onboard LAN, Intel 10GBASE-SR 2-port LAN Adapter, Intel 10GBASE-T 2-port Adapter, and 10Gb 2-port CNA Adapter.																										

Limits on the number of ports for each physical partition

A 4-blade SMP, which consists of four 520X Server Blades, can configure up to 16 adapters, but due to the restrictions caused by an operating system or a driver, the total number of ports that the system can recognize is limited. The following table lists the maximum number of the ports available for each physical partition.

Device	Part name	The maximum number of ports or adapters that the server blade can recognize	Remarks
Hitachi 8Gb FC HBA	Hitachi 8Gb 2-port FC Adapter	Linux: 32 ports Windows: 32 ports VMware ESX: 16 ports	
Hitachi 16Gb FC HBA	Hitachi 16Gb 2-port FC Adapter		
Intel 1Gb NIC	1Gb 4-port LAN Adapter	Linux: 64 ports Windows: 32 ports	Limit by interrupt vectors
Intel 10Gb 2Port NIC	Intel 10GBASE-SR 2-port LAN Adapter	Linux: 32 ports / 16 cards Windows: 8 ports / 4 cards	Limit by interrupt vectors
Intel 10Gb 2Port NIC	Intel 10Gb 2-port LAN (10GBASE-T) Adapter		
Emulex 8Gb FC HBA	Emulex 8Gb 2port FC Adapter	16 ports / 8 cards	Limit by I/O Space
Emulex 16Gb FC HBA	Emulex 16Gb 2-port FC Adapter		
Emulex 10Gb LAN/CNA	10Gb 2-port CNA Adapter	16 ports (Physical ports)	
Onboard LAN	Onboard LAN		

Notes:

1. In addition to the restrictions described above, the following restrictions apply in a virtual machine environment.

a. In an LPAR Manager environment

- Up to 64 FC ports for each Hyper

- Up to 12 physical LAN ports (6 controllers) in shared mode

b. In a Hyper-V environment

- Up to 10 LAN ports for each physical partition

c. In VMware environment

- Up to 16 LAN ports on Intel 1Gb NIC for each physical partition

- Up to 8 LAN ports on Intel 10Gb NIC for each physical partition

- Up to 8 LAN ports on Emulex 10Gb NIC for each physical partition

- If 10Gb NIC and 1Gb NIC are configured in the same SMP, up to 6 10Gb LAN ports and up to 4 1Gb LAN ports.

2. In addition to the restrictions described above, the total number of the CNA, LAN, and FC ports is restricted depending on the total number of logical cores of the CPUs in a Windows environment. The number of CPU cores and the numbers of ports must satisfy the following condition.

$$70 \times N_C \geq 16 \times N_{FC} + 26 \times N_{LAN} + 136 \times N_{CNA}$$

N_{FC} : The total number of Intel 1Gb LAN (including Onboard LAN) ports and Intel 10Gb LAN ports

N_{LAN} : The total number of Emulex 8Gb FC ports

N_{CNA} : The total number of Emulex 10Gb LAN/CNA physical ports

N_C : The total number of the logical cores in the partition (The number of the CPU's physical cores $\times$ the number of configured CPUs). If SMT is enabled, double as many as the total number of the logical cores.

3. The following table lists the upper limits of the Onboard LANs, which depends on the number of CNA ports on an SMP. The Onboard LANs can be activated with LoM Activation License within the limits. If 1Gb LAN Mezzanines are configured, no Onboard LAN in the SMP can be activated.

Number of enabled LoMs	Installable number of CNA Card	Total number of CNA port	Applicable SMP configuration
1	0	8	4-blade SMP, 2-blade SMP
2	1	6	4-blade SMP, 2-blade SMP
3	2	4	4-blade SMP, 2-blade SMP
4	3	2	4-blade
5	4	0	4-blade

Restrictions on Emulex CNA

The following table lists the restrictions on Emulex CNA.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
✓	✓	✓			In a Windows environment, the number of logical partition is limited to sixteen or fewer.

Available combinations of I/O adapters and Onboard LAN

The following table lists the combinations of I/O adapters and Onboard LAN that can be configured in the same SMP or in the same non-SMP server blade.

Product name	1Gb 4-port LAN Adapter	10GBASE-SR 2-port LAN Adapter	10GBASE-T 2-port Adapter	10Gb 2-port CNA Adapter	Onboard LAN	Hitachi 8Gb 2-port FC Adapter	Emulex 8Gb 2-port FC Adapter	Hitachi 16Gb 2-port FC Adapter	Emulex 16Gb 2-port FC Adapter	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 1.1TB	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 2.2TB
1Gb 4-port LAN Adapter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10GBASE-SR 2-port LAN Adapter	✓	✓	✓	N/A	✓	✓	✓	✓	✓	✓	✓
10GBASE-T 2-port Adapter	✓	✓	✓	N/A	✓	✓	✓	✓	✓	✓	✓
10Gb 2-port CNA Adapter	✓	N/A	N/A	✓	✓	✓ ¹	✓	✓ ¹	✓	✓	✓
Onboard LAN	✓	✓	✓	✓	✓	✓ ¹	✓	✓ ¹	✓	✓	✓
Hitachi 8Gb 2-port FC Adapter	✓	✓	✓	✓ ¹	✓ ¹	✓	N/A	✓	N/A	✓ ²	✓ ²
Emulex 8Gb 2-port FC Adapter	✓	✓	✓	✓	✓	N/A	✓	N/A	✓	✓	✓
Hitachi 16Gb 2-port FC Adapter	✓	✓	✓	✓ ¹	✓ ¹	✓	N/A	✓	N/A	✓	✓
Emulex 16Gb 2-port FC Adapter	✓	✓	✓	✓	✓	N/A	✓	N/A	✓	✓	✓

Product name	1Gb 4-port LAN Adapter	10GBASE-SR 2-port LAN Adapter	10GBASE-T 2-port Adapter	10Gb 2-port CNA Adapter	Onboard LAN	Hitachi 8Gb 2-port FC Adapter	Emulex 8Gb 2-port FC Adapter	Hitachi 16Gb 2-port FC Adapter	Emulex 16Gb 2-port FC Adapter	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 1.1TB	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 2.2TB
HGST PCIe MLC Flash Drive Adapter (FlashMax3) 1.1TB	✓	✓	✓	✓	✓	✓ ²	✓	✓	✓	✓	✓
HGST PCIe MLC Flash Drive Adapter (FlashMax3) 2.2TB	✓	✓	✓	✓	✓	✓ ²	✓	✓	✓	✓	✓
Legend ✓: Supported Notes: 1. If the personality of the CNA or Onboard LAN is NIC, the combination is available. If the personality of the CNA or Onboard LAN is iSCSI or FCoE, the combination is unavailable. 2. A combination of Hitachi FC adapter and HGST PCIe MLC Flash Drive Adapter cannot be installed in the I/O adapter slots that are connected to the same PCIe Adapter Connection Mezzanine.											

Configuration rules for 10Gb 2-port CNA Adapter

The following table lists the configuration rules for 10Gb 2-port CNA Adapter.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
✓	✓	✓			In an N+M cold standby environment, the personality and port partition settings of the active board cannot be transferred to the backup board. The active board and backup board that are installed in the same slot number of each system must store the identical personality and port partition settings.
✓	✓	✓			CNA FCoE I/F and CNA iSCSI I/F cannot be configured in the same partition.

Configuration rules for PCIe flash drives

The following table lists the number of PCIe flash drives that is available for each configuration.

Configuration		Maximum number of PCIe Flash	Remarks
520X B1/B2/B3	Server blade	2	Can be installed only in I/O adapter slots whose slot numbers end with B.
	2-blade SMP	4*	Can be installed only in I/O adapter slots whose slot numbers end with B.
	4-blade SMP	8*	Can be installed only in I/O adapter slots whose slot numbers end with B.

Configuration		Maximum number of PCIe Flash	Remarks
520H B3/B4	Server blade	2	
	Server blade + PCI Expansion Blade	8*	
* If a server blade runs VMware ESXi6.0 or 6.0U1, the number of HGST PCIe MLC Flash Drive Adapters that the blade or SMP can contain is limited to three or fewer.			

Boot device

Model						Configuration rule				
520X			520H							
			w/o PCI Exp. Blade		w/ PCI Exp. Blade					
B1	B2	B3	B3	B4	B3					
✓	✓	✓	✓	✓	✓	The internal HDDs in a system that is booted up using FC boot, iSCSI boot, or FCoE boot can handle data if LPAR Manager, N+M cold standby, or HCSM does not apply to the system.				
✓	✓	✓	✓	✓	✓	FC boot, iSCSI boot, and FCoE boot cannot be set up together in the same server blade. A combination of a boot device and a data path in the same server blade is not supported, but they can be configured in the same server chassis.				
✓	✓	✓	✓	✓	✓	If internal HDDs are used as boot devices, any one of FC, iSCSI, or FCoE device can handle data.				
✓	✓	✓	✓	✓	✓	The boot devices must be installed in the primary blade. Up to two devices can be used as boot device. Two devices that are used as boot device must be the same type. The device in the slot of the lowest slot number on the server blade of the lowest server number is recognized as the boot device.				
							FC Data	iSCSI Data	FCoE Data	Internal HDD Data
						FC Boot	✓	N/A	N/A	✓*
						iSCSI Boot	N/A	✓	N/A	✓*
						FCoE Boot	N/A	N/A	✓	✓*
						Internal HDD boot	✓			✓
*Not supported in LPAR Manager, N+M cold standby, or HCSM configuration.										
					✓	PCI cards that are installed in the PCI Expansion Blade cannot be used as boot device.				

Device recognition

A system recognizes the devices that connect with the system during the boot up. The devices are recognized by the system in the following order.

520X B1

In each 520X B1 Server Blade, the devices are recognized in the following order:

1. Mezzanine#1
2. IOBD 01A
3. IOBD 01B
4. Onboard LAN
5. Mezzanine#3
6. IOBD 02A
7. IOBD 02B

If an SMP is configured, the primary server blade is recognized first, and then non-primary server blades are recognized in ascending order of the server blade slot number. In each 520X B1 Server Blade, the devices are recognized in the order described above. The following example shows device recognition order of a 4-blade SMP that is installed in server blade slot 1 through 8.

Order	Blade slot	Slot no.
1	Server Blade 1 (Primary blade)	Mezzanine#1
2		IOBD 01A
3		IOBD 01B
4		Onboard LAN
5		Mezzanine#3
6		IOBD 02A
7		IOBD 02B
8	Server Blade 3	Mezzanine#1
9		IOBD 03A
10		IOBD 03B
11		Onboard LAN
12		Mezzanine#3
13		IOBD 04A
14		IOBD 04B
15	Server Blade 5	Mezzanine#1
16		IOBD 05A
17		IOBD 05B
18		Onboard LAN
19		Mezzanine#3
20		IOBD 06A
21		IOBD 06B

Order	Blade slot	Slot no.
22	Server Blade 7	Mezzanine#1
23		IOBD 07A
24		IOBD 07B
25		Onboard LAN
26		Mezzanine#3
27		IOBD 08A
28		IOBD 08B

520X B2

In each 520X B2 Server Blade, the devices are recognized in the following order:

1. Mezzanine#1
2. Onboard LAN
3. IOBD 01A
4. IOBD 01B
5. Mezzanine#3
6. IOBD 02A
7. IOBD 02B

If an SMP is configured, the primary server blade is recognized first, and then non-primary server blades are recognized in ascending order of the number of a server slot in which the server blade is installed. In each 520X B2 Server Blade, the devices are recognized in the order described above. The following example shows device recognition order of a 4-blade SMP that is installed in server blade slot 1 through 8.

Order	Blade slot	Slot no.
1	Server Blade 1 (Primary blade)	Mezzanine#1
2		Onboard LAN
3		IOBD 01A
4		IOBD 01B
5		Mezzanine#3
6		IOBD 02A
7		IOBD 02B
8	Server Blade 3	Mezzanine#1
9		Onboard LAN
10		IOBD 03A
11		IOBD 03B
12		Mezzanine#3
13		IOBD 04A

Order	Blade slot	Slot no.
14		IOBD 04B
15	Server Blade 5	Mezzanine#1
16		Onboard LAN
17		IOBD 05A
18		IOBD 05B
19		Mezzanine#3
20		IOBD 06A
21		IOBD 06B
22	Server Blade 7	Mezzanine#1
23		Onboard LAN
24		IOBD 07A
25		IOBD 07B
26		Mezzanine#3
27		IOBD 08A
28		IOBD 08B

520H

In each 520H Server Blade, the devices are recognized in the following order:

1. Onboard LAN
2. Mezzanine #1
3. PCIe slot #01A
4. PCIe slot #01B

520H with PCI Expansion Blade

If a PCI Expansion Blade is attached to a 520H Server Blade, the devices are recognized in the following order:

1. Onboard LAN
2. Mezzanine #1
3. Expansion slot #0
4. Expansion slot #1
5. PCIe slot #01A
6. PCIe slot #01B
7. PCIe slot #02A
8. PCIe slot #02B
9. Expansion slot #2
10. Expansion slot #3
11. Expansion slot #4

12.Expansion slot #5

SMP configuration

520X Server Blades support 2-blade SMP and 4-blade SMP configuration. To configure an SMP, connect appropriate SMP connection board with the server blades.

The following table lists the products codes for SMP Connection Board.

Q'ty per chassis					Product name		Product code
520X			520H				
B1	B2	B3	B3	B4			
0-4	0-4	0-4			SMP connection board	2-blade SMP Connection Board	GG-EZ3SMB4X1-(Y R)
0-2	0-2	0-2				4-blade SMP Connection Board	GG-EZ3SMB8X1-(Y R)

The following table lists the processors that support SMP configuration and the type of SMP they support.

Model	Processor	2-blade SMP	4-blade SMP
520X B1	Processor Xeon E7-4820v2	✓	
	Processor Xeon E7-4860v2	✓	
	Processor Xeon E7-4880v2	✓	
	Processor Xeon E7-8880v2	✓	✓
	Processor Xeon E7-8890v2	✓	✓
	Processor Xeon E7-8891v2	✓	✓
520X B2	Processor Xeon E7-8880v3	✓	✓
	Processor Xeon E7-8890v3	✓	✓
	Processor Xeon E7-8893v3	✓	✓

SMP configuration rules

The following table lists the SMP configuration rules.

The following table lists the SMP configuration rules:

Model			Configuration rule						
520X									
B1	B2	B3							
✓	✓	✓	The server blades that constitute an SMP must have the same CPU and memory configuration.						
✓	✓	✓	The following table lists available server slot combinations for a set of server blades that are to constitute an SMP configuration. <table><tr><th>SMP configuration</th><th>Slot combinations for server blades</th></tr><tr><td>2-blade SMP</td><td>#1-#3, #3-#5, #5-#7, #9-#11, #11-#13, #13-#15</td></tr><tr><td>4-blade SMP</td><td>#1-#7, #9-#15</td></tr></table>	SMP configuration	Slot combinations for server blades	2-blade SMP	#1-#3, #3-#5, #5-#7, #9-#11, #11-#13, #13-#15	4-blade SMP	#1-#7, #9-#15
SMP configuration	Slot combinations for server blades								
2-blade SMP	#1-#3, #3-#5, #5-#7, #9-#11, #11-#13, #13-#15								
4-blade SMP	#1-#7, #9-#15								

Model			Configuration rule
520X			
B1	B2	B3	
✓	✓	✓	The server blades that constitute an SMP must have the same CPU and memory configuration.
✓	✓	✓	Server slot #15 is only available for a server blade that constitutes an SMP. A server blade that is installed in server slot #15 cannot use any of mezzanine cards, I/O board modules, or switch modules.
✓	✓	✓	If a 4-blade SMP runs VMware 5.5 or 6.0, the number of 10GBASE-SR 2-port LAN Adapters and/or Intel 10Gb 2-port LAN Adapters that the SMP can contain is limited to three or fewer.
✓	✓	✓	If a 2-blade SMP that is booted from the internal drive runs VMware 5.1; FC, iSCSI and FCoE data are unavailable.
✓	✓	✓	If a 2-blade SMP or 4-blade SMP that is booted from the internal drive runs VMware 5.5 or 6.0, iSCSI data is unavailable.
✓	✓	✓	If a 2-blade SMP that is booted from FC or iSCSI runs VMware ESXi5.1 or 5.5, the blade cannot contain internal drives.
✓	✓	✓	If an SMP that runs RHEL 7.1 does not contain Hitachi 8Gb 2-port FC Adapters, the SMP can contain up to eleven Hitachi 16Gb 2-port FC Adapters.
✓	✓	✓	If an SMP that runs RHEL 7.1 contains one Hitachi 16Gb 2-port FC Adapter, the SMP can contain up to eight Hitachi 8Gb 2-port FC Adapters.
✓	✓	✓	If an SMP that runs RHEL 7.1 contains two or more Hitachi 16Gb 2-port FC Adapters, the SMP cannot contain Hitachi 8Gb 2-port FC Adapters.
✓	✓	✓	If a 4-blade SMP runs VMware 6.0, the fourth server blade of the SMP cannot contain HDDs and/or SSDs because the RAID controller and USB port do not function.

Primary server blade

Primary server blade is the server blade that is installed in the server slot of the lowest number among the server blades that constitute an SMP.

Number of licenses needed for an SMP

If an SMP needs TPM, one TPM Activation License is required for each SMP, not for each of the server blades that constitute the SMP. If the TPM is active, data encryption applies to all the HDDs configured in the SMP.

If an SMP needs CNA, a LoM Activation License is only required for the server blade that needs CNA.

If an SMP needs LPAR Manager, one LPAR Manager License is required for each server blade of the SMP.

RAID

The following table lists the available RAID configurations and the drives. Inter-blade RAID is not supported. The drives used in a RAID group must have the same specifications (drive type, interface, capacity, and rotation speed).

The drives must be filled from the server blade that is installed in the smallest server slot number among the RAID groups.

The following table lists available RAID configurations.

			2-blade SMP			4-blade SMP								
Number of HDDs			2	4		2	4		6			8		
RAID	Number of RAID groups		1	2		1	2		3			4		
	Number of HDDs in a RAID group		2	2	2	2	2	2	2	2	2	2	2	2
	RAID level	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drive	HDD 147 GB 15 krpm		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	HDD 300 GB 15 krpm		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	HDD 600 GB 15 krpm		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	HDD 600 GB 10 krpm		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	HDD 900 GB 10 krpm		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	HDD 1.2 TB 10 krpm		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	HDD 1.8 TB 10 krpm		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SSD 200 GB		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SSD 400 GB		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SSD 800 GB		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Legend														
✓: Applicable														

Internal flash devices

The following table lists the products codes for internal flash devices.

Q'ty per blade					Product name		Product code
520X			520H				
B1	B2	B3	B3	B4			
			0-2	0-2	Flash device	SD Card	GG-MC3SDC1X1-(Y R)
0-2	0-2	0-2				USB Memory	GG-MC3USB2X1-(Y R)
			0-1	0-1	Flash device enablement kit	SD Card Enablement Kit	GG-CH3SEK1X1-(Y R)

Internal flash device configuration rules

The following table lists the configuration rules for Internal flash device.

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
			✓	✓	The SD Card Enablement Kit is required to install the SD Cards.
✓	✓	✓	✓	✓	Internal flash devices are unavailable for an N+M Cold Standby configuration.

Expansion blade options

The following table lists the product codes for the options for PCI Expansion Blade except PCI cards.

Q'ty per PCI Exp. Blade	Product name		Product code
1	Connection kit	PCI Blade Connection Kit F/H	GG-CB3MPT4X1-(Y R)
0-1		PCI Blade Connection kit L/P	GG-CB3MPT5X1-(Y R)
0-1	Card adapter F/H	PCI Blade Card Adapter F/H ×16	GG-CB3RAK1X1-(Y R)
0-1		PCI Blade Card Adapter F/H ×8	GG-CB3RAK2X1-(Y R)
0-1	Card adapter L/P	PCI Blade Card Adapter L/P ×8	GG-CB3RAK3X1-(Y R)
0-1		PCI Blade Card Adapter L/P ×4	GG-CB3RAK4X1-(Y R)
0-1	Power cable	PCI Blade Optional Power Cable	GG-LG3GPC1X1-(Y R)

PCI Expansion Blade configuration rules

The following table lists the configuration rules for the PCI Expansion Blade options.

