

NEC Express5800/R120g-2E

Configuration Guide

Storage-Rich 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.

Contents

TECHNICAL SPECIFICATION	3
Key Features.....	3
Specification.....	3
EXTERNAL VIEWS	7
Front and Rear Views	7
Dimensions (mm).....	11
CONFIGURATION DIAGRAM	12
EXPANSION SLOT	13
SERVER CONFIGURATION	14
1 Base Models.....	14
2 Processors and Heat Sink	14
2.1 For 2.5-inch Drive Model.....	14
2.2 For 3.5-inch Drive Model.....	15
3 Memory	16
3.1 Memory Configuration.....	16
4 Internal Hard Disk Drives	19
4.1 RAID Configuration	19
4.2 Internal Drive Configuration for 2.5-inch Drive Model.....	21
4.3 Supported HDD/SDD	24
5 2.5-inch PCIe SSD	27
5.1 2.5-inch PCIeSSD Installation Kit	27
5.2 PCIe SSD.....	27
6 Optical Drive.....	28
7 PCI Card.....	28
7.1 Network Interface Controller	28
7.2 InfiniBand	30
7.3 External Storage Controller	30
7.4 Serial Port Adapter.....	31
8 Other Add-in Components	32
8.1 Redundant Power Supply Module	32
8.2 Redundant Fan Kit.....	32
8.3 Trusted Platform Module Kit	32
8.4 Internal Flash Memory	32
8.5 Flash FDD.....	32
9 Add-on Components	33
9.1 17-inch LCD Console Drawer	33
9.2 KVM Switch.....	33
9.3 Cable Management Arm	34
9.4 Server Management License.....	34
REFERENCES.....	35
Boot Mode Setting	35
Server Management	36
Endurance of SSD.....	37
OS Support Matrix for PCI Cards and Embedded Controller	38
Supported PCI Cards and Installable Slots	39
Copyright Notice and Liability Disclaimer.....	40

Technical Specification

Key Features

- High performance with the latest Intel® Xeon® processor E5-2600 v4 product family
- Up to 512 GB of memory capacity, supporting high speed and energy efficient DDR4-2
- Up to 26 x 2.5-inch hard drives or twelve 3.5-inch hard drives plus two 2.5-inch hard drives
- High energy efficiency with power capping feature and 80 PLUS® Platinum power supply
- Full manageability by integrated EXPRESSSCOPE Engine 3

Specification

2.5-inch Drive Model

Model		R120g-2E		
Part Number		N8100-2468F		
Processor	Type	Intel® Xeon® processor E5-2620 v4	Intel® Xeon® processor E5-2630 v4	Intel® Xeon® processor E5-2650 v4
	Clock speed	2.10 GHz	2.20 GHz	2.20 GHz
	Number of Processors	1 to 2		
	Cache	20 MB	25 MB	30 MB
	Cores and Threads	8C-16T	10C-20T	12C-24T
Chipset		Intel® C612 Chipset		
Memory	Type	DDR4-2400 Registered DIMM (4/8/16/32GB)		
	Standard Capacity	0 GB		
	Maximum Capacity	1 TB (16 x 64 GB)		
	Memory protection	ECC, x4 SDDC, Memory Mirroring, Memory Lockstep, Memory Sparring		
Internal Storage	Standard Capacity	0 GB		
	Maximum Capacity	SAS HDD : 46.8 TB (26 x 1.8 TB) SATA HDD : 52 TB (26 x 2 TB) SAS SSD : 10.4 TB (26 x 400 GB) SATA SSD : 41.6 TB (26 x 1.6 TB)		
	Disk Controller	SATA: 6Gb/s (Integrated) SAS: 12Gb/s (Optional)		
	RAID	SATA : RAID 0/1/10 (Optional), RAID 5/6/50/60 (Optional) SAS : RAID 0/1/5/6/10/50/60 (Optional)		
	Hot Plug	Supported		
	Optical Disk Drive	Optional		
	Optical Drive Bays	0		
	3.5-inch Media Bays	0		
	Disk Drive Bays	26 ¹		
	Expansion Slots	Standard	Total: 5 slots available 2 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x8 (x8 connector) 1 PCIe 3.0 x8 (x8 connector) (Dual processor configuration only) 1 PCIe 2.0 x4 (x8 connector)	
Controller (VRAM)		Integrated in Server Management Controller (32MB)		
Resolution / Color		1600 x 1200 / 16.7M ²		
Interfaces		1 x VGA (15-pin mini D-sub, 1 x rear)		
		5 x USB3.0 (2 x front, 2 x rear, 1 x internal)		
	3 x USB2.0 (2 x rear, 1 x internal)			

CONFIGURATION GUIDE – NEC Express5800/R120g-2E Storage-Rich

Model		R120g-2E		
		1 to 2 x Serial (9-pin mini D-sub, RS232-C, 1 to 2 x rear) 2 x 1000BASE-T LAN connector (RJ-45, 2 x rear) 1 x Management LAN connector (RJ-45, 1 x rear)		
Server Management		EXPRESSSCOPE Engine 3		
Redundant Fan		Optional, hot plug		
Redundant Power Supply		Optional, hot plug		
Power Supply		1 to 2 x 800 Watt or 1000 Watt 80 PLUS® Platinum certified hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz, or		
Power Consumption	Max. Config, Idling	349 VA / 347 Watt	350 VA / 348 Watt	352 VA / 350 Watt
	Max. Config, Operating	755 VA / 750 Watt	813 VA / 807 Watt	893 VA / 886 Watt
Acoustic Noise (Sound Pressure Level)³	Max. Config, Idling	53.0dB	53.0dB	53.0dB
	Max. Config, Operating	61.1 dB	62.0 dB	64.2 dB
Dimensions (W x D x H)		448.0 x 683.8 x 87.2 mm / 17.6 x 26.9 x 3.4 in (2U)		
Weight (Minimum / Maximum)		18 kg / 30 kg, 39.68 lbs. / 66.14 lbs.		
Temperature, Relative Humidity (non-condensing)		Operating: 5° to 40° C ⁴ / 41° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%		
Regulatory and Safety		FCC, UL, CB, CE, BSMI, UL(Mexico), CCC, RCM, RoHS, WEEE		
Operating Systems		Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Microsoft® Windows Server® 2012 R2 Standard Microsoft® Windows Server® 2012 R2 Datacenter Microsoft® Windows Server® 2016 Standard Microsoft® Windows Server® 2016 Datacenter Red Hat Enterprise Linux 6.7 or later (x86_64) ⁵ Red Hat Enterprise Linux 7.2 or later ⁵ VMware ESXi™ 5.5 Update 3 VMware ESXi™ 6.0 Update 1 VMware ESXi™ 6.5		

- ¹ An optional drive cage is required to install more than 24 hard drives.
- ² Maximum resolution available via EXPRESSSCOPE Engine 3 remote console is 1280 x 1024 / 65K colors.
- ³ Noise emission was measured in accordance with ISO 7779. The actual value may vary by the operating environment.
- ⁴ Operable up to 35°C (95°F) when N8181-126 Redundant Fan Kit is installed and any of N8150-541/-483/-486/-518 SAS HDD is installed in the rear HDD cage.
- ⁵ For Linux support, contact our sales representative or go to the NEC website at: <http://www.nec.com/global/prod/express/linux/index.html>

3.5-inch Drive Model

Model		R120g-2E		
Part Number		N8100-2470F		
Processor	Type	Intel® Xeon® processor E5-2603 v4	Intel® Xeon® processor E5-2620 v4	Intel® Xeon® processor E5-2630 v4
	Clock speed	1.70 GHz	2.10 GHz	2.20 GHz
	Number of Processors	1 to 2		
	Cache	15 MB	20 MB	25 MB
	Cores and Threads	6C-6T	8C-16T	10C-20T
Chipset		Intel® C612 Chipset		
Memory	Type	DDR4-2400 Registered DIMM (4/8/16/32GB)		
	Standard Capacity	0 GB		
	Maximum Capacity	1 TB (16 x 64 GB)		
	Memory protection	ECC, x4 SDDC, Memory Mirroring, Memory Lockstep, Memory Sparring		
Internal Storage	Standard Capacity	0 GB		
	Maximum Capacity	SATA HDD : 120 TB (12 x 10 TB) plus 2.5-inch SATA: 4 TB (2 x 2 TB) 2.5-inch SAS: 3.6 TB (2 x 1.8 TB) 2.5-inch SATA SSD: 3.2 TB (2 x 1.6 TB) 2.5-inch SAS SSD: 800 GB (2 x 400 GB)		
	Disk Controller	SATA: 6Gb/s (Integrated) SAS: 12Gb/s (Optional)		
	RAID	SATA : RAID 0/1/10 (Optional), RAID 5/6/50/60 (Optional) SAS : RAID 0/1/5/6/10/50/60 (Optional)		
	Hot Plug	Supported		
	Optical Disk Drive	Optional		
	Optical Drive Bays	0		
	3.5-inch Media Bays	0		
	Disk Drive Bays	14 ¹		
	Expansion Slot	Standard	Total: 5 slots available 2 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x8 (x8 connector) 1 PCIe 3.0 x8 (x8 connector) (Dual processor configuration only) 1 PCIe 2.0 x4 (x8 connector)	
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)		
	Resolution / Color	1600 x 1200 / 16.7M ²		
Interfaces		1 x VGA (15-pin mini D-sub, 1 x rear) 5 x USB3.0 (2 x front, 2 x rear, 1 x internal) 3 x USB2.0 (2 x rear, 1 x internal) 1 to 2 x Serial (9-pin mini D-sub, RS232-C, 1 to 2 x rear) 2 x 1000BASE-T LAN connector (RJ-45, 2 x rear) 1 x Management LAN connector (RJ-45, 1 x rear)		
Server Management		EXPRESSSCOPE Engine 3		
Redundant Fan		Optional, hot plug		
Redundant Power Supply		Optional, hot plug		
Power Supply		1 to 2 x 800 Watt or 1000 Watt 80 PLUS® Platinum certified hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz, or		
Power Consumption	Max. Config, Idling	244 VA / 243 Watt	242 VA / 240 Watt	243 VA / 242 Watt
	Max. Config, Operating	599 VA / 595 Watt	658 VA / 653 Watt	723 VA / 718 Watt
Acoustic Noise	Max. Config, Idling	53.0dB	53.0dB	53.0dB

