

NEC Express5800/T110h-S System Configuration Guide



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

Key Features

- Ultra compact form of 98 mm in width, 13 liters in volume
- High performance with the latest Intel® Xeon® processor E3-1200 v5 processor family
- Up to 64 GB of high speed DDR4 memory
- Agent-less management with improved EXPRESSCOPE Engine 3
- Wide range of operating ambient temperature from 5 to 48°C (41 to 118°F)

Specification

(1 / 2)

Model		T110h-S		
Part Number		N8100-2327F, N8100-2328F		
Processor	Type	Intel® Pentium® processor G4400	Intel® Xeon® processor E3-1220 v5	Intel® Xeon® processor E3-1230 v5
	Clock speed	3.30 GHz	3.00 GHz	3.40 GHz
	Number of Processors	1		
	Cache	3 MB	8MB	
	Cores and Threads	2C / 2T	4C / 4T	4C / 8T
Chipset		Intel® C236 Chipset		
Memory	Type	DDR4-2133 ECC Unbuffered DIMM		
	Standard Capacity	0 GB		
	Maximum Capacity	64 GB (4 x 16 GB)		
Internal Storage	Standard Capacity	0 GB		
	Maximum Capacity	20 TB (2 x 8 TB + 2x 2TB)		
	Disk Controller	SATA : 6 Gb/s (Integrated) SATA/SAS : 6/12 Gb/s (Optional)		
	RAID	SATA : RAID 0/1/10 (Standard ¹) SATA/SAS : RAID 0/1/5/6/10/50/60 (Optional)		
	Hot Plug	Supported with hot plug drive bay		
	Optical Disk Drive	Optional		
	3.5-inch Media Bays	2		
Expansion Slots		Total: 4 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x4 (x8 connector) 1 PCIe 3.0 x2 (x8 connector) 1 PCIe 3.0 x1 (x8 connector)		
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)		
	Resolution / Color	1600 x 1200 / 16.7M ²		
Interfaces		1 VGA (15-pin mini D-sub, 1 rear) 1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 rear) 6 USB 3.0 (2 front, 4 rear) (plus 1 internal USB 3.0) 2 1000BASE-T LAN connector (RJ-45, 2 rear) 1 1000BASE-T LAN connector for Management (RJ-45, 1 rear)		
Server Management		EXPRESSSCOPE Engine 3		
System Fan		Standard		
Power Supply		1 x 250 Watt 80 PLUS® Platinum certified non-hot plug PSU 2 x 460 Watt 80 PLUS® Platinum certified Hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz		
Power Consumption	(Max. Config, Idling)	94 VA / 94 Watt	96 VA / 96 Watt	97 VA / 96 Watt
	(Max. Config, Operating)	165 VA / 164 Watt	204 VA / 203 Watt	233 VA / 232 Watt
Acoustic Noise (Sound Pressure Level) ³	Minimum Config.	26.1 dB		
	Maximum Config.	35.8 dB		

Model	T110h-S
Dimensions (W x D x H)	98.0 x 386.5 x 341.0 mm / 3.9 x 15.2 x 13.4 in
Weight (Minimum / Maximum)	8 kg / 11.5 kg, 17.64 lbs. / 25.35 lbs.
Temperature, Relative Humidity (non-condensing)	Operating: 5° to 40° C / 41° to 104° F or 5 to 48°C / 41 to 118°F (Optional), 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%
Regulatory and Safety	FCC, c-UL, CE, CB, RoHS, WEEE, BSMI, CCC
Operating Systems and Virtualization Software	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 Red Hat Enterprise Linux 6.7 or later (x86_64) ⁴ Red Hat Enterprise Linux 7.2 or later ⁴ VMware ESXi 5.5 Update 3 ⁵ VMware ESXi 6.0 Update 1 ⁵

¹ Embedded SATA RAID controller is supported only on limited operating systems.

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, at 25°C. The actual value may vary by the operating environment.

⁴ For Linux support, contact your sales representative or go to the NEC website at:
<http://www.nec.com/global/prod/express/linux/index.html>

⁵ Support on Xeon and Core processor systems only.

(2 / 2)

Model	T110h-S			
Part Number	N8100-2327F, N8100-2328F			
Processor	Type	Intel® Xeon® processor E3-1240L v5	Intel® Xeon® processor E3-1260L v5	Intel® Xeon® processor E3-1270 v5
	Clock speed	2.10 GHz	2.90 GHz	3.60 GHz
	Number of Processors	1		
	Cache	8 MB		
	Cores and Threads	4C / 8T		
Chipset	Intel® C236 Chipset			
Memory	Type	DDR4-2133 ECC Unbuffered DIMM		
	Standard Capacity	0 GB		
	Maximum Capacity	64 GB (4 x 16 GB)		
Internal Storage	Standard Capacity	0 GB		
	Maximum Capacity	24 TB (2 x 10 TB + 2x 2TB)		
	Disk Controller	SATA : 6 Gb/s (Integrated) SATA/SAS : 6/12 Gb/s (Optional)		
	RAID	SATA : RAID 0/1/10 (Standard ¹) SATA/SAS : RAID 0/1/5/6/10/50/60 (Optional)		
	Hot Plug	Supported with hot plug drive bay		
	Optical Disk Drive	Optional		
	3.5-inch Media Bays	2		
	Disk Drive Bays	2 or 4 or 6		
Expansion Slots	Total: 4 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x4 (x8 connector) 1 PCIe 3.0 x2 (x8 connector) 1 PCIe 3.0 x1 (x8 connector)			
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)		
	Resolution / Color	1600 x 1200 / 16.7M ²		
Interfaces	1 VGA (15-pin mini D-sub, 1 rear) 1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 rear) 6 USB 3.0 (2 front, 4 rear) (plus 1 internal USB 3.0) 2 1000BASE-T LAN connector (RJ-45, 2 rear) 1 1000BASE-T LAN connector for Management (RJ-45, 1 rear)			

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Model		T110h-S		
Server Management		EXPRESSSCOPE Engine 3		
System Fan		Standard		
Power Supply		1 x 250 Watt 80 PLUS® Platinum certified non-hot plug PSU 2 x 460 Watt 80 PLUS® Platinum certified Hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz		
Power Consumption	(Max. Config, Idling)	94 VA / 94 Watt		96 VA / 95 Watt
	(Max. Config, Operating)	153 VA / 152 Watt	185 VA / 184 Watt	232 VA / 230 Watt
Acoustic Noise (Sound Pressure Level)³	Minimum Config.	26.1 dB		
	Maximum Config.	35.8 dB		
Dimensions (W x D x H)		98.0 x 386.5 x 341.0 mm / 3.9 x 15.2 x 13.4 in		
Weight (Minimum / Maximum)		8 kg / 11.5 kg, 17.64 lbs. / 25.35 lbs.		
Temperature, Relative Humidity (non-condensing)		Operating: 5° to 40° C / 41° to 104° F or 5 to 48°C / 41 to 118°F (Optional), 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%		
Regulatory and Safety		FCC, c-UL, CE, CB, RoHS, WEEE, BSMI, CCC		
Operating Systems and Virtualization Software		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 Red Hat Enterprise Linux 6.7 or later (x86_64) ⁴ Red Hat Enterprise Linux 7.2 or later ⁴ VMware ESXi 5.5 Update 3 ⁵ VMware ESXi 6.0 Update 1 ⁵		

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² Maximum resolution available via EXPRESSSCOPE Engine 3 remote console is 1280 x 1024 / 65K colors.