PCI Exp. Blade	Configuration rule
✓	One PCI Blade Connection Kit F/H is required for each PCI Expansion Blade to connect the expansion blade with the server blade.
✓	Either PCI Blade Card Adapter F/H ×16 or PCI Blade Card Adapter F/H ×8 must be configured even if PCI cards are not to be installed in the PCI Expansion Blade.
✓	PCI Blade Card Adapter F/H ×16 can contain one PCI card whose lane is ×16, ×8, ×4, ×2, or ×1.
✓	PCI Blade Card Adapter F/H ×8 can contain up to two PCI cards whose lane is ×8, ×4, ×2, or ×1.
✓	To install one or more PCI cards in slot 2, 3, 4, or 5, configure a PCI Blade Connection Kit L/P.
✓	To install one or more PCI cards in slot 2, 3, 4, or 5, configure either a PCI Blade Card Adapter L/P ×8 or PCI Blade Card Adapter L/P ×4.
✓	A PCI Blade Card Adapter L/P ×8 can contain up to two PCI cards whose lane is ×8, ×4, ×2, or ×1.

PCI Exp. Blade	Configuration rule
✓	A PCI Blade Card Adapter L/P ×4 can contain up to four PCI cards whose lane is ×4, ×2, or ×1.
✓	A PCI Blade Card Adapter L/P ×4 have a ×8 connector, but only four of the eight lanes operate.
✓	If the total power consumption of the PCI cards exceeds 75 W, configure a PCI Blade Optional Power Cable, which expands the power capacity up to 225 W.

Restrictions on operating systems

The following table lists the restrictions on operating systems.

The following table lists the restrictions on operating systems:

Model					Configuration rule
520X			520H		
B1	B2	B3	B3	B4	
✓					If a server blade that corresponds to the following configuration runs Windows OS, Hyper-Threading must be enabled. - Eight E7-8891v2 configuration (4-blade SMP)
			✓		If a server blade that corresponds to any of the following configurations runs Windows OS, Hyper-Threading must be enabled. - One E5-2660v3 configuration - One E5-2640v3 configuration - One E5-2620v3 configuration - One E5-2603v3 configuration - One E5-2637v3 configuration - Two E5-2637v3 configuration
			✓		If a server blade that corresponds to the following configuration runs Windows OS, 1Gb 4-port LAN Adapter and Emulex 16Gb 2-port FC Adapter are unavailable. - One E5-2637v3 configuration
			✓		If a server blade with a PCI Expansion Blade that corresponds to any of the following configurations runs Windows OS and Hyper-Threading is disabled, the blade cannot contain a 1Gb 4-port LAN Adapter. - Two E5-2640v3 configuration - Two E5-2620v3 configuration - Two E5-2603v3 configuration
	✓				If a server blade that corresponds to the following configuration runs Windows OS, Hyper-Threading must be enabled. - Two E7-8893v3 configuration
	✓				If a server blade that corresponds to the following configuration runs Windows OS, the number of Emulex 16Gb 2-port FC Adapters that the blade can contain is limited to two. - Two E7-8893v3 configuration
			✓		In a RHEL environment, the maximum amount of memory that a server blade can contain is limited as follows: - RHEL 6: 768 GB - RHEL 7: 1.5 TB
	✓				In a RHEL environment, the maximum amount of memory that a server blade can contain is limited as follows: - RHEL 6: 6 TB - RHEL 7: 12 TB

Configuring LPAR Manager

This chapter describes how to configure LPAR Manager.

- ☐ [LPAR Manager](#)
- ☐ [I/O configuration](#)
- ☐ [Supported options](#)
- ☐ [Cable connection](#)

LPAR Manager

LPAR Manager Licenses enables a CB 2500 server blade to configure multiple server environments on the server by logically dividing the server. Each logically divided server environment is called an LPAR (Logical PARTition) and operates independently without mutual influence.

By default, a CB 2500 server blade operates in basic mode, which does not divide the server. If LPAR Manager is applied, the server blade operates in LP mode, which logically divides the server into several LPARs.

LPAR Manager can configure up to four LPARs with LPAR Manager Essential License. LPAR Manager Advanced License and LPAR Manager Enterprise License increase the maximum number of LPARs. These licenses are needed for each server blade that configures five or more LPARs.

For the detailed information on the LPAR Manager Licenses, see the *Hitachi Compute Blade 2500 Series Logical Partitioning Manager User Guide*.

The following table lists the products codes for LPAR Manager Licenses.

Q'ty per blade					Product name		Product code	
520X			520H					
B1	B2	B3	B3	B4				
1			1		LPAR Manager license	LPAR Manager Essential License	Installed as standard	
	0-1	0-1		0-1		LPAR Manager Essential License	Installed as standard	
0-1			0-1			LPAR Manager Advanced License	GG-AR3VLADX1-Y	
	0-1	0-1		0-1		LPAR Manager Advanced License	044-230371-03.P	
	0-1	0-1		0-1		LPAR Manager Advanced License Trial	044-230371-02.P	
	0-1	0-1		0-1		LPAR Manager Enterprise License	044-230372-03.P	
	0-1	0-1		0-1		LPAR Manager Enterprise License Trial	044-230372-02.P	
	0-1	0-1		0-1		LPAR Manager License Adv. to Ent. License Upgrade	044-230373-03.P	
*It is not yet determined when 520X B3 and 520H B4 support LPAR Manager.								

LPAR Manager configuration rules

The following table lists the LPAR Manager configuration rules.

LPAR Manager			Configuration rule
Essential License	Advanced License	Enterprise License	
✓	✓	✓	LPAR must have at least one LAN port to connect the system to the management LAN.
✓	✓	✓	LP mode requires the system to adopt SAN boot, and internal storage is unavailable.

LPAR Manager			Configuration rule
Essential License	Advanced License	Enterprise License	
✓	✓	✓	The Management Modules must connect to the LAN Switch Modules or 10Gb DCB Switch Modules with LAN cables*. For examples of the connection, see Cable connection .
✓			Up to four LPARs can be configured.
	✓		Up to 30 LPARs can be configured.
		✓	Up to 60 LPARs can be configured.
✓	✓	✓	LPAR does not support VMware and Hyper-V.
✓	✗		LPAR migration is not supported.
✓	✓	✓	When using SR-IOV function on an I/O device that contains Emulex XE104, ARP monitoring of Linux bonding is not supported. An I/O device that contains Emulex BE3 supports both ARP and MII monitoring.
✓	✓	✓	When configuring a NIC that does not support management LAN, consider the following. The following table lists NICs and their support status for management LAN.
			The system assigns management LAN to a NIC that the system recognizes first during its booting process. Therefore, a NIC that supports management LAN must be recognized by the system before the system recognizes a NIC that does not support management LAN. Take the device recognition order into consideration when determining the slots in which NICs are installed. The system recognizes the devices in the following order: Mezzanine #1 → IOBD 01A → IOBD 01B → Onboard LAN → Mezzanine #3 (Unavailable for mezzanine) → IOBD 02A → IOBD 02B
✓	✓	✓	If the LPAR Manager configuration of the standby system is different from that of the primary system, the standby system cannot take over the LPAR environment from the primary system.
		✓	For the restrictions on the use of SuSE Linux, see the <i>Installation Guide for SuSE Linux Logical partitioning manager OS Installation Guide</i> .
	✓	✓	Trial Licenses are valid for limited period.

*The customer must supply their own LAN cables.

I/O configuration

The following table lists the maximum number of the physical I/O ports that are available for an LPAR.

are available for all EPRs.

Configuration	I/O devices		Number of ports							
			520X						520H	
			1-blade		2-blade SMP		4-blade SMP			
			LAN	FC	LAN	FC	LAN	FC		
Configuration includes 1Gb LAN		Onboard LAN								
		Mezzanine #1	4		8		16		4	
		IOBD 01A		2		4		8		2
		IOBD 01B		2		4		8		2
		IOBD 02A		2		4		8		
		IOBD 02B		2		4		8		
		Total	4	8	8	16	16	32	4	4
Configuration includes 10Gb LAN with maximum FC ports		Onboard LAN	4		8		16		4	
		Mezzanine #1								
		IOBD 01A		2		4		8		2
		IOBD 01B		2		4		8		2
		IOBD 02A		2		4		8		
		IOBD 02B		2		4		8		
		Total	4	8	8	16	16	32	4	4
Configuration includes 10Gb LAN with maximum LAN ports		Onboard LAN	4		8		16		4	
		Mezzanine #1								
		IOBD 01A		2		4		8		2
		IOBD 01B	2		4		8		2	
		IOBD 02A	2		4		8			
		IOBD 02B	2		4		8			
		Total	10	2	20	4	40	8	6	2

Supported options

The following table lists the support status of the devices in LP mode.

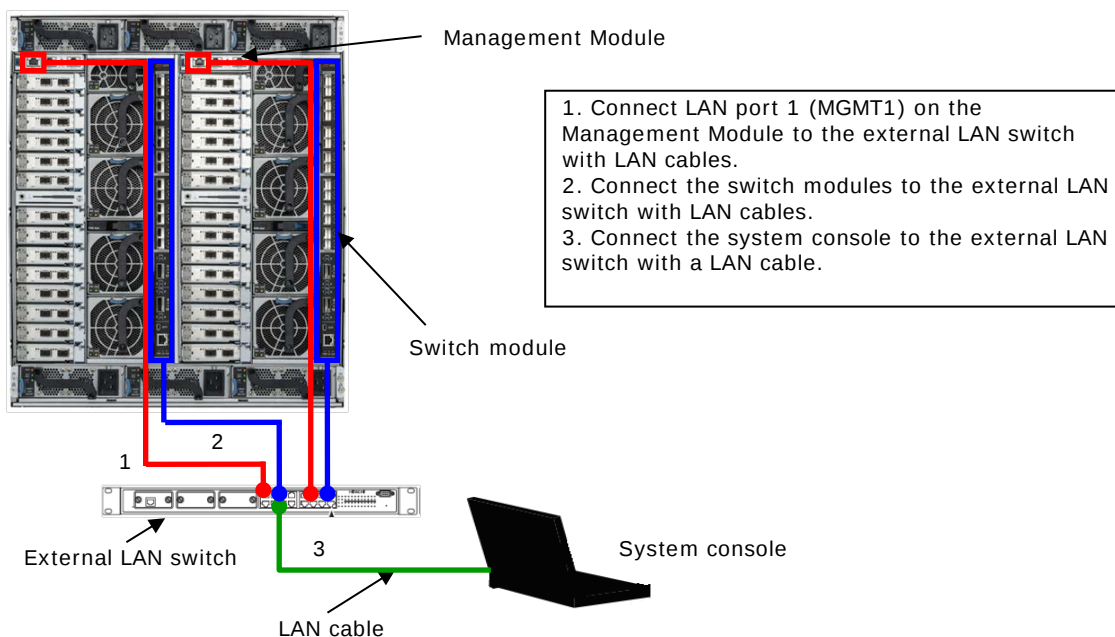
	Product name	LP mode
Mezzanine	Onboard LAN	✓
	1Gb 4-port LAN Mezzanine	✓
	PCIe Adapter Connection Mezzanine	✓
I/O adapter	1Gb 4-port LAN Adapter	

	Product name	LP mode
	10GBASE-SR 2-port LAN Adapter	✓
	10GBASE-T 2-port Adapter	
	10Gb 2-port CNA Adapter	✓
	Hitachi 8Gb 2-port FC Adapter	✓
	Emulex 8Gb 2-port FC Adapter	
	Hitachi 16Gb 2-port FC Adapter	
	Emulex 16Gb 2-port FC Adapter	
	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 1.1TB	
	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 2.2TB	
	HGST PCIe MLC Flash Drive Adapter (FlashMax2) 4.8TB (HDS will not productize)	
Legend ✓:Supported		

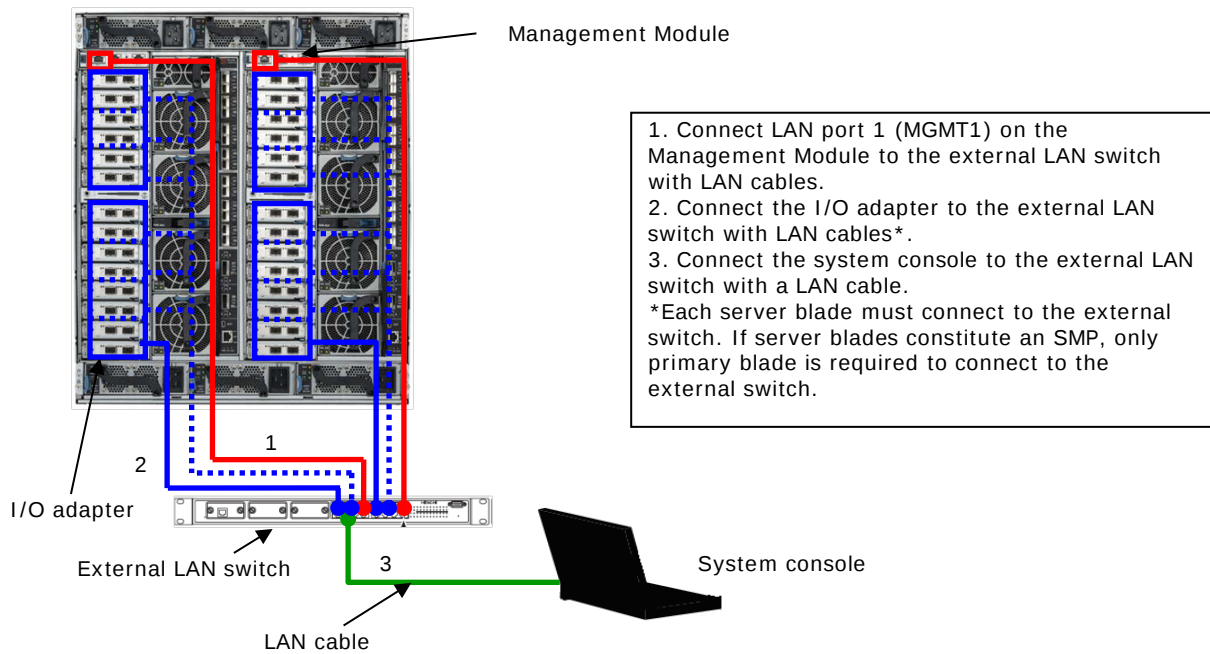
Cable connection

The following are examples of connection between the management modules and switches.

The following figure shows an example of connection using a LAN port on the onboard LAN or mezzanine for the management LAN.



The following figure shows an example of connection using a LAN port on the I/O adapters for the management LAN.



Configuring power supply modules

This chapter describes how to configure Power Supply Modules in the CB 2500 Server Chassis.

- [Estimating the number of power supply modules](#)
- [AC power cable](#)

Estimating the number of power supply modules

Calculate the total power consumption of the server chassis including the chassis options and the server blades. Then, check that the planned configuration can be installed in a chassis, and how many power supply modules are needed.

1. Calculate the total power consumption of the server chassis by using the following table.

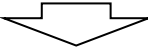
Power consumption table

Product type	Server blade type and processor type	Product code	Maximum power consumption per unit	Q'ty	Power consumption × Quantity
Chassis	CB 2500 Server Chassis Type A1 (includes two Management Modules, two Management LAN Modules, two I/O Adapter Cages, and two Power Supply Modules)	GG-RE4A1UBX1-Y	870		
Power Supply Module	Power Supply Module	GG-BP4PWS1X1-Y	40		
Switch Modules	1/10Gb LAN Switch Module	GG-BE4LSW1X1-Y	64		
	10Gb DCB Switch Module	GG-BE4LSW2X1-Y	105		
520X B1 Server Blade + Processor + RDIMM + Options ¹	520X B1 Server Blade Processor Xeon E7-4820v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32005X1-Y	707		
	520X B1 Server Blade Processor Xeon E7-4860v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32604X1-Y	828		
	520X B1 Server Blade Processor Xeon E7-4880v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32504X1-Y	829		
	520X B1 Server Blade Processor Xeon E7-8880v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32505X1-Y	829		
	520X B1 Server Blade Processor Xeon E7-8890v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32802X1-Y	863		
	520X B1 Server Blade Processor Xeon E7-8891v2 ×2	GG-RV3XGE0B1X1-Y GG-EC33201X1-Y	892		
520X B1 Server Blade + Processor + LRDIMM + Options ¹	520X B1 Server Blade Processor Xeon E7-4820v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32005X1-Y	813		
	520X B1 Server Blade Processor Xeon E7-4860v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32604X1-Y	934		
	520X B1 Server Blade Processor Xeon E7-4880v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32504X1-Y	935		
	520X B1 Server Blade Processor Xeon E7-8880v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32505X1-Y	935		
	520X B1 Server Blade Processor Xeon E7-8890v2 ×2	GG-RV3XGE0B1X1-Y GG-EC32802X1-Y	969		
	520X B1 Server Blade Processor Xeon E7-8891v2 ×2	GG-RV3XGE0B1X1-Y GG-EC33201X1-Y	998		
520X B2 Server Blade + Processor + RDIMM + Options ¹	520X B2 Server Blade Processor Xeon E7-8880v3 ×2	GG-RV3XGE0B2X1-Y GG-EC32306X1-Y	753		
	520X B2 Server Blade Processor Xeon E7-8890v3 ×2	GG-RV3XGE0B2X1-Y GG-EC32506X1-Y	765		
	520X B2 Server Blade Processor Xeon E7-8893v3 ×2	GG-RV3XGE0B2X1-Y GG-EC33203X1-Y	586		