CONFIGURATION GUIDE – NEC Express5800/R120g-2E Storage-Rich

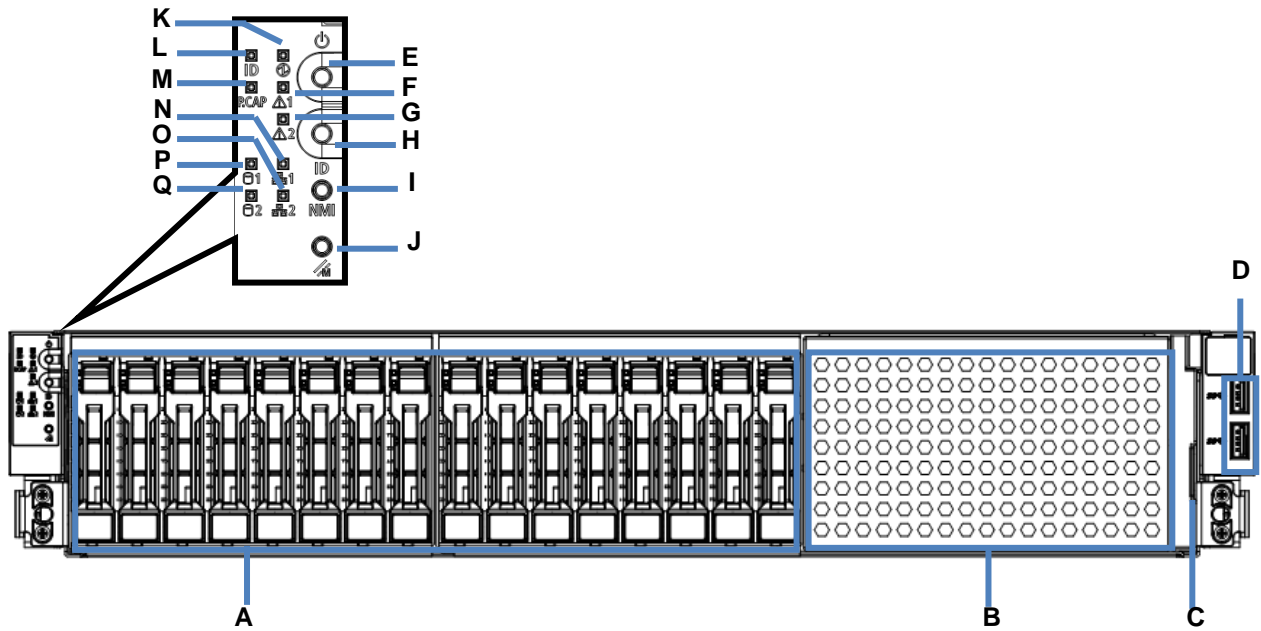
Model	R120g-2E			
(Sound Pressure Level)³	Max. Config, Operating	61.1 dB	61.1 dB	62.0 dB
Dimensions (W x D x H)	448.0 x 683.8 x 87.2 mm / 17.6 x 26.9 x 3.4 in (2U)			
Weight (Minimum / Maximum)	18 kg / 31 kg, 39.68 lbs. / 68.34 lbs.			
Temperature, Relative Humidity (non-condensing)	Operating: 5° to 40° C ⁴ / 41° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%			
Regulatory and Safety	FCC, UL, CB, CE, BSMI, UL(Mexico), CCC, RCM, RoHS, WEEE			
Operating Systems	Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Microsoft® Windows Server® 2012 R2 Standard Microsoft® Windows Server® 2012 R2 Datacenter Microsoft® Windows Server® 2016 Standard Microsoft® Windows Server® 2016 Datacenter Red Hat Enterprise Linux 6.7 or later (x86_64) ⁵ Red Hat Enterprise Linux 7.2 or later ⁵ VMware ESXi™ 5.5 Update 3 VMware ESXi™ 6.0 Update 1 VMware ESXi™ 6.5			

- ¹ An optional drive cage is required to install more than 12 hard drives.
- ² Maximum resolution available via EXPRESSSCOPE Engine 3 remote console is 1280 x 1024 / 65K colors.
- ³ Noise emission was measured in accordance with ISO 7779. The actual value may vary by the operating environment.
- ⁴ Operable up to 35°C (95°F) when N8181-126 Redundant Fan Kit is installed and any of N8150-541/-483/-486/-518 SAS HDD is installed in the rear HDD cage.
- ⁵ For Linux support, contact our sales representative or go to the NEC website at: <http://www.nec.com/global/prod/express/linux/index.html>

External Views

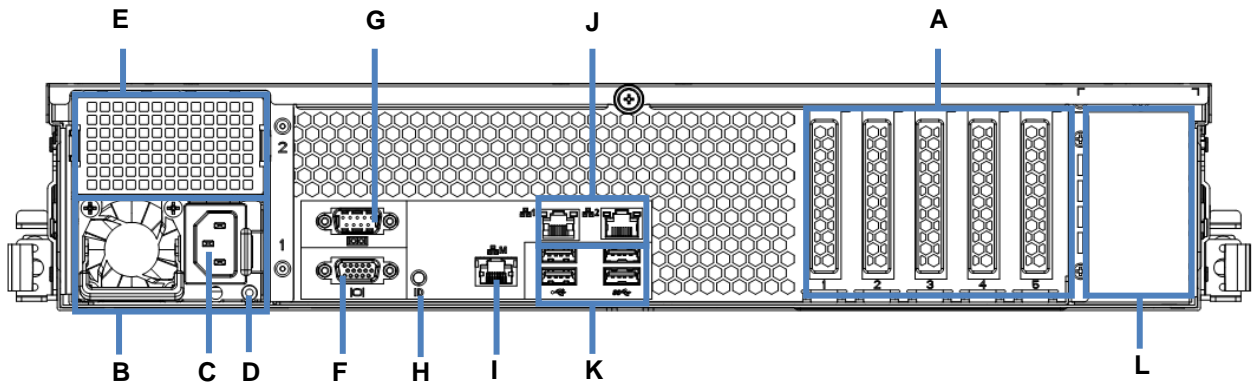
Front and Rear Views

Front View for 2.5-inch Drive Model



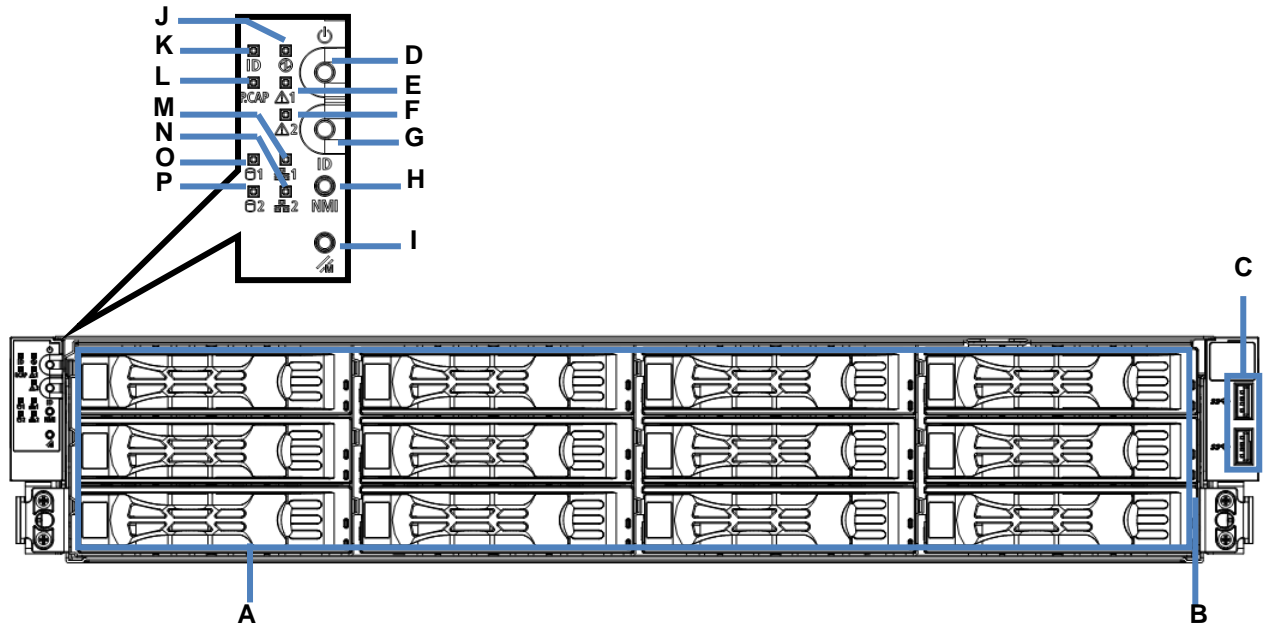
Legend			
A.	2.5-inch Drive Bays	J.	BMC RESET Switch
B.	2.5-inch Additional HDD Cage Bay	K.	POWER LED
C.	Pull-out Tab	L.	UID LED
D.	USB Connectors	M.	Power Capping LED
E.	POWER Switch	N.	LINK/ACT LED(LAN1)
F.	STATUS LED 1	O.	LINK/ACT LED(LAN2)
G.	STATUS LED 2	P.	DISK LED 1
H.	UID Switch	Q.	DISK LED 2
I.	DUMP (NMI) Switch		

Rear View for 2.5-inch Drive Model



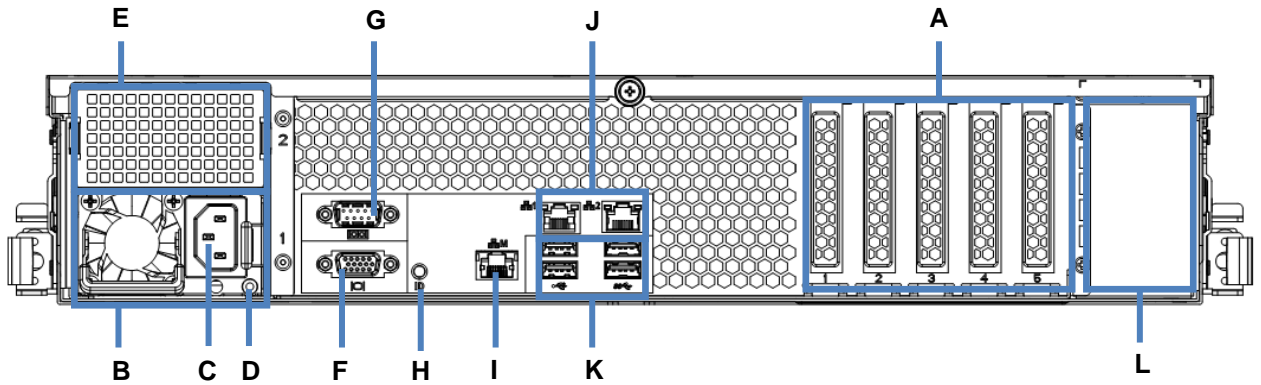
Legend	
A.	PCI Slots (Low-Profile)
B.	Power Supply
C.	AC Inlet
D.	AC POWER LED
E.	Additional Power Supply Slot
F.	Display Connector
G.	Serial Port Connector
H.	UID Switch/LED
I.	Management LAN Connector
J.	LAN Connector
K.	USB Connectors
L.	2.5-inch Additional HDD Cage bay

