

NEC Express5800/R320g Configuration Guide

Linux model



Introduction

This document contains product and configuration information that will enable you to configure your system. The guide will ensure fast and proper configuration of your NEC Express5800 server.

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Technical Specification

Specification

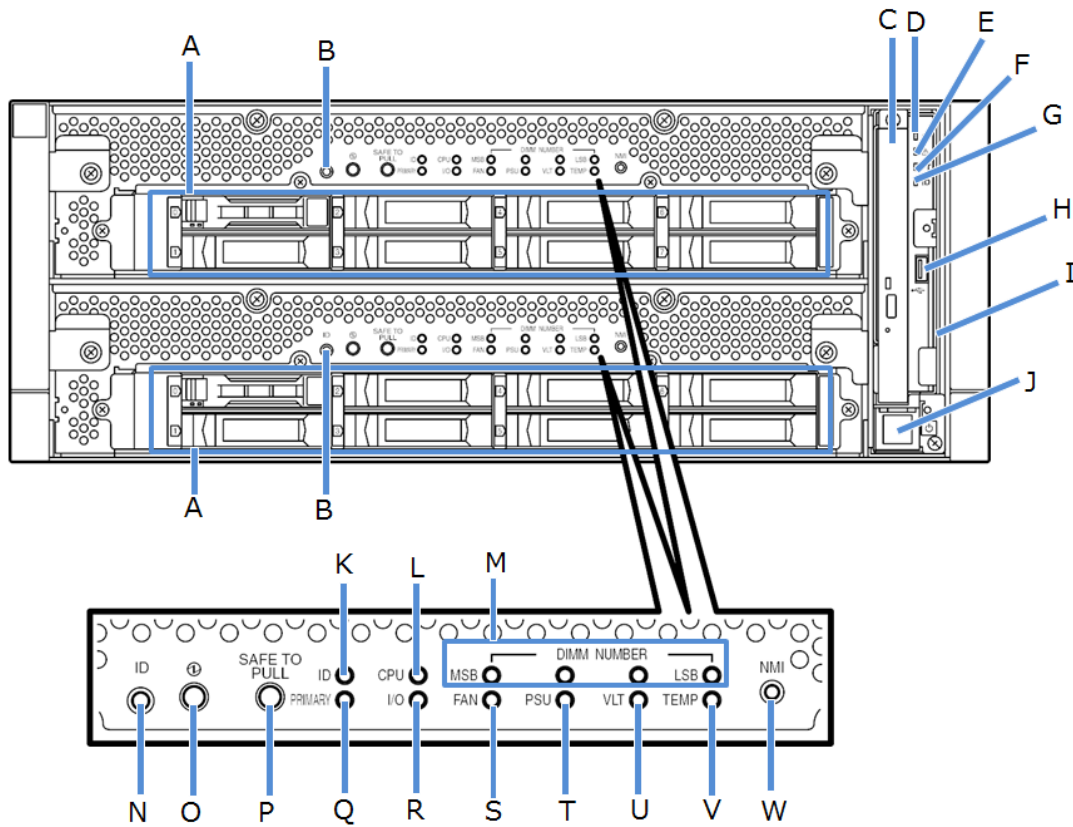
Model		R320g-E4	R320g-M4
Part Number		N8800-240F	N8800-241F
Processor	Type	Intel® Xeon® processor Silver 4114	Intel® Xeon® processor Gold 6127M
	Clock speed	2.20 GHz	2.20 GHz
	Logical Number of Processors	1 or 2	
	Cache	13.75MB	22MB
	Cores and Threads	10C / 20T	16C / 32T
Chipset		Intel® C621 Chipset / GeminiEngine™	
Memory	Type	DDR4-2666 Registered DIMM (16/32 GB DIMM)	
	Memory Clock	2400 MHz	
	Logical Standard Capacity	0 GB	
	Logical Maximum Capacity	640GB (20 x 32 GB)	
	Memory protection	ECC, x4 SDDC	
Internal Storage	Standard Capacity	0GB	
	Maximum Logical Capacity	HDD : SAS 9.6 TB (8x 1.2TB) SSD : SAS 3.2 TB (8x 400GB)	
	Disk Controller	SAS: 12Gb/s (Standard)	
	RAID	SAS : RAID 1 (Standard)	
	Hot Plug	Supported	
	Optical Disk Drive	DVD Super Multi drive (Standard) ¹	
	Optical Drive Bays	1	
	Logical Disk Drive Bays	8	
Expansion Slots		Total: 2 slots available 2 PCIe 3.0 x8 (x8 connector)	Total: 4 slots available 4 PCIe 3.0 x8 (x8 connector)
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)	
	Resolution / Color Supported	800 x 600, 1024 x 768, 1280 x 1024 / 16.7M	
Interfaces		1 VGA (15-pin mini D-sub, 1 rear per system) 4 USB2.0 (1 front, 3 rear per system) 4 1000BASE-T LAN connector (RJ-45, 2 rear per module) 2 Management LAN connector (RJ-45, 1 rear per module) 2 USB3.0 (option, for backup devices)	1 VGA (15-pin mini D-sub, 1 rear per system) 4 USB2.0 (1 front, 3 rear per system) 4 10GBASE-T LAN connector (RJ-45, 2 rear per module) 4 1000BASE-T LAN connector (RJ-45, 2 rear per module) 2 Management LAN connector (RJ-45, 1 rear per module) 2 USB3.0 (option, for backup devices)
Server Management		EXPRESSSCOPE Engine 3	
Power Supply		2x 800W 80 Plus® Platinum	2x 1200W 80 Plus® Platinum
		100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz	
Power Consumption	(Max. Config, Operating)	1,274 VA / 1,272 Watt	1,463VA / 1,461 Watt
Dimensions (W x D x H)		483.0 x 734.0 x 176 mm / 19.0 x 29.0 x 7.0 in (4U)	
Weight (Minimum / Maximum)		46 kg / 53 kg, 101 lbs. / 116 lbs.	
Temperature, Relative Humidity (non-condensing)		Operating: 10° to 40° C / 50° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%	
Regulatory and Safety		FCC, CE, BSMI, CCC, UL, CB, RoHS	
Operating Systems		Red Hat® Enterprise Linux® 7.6(x86_64)	