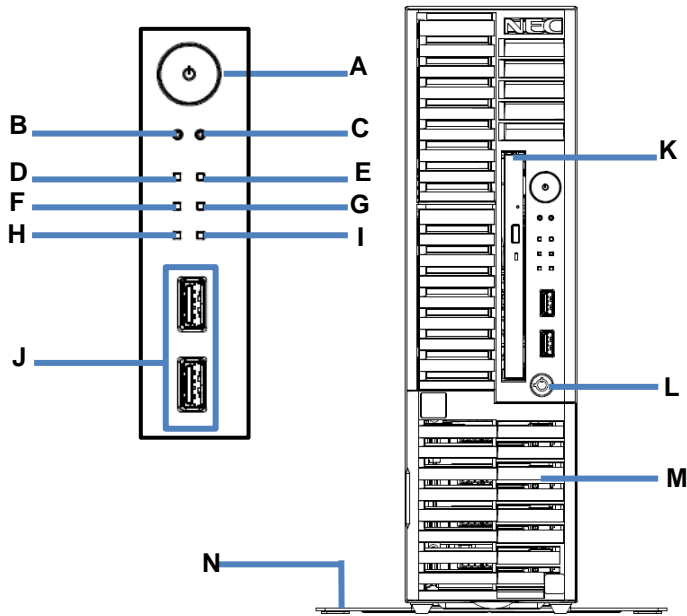
³ Noise emission was measured in accordance with ISO 7779, at 25°C. The actual value may vary by the operating environment.

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<http://www.nec.com/global/prod/express/linux/index.html>

⁵ Support on Xeon and Core processor systems only.

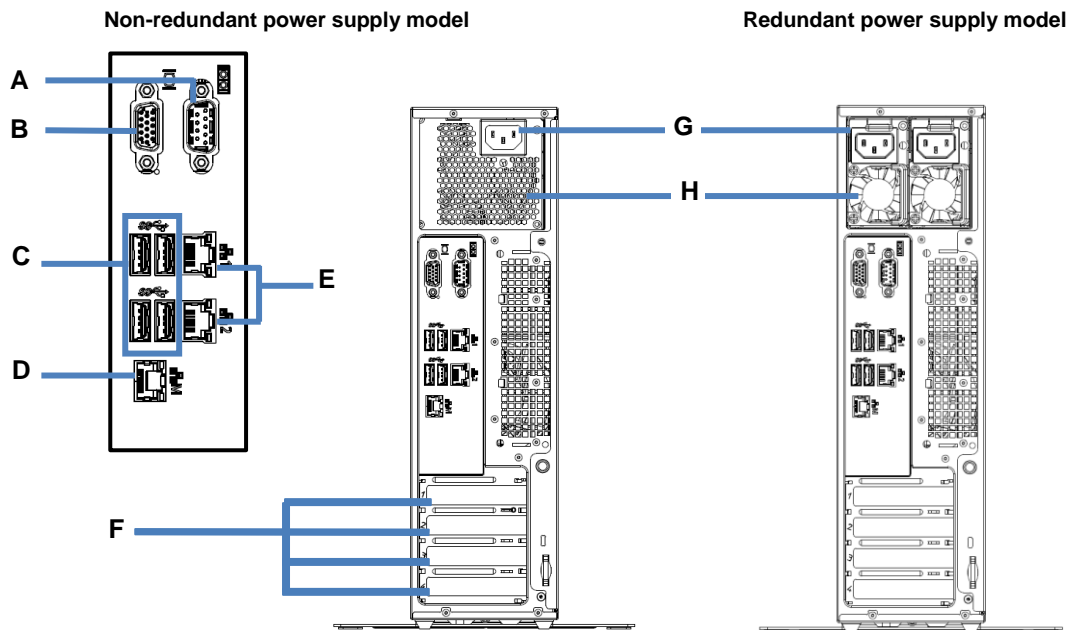
External Views

Front View



Legend			
A.	Power Button	H.	Global LED 1
B.	Dump (NMI) Button	I.	Global LED 2
C.	BMC Reset Button	J.	USB 3.0 Connectors
D.	Power LED	K.	Optical Disk Drive
E.	Power Capping LED	L.	Cover Key (2.5 inch Drive Configuration)
F.	STATUS LED 1	M.	Drive Bay Cover
G.	STATUS LED 2	N.	Stabilizer

Rear Views



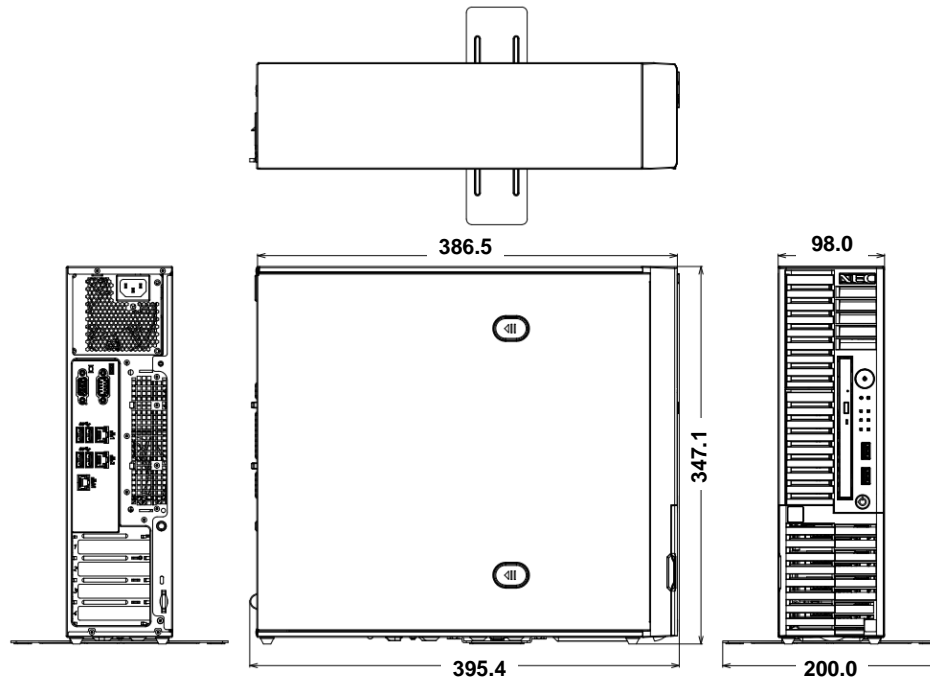
Legend

A.	Serial Port Connector	E.	Data LAN Connectors
B.	VGA Connector	F.	PCI Slots
C.	USB Connectors	G.	AC Inlet
D.	Management LAN Connector	H.	Power Supply Unit

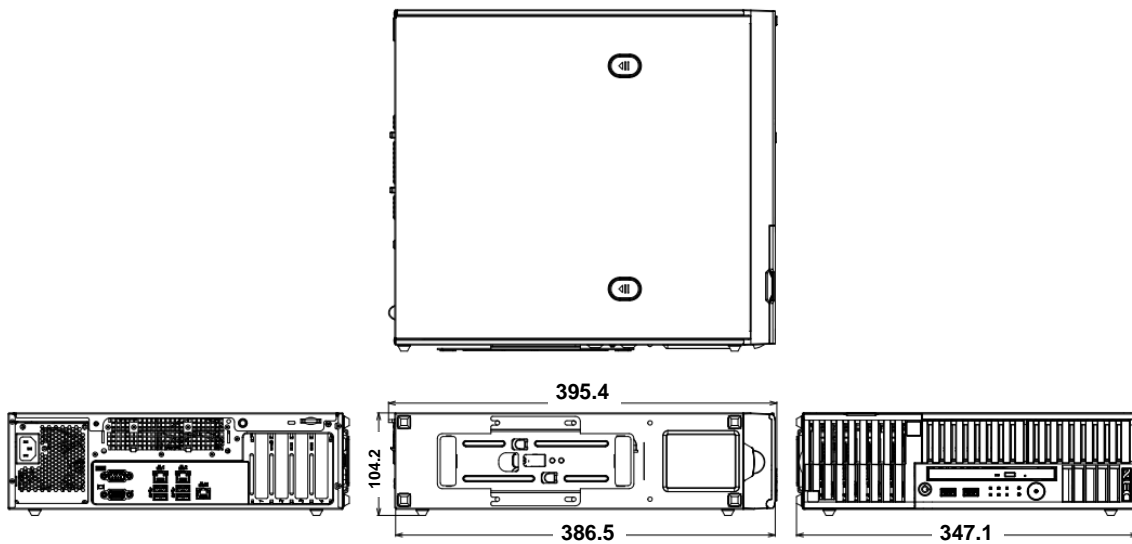
Dimensions (mm)