Product type	Server blade type and processor type	Product code	Maximum power consumption per unit	Q'ty	Power consumption × Quantity
520X B2 Server Blade + Processor + LRDIMM + Options ¹	520X B2 Server Blade Processor Xeon E7-8880v3 ×2	GG-RV3XGE0B2X1-Y GG-EC32306X1-Y	939		
	520X B2 Server Blade Processor Xeon E7-8890v3 ×2	GG-RV3XGE0B2X1-Y GG-EC32506X1-Y	951		
	520X B2 Server Blade Processor Xeon E7-8893v3 ×2	GG-RV3XGE0B2X1-Y GG-EC3203X1-Y	773		
520X B3 Server Blade + Processor + RDIMM + Options ¹	520X B3 Server Blade Processor Xeon E7-8880v4 ×2	GG-RV3XGE0B3X1Y GG-EC3E804X1-Y	TBD		
	520X B3 Server Blade Processor Xeon E7-8890v4 ×2	GG-RV3XGE0B3X1Y GG-EC3E904X1-Y	TBD		
	520X B3 Server Blade Processor Xeon E7-8893v4 ×2	GG-RV3XGE0B3X1Y GG-EC3E934X1-Y	TBD		
520H B3 Server Blade + Processor + RDIMM + Options ²	520H B3 Server Blade Processor Xeon E5-2603v3 ×1	GG-RV3XGC0B3X1-Y GG-EC31601X1-Y	304		
	520H B3 Server Blade Processor Xeon E5-2603v3 ×2	GG-RV3XGC0B3X1-Y GG-EC31601X1-Y	379		
	520H B3 Server Blade Processor Xeon E5-2620v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32405X1-Y	367		
	520H B3 Server Blade Processor Xeon E5-2620v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32405X1-Y	451		
	520H B3 Server Blade Processor Xeon E5-2637v3 ×1	GG-RV3XGC0B3X1-Y GG-EC33503X1-Y	462		
	520H B3 Server Blade Processor Xeon E5-2637v3 ×2	GG-RV3XGC0B3X1-Y GG-EC33503X1-Y	568		
	520H B3 Server Blade Processor Xeon E5-2640v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32605X1-Y	372		
	520H B3 Server Blade Processor Xeon E5-2640v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32605X1-Y	466		
	520H B3 Server Blade Processor Xeon E5-2660v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32606X1-Y	421		
	520H B3 Server Blade Processor Xeon E5-2660v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32606X1-Y	519		
	520H B3 Server Blade Processor Xeon E5-2667v3 ×1	GG-RV3XGC0B3X1-Y GG-EC33202X1-Y	462		
	520H B3 Server Blade Processor Xeon E5-2667v3 ×2	GG-RV3XGC0B3X1-Y GG-EC33202X1-Y	568		
	520H B3 Server Blade Processor Xeon E5-2690v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32607X1-Y	462		
	520H B3 Server Blade Processor Xeon E5-2690v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32607X1-Y	568		
	520H B3 Server Blade Processor Xeon E5-2697v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32608X1-Y	472		
	520H B3 Server Blade Processor Xeon E5-2697v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32608X1-Y	585		
	520H B3 Server Blade Processor Xeon E5-2698v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32303X1-Y	TBD		
	520H B3 Server Blade Processor Xeon E5-2698v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32303X1-Y	TBD		
	520H B3 Server Blade Processor Xeon E5-2699v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32304X1-Y	472		
	520H B3 Server Blade Processor Xeon E5-2699v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32304X1-Y	585		
520H B3 Server Blade + Processor + LRDIMM + Options ²	520H B3 Server Blade Processor Xeon E5-2603v3 ×1	GG-RV3XGC0B3X1-Y GG-EC31601X1-Y	328		
	520H B3 Server Blade Processor Xeon E5-2603v3 ×2	GG-RV3XGC0B3X1-Y GG-EC31601X1-Y	427		
	520H B3 Server Blade Processor Xeon E5-2620v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32405X1-Y	391		
	520H B3 Server Blade Processor Xeon E5-2620v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32405X1-Y	499		
	520H B3 Server Blade Processor Xeon E5-2637v3 ×1	GG-RV3XGC0B3X1-Y GG-EC33503X1-Y	486		

Product type	Server blade type and processor type	Product code	Maximum power consumption per unit	Q'ty	Power consumption × Quantity
	520H B3 Server Blade Processor Xeon E5-2637v3 ×2	GG-RV3XGC0B3X1-Y GG-EC33503X1-Y	616		
	520H B3 Server Blade Processor Xeon E5-2640v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32605X1-Y	396		
	520H B3 Server Blade Processor Xeon E5-2640v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32605X1-Y	513		
	520H B3 Server Blade Processor Xeon E5-2660v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32606X1-Y	445		
	520H B3 Server Blade Processor Xeon E5-2660v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32606X1-Y	567		
	520H B3 Server Blade Processor Xeon E5-2667v3 ×1	GG-RV3XGC0B3X1-Y GG-EC33202X1-Y	486		
	520H B3 Server Blade Processor Xeon E5-2667v3 ×2	GG-RV3XGC0B3X1-Y GG-EC33202X1-Y	616		
	520H B3 Server Blade Processor Xeon E5-2690v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32607X1-Y	486		
	520H B3 Server Blade Processor Xeon E5-2690v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32607X1-Y	616		
	520H B3 Server Blade Processor Xeon E5-2697v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32608X1-Y	496		
	520H B3 Server Blade Processor Xeon E5-2697v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32608X1-Y	633		
	520H B3 Server Blade Processor Xeon E5-2698v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32303X1-Y	TBD		
	520H B3 Server Blade Processor Xeon E5-2698v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32303X1-Y	TBD		
	520H B3 Server Blade Processor Xeon E5-2699v3 ×1	GG-RV3XGC0B3X1-Y GG-EC32304X1-Y	496		
	520H B3 Server Blade Processor Xeon E5-2699v3 ×2	GG-RV3XGC0B3X1-Y GG-EC32304X1-Y	633		
520H B4 Server Blade + Processor + RDIMM + Options ²	520H B4 Server Blade Processor Xeon E5-2637v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C374X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2637v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C374X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2643v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C434X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2643v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C434X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2650v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C504X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2650v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C504X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2667v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C674X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2667v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C674X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2683v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C834X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2683v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C834X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2690v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C904X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2690v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C904X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2697v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C974X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2697v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C974X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2698v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C984X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2698v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C984X1-Y	TBD		
	520H B4 Server Blade Processor Xeon E5-2699v4 ×1	GG-RV3XGC0B4X1-Y GG-EC3C994X1-Y	TBD		

Product type	Server blade type and processor type	Product code	Maximum power consumption per unit	Q'ty	Power consumption × Quantity
	520H B4 Server Blade Processor Xeon E5-2699v4 ×2	GG-RV3XGC0B4X1-Y GG-EC3C994X1-Y	TBD		
PCI Expansion Blade	PCI Expansion Blade PCI Blade Connection Kit F/H PCI blade connection kit L/P	GG-ES3PCB1X1-Y GG-CB3MPT4X1-Y GG-CB3MPT5X1-Y	52		



Total power consumption W

Notes:

1. Two PCIe Adapter Connection Mezzanines, four HGST PCIe MLC Flash Drive 2.2TB, and two HDDs.
2. One PCIe Adapter Connection Mezzanine, two HGST PCIe MLC Flash Drive 2.2TB, and two HDDs.

2. Compare the calculated total power consumption with the capacity of the PS configuration in the following table.
 - a. Total power consumption ≤ PS capacity.
 If the PS configuration satisfies above condition, a server chassis can contain all the planned server blades. Select the best configuration from available options, and calculate the required number of Power Supply Modules.
Note: A CB 2500 Server Chassis contains two Power Supply Modules as standard. Therefore, the number of Power Supply Modules that need to be purchased is calculated by subtracting 2 from the number of required Power Supply Modules.
 - b. Total power consumption > PS capacity.
 All the planned server blades cannot be installed in a chassis of the intended PS configuration. Install the server blades into two server chassis or reconsider the PS configuration.

Number of Power Supply Modules	Power supply capacity			
	Normal		w/ C13 PDU support feature	
	w/o Power capacity expansion feature	w/ Power capacity expansion feature	w/o Power capacity expansion feature	w/ Power capacity expansion feature
2 (Active: 1 + Standby: 1)	2,465 W	3,160 W	2,084 W	2,560 W
3 (Active: 2 + Standby: 1)	4,930 W	6,320 W	4,168 W	5,120 W
4 (Active: 2 + Standby: 2)	4,930 W	6,320 W	4,168 W	5,120 W
4 (Active: 3 + Standby: 1)	7,395 W	9,480 W	6,252 W	7,680 W
6 (Active: 3 + Standby: 3)	7,395 W	9,480 W	6,252 W	7,680 W
5 (Active: 4 + Standby: 1)	9,860 W	12,325 W	8,336 W	10,240 W
6 (Active: 5 + Standby: 1)	12,325 W	14,790 W	10,420 W	12,504 W

AC power cable

The following table lists the required specifications for AC power cable.

Item	Specifications
Number of connectors on a PSM	1
Rated voltage	250 V or higher
Rated current	16 A or higher
Connector type on a PSM	IEC60320-C20 (Connector type on cable: C19)

If C13 PDU support feature is enabled, the following AC power cable is required.

Item	Specifications
Number of connectors on a PSM	1
Rated voltage	250 V or higher
Rated current	12 A or higher
Connector type on PSM	IEC60320-C20 (Connector type on cable: C19)
Connector type on PDU	IEC60320-C13 (Connector type on cable: C14)

Memory installation pattern

This chapter shows the memory installation patterns available for CB 2500 server blades.

- ☐ [520X B1](#)
- ☐ [520H B3](#)
- ☐ [520X B2](#)
- ☐ [520H B4](#)

520X B1

Table 6-1 Memory installation (RDIMM, Independent mode, 1.5 V)

Physical	Total capacity (GB)					Clock frequency (MHz)	Quantity	Capacity of memory module (GB)																											
	Logical							DIMM group 0												DIMM group 1								DIMM group 2							
	Independent Mode	Independent Mode with Rank Spaving	Independent Mode with Mirrored Channel Mode					Memory channel												Memory channel								Memory channel							
								A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
8GB	16GB	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K		
64	✓	64		N/A	✓	32	1,333	8		8	8	8	8																						
128	✓	128		N/A	✓	64	1,333	16		8	8	8	8	8	8	8	8																		
128	✓	128	✓	64	✓	64	1,333		8	16	16	16	16																						
192	✓	192		N/A	✓	96	1,333	24		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
256	✓	256	✓	128	✓	128	1,333	32		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
256	✓	256	✓	128	✓	128	1,333		16	16	16	16	16	16	16	16	16																		
320	✓	320	✓	192	✓	160	1,066	40		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
320	✓	320	✓	192	✓	160	1,333	8	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8												
384	✓	384	✓	256	✓	192	1,066	48		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
384	✓	384	✓	256	✓	192	1,333		24	16	16	16	16	16	16	16	16	16	16	16	16	16													
384	✓	384	✓	256	✓	192	1,333	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
448	✓	448	✓	320	✓	224	1,066	24	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
512	✓	512	✓	384	✓	256	1,333		32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		
512	✓	512	✓	384	✓	256	1,066	32	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
576	✓	576	✓	448	✓	288	1,066	8	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		
640	✓	640	✓	512	✓	320	1,066		40	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		
640	✓	640	✓	512	✓	320	1,066	16	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		
768	✓	768	✓	640	✓	384	1,066		48	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		

Product codes of configurable memory modules are as follows:
8GB memory (GG-MJ3N8G1X3-Y) and 16GB memory (GG-MJ316G1X1-Y, GG-MJ316G1X2-Y, or GG-MJ316G1X3-Y).

Table 6-2 Memory installation (RDIMM, Lockstep mode, 1.5 V)

Physical	Total capacity (GB)					Clock frequency (MHz)	Quantity	Capacity of memory module (GB)																															
	Logical							DIMM group 0								DIMM group 1								DIMM group 2															
	Lockstep Mode	Lockstep Mode with Rank Sparing Mode	Lockstep Mode with Mirrored Channel Mode	Memory channel								Memory channel								Memory channel																			
				8GB	16GB			A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H								
64	✓	64	N/A	✓	32	1.333	8		8	8	8	8																											
128	✓	128	N/A	✓	64	1.333	16		8	8	8	8	8	8	8	8																							
128	✓	128	✓	64	✓	1.333		8	16	16	16	16																											
192	✓	192	N/A	✓	96	1.333	24		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8											
256	✓	256	✓	128	✓	1.333	32		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8										
256	✓	256	✓	128	✓	1.333		16	16	16	16	16	16	16	16	16	16																						
320	✓	320	✓	192	✓	1.066	40		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8						
320	✓	320	✓	192	✓	1.333	8	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8																	
384	✓	384	✓	256	✓	1.066	48		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8					
384	✓	384	✓	256	✓	1.333		24	16	16	16	16	16	16	16	16	16	16	16	16	16	16																	
384	✓	384	✓	256	✓	1.333	16	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8										
448	✓	448	✓	320	✓	1.066	24	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8					
512	✓	512	✓	384	✓	1.333		32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16					
512	✓	512	✓	384	✓	1.066	32	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8					
576	✓	576	✓	448	✓	1.066	8	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16					
640	✓	640	✓	512	✓	1.066		40	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16					
640	✓	640	✓	512	✓	1.066	16	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16					
768	✓	768	✓	640	✓	1.066		48	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16					

Product codes of configurable memory modules are as follows:
8GB memory (GG-MJ3N8G1X3-Y) and 16GB memory (GG-MJ316G1X1-Y, GG-MJ316G1X2-Y, or GG-MJ316G1X3-Y).

Table 6-3 Memory installation (RDIMM, Independent mode, 1.35 V)

Physical	Total capacity (GB)						Clock frequency (MHz)	Quantity		Capacity of memory module (GB)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Logical									DIMM group 0								DIMM group 1								DIMM group 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Independent Mode	Independent Mode with Rank Sparing Mode		Independent Mode with Mirrored Channel Mode						Memory channel								Memory channel								Memory channel																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

Table 6-4 Memory installation (RDIMM, Lockstep mode, 1.35 V)

Total capacity (GB)						Clock frequency (MHz)	Quantity		Capacity of memory module (GB)																							
Physical	Logical								DIMM group 0								DIMM group 1								DIMM group 2							
	Independent Mode	Independent Mode with Rank Sparring Mode	Independent Mode with Mirrored Channel Mode	Memory channel								Memory channel								Memory channel												
				A	B		C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H				
				8GB	16GB		R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K		
64	✓	64	N/A	✓	32	1,333	8		8	8	8	8																				
128	✓	128	N/A	✓	64	1,333	16		8	8	8	8	8	8	8	8																
128	✓	128	✓	64	✓	64	1,333	8	16	16	16	16																				
192	✓	192	N/A	✓	96	1,066	24		8	8	8	8	8	8	8	8	8	8	8	8												
256	✓	256	✓	128	✓	128	1,066	32		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8			
256	✓	256	✓	128	✓	128	1,333		16	16	16	16	16	16	16	16	16	16	16	16												
320	✓	320	✓	192	✓	160	1,066	8	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8									
384	✓	384	✓	256	✓	192	1,066		24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16			
384	✓	384	✓	256	✓	192	1,066	16	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8			
512	✓	512	✓	384	✓	256	1,066		32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16			

Product codes of configurable memory modules are as follows:
8GB memory (GG-MJ3N8G1X3-Y) and 16GB memory (GG-MJ316G1X1-Y or GG-MJ316G1X2-Y).

Table 6-5 Memory installation (LRDIMM, Independent mode, 1.5 V)

Total capacity (GB)						Clock frequency (MHz)	Quantity	Capacity of memory module (GB)																							
Physical	Logical			Independent Mode with Rank Sparring Mode	Independent Mode with Mirrored Channel Mode			DIMM group 0								DIMM group 1								DIMM group 2							
	Independent Mode	Independent Mode with Rank Sparring Mode	Independent Mode with Mirrored Channel Mode					Memory channel								Memory channel								Memory channel							
								A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
256	✓	256	✓	192	✓	1,333	8		32	32	32	32																			
512	✓	512	✓	384	✓	1,333	16		32	32	32	32	32	32	32	32															
768	✓	768	✓	640	✓	1,333	24		32	32	32	32	32	32	32	32	32	32	32	32	32										
1,024	✓	1,024	✓	896	✓	1,333	32		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
1,280	✓	1,280	✓	1,152	✓	1,066	40		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
1,536	✓	1,536	✓	1,408	✓	1,066	48		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

Product codes of configurable memory modules are as follows:
32GB memory (GG-MJ332G2X2-Y).
Install Dummy Memory Modules in empty slot.

Table 6-6 Memory installation (LRDIMM, Lockstep mode, 1.5 V)

Physical	Total capacity (GB)						Clock frequency (MHz)	Quantity	Capacity of memory module (GB)																											
	Logical								DIMM group 0								DIMM group 1								DIMM group 2											
	Independent Mode	Independent Mode with Rank Sparring Mode	Independent Mode with Mirrored Channel Mode						Memory channel								Memory channel								Memory channel											
						32GB		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H					
								R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K					
256	✓	256	✓	192	✓	128	1,600	8		32	32	32	32																							
512	✓	512	✓	384	✓	256	1,600	16		32	32	32	32	32	32	32																				
768	✓	768	✓	640	✓	384	1,600	24		32	32	32	32	32	32	32	32	32	32	32	32															
1,024	✓	1,024	✓	896	✓	512	1,600	32		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32					
1,280	✓	1,280	✓	1,152	✓	640	1,333	40		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32					
1,536	✓	1,536	✓	1,408	✓	768	1,333	48		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32					

Product codes of configurable memory modules are as follows:
32GB memory (GG-MJ332G2X2-Y).
Install Dummy Memory Modules in empty slot.

Table 6-7 Memory installation (LRDIMM, Independent mode, 1.35 V)

Physical	Total capacity (GB)				Clock frequency (MHz)	Quantity	Capacity of memory module (GB)																									
	Logical						DIMM group 0								DIMM group 1								DIMM group 2									
	Independent Mode	Independent Mode with Rank Sparring Mode	Independent Mode with Mirrored Channel Mode				Memory channel								Memory channel								Memory channel									
							32GB		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
									R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K
256	✓	256	✓	192	✓	128	1,333	8		32	32	32	32																			
512	✓	512	✓	384	✓	256	1,333	16		32	32	32	32	32	32	32	32															
768	✓	768	✓	640	✓	384	1,333	24		32	32	32	32	32	32	32	32	32	32	32	32											
1 024	✓	1 024	✓	896	✓	512	1,333	32		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32		

Product codes of configurable memory modules are as follows:
32GB memory (GG-MJ332G2X2-Y).
Install Dummy Memory Modules in empty slot.

Table 6-8 Memory installation (LRDIMM, Lockstep mode, 1.35 V)

[illegible]

Product codes of configurable memory modules are as follows:

32GB memory (GG-MJ332G2X2-Y).

Install Dummy Memory Modules in empty slot.