¹ Writing software is not provided for this DVD drive.

External Views

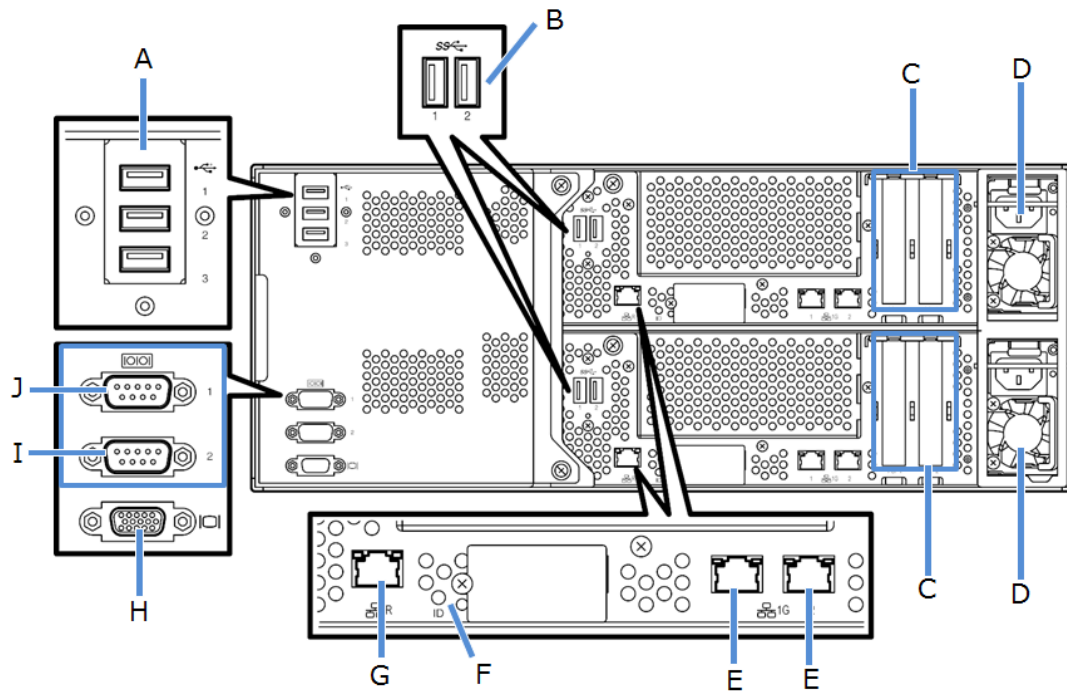
Front and Rear Views

Front View



Legend	
A.	Drive Bays
B.	UID Button
C.	Optical Disk Drive
D.	System Power LED
E.	System Status LED
F.	System FT LED
G.	UID LED
H.	USB Connector
I.	Pull-out Tab
J.	Power Button
K.	Module ID LED
L.	CPU Fault LED
M.	Memory Fault LED
N.	UID Button
O.	Module Power LED
P.	SAFE TO PULL LED
Q.	PRIMARY LED
R.	IO Module Fault LED
S.	Fan Fault LED
T.	PSU Fault LED
U.	DC Power Fault LED
V.	Temperature Fault
W.	NMI Button