Front View for 3.5-inch Drive Model



Legend			
A.	3.5-inch Drive Bays	I.	BMC RESET Switch
B.	Pull-out Tab	J.	POWER LED
C.	USB Connectors	K.	UID LED
D.	POWER Switch	L.	Power Capping LED
E.	STATUS LED 1	M.	LINK/ACT LED(LAN1)
F.	STATUS LED 2	N.	LINK/ACT LED(LAN2)
G.	UID Switch	O.	DISK LED 1
H.	Dump (NMI) Switch	P.	DISK LED 2

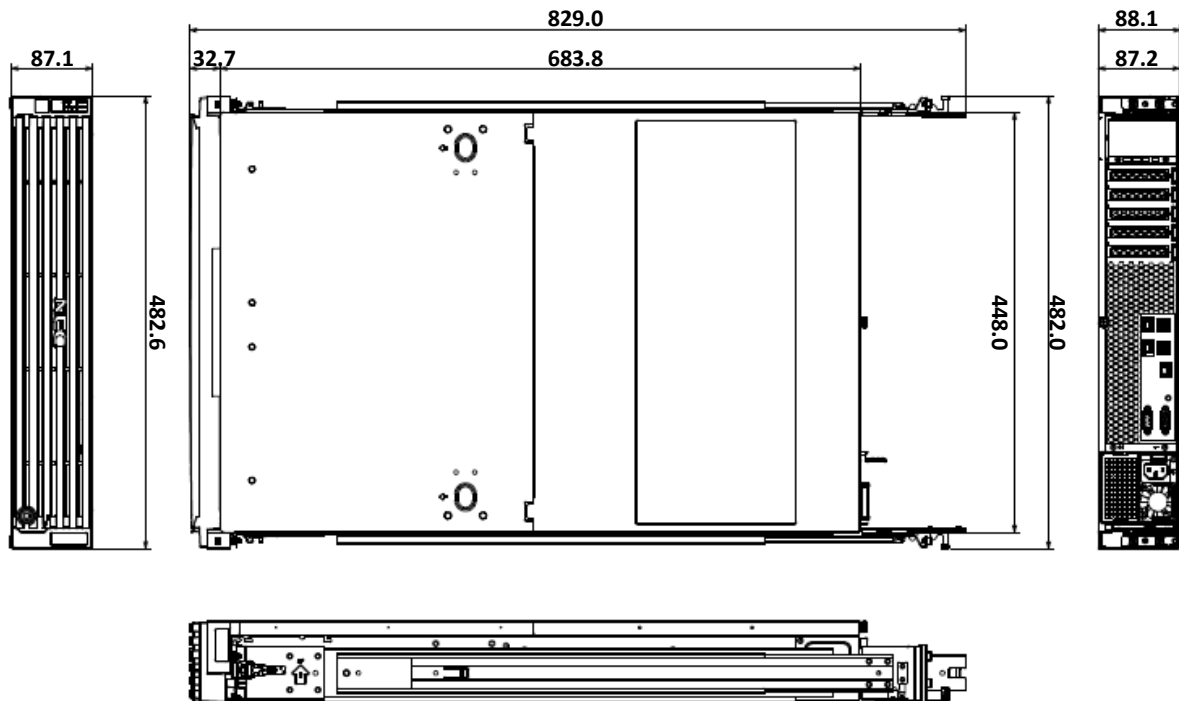
Rear View for 3.5-inch Drive Model



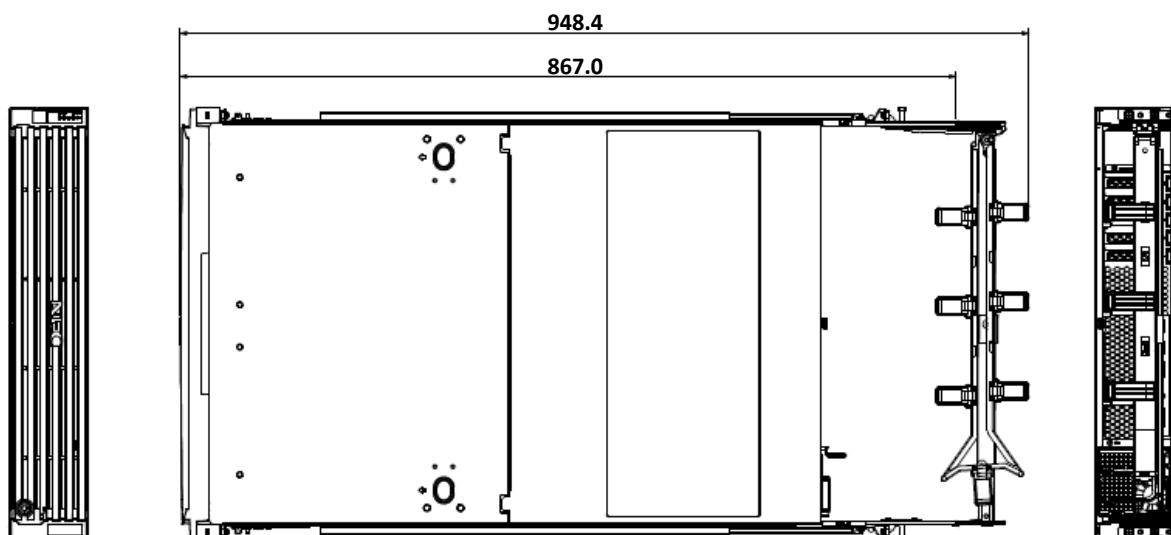
Legend			
A.	PCI Slots (Low-Profile)	G.	Serial Port Connector
B.	Power Supply	H.	UID Switch/LED
C.	AC Inlet	I.	Management LAN Connector
D.	AC POWER LED	J.	LAN Connector
E.	Additional Power Supply Slot	K.	USB Connectors
F.	Display Connector	L.	2.5-inch Additional HDD Cage bay

Dimensions (mm)

