

# NEC Express5800/R320f Configuration Guide

## Windows 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

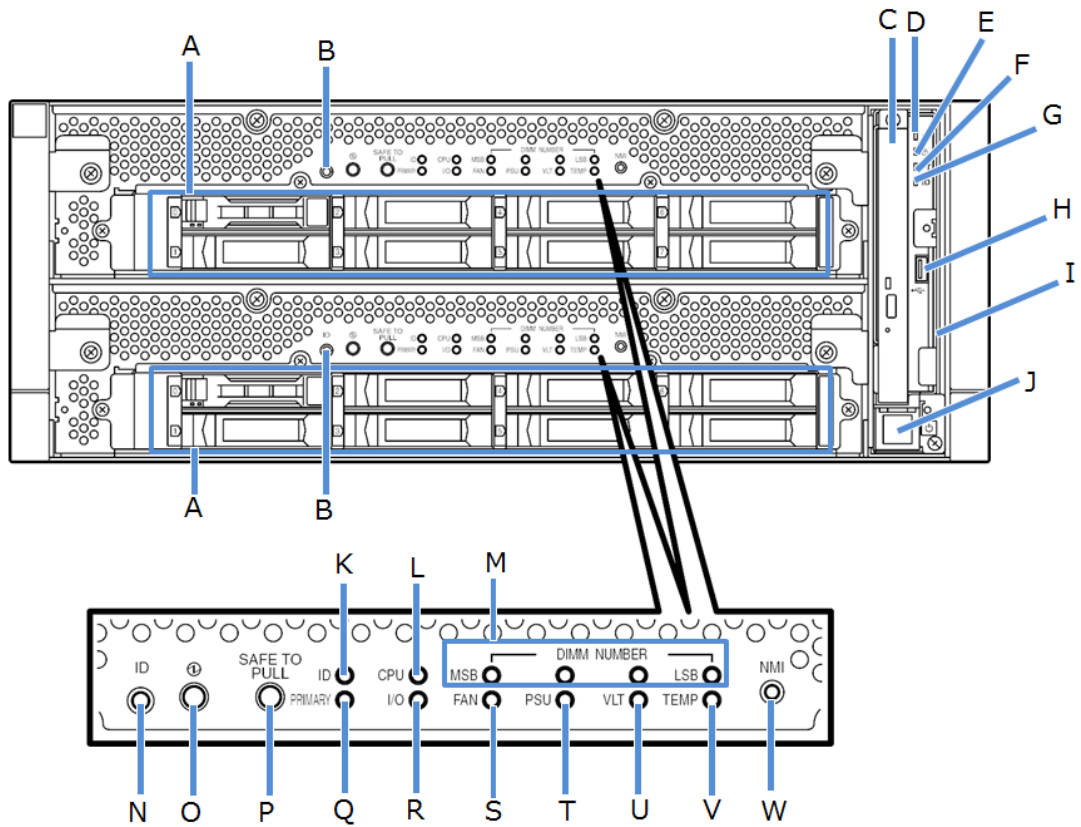
Model		R320f-E4	R320f-M4
<b>Part Number</b>		N8800-218F	N8800-219F
<b>Processor</b>	<b>Type</b>	Intel® Xeon® processor E5-2630 v4	Intel® Xeon® processor E5-2671 v4
	<b>Clock speed</b>	2.20 GHz	2.30 GHz
	<b>Logical Number of Processors</b>	1 or 2	
	<b>Cache</b>	25MB	35MB
	<b>Cores and Threads</b>	10C / 20T	14C / 28T
<b>Chipset</b>		Intel® C612 Chipset with GeminiEngine™	
<b>Memory</b>	<b>Type</b>	DDR4-2400 Registered DIMM (8/16/32 GB DIMM)	
	<b>Memory Clock</b>	2133 MHz	
	<b>Logical Standard Capacity</b>	0 GB	
	<b>Logical Maximum Capacity</b>	512GB (16 x 32 GB)	
	<b>Memory protection</b>	ECC, x4 SDDC	
<b>Internal Storage</b>	<b>Standard Capacity</b>	0GB	
	<b>Maximum Logical Capacity</b>	HDD : SAS 9.6 TB (8x 1.2TB) SSD : SAS 1.6 TB (8x 200GB)	
	<b>Disk Controller</b>	SAS: 12Gb/s (Standard)	
	<b>RAID</b>	SAS : RAID 1 (Standard)	
	<b>Hot Plug</b>	Supported	
	<b>Optical Disk Drive</b>	DVD Super Multi drive (Standard) <sup>1</sup>	
	<b>Optical Drive Bays</b>	1	
	<b>Logical Disk Drive Bays</b>	8	
<b>Expansion Slots</b>		Total: 2 slots available 2 PCIe 3.0 x4 (x8 connector)	Total: 4 slots available 4 PCIe 3.0 x8 (x8 connector) 2 PCIe 3.0 x4 (x8 connector)
<b>Video</b>	<b>Controller (VRAM)</b>	Integrated in Server Management Controller (32MB)	
	<b>Resolution / Color Supported</b>	800 x 600, 1024 x 768, 1280 x 1024, 1,600x1,200/ 16.7M	
<b>Interfaces</b>		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)
<b>Server Management</b>		EXPRESSSCOPE Engine 3	
<b>Power Supply</b>		2 x 800 Watt (1 per module, 80 PLUS® Platinum certified) 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz	
<b>Power Consumption</b>	<b>(Max. Config, Operating)</b>	1,430 VA / 1,420 Watt	
<b>Dimensions (W x D x H)</b>		483.0 x 734.0 x 176 mm / 19.0 x 29.0 x 7.0 in (4U)	
<b>Weight (Minimum / Maximum)</b>		45 kg / 51 kg, 99.21 lbs. / 112.44 lbs.	
<b>Temperature, Relative Humidity (non-condensing)</b>		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%	
<b>Regulatory and Safety</b>		FCC, CE, BSMI, CCC, UL, CB, RoHS	
<b>Operating Systems</b>		Microsoft® Windows Server® 2016 Standard Microsoft® Windows Server® 2016 Datacenter Microsoft® Windows Server® 2012 R2 Standard Microsoft® Windows Server® 2012 R2 Datacenter	