Rear View for R320g-E4

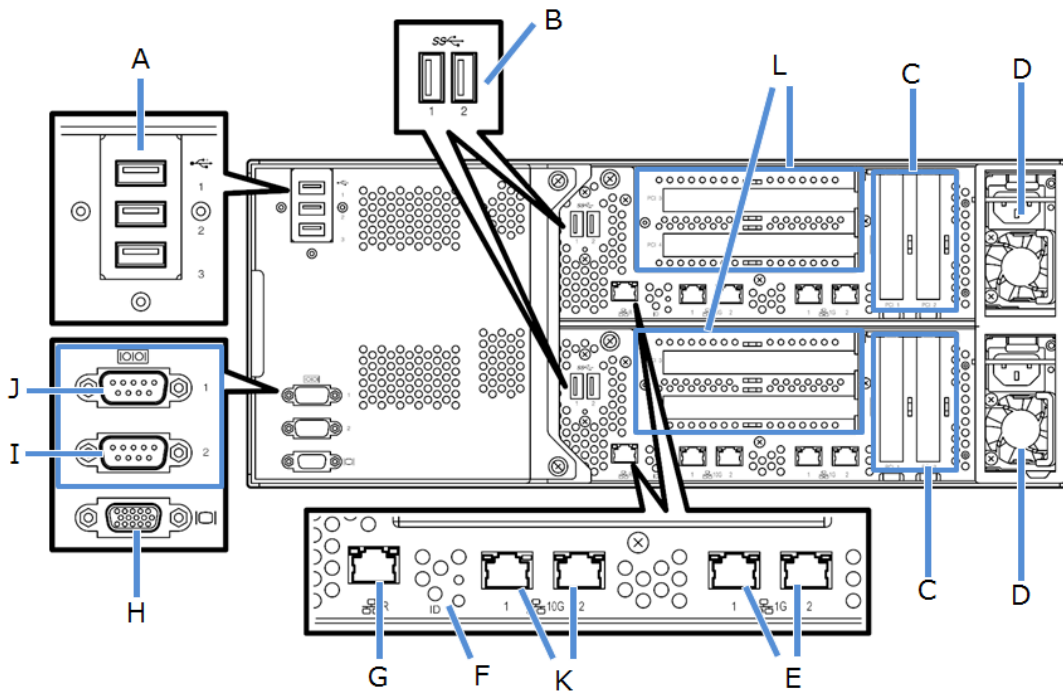


Legend			
A.	USB Connectors	F.	Module ID LED
B.	USB Connectors (option, for backup use)	G.	Management LAN Connector
C.	PCI Slots (Low-Profile)	H.	VGA Connector
D.	Power supply unit	I.	Serial Port Connector 2 ¹
E.	Data LAN Connector(1000Base-T) ²	J.	Serial Port Connector 1 ¹

¹ For service personnel only.

² WOL(Wake On LAN) is supported on only the standard Data LAN Connector(1000Base-T).

Rear View for R320g-M4



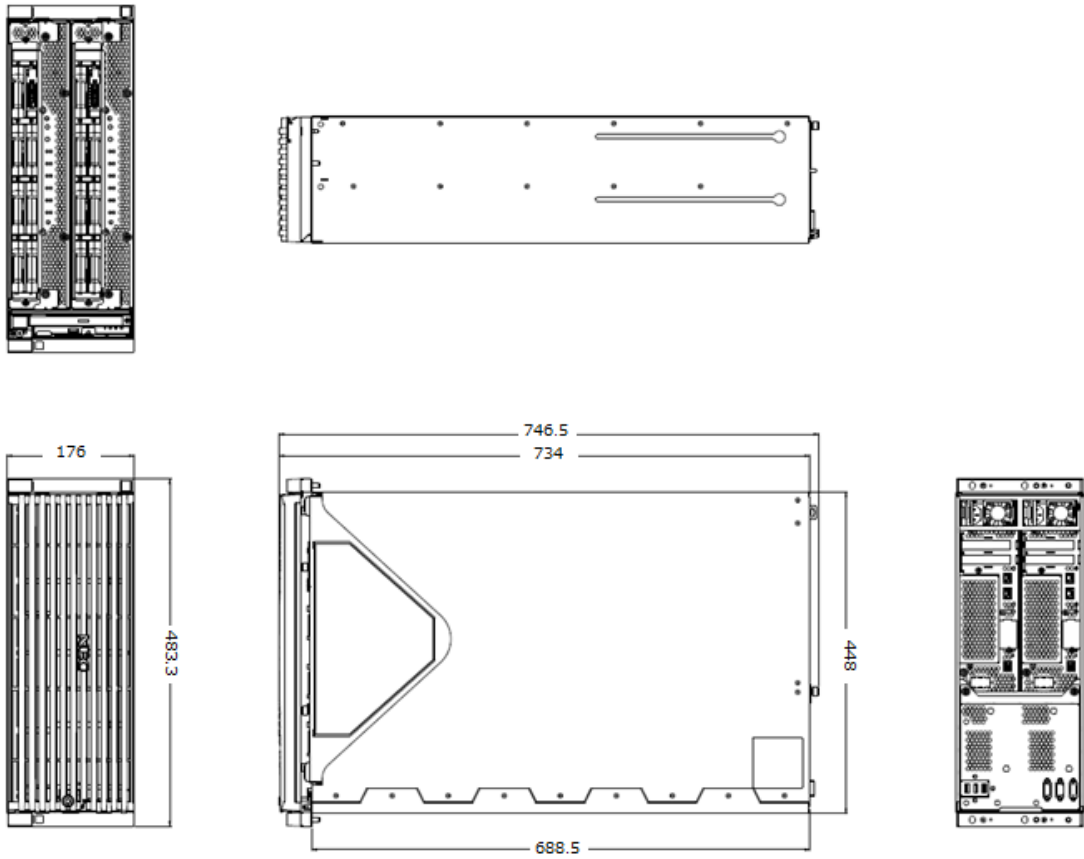
Legend			
A.	USB Connectors	G.	Management LAN Connector
B.	USB Connectors (option, for backup use)	H.	VGA Connector
C.	PCI Slots (Low-Profile)	I.	Serial Port Connector 2 ¹
D.	Power supply unit	J.	Serial Port Connector 1 ¹
E.	Data LAN Connector(1000Base-T) ²	K.	Data LAN Connector (10GBase-T)
F.	Module ID LED	L.	PCI Slots (Full-height)

¹ For service personnel only.