Standard Bezel

Tower Orientation

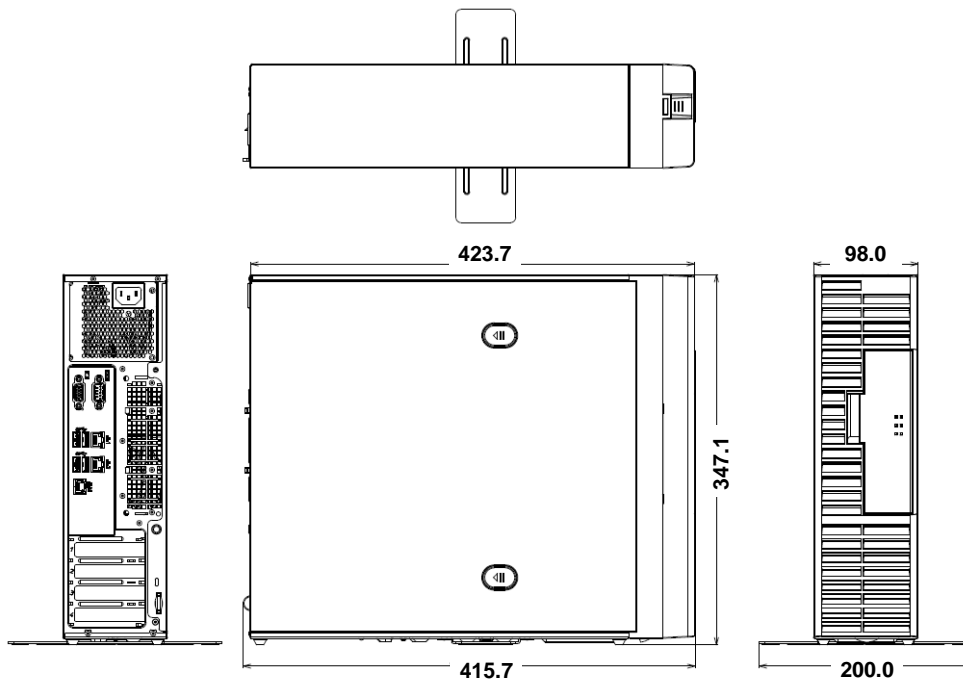


Desktop Orientation

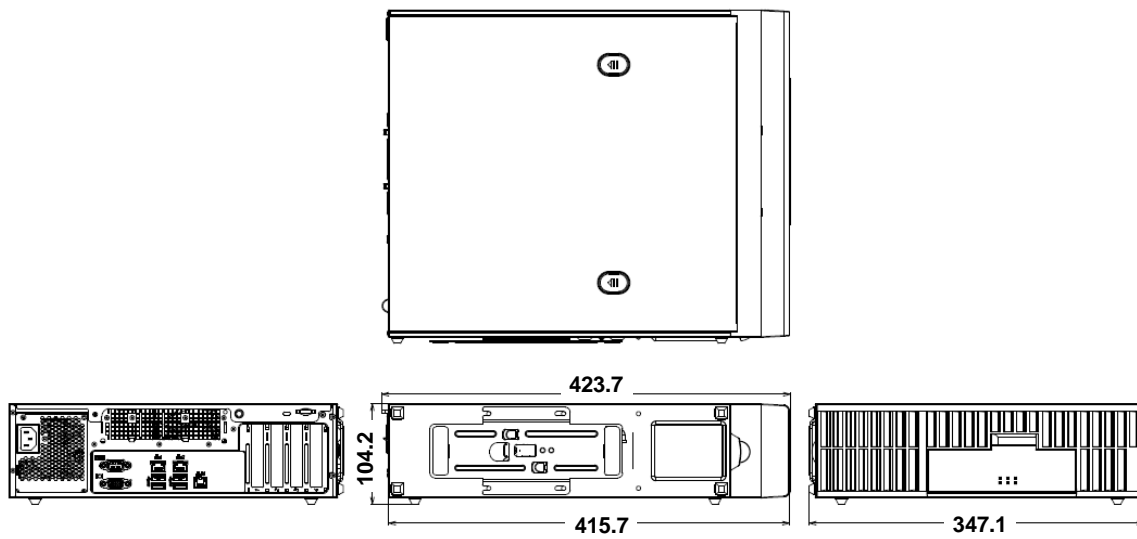


Dust Proof Bezel

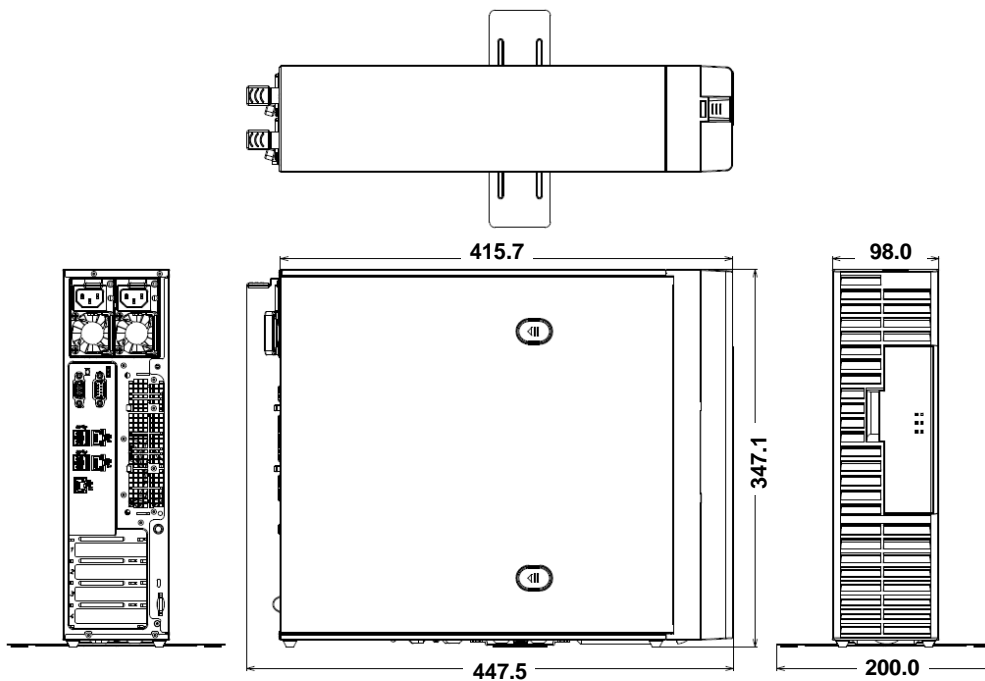
Tower Orientation (Non-redundant power supply)