<sup>1</sup> Writing software is not provided for this DVD drive.

# External Views

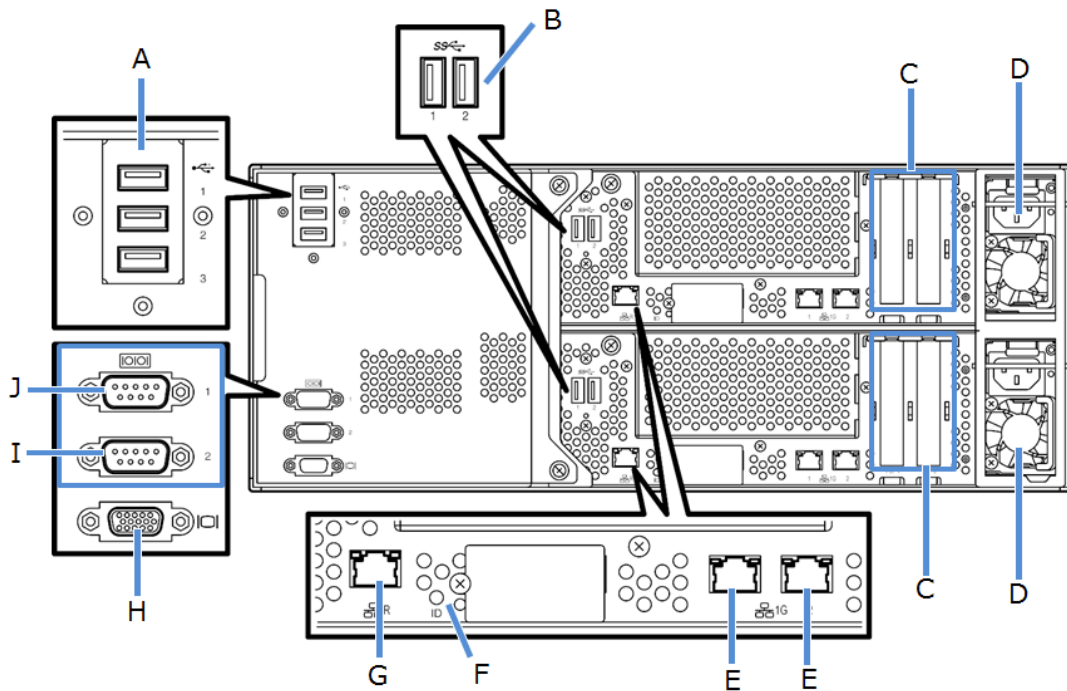
## Front and Rear Views

### 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

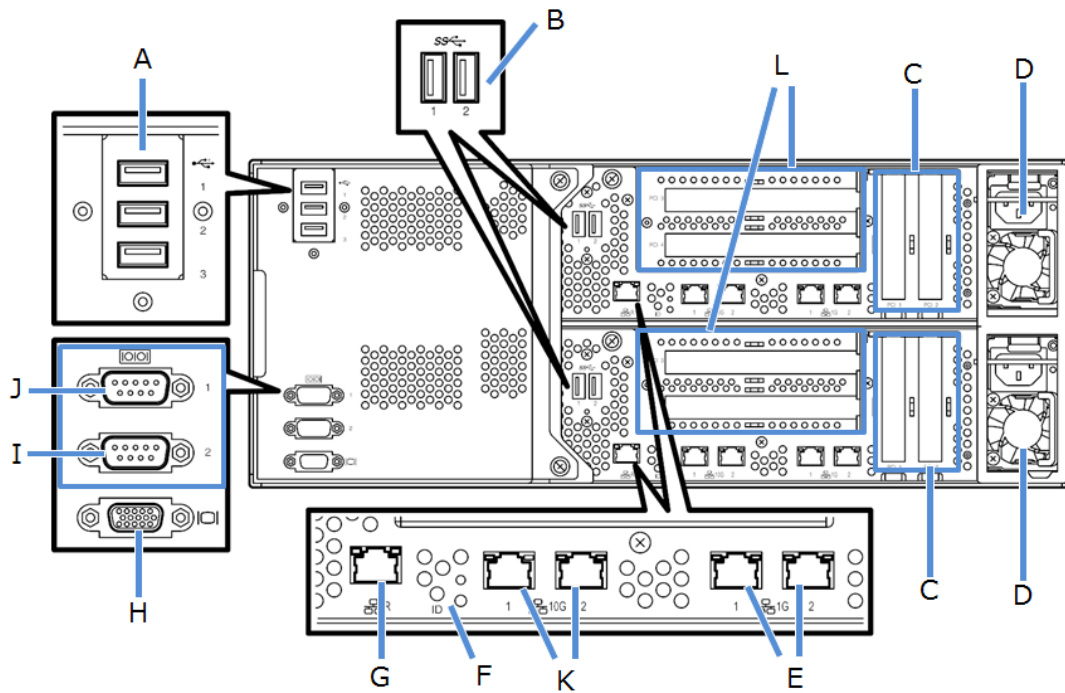
Rear View for R320f-E4



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 <sup>1</sup>
E.	Data LAN Connector	J.	Serial Port Connector 1 <sup>1</sup>

<sup>1</sup> For service personnel only.

Rear View for R320f-M4

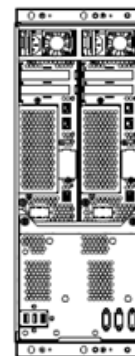
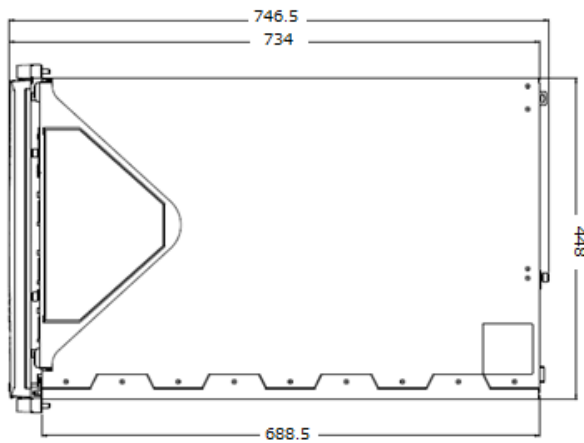
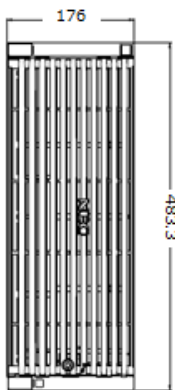