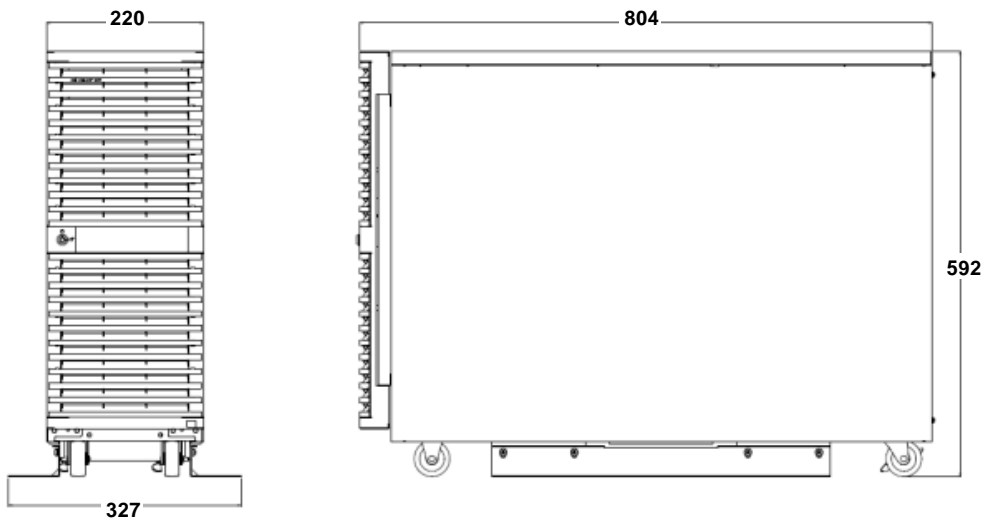
² WOL(Wake On LAN) is supported on only the standard Data LAN Connector(1000Base-T).

Dimensions (mm)

Rack mount

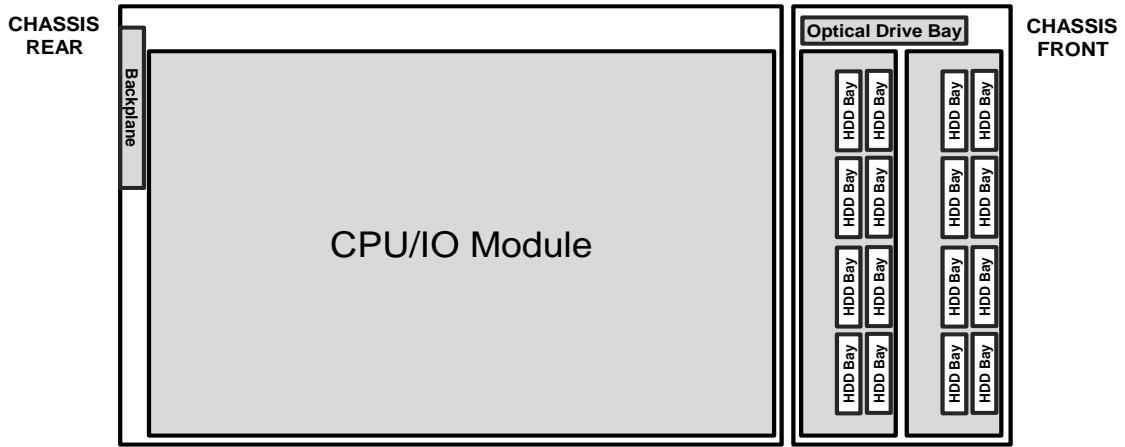


Tower Conversion (Optional)