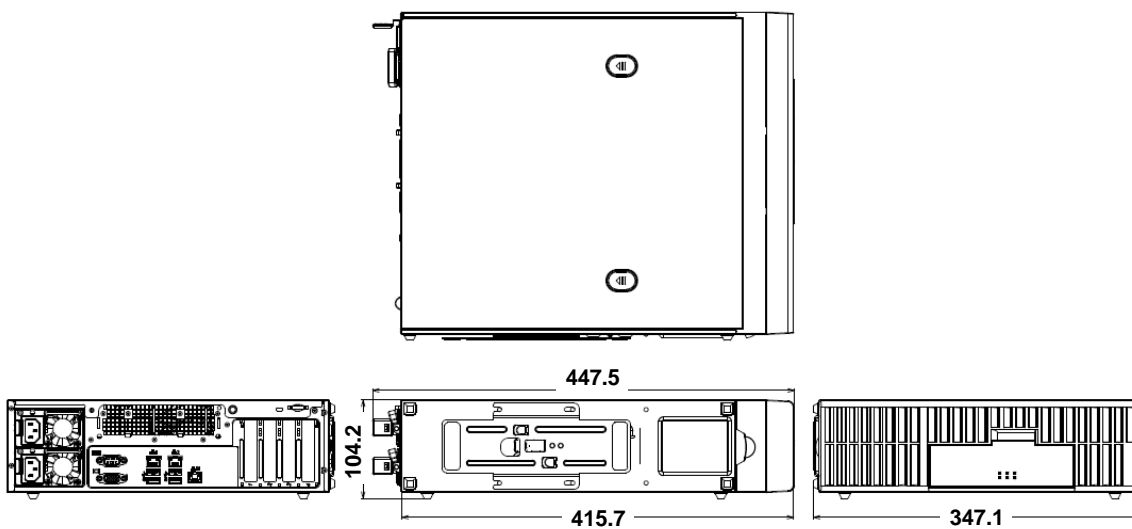
Desktop Orientation (Non-redundant power supply)



Tower Orientation (Redundant power supply)

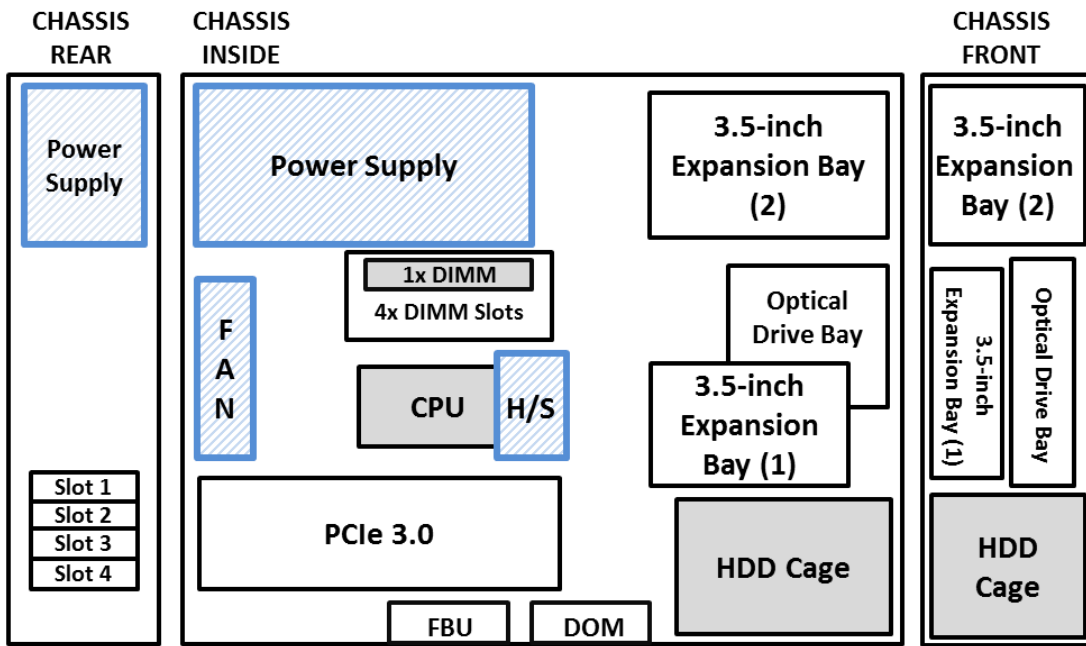


Desktop Orientation (Redundant power supply)



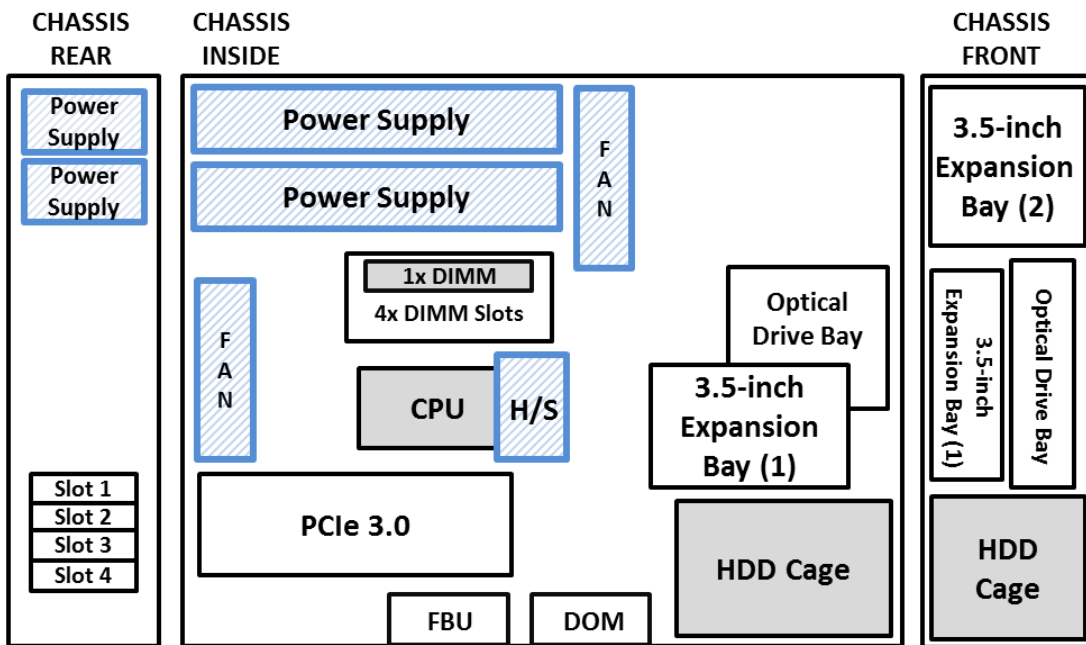
Configuration Diagram

Non-redundant Power Supply Model



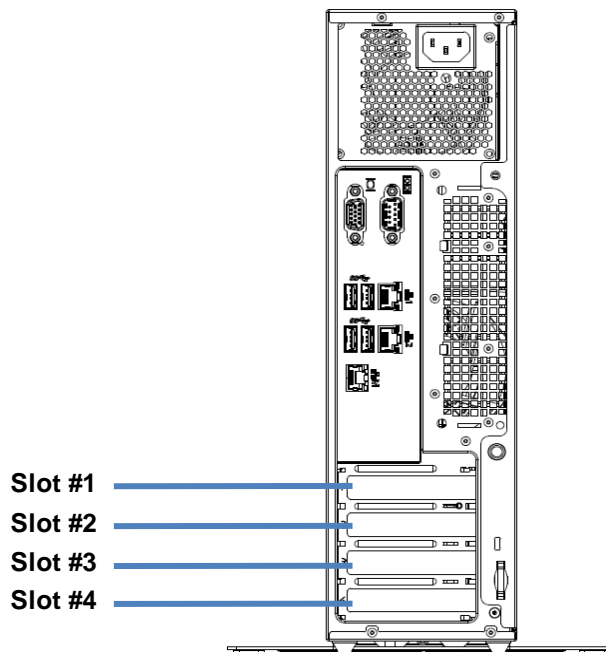
Legend: Standard Components Mandatory Components

Redundant Power Supply Model



Legend: Standard Components Mandatory Components

Expansion Slots



Legend

#1	PCIe 3.0 x2, x8 connector, Low Profile, up to 168mm length
#2	PCIe 3.0 x1, x8 connector, Low Profile, up to 168mm length
#3	PCIe 3.0 x16, x16 connector, Low Profile, up to 168mm length
#4	PCIe 3.0 x4, x8 connector, Low Profile, up to 168mm length

Server Configuration

1 Base Models

Product Name / Description	Part Number
Express5800/T110h-S no Processor, no RAM, no Drive Cage, no HDD, no Optical Drive Including: 250 Watt 80 PLUS® Platinum certified non-hot plug power supply	N8100-2327F
Express5800/T110h-S no Processor, no RAM, no Drive Cage, no HDD, no Optical Drive Including: 2x 460 Watt 80 PLUS® Platinum certified hot plug power supply	N8100-2328F

NOTE:

- The base model must be ordered with a processor kit, memory, a drive cage, and an optical drive.
- For Windows Server 2008 R2 installation, EXPRESSBUILDER DVD is required.