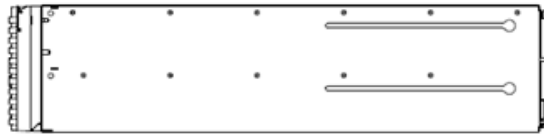
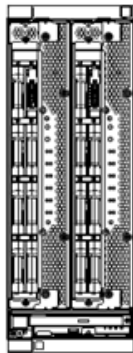


Legend			
A.	USB Connectors	G.	Management LAN Connector
B.	USB Connectors (option, for backup use)	H.	VGA Connector
C.	PCI Slots (Low-Profile)	I.	Serial Port Connector 2 <sup>1</sup>
D.	Power supply unit	J.	Serial Port Connector 1 <sup>1</sup>
E.	Data LAN Connector	K.	Data LAN Connector (10GBase-T)
F.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

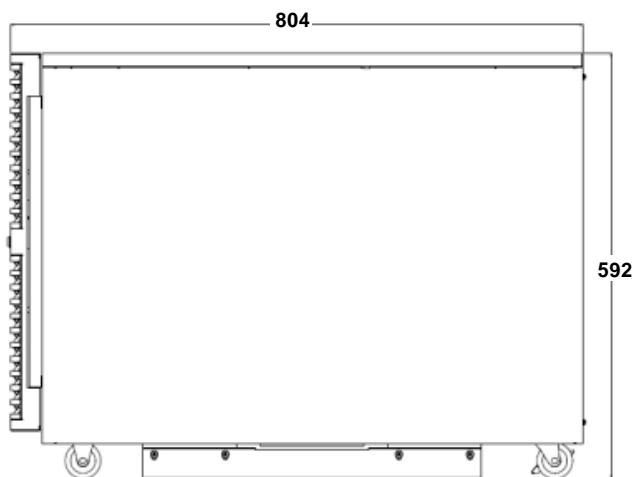
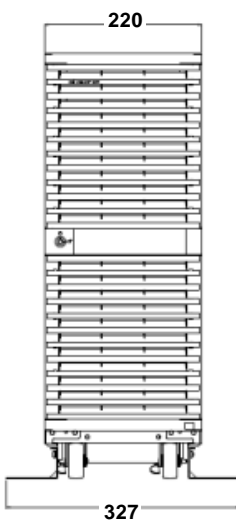
<sup>1</sup> For service personnel only.