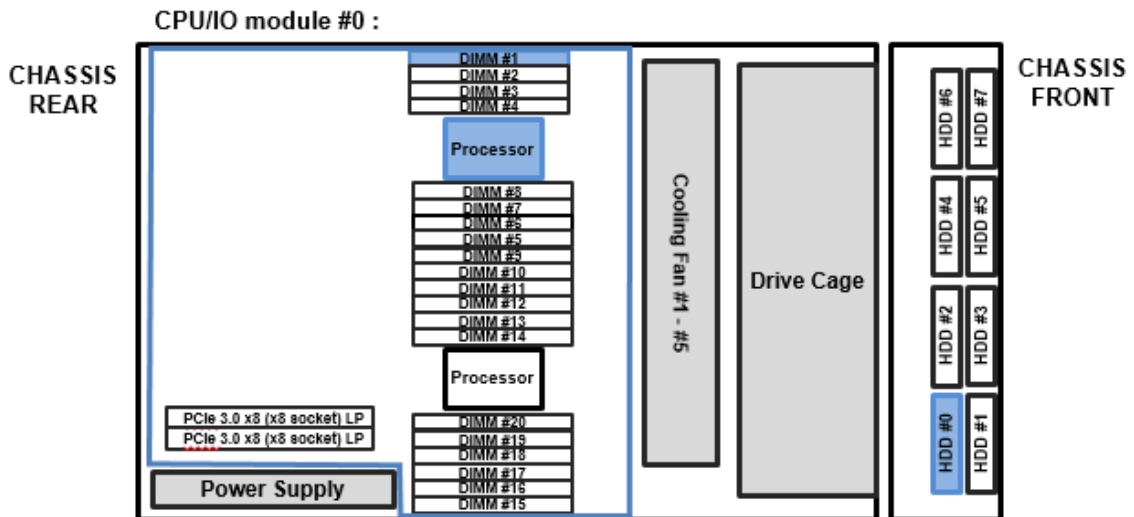
Configuration Diagram

Server

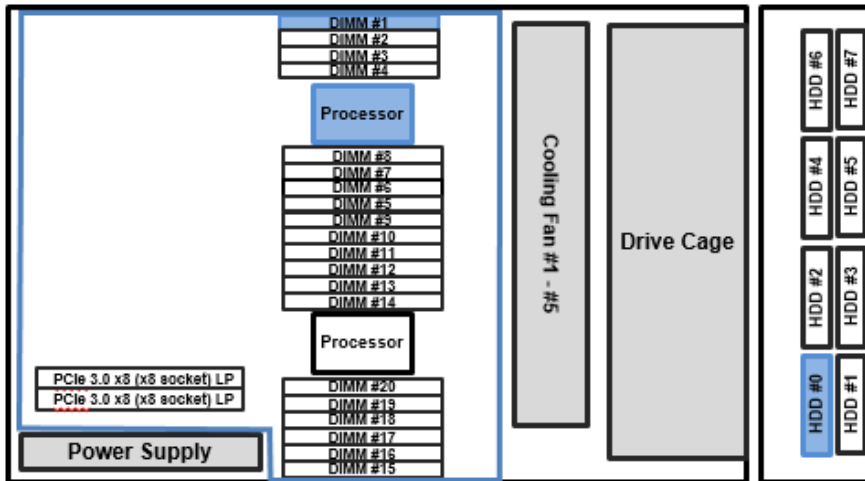


CPU/IO Module

R320g-E4

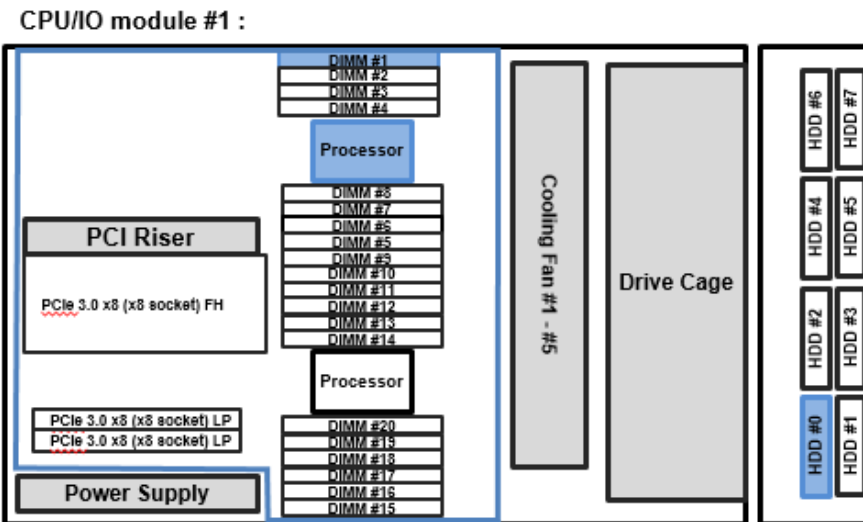
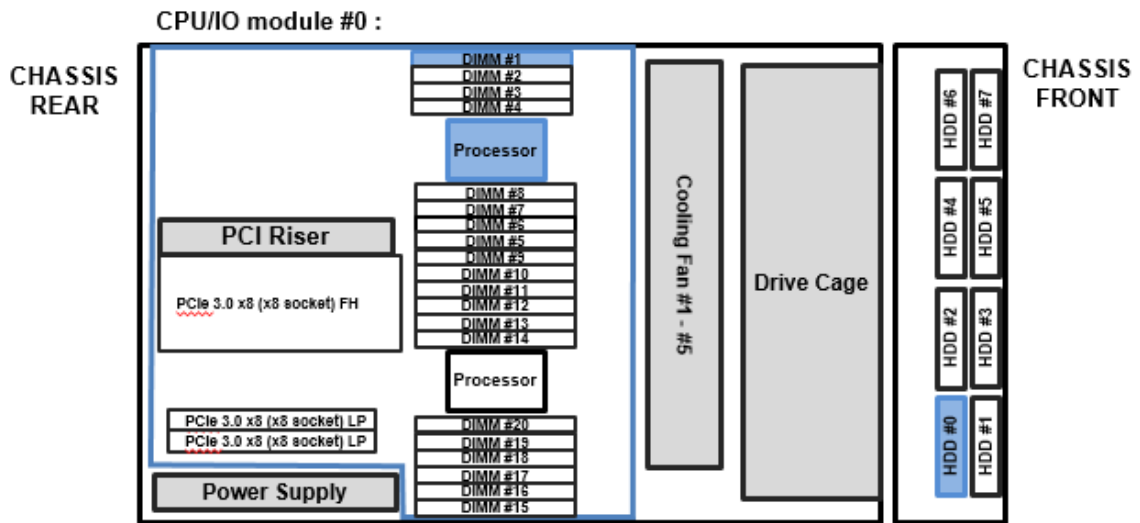


CPU/IO module #1 :



Legend: ■ Mandatory components Standard components

R320g-M4



Legend: Mandatory components Standard components

Server Configuration

1 Base Models

Product Name / Description	Part Number
Express5800/R320g-E4(10C/Silver 4114) no RAM, no 2.5-inch HDD Including: Intel Xeon Processor Silver 4114, 1 x DVD Super Multi, EXPRESSBUILDER DVD	N8800-240F
Express5800/R320g-M4(16C/Gold 6127M) no RAM, no 2.5-inch HDD Including: Intel Xeon Processor Gold 6127M, 1 x DVD Super Multi, EXPRESSBUILDER DVD	N8800-241F

2 2nd Processor

Available logical sockets: 1

Product Name / Description	Part Number
Xeon Silver 4114 Processor Kit : 2.20 GHz / 10C-20T / 13.75 MB, 2 processors included	N8801-052
Xeon Gold 6127M Processor Kit : 2.20 GHz / 16C-32T / 22 MB, 2 processors included	N8801-053

NOTE:

- The 2nd processor must be the same as what is used in the base model

3 Memory

Available logical slots: 1CPU: 8slots, 2CPU: 20slots

Product Name / Description	Part Number
16GB DDR4-2666 REG Memory Kit: 2 x 1 x 16GB DIMM included	N8802-069
128GB DDR4-2666 REG Memory Kit : 2 x 4 x 32GB DIMM included	N8802-070

NOTE:

- Minimum one memory kit must be installed.