2 Processor

Available sockets: 1

Category	Product Name / Description	Part Number
Processors Required	Pentium G4400 Processor Kit Intel® Pentium® Processor G4400 (3.3 GHz, 2C/2T, 3 MB)	N8101-939F
	Xeon E3-1220v5 Processor Kit Intel® Xeon® Processor E3-1220 v5 (3.0 GHz, 4C/4T, 8 MB)	N8101-941F
	Xeon E3-1230 v5 Processor Kit Intel® Xeon® Processor E3-1230 v5 (3.4 GHz, 4C/8T, 8 MB)	N8101-942F
	Xeon E3-1240L v5 Processor Kit Intel® Xeon® Processor E3-1240L v5 (2.1 GHz, 4C/8T, 8 MB)	N8101-943F
	Xeon E3-1260L v5 Processor Kit Intel® Xeon® Processor E3-1260L v5 (2.9 GHz, 4C/8T, 8 MB)	N8101-944F
	Xeon E3-1270 v5 Processor Kit Intel® Xeon® Processor E3-1270 v5 (3.6 GHz, 4C/8T, 8 MB)	N8101-945F

NOTE:

- One processor kit from above must be installed.
- VMware ESXi is supported only on Xeon processor systems.

3 Memory

Available slots: 4

Product Name / Description	Part Number
4GB DDR4-2133 UNB Memory Kit 1 x 4GB Unbuffered ECC DIMM, DDR4-2133	N8102-656F
8GB DDR4-2133 UNB Memory Kit 1 x 8GB Unbuffered ECC DIMM, DDR4-2133	N8102-657F
16GB DDR4-2133 UNB Memory Kit 1 x 16GB Unbuffered ECC DIMM, DDR4-2133	N8102-658F

NOTE:

- Minimum one memory kit must be installed.
- It is recommended to install memory kits in pairs of two identical DIMMs for dual-channel symmetric memory configurations to increase memory transfer speed.
- The memory requirement to run VMware ESXi™ are below:
 - VMware ESXi 5.5 : at least 5 GB
 - VMware ESXi 6.0 : at least 5 GB

Maximum Available Memory

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

Operating Systems	Maximum Memory Size Supported by Operating Systems	Maximum Available Memory
Microsoft Windows Server 2008 R2 Standard ¹	32 GB	32 GB
Microsoft Windows Server 2008 R2 Enterprise ¹	2 TB	64 GB
Microsoft Windows Server 2012 Standard ¹	4 TB	64 GB
Microsoft Windows Server 2012 Datacenter ¹		
Microsoft Windows Server 2012 R2 Standard ¹		
Microsoft Windows Server 2012 R2 Datacenter ¹		
Red Hat Enterprise Linux 6 (x86_64)	6 TB	64 GB
Red Hat Enterprise Linux 7		
VMware ESXi 5.5 ²	4 TB	64 GB
VMware ESXi 6.0 ³	6 TB	64 GB

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

- Windows Server 2008 R2 Standard : 32 GB
- Windows Server 2008 R2 Enterprise : 1TB
- Windows Server 2012 and Windows Server 2012 R2 : 4 TB

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

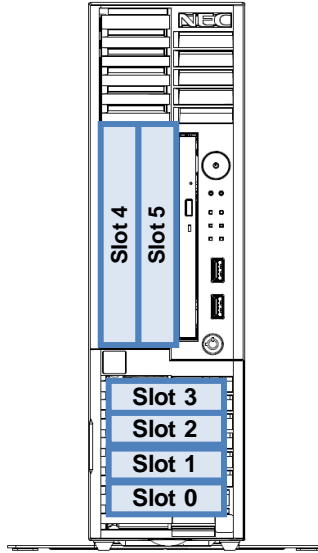
³ Up to 4 TB of main memory is available to each virtual machine.

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

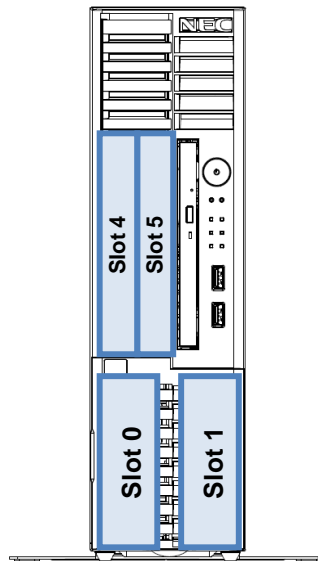


Operating System	Supported RAID configuration		Supported HDD/SSD
	RAID and Cache	Section	
Windows Server 2008 R2 VMware ESXi 5.5 VMware ESXi 6	Non-RAID (Embedded SATA)	4.2.1	4.3.1
	RAID 0/1 (Embedded SATA RAID) (WS2008R2 only)	4.2.2	4.3.2
	RAID 0/1/10 No Cache	4.2.3	4.3.3
	RAID 0/1/10 1GB Cache	4.2.4	
	RAID 5/6/50/60 1GB Cache	4.2.5	
	RAID 5/6/50/60 2GB Cache	4.2.6	
Windows Server 2012 Windows Server 2012 R2	Non-RAID (Embedded SATA)	4.2.1	4.3.1
	RAID 0/1 (Embedded SATA RAID)	4.2.2	4.3.2
	RAID 0/1/10 No Cache	4.2.3	4.3.4
	RAID 0/1/10 1GB Cache	4.2.4	
	RAID 5/6/50/60 1GB Cache	4.2.5	
	RAID 5/6/50/60 2GB Cache	4.2.6	
Red Hat Enterprise Linux 6 Red Hat Enterprise Linux 7	Non-RAID (Embedded SATA)	4.2.1	4.3.1
	RAID 0/1/10 No Cache	4.2.3	4.3.4
	RAID 0/1/10 1GB Cache	4.2.4	
	RAID 5/6/50/60 1GB Cache	4.2.5	
	RAID 5/6/50/60 2GB Cache	4.2.6	

NOTE:

- Up to four drives can be installed when you choose the Embedded SATA Non-RAID controller.
- All drives within a RAID array should be of the same 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, and SSDs can be mixed in a system. However, SAS HDDs and SATA HDDs cannot be mixed in the same cage, and HDDs in the same cage must have the same rotational speed.
- Internal RDX drive cannot be installed in the redundant power supply model with optional 2.5-inch drive cage.

4.1.2 3.5-inch Drive



Operating System	Supported RAID configuration		Supported HDD/SSD
	RAID and Cache	Section	
Windows Server 2008 R2 VMware ESXi 5.5 VMware ESXi 6	Non-RAID (Embedded SATA)	4.2.7	4.3.5
	RAID 0/1 (Embedded SATA RAID) (WS2008R2 only)	4.2.8	
	RAID 0/1/10 No Cache	4.2.9	
	RAID 0/1/10 1GB Cache	4.2.10	3.5-inch: 4.3.5 2.5-inch: 4.3.3
Windows Server 2012 Windows Server 2012 R2	Non-RAID (Embedded SATA)	4.2.7	4.3.5
	RAID 0/1 (Embedded SATA RAID)	4.2.8	
	RAID 0/1/10 No Cache	4.2.9	4.3.6
	RAID 0/1/10 1GB Cache	4.2.10	3.5-inch: 4.3.6 2.5-inch: 4.3.4
Red Hat Enterprise Linux 6 Red Hat Enterprise Linux 7	Non-RAID (Embedded SATA)	4.2.7	4.3.5
	RAID 0/1/10 No Cache	4.2.9	4.3.6
	RAID 0/1/10 1GB Cache	4.2.10	3.5-inch: 4.3.6 2.5-inch: 4.3.4

NOTE:

- All hard drives within a RAID array should be of the same capacity and rotation speed.
- 2.5-inch drives installed in the optional cage must be identical.
- Install an operating system in the 3.5-inch drives with this configuration.
- 2.5-inch drives cannot be set as hot-spare for the RAID group of 3.5-inch drives.
- Internal RDX drive cannot be installed in the redundant power supply model with optional 2.5-inch drive cage.
- Hot plug insertion/removal of any drive is not supported when both 3.5-inch and 2.5-inch drives are installed.