## Dimensions (mm)

### Rack mount

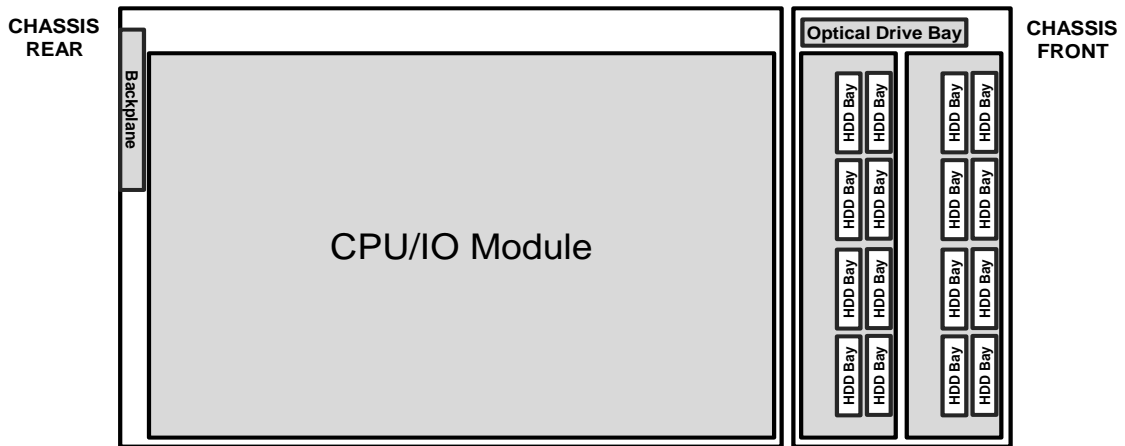


### Tower Conversion (Optional)



# Configuration Diagram

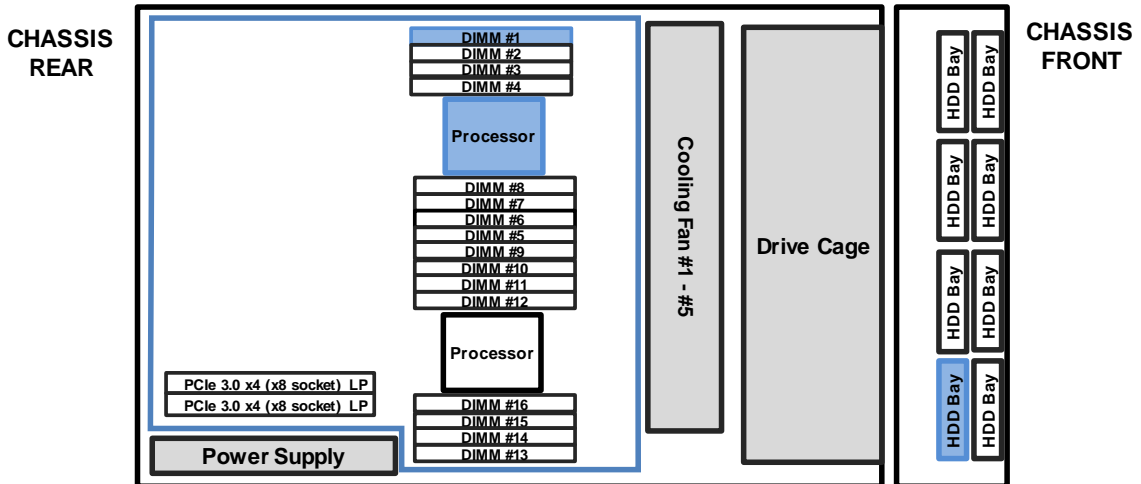
## Server



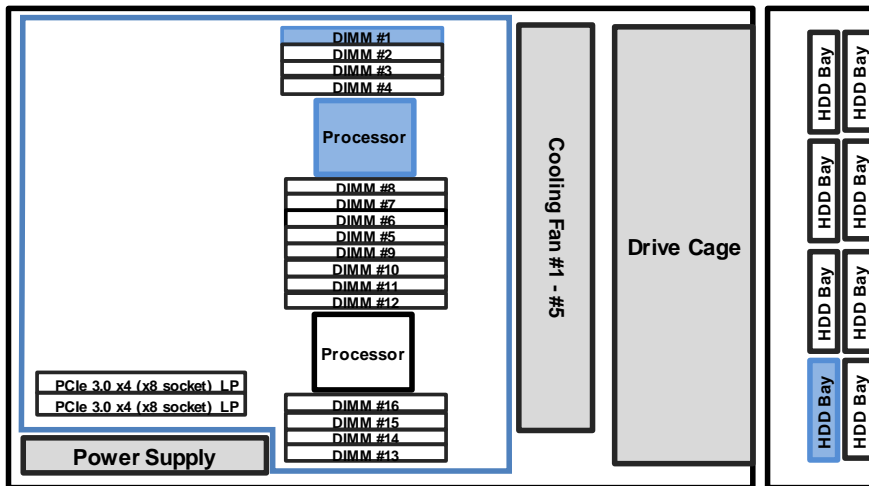
## CPU/IO Module

### R320f-E4

CPU/IO module #0 :