Without Cable Arm

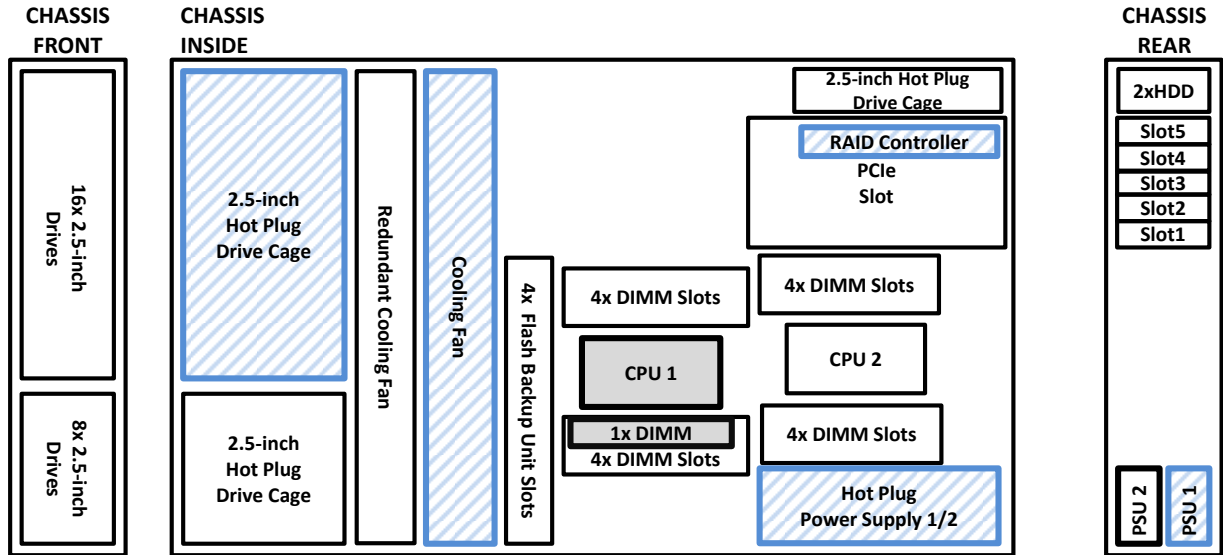


With Cable Arm



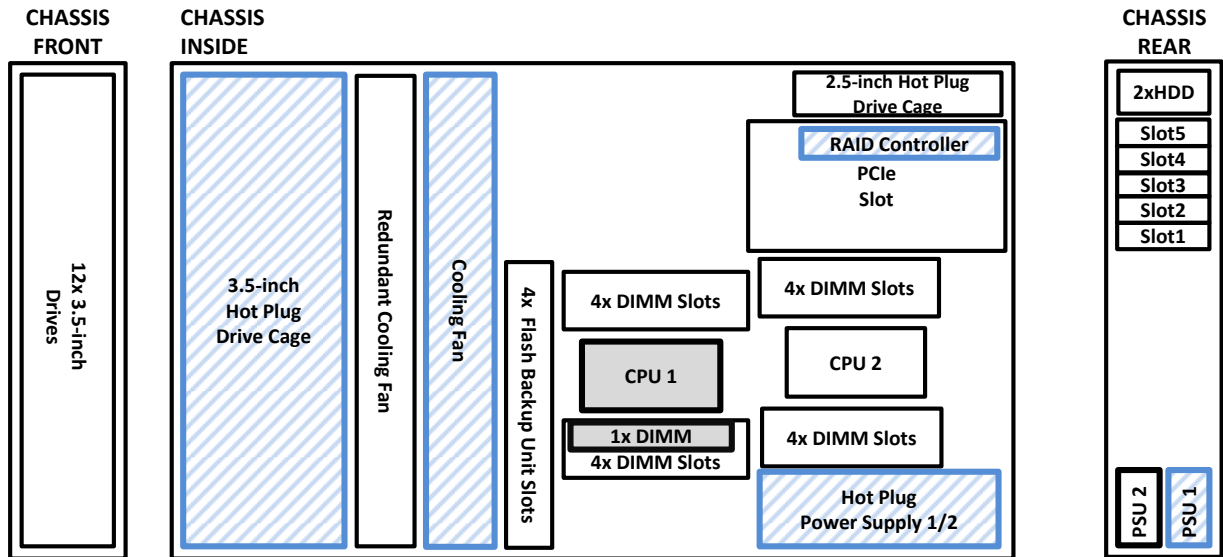
Configuration Diagram

2.5-inch Drive Model



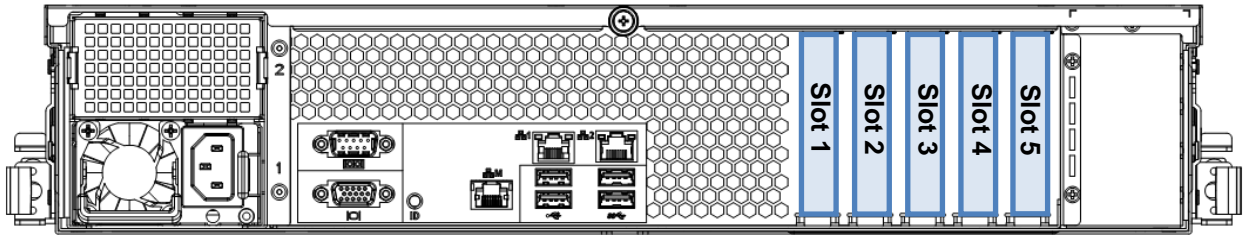
Legend: Standard Components Minimum required components

3.5-inch Drive Model



Legend: Standard Components Minimum required components

Expansion Slot



Legend		Remarks
#1	PCIe 3.0 x8, x8 connector, Low-profile, up to 168 mm length	2 CPUs required
#2	PCIe 3.0 x16, x16 connector, Low-profile, up to 200 mm length	
#3	PCIe 3.0 x8, x8 connector, Low-profile, up to 200 mm length	
#4	PCIe 3.0 x16, x16 connector, Low-profile, up to 200 mm length	
#5	PCIe 2.0 x4, x8 connector, Low-profile, up to 168 mm length	

NOTE:

- Slot #1 is only available in a dual processor configuration.

Server Configuration

1 Base Models

2.5-inch Drive Model

Product Name / Description	Part Number
NEC Express5800/R120g-2E no processor, no RAM, no HDD, no ODD Including : 1 x 800 Watt 80 PLUS® Platinum Power Supply Unit, Front Bezel, 16 x 2.5-inch Drive Cage, SAS Expander card, 2 sets of Mini-SAS HD cable	N8100-2468F

NOTE:

- The base model must be ordered with a processor kit and a memory kit.

3.5-inch Drive Model

Product Name / Description	Part Number
NEC Express5800/R120g-2E no processor, no RAM, no HDD, no ODD Including : 1 x 800 Watt 80 PLUS® Platinum Power Supply Unit, Front Bezel, 12 x 3.5-inch Drive Cage, SAS Expander card, 2 sets of Mini-SAS HD cable	N8100-2470F

NOTE:

- The base model must be ordered with a processor kit and a memory kit.

2 Processors and Heat Sink

2.1 For 2.5-inch Drive Model

Available sockets: 2

Category	Product Name / Description	Part Number
Processors 1 Processor Required	Xeon E5-2620 v4 Processor Kit Intel® Xeon® Processor E5-2620 v4 (2.10 GHz, 8C/16T, 20 MB)	N8101-1070F
	Xeon E5-2630 v4 Processor Kit Intel® Xeon® Processor E5-2630 v4 (2.20 GHz, 10C/20T, 25 MB)	N8101-1072F
	Xeon E5-2650 v4 Processor Kit Intel® Xeon® Processor E5-2650 v4 (2.20 GHz, 12C/24T, 30 MB)	N8101-1073F
Heat Sink	1st Processor Heat Sink For 1 st Processor	(Standard)
	2nd Processor Heat Sink For 2 nd Processor	N8101-1079F

NOTE:

- Minimum one processor kit from above must be installed.
- The processors must be the same to configure dual processor system.

2.2 For 3.5-inch Drive Model

Available sockets: 2

Category		Product Name / Description	Part Number
Processors 1 Processor Required		Xeon E5-2603 v4 Processor Kit Intel® Xeon® Processor E5-2603 v4 (1.70 GHz, 6C/6T, 15 MB)	N8101-1068F
		Xeon E5-2620 v4 Processor Kit Intel® Xeon® Processor E5-2620 v4 (2.10 GHz, 8C/16T, 20 MB)	N8101-1070F
		Xeon E5-2630 v4 Processor Kit Intel® Xeon® Processor E5-2630 v4 (2.20 GHz, 10C/20T, 25 MB)	N8101-1072F
Heat Sink	1st	Processor Heat Sink For 1 st Processor	(Standard)
	2nd	Processor Heat Sink For 2 nd Processor	N8101-1079F

NOTE:

- Minimum one processor kit from above must be installed.
- The processors must be the same to configure dual processor system.

The maximum number of logical processors supported by OS

See the table below for the maximum number of logical processors that you can actually use on your system.

Number of Logical Processors Supported by Operating Systems	Maximum Number of Logical Processors	Available Logical Processors
Microsoft Windows Server 2008 R2 Standard (x64)	256 ¹	56
Microsoft Windows Server 2008 R2 Enterprise (x64)		
Microsoft Windows Server 2012 Standard	640 ¹	56
Microsoft Windows Server 2012 Datacenter		
Microsoft Windows Server 2012 R2 Standard		
Microsoft Windows Server 2012 R2 Datacenter		
Microsoft Windows Server 2016 Standard		
Microsoft Windows Server 2016 Datacenter		
Red Hat Enterprise Linux 6 (x86_64)	240	56
Red Hat Enterprise Linux 7		
VMware ESXi 5.5	320	56
VMware ESXi 6.0	480	56
VMware ESXi 6.5	576	72

¹ The maximum numbers of logical processors when using Hyper-V are below:

- Windows Server 2008 R2 : 64 logical processors
- Windows Server 2012 : 320 logical processors
- Windows Server 2012 R2 : 320 logical processors
- Windows Server 2016: 512

3 Memory

3.1 Memory Configuration

Refer to the section in accordance with your memory configuration:

- Independent Channel: Refer to 3.1.1
- Memory Sparing Configuration: Refer to 3.1.2
- Memory Mirroring / Memory Lockstep Configuration: Refer to 3.1.3

Memory Configuration Feature Comparison

See the table below for feature comparisons of memory configurations supported.

	Independent Channel	Memory Sparing	Memory Lockstep	Memory Mirroring
Performance	Best	Better	Better	Good
Data Protection	No	Multiple single bit error protection	No	Multiple single bit and multi bit error protection
Redundancy	No	Partly	No	Fully
Data Correction	ECC, x4 SDDC	ECC, x4 SDDC	ECC, x8 SDDC	ECC, x4 SDDC
Available Memory	Full physical memory	3/4 physical memory	Full physical memory	Half physical memory
Available Memory Channels	4	4	4	4
Notes	-	All DIMMs in the system must be identical.	Paired DIMMs must be identical.	Paired DIMMs must be identical.

3.1.1 Independent Channel Configuration

Available slots: 8 per processor

Category	Product Name / Description	Part Number
Registered DIMM (RDIMM)	4GB DDR4-2400 REG Memory Kit (1x4GB) 1 x 4GB Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-686F
	8GB DDR4-2400 REG Memory Kit (1x8GB) 1 x 8GB Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-687F
	16GB DDR4-2400 REG Memory Kit (1x16GB) 1 x 16GB Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-688F
	32GB DDR4-2400 REG Memory Kit (1x32GB) 1 x 32GB Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-689F
TSV Registered DIMM (TSV RDIMM)	64GB DDR4-2400 REG Memory Kit (1x64GB) 1 x64GB TSV Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-690F

NOTE:

- Minimum one memory kit per processor must be installed.
- It is recommended to install memory kits in multiples of four (four identical DIMMs) for quad-channel symmetric memory configurations to increase memory transfer speed.
- When two processors are installed, balance the DIMMs across the two processors.
- Mix configurations of RDIMM and TSV RDIMM are not supported.
- At least 5 GB of memory is required for VMware ESXi.

3.1.2 Memory Sparing Configuration

Available slots: 8 per processor

Product Name / Description	Part Number
16GB DDR4-2400 REG Memory Kit (2x8GB) 2 x 8GB Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-693
32GB DDR4-2400 REG Memory Kit (2x16GB) 2 x 16GB Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-694

NOTE:

- Minimum one memory kit per processor must be installed.
- The configured memories must be identical.
- The logical memory capacity becomes three-fourths of physical capacity.

3.1.3 Memory Mirroring / Memory Lockstep Configuration

Available slots: 8 per processor

Product Name / Description	Part Number
16GB DDR4-2400 REG Memory Kit (2x8GB) 2 x 8GB Registered ECC DIMM, DDR4-2400(PC4-2400)	N8102-691
32GB DDR4-2400 REG Memory Kit (2x16GB) 2 x 16GB Registered ECC DIMM, DDR4-2400 (PC4-2400)	N8102-692

NOTE:

- Minimum one memory kit per processor must be installed.
- The logical memory capacity becomes a half of physical capacity on memory mirroring configuration.

Maximum Memory Speed

See the table below for the actual maximum memory transfer speed in Independent Channel / Memory Sparing Configuration.

DDR4 memory speed depends on the type of DIMMs, the native memory bus speed of the memory controller and memory configuration. All memory buses operate at the clock frequency of the DIMM with the lowest frequency.

Processor Type	Populated DIMMs	# of DIMMs per processor	DIMM Speed
E5-2603 v4	RDIMM: 4, 8, 16, 32 GB	-	1866 MHz
E5-2620 v4 E5-2630 v4	RDIMM: 4, 8, 16, 32 GB	-	2133 MHz
E5-2650 v4	RDIMM: 4, 8, 16, 32 GB	-	2400 MHz

Maximum Available Memory

See the table below for the maximum memory size that you can actually use on your system.

The maximum available memory is less than the maximum physical memory supported by your system because some chipsets require PCI resource space of about 750MB. PCI resource requirements vary depending on the type and the number of PCI cards you are using.