520H B3

Table 6-9 Memory installation (520H B3, RDIMM, 1.2 V, 1-CPU)

Total capacity (GB)						Clock frequency (MHz)	Capacity of memory module (GB)																										
Physical	Logical				Quantity		DIMM group 0								DIMM group 1								DIMM group 2										
	Independent channel mode	Rank sparing mode	Mirrored channel mode				Memory channel								Memory channel								Memory channel										
						8GB	16GB	32GB		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
8	✓	8	N/A		N/A	2,133	1			8																							
16	✓	16	N/A		N/A	2,133	2			8	8																						
16	✓	16	N/A		N/A	2,133		1		16																							
24	✓	24	N/A		N/A	2,133	3			8	8	8																					
32	✓	32	N/A	✓	16	2,133	4			8	8	8	8																				
32	✓	32	N/A		N/A	2,133		2		16	16																						
32	✓	32	N/A		N/A	2,133		1		32																							
40	✓	40	N/A		N/A	2,133	5			8	8	8	8					8															
48	✓	48	N/A		N/A	2,133	6			8	8	8	8					8	8														
48	✓	48	N/A		N/A	2,133		3		16	16	16																					
56	✓	56	N/A		N/A	2,133	7			8	8	8	8					8	8	8													
64	✓	64	✓	32	✓	32	8			8	8	8	8					8	8	8	8												
64	✓	64	N/A	✓	32	2,133		4		16	16	16	16																				
64	✓	64	N/A		N/A	2,133		2		32	32																						
72	✓	72	N/A		N/A	1,600	9			8	8	8	8					8	8	8	8					8							
72	✓	72	N/A		N/A	2,133	1	4		16	16	16	16					8															
80	✓	80	N/A		N/A	1,600	10			8	8	8	8					8	8	8	8					8	8						
80	✓	80	N/A		N/A	2,133	2	4		16	16	16	16					8															
80	✓	80	N/A		N/A	2,133		5		8	16	16	16	16				16															
88	✓	88	N/A		N/A	1,600	11			8	8	8	8	8				8	8	8	8					8	8	8					
88	✓	88	N/A		N/A	2,133	3	4		16	16	16	16					8	8														
96	✓	96	✓	64	✓	48	12			8	8	8	8					8	8	8	8					8	8	8	8				
96	✓	96	✓	64	✓	48	4			16	16	16	16					8	8	8	8												
96	✓	96	N/A		N/A	2,133		6		16	16	16	16					16	16														
96	✓	96	N/A		N/A	2,133		3		32	32	32																					
104	✓	104	N/A		N/A	1,600	5	4		16	16	16	16					8	8	8	8					8							
112	✓	112	N/A		N/A	1,600	6	4		16	16	16	16					8	8	8	8					8	8						
112	✓	112	N/A		N/A	2,133		7		16	16	16	16					16	16	16													
120	✓	120	N/A		N/A	1,600	7	4		16	16	16	16					8	8	8	8					8	8	8					
128	✓	128	✓	96	✓	64	8	4		16	16	16	16					8	8	8	8					8	8	8	8				
128	✓	128	✓	96	✓	64		8		16	16	16	16					16	16	16	16												
128	✓	128	N/A	✓	64	2,133		4		32	32	32	32																				
136	✓	136	N/A		N/A	1,600	1	8		16	16	16	16					16	16	16	16					8							
136	✓	136	N/A		N/A	2,133	1	4		32	32	32	32					8															
144	✓	144	N/A		N/A	1,600	2	8		16	16	16	16					16	16	16	16					8	8						
144	✓	144	N/A		N/A	1,600		9		16	16	16	16					16	16	16	16					16							
144	✓	144	N/A		N/A	2,133	2	4		32	32	32	32					8															
144	✓	144	N/A		N/A	2,133		1	4	32	32	32	32					16															
152	✓	152	N/A		N/A	1,600	3	8		16	16	16	16					16	16	16	16					8	8	8					
152	✓	152	N/A		N/A	2,133	3			32	32	32	32					8	8														
160	✓	160	✓	128	✓	80	4	8		16	16	16	16					16	16	16	16					8	8	8	8				
160	✓	160	N/A		N/A	1,600		10		16	16	16	16					16	16	16	16												
160	✓	160	✓	96	✓	80	4	4		32	32	32	32					8	8	8	8					16	16						
160	✓	160	N/A		N/A	2,133		2	4	32	32	32	32					16	16														
160	✓	160	N/A		N/A	2,133		5		32	32	32	32					32															
168	✓	168	N/A		N/A	1,600	5	4		32	32	32	32					8	8	8	8					8							
176	✓	176	N/A		N/A	1,600		11		16	16	16	16					16	16	16	16					16	16	16					
176	✓	176	N/A		N/A	1,600	6	4		32	32	32	32					8	8	8	8					8							
176	✓	176	N/A		N/A	2,133		3	4	32	32	32	32					16	16	16													
184	✓	184	N/A		N/A	1,600	7	4		32	32	32	32					8	8	8	8					8	8	8					
192	✓	192	✓	160	✓	96	1,600	12		16	16	16	16					16	16	16	16					16	16	16	16				
192	✓	192	✓	128	✓	96	1,600	8	4	32	32	32	32					8	8	8	8					8	8	8	8				
192	✓	192	✓	128	✓	96	2,133		4	4	32	32	32	32				16	16	16	16												
192	✓	192	N/A		N/A	2,133		6		32	32	32	32					32	32														
200	✓	200	N/A		N/A	1,600	1	4	4	32	32	32	32					16	16	16	16					8							
208	✓	208	N/A		N/A	1,600	2	4		16	16	16	16					16	16	16	16					8	8						
208	✓	208	N/A		N/A	1,600		5	4	32	32	32	32					16	16	16	16					16							
216	✓	216	N/A		N/A	1,600	3	4	4	32	32	32	32					16	16	16	16					8	8	8					
224	✓	224	✓	160	✓	112	1,600	4	4	32	32	32	32					16	16	16	16					8	8	8	8				
224	✓	224	N/A		N/A	1,600		6	4	32	32	32	32					16	16	16	16					16	16						
224	✓	224	N/A		N/A	2,133		7		32	32	32	32					32	32	32													
240	✓	240	N/A		N/A	1,600		7	4	32	32	32	32					16	16	16	16					16	16	16					
256	✓	256	✓	192	✓	128	1,600	8	4	32	32	32	32					16	16	16	16					16	16	16	16				
256	✓	256	✓	192	✓	128	2,133		8	32	32	32	32					32	32	32	32												
264	✓	264	N/A		N/A	1,600	1		8	32	32	32	32					32	32	32	32					8							
272	✓	272	N/A		N/A	1,600	2		8	32	32	32	32					32	32	32	32</												

Product code of configurable memory module is as follows:

8GB memory (GG-MJ3N8G3X1-Y), 16GB memory (GG-MJ316G3X1-Y), or 32GB memory (GG-MJ332G3X1-Y)

Table 6-10 Memory installation (520H B3, RDIMM, 1.2 V, 2-CPU)

Physical	Total capacity (GB)				Clock frequency (MHz)	Quantity			Capacity of memory module (GB)																							
	Logical		Mirrored channel mode	Rank sparing mode					DIMM group 0						DIMM group 1						DIMM group 2											
	Independent channel mode					8GB	16GB	32GB	Memory channel						Memory channel						Memory channel											
									A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
16	✓	✓	16	N/A	N/A	2,133	2		8	8																						
32	✓	✓	32	N/A	N/A	2,133	4		8	8																						
32	✓	✓	32	N/A	N/A	2,133		2	16					16																		
48	✓	✓	48	N/A	N/A	2,133	6		8	8	8		8	8	8																	
64	✓	✓	64	N/A		32	8		8	8	8	8	8	8	8	8																
64	✓	✓	64	N/A		2,133		4	16	16			16	16																		
64	✓	✓	64	N/A		2,133		2	32				32																			
80	✓	✓	80	N/A		2,133	10		8	8	8	8	8	8	8	8					8											
96	✓	✓	96	N/A		2,133	12		8	8	8	8	8	8	8	8	8	8			8	8										
96	✓	✓	96	N/A		2,133		6	16	16	16		16	16	16																	
112	✓	✓	112	N/A		2,133	14		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8									
128	✓	✓	128	✓	64	✓	16		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8								
128	✓	✓	128		N/A	✓	64		16	16	16	16	16	16	16	16																
128	✓	✓	128	N/A		2,133		4	32	32			32	32																		
144	✓	✓	144	N/A		1,600	18		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8						
144	✓	✓	144	N/A		2,133	2	8	16	16	16	16	16	16	16	16	8					8										
160	✓	✓	160	N/A		1,600	20		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8					
160	✓	✓	160	N/A		2,133	4	8	16	16	16	16	16	16	16	16	8					8										
160	✓	✓	160	N/A		2,133		10	16	16	16	16	16	16	16	16	16					16										
176	✓	✓	176	N/A		1,600	22		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
176	✓	✓	176	N/A		2,133	6	8	16	16	16	16	16	16	16	16	8	8				8	8									
192	✓	✓	192	✓	128	✓	96		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
192	✓	✓	192	✓	128	✓	96		16	16	16	16	16	16	16	16	8	8				8	8									
192	✓	✓	192	N/A		2,133	12		16	16	16	16	16	16	16	16	16	16			16	16										
192	✓	✓	192	N/A		2,133		6	32	32	32		32	32	32																	
208	✓	✓	208	N/A		1,600	10	8	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8							
224	✓	✓	224	N/A		1,600	12	8	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8					
224	✓	✓	224	N/A		2,133		14	16	16	16	16	16	16	16	16	16	16	16			16	16	16								
240	✓	✓	240	N/A		1,600	14	8	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
256	✓	✓	256	✓	192	✓	128	16	8	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
256	✓	✓	256	✓	192	✓	128	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16									
256	✓	✓	256	N/A	✓	128	2,133		8	32	32	32	32	32	32	32	32															
272	✓	✓	272	N/A		1,600	2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8							
272	✓	✓	272	N/A		2,133	2	8	32	32	32	32	32	32	32	32	8					8										
288	✓	✓	288	N/A		1,600	4	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8	8						
288	✓	✓	288	N/A		1,600		18	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16						
288	✓	✓	288	N/A		2,133	4	8	32	32	32	32	32	32	32	32	8	8				8										
288	✓	✓	288	N/A		2,133		2	8	32	32	32	32	32	32	32	16				16											
304	✓	✓	304	N/A		1,600	6	16	8	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8	8	8				
304	✓	✓	304	N/A		2,133	6	8	32	32	32	32	32	32	32	32	8	8				8	8									
304	✓	✓	304	✓	256	✓	160		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8
320	✓	✓	320	N/A		1,600	20		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16					
320	✓	✓	320	✓	192	✓	160	8	8	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8							
320	✓	✓	320	N/A		2,133		4	8	32	32	32	32	32	32	32	16	16				16	16									
320	✓	✓	320	N/A		2,133		10	32	32	32	32	32	32	32	32	32				32											
336	✓	✓	336	N/A		1,600	10	8	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8							
352	✓	✓	352	N/A		1,600		22	8	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16					
352	✓	✓	352	N/A		1,600	12	8	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8					
352	✓	✓	352	N/A		2,133		6	8	32	32	32	32	32	32	32	16	16			16	16	16									
368	✓	✓	368	N/A		1,600	14	8	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
384	✓	✓	384	✓	320	✓	192	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
384	✓	✓	384	✓	256	✓	192	16	8	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
384	✓	✓	384	✓	256	✓	192	8	8	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16								
384	✓	✓	384	N/A		2,133	12		32	32	32	32	32	32	32	32	32	32			32	32										
400	✓	✓	400	N/A		1,600	2	8	8	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	8							
416	✓	✓	416	N/A		1,600	4	8	8	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	8	8					
416	✓	✓	416	N/A		1,600		10	8	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16							
432	✓	✓	432	N/A		1,600	6	8	16	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	8	8					
448	✓	✓	448	✓	320	✓	224	8	8	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	8	8	8	8	8	8	8
448	✓	✓	448	N/A		1,600		12	8	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16						
448	✓	✓	448	N/A		2,133		14	32	32	32	32	32	32	32	32	32	32			32	32										
480	✓	✓	480</																													

Product code of configurable memory module is as follows:
8GB memory (GG-MJ31N8G3X1-Y), 16GB memory (GG-MJ316G3X1-Y), or 32GB memory (GG-MJ332G3X1-Y)

Table 6-11 Memory installation (520H B3, LRDIMM, 1.2 V, 1-CPU)

Physical	Total capacity (GB)				Clock frequency (MHz)	Quantity				Capacity of memory module (GB)																							
	Logical									DIMM group 0								DIMM group 1								DIMM group 2							
	Independent channel mode	Rank sparing mode	Mirrored channel mode			32GB	64GB			Memory channel								Memory channel								Memory channel							
										A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
32	✓	32	N/A		2,133	1				32																							
64	✓	64	N/A		2,133	2				32	32																						
64	✓	64	N/A		2,133		1			64																							
96	✓	96	N/A		2,133	3				32	32	32																					
128	✓	128	✓	96	2,133	4				32	32	32	32																				
128	✓	128		N/A		2,133		2		64	64																						
160	✓	160	N/A		2,133	5				32	32	32	32					32															
192	✓	192	N/A		2,133	6				32	32	32	32					32	32														
192	✓	192	N/A		2,133		3			64	64	64																					
224	✓	224	N/A		2,133	7				32	32	32	32						32	32	32												
256	✓	256	✓	224	2,133	8				32	32	32	32						32	32	32	32											
256	✓	256	✓	192	2,133		4			64	64	64	64																				
288	✓	288	N/A		1,600	9				32	32	32	32					32	32	32	32					32							
288	✓	288	N/A		2,133	1	4			64	64	64	64					32															
320	✓	320	N/A		1,600	10				32	32	32	32					32	32	32	32					32	32						
320	✓	320	N/A		2,133	2	4			64	64	64	64					32	32														
320	✓	320	N/A		2,133		5			64	64	64	64					64															
352	✓	352	N/A		1,600	11				32	32	32	32					32	32	32	32					32	32	32					
352	✓	352	N/A		2,133	3	4			64	64	64	64					32	32	32													
384	✓	384	✓	352	1,600	12				32	32	32	32					32	32	32	32					32	32	32	32				
384	✓	384	✓	320	2,133	4	4			64	64	64	64					32	32	32	32												
384	✓	384	N/A		2,133	6				64	64	64	64					64	64														
416	✓	416	N/A		1,600	5	4			64	64	64	64					32	32	32	32					32							
448	✓	448	N/A		1,600	6	4			64	64	64	64					32	32	32	32					32	32						
448	✓	448	N/A		2,133	7				64	64	64	64					64	64	64													
480	✓	480	N/A		1,600	7	4			64	64	64	64					32	32	32	32					32	32	32					
512	✓	512	✓	448	1,600	8	4			64	64	64	64					32	32	32	32					32	32	32	32				
512	✓	512	✓	448	2,133	8				64	64	64	64					64	64	64	64												
544	✓	544	N/A		1,600	1	8			64	64	64	64					64	64	64	64					32							
576	✓	576	N/A		1,600	2	8			64	64	64	64					64	64	64	64					32	32						
576	✓	576	N/A		1,600		9			64	64	64	64					64	64	64	64					64							
608	✓	608	N/A		1,600	3	8			64	64	64	64					64	64	64	64					32	32	32					
640	✓	640	✓	576	1,600	4	8			64	64	64	64					64	64	64	64					32	32	32	32				
640	✓	640	N/A		1,600		10			64	64	64	64					64	64	64	64					64	64						
704	✓	704	N/A		1,600		11			64	64	64	64					64	64	64	64					64	64	64					
768	✓	768	✓	704	1,600		12			64	64	64	64					64	64	64	64					64	64	64	64				

Product code of configurable memory module is as follows:
32GB memory (GG-MJ332G4X1-Y) or 64GB memory (GG-MJ364G4X1-Y)

Table 6-12 Memory installation (520H B3, LRDIMM, 1.2 V, 2-CPU)

Physic al	Total capacity (GB)				Clock frequency (MHz)	Quantity			Capacity of memory module (GB)																									
	Logical								DIMM group 0								DIMM group 1								DIMM group 2									
	Independent channel mode	Rank sparing mode	Mirrored channel mode			32GB	64GB			Memory channel								Memory channel								Memory channel								
										A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	
64	✓	64	N/A	N/A	2,133	2			32					32																				
128	✓	128	N/A		2,133	4			32	32				32	32																			
128	✓	128	N/A		2,133		2		64					64																				
192	✓	192	N/A		2,133	6			32	32	32			32	32	32																		
256	✓	256	✓	192	2,133	8			32	32	32	32		32	32	32	32																	
256	✓	256	N/A		2,133		4		64	64				64	64																			
320	✓	320	N/A		2,133	10			32	32	32	32		32	32	32	32	32						32										
384	✓	384	N/A		2,133	12			32	32	32	32	32		32	32	32	32	32	32			32	32										
384	✓	384	N/A		2,133		6		64	64	64			64	64	64																		
448	✓	448	N/A		2,133	14			32	32	32	32		32	32	32	32	32	32	32	32			32	32	32								
512	✓	512	✓	448	2,133	16			32	32	32	32		32	32	32	32	32	32	32	32	32		32	32	32	32							
512	✓	512	✓	384	2,133		8		64	64	64	64		64	64	64	64																	
576	✓	576	N/A		1,600	18			32	32	32	32		32	32	32	32	32	32	32	32	32		32	32	32	32							
576	✓	576	N/A		2,133	2	8		64	64	64	64		64	64	64	64	64	64	64	64	64												
640	✓	640	N/A		1,600	20			32	32	32	32		32	32	32	32	32	32	32	32	32	32		32	32	32	32						
640	✓	640	N/A		2,133	4	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64											
640	✓	640	N/A		2,133		10		64	64	64	64		64	64	64	64	64					64											
704	✓	704	N/A		1,600	22			32	32	32	32		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32						
704	✓	704	N/A		2,133	6	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64											
768	✓	768	✓	704	1,600	24			32	32	32	32		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32					
768	✓	768	✓	640	2,133	8	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64					
768	✓	768	N/A		2,133	12			64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64					
832	✓	832	N/A		1,600	10	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64					
896	✓	896	N/A		1,600	12	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64				
896	✓	896	N/A		2,133	14	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64				
960	✓	960	N/A		1,600	14	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64				
1,024	✓	1,024	✓	896	1,600	16	8		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64				
1,024	✓	1,024	✓	896	2,133	16			64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64				
1,088	✓	1,088	N/A		1,600	2	16		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	32			
1,152	✓	1,152	N/A		1,600	4	16		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	32			
1,152	✓	1,152	N/A		1,600	18			64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64			
1,216	✓	1,216	N/A		1,600	6	16		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	32			
1,280	✓	1,280	✓	1,152	1,600	8	16		64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	32			
1,280	✓	1,280	N/A		1,600	20			64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64			
1,408	✓	1,408	N/A		1,600	22			64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64			
1,536	✓	1,536	✓	1,408	1,600	24			64	64	64	64		64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64		

520X B2

Table 6-13 Memory installation (RDIMM, Independent mode, 1.2 V)

Physical	Total capacity (GB)				Clock frequency (MHz)	Quantity			Capacity of memory module (GB)																									
	Logical								DIMM group 0								DIMM group 1								DIMM group 2									
	Independent Mode	Independent Mode with Rank Sparring Mode	Independent Mode with Mirrored Channel Mode			8GB	16GB	32GB		Memory channel								Memory channel								Memory channel								
										A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	
64	✓	64	N/A	✓	32	1,600	8			8	8	8	8																					
128	✓	128	N/A	✓	64	1,600	16			8	8	8	8	8	8	8																		
128	✓	128	✓	64	✓	1,600		8		16	16	16	16																					
192	✓	192	N/A	✓	96	1,600	24			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
256	✓	256	✓	128	✓	1,600	32			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
256	✓	256	✓	128	✓	1,600		16		16	16	16	16	16	16	16	16																	
256	✓	256	✓	128	✓	1,600		8		32	32	32	32																					
320	✓	320	✓	256	✓	1,600	40			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
320	✓	320	✓	192	✓	1,600	8	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
384	✓	384	✓	320	✓	1,600	48			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
384	✓	384	✓	256	✓	1,600	16	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
384	✓	384	✓	256	✓	1,600	24			16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
448	✓	448	✓	320	✓	1,600	24	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
512	✓	512	✓	384	✓	1,600	32	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
512	✓	512	✓	384	✓	1,600		32		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
512	✓	512	✓	256	✓	1,600		16		32	32	32	32	32	32	32	32																	
576	✓	576	✓	448	✓	1,600	8	32		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
576	✓	576	✓	320	✓	1,600	8	16		32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
640	✓	640	✓	512	✓	1,600	16	32		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
640	✓	640	✓	512	✓	1,600		40		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
640	✓	640	✓	384	✓	1,600	16		16	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
640	✓	640	✓	384	✓	1,600		8	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
704	✓	704	✓	448	✓	1,600	24	16		32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
768	✓	768	✓	640	✓	1,600		48		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓	512	✓	1,600	32		16	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
768	✓	768	✓	512	✓	1,600		16	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓	512	✓	1,600		24		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
832	✓	832	✓	576	✓	1,600	8	16	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
896	✓	896	✓	640	✓	1,600	16	16	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
896	✓	896	✓	640	✓	1,600	24	16		32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
1,024	✓	1,024	✓	768	✓	1,600	32	16		32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
1,024	✓	1,024	✓	768	✓	1,600		32		32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
1,088	✓	1,088	✓	832	✓	1,600	8		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,152	✓	1,152	✓	896	✓	1,600	16		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,152	✓	1,152	✓	896	✓	1,600		8	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,280	✓	1,280	✓	1,024	✓	1,600		16	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,280	✓	1,280	✓	1,024	✓	1,600		40		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,536	✓	1,536	✓	1,280	✓	1,600		48		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	

Product codes of configurable memory modules are as follows:
8GB memory (GG-MJ3N8G3X1-Y), 16GB memory (GG-MJ316G3X1-Y), and 32GB memory (GG-MJ332G3X1-Y).