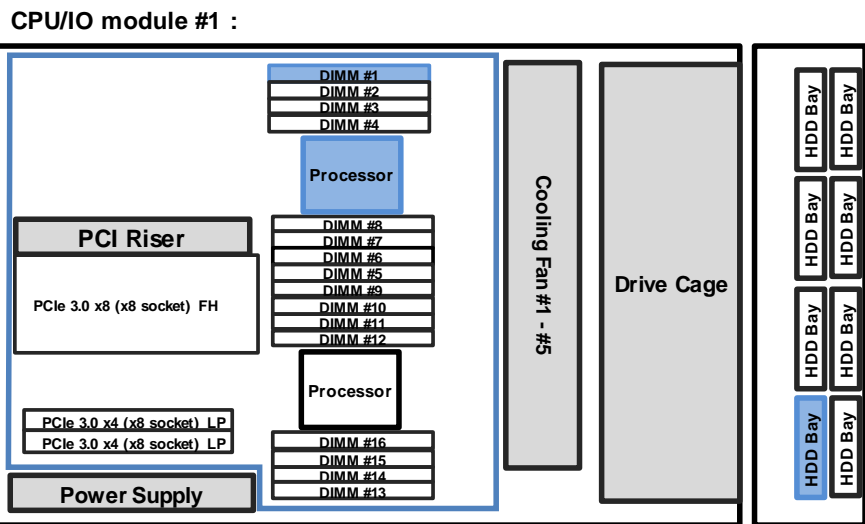
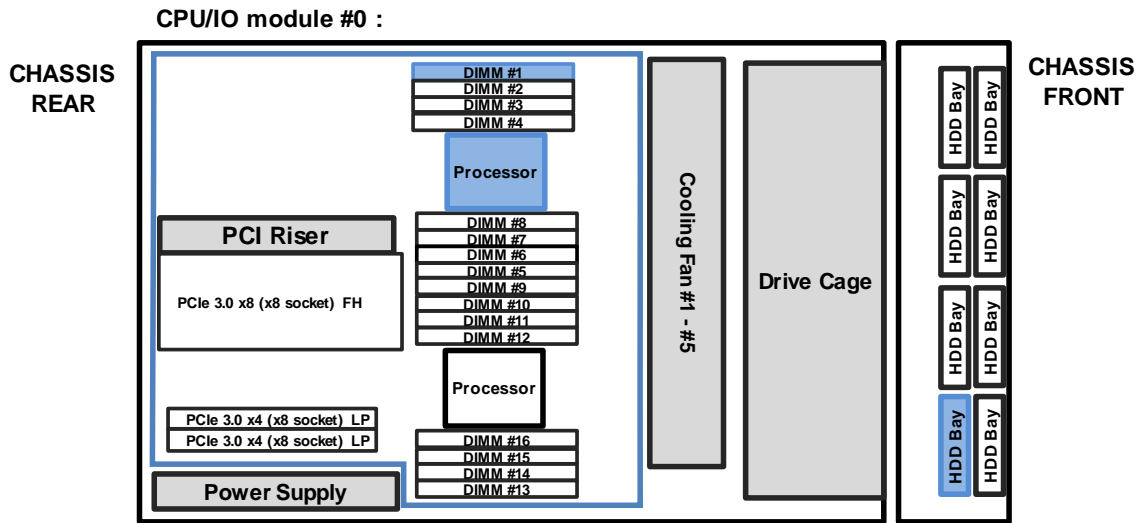
CPU/IO module #1 :



Legend:  Mandatory components  Standard components



R320f-M4



Legend:  Mandatory components  Standard components

# Server Configuration

## 1 Base Models

Product Name / Description	Part Number
<b>Express5800/R320f-E4(10C/E5-2630v4)</b> no RAM, no 2.5-inch HDD Including: Intel Xeon Processor E5-2630 v4, 1 x DVD Super Multi, EXPRESSBUILDER DVD	N8800-218F
<b>Express5800/R320f-M4(14C/E5-2671v4)</b> no RAM, no 2.5-inch HDD Including: Intel Xeon Processor E5-2671 v4, 1 x DVD Super Multi, EXPRESSBUILDER DVD	N8800-219F

## 2 2nd Processor

Available logical sockets: 1

Product Name / Description	Part Number
<b>Xeon E5-2630v4 Processor Kit : 2.20 GHz / 10C-20T / 25 MB, 2 processors included</b>	N8801-050
<b>Xeon E5-2671v4 Processor Kit : 2.30 GHz / 14C-28T / 35 MB, 2 processors included</b>	N8801-051

**NOTE:**

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

## 3 Memory

Available logical slots: 8 per processor

Product Name / Description	Part Number
<b>8GB DDR4-2400 REG Memory Kit : 2 x 1 x 8GB DIMM included</b>	N8802-066
<b>64GB DDR4-2400 REG Memory Kit : 2 x 4 x 16GB DIMM included</b>	N8802-067
<b>128GB DDR4-2400 REG Memory Kit : 2 x 4 x 32GB DIMM included</b>	N8802-068

**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		
		8GB	64GB	128GB
1	8GB <sup>1</sup>	1	-	-
	16GB	2	-	-
	24GB	3	-	-
	32GB	4	-	-
	48GB	6	-	-
	64GB	8	-	-
			-	1
	96GB	4	1	-
	128GB	-	2	-
			-	1
2	8GB <sup>1</sup>	1	-	-
	16GB <sup>1</sup>	2	-	-
	24GB <sup>1</sup>	3	-	-
	32GB	4	-	-
	48GB	6	-	-
	64GB	8	-	-
	96GB	12	-	-
	128GB	16	-	-
			-	2
	256GB	-	4	-
		-	2	
	512GB	-	-	4

<sup>1</sup> 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)	200GB Hot Plug 2.5-inch SSD: 1 x 200GB	N8850-067

**NOTE:**

- Hard drives must be installed in identical pairs to configure RAID 1.
- Storage pool and Thin Provisioning are not supported on Windows Operating System.

### Required System Disk Capacity

See the table below for minimum required system disk capacity to store whole memory dump data.