4.2 Required Components for RAID Configuration

4.2.1 Embedded SATA non-RAID Controller for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4x 6Gb/s SATA	(Standard)
Cable	Internal SATA Cable Mini-SAS to mini-SAS	(Included in the Drive Cage)
Drive Cage Required	2.5-inch Drive Cage 4 x 2.5-inch hot plug drive bays	N8154-82F

NOTE

- Hot plug insertion/removal is not supported with the embedded SATA non-RAID controller.

4.2.2 Embedded SATA RAID Controller for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4x 6Gb/s SATA, RAID0/1/10 capable	(Standard)
Cable	Internal SATA Cable Mini-SAS to mini-SAS	(Included in the Drive Cage)
Drive Cage Required	2.5-inch Drive Cage 4 x 2.5-inch hot plug drive bays	N8154-82F

NOTE

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

4.2.3 RAID 0/1 Controller without Cache for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (RAID 0/1) Avago(LSI) MegaRAID SAS 9341-8i RAID0/1/10, no memory cache, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-188
Cable	Internal SATA Cable mini-SAS to mini-SAS, miniSAS – 2x Single SATA	(Included in the Drive Cage)
Drive Cage Required	2.5-inch Drive Cage 4 x 2.5-inch hot plug drive bays	N8154-82F
Optional Drive Cage (For more than 4 drives)	2.5-Inch Hot Plug Drive Cage Kit 2x 2.5-inch hot plug drive bays Including 1x mini-SAS to 2x Single SATA cable	N8154-83F

NOTE:

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

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

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1) LSI MegaRAID SAS 9362-8i RAID0/1/10, 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 500mm Cable for Flash Backup Unit included	N8103-180
Cable	Internal SATA Cable mini-SAS to mini-SAS, miniSAS – 2x Single SATA	(Included in the Drive Cage)
Drive Cage Required	2.5-inch Drive Cage 4 x 2.5-inch hot plug drive bays	N8154-82F
Optional Drive Cage (For more than 4 drives)	2.5-Inch Hot Plug Drive Cage Kit 2x 2.5-inch hot plug drive bays Including 1x mini-SAS to 2x Single SATA cable	N8154-83F

NOTE:

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

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

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 500mm Cable for Flash Backup Unit included	N8103-180
Cable	Internal SATA Cable mini-SAS to mini-SAS, miniSAS – 2x Single SATA	(Included in the Drive Cage)
Drive Cage Required	2.5-inch Drive Cage 4 x 2.5-inch hot plug drive bays	N8154-82F
Optional Drive Cage (For more than 4 drives)	2.5-Inch Hot Plug Drive Cage Kit 2x 2.5-inch hot plug drive bays Including 1x mini-SAS to 2x Single SATA cable	N8154-83F

NOTE:

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

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

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, 2 GB, 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 500mm Cable for Flash Backup Unit included	N8103-180
Cable	Internal SATA Cable mini-SAS to mini-SAS, miniSAS – 2x Single SATA	(Included in the Drive Cage)
Drive Cage Required	2.5-inch Drive Cage 4 x 2.5-inch hot plug drive bays	N8154-82F
Optional Drive Cage (For more than 4 drives)	2.5-Inch Hot Plug Drive Cage Kit 2x 2.5-inch hot plug drive bays Including 1x mini-SAS to 2x Single SATA cable	N8154-83F

NOTE:

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

4.2.7 Embedded SATA non-RAID Controller for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4x 6Gb/s SATA	(Standard)
Cable	Internal SAS/SATA Cable miniSAS to 2x Single SATA	(Included in the Drive Cage)
Drive Cage Required	3.5-inch Drive Cage 2 x 3.5-inch non hot plug (fixed) drive bays	N8154-84F

4.2.8 Embedded SATA RAID Controller for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4x 6Gb/s SATA	(Standard)
Cable	Internal SAS/SATA Cable miniSAS to 2x Single SATA	(Included in the Drive Cage)
Drive Cage Required	3.5-inch Drive Cage 2 x 3.5-inch non hot plug (fixed) drive bays	N8154-84F

NOTE:

- All hard drives within a RAID array should be of the same capacity.

4.2.9 RAID 0/1 Controller without Cache for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (RAID 0/1) Avago(LSI) MegaRAID SAS 9341-8i RAID0/1/10, no memory cache, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-188
Cable Required	RAID LED Cable	K410-293(00)
Cable	Internal SAS/SATA Cable miniSAS to 2x Single SATA	(Included in the Drive Cage)
Drive Cage Required	3.5-inch Drive Cage 2 x 3.5-inch non hot plug (fixed) drive bays	N8154-84F

NOTE:

- All hard drives within a RAID array should be of the same capacity.

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

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1) LSI MegaRAID SAS 9362-8i RAID0/1/10, 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 500mm Cable for Flash Backup Unit included	N8103-180
Cable Required	RAID LED Cable	K410-293(00)
Cable	Internal SATA Cable mini-SAS to 2x Single SATA, for 3.5-inch drive cage	(Standard)
	Internal SAS/SATA Cable mini-SAS to 2x Single SATA, for 2.5-inch drive cage	(Included in the Drive Cage)
Drive Cage Required	3.5-inch Drive Cage 2 x 3.5-inch non hot plug (fixed) drive bays	N8154-84F
Optional Drive Cage (For more than 2 drives)	2.5-Inch Hot Plug Drive Cage Kit 2x 2.5-inch hot plug drive bays Including 1x mini-SAS to 2x Single SATA cable	N8154-83F

NOTE:

- All hard drives within a RAID array should be of the same capacity.

SYSTEM CONFIGURATION GUIDE – NEC Express5800/T110h-S

- 2.5-inch drives installed in the optional cage must be identical.
- Hot plug insertion/removal of any drive is not supported when both 3.5-inch and 2.5-inch drives are installed.

4.3 Supported Drives

4.3.1 2.5-inch Drives (1)

Category		Product Name / Description	Part Number
Drive For 2.5-inch drive cage: 4 slots available For optional drive cage: 2 slots available	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-487
		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

4.3.2 2.5-inch Drives (2)

Category		Product Name / Description	Part Number
Drive For 2.5-inch drive cage: 4 slots available For optional drive cage: 2 slots available	SATA HDD (512n)	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-487
		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
	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

4.3.3 2.5-inch Drives (3)

Category		Product Name / Description	Part Number
Drive For 2.5-inch drive cage: 4 slots available For optional drive cage: 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 1 x 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 1 x 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 1 x 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 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-518

SATA HDD (512n)	250GB 7.2K Hot Plug 2.5-inch SATA HDD	N8150-487
	1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	
	500GB 7.2K Hot Plug 2.5-inch SATA HDD	N8150-488
	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	N8150-489
	1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	
	2TB 7.2K Hot Plug 2.5-inch SATA HDD	N8150-527
	1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	
SAS SSD (eMLC)	200GB Hot Plug 2.5-inch SAS SSD	N8150-721
	1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	
	400GB Hot Plug 2.5-inch SAS SSD	N8150-722
	1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	
SATA SSD (ME)	200GB Hot Plug 2.5-inch SATA SSD	N8150-725
	1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	
	400GB Hot Plug 2.5-inch SATA SSD	N8150-726
	1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	
	800GB Hot Plug 2.5-inch SATA SSD	N8150-727
	1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	
SATA SSD (VE)	200GB Hot Plug 2.5-inch SATA SSD	N8150-732
	1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	
	400GB Hot Plug 2.5-inch SATA SSD	N8150-733
	1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector VE	
	800GB Hot Plug 2.5-inch SATA SSD	N8150-734
	1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	
	1.6TB Hot Plug 2.5-inch SATA SSD	N8150-735
	1 x 1.6 TB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	

NOTE:

- All hard drives within a RAID array should be of the same capacity.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, and SSDs can be mixed in a system. However, SAS HDDs and SATA HDDs cannot be mixed in the same cage, and HDDs in the same cage must have the same rotational speed.
- 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.
- The 2.5-inch SAS/SATA SSDs have limited lifetime. Refer to [Endurance of SSD](#) for details.