Memory Configuration Guideline

See the table below for the number of memory kits required in accordance with logical main memory size and number of logical processors. Memory configurations which are not listed below are not supported in the system.

Number of Logical Processors	Logical Main Memory Size	Number of Memory Kits Required		
		16GB	128GB	
1	16GB ¹	1	-	
	32GB	2	-	
	48GB	3	-	
	64GB	4	-	
	96GB	6	-	
	128GB	8	-	
		-	-	1
		256GB	-	2
2	16GB ¹	1	-	
	32GB ¹	2	-	
	48GB ¹	3	-	
	64GB	4	-	
	96GB	6	-	
	128GB	8	-	
	192GB	12	-	
	256GB	16	-	
		-	-	2
		320GB	20	-
		512GB	-	4
		640GB	-	5

¹ Interleave is not supported.

4 Internal Hard Disk Drives

Available bays: 8

Category	Product Name / Description	Part Number
SAS HDD	300GB 15K Hot Plug 2.5-inch SAS HDD : 1 x 300GB	N8850-063
	600GB 15K Hot Plug 2.5-inch SAS HDD : 1 x 600GB	N8850-064
	900GB 10K Hot Plug 2.5-inch SAS HDD : 1 x 900GB	N8850-065
	1.2TB 10K Hot Plug 2.5-inch SAS HDD : 1 x 1.2TB	N8850-066
SAS SSD (ME)	400GB Hot Plug 2.5-inch SSD: 1 x 400GB	N8850-068

NOTE:

- Hard drives must be installed in identical pairs to configure RAID 1.

Recommended Partition layout

See the table below for the recommended partition layout.

Partition	Size ¹	File system ²
Pattern 1		
/boot/efi	200MB	EFI System Partition
/boot	1024MB	ext4 ³
/var/crash	16GB	ext4 ⁴
swap	⁵	swap
/	32GB	ext4
Free space	Remaining	-
Pattern 2		
/boot/efi	200MB	EFI System Partition
/boot	1024MB	ext4 ³
/var/crash	16GB	ext4 ⁴
swap	⁵	swap
/	32GB	ext4

/home	Remaining	ext4
Pattern 3		
/boot/efi	200MB	EFI System Partition
/boot	1024MB	ext4 ³
/var/crash	16GB	ext4 ⁴
swap	⁵	swap
/	Remaining	ext4

¹ The actual partition size may slightly differ from the table above. (Because of the cylinder boundary for partition)

² The default file system is xfs, but ext4 is recommended which has long operational experience.

³ To add the latest kernel with security patches and other updates, adequate free space in this partition is needed. At least 300 to 500MB partition size is recommended.

⁴ /var/crash partition for dump is required for ft Server Control Software. The size must be 16 GB regardless of the system memory capacity.

⁵ The recommended swap partition size is as follows:

Memory Size	Swap Capacity
16GB to 64GB	Half of the memory size
Over 64GB	Depends on the load

NOTE:

- The swap may not be used so much when the memory size is large. It depends on the applications and operations.
- Use the free command to confirm the status of swap in operation. If usage rate of swap is high, extend the swap space or add memory.
- Only RAID1 is supported for hard drives including system partition. RAID1 or RAID1+0 can be configured for other data drives.
- LVM of hard drives including system partition is not supported. LVM is supported on data drives configured as RAID1 or RAID1+0. However, configuring RAID with LVM logical volumes is not supported.
- Be sure to place /usr partition in the /(root) partition because boot process would be complex if located in any other partition.

Notes for BTO with HDD/SSD

The smallest capacity HDD/SSD is installed in the 1st HDD bay (as system disk) at factory.

5 Optical Drive

Available bays: 1

Product Name / Description	Part Number
Internal DVD Super Multi Drive 1 x DVD Super Multi drive, not including writing software	(Standard)

6 PCI Card

6.1 LAN Controller

Category	Product Name / Description	Part Number
LAN Controller	1000BASE-T 2ch board kit : 2 x GbE NIC Intel® Ethernet Server Adapter I350-T2V2	N8804-012
	10GBASE-T 2ch Adapter Kit : 2 x 10GbE NIC Intel® Ethernet Converged Network Adapter X550 NOTE: - Up to one controller per module - FCoE functionality is not supported	N8804-013

NOTE:

- For iSCSI (data) connection, NEC Storage M12e, M120, M320, M320F are supported. For NEC Storage, contact your sales representative or refer to the NEC Storage WEB site. (<http://www.nec.com/global/prod/storage/>)
- WOL(Wake On LAN) is supported on only the standard Data LAN Connector(1000Base-T).
The above optional LAN Controller(N8804-012/013) do not support WOL.