Table 6-14 Memory installation (RDIMM, Lockstep mode, 1.2 V)

Physical	Total capacity (GB)					Clock frequency (MHz)	Quantity			Capacity of memory module (GB)																											
	Logical									DIMM group 0								DIMM group 1								DIMM group 2											
	Lockstep Mode	Lockstep Mode with Rank Sparring Mode		Lockstep Mode with Mirrored Channel Mode	8GB16GB32GB			Memory channel								Memory channel								Memory channel													
		A	B					C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H								
																														R	T	N	P	L	M	J	K
64	✓	64		N/A	✓	32	1,866	8			8	8	8	8																							
128	✓	128		N/A	✓	64	1,866	16			8	8	8	8	8	8	8																				
128	✓	128	✓	64	✓	64	1,866		8		16	16	16	16																							
192	✓	192		N/A	✓	96	1,866	24			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8											
256	✓	256	✓	128	✓	128	1,866	32			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8										
256	✓	256	✓	128	✓	128	1,866		16		16	16	16	16	16	16	16	16																			
256	✓	256	✓	128	✓	128	1,866			8	32	32	32	32																							
320	✓	320	✓	192	✓	160	1,600	40			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
320	✓	320	✓	192	✓	160	1,866	8	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
384	✓	384	✓	256	✓	192	1,600	48			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
384	✓	384	✓	256	✓	192	1,866	16	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8									
384	✓	384	✓	256	✓	192	1,866	24			16	16	16	16	16	16	16	16	16	16	16	16	16	16													
448	✓	448	✓	320	✓	224	1,600	24	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
512	✓	512	✓	384	✓	256	1,600	32	16		16	16	16	16	16	16	16	16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
512	✓	512	✓	384	✓	256	1,866			16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16								
576	✓	576	✓	448	✓	288	1,600	8	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8				
576	✓	576	✓	448	✓	288	1,866	8	16	16	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8								
640	✓	640	✓	512	✓	320	1,600	16	32		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8				
640	✓	640	✓	512	✓	320	1,600		40		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16				
640	✓	640	✓	384	✓	320	1,866	16		16	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8									
640	✓	640	✓	384	✓	320	1,866		8	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16									
704	✓	704	✓	448	✓	352	1,600	24		16	32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
768	✓	768	✓	640	✓	384	1,600		48		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16				
768	✓	768	✓	512	✓	384	1,600	32	16		32	32	32	32	32	32	32	32	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
768	✓	768	✓	512	✓	384	1,866		16	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16										
768	✓	768	✓	512	✓	384	1,866		24		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32									
832	✓	832	✓	576	✓	416	1,600	8	16	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	8	8	8	8	8				
896	✓	896	✓	640	✓	448	1,600	16	16	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	8	8	8	8				
896	✓	896	✓	640	✓	448	1,600	24	16		32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16				
1,024	✓	1,024	✓	768	✓	512	1,866		32	16	32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16				
1,024	✓	1,024	✓	768	✓	512	1,866			32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32				
1,088	✓	1,088	✓	832	✓	544	1,600		8		32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16			8	8	8				
1,152	✓	1,152	✓	896	✓	576	1,600		32	16	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32				
1,152	✓	1,152	✓	896	✓	576	1,600		8	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	16	16	16	16	16				
1,280	✓	1,280	✓	1,024	✓	640	1,600			16	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	16	16	16	16	16				
1,280	✓	1,280	✓	1,024	✓	640	1,600				32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32				
1,536	✓	1,536	✓	1,280	✓	768	1,600		48		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32				

Table 6-15 Memory installation (LRDIMM, Independent mode, 1.2 V)

Physical	Total capacity (GB)						Clock frequency (MHz)	Quantity		Capacity of memory module (GB)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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	Independent Mode	Independent Mode with Rank Sparing Mode		Independent Mode with Mirrored Channel Mode		Memory channel																Memory channel																Memory channel																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
						A				B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
						R				T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
512	✓	512	✓	384	✓	256	1,600	8		64	64	64	64																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

Product codes of configurable memory modules are as follows:
64GB memory (GG-MJ364G4X1-Y).

Table 6-16 Memory installation (LRDIMM, Lockstep mode, 1.2 V)

		Total capacity (GB)				Clock frequency (MHz)	Quantity				Capacity of memory module (GB)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Physica	Logical										DIMM group 0								DIMM group 1								DIMM group 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Independent Mode	Independent Mode with Rank Sparing Mode		Independent Mode with Mirrored Channel Mode							64GB				Memory channel								Memory channel								Memory channel																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
							A	B	C	D					E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
							R	T	N	P					L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
512	✓	512	✓	384	✓	256	1,866	8						64	64	64	64																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

Product codes of configurable memory modules are as follows:
64GB memory (GG-MJ364G4X1-Y).

520H B4

Table 6-17 Memory installation (RDIMM, 1.2 V, 1-CPU)

[illegible]

Product code of configurable memory module is as follows:
16GB memory (GG-MJ316G5X1-Y), or 32GB memory (GG-MJ332G5X1-Y)

Table 6-18 Memory installation (RDIMM, 1.2 V, 2-CPU)

[illegible]

Product code of configurable memory module is as follows:
16GB memory (GG-MJ316G5X1-Y), or 32GB memory (GG-MJ332G5X1-Y)

520X B3

Table 6-19 Memory installation (RDIMM, Independent mode, 1.2 V)

Physical	Total capacity (GB)					Clock frequency (MHz)	Quantity				Capacity of memory module (GB)																							
	Logical				DIMM group 0								DIMM group 1								DIMM group 2													
	Independent Mode	Independent Mode with Rank Sparing Mode	Independent Mode with Mirrored Channel Mode	Memory channel						Memory channel								Memory channel																
				A	B		C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H						
128	✓	128	✓ ²	64	✓	64	1,600	8					16	16	16	16																		
256	✓	256	✓ ²	128	✓	128	1,600	16					16	16	16	16	16	16	16															
256	✓	256	✓	128	✓	128	1,600		8				32	32	32	32																		
384	✓	384	✓ ²	256	✓	192	1,600	24					16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
512	✓	512	✓ ¹	256	✓	256	1,600	32					16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
512	✓	512	✓ ²	384	✓	256	1,600	32					16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
512	✓	512	✓	256	✓	256	1,600		16				32	32	32	32	32	32	32	32														
640	✓	640	✓ ¹	384	✓	320	1,600	40					16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
640	✓	640	✓ ²	512	✓	320	1,600	40					16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
640	✓	640	✓	384	✓	320	1,600	8	16				32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓ ¹	512	✓	384	1,600	48					16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓ ²	640	✓	384	1,601	48					16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓	512	✓	384	1,600	16	16				32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓	512	✓	384	1,600	24					32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
896	✓	896	✓	640	✓	448	1,600	24	16				32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	
1,024	✓	1,024	✓	768	✓	512	1,600	32	16				32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	16	16	
1,024	✓	1,024	✓	768	✓	512	1,600		32				32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,152	✓	1,152	✓	896	✓	576	1,600	8	32				32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,280	✓	1,280	✓	1,024	✓	640	1,600	16	32				32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,280	✓	1,280	✓	1,024	✓	640	1,600		40				32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,536	✓	1,536	✓	1,280	✓	768	1,600		48				32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	

Product codes of configurable memory modules are as follows:

16GB memory (GG-MJ316G3X1-Y or GG-MJ316G5X1-Y), and 32GB memory (GG-MJ332G5X1-Y).

Notes:

1 Applicable when configured with GG-MJ316G5X1-Y (1 Rank).

2 Applicable when configured with GG-MJ316G3X1-Y (2 Rank).

Table 6-20 Memory installation (RDIMM, Lockstep mode, 1.2 V)

Physica	Total capacity (GB)				Clock frequency (MHz)	Quantity				Capacity of memory module (GB)																							
	Logical			DIMM group 0								DIMM group 1								DIMM group 2													
	Lockstep Mode	Lockstep Mode with Rank Sparring Mode	Lockstep Mode with Mirrored Channel Mode	Memory channel								Memory channel								Memory channel													
				A		B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H					
	16GB	32GB						R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K	R	T	N	P	L	M	J	K		
128	✓	128	✓ ²	64	✓	64	1,866	8						16	16	16	16																
256	✓	256	✓ ²	128	✓	128	1,866	16						16	16	16	16	16	16	16	16												
256	✓	256	✓	128	✓	128	1,866		8					32	32	32	32																
384	✓	384	✓ ²	256	✓	192	1,866	24						16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
512	✓	512	✓ ¹	256	✓	256	1,866	32						16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
512	✓	512	✓ ²	384	✓	256	1,866	32						16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
512	✓	512	✓	256	✓	256	1,866		16					32	32	32	32	32	32	32	32												
640	✓	640	✓ ¹	384	✓	320	1,600	40						16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
640	✓	640	✓ ²	512	✓	320	1,600	40						16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
640	✓	640	✓	384	✓	320	1,866	8	16					32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓ ¹	512	✓	384	1,600	48						16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓ ²	640	✓	384	1,600	48						16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓	512	✓	384	1,866	16	16					32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	
768	✓	768	✓	512	✓	384	1,866		24					32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
896	✓	896	✓	640	✓	448	1,600	24	16					32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	
1,024	✓	1,024	✓	768	✓	512	1,600	32	16					32	32	32	32	32	32	32	32	16	16	16	16	16	16	16	16	16	16	16	
1,024	✓	1,024	✓	768	✓	512	1,866		32					32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,152	✓	1,152	✓	896	✓	576	1,600	8	32					32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	16	16	16	16	
1,280	✓	1,280	✓	1,024	✓	640	1,600	16	32					32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	16	16	16	16	
1,280	✓	1,280	✓	1,024	✓	640	1,600		40					32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
1,536	✓	1,536	✓	1,280	✓	768	1,600		48					32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	

Specifications

This chapter describes specifications of CB 2500.

- ☐ [Server chassis](#)
- ☐ [Server blades](#)
- ☐ [Server chassis options](#)
- ☐ [Blade option](#)

Server chassis

CB 2500 Server Chassis A1 specifications

Item			Description
Install-able modules	Server blades		0 - 14 (Half-width) 0 - 8 (Full-width)
	1/10Gb LAN switch module		0 - 2
	Interface	External	1 Gb/sec ×10 ports 1 Gb/sec ×20 ports + 10 Gbp/sec ×4 ports (maximum)
		Internal	1 Gb/sec ×14 ports 1 Gb/sec ×28 ports (maximum)
	10Gb DCB switch module		0 - 2
	Interface		Total of external/internal ports : 10Gbps ×24 ports (Max: external: 10Gbps ×14ports + 40Gbps ×2 ports internal: 10Gbps ×42 ports)
	I/O board module		0 - 28
	Management modules		2 (redundant configuration)
	Management LAN module		2 (redundant configuration)
	Power supply module		2 – 6 (N+1 redundant configuration or N+N redundant configuration)
	80mm cooling fan		8 (redundant configuration)
	40mm cooling fan		2 (redundant configuration)
	Fan logic module		2 (redundant configuration)
	Dimensions (W × D × H)		447 × 830× 527 (mm)
	Chassis width		19 inches rack mount
	EIA standard unit		12 U
Weight			250 kg (maximum)
Power requirements	AC input voltage		200-240 VAC, single phase (±10%)
	Frequency		50/60 Hz (±1%)
	Input current		5+1: 69 A (maximum) 3+3 (Power supply capacity expansion: enabled): 60 A (maximum) 3+3 (Power supply capacity expansion: disabled): 41.4 A (maximum)
	Rated voltage		AC200 V
	Grounding		D class grounding
Environm- ental requirements	Ambient temperature		5°C – 40°C* (Non-operating: -10 - 40°C)
	Relative humidity		8% - 80%, no condensation allowed (Non-operating: 8% - 90%)
	Vibration		2.45 m/s ² peak, 5 s (downtime: 9.8 m/s ² peak, 5 s)
Noise (during normal operations/ redundant configuration)			70 db (A) or lower (25°C, 70% load)

Item	Description
Cooling	Forced cooling with FAN
* If a server chassis contains a 520H B3 Server Blade with E5-2637v3, E5-2667v3, E5-2697v3 or E5-2699v3, the temperature must be 35°C or lower.	

Management Module

Management Module specifications

Item		Description
External interface	USB	USB 2.0 ×2 ports
	Serial	1 port
Internal interface	For server blades	1Gb/sec SerDes ×15 ports
		I2C ×15 ports
	For switch modules	1Gb/sec SerDes ×2 ports
		I2C ×2 ports
	For power supply modules	I2C ×6 ports
	For fan modules	I2C ×2 ports
	Between management modules	1Gb/sec SerDes ×1 port
	Management LAN	1Gb/sec SGMII ×2 port
	Maintenance LAN	1Gb/sec SGMII ×1 port
Indicator (LED)	Indication of chassis information	Power, Alarm, Warning, Location
	Indication of management module information	Power, Alarm, Master, Heart Beat
Console functions	System console (CLI)	Provides CLI(Command Line Interface) for System operation/management
	System web console (GUI)	System Web console support
Middleware interfacing function	Server management software	Supported
	Pre-Configure	Supported
	SNMP management	Supported
Remote maintenance functions	E-mail notification	Notifies users of failure information(alert) via e-mail
	F/W update	Supported
Dimensions (W × D × H)		192 × 478.5 × 25 (mm)

Management LAN Module

Management LAN Module specifications

Item		Description
External interface	Management LAN	1000BASE-T/100BASE-TX/10BASE-T×2 port
	Maintenance LAN	1000BASE-T/100BASE-TX/10BASE-T×1 port
Internal interface	For management module	1Gbps SGMII×3 ports
		I2C×1 port
		MIIM×1 port
Dimensions (W × D × H)		91.5×291×20.8 (mm)

Server blades

520X

520X B1 specifications

Items			Specifications					
CPU		Supported CPU	E7-4820v2 (TBD)	E7-4860v2	E7-4880v2 (TBD)	E7-8880v2	E7-8890v2	E7-8891v2
		Number of cores ^a	8	12	15	15	15	10
		CPU frequency	2.00 GHz	2.60 GHz	2.50 GHz	2.50 GHz	2.80 GHz	3.20 GHz
		QPI frequency	7.2 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s
		L3 cache	12 MB	30 MB	37.5 MB	37.5 MB	37.5 MB	37.5 MB
		TDP	105 W	130 W	130 W	130 W	155 W	155 W
	L1 cache		32 kB instruction and 32 kB data for each core					
	L2 cache		256 kB for each core					
	Number of CPUs		Maximum: 2					
	Chipset			Intel C600 series chipset (Patsburg J)				
Main memory	DIMM type (per slot)		DDR3 RDIMM 8, 16 GB, LRDIMM 32 GB					
	Operation mode		Independent mode (Default), Lockstep mode, Rank sparing mode, Mirrored channel mode					
	Number of slots		48					
	Memory capacity		Maximum: 1536 GB (32 GB ×48)					
	Memory frequency		1066, 1333, 1600 MT/s					
SMP	SMP configuration		2-Blades w/ 2-blade SMP connection board			2 Blades w/ 2-blade SMP connection board or 4 Blades w/ 4-blade SMP connection board		
	SMP QPI port		Full width ×3 ports			Full width ×3 ports		
	SMP QPI frequency		8.0 GT/s					

Items			Specifications
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS
		Number of drives	Maximum: 2 (2.5" SAS HDD, SSD)
		Number of HDDs/RAID groups	2/RAID Group
		RAID function	RAID 0, 1
	VGA	Controller	G200eR2 (Renesas SH7757 embedded)
		Resolution	640 × 400 – 1680 × 1050
		Refresh rate	60 – 85 Hz
		Bit per pixel	8, 16, 32
	Internal USB port		USB 2.0 ×2
	Onboard LAN	Controller	Emulex Skyhawk P1
		Midplane I/F	10 Gb/1 Gb Ethernet ×4
		Function	Wake on LAN, PXE boot, FCoE, iSCSI
	Mezzanine card slot #1	Controller	IvyBridge-EX
		I/F	CPU1 to Mezzanine: PCI Express Gen3 ×16 CPU2 to Mezzanine: PCI Express Gen3 ×8
	Mezzanine card slot #2	Controller	IvyBridge-EX
		I/F	CPU1 to Mezzanine: PCI Express Gen3 ×16 CPU2 to Mezzanine: PCI Express Gen3 ×8
	Mezzanine card slot #3	Controller	IvyBridge-EX
		I/F	CPU2 to Mezzanine: PCI Express Gen3 ×8
	Mezzanine card slot #4	Controller	IvyBridge-EX
		I/F	CPU2 to Mezzanine: PCI Express Gen3 ×8
Management functions	BMC	Controller	Renesas SH7757
		F/W	AVOCENT-base
		IPMI standard	IPMI 2.0
	FPGA		Xilinx XC3S200A
	Power management controller		Renesas H8S2117
	KVM		Remote KVM
	COM		Serial redirection
Midplane interface	Mezzanine card I/F		High Speed Serdes x8, Up to 14Gbps/lane (Stretch Goal: 25Gb capable) for each slot
	Management I/F		1Gbps SERDES 1port, I2C 1port, Misc I/F for each Management module
	DC input power supply voltage		DC +12 V

Items			Specifications
Front I/F	USB I/F		1 (USB3.0) ^{b,c}
	KVM connector		1 (VGA, COM, USB2.0 ×2) ^b
	Indicator and switch	Switch	2 (Power, NMI reset)
		LED	7 (Enclosure power, Location identify, Error log, Enclosure fault, Primary, QPI link fault, QPI link status)
		LED (SAS Tray)	2 (Fault, Active)
TPM			TPM1.2 rev.116
Security	TXT		Supported
	Secure boot		Supported ^e
	Hitachi cross-product security spec.)		Supported
Failure indication panel			8 LEDs (LP, S BRD, NMI, TEMP, MEM, MIS, ADJ, Blank)
Power consumption			713 W (E7-4820v2) 834 W (E7-4860v2) 835 W (E7-4880v2) 835 W (E7-8880v2) 869 W (E7-8890v2) 898 W (E7-8891v2)
External dimension (W × D × H)			435.3 × 492.7 × 55.5 mm
Weight			13.8 kg (max.) ^d
Notes:			
a. Depending on the type of the software, you are required to purchase the same number of license as the cores.			
b. The non-primary blades included in an SMP does not support VGA and COM.			
c. 520X does not support legacy boot via the USB3.0 port on the front panel.			
d. Includes SMP connection boards.			
e. Only Hitachi 16G FC Adapter, Windows2012/2012R2 is supported			

520X B2 specifications

Items			Specifications			
CPU		Supported CPU	E7-8880v3	E7-8890v3	E7-8893v3	
		Number of cores ^a	18	18	4	
		CPU frequency	2.30 GHz	2.50 GHz	3.20 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	
	L1 cache		32 kB instruction and 32 kB data for each core			
	L2 cache		256 kB for each core			
	Number of CPUs		Maximum: 2			
	Chipset		Intel C600 series chipset (Patsburg J)			

Items			Specifications
Main memory	DIMM type (per slot)		DDR4 RDIMM 8, 16, 32 GB, LRDIMM 64 GB
	Operation mode		Independent mode (Default), Lockstep mode, Rank sparing mode, Mirrored channel mode
	Number of slots		48
	Memory capacity		Maximum: 3072 GB (64 GB ×48)
	Memory frequency		1333, 1600, 1866 MT/s
SMP	SMP configuration		2 Blades w/ 2-blade SMP connection board or 4 Blades w/ 4-blade SMP connection board
	SMP QPI port		Full width ×3 ports
	SMP QPI frequency		9.6 GT/s
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS
		Number of drives	Maximum: 2 (2.5" SAS HDD, SSD)
		Number of HDDs/RAID groups	2/RAID Group
		RAID function	RAID 0, 1
	VGA	Controller	G200eR2 (Renesas SH7757 embedded)
		Resolution	640 × 400 – 1680 × 1050
		Refresh rate	60 – 85 Hz
		Bit per pixel	8, 16, 32
	Internal USB port		USB 2.0 ×2
	Onboard LAN	Controller	Emulex Skyhawk P1
		Midplane I/F	10 Gb/1 Gb Ethernet ×4
		Function	Wake on LAN, PXE boot, FCoE, iSCSI
	Mezzanine card slot #1	Controller	Haswell-EX
		I/F	CPU1 to Mezzanine: PCI Express Gen3 ×16
	Mezzanine card slot #2	Controller	Haswell-EX
		I/F	CPU1 to Mezzanine: PCI Express Gen3 ×16
	Mezzanine card slot #3	Controller	Haswell-EX
		I/F	CPU2 to Mezzanine: PCI Express Gen3 ×16
	Mezzanine card slot #4	Controller	Haswell-EX
		I/F	CPU2 to Mezzanine: PCI Express Gen3 ×16

Items			Specifications
Management functions	BMC	Controller	Renesas SH7757
		F/W	AVOCENT-base
		IPMI standard	IPMI 2.0
	FPGA		Xilinx XC3S200A
	Power management controller		Renesas H8S2117
	KVM		Remote KVM
	COM		Serial redirection
Midplane interface	Mezzanine card I/F		High Speed Serdes x8, Up to 14Gbps/lane (Stretch Goal: 25Gb capable) for each slot
	Management I/F		1Gbps SERDES 1port, I2C 1port, Misc I/F for each Management module
	DC input power supply voltage		DC +12 V
Front I/F	USB I/F		1 (USB3.0) ^{b,c}
	KVM connector		1 (VGA, COM, USB2.0 ×2) ^b
	Indicator and switch	Switch	2 (Power, NMI reset)
		LED	7 (Enclosure power, Location identify, Error log, Enclosure fault, Primary, QPI link fault, QPI link status)
		LED (SAS Tray)	2 (Fault, Active)
TPM			TPM1.2 rev.116
Security	TXT		Supported
	Secure boot		Supported ^d
	Hitachi cross-product security spec.)		Supported
Failure indication panel			8 LEDs (LP, S BRD, NMI, TEMP, MEM, MIS, ADJ, Blank)
Power consumption			843 W (E7-8880v3) 855 W (E7-8890v3) 677 W (E7-8893v3)
External dimension (W × D × H)			435.3 × 492.7 × 55.5 mm
Weight			13.8 kg (max.) ^e
Notes:			
a. Depending on the type of the software, you are required to purchase the same number of license as the cores.			
b. The non-primary blades included in an SMP does not support VGA and COM.			
c. 520X does not support legacy boot via the USB3.0 port on the front panel.			
d. Supported only by Hitachi 16G FC Adapter that operate in Windows 2012 or 2012R2 environment.			
e. Includes SMP connection boards.			