Maximum Memory Size Supported by OS		Maximum Available Memory
Microsoft Windows Server 2008 R2 Standard ¹	32 GB	32 GB
Microsoft Windows Server 2008 R2 Enterprise ¹	2 TB	1 TB
Microsoft Windows Server 2012 Standard ¹	4 TB	1 TB
Microsoft Windows Server 2012 Datacenter ¹		
Microsoft Windows Server 2012 R2 Standard ¹		
Microsoft Windows Server 2012 R2 Datacenter ¹		
Microsoft Windows Server 2016 Standard ¹	24 TB	1 TB
Microsoft Windows Server 2016 Datacenter ¹		
Red Hat Enterprise Linux 6 (x86_64)	6 TB	1 TB
Red Hat Enterprise Linux 7		
VMware ESXi 5.5 ²	4 TB	1 TB
VMware ESXi 6.0 ³	6 TB	1 TB
VMware ESXi 6.5 ⁴	12 TB	1 TB

¹ The maximum available memory size of Hyper-V systems is below:

- Windows Server 2008 R2 Standard : 32 GB
- Windows Server 2008 R2 Enterprise : 1 TB
- Windows Server 2012, Windows Server 2012 R2 : 4 TB
- Windows Server 2016: 24 TB

² Up to 1TB of main memory is available to each virtual machine.

³ Up to 4TB of main memory is available to each virtual machine.

⁴ Up to 6TB of main memory is available to each virtual machine.

4 Internal Hard Disk Drives

4.1 RAID Configuration

Refer to the section in accordance with your disk form factor and RAID configuration.

4.1.1 2.5-inch Drive Model

Refer to the section in accordance with your OS and RAID configuration. For example, when you would like to configure RAID 0/1/10 1GB cache with Windows Server 2012 R2, refer to the section 4.2.1 for the required components and then refer to the section 4.3.2 for the hard drives.

Operating System	Supported RAID configuration			Supported HDD/SSD
	RAID and Cache		Section	
Windows Server 2008 R2	RAID 0/1/10	1GB Cache	4.2.1	4.3.1
VMware ESXi 5.5	RAID 5/6/50/60	1GB Cache	4.2.2	
VMware ESXi 6.0	RAID 5/6/50/60	2GB Cache	4.2.3	
Windows Server 2012	RAID 0/1/10	1GB Cache	4.2.1	4.3.2
Windows Server 2012 R2	RAID 5/6/50/60	1GB Cache	4.2.2	
Windows Server 2016	RAID 5/6/50/60	2GB Cache	4.2.3	
Red Hat Enterprise Linux 6				
Red Hat Enterprise Linux 7				
VMware ESXi 6.5				

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed. Also, hard drives in the back side (slot 24 to 25) must be in a separate RAID array than RAID arrays of hard drives in the front side (slot 0 to 23).
- Dedicated Hot Spare / Global Hot Spare are supported by using RAID controller card (PCI Express). However, Global Hot Spare is not supported on the configuration 4.2.1 to 4.2.3 with an optional drive cage (rear side). Also, hard drives in the back side cannot be used as Hot Spare drives of a RAID array of hard drives in the front side and front side drives cannot be used as Hot Spare drives of a RAID array of hard drives in the back side.
- Up to two kinds of drives selected from SAS 10K HDDs (512n), SAS 10K HDDs (512e), SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME) and SATA SSDs (VE) can be mixed in each drive cage.
- It is recommended to set RAID array configuration drives less than eight per disk group in order to minimize the risk of becoming multiple hard drives failure.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.
- Operable ambient temperature is up to 35°C (95°F) when N8181-126 Redundant Fan Kit is installed and any of N8150-541/-483/-486/-518 SAS HDD is installed in the rear HDD cage.

4.1.2 3.5-inch Drive Model

Refer to the section in accordance with your OS and RAID configuration. For example, when you would like to configure RAID 0/1/10 1GB cache with Windows Server 2012 R2, refer to the section 4.2.4 for the required components and then refer to the section 4.3.4 and/or 4.3.2 for the hard drives.

Operating System	Supported RAID configuration		Supported HDD/SSD
	RAID and Cache	Section	
Windows Server 2008 R2	RAID 0/1/10 1GB Cache	4.2.4	3.5-inch: 4.3.3 2.5-inch: 4.3.1
VMware ESXi 5.5	RAID 5/6/50/60 1GB Cache	4.2.5	
VMware ESXi 6.0	RAID 5/6/50/60 2GB Cache	4.2.6	
Windows Server 2012	RAID 0/1/10 1GB Cache	4.2.4	3.5-inch: 4.3.4 2.5-inch: 4.3.2
Windows Server 2012 R2	RAID 5/6/50/60 1GB Cache	4.2.5	
Windows Server 2016	RAID 5/6/50/60 2GB Cache	4.2.6	
Red Hat Enterprise Linux 6	RAID 5/6/50/60 2GB Cache	4.2.6	
Red Hat Enterprise Linux 7			

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed. Also, hard drives in the back side (slot 24 to 25) must be in a separate RAID array than RAID arrays of hard drives in the front side (slot 0 to 11) for configuration 4.2.4 to 4.2.6.
- Dedicated Hot Spare / Global Hot Spare are supported by using RAID controller card (PCI Express). However, Global Hot Spare is not supported on the configuration 4.2.4 to 4.2.6 with an optional drive cage (rear side). Also, hard drives in the back side cannot be used as Hot Spare drives of a RAID array of hard drives in the front side and front side drives cannot be used as Hot Spare drives of a RAID array of hard drives in the back side.
- It is recommended to set RAID array configuration drives less than eight per disk group in order to minimize the risk of becoming multiple hard drives failure.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.
- Operable ambient temperature is up to 35°C (95°F) when N8181-126 Redundant Fan Kit is installed and any of N8150-541/-483/-486/-518 SAS HDD is installed in the rear HDD cage.

4.2 Internal Drive Configuration for 2.5-inch Drive Model

4.2.1 Up to 26 Drives with RAID 0/1 Controller with 1GB Cache

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1) LSI MegaRAID SAS 9362-8i RAID 0/1/10, 1GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-176
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Cable	Internal SAS/SATA Cable 1 x mini-SAS to 1 x mini-SAS, 2 sets	(Standard)
Drive Cage	2.5-inch Drive Cage 16 x 2.5-inch hot plug drive bays	(Standard)
Optional Drive Cage (For more than 16 Drives on the front)	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-75
Optional Drive Cage (Rear side)	2.5-Inch Drive Cage 2 x 2.5-inch hot plug drive bays Including 1 set of 1 x Mini SAS HD to 1 x Mini SAS HD cable and non-hot plug Fan.	N8154-76

NOTE:

- For Supported HDD/SSD, refer to [4.3.1](#) for Windows Server 2008R2 or VMware. Refer to [4.3.2](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 7.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME) and SATA SSDs (VE) can be mixed in each drive cage.

4.2.2 Up to 26 Drives with RAID 5/6 Controller with 1GB Cache

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 1GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-177
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Cable	Internal SAS/SATA Cable 1 x mini-SAS to 1 x mini-SAS, 2 sets	(Standard)
Drive Cage	2.5-inch Drive Cage 16 x 2.5-inch hot plug drive bays	(Standard)
Optional Drive Cage (For more than 16 Drives on the front)	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-75
Optional Drive Cage (Rear side)	2.5-Inch Drive Cage 2 x 2.5-inch hot plug drive bays Including 1 set of 1 x Mini SAS HD to 1 x Mini SAS HD cable and non-hot plug Fan.	N8154-76

NOTE:

- For Supported HDD/SSD, refer to [4.3.1](#) for Windows Server 2008R2 or VMware. Refer to [4.3.2](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 7.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME) and SATA SSDs (VE) can be mixed in each drive cage.

4.2.3 Up to 26 Drives with RAID 5/6 Controller with 2 GB Cache

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (2GB, RAID 0/1/5/6) LSI MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 2GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-178
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Cable	Internal SAS/SATA Cable 1 x mini-SAS to 1 x mini-SAS, 2 sets	(Standard)
Drive Cage	2.5-inch Drive Cage 16 x 2.5-inch hot plug drive bays	(Standard)
Optional Drive Cage (For more than 16 Drives on the front)	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-75
Optional Drive Cage (Rear side)	2.5-Inch Drive Cage 2 x 2.5-inch hot plug drive bays Including 1 set of 1 x Mini SAS HD to 1 x Mini SAS HD cable and non-hot plug Fan.	N8154-76

NOTE:

- For Supported HDD/SSD, refer to 4.3.1 for Windows Server 2008R2 or VMware. Refer to 4.3.2 for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 7.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME) and SATA SSDs (VE) can be mixed in each drive cage.

4.2.4 3.5-inch and 2.5-inch Drives with RAID 0/1 Controller with 1GB Cache

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1) LSI MegaRAID SAS 9362-8i RAID 0/1/10, 1GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-176
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Cable	Internal SAS/SATA Cable 1 x Mini SAS HD to 1 x Mini SAS HD, 2 sets	(Standard)
Drive Cage	3.5-inch Drive Cage 12 x 3.5-inch hot plug drive bays	(Standard)
Optional Drive Cage (Rear side)	2.5-Inch Drive Cage 2 x 2.5-inch hot plug drive bays Including 1 set of 1 x Mini SAS HD to 1 x Mini SAS HD cable and non-hot plug Fan.	N8154-76

NOTE:

- For Supported HDD/SSD, refer to 4.3.3 (3.5-inch) and 4.3.1 (2.5-inch) for Windows Server 2008R2 or VMware. Refer to 4.3.4 (3.5-inch) and 4.3.2 (2.5-inch) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 7.
- All drives within a RAID array should be of the same type, capacity and rotation speed.

4.2.5 3.5-inch and 2.5-inch Drives with RAID 5/6 Controller with 1GB Cache

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 1GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-177
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Cable	Internal SAS/SATA Cable 1 x Mini SAS HD to 1 x Mini SAS HD, 2 sets	(Standard)
Drive Cage	3.5-inch Drive Cage 12 x 3.5-inch hot plug drive bays	(Standard)
Optional Drive Cage (Rear side)	2.5-Inch Drive Cage 2 x 2.5-inch hot plug drive bays Including 1 set of 1 x Mini SAS HD to 1 x Mini SAS HD cable and non-hot plug Fan.	N8154-76

NOTE:

- For Supported HDD/SSD, refer to 4.3.3 (3.5-inch) and 4.3.1 (2.5-inch) for Windows Server 2008R2 or VMware. Refer to 4.3.4 (3.5-inch) and 4.3.2 (2.5-inch) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 7.
- All drives within a RAID array should be of the same type, capacity and rotation speed.