6.2 Fibre Channel /SAS Controller

Category	Product Name / Description	Part Number
Fibre Channel Controller	Fibre Channel 1ch Adapter Kit : 2 x FC Controller QLogic QLE2670 16Gbps Fibre Channel Adapters	N8803-040AF
SAS Controller	SAS Controller : 1 x SAS Controller Broadcom SAS9300-8e 12Gbps Host Bus Adapter NOTE: - K410-322(02) SAS Cable is required for tape drive connection	N8803-041

NOTE:

- For FC connection, NEC Storage M12e, M120, M320, M320F are supported. For NEC Storage, contact your sales representative or refer to the NEC Storage WEB site. (<http://www.nec.com/global/prod/storage/>)

7 Other Add-in Components

7.1 Input Devices

Category	Product Name / Description	Part Number
Keyboard	USB Keyboard	N8870-002AF
Mouse	USB Optical Wheel Mouse	N8870-012
Cable	USB cable : 1.5m USB extension cable	K410-177(1A)

8 Add-on Components

8.1 17-inch LCD Console Drawer

Category		Product Name / Description	Part Number
Drawer w/ KVM Switch	Drawer	17-inch LCD Console Drawer (8port) 17-inch LCD, US 83-keys Keyboard, Optical mouse, 8 port KVM switch, 1U height, black	N8143-106F
	Cable	Switch Unit Connection Cable Set (USB, 1.8m) 1.8 m, 1 x 15-pin mini D-SUB to 1 x 15-pin mini D-SUB / 1 x 4-pin USB A	K410-118(1A)
		Switch Unit Connection Cable Set (USB, 3m) 3 m, 1 x 15-pin mini D-SUB to 1 x 15-pin mini D-SUB / 1 x 4-pin USB A	K410-118(03)
		Switch Unit Connection Cable Set (USB, 5m) 5 m, 1 x 15-pin mini D-SUB to 1 x 15-pin mini D-SUB / 1 x 4-pin USB A	K410-118(05)
Drawer w/o KVM Switch	Drawer	17inch LCD Console Unit 1U 17-inch LCD, US 83-keys Keyboard, Optical mouse, 1U height, 4-pin USB B to 4-pin USB A cable 2 m, PS/2 Y-splitter cable 2m, 15-pin mini D-sub VGA cable 2 m, black	N8143-105F
		17inch LCD Console Drawer (1port) 17-inch LCD, US 103-keys Keyboard with 10-key, Touch pad with 3-button, 1U height, 4-pin USB B to 4-pin USB A cable 1.8 m, Two PS/2 cable 1.8 m, 15-pin mini D-sub VGA cable 1.8 m, black	N8143-108F
	Keypad	Keyboard Unit (JP) JP 108-keys Keyboard with 10-key for N8143-108F 17inch LCD Console Drawer (1port)	N8143-109
		Keyboard Unit (UK) UK 104-keys Keyboard with 10-key, for N8143-108F 17inch LCD Console Drawer (1port)	N8143-111

8.2 KVM Switch

Category		Product Name / Description	Part Number
KVM Switch		Server Switch Unit (8 server) 1U USB 8 port KVM switch, black	N8191-14F
Cable	KVM	Switch Unit Connection Cable Set (USB,1.8m) 1.8 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(1A)
		Switch Unit Connection Cable Set (USB,3m) 3 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(03)
		Switch Unit Connection Cable Set (USB,3m) 5 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(05)
Cascading		Switch Unit Connection Cable 1.8 m 1.8 m, 1 x 15-pin mini D-sub - 1x 15-pin mini D-Sub / 2x PS/2	K410-119(1A)

8.3 Flash FDD

Order the Flash FDD if you need to prepare an alternative for a floppy drive.

Product Name / Description	Part Number
Flash FDD USB flash emulating USB floppy disk, Native capacity 1.44 MB	N8160-96

8.4 Operating System

Red Hat® Enterprise Linux® 7.6 (x86_64) is supported on the R320g series. Purchase the OS and support service from a Red Hat reseller directly.

8.5 ft Server Control Software

Product Name / Description	Part Number
ft Server Control Software 11.1.6 for Red Hat Enterprise Linux 7.6	UL4349-00DE

NOTE:

- ft Server Control Software for Linux is not included in the base model. Be sure to order UL4349-00DE to install Red Hat Enterprise Linux 7.6 on R320g series.

8.6 Tower Conversion Kit

Product Name / Description	Part Number
Tower Conversion Kit 23 inch height pedestal with front bezel , for R320g-E4	N8843-005
Tower Conversion Kit 23 inch height pedestal with front bezel , for R320g-M4	N8843-006

8.7 Dust Proof Filter

The server supports the dust resistant feature. Choose the following kit to install the system in dusty places.

Category	Product Name / Description	Part Number
Filter	4U-FT Dust Filter For R320g Dust Proof filter 10 pcs, attachment brackets for the front bezel included	N8847-002

8.8 External Tape Drives

8.8.1 Tape Drive Selection

Refer to the section in accordance with your type of tape drives.