520X B3 specifications

Items			Specifications			
CPU		Supported CPU	E7-8880v4	E7-8890v4	E7-8893v4	
		Number of cores ^a	22	24	4	
		CPU frequency	2.10 – 2.20 GHz	2.00 – 2.10 GHz	3.20 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	
	L1 cache		TBD			
	L2 cache		TBD			
	Number of CPUs		Maximum: 2			
Chipset			Intel C600 series chipset (Patsburg J)			
Main memory	DIMM type (per slot)		DDR4 RDIMM 16, 32, 64, 128 GB			
	Operation mode		Independent mode (Default), Lockstep mode, Rank sparing mode, Mirrored channel mode			
	Number of slots		48			
	Memory capacity		Maximum: 3072 GB (64 GB × 48)			
	Memory frequency		1600, 1866 MT/s			
SMP	SMP configuration		1-blade SMP w/o SMP connection board 2-blade SMP w/ 2-blade SMP connection board 4-blade SMP w/ 4-blade SMP connection board			
	SMP QPI port		Full width × 3 ports			
	SMP QPI frequency		9.6 GT/s			
I/O	Internal disk I/F	Controller	LSI SAS 3004			
		I/F	SAS			
		Number of drives	Maximum: 2 (2.5" SAS HDD, SSD)			
		Number of HDDs/RAID groups	2/RAID Group			
		RAID function	RAID 0, 1			
	VGA	Controller	G200eR2 (Renesas SH7757 embedded)			
		Resolution	640 × 400 – 1680 × 1050			
		Refresh rate	60 – 85 Hz			
		Bit per pixel	8, 16, 32			
	Internal USB port		USB 2.0 × 2			
	Onboard LAN	Controller	Emulex Skyhawk P2			
		Midplane I/F	10 Gb/1 Gb Ethernet × 4			
		Function	Wake on LAN, PXE boot, FCoE, iSCSI			

Items			Specifications
	Mezzanine card slot #1	Controller	Broadwell-EX
		I/F	CPU1 to Mezzanine: PCI Express Gen3 ×16
	Mezzanine card slot #2	Controller	Broadwell-EX
		I/F	CPU1 to Mezzanine: PCI Express Gen3 ×16
	Mezzanine card slot #3	Controller	Broadwell-EX
		I/F	CPU2 to Mezzanine: PCI Express Gen3 ×16
Mezzanine card slot #4	Controller	Broadwell-EX	
	I/F	CPU2 to Mezzanine: PCI Express Gen3 ×16	
Management functions	BMC	Controller	Renesas SH7757
		F/W	AVOCENT-base
		IPMI standard	IPMI 2.0
	FPGA		Xilinx XC3S200A
	Power management controller		Renesas H8S2117
	KVM		Remote KVM
	COM		Serial redirection
Midplane interface	Mezzanine card I/F		High Speed Serdes x8, Up to 14Gbps/lane (Stretch Goal: 25Gb capable) for each slot
	Management I/F		1Gbps SERDES 1port, I2C 1port, Misc I/F for each Management module
	DC input power supply voltage		DC +12 V
Front I/F	USB I/F		1 (USB3.0) ^{b,c}
	KVM connector		1 (VGA, COM, USB2.0 ×2) ^b
	Indicator and switch	Switch	2 (Power, NMI reset)
		LED	7 (Enclosure power, Location identify, Error log, Enclosure fault, Primary, QPI link fault, QPI link status)
		LED (SAS Tray)	2 (Fault, Active)
TPM			TPM1.2, TPM2.0 ^f
Security	TXT		Supported
	Secure boot		Supported ^d
	Hitachi cross-product security spec.)		Supported
Failure indication panel			8 LEDs (LP, S BRD, NMI, TEMP, MEM, MIS, ADJ, Blank)
Power consumption			TBD (E7-8880v4) TBD (E7-8890v4) TBD (E7-8893v4)
External dimension (W × D × H)			435.3 × 492.7 × 55.5 mm
Weight			13.8 kg (max.) ^e

Items	Specifications
Notes: a. Depending on the type of the software, you are required to purchase the same number of license as the cores the server contains. b. The non-primary blades included in an SMP do not support VGA and COM. c. 520X does not support legacy boot via the USB3.0 port on the front panel. d. Supported only by Hitachi 16G FC Adapter that operate in Windows 2012 or 2012R2 environment. e. Includes SMP connection boards. f. Scheduled to be supported in Sep. 2016.	

520H

520H B3 specifications

Items			Specifications				
CPU		Supported CPU	E5-2603v3 (TBD)	E5-2620v3 (TBD)	E5-2637v3	E5-2640v3 (TBD)	E5-2660v3
		Number of cores ¹	6	6	4	8	10
		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 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
		Supported CPU	E5-2667v3	E5-2690v3	E5-2697v3	E5-2698v3	E5-2699v3
		Number of cores ¹	8	12	14	16	18
		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
	L1 cache		32 kB instruction and 32 kB data for each core				
	L2 cache		256 kB for each core				
	Number of CPUs		Maximum: 2				
Main memory	DIMM type (per slot)		DDR4 RDIMM 8, 16 GB, LRDIMM 32 GB				
	Operation mode		Independent channel mode, Rank sparing mode, Mirrored channel mode				
	Number of slots		24				
	Memory capacity (max.)		384 GB (16 GB RDIMM × 24), 768 GB (32 GB LRDIMM × 24)				
	Memory frequency		1600, 1866, 2133 MT/s				
HDD, SSD	Number of HDDs		Maximum: 2				
	Capacity ^b		Maximum: 3.6 TB				
Mezzanine I/F	Lane		16				
	Interrupt		MSI, MSI-X				
I/O	Internal disk I/F	Controller	LSI SAS 3004				
		I/F	SAS				

Items			Specifications
		Number of I/F	Maximum: 2 (2.5" SAS HDD, SSD)
		RAID function	RAID 0, 1
	VGA	Resolution	640 × 400 – 1680 × 1050
		Refresh rate	60 – 85 Hz
		Bit per pixel	8, 16, 32
	Internal SD card slot	Number of SD cards	Maximum: 2
		RAID function	Not supported
	Onboard CNA ^c	Controller	Emulex Skyhawk P2
		Midplane I/F	10 Gb/1 Gb Ethernet ×4
		Function	Wake on LAN, PXE boot, FCoE, iSCSI
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB 3.0)
	KVM connector		1 (VGA, COM, USB 2.0 ×2)
Security	TPM		TPM1.2
	TXT		Supported
	Secure boot		Supported ^d
Power consumption			292 W (E5-2603v3) 364 W (E5-2620v3) 481 W (E5-2637v3) 378 W (E5-2640v3) 432 W (E5-2660v3) 481 W (E5-2667v3) 481 W (E5-2690v3) 498 W (E5-2697v3) TBD (E5-2698v3) 498 W (E5-2699v3)
External dimension (W × D × H: mm)			215.4 × 492.7 × 51.1
Weight			6.7 kg (max.)
Notes: a. Depending on the type of the software, you are required to purchase the same number of licenses as the cores. b. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10 ⁹ bytes. c. Optional mezzanine cards cannot be installed in mezzanine slot #1 on 520H B3. d. Supported only by Hitachi 16G FC Adapter that operate in Windows 2012 or 2012R2 environment			

520H B4 specifications

Items			Specifications				
CPU		Supported CPU	E5-2603v4 (TBD)	E5-2609v4 (TBD)	E5-2620v4 (TBD)	E5-2630v4 (TBD)	E5-2637v4 (TBD)
		Number of cores ¹	6	8	8	10	4
		CPU frequency	1.7 GHz	1.7 GHz	2.1 GHz	2.2 GHz	3.5 GHz
		QPI frequency	6.4 GT/s	6.4 GT/s	8 GT/s	8 GT/s	9.6 GT/s
		L3 cache	15 MB	20 MB	20 MB	25 MB	15 MB
		TDP	85 W	85 W	85 W	85 W	135 W
		Supported CPU	E5-2640v4 (TBD)	E5-2643v4 (TBD)	E5-2650v4 (TBD)	E5-2660v4 (TBD)	E5-2667v4 (TBD)
		Number of cores ¹	10	6	12	14	8
		CPU frequency	2.4 GHz	3.4 GHz	2.2 GHz	2.0 GHz	3.2 GHz
		QPI frequency	8 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s
		L3 cache	25 MB	20 MB	30 MB	35 MB	25 MB
		TDP	90 W	135 W	105 W	105 W	135 W
		Supported CPU	E5-2680v4 (TBD)	E5-2683v4 (TBD)	E5-2690v4 (TBD)	E5-2695v4 (TBD)	E5-2697v4 (TBD)
		Number of cores ¹	14	16	14	18	18
		CPU frequency	2.4 GHz	2.1 GHz	2.6 GHz	2.1 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	35 MB	40 MB	35 MB	45 MB	45 MB
		TDP	120 W	120 W	135 W	120 W	145 W
		Supported CPU	E5-2697Av4 (TBD)	E5-2698v4 (TBD)	E5-2699v4 (TBD)		
		Number of cores ¹	16	20	22		
		CPU frequency	2.6 GHz	2.2 GHz	2.2 GHz		
		QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s		
		L3 cache	40 MB	50 MB	55 MB		
		TDP	145 W	135 W	145 W		
	L1 cache		32 kB instruction and 32 kB data for each core				
	L2 cache		256 kB for each core				
	Number of CPUs		Maximum: 2				
Main memory	DIMM type (per slot)		DDR4 RDIMM 16, 32, 64, 128 GB				
	Operation mode		Independent Channel Mode, Rank Sparing Mode, Mirrored Channel Mode				
	Number of slots		24				
	Memory capacity (max.)		1536 GB (64 GB RDIMM × 24)				
	Memory frequency		1600, 1866, 2133, 2400 MT/s				

Items			Specifications
HDD, SSD	Number of HDDs		Maximum: 2
	Capacity ^b		Maximum: 3.6 TB
Mezzanine I/F	Lane		16
	Interrupt		MSI, MSI-X
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS
		Number of I/F	Maximum: 2 (2.5" SAS HDD, SSD)
		RAID function	RAID 0, 1
	VGA	Resolution	640 × 400 – 1680 × 1050
		Refresh rate	60 – 85 Hz
		Bit per pixel	8, 16, 32
	Internal SD card slot	Number of SD cards	Maximum: 2
		RAID function	Not supported
	Onboard CNA ^c	Controller	Emulex Skyhawk P2
		Midplane I/F	10 Gb/1 Gb Ethernet ×4
		Function	Wake on LAN, PXE boot, FCoE, iSCSI
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB 3.0)
	KVM connector		1 (VGA, COM, USB 2.0 ×2)
Security	TPM		TPM1.2, TPM2.0 ^e
	TXT		Supported
	Secure boot		Supported ^d
Power consumption			TBD (E5-2603v4) TBD (E5-2609v4) TBD (E5-2620v4) TBD (E5-2630v4) TBD (E5-2637v4) TBD (E5-2640v4) TBD (E5-2643v4) TBD (E5-2650v4) TBD (E5-2660v4) TBD (E5-2667v4) TBD (E5-2680v4) TBD (E5-2683v4) TBD (E5-2690v4) TBD (E5-2695v4) TBD (E5-2697v4) TBD (E5-2697Av4) TBD (E5-2698v4) TBD (E5-2699v4)
External dimension (W × D × H: mm)			215.4 × 492.7 × 51.1

Items	Specifications
Weight	6.7 kg (max.)
Notes: a. Depending on the type of the software, you are required to purchase the same number of licenses as the cores. b. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10 ⁹ bytes. c. Optional mezzanine cards cannot be installed in mezzanine slot #1 on 520H B4. d. Supported only by Hitachi 16G FC Adapter that operate in Windows 2012 or 2012R2 environment. e. Scheduled to be supported in Sep. 2016.	

Expansion blade

PCI Expansion Blade specifications

Items		Specifications
Attachable server blade		520H B3 Server Blade
N + M cold standby		Not supported
PCI card slots in PCI Expansion Blade	Figure	Full height, Full length / Full height, Half length / Low profile
	Quantity	6 (max.)
	PCIe link speed	Max Gen3 (8.0 GT/s)
	Hot plug	Not supported
PCI card slots in I/O Adapter Cage	Figure	Low profile
	Quantity	4 (max.)
	PCIe link speed	Max Gen3 (8.0 GT/s)
	Hot plug	Not supported
Mezzanine	Quantity	2 (max.)

Server chassis options

LCD Touch Console specifications

Item	Specifications
USB Connector	USB Connector
LCD Touch Console Controller	Initial settings (Network setting of Management Module, Web Console enable/disable setting, HTTP/HTTPS enable/disable setting) Indicates the failure location and part in case of failure. Supports user or maintenance engineer to replace failed part (applicable to limited parts) Update firmware by user or maintenance engineer Displays the status of the modules in the server chassis Logs used for failure analysis

1/10Gb LAN Switch Module specifications

Item		Specifications
Performance	Switch capacity	176 Gb/sec non-blocking switching throughput (full duplex)
	Packet processing performance	1.8 us latency
LAN port	Internal ports (dpwnlink)	Full-duplex Gigabit ports ×28 (14 ports are enabled by default. An optional FoD license is required to activate another 14 ports).
	External ports (uplink)	RJ45 (10/100/1000) ×20 ports (10 ports are enabled by default. Another 10 ports are optional). SFP+ (1G/10G) ×4 (These ports are disabled by default. An optional FoD license is required to activate them).
	Management port	Full-duplex Gigabit Port ×2 (Connected to Management
Connector type	External LAN port	RJ45 for 10/100/1000Mb/sec ×20 SFP+ for 1/10Gb/sec
	External LAN port for management	N/A
	External serial port for management	RS-232 serial port (mini-USB connector) ×1 requires dedicated debug cable
Console port (Management port)		RS-232 serial port (mini-USB connector) Two internal full-duplex 1GbE ports to the chassis management module.
Layer2 functions	VLAN	802.1Q VLAN (tagging, port, protocol-based, VLANs) Up to 1024 VLANs supported per switch, with VLAN numbers ranging from 1 to 4095 (4095 is used for management module's connection only) Private VLANs IEEE 802.1D STP IEEE 802.1s Multiple STP (MSTP): 32 instances IEEE 802.1w Rapid STP (RSTP) Per-VLAN Rapid STP (PVRST) enhancement
Layer3 functions	IPv4 Layer3 functions	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 Layer3 functions	IPv6 Host Management IPv6 forwarding Support for up to 128 static routers Routing protocol support (OSPF v3 routing protocol) IPv6 filtering with ACLs
Network functions		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 IEEE 802.3ad Link Aggregation Control Protocol Layer 2 Trunk Failover to support active/standby configurations of network adapter teaming Virtual Router Redundancy Protocol (VRRP)
Security		VLAN-based, MAC-base, IP-based ACLs IEEE 802.1x port-based authentication and authorization

Item		Specifications
Operation and management functions		Simple Network Management Protocol (SNMP V1, V2, and V3) Telnet interface for CLI SSH and SSHv2 for CLI Serial interface for CLI HTTP browser for GUI Firmware image update (TFTP and FTP) Remote Monitoring (RMON) agent sFLOW agent for monitoring traffic in data networks Port mirroring POST diagnostics
Standard Support		IEEE 802.1D Spanning Tree Protocol (STP) IEEE 802.1s Multiple STP (MSTP) IEEE 802.1w Rapid STP (RSTP) 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 802.3z 1000BASE-SX short range fiber optics Gigabit Ethernet IEEE 802.3z 1000BASE-LX long range fiber optics 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 IEEE 802.3ae 10GBASE-LR long range fiber optics 10 Gb Ethernet 10GSFP+Cu SFP+ Direct Attach copper
Power		Up to 52 W
Weight		3.7 kg
Cooling		Forced air cooling
Dimensions (W × D × H)		401 × 317 × 30 (mm)

10Gb DCB Switch Module specifications

Item		Specifications
Performance	Switch capacity	1280 Gb/sec (full-duplex, 100% line rate performance)
	Packet processing performance	850 ns (any-to-any port latency)
Switch port	Internal ports	Full-duplex 10 Gigabit port ×42
	External ports	10 Gb Ethernet SFP+ ×14 40 Gb Ethernet QSFP+ ×2
	Management Port	Full-duplex Gigabit port (Connected to Management Modules) ×2 RJ-45 Gigabit port (on front panel) ×1
Console port (Management port)	External LAN port	SFP+ for 1G/10 Gb/sec ×14 QSFP+ for 40 Gb/sec ×2
	External LAN port for mgmt.	RJ-45 for 10/100/1000 Mb/sec ×1
	External serial port for mgmt.	RS-232 serial port ×1 (mini-USB connector) Required dedicated debug cable

Item		Specifications
Layer2 functions		VLAN encapsulation 802.1Q Layer 2 Virtual Local Area Networks (VLANs): 4096 VLANs (4095 is used for management module's connection only) IEEE 802.1D STP IEEE 802.1s Multiple STP (MSTP): 32 instances IEEE 802.1w Rapid STP (RSTP) Per-VLAN Spanning Tree (PVST+/PVRST+) Internet Group Management Protocol (IGMP) v1/v2 snooping
Layer3 functions	IPv4 Layer3 functions	Host management IPv4 forwarding Static routes Open Shortest Path First (OSPF) Border Gateway Protocol (BGP) Virtual Router Redundancy Protocol (VRRP) and VRRP-E support
	IPv6 Layer3 functions	TBD
Network functions (Brocade VCS features)		Automatic Fabric Formation Distributed Fabric Services Transparent LAN Services Virtual Link 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) VM-Aware Network Automation
Converged Enhanced Ethernet (CEE) and FCoE features		TBD
Network Functions (others)		Eight priority levels for QoS IEEE 802.1p Class of Service (CoS) Per-port QoS configuration Eight queues per port Scheduling: Strict Priority (SP), Shaped Deficit Weighted Round-Robin (SDWRR) IEEE 802.3ad Link Aggregation Control Protocol
Security		Management access ACLs IEEE 802.1x port-based authentication Radius and TACACS+
Operation and management functions		Simple Network Management Protocol (SNMP) Telnet interface for CLI SSH and SSHv2 for CLI Serial interface for CLI Firmware image update (TFTP and FTP) POST diagnostics