4.2.6 3.5-inch and 2.5-inch Drives with RAID 5/6 Controller with 2GB Cache

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (2GB, RAID 0/1/5/6) LSI MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 2GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-178
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Cable	Internal SAS/SATA Cable 1 x Mini SAS HD to 1 x Mini SAS HD, 2 sets	(Standard)
Drive Cage	3.5-inch Drive Cage 12 x 3.5-inch hot plug drive bays	(Standard)
Optional Drive Cage (Rear side)	2.5-Inch Drive Cage 2 x 2.5-inch hot plug drive bays Including 1 set of 1 x Mini SAS HD to 1 x Mini SAS HD cable and non-hot plug Fan.	N8154-76

NOTE:

- For Supported HDD/SSD, refer to 4.3.3 (3.5-inch) and 4.3.1 (2.5-inch) for Windows Server 2008R2 or VMware. Refer to 4.3.4 (3.5-inch) and 4.3.2 (2.5-inch) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 7.
- All hard drives within a RAID array should be of the same capacity and rotation speed.

4.3 Supported HDD/SDD

4.3.1 2.5-inch drives for RAID Controller Configuration (1)

For Windows Server 2008R2 or VMware

Category	Product Name / Description	Part Number
Drive For 2.5-inch drive model: Standard :16 slots available Max : 26 slots available For 3.5-inch drive model: 2 slots available	SAS HDD (512n) 300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-479
	450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-480
	600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-481
	900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-482
	1.2TB 10K Hot Plug 2.5-inch SAS HDD 1 x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-483
	300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-485
	450GB 15K Hot Plug 2.5-inch SAS HDD 1x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-486
	600GB 15K Hot Plug 2.5-inch SAS HDD 1x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-518
	SATA HDD (512n) 500GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-488
	1TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-489
2TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-527	
SAS SSD (ME) 200GB Hot Plug 2.5-inch SAS SSD 1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-721	
400GB Hot Plug 2.5-inch SAS SSD 1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-722	
SATA SSD (ME) 200GB Hot Plug 2.5-inch SATA SSD 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-725	
400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-726	
800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-727	
SATA SSD (VE) 200GB Hot Plug 2.5-inch SATA SSD 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-732	
400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-733	
800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-734	
1.6TB Hot Plug 2.5-inch SATA SSD 1 x 1.6 TB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-735	

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME) and SATA SSDs (VE) can be mixed in each drive cage.
- For monitoring SATA SSD life on VMware, NEC ESM PRO Manager Ver.6.05 or later is required. Please download the latest version on the NEC web site.
- The 2.5-inch SAS/SATA SSDs have limited lifetime. Refer to [Endurance of SSD](#) for details.

4.3.2 2.5-inch drives for RAID Controller Configuration (2)

Category	Product Name / Description		Part Number
Drive For 2.5-inch drive model: Standard :16 slots available Max : 26 slots available For 3.5-inch drive model: 2 slots available	SAS HDD (512n)	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-479
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-480
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-481
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-482
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1 x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-483
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-485
	SAS HDD (512e)	450GB 15K Hot Plug 2.5-inch SAS HDD 1x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-486
		600GB 15K Hot Plug 2.5-inch SAS HDD 1x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-518
		1.8TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.8TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512e sector	N8150-541
		SATA HDD (512n)	500GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector
1TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector			N8150-489
2TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector			N8150-527
SAS SSD (ME)	200GB Hot Plug 2.5-inch SAS SSD 1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-721	
	400GB Hot Plug 2.5-inch SAS SSD 1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-722	
SATA SSD (ME)	200GB Hot Plug 2.5-inch SATA SSD 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-725	
	400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-726	
	800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-727	
SATA SSD (VE)	200GB Hot Plug 2.5-inch SATA SSD 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-732	
	400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-733	
	800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-734	
	1.6TB Hot Plug 2.5-inch SATA SSD 1 x 1.6 TB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-735	

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs (512n), SAS 10K HDDs (512e), SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME) and SATA SSDs (VE) can be mixed in each drive cage.
- For 512e sector HDD, the supported operating systems of virtual machines on Hyper-V are:
- Windows Server 2008 R2 SP1 or later
- Windows 7 SP1 or later
- The 2.5-inch SAS/SATA SSDs have limited lifetime. Refer to [Endurance of SSD](#) for details.

4.3.3 3.5-inch drives for RAID Controller Configuration (1)

Category	Product Name / Description		Part Number
Drive 12 slots	SATA HDD (512n)	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-524

available	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-504
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-505
	3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-506
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-507

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed.

4.3.4 3.5-inch drives for RAID Controller Configuration (2)

For Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 7

Category	Product Name / Description	Part Number
Drive 12 slots available	SATA HDD (512n) 500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-524
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-504
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-505
	3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-506
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n Sector	N8150-507
	SATA HDD (512e) 6TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 6 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e Sector	N8150-540
	8TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 8 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e Sector	N8150-528
	10TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 10 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e Sector	N8150-543

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed.
- For 512e sector HDD, the supported operating systems of virtual machines on Hyper-V are:
 - Windows Server 2008 R2 SP1 or later
 - Windows 7 SP1 or later

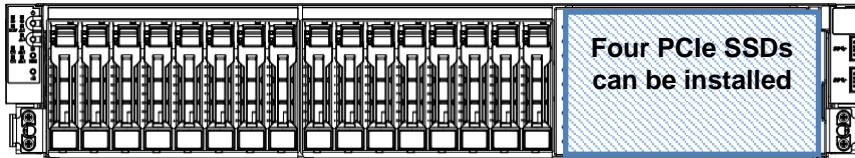
5 2.5-inch PCIe SSD

5.1 2.5-inch PCIeSSD Installation Kit

Product Name / Description	Part Number
2.5-inch PCIeSSD Installation Kit 2.5-inch Drive Cage for 4 x SDDs, PCIe SSD switch card, and PCIe cable NOTE: This option is for 2.5-inch Drive Model only	N8118-304

NOTE:

- This option is available for 2.5-inch Drive Model only.
- One PCIe slot is required to install the PCIe SSD switch card.
- 2.5-inch Additional HDD Cage Bay on the front side is used to install 2.5-inch PCIeSSDs. Therefore, the 2.5-inch Hot Plug Drive Cage Kit N8154-75 cannot be installed at the same time.



- The PCIe SSD slots do not support hot-plug.
- Operating system cannot be installed on any PCIe SSD.

5.2 PCIe SSD

Category	Product Name / Description	Part Number
PCIe SSD 4 slots available	800GB Non-Hot Plug 2.5-inch PCIe SSD 1x 800 GB PCIe SSD, 2.5-inch	N8118-500

NOTE:

- 2.5-inch PCIeSSD Installation Kit is required to install this product.
- Warranty period is 3 years (36 months) or until the total bytes of written value (TBW) exceeds the limit value, whichever occurs first. It is recommended to check the TBW periodically.
- Operating system cannot be installed on any PCIe SSD.

6 Optical Drive

Category	Product Name / Description	Part Number
External	External DVD Dual drive DVD Dual drive, Bus powered, 1.5A required, not including writing software	N8160-101F

NOTE:

- Up to 1 optical drive can be connected.

7 PCI Card

Please refer to [Supported PCI Cards and Installable Slots](#) with regard to the position of PCI slot which can mount PCI card supported.

7.1 Network Interface Controller

Category	Product Name / Description	Part Number
Adapter	1GbE	
	1000BASE-T Adapter Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-150
	Dual Port 1000BASE-T Adapter Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-151
	Dual Port 1000BASE-T Adapter Intel® 82580 Gigabit Ethernet Controller PCIe 2.0 x4	N8104-145
	NOTE: - PXE boot is not supported on UEFI environment.	
	Quad Port 1000BASE-T Adapter Broadcom ® BCM5719 Gigabit Ethernet Controller PCIe 2.0 x4	N8104-152
	NOTE: - Network cables with RJ-45 plug covers cannot be used.	
10GbE	10GBASE SFP+ Adapter (SFP+/2ch) Qlogic NetXtreme II BCM57810S PCIe 2.0 x8, Low Profile / Full Height	N8104-149
	NOTE: - N8104-129 SFP+ Module is required to connect with an optical cable.	
	10GBASE Adapter (SFP+/2ch) Intel Ethernet Converged Network Adapters X710 PCIe 3.0 x8	N8104-158
	NOTE: - N8104-129 SFP+ Module is required to connect with an optical cable.	
	Dual Port 10GBASE-T Adapter Intel® Ethernet Controller X540 PCIe 2.0(x8) , Low Profile / Full Height	N8104-153
	Dual Port 10GBASE-T Adapter Intel® Ethernet Controller X550 PCIe 3.0 x4, Low Profile / Full Height	N8104-157
SFP+ Module	SFP+ Module (10G-SR) 1 x SFP+ Module	N8104-129

NOTE:

- Supports up to three 10GbE network adapters in a single-processor configuration, and up to five in a dual-processor configuration.
- Network performance may be reduced depending on the applications and memory performance when three or more 10Gb Network Adapters are installed.
- For VMware ESXi, there are some limitations concerning the number of installable PCI cards. Refer to [Supported PCI Cards and Installable Slots](#) for details.

NIC Teaming feature – NIC Teaming and bonding features

See the table below for supported network interfaces and OS combinations.

Windows Server 2008 R2 supports BASP (Broadcom Advanced Server Program) or Intel PROSet teaming while Windows Server 2012 (and later) and Linux support teaming with bonding function supported by OS.

Network Interface	Team	Operating Systems
1GbE NIC Embedded/N8104-150/-151/-152	Up to four ports per one team	Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux
N8104-145	Up to four ports per one team	Windows Server 2008 R2
10GbE NIC (10GBASE-SR) N8104-149	Up to four ports per one team	Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux
N8104-158	Up to four ports per one team	Red Hat Enterprise Linux 7.2 or later
10GbE NIC (10GBASE-T) N8104-153/-157	Up to four ports per one team	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux

NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.
- The network interfaces for each team must be the same.
- When 10GbE NIC teaming and 1GbE NIC teaming are mixed, the teams must be up to five per one system. However, the teams must be up to four per one system when using Windows Server 2008 R2.