- LTO: Refer to 8.8.2
- RDX: Refer to 8.8.5

8.8.2 LTO / SAS

Category	Product Name / Description	Part Number
Controller Required	SAS Controller 1 x Broadcom SAS9300-8e 12Gb/s SAS, 8(SFF-8644), PCIe3.0(x8), Low Profile / Full Height	N8803-041
External Cable Required	External SAS cable 2 m, for Tape Drive Enclosure connection	K410-322(02)
Tape Enclosure Required	1U Device Expansion Unit 2 x 5-inch media bays	N8141-69F
Power Supply Recommended	Power Unit non-hot plug power supply	N8181-124F
Internal Cable	SAS Cable For 1U Device Expansion Unit internal connection	K410-335(00)
NOTE: - Required one per each tape drive.		
Drive 2 bays available	Internal LTO (SAS) LTO6, Half height, Native capacity 2.5 TB, black	N8151-129
	Internal LTO (SAS) LTO7, Half height, Native capacity 6 TB, black	N8151-136

8.8.3 Notes for Double Backup

In a single backup configuration, in case a CPU/IO module or backup device fails, backup is not possible until the failed part is repaired or replaced. If this does not meet your system requirements, consider a double backup configuration. Refer to the following notes on double backup configuration.

- When configuring two sets of a SAS controller, a SAS cable and a backup device, two backup devices are recognized separately by the OS. When scheduling an automatic backup job, make a job for each backup device so that the other backup device can backup in case one device fails.

8.8.4 Supported Backup Software

See the table below for the supported backup software on NEC EXPRESS5800/R320g.

Tape drive		Backup software
Product Name / Description	Part Number	NetVault 12.X
		RHEL7.6 or later
Internal LTO (SAS) LTO6, Half height, Native capacity 2.5 TB	N8151-129	Under evaluation
Internal LTO (SAS) LTO7, Half height, Native capacity 6 TB, black	N8151-136	Under evaluation

8.8.5 RDX

Category	Product Name / Description	Part Number
Internal Cable <i>Required</i>	Internal USB Cable 1 x Internal USB Cable for USB3.0	K410-349(00)
External Cable <i>Required</i>	External USB Cable 1.17 m, 1 x external USB3.0 to 1 x USB3.0 device, mount bracket included	K410-307(1A)
Tape Enclosure <i>Required</i>	1U Device Expansion Unit 2 x 5-inch media bays	N8141-69F
Power supply <i>Recommended</i>	Power Unit non-hot plug power supply	N8181-124F
Drive <i>Required</i>	Internal RDX (USB) RDX(USB), installed in N8141-69F 1U Device Expansion Unit	N8151-125

NOTE:

- Do not boot the OS from RDX. Remove the RDX from boot order or set the lowest priority on the BIOS setup menu.
- The eject button may be disabled when the OS is running.
- Refer to the User's guide of RDX for the supported file system.
- For backup software, NetVault 12 has been tested.
- Backup/restore by Linux standard commands has been tested.
- Please do not use RDX for other purposes than backup/restore.

8.9 RDX Cartridge

Product Name	Part Number
RDX Cartridge (500GB)	N8153-02
RDX Cartridge (1TB)	N8153-03
RDX Cartridge (2TB)	N8153-09
RDX Cartridge (3TB)	N8153-10
RDX Cartridge (4TB)	N8153-11

References

Server Management

The EXPRESSSCOPE Engine 3, integrated into the server, provides superior remote control and system management features listed in the table below.

Hardware monitoring	Temperature/voltage/power/fan	✓
	Hardware event log collection	✓
Boot monitoring	Booting, BIOS/POST stall, OS stall, shutdown	✓
Alerting	HW error, Boot error and OS panic (by SNMP, E-Mail)	✓
Remote KVM (via LAN)	POST/BIOS setup, ROM utility	✓
	Panic screen, Boot screen	✓
	Text-based screen (OS console)	✓
	GUI-based screen (OS console)	✓
Remote control (via LAN)	Remote reset/power on-off/ dump	✓
	OS shutdown	✓
	Remote media (CD/DVD/FD/USB Memory)	✓
	Server Management Command Line Protocol (DMTF compliant)	✓
	Remote control via Web browser (without dedicated app)	✓
	Scheduling (without UPS, but needed ESMPRO/SM)	✓
Others	Set automatic IP address via DNS/DHCP	✓
	LDAP/Active Directory Authentication/User Management	✓
	Synchronize clock time with host RTC	✓
	Access log collection	✓
Industry standard	IPMI	2.0

Supported PCI Cards and Installable Slots

R320g-E4

Part Number	Product Name	Slots		Notes
	Slot # :	#1	#2	
	PCI Slot:	X8	X8	
	Card height:	LP	LP	
	Slot type:	x8	x8	
N8804-012	1000BASE-T 2ch board kit	✓	✓	
N8804-013	10GBASE-T 2ch board set	✓	✓	Max. 1
N8803-040AF	Fibre Channel board kit	✓ ¹	✓ ¹	
N8803-041	SAS board	✓ ¹	✓ ¹	Max. 1

¹ Not installable when using Tower Conversion Kit.

R320g-M4

Part Number	Product Name	Slots				Notes
	Slot # :	#1	#2	#3	#4	
	PCI Slot:	X8	X8	X8	X8	
	Card height:	LP	LP	FH	FH	
	Slot type:	x8	x8	x8	x8	
N8804-012	1000BASE-T 2ch board kit	✓	✓	✓	✓	
N8804-013	10GBASE-T 2ch board set	-	-	✓	✓	Max. 1
N8803-040AF	Fibre Channel board kit	-	-	✓ ¹	✓ ¹	
N8803-041	SAS board	✓ ¹	✓ ¹	✓ ¹	✓ ¹	Max. 1

¹ Not installable when using Tower Conversion Kit.

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For hard drive capacity measurements, 1 GB = 1 billion bytes. Actual formatted capacity is less.

Revision History

Revision	Date	Description
1.0	Oct. 15/2019	Initial release