4.3.4 2.5-inch Drives (4)

Category	Product Name / Description	Part Number
Drive For 2.5-inch drive cage: 4 slots available For optional drive cage: 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	N8150-480
	1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	
	600GB 10K Hot Plug 2.5-inch SAS HDD	N8150-481
	1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	
	900GB 10K Hot Plug 2.5-inch SAS HDD	N8150-482
	1 x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	
	1.2TB 10K Hot Plug 2.5-inch SAS HDD	N8150-483
	1 x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	
	300GB 15K Hot Plug 2.5-inch SAS HDD	N8150-485
	1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	
	450GB 15K Hot Plug 2.5-inch SAS HDD	N8150-486
	1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	
	600GB 15K Hot Plug 2.5-inch SAS HDD	N8150-518
	1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	
SAS HDD (512e)	1.8TB 10K Hot Plug 2.5-inch SAS HDD	N8150-541
	1x 1.8TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512e sector	
SATA HDD (512n)	250GB 7.2K Hot Plug 2.5-inch SATA HDD	N8150-487
	1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	
	500GB 7.2K Hot Plug 2.5-inch SATA HDD	N8150-488
	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	N8150-489
	1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	

	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 (eMLC)	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 hard drives within a RAID array should be of the same capacity.
- Up to two kinds of drives selected from SAS 10K HDDs (512n), SAS 10K HDDs (512e), SAS 15K HDDs, SATA HDDs, and SSDs can be mixed in a system. However, SAS HDDs and SATA HDDs cannot be mixed in the same cage, and HDDs in the same cage must have the same rotational speed.
- 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.
- The 2.5-inch SAS/SATA SSDs have limited lifetime. Refer to [Endurance of SSD](#) for details.

4.3.5 Non-hot Plug 3.5-inch Drives (1)

Category	Product Name / Description	Part Number
Drive 2slots available	SATA HDD (512n) 500GB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-526
	1TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-514
	2TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-515
	3TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-516
	4TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-517

NOTE:

- Hot plug insertion/removal is not supported with the embedded SATA Non-RAID controller.

4.3.6 Non-hot Plug 3.5-inch Drives (2)

Category	Product Name / Description	Part Number
Drive 2 slots available	SATA HDD (512n) 500GB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-526
	1TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-514
	2TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-515
	3TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-516
	4TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-517
	SATA HDD (512e) 6TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 6 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-538
	8TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 8 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e Sector	N8150-539

10TB 7.2K non-Hot Plug 3.5-inch SATA HDD
 1 x 10 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e Sector

N8150-542

NOTE:

- All drives within a RAID array should be of the same capacity.
- Embedded SATA RAID Controller does not support RAID 10 configured with 2TB or more HDDs.
- 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 Internal Optical Drive

Category	Product Name / Description	Part Number
Internal	Internal Slim DVD-ROM Drive Slim DVD-ROM drive	N8151-130
	Internal DVD Super Multi Drive Slim DVD Super Multi drive, not including writing software	N8151-131F
	NOTE: - Not supported for Linux or VMware.	
	Optical Drive Bay Cover Blank panel	N8151-133
External	External DVD Super MULTI Drive Slim DVD Super Multi drive, Bus powered, 1.5A required, not including writing software	N8160-98F
	NOTE: - Windows Server 2008 R2 installation is not supported with this drive.	

NOTE:

- An optical drive is required for maintenance and OS installation.
- Up to 1 optical drive can be connected.
- N8151-133 Optical Drive Bay Cover must be installed when not installing any internal optical drives.

6 Internal RDX Drives

Category	Product Name / Description	Part Number
Controller	Internal USB Controller 1 x USB port	(Standard)
Cable Required	Internal USB cable 1x Internal USB3.0 to 1x USB 3.0 device	K410-352(00)
Drive 1 bays available	Internal RDX (USB) NOTE: - Not supported for VMware.	N8151-105

NOTE:

- Optional 2.5-inch drive cage cannot be installed in the redundant power supply model with Internal RDX drive.

7 PCI Card

7.1 Network Interface Controller

Category	Product Name / Description		Part Number
Adapter	GbE	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
		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 BCM57810 10G SFP+ Dual Port Network Interface Card PCIe 2.0 x8	N8104-149
		NOTE: - N8104-129 SFP+ Module is required to connect with an optical cable. - Up to two SFP+ Modules can be installed. - Up to two adapters can be installed. - 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)	N8104-153
		NOTE: - N8103-184 and N8104-153 cannot be installed at the same time.	
		Dual Port 10GBASE-T Adapter Intel X550-BT2 PCIe 3.0 x4	N8104-157
SFP+ Module		SFP+ Module (10G-SR) 1 x SFP+ Module for N8104-149	N8104-129

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) teaming while Windows Server 2012 or later and Linux support teaming with bonding function supported by OS.

Network Interface	Team	Operating Systems
1GbE NIC Embedded 1GbE NIC and N8104-150/-151/-152	Up to four teams per one system Up to four ports per one team	Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux
10GbE NIC N8104-149	Up to two teams per one system Up to two ports per one team	Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux
10GbE NIC N8104-153/-157	Up to one teams per one system Up to two ports per one team	Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux

NOTE:

- The network interfaces for a teaming must be the same.
- When 10GbE and 1GbE LAN teams are mixed, the teams must be up to four per one system.

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, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 7, VMware
10GbE	N8104-149	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 7, VMware
	N8104-153/-157	Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 7, VMware

NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.

7.2 SAS Controller

Product Name / Description	Part Number
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, Int. 4 / Ext. 4, 7-pin SATA / SFF-8088, PCIe 3.0 x8	N8103-184

NOTE:
- N8103-184 and N8104-153 cannot be installed at the same time.

7.3 Graphics Accelerator

Product Name / Description	Part Number
Graphics Accelerator NVIDIA NVS315 PCIe 2.0(x16), 1xDVI-VGA conversion connector, DMS-59-DVI-I cable included	N8105-48

NOTE:

- VGA connector of the server cannot be used when this option is installed.
- Remote KVM cannot be used when this option is installed.
- Dual display configuration is possible with this option.

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 Trusted Platform Module Kit

Product Name / Description	Part Number
Trusted Platform Module Kit TPM 2.0 module	N8115-23A

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.

8.2 Internal Flash Memory

Product Name / Description	Part Number
VMware ESXi support kit Internal USB flash memory to install VMware ESXi system	N8106-011

NOTE:

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

8.3 High Temperature Support Option

Product Name / Description	Part Number
High temperature resistant Kit Required for high temperature operation over 40°C (up to 48°C)	N8181-140F

NOTE:

- To apply this option, there are some configuration limitations below.

Required System Configuration:

- See [Supported PCI cards and Installable Slots](#) for the PCI slot limitation.
- Internal RDX or optional 2.5-inch drive cage must not be installed.