It is recommended to install hard drives providing the minimum required system disk capacity to reduce the time to resynchronize after a hard drive replacement. (same for Windows Server® 2012 R2/ Windows Server® 2016)

Memory Size	Required System Disk Capacity	
	HDD	SSD
Up to 48GB	300GB	200GB
64GB		Not supported
96GB	600GB	
128GB	900GB	
256GB to 512GB	1.2TB	

### Notes for BTO with SSD

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

- When the memory size is 64GB or more, system disk capacity should be at least 300GB. In that case, BTO with SSD is not possible. If you want to use 200GB SSD as data disk in such a system, order the 200GB SSD separately and install it later.

### Cautions for using the RDR function

- When setting RDR in the ft control software version 11.2.xxxx, there are cases a RAW volume is created with the size of 1MB. There is no problem with deleting that volume. Refer to Chapter 1 (4. Setting Up Windows Server 2012 R2) (4.10 Creating Volume) in Installation Guide (Windows).

### Configuration of Dynamic disk

A disk installed OS must not be configured as Dynamic disk. Please use as Basic disk. A disk not installed OS (means a disk saved user data) can support Dynamic disk.

- If a mirrored volume (RAID-1) or RAID-5 volume is built on a dynamic disk, the System FT LED and Safe To Pull LED indicating the status of the ft server may not be displayed correctly, and information of duplex and simplex status of the PCI module may not be output to the event log properly. If you are going to use a dynamic disk, convert only a data disk to a dynamic disk and build as a simple volume, spanned volume, or striped volume.
- Volumes on the dynamic disk can't be moved to another system because RDR setting don't be taken over. Please backup volumes on the dynamic disk before you re-install the OS. After you re-install the OS, convert a data disk with RDR setting to a dynamic disk and restore volumes.

## 5 Optical Drive

Available bays: 1

Product Name / Description	Part Number
<b>Internal DVD Super Multi Drive</b> 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	<b>100BASE-T 2ch board kit : 2 x GbE NIC</b> Intel® Ethernet Server Adapter I350-T2V2	N8804-012
	<b>10GBASE-T 1ch Adapter Kit : 2 x 10GbE NIC</b> Intel® X540-T1	N8804-011
<b>NOTE:</b>		
- Up to one controller per module		
- FCoE functionality is not supported		

**NOTE:**

- <For Microsoft® Windows Server® 2016 Standard / Datacenter>  
Be sure to use **NIC teaming feature (LBFO)** supported by Windows Server 2016.  
<For Microsoft® Windows Server® 2012 R2 Standard / Datacenter>  
Be sure to use **Intel PROset** for network teaming. Do not use Windows Server 2012 R2 NIC Teaming (LBFO) since it may cause system trouble.
- For iSCSI (data) connection, NEC Storage M11e, M110, M310 are supported. For NEC Storage, contact your sales representative or refer to the NEC Storage WEB site. (<http://www.nec.com/global/prod/storage/>)

### 6.2 Fibre Channel / SAS Controller

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

**NOTE:**

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- For supported NEC Storage products to connect with N8803-040F, 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	<b>17-inch LCD Console Drawer (8port)</b> 17-inch LCD, US 83-keys Keyboard, Optical mouse, 8 port KVM switch, 1U height, black	N8143-106F
	Cable	<b>Switch Unit Connection Cable Set (USB, 1.8m)</b> 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)
		<b>Switch Unit Connection Cable Set (USB, 3m)</b> 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)
		<b>Switch Unit Connection Cable Set (USB, 5m)</b> 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	<b>17inch LCD Console Unit 1U</b> 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
		<b>17inch LCD Console Drawer (1port)</b> 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	<b>Keyboard Unit (JP)</b> JP 108-keys Keyboard with 10-key for N8143-108F 17inch LCD Console Drawer (1port)	N8143-109
		<b>Keyboard Unit (UK)</b> 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	<b>Server Switch Unit (8 server)</b> 1U USB 8 port KVM switch, black	N8191-14F	
Cable	KVM	<b>Switch Unit Connection Cable Set (USB,1.8m)</b> 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)
		<b>Switch Unit Connection Cable Set (USB,3m)</b> 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)
		<b>Switch Unit Connection Cable Set (USB,3m)</b> 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	<b>Switch Unit Connection Cable 1.8 m</b> 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
<b>Flash FDD</b> USB flash emulating USB floppy disk, Native capacity 1.44 MB	N8160-96

## 8.4 Tower Conversion Kit

Product Name / Description	Part Number
<b>Tower Conversion Kit</b> 23 inch height pedestal with front bezel	N8843-005

## 8.5 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
<b>Filter</b>	<b>4U-FT Dust Filter</b> For R320e Dust Proof filter 10 pcs, attachment brackets for the front bezel included	N8847-002

## 8.6 External Tape Drives

### 8.6.1 Tape Drive Selection

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

- LTO: Refer to [8.6.2](#)
- RDX: Refer to [8.6.5](#)