Item	Specifications
	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 802.3ae 10GBASE-LR long 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 802.3u 100BASE-TX Fast Ethernet IEEE 802.3x Full-duplex Flow Control SFF-8431 10GSFP+Cu SFP+ Direct Attach Cable
Power	Up to 95W
Weight	3.58 kg
Cooling	Forced air cooling
Dimensions (W × D × H)	402 × 297 × 30 (mm)

Power Supply Module specifications

Item	Specifications
Input spec.	Rated voltage
	200 – 240 V AC (±10%)
	Frequency
	50/60 Hz (±3Hz)
	Phases
	Single
	Rated current
	13.8 A
Dimensions (W × D × H)	TBD

Blade option

1Gb 4-port LAN Mezzanine specifications

Item	Specifications
Controller	Broadcom BCM5719 ×1 (4 ports)
Vendor ID	Vendor ID
	14E4h
	Device ID
	1657h
	Subsystem vendor ID
	1054h
	Subsystem device ID
	3056h
Interrupt type	INTA, MSI, and MSI-X
Server interface	Standard
	PCI Express 2.0
	Transfer rate per lane
	5 GT/sec
	Number of lanes
	4

Item		Specifications
Switch module interface	Connectable switch module	1/10Gb LAN Switch Module 10Gb DCB Switch Module Cisco Nexus B22 Fabric Extender (Scheduled to be supported in 1Q 2015.)
	Standard	1000BASE-X
	Transfer rate per port	1000 Mb/sec
	Number of ports	4 ports (2 port ×2 switch modules)
Network	Protocol	IPx4/IPv6/TCP/UDP
	Maximum MTU	9000 Byte
	VLAN	IEEE 802.1Q (Tag VLAN)
	Offload	Large Send Offload (LSO) TCP Segmentation Offload (TSO) TCP/UDP Checksum Offload
	Redundancy /Load Balance	IEEE 802.3ad (Link Aggregation) Teaming
	PXE boot	Supported
	WOL	Supported
Server Function	Virtualization	Unsupported
	Load Balance	RSS (Receive Side Scaling)
Power consumption in operation		4 W
Weight		0.12 kg

PCIe Adapter Connection Mezzanine specifications

Item		Specifications
PCIe switch		PLX PCI Express Switch (PEX8732)
Vendor ID	Vendor ID	10B5h
	Device ID	8732h
	Subsystem vendor ID	10B5h
	Subsystem device ID	8732h
Server interface	Standard	PCI Express 3.0
	Transfer rate per lane	8 GT/sec
	Number of lanes	16
	Number of ports	1
IOBD interface	Standard	PCI Express 3.0
	Transfer rate per lane	8 GT/sec
	Number of lanes	8
	Number of ports	2
Power consumption in operation		TBD
Weight		TBD

LPAR Manager specifications

Item		Specifications	
		520X	520H
Supported I/O	Interface	NIC (Dedicated/Shared) FC (Dedicated/Shared)	NIC (Dedicated/Shared) FC (Dedicated/Shared)
	Onboard device	USB 3.0, USB 2.0 (Used by multiple LPARs by switching) Video: XGA(1,024 × 768)	USB 2.0 (Used by multiple LPARs by switching) Video: XGA(1,024 × 768)
LPAR	Maximum number of LPARs for each server blade	4 (Default) 30 (LPAR Manager Advanced License) 60 (LPAR Manager Enterprise License)	4 (Default) 30 (LPAR Manager Advanced License)
	Maximum number of CPUs (cores)	2 (30 cores)	2 (36 cores)
	4-blade SMP	8 (120 cores)	N/A
	Maximum number of logical cores for each LPAR	64	64
	CPU allocation	Dedicated/Shared	Dedicated/Shared
	Maximum amount of memory	1.5 TB	768 GB
	4-blade SMP	6 TB	N/A
	Maximum number I/O adapters ¹	7	4
	4-blade SMP	28	N/A
	Maximum number of virtual NIC ports	16	16
Operation environment	Keyboard, Video, Mouse	Remote control	Remote control
	FDD, CD, DVD, USB memory	Through USB or remote console	Through USB or remote console
Operability	HCSM cooperation ³	LPAR configuration management. LPAR power control (HCSM + Visual Management plug-in) ² N+M Cold Standby (HCSM/N+M Cold Standby plug-in) OS deployment management (HCSM/DPM plug-in) Power consumption management (HCSM/Power Conductor plug-in) Server performance monitoring (HCSM/Performance Gauge plug-in) Server/Storage performance monitoring (HCSM/Hitachi Tuning Manager)	LPAR configuration management. LPAR power control (HCSM + Visual Management plug-in) ² N+M Cold Standby (HCSM/N+M Cold Standby plug-in) OS deployment management (HCSM/DPM plug-in) Power consumption management (HCSM/Power Conductor plug-in) Server performance monitoring (HCSM/Performance Gauge plug-in) Server/Storage performance monitoring (HCSM/Hitachi Tuning Manager)
	Operation	Power saving during CPU idling Network Time Protocol (NTP) synchronization	Power saving during CPU idling Network Time Protocol (NTP) synchronization

Item	Specifications	
	520X	520H
Availability	Fall back, Failure notice(E-mail & ASSIST), Failure warning (SEL & ASSIST), Guest memory damp	Fall back, Failure notice(E-mail & ASSIST), Failure warning (SEL & ASSIST), Guest memory damp
Notes: 1. Total of mezzanines and I/O adapters including PCIe Adapter Connection Mezzanine 2. Required only when LPAR Manager Advanced License or Enterprise License is configured 3. All HCSM plug-ins require HCSM/BM		

Product code

This chapter lists the product codes for CB 2500.

- ☐ [Server chassis](#)
- ☐ [Blade](#)

Server chassis

Server chassis

Product type	Product name	Product code	Price	Remarks
Server chassis	CB 2500 Chassis Type A1	GG-RE4A1UBX1-Y		
LCD touch console	LCD Touch Console	GG-DT3LCD1X1-(Y R)		Already Productized on CB 500
I/O adapter cage	I/O Adapter Cage	GG-BE4ICG1X1-Y		
Power supply module	Power Supply Module	GG-BP4PWS1X1-(Y R)		
C13 PDU support feature	C13 PDU Support Feature	GG-AR4PEN1X1-Y		
KVM cable	KVM Cable	GG-LR3KVM1X1-(Y R)		Already Productized on CB 500
Dummy module	Dummy Server Blade (Half-width)	GG-BE3SVMDX1-Y		Already Productized on CB 500
	Dummy Switch Module	GG-BE4SWMDX1-Y		
	Dummy I/O Adapter	GG-BE4CDMDX1-Y		
	Dummy Power Supply Module	GG-BE4PSMDX1-Y		

Switch module

Product type	Product name	Product code	Price	Remarks
Switch module	1/10Gb LAN Switch Module	GG-BE4LSW1X1-(Y R)		
	10Gb DCB Switch Module	GG-BE4LSW2X1-(Y R)		
Upgrade license	Port Upgrade License for LANSW	GG-BE4LSL1X1-Y		
	10Gb Activation License for LANSW	GG-BE4LSL2X1-Y		
	Port Upgrade License 14p, DCB	GG-BE4LSL4X1-Y		Targeting Q-Code: TBD
	FCoE License for DCBSW	GG-BE4LSL5X1-Y		Targeting Q-Code: Mar. 25, 2016
	Port Upgrade License 18p, DCB	GG-BE4LSL6X1-Y		
	40Gb Activation License, DCB	GG-BE4LSL7X1-Y		
Optical transceiver	Optical Transceiver for LANSW	GG-BE4SFP1X1-(Y R)		
	10Gb Optical Transceiver for DCBSW	GG-BE3SFP2X1-(Y R)		Already Productized on CB 500
	RJ-45 Connector for DCB-SW	GG-BE3SFP3X1-(Y R)		Already Productized on CB 500 To be discontinued in May 2016

Product type	Product name	Product code	Price	Remarks
	RJ-45 Connector for DCB-SW	XBR-000190.P		
	40Gb Optical Transceiver for DCBSW (compatible with 10GBASE-SR)	40G-QSFP-SR4-INT.P		
Cable	10Gb SFP+ Passive Twinax 3m	GG-LN4TWC1X1-(Y R)		
	10Gb SFP+ Passive Twinax 5m	GG-LN4TWC2X1-(Y R)		
	10G SFP+ Twinax Cable 3m	GG-LN3TWC2X1-(Y R)		Already Productized on CB 500
	10G SFP+ Twinax Cable 5m	GG-LN3TWC3X1-(Y R)		Already Productized on CB 500
	40GB QSFP to QSFP 3m for DCBSW	40G-QSFP-QSFPC0301.P		
	40GB QSFP to QSFP 5m for DCBSW	40G-QSFP-QSFPC0501.P		
	300m optic instead of 100m for DCBSW	HD-10G-SFPP-SR.P		
	40GBASE-SR4 QSFP+ (MODULE)-300M	40G-QSFP-ESR4.P		
	4x10Gb SFP+ to 40Fb Active Twinax Cable 3m	40G-QSFP-4SFP-C-0301.P		
	4x10Gb SFP+ to 40Fb Active Twinax Cable 5m	40G-QSFP-4SFP-C-0501.P		
	Management Cable for Switch Module	GG-LR4MNC1X1-(Y R)		

Blade

Server blades

Product type	Product name	Product code	Price	Remarks
Server blade	520X B1 Server Blade	GG-RV3XGE0B1X1-Y		
	520X B2 Server Blade	GG-RV3XGE0B2X1-Y		
	520X B3 Server Blade	GG-RV3XGE0B3X1-Y		Targeting Q-Code: May 2016
	520H B3 Server Blade	GG-RV3XGC0B3X1-Y		
	520H B4 Server Blade	GG-RV3XGC0B4X1-Y		Targeting Q-Code: May 2016
LoM Activation License	LoM Activation License for Type 2	GG-AR3LAL2X1-Y		Already Productized on CB 500
TPM Activation License	TPM Activation License	GG-AR3TPL1X1-Y		Already Productized on CB 500

Expansion blade

Product type	Product name	Product code	Price	Remarks
Expansion blade	PCI Expansion Blade	GG-ES3PCB1X1-(Y R)		Already Productized on CB 500

Shelf

Product type	Product name	Product code	Price	Remarks
Shelf	Shelf for Half-width Blade	GG-BE3SHL1X1-Y		Already Productized on CB 500
	Shelf for Expansion Blade	GG-BE3SHL2X1-Y		Already Productized on CB 500

Processors

Product type	Product name	Product code	Price	Remarks
520X B1	Processor Xeon E7-4820v2	GG-EC32005X1-(Y R)		In oracle but no intention to productize
	Processor Xeon E7-4860v2	GG-EC32604X1-(Y R)		
	Processor Xeon E7-4880v2	GG-EC32504X1-(Y R)		In oracle but no intention to productize
	Processor Xeon E7-8880v2	GG-EC32505X1-(Y R)		
	Processor Xeon E7-8890v2	GG-EC32802X1-(Y R)		
	Processor Xeon E7-8891v2	GG-EC33201X1-(Y R)		
520X B2	Processor Xeon E7-8880v3	GG-EC32306X1-(Y R)		
	Processor Xeon E7-8890v3	GG-EC32506X1-(Y R)		
	Processor Xeon E7-8893v3	GG-EC33203X1-(Y R)		
520X B3	Processor Xeon E7-8880v4	GG-EC3E804X1-(Y R)		Targeting Q-Code: May 12, 2016
	Processor Xeon E7-8890v4	GG-EC3E904X1-(Y R)		Targeting Q-Code: May 2016
	Processor Xeon E7-8893v4	GG-EC3E934X1-(Y R)		Targeting Q-Code: May 2016

Product type	Product name	Product code	Price	Remarks
520H B3	Processor Xeon E5-2603v3	GG-EC31601X1-(Y R)		In oracle but no intention to productize
	Processor Xeon E5-2620v3	GG-EC32405X1-(Y R)		In oracle but no intention to productize
	Processor Xeon E5-2637v3	GG-EC33503X1-(Y R)		
	Processor Xeon E5-2640v3	GG-EC32605X1-(Y R)		In oracle but no intention to productize
	Processor Xeon E5-2660v3	GG-EC32606X1-(Y R)		
	Processor Xeon E5-2667v3	GG-EC33202X1-(Y R)		
	Processor Xeon E5-2690v3	GG-EC32607X1-(Y R)		
	Processor Xeon E5-2697v3	GG-EC32608X1-(Y R)		
	Processor Xeon E5-2698v3	GG-EC32303X1-(Y R)		
	Processor Xeon E5-2699v3	GG-EC32304X1-(Y R)		
520H B4	Processor Xeon E5-2603v4	TBD		Targeting Q-Code: TBD
	Processor Xeon E5-2609v4	TBD		Targeting Q-Code: TBD
	Processor Xeon E5-2620v4	TBD		Targeting Q-Code: TBD
	Processor Xeon E5-2630v4	TBD		Targeting Q-Code: TBD
	Processor Xeon E5-2637v4	GG-EC3C374X1-(Y R)		Targeting Q-Code: May 2016
	Processor Xeon E5-2640v4	TBD		Targeting Q-Code: TBD
	Processor Xeon E5-2643v4	GG-EC3C434X1-(Y R)		Targeting Q-Code: June 2016
	Processor Xeon E5-2650v4	GG-EC3C504X1-(Y R)		Targeting Q-Code: May 2016
	Processor Xeon E5-2660v4	TBD		Targeting Q-Code: TBD
	Processor Xeon E5-2667v4	GG-EC3C674X1-(Y R)		Targeting Q-Code: June 2016
	Processor Xeon E5-2680v4	TBD		Targeting Q-Code: TBD
	Processor Xeon E5-2683v4	GG-EC3C834X1-(Y R)		Targeting Q-Code: June 2016
	Processor Xeon E5-2690v4	GG-EC3C904X1-(Y R)		Targeting Q-Code: June 2016
	Processor Xeon E5-2695v4	TBD		Targeting Q-Code: TBD

Product type	Product name	Product code	Price	Remarks
	Processor Xeon E5-2697v4	GG-EC3C974X1-(Y R)		Targeting Q-Code: May 2016
	Processor Xeon E5-2697Av4			Targeting Q-Code: TBD
	Processor Xeon E5-2698v4	GG-EC3C984X1-(Y R)		Targeting Q-Code: May 2016
	Processor Xeon E5-2699v4	GG-EC3C994X1-(Y R)		Targeting Q-Code: May 2016
Heat sink	Heat Sink for Type 2	GG-EC3HSK7X1-(Y R)		
	Heat Sink for 520H B3 1st	GG-EC3HSK8X1-(Y R)		
	Heat Sink for 520H B3 2nd	GG-EC3HSK9X1-(Y R)		
Dummy	Dummy Processor Module	GG-EC3DMM1X1-Y		Already Productized on CB 500

Memory modules

Product type	Product name	Product code	Price	Remarks
RDIMM	DDR3 16GB Memory, 2R, 1333	GG-MJ316G1X1-(Y R)		Already Productized on CB 500
	DDR3 8GB Memory, 1R, 1600	GG-MJ3N8G1X3-(Y R)		Already Productized on CB 500
	DDR3 16GB Memory, 2R, 1600	GG-MJ316G1X2-(Y R)		Already Productized on CB 500
	DDR3 16GB Memory, 2R, 1866	GG-MJ316G1X3-(Y R)		Already Productized on CB 500
	DDR4 8GB Memory, 1R, 2133	GG-MJ3N8G3X1-(Y R)		Already Productized on CB 500
	DDR4 16GB Memory, 2R, 2133	GG-MJ316G3X1-(Y R)		Already Productized on CB 500
	DDR4 32GB Memory, 2R, 2133	GG-MJ332G3X1-(Y R)		
	DDR4 16GB Memory, 1R, 2400	GG-MJ316G5X1-(Y R)		Targeting Q-Code: Mar. 24, 2016
	DDR4 32GB Memory, 2R, 2400	GG-MJ332G5X1-(Y R)		Targeting Q-Code: Mar. 24, 2016
	DDR4 64GB Memory, 4R, 2400	TBD		Targeting Q-Code: Sep. 2016
	DDR4 128GB Memory	TBD		Cancelled
LRDIMM	DDR3 32GB Memory, 4R, 1600	GG-MJ332G2X2-(Y R)		Already Productized on CB 500
	DDR4 32GB Memory, 4R, 2133	GG-MJ332G4X1-(Y R)		Already Productized on CB 500
	DDR4 64GB Memory, 4R, 2133	GG-MJ364G4X1-(Y R)		

Product type	Product name	Product code	Price	Remarks
Dummy Memory Module	Dummy Memory Module	GG-MJ3DMM1X1-Y		Already Productized on CB 500

Internal HDDs/SSDs

Product type	Product name	Product code	Price	Remarks
HDD	SAS HDD, 147 GB, 15 krpm, for Type 2	GG-UH31472X6-(Y R)		
	SAS HDD, 147 GB, 15 krpm, for Type 2 w/o BNST	GG-UH31472X6C-(Y R)		
	SAS HDD, 300 GB, 15 krpm, for Type 2	GG-UH33002X6-(Y R)		
	SAS HDD, 300 GB, 15 krpm, for Type 2 w/o BNST	GG-UH33002X6C-(Y R)		
	SAS HDD, 300 GB, 15 krpm, 12C, for Type 2	GG-UH33002X8-(Y R)		Targeting Q-Code: May 2016
	SAS HDD, 600 GB, 10 krpm, for Type 2	GG-UH36001X6-(Y R)		
	SAS HDD, 600 GB, 10 krpm, for Type 2 w/o BNST	GG-UH36001X6C-(Y R)		
	SAS HDD, 600 GB, 15 krpm, for Type 2 w/o BNST	GG-UH36002X6-(Y R)		Targeting Q-Code: May 2016
	SAS HDD, 600 GB, 10 krpm, 12C, for Type 2	GG-UH36001X8-(Y R)		Targeting Q-Code: May 2016
	SAS HDD, 900 GB, 10 krpm, for Type 2	GG-UH39001X6-(Y R)		
	SAS HDD, 900 GB, 10 krpm, for Type 2 w/o BNST	GG-UH39001X6C-(Y R)		
	SAS HDD, 1.2 TB, 10 krpm, for Type 2	GG-UH31T21X6-(Y R)		
	SAS HDD, 1.2 TB, 10 krpm, for Type 2 w/o BNST	GG-UH31T21X6C-(Y R)		
	SAS HDD, 1.8 TB, 10 krpm, for Type 2 w/o BNST	GG-UH31T81X6-(Y R)		
SSD	SAS SSD, 200 GB, for Type 2	GG-UH32003X6-(Y R)		
	SAS SSD, 400 GB, for Type 2	GG-UH34003X6-(Y R)		
	SAS SSD, 800 GB, for Type 2	GG-UH38003X6-(Y R)		
HDD Kit	SAS HDD Kit for Type 2	GG-UH3HDK5X1-(Y R)		
	SAS HDD Kit for 520H B3	GG-UH3HDK6X1-(Y R)		
Dummy HDD Module	Dummy HDD Module for Type 2	GG-UH3DMM2X1-Y		

Mezzanine cards

Product type	Product name	Product code	Price	Remarks
LAN	1Gb 4-port LAN Mezzanine	GG-CN3M1G2X1-(Y R)		Already Productized on CB 500
Pass Through	PCIe Adapter Connection Mezzanine	GG-CB4MPS1X1-(Y R)		