Using iSCSI

See the table below for supported network interfaces and OS combinations.

Category	Network Interface	Operating Systems
1GbE	Embedded 1GbE NIC/ N8104-150/-151/-152	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Red Hat Enterprise Linux, VMware
	N8104-145	Windows Server 2008 R2, VMware
10GbE (10GBASE-SR)	N8104-149	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Red Hat Enterprise Linux, VMware
	N8104-158	Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Red Hat Enterprise Linux, VMware
10GbE (10GBASE-T)	N8104-153	Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Red Hat Enterprise Linux
	N8104-157	Windows Server 2012, Windows Server 2012 R2 Red Hat Enterprise Linux

NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.

7.2 InfiniBand

Category	Product Name / Description		Part Number
Controller	Single Port InfiniBand Adapter Mellanox ConnectX-3 VPI, MCX353A-FCBT, FDR, PCIe 3.0(x8)		N8104-146
	Dual Port InfiniBand Adapter Mellanox ConnectX-3 VPI, MCX354A-FCBT, FDR, PCIe 3.0(x8)		N8104-147
Cable	InfiniBand Cable 2m/FRD Copper		K410-304(02)
	InfiniBand Cable 3m/FRD Copper		K410-304(03)
Switch	Unit	InfiniBand Switch 36 ports/FDR Mellanox MSX6036F-1SFR 36 ports, FDR, One power supply module included, no power cord	NE3707-061
	Power Supply	Redundant Power Supply Unit Power supply module for 36 ports InfiniBand switch, no power cord	NE3707-063

NOTE:

- Up to two InfiniBand adapters can be installed into the system and two adapters should be of the same type.
- The InfiniBand adapters and other options are make-to-order products. Please consult our sales representative in regards to production lead time.

7.3 External Storage Controller

7.3.1 RAID Controller

Category	Product Name / Description	Part Number
Controller	RAID Controller (2GB, RAID0/1/5/6) LSI MegaRAID SAS 9380-8e RAID0/1/5/6/10/50/60, 2GB, Ext. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s, Flash cache protection modules included	N8103-179

NOTE:

- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.
- It is recommended to set RAID array configuration drives less than eight in order to minimize the risk of becoming multiple hard drives failure.
- For VMware ESXi, there are some limitations concerning the number of installable PCI cards. Refer to [Supported PCI Cards and Installable Slots](#) for details.

7.3.2 Fibre Channel / SAS Controller

Category	Product Name / Description	Part Number
Fibre Channel	Fibre Channel Controller (1ch) Emulex LightPulse LPe1250-F8 Host Bus Adapter 8Gb/s, Optical, PCIe 2.0 x8	N8190-159
	Fibre Channel Controller (2ch) Emulex LightPulse LPe12002-M8 Host Bus Adapter 8Gb/s, Optical, PCIe 2.0 x8	N8190-160
	Fibre Channel Controller (1ch) Emulex LightPulse LPe16000B-M6 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0 x8	N8190-157A
	Fibre Channel Controller (2ch) Emulex LightPulse LPe16002B-M6 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0 x8	N8190-158A
	Fibre Channel Controller (1ch) QLogic, QLE2690 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0(x8)	N8190-161

	Fibre Channel Controller (2ch) QLogic, QLE2692 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0(x8)	N8190-162
SAS	SAS Controller LSI SAS9212-4i4e Host Bus Adapter 6Gb/s SAS, Int. 4 / Ext. 4, 7-pin SATA / SFF-8088, PCIe 2.0 x8	N8103-142
	SAS Controller LSI SAS9300-8e Host Bus Adapter 12Gb/s SAS, ext. 8(SFF-8644 x2), PCIe 3.0 x8	N8103-184

NOTE:

- With regard to 16Gb/s Fiber Channel Controllers, up to two ports in a single processor configuration with Xeon E5-2603 v4, and up to six ports in a dual processor configuration with Xeon E5-2603 v4 are allowed in the system.
- Up to three SAS Controllers can be installed.
- For VMware ESXi, there are some limitations concerning the number of installable PCI cards. Refer to [Supported PCI Cards and Installable Slots](#) for details.

7.4 Serial Port Adapter

Product Name / Description	Part Number
Serial Port Adapter Serial port fixed to PCI bracket	N8117-01A

NOTE:

- Up to one Serial Port Adapter can be installed.

8 Other Add-in Components

8.1 Redundant Power Supply Module

Product Name / Description	Part Number
800W Hot Plug Power Supply 1 x 800 Watt 80 PLUS® Platinum	N8181-122F

8.2 Redundant Fan Kit

Product Name / Description	Part Number
Redundant Fan Kit hot plug redundant cooling fans for R120g-2E	N8181-126

NOTE:

Operable ambient temperature is up to 35°C (95°F) when N8181-126 Redundant Fan Kit is installed and N8150-541/-483/-486/-518 SAS HDD is installed in the rear HDD cage.

8.3 Trusted Platform Module Kit

Product Name / Description	Part Number
Trusted Platform Module Kit TPM 2.0 module	N8115-26

NOTE:

- Supported for Windows Server 2012 and Windows Server 2012 R2 only.

NOTE:

- The kit is not available in China.
- The kit is not removable after attachment.
- "TPM Support" in BIOS setup menu must be activated prior to use of this kit.
- To use Windows BitLocker drive encryption, be sure to keep the "recovery password" of BitLocker function. The recovery password is required to restore data for hardware replacement during a system error.

8.4 Internal Flash Memory

Product Name / Description	Part Number
VMware ESXi support kit Internal USB flash memory to install VMware ESXi system	N8106-009

NOTE:

- The kit does not include VMware ESXi installation media and license.

8.5 Flash FDD

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

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

NOTE:

- Up to one drive can be connected.
- Not supported when VMware is running on the server.

9 Add-on Components

9.1 17-inch LCD Console Drawer

Category		Product Name / Description	Part Number
Drawer w/ KVM	Drawer	17-inch LCD Console Drawer (8port) 17-inch LCD, US 83-keys Keyboard, Optical mouse, 8 port KVM switch, 1U height	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	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	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	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

NOTE:

- There are two VGA connectors on R120g-2E, one on the front side and one on the rear side. However, the front side only works when both are connected at the same time.

9.2 KVM Switch

Category		Product Name / Description	Part Number
KVM Switch		Server Switch Unit (8 server) 1U USB 8 port KVM switch	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)

NOTE:

- There are two VGA connectors on R120g-2E, one on the front side and one on the rear side. However, the front side only works when both are connected at the same time.

9.3 Cable Management Arm

Product Name / Description	Part Number
Cable Management Arm 2U Kit for R120g-2E	N8143-95

9.4 Server Management License

The server integrates the EXPRESSSCOPE Engine 3 as standard. Refer to [Server Management](#) for the standard management features. For more extensive remote KVM and remote media features, choose the following kit.

Product Name / Description	Part Number
<p>Remote KVM and Media License Kit</p> <p>License for one server.</p> <p>Remote KVM and remote media are enabled regardless of OS status.</p> <p>Remote KVM:</p> <ul style="list-style-type: none"> - Displays a graphics console on the web browser of the remote terminal (PC/server). - Controls keyboard and mouse via the remote terminals' web browser <p>Remote media:</p> <ul style="list-style-type: none"> - Enables the user to use the CD / DVD / FD / Flash memory of the remote terminals (PC/server) as if accessing the local drives. 	N8115-04

NOTE:

- Remote KVM and remote media features are not available for virtual machines.

References

Boot Mode Setting

The server supports Legacy mode and UEFI mode (default) as an OS Boot Mode. See the table below for the Boot Mode and X2APIC setting for each Operating System. As the default settings at the factory, UEFI mode is set as OS Boot mode and X2APIC is enabled. Refer to the User's Guide and change the settings before installing an Operating System requiring Legacy Mode.

Operating System	Supported Boot Mode	Supported X2APIC Setting
Windows Server 2008 R2 (x64)	Legacy	Disabled
Windows Server 2012	UEFI	Enabled
Windows Server 2012 R2	UEFI	Enabled
Windows Server 2016	UEFI	Enabled
Red Hat Enterprise Linux 6(x86_64)	UEFI	Enabled
Red Hat Enterprise Linux 7	UEFI	Enabled
VMware ESXi 5.5	Legacy	Disabled
VMware ESXi 6.0	Legacy	Disabled
VMware ESXi 6.5	UEFI / Legacy	Enabled (UEFI) / Disabled (Legacy)

Server Management

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

		Standard	With Remote KVM and Media License kit
Hardware monitoring	Temperature/voltage/power/RAID/standard LANfan /degeneration (memory/hard drive)	✓	✓
	Hardware configuration information collection	✓	✓
	Hardware event log collection	✓	✓
Boot monitoring	BIOS/POST stall, Booting, OS stall, shutdown	✓ ¹	✓ ¹
Alerting	HW error, Boot error , and OS panic (by SNMP, E-Mail)	✓	✓
Remote KVM (via LAN)	POST/BIOS setup, ROM utility	✓ ²	✓
	Panic screen, Boot screen	✓ ^{2, 3, 4}	✓
	CUI-based screen (OS console)	✓ ^{2, 4}	✓
	GUI-based screen (OS console)	-	✓
	Remote console recording function	-	✓
	Manual Video recording	-	✓
	Automatic video recording	-	✓ ¹
Remote control (via LAN)	Remote reset/power on-off/ dump	✓	✓
	Remote power capping	✓	✓
	BIOS/BMC FW update	✓	✓
	Remote BIOS setup(partial configuration only)	✓	✓
	OS shutdown	✓ ¹	✓ ¹
	Remote media (CD/DVD/FD/USB)	-	✓
	CLP (Command Line Protocol) (DMTF compliant)	✓	✓
	Remote control via Web browser (multi user login at the same time)	✓	✓
	Scheduling (without UPS)	✓ ¹	✓ ¹
	BIOS setting by using XML file	✓	✓
Maintenance	EXPRESSSCOPE® Profile key (Backup/restore BIOS/BMC setup information)	✓	✓
Others	Set automatic IP address via DNS/DHCP	✓	✓
	LDAP/Active Directory verification/user control	✓	✓
	Clock synchronization of main unit and the RTC	✓	✓
	Access log collection	✓	✓
	IPMI	2.0	2.0
	IPv6(Web console/CLP only)	✓	✓

¹ The feature is not supported on VMware ESXi systems.