### 8.6.2 LTO / SAS

Category	Product Name / Description	Part Number
<b>Controller Required</b>	<b>SAS Controller</b> 1 x Broadcom SAS9300-8e 12Gb/s SAS, 8(SFF-8644), PCIe3.0(x8), Low Profile / Full Height	N8803-041
<b>External Cable Required</b>	<b>External SAS cable</b> 2 m, for Tape Drive Enclosure connection	K410-322(02)
<b>Tape Enclosure Required</b>	<b>1U Device Expansion Unit</b> 2 x 5-inch media bays	N8141-69F
<b>Power Supply Recommended</b>	<b>Power Unit</b> non-hot plug power supply	N8181-124F
<b>Internal Cable</b>	<b>SAS Cable</b> For 1U Device Expansion Unit internal connection <b>NOTE:</b> - Required one per each tape drive.	K410-335(00)
<b>Drive</b> 2 bays available	<b>Internal LTO (SAS)</b> LTO4, Half height, Native capacity 800GB, black	N8151-127
	<b>Internal LTO (SAS)</b> LTO5, Half height, Native capacity 1500GB, black	N8151-128
	<b>Internal LTO (SAS)</b> LTO6, Half height, Native capacity 2.5 TB, black	N8151-129
	<b>Internal LTO (SAS)</b> LTO7, Half height, Native capacity 6 TB, black	N8151-136

### 8.6.3 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.
- With BrightStor ARCserve Backup, backup is not executed if you enter an asterisk (\*) in the group box under the destination tab when defining a job. Be sure to create two backup jobs by correctly selecting the device group for the group box, and entering an asterisk (\*) or the name of the media in the media box.

### 8.6.4 Supported Backup Software

See the table below for the supported backup software on NEC Express5800 fault tolerant servers.

#### For Microsoft® Windows Server® 2016 Standard / Datacenter

Tape drive		Backup software		
Part Number	Description	Arcserve	BackupExec	NetVault
		Arcserve r17.5	BackupExec 16	NetVault 11.X
		Windows Server 2016	Windows Server 2016	Windows Server 2016
N8151-127	Internal LTO4	✓ *a1	✓ *b1	RPQ
N8151-128	Internal LTO5	✓ *a1	✓ *b1	RPQ
N8151-129	Internal LTO6	✓ *a1	✓ *b1	RPQ
N8151-136	Internal LTO7	✓ *a1	✓ *b1	RPQ

\*a1: Do not disable the tape driver on the device manager.

\*b1: Apply the device driver provided with tape drive

**NOTE:**

- Disaster Recovery Option is not supported on the ft server system.

#### For Microsoft® Windows Server® 2012 R2 Standard / Datacenter

Tape drive		Backup software		
Part Number	Description	Arcserve	Arcserve	Backup Exec
		Arcserve r16.5	Arcserve r17	Backup Exec 15
		WS2012 R2	WS2012 R2	WS2012 R2
N8151-127	Internal LTO 4	✓ *a1	TBC	✓
N8151-128	Internal LTO5	✓ *a1	TBC	✓
N8151-129	Internal LTO6	✓ *a1	✓ *a1	✓
N8151-136	Internal LTO7	-	✓ *a1	✓

\*a1: Do not disable the tape driver on the device manager.

**NOTE:**

- Disaster Recovery Option is not supported on the ft server system.

### 8.6.5 RDX

Category	Product Name / Description	Part Number
<b>Internal Cable</b> <i>Required</i>	<b>Internal USB Cable</b> 1 x Internal USB Cable for USB3.0	K410-349(00)
<b>External Cable</b> <i>Required</i>	<b>External USB Cable</b> 1.17 m, 1 x external USB3.0 to 1 x USB3.0 device, mount bracket included	K410-307(1A)
<b>Tape Enclosure</b> <i>Required</i>	<b>1U Device Expansion Unit</b> 2 x 5-inch media bays	N8141-69F
<b>Power supply</b> <i>Recommended</i>	<b>Power Unit</b> non-hot plug power supply	N8181-124F
<b>Drive</b> <i>Required</i>	<b>Internal RDX (USB)</b> 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.
- NTFS is recommended as the file system. exFAT is not supported.
- For backup software, use Windows Server Backup, Arcserve Backup or Backup Exec.
- Please do not access RDX from the OS directly, since RDX connection is not duplicated. Be sure to use backup software.



## 8.7 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

# References

## Server Management

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

<b>Hardware monitoring</b>	Temperature/voltage/power/ fan /degeneration (memory/hard drive)	✓
	Hardware event log collection	✓
<b>Boot monitoring</b>	Booting, BIOS/POST stall, OS stall, shutdown	✓
<b>Alerting</b>	HW error, Boot error and OS panic (by SNMP, E-Mail)	✓
<b>Remote KVM (via LAN)</b>	POST/BIOS setup, DOS utility	✓
	Panic screen, Boot screen	✓
	Text-based screen (OS console)	✓
	GUI-based screen (OS console)	✓
<b>Remote control (via LAN)</b>	Remote reset/power on-off/ dump	✓
	OS shutdown	✓
	Remote media (CD/DVD/FD)	✓
	Server Management Command Line Protocol (DMTF compliant)	✓
	Remote control via Web browser (without dedicated app)	✓
	Remote batch	✓
	Scheduling (without UPS)	✓
<b>Others</b>	Set automatic IP address via DNS/DHCP	✓
<b>Remote wakeup</b>	Wake On LAN, Wake On Ring	✓
<b>Centralized management</b>	Monitoring and control of multiple servers	✓
<b>Industry standard</b>	IPMI	2.0

## Supported PCI Cards and Installable Slots

### R320f-E4

Part Number	Product Name	Slots		Notes
	Slot # :	#1	#2	
	PCI Slot:	x4	x4	
	Card height:	LP	LP	
	Slot type:	x8	x8	
N8804-012	1000BASE-T 2ch board kit	✓	✓	
N8804-011	10GBASE-T 1ch board set	✓	✓	Max. 1
N8803-040AF	Fibre Channel board kit	✓ <sup>1</sup>	✓ <sup>1</sup>	
N8803-041	SAS board	✓ <sup>1</sup>	✓ <sup>1</sup>	Max. 1

<sup>1</sup> Not installable when using Tower Conversion Kit.