I/O adapters

Product type	Product name	Product code	Price	Remarks
LAN	1Gb 4-port LAN Adapter	GG-CN4N1G2X1-(Y R)		
	Intel 10GBASE-SR 2-port LAN Adapter	GG-CN4NXG1X1-(Y R)		
	Intel 10GBASE-T 2-port Adapter	GG-CN4NXG2X1-(Y R)		
CNA	10Gb 2-port CNA Adapter	GG-CN4NXG3X1-(Y R)		
FC	Hitachi 8Gb 2-port FC Adapter	GG-CC4N8G2X1-(Y R)		
	Emulex 8Gb 2-port FC Adapter	GG-CC4N8G3X1-(Y R)		
	Hitachi 16Gb 2-port FC Adapter	GG-CC4N162X1-(Y R)		
	Emulex 16Gb 2-port FC Adapter	GG-CC4N163X1-(Y R)		
PCIe flash drive	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 1.1TB	GG-CG4VFD1X1-(Y R)		
	HGST PCIe MLC Flash Drive Adapter (FlashMax3) 2.2TB	GG-CG4VFD2X1-(Y R)		
	HGST PCIe MLC Flash Drive Adapter (FlashMax2) 4.8TB	GG-CG4VFD3X1-(Y R)		HDS will not productize
GPU	NVIDIA Grid K2 GPU Adapter	GG-CV3GPU2X1-(Y R)		Already Productized on CB 500
I/O adapter module	I/O Board Module	GG-BE4CDM1X1-(Y R)		
Dummy	PCI Filler Panel for I/O Board Module	36-9230-ND.P		

SMP Connection Boards

Product type	Product name	Product code	Price	Remarks
SMP connection board	2-blade SMP Connection Board	GG-EZ3SMB4X1-(Y R)		Already Productized on CB 500
	4-blade SMP Connection Board	GG-EZ3SMB8X1-(Y R)		Already Productized on CB 500

Internal flash device

Product type	Product name	Product code	Price	Remarks
Flash device	SD Card	GG-MC3SDC1X1-(Y R)		Already Productized on CB 500
	USB Memory	GG-MC3USB2X1-(Y R)		Already Productized on CB 500
Flash device enablement kit	SD Card Enablement Kit	GG-CH3SEK1X1-(Y R)		Already Productized on CB 500

Expansion blade

Product type	Product name	Product code	Price	Remarks
Connection kit	PCI Blade Connection Kit F/H	GG-CB3MPT4X1-(Y R)		
	PCI Blade Connection Kit L/P	GG-CB3MPT5X1-(Y R)		
Card adapter F/H	PCI Blade Card Adapter F/H ×16	GG-CB3RAK1X1-(Y R)		Already Productized on CB 500
	PCI Blade Card Adapter F/H ×8	GG-CB3RAK2X1-(Y R)		Already Productized on CB 500
Card adapter L/P	PCI Blade Card Adapter L/P ×8	GG-CB3RAK3X1-(Y R)		Already Productized on CB 500
	PCI Blade Card Adapter L/P ×4	GG-CB3RAK4X1-(Y R)		Already Productized on CB 500
Power cable	PCI Blade Optional Power Cable	GG-LG3GPC1X1-(Y R)		Already Productized on CB 500

LPAR Manager

Product type	Product name	Product code	Price	Remarks
LPAR Manager license	LPAR Manager Advanced License	GG-AR3VLADX1-Y		Already Productized on CB 500
	LPAR Manager Advanced License	044-230371-03.P		
	LPAR Manager Advanced License Trial	044-230371-02.P		
	LPAR Manager Enterprise License	044-230372-03.P		
	LPAR Manager Enterprise License Trial	044-230372-02.P		
	LPAR Manager License Adv. to Ent. License Upgrade	044-230373-03.P		

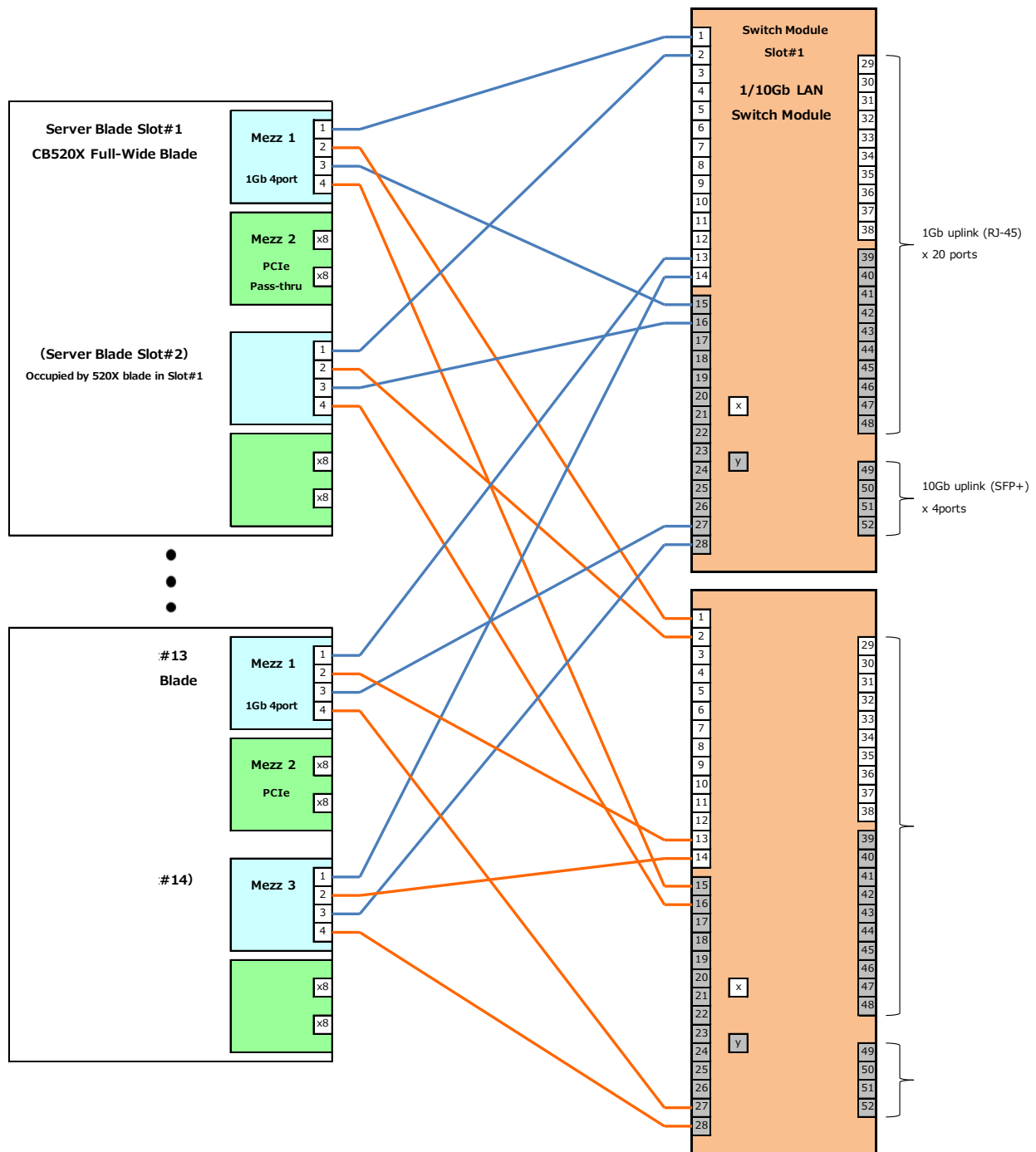


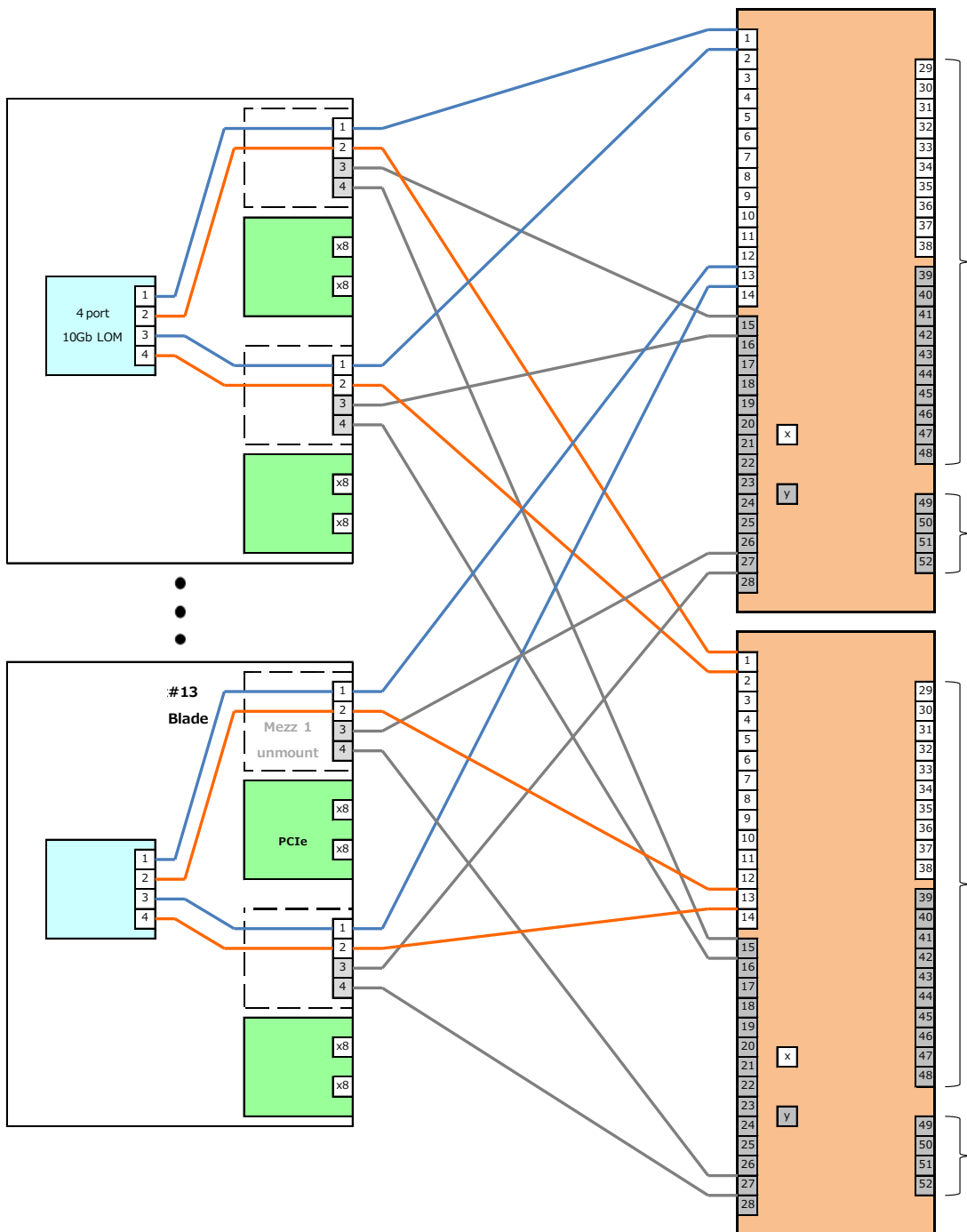
Appendix

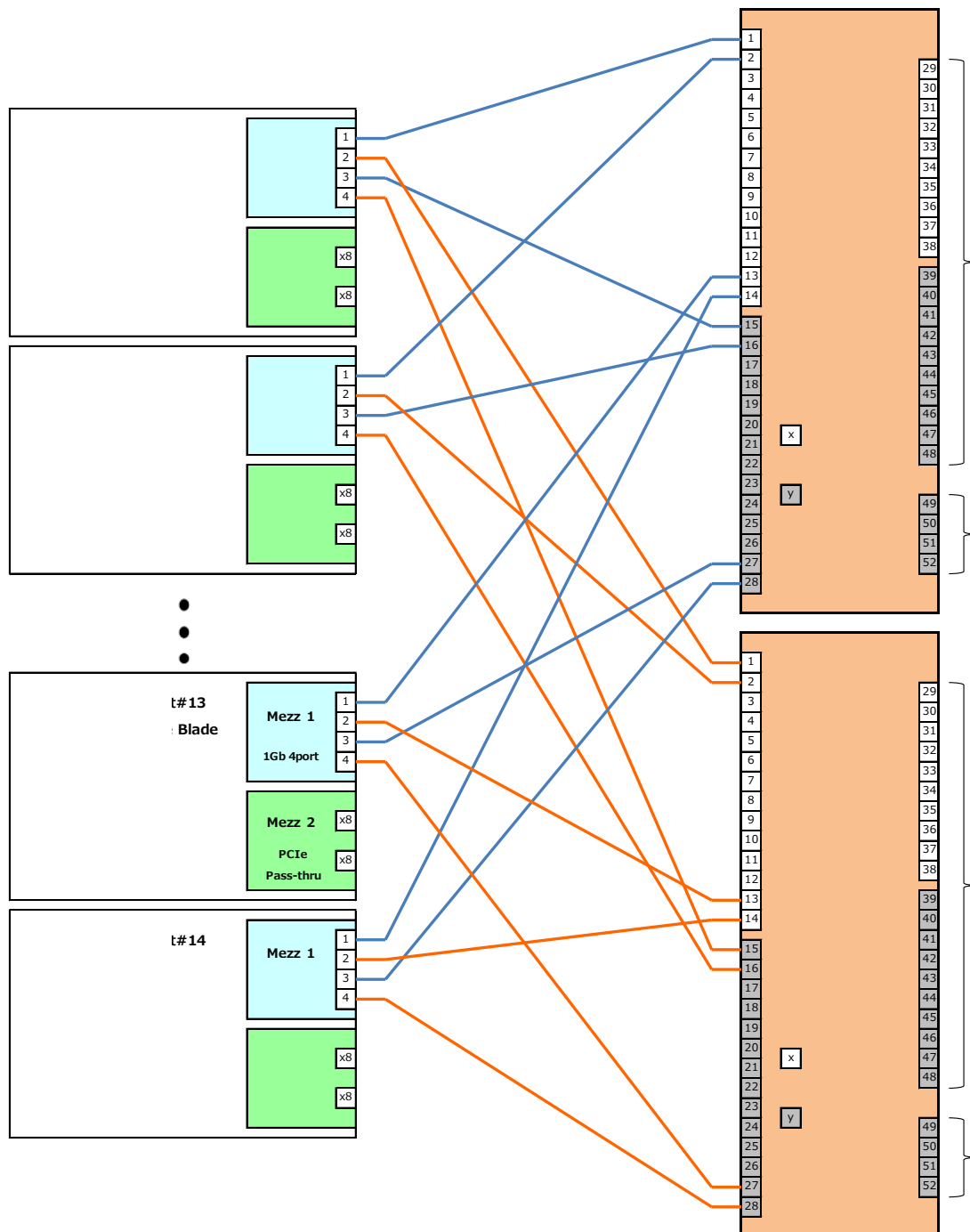
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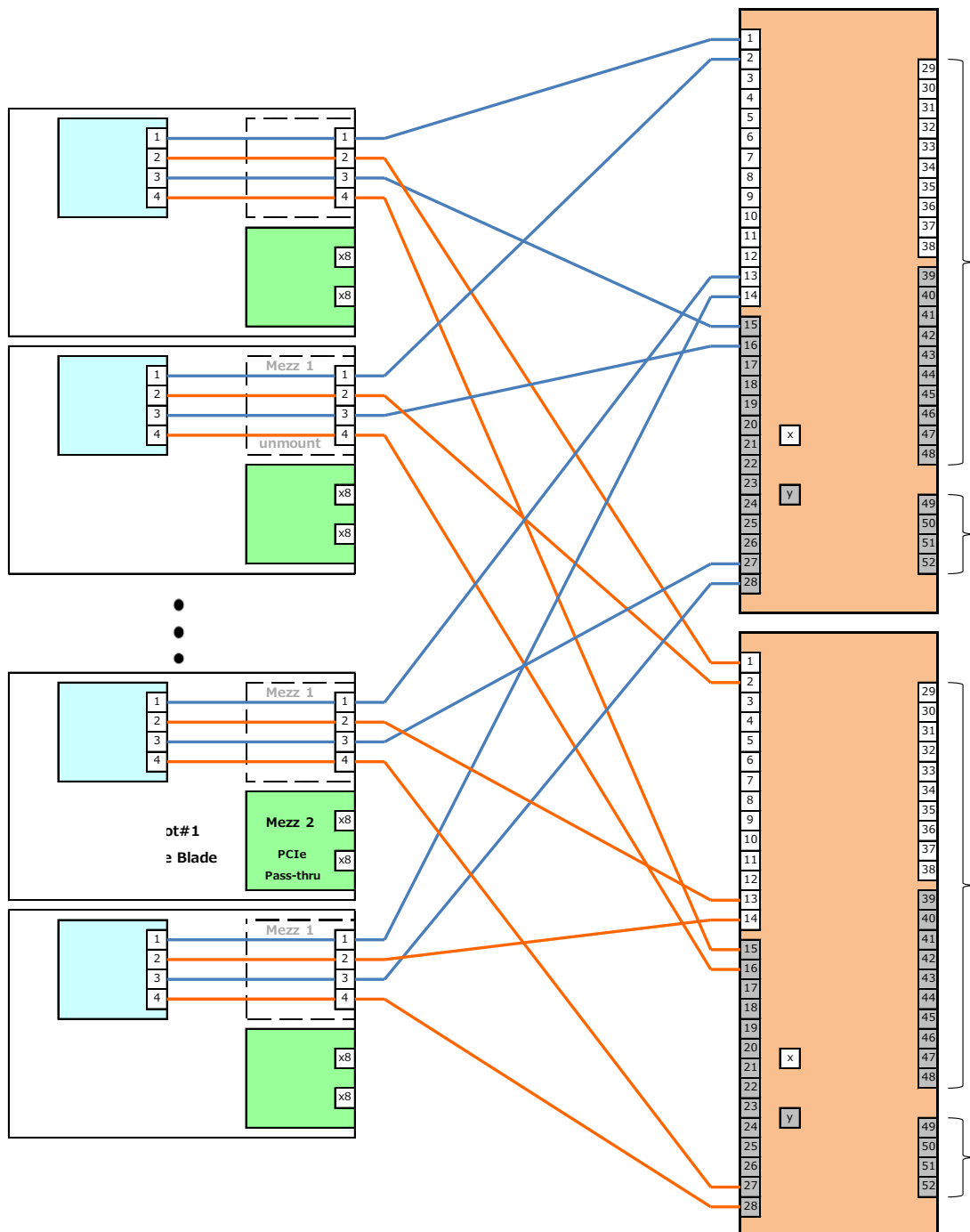
- [Block diagram between onboard LAN/mezzanine and switch module](#)

Block diagram between onboard LAN/mezzanine and switch modules











Acronyms and abbreviations

BNST	Benzenamine, N-phenyl-, reaction products with Styrene and 2,4,4-Trimethylpentene
CB	Hitachi Compute Blade
CNA	Converged Network Adapter
DCBSW	DCB SWitch module
DIMM	Dual Inline Memory Module
EMC	ElectroMagnetic Compatibility
FC	Fibre Channel
FCSW	Fibre Channel SWitch
IOEU	I/O Expansion Unit
LANSW	LAN SWitch
LPAR	Logical PARTition
LRDIMM	Load-Reduced DIMM
LU	Logical Unit
LV RDIMM	Low Voltage Registered DIMM
NTP	Network Time Protocol
PSM	Power Supply Module
RAID	Redundant Array of Inexpensive Disks
RDIMM	Registered DIMM
RHEL	Red Hat Enterprise Linux
SAN	Storage Area Network
SC	Server Conductor
SMP	Symmetric Multi Processing
SVP	Service Processor (another name for management module)
TPM	Trusted Platform Module
WOL	Wake-on-LAN

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