² The optional serial port is not available for the feature.

³ Monitoring boot screens is not supported on VMware systems.

⁴ In VMware systems, only the direct console user interface is supported.

Endurance of SSD

The 2.5-inch SAS/SATA SSDs have limited lifetime, which can only be written a limited number of times before it fails. The warranty period of SSD is the stated period of warranty or until the total bytes of written value (PBW) exceeds the limit value, whichever occurs first. It is recommended to check the total bytes of written value periodically.

Refer to the table below for the write endurance (PBW and DWPD), warranty period and monitoring tool.

SSD Lifetime

Part Number	Product Name	PBW	DWPD	Period	Monitoring Tool
SAS SSD					
N8150-721	200GB Hot Plug 2.5-inch SAS SSD	3.6PBW	10 Times	3 Years	Universal RAID Utility, EXPRESSBUILDER (System Test and Diagnostics)
N8150-722	400GB Hot Plug 2.5-inch SAS SSD	7.3PBW	10 Times	3 Years	
SATA SSD (Middle Endurance)					
N8150-725	200GB Hot Plug 2.5-inch SATA SSD	3.6PBW	10 Times	3 Years	
N8150-726	400GB Hot Plug 2.5-inch SATA SSD	7.3PBW	10 Times	3 Years	
N8150-727	800GB Hot Plug 2.5-inch SATA SSD	14.6PBW	10 Times	3 Years	
SATA SSD (Value Endurance)					
N8150-732	200GB Hot Plug 2.5-inch SATA SSD	1.1PBW	3 Times	3 Years	
N8150-733	400GB Hot Plug 2.5-inch SATA SSD	3.0PBW	3 Times	3 Years	
N8150-734	800GB Hot Plug 2.5-inch SATA SSD	5.3PBW	3 Times	3 Years	
N8150-735	1.6TB Hot Plug 2.5-inch SATA SSD	10.7PBW	3 Times	3 Years	

- PBW(Peta-Bytes Write): Total amount of data that can be written into the SSD. 1PB=1,000TB.
- DWPD(Drive Writes per Day): Rewrite capacity of the SSD per day.
- Check the lifetime of SSD by monitoring tool regularly.
- It is recommended to replace the SSD before it reaches its end of life. For repurchase, please contact your sales representative.
- For detailed operating methods of monitoring tool, refer to the User's Guide.

OS Support Matrix for PCI Cards and Embedded Controller

Part number	Product Name	WS 2016	WS 2012 R2	WS 2012	WS 2008 R2	RHEL 7	RHEL 6 x64	ESXi 6.5	ESXi 6.0	ESXi 5.5
-	Embedded SATA non-RAID Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓
-	Embedded SATA RAID Controller	✓	✓	✓	✓	-	-	-	-	-
-	Embedded 1GbE NIC	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8103-176	RAID Controller (1 GB, RAID 0/1)	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8103-177	RAID Controller (1 GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8103-178	RAID Controller (2 GB,RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8103-179	RAID Controller (2 GB,RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8118-303	2.5-inch PCIeSSD Installation Kit	✓	✓	✓	-	-	✓	-	-	-
N8190-162	Fibre Channel Controller (2ch)	✓	-	-	-	-	-	-	-	-
N8190-161	Fibre Channel Controller (1ch)	✓	-	-	-	-	-	-	-	-
N8190-158A	Fibre Channel Controller (2ch)	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8190-157A	Fibre Channel Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8104-147	Dual Port InfiniBand Adapter	-	✓	✓	-	✓	✓	-	-	-
N8104-146	Single Port InfiniBand Adapter	-	✓	✓	-	✓	✓	-	-	-
N8104-158	10GBASE Adapter (SFP+/2ch)	-	-	-	-	✓	-	-	-	-
N8104-157	Dual Port 10GBASE-T Adapter	✓	✓	✓	-	✓	✓	-	-	-
N8103-184	SAS Controller	-	✓	✓	-	✓	✓	✓	✓	✓
N8190-160	Fibre Channel Controller (2ch)	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8190-159	Fibre Channel Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8104-153	Dual Port 10GBASE-T Adapter	✓	✓	✓	-	✓	✓	✓	✓	✓
N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8103-142	SAS Controller	✓	✓	✓	✓	✓	✓	-	✓	✓
N8104-152	Quad Port 1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8104-145	Dual Port 1000BASE-T Adapter	-	-	-	✓	✓	✓	-	-	✓
N8104-151	Dual Port 1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8104-150	1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓	✓	✓

Supported PCI Cards and Installable Slots

Priority	Part Number	Product Name	Slots				
			#1 ¹	#2	#3	#4	#5
(1)	N8103-176	RAID Controller (1 GB, RAID 0/1)	(4)	(2)	(1)	(3)	-
(2)	N8103-177	RAID Controller (1 GB, RAID 0/1/5/6)	(4)	(2)	(1)	(3)	-
(3)	N8103-178	RAID Controller (2 GB,RAID 0/1/5/6)	(4)	(2)	(1)	(3)	-
(4)	N8103-179	RAID Controller (2 GB,RAID 0/1/5/6)	(4)	(2)	(1)	(3)	-
(5)	N8118-303	2.5-inch PCIeSSD Installation Kit	-	-	-	(2)	-
(6)	N8190-162	Fibre Channel Controller (2ch)	(4)	(2)	(1)	(3)	-
(7)	N8190-161	Fibre Channel Controller (1ch)	(4)	(2)	(1)	(3)	-
(8)	N8190-158A	Fibre Channel Controller (2ch)	(4)	(2)	(1)	(3)	-
(9)	N8190-157A	Fibre Channel Controller	(4)	(2)	(1)	(3)	-
(10)	N8104-147	Dual Port InfiniBand Adapter	(4)	(2)	(1)	(3)	-
(11)	N8104-146	Single Port InfiniBand Adapter	(4)	(2)	(1)	(3)	-
(12)	N8104-158	10GBASE Adapter (SFP+/2ch)	(4)	(2)	(1)	(3)	-
(13)	N8104-157	Dual Port 10GBASE-T Adapter	(4)	(2)	(1)	(3)	-
(14)	N8103-184	SAS Controller	(4)	(2)	(1)	(3)	-
(15)	N8190-160	Fibre Channel Controller (2ch)	(4)	(2)	(1)	(3)	-
(16)	N8190-159	Fibre Channel Controller	(4)	(2)	(1)	(3)	-
(17)	N8104-153	Dual Port 10GBASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(18)	N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	(4)	(2)	(1)	(3)	(5)
(19)	N8103-142	SAS Controller	(4)	(2)	(1)	(3)	(5)
(20)	N8104-152	Quad Port 1000BASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(21)	N8104-145	Dual Port 1000BASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(22)	N8104-151	Dual Port 1000BASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(23)	N8104-150	1000BASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(24)	N8117-01A	Serial Port Adapter	-	-	(1)	(2)	(3)

¹ The slot #1 is not available when a single processor configuration.

NOTE:

- The number between parentheses shows the population priority (recommendation). For example, install N8103-176 (1) in the slot #3, N8190-160 (13) in the slot #2 and N8104-153 (15) in the slot #4 when you have those cards.
- For VMware ESXi 5.5, there are some limitations as follows:
 - When any of N8104-149/-153/-157 is installed, N8104-152 cannot be installed and the number of installable N8104-150/-151 is limited up to one.
 - Up to two cards of N8104-152 can be installed.
 - Up to four cards of N8104-150/-151 can be installed.
 - Up to three cards of N8104-149/-153/-157 can be installed.
 - Up to four cards of N8190-158A/N8190-160/N8103-184 can be installed.
 - When the above four groups are mixed (N8104-152, N8104-150/-151, N8104-149/-153/-157, and N8190-158A/N8190-160/N8103-184), the number of installable cards among them becomes up to three.
 - When configured with Xeon E5-2660 v4/2690 v4, up to one card of N8103-176/-177/-178/-179 can be installed
 - When configured with Xeon E5-2650 v4, up to two cards of N8103-176/-177/-178/-179 can be installed
- For VMware ESXi 6.0, there are some limitations as follows:
 - When any of N8104-149/-153/-157 is installed, N8104-152 cannot be installed and the number of installable N8104-150/-151 is limited up to one.
- For the configuration limitation for VMware ESXi, refer to the following documents.

VMware ESXi5.5

<https://www.vmware.com/pdf/vsphere5/r55/vsphere-55-configuration-maximums.pdf>

VMware ESXi6.0

<https://www.vmware.com/pdf/vsphere6/r60/vsphere-60-configuration-maximums.pdf>

Copyright Notice and Liability Disclaimer

The information contained herein is subject to change without notice.

Microsoft and Windows Server are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries

Intel and Xeon are registered trademarks or trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a trademark of Linus Torvalds.

Red Hat is a registered trademark of Red Hat, Inc. in the U.S.

All other products, brands, or trade names used in this document are trademarks or registered trademarks of their respective holders.

NEC shall not be liable for technical or editorial errors or omissions contained herein.

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

Revision History

Revision	Date	Description
6.0	April 26, 2017	<p>New products added: External DVD Dual drive / N8160-101F</p> <p>Discontinued product deleted: External DVD Super Multi Drive / N8160-98F</p>
5.0	February 24, 2017	<p>New products added: Fibre Channel Controller(1ch) / N8190-161 Fibre Channel Controller(2ch) / N8190-162</p> <p>Others: Added VMware ESXi 6.5 to the list of operating system supported Updated OS support matrix</p>
4.0	January 26, 2017	<p>New products added: 10TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-543</p> <p>Others: Added Windows Server 2016 to the list of operating system supported Updated OS support matrix</p>
3.0	October 12, 2016	<p>New products added: 6TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-540 1.8TB 10K Hot Plug 2.5-inch SAS HDD / N8150-541 10GBASE Adapter (SFP+/2ch) / N8104-158</p> <p>Discontinued product deleted: 6TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-503 1.8TB 10K Hot Plug 2.5-inch SAS HDD / N8150-490</p> <p>Others: Removed 4Kn sector HDD descriptions</p>
2.0	July 20, 2016	<p>New products added: 64GB DDR4-2400 REG Memory Kit (1x64GB) / N8102-690F 8TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-528 External DVD Super Multi Drive / N8160-98F</p> <p>Discontinued product deleted: External DVD Super MULTI Drive / N8160-97F</p>
1.0	April 25, 2016	Initial release