### R320f-M4

Part Number	Product Name	Slots				Notes
	Slot # :	#1	#2	#3	#4	
	PCI Slot:	x4	x4	X8	X8	
	Card height:	LP	LP	FH	FH	
	Slot type:	x8	x8	x8	x8	
N8804-012	1000BASE-T 2ch board kit	✓	✓	✓	✓	
N8804-011	10GBASE-T 1ch board set	-	-	✓	✓	Max. 1
N8803-040AF	Fibre Channel board kit	-	-	✓ <sup>1</sup>	✓ <sup>1</sup>	
N8803-041	SAS board	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	Max. 1

<sup>1</sup> Not installable when using Tower Conversion Kit.

## Notes for using Hyper-V

### Brief system interruption during synchronization process

In the synchronization process of CPU modules, a memory copy is performed to duplex memory on both CPU modules. Most of the memory area can be copied without interrupting the system through the so-called brownout copy method, and just a small portion requires the system to stop. However, with Hyper-V, the system cannot use the brownout copy method. Therefore, the system does not respond for a longer period of time during the synchronization process of the CPU modules than without Hyper-V. See the table below for the reference values of interruption during re-synchronization of CPU/IO modules in a Hyper-V system. It is recommended that your system design take the interruption into account.

Model / Memory Size	8GB	16GB	32GB	64GB	128GB	256GB	512GB
Express5800/R320f-E4	2sec	3sec	5sec	8sec	16sec	30sec	60sec
Express5800/R320f-M4	2sec	3sec	3sec	7sec	10sec	18sec	27sec

### Backup

When using Hyper-V on a FT server, prepare a separate server for backup in the same way as for other general purpose servers with Hyper-V. For backup patterns, refer to each backup software company's web site.

### NEC ESMPRO Agent

For monitoring guest operating systems, NEC ESMPRO Agent for Guest OS is required. Contact your sales representative for this software.

## About Windows Server License Count on ft Server

### License definition (Windows Server 2012 R2 downgrade from Windows Server 2016)

The basic way to understand Windows Server license definition of ft Server is not different from that of a general server. When invoking downgrade rights, the license definition is based on Windows Server 2016. It should be noted that licenses on ft Server are counted based on the number of physical cores, but when OS of OEM version is used, licenses are counted based on the number of cores mounted in one system on ft Server.

Attention is required, on the other hand, in the case with OS (such as PKG version and VL version) other than OEM version, the above special rule of core counting on one system is not applied.

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The system of counting server license transitioned from "CPU-based license" to "CPU core-based license".

If the configuration is within 2 CPUs with 16 cores, the rule of counting licenses are the same as before, however, if it exceeds 2 CPUs with 16 cores, the rule differs from before.

### License definition (Windows Server 2016)

The basic way to understand Windows Server 2016 license definition of ft Server is not different from that of a general server. It should be noted that licenses on ft Server are counted based on the number of physical cores, but when OS of OEM version is used, licenses are counted based on the number of cores mounted in one system on ft Server.

Attention is required, on the other hand, in the case with OS (such as PKG version and VL version) other than OEM version, the above special rule of core counting on one system is not applied.

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Same as the conventional systems, "Server License" and "Client Access License (CAL)" are required. To use Windows Server 2016 server, CAL of Windows Server 2016 is necessary (old CAL such as that of Windows Server 2012 cannot be applied, therefore, CAL of Windows Server 2016 should be purchased).

The system of counting server license transitioned from "CPU-based license" to "CPU core-based license". If the configuration is within 2 CPUs with 16 cores, the rule of counting licenses are the same as before, however, if it exceeds 2 CPUs with 16 cores, the rule differs from before.

#### <Three rules>

1. **All physical cores in the server are required to be licensed.**
2. **Each physical processor is required to be licensed with a minimum of 8 physical cores.**
3. **Each physical server is required to be licensed with a minimum of 16 physical cores.**

[Ex.1] 10cores R320f-E4, 1CPU → OEM version: 10 cores mounted on one system,  
but 16 core licenses are required according to the rule 3.  
other than OEM version: 20 core licenses are required for the cores mounted on both systems.

[Ex.2] 10cores R320f-E4, 2CPUs → OEM version: 20 core licenses are required for the cores mounted on one system.  
other than OEM version: 40 core licenses are required for the cores mounted on both systems.

[Ex.3] 14 cores R320f-M4, 2CPUs → OEM version: 28 core licenses are required for the cores mounted on one system.  
other than OEM version: 56 core licenses are required for the cores mounted on both systems.

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

## Revision History

Revision	Date	Description
2.0	April 20, 2018	Windows server 2012 R2 support
1.0	August 8, 2017	Initial release