8.4 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 derive can be connected
- Not supported when VMware is running on the server.

8.5 Input Devices

Product Name / Description	Part Number
Keyboard and Mouse Pack (US) 1 x 104-keys White USB keyboard, 1 x USB White Optical Wheel Mouse	(Standard)

9 Add-on Components

9.1 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
Remote KVM and Media License Kit License for one server. Remote KVM and remote media are enabled regardless of OS status. Remote KVM: <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 Remote media: <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.

9.2 Dust Proof Kit

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

Category	Product Name / Description	Part Number
Front Bezel	Dust Proof Bezel Including 1 set of dust proof filter	N8146-74
	Dust Proof Bezel Including 1 set of filter replacement sensors, 1 set of dust proof filter	N8146-75
Filter	Dust proof filter (5 pcs.) For Dust Proof filter Removal capacity of particles : Up to 1 µm-sized	N8147-23
Sensor	Filter replacement Sensor For N8146-74 Dust Proof Bezel	N8146-76

9.3 Tamper Proof Power Button Covers

Product Name / Description	Part Number
Tamper Proof Cover For Standard Bezel Tamper proof cover to prevent erroneous operation of a power button	N8146-77

NOTE:

- The Tamper Proof Cover is not available for Dust Proof Bezel.

9.4 Rack Conversion Kit

Product Name / Description	Part Number
Rack Conversion Kit Convert to 3U form factor	N8143-120

9.5 Medium and Cartridge

Category	Product Name	Drive supported	Part Number	
RDX	HDD	RDX Cartridge (500GB)	N8151-105	N8153-02
		RDX Cartridge (1TB)	N8151-105	N8153-03
		RDX Cartridge (2TB)	N8151-105	N8153-09
		RDX Cartridge (3TB)	N8151-125	N8153-10
		RDX Cartridge (4TB)	N8151-125	N8153-11

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
Red Hat Enterprise Linux 6(x86_64)	UEFI	Enabled
Red Hat Enterprise Linux 7	UEFI	Enabled
VMware ESXi 5.5 Update3	Legacy	Disabled
VMware ESXi 6 Update1	Legacy	Disabled

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/hard drive ¹ /fan/voltage/power consumption/ System LAN/degeneration/ (memory/hard drive ¹)	✓	✓
	Hardware configuration information collection	✓	✓
	Hardware event log collection	✓	✓
Boot monitoring	BIOS/POST stall, Booting, OS stall, shutdown	✓ ³	✓ ³
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, 4, 5}	✓
	CUI-based screen (OS console)	✓ ^{2, 5}	✓
	GUI-based screen (OS console)	-	✓
	Remote Screen Video Capture	-	✓
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	✓ ³	✓ ³
	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, require NEC ESMPRO Manager)	✓ ³	✓ ³
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	✓	✓
Industry Standard	IPMI support	2.0	2.0

¹ The feature is not supported on non-hot plug 3.5-inch drive.

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

³ The feature is not supported on VMware systems.

⁴ Monitoring boot screens is not supported on VMware systems.

⁵ 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 (Low 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 Controllers

Part Number	Product Name	WS 2012 R2	WS 2012	WS 2008 R2	RHEL 7	RHEL 6 x64	ESXi 6.0	ESXi 5.5
		-	Embedded SATA non-RAID Controller	✓	✓	✓	✓	✓
-	Embedded SATA RAID Controller	✓	✓	-	-	-	-	-
-	Embedded 1GbE NIC	✓	✓	✓	✓	✓	✓	✓
N8103-188	RAID Controller (RAID 0/1)	✓	✓	✓	✓	✓	✓	✓
N8103-176	RAID Controller (1GB, RAID 0/1)	✓	✓	✓	✓	✓	✓	✓
N8103-177	RAID Controller (1GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓
N8103-178	RAID Controller (2GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓
N8105-48	Graphics Accelerator	✓	-	-	-	-	-	-
N8104-157	Dual Port 10GBASE-T Adapter	✓	✓	-	✓	✓	✓	✓
N8104-153	Dual Port 10GBASE-T Adapter	✓	✓	-	✓	✓	✓	✓
N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	✓	✓	✓	✓	✓	✓	✓
N8103-184	SAS Controller	✓	✓	-	✓	✓	✓	✓
N8103-142	SAS Controller	✓	✓	✓	✓	✓	✓	✓
N8104-152	Quad Port 1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓
N8104-151	Dual Port 1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓
N8104-150	1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓

Supported PCI cards and Installable Slots

Part Number	Product Name	Slots			
		#1	#2	#3	#4
N8103-188	RAID Controller (RAID 0/1)	-	-	-	(1)
N8103-176	RAID Controller (1GB, RAID 0/1)	-	-	-	(1)
N8103-177	RAID Controller (1GB, RAID 0/1/5/6)	-	-	-	(1)
N8103-178	RAID Controller (2GB, RAID 0/1/5/6)	-	-	-	(1)
N8105-48	Graphics Accelerator	-	-	(1)	-
N8104-157	Dual Port 10GBASE-T Adapter	-	-	(1) ¹	(2)
N8104-153	Dual Port 10GBASE-T Adapter	-	-	(1) ¹	(2)
N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	-	-	(1) ¹	(2)
N8103-184	SAS Controller	-	-	(1) ¹	(2)
N8103-142	SAS Controller	-	(3) ¹	(1) ¹	(2)
N8104-152	Quad Port 1000BASE-T Adapter	(1) ¹	(3) ¹	-	(2)
N8104-151	Dual Port 1000BASE-T Adapter	(2)	(4)	(1)	(3)
N8104-150	1000BASE-T Adapter	(2)	(4)	(1)	(3)
N8117-01A	Serial Port Adapter	(2)	(4)	(1)	(3)

¹ Not installable when high temperature support option is applied.

NOTE:

- The number between parentheses shows the population priority (recommendation). For example, install N8103-176 in the slot #4 and N8104-151 in the slot #3 when you have those cards.
- There are PCI slot limitations depending on the processor and operating system. Please refer to the following and be careful to choose a processor and PCI cards.

PCI slot limitations

See the table below for the limitations on installing PCI cards (due to the number of interrupts that can be processed in the system) depending on the installed processor.

Processor	RAID controller required	PCI slot limitations
Pentium G4400	Yes	<ul style="list-style-type: none"> Do not install the following PCI cards. N8103-184 SAS Controller N8104-152 Quad Port 1000BASE-T Adapter Up to one card from the following can be installed. N8104-153 Dual Port 10GBASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter Up to one card of N8104-153 Dual Port 10GBASE-T Adapter can be installed. No limitations for other cards.
	No	<ul style="list-style-type: none"> Up to one of either N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter can be installed and up to one card from the following can be installed. Then, no limitations for other cards. N8104-153 Dual Port 10GBASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter No limitations when N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter is not installed, except N8104-153 as noted below. Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed.
Xeon E3-1220v5	Yes	<ul style="list-style-type: none"> Up to two cards from the following can be installed. N8103-184 SAS Controller (up to one) N8104-152 Quad Port 1000BASE-T Adapter Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed. No limitations for other cards.
	No	<ul style="list-style-type: none"> Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed. No limitations for other cards.
Other processors	-	<ul style="list-style-type: none"> Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed. No limitations for other cards.

PCI slot limitations for VMware

- Do not install N8104-152 Quad Port 1000BASE-T Adapter when any of the following cards is installed.
N8104-153 Dual Port 10GBASE-T Adapter
N8104-157 Dual Port 10GBASE-T Adapter
N8104-149 10GBASE SFP+ Adapter (SFP+/2ch)
- 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>

Secure Boot Mode

This server supports Secure Boot. It is supported with UEFI Boot mode and protects the security by only allowing software programs with digital signature to run. The supported operating systems, software, and boot devices are below. The default setting of Secure Boot is disabled. Keep the setting disabled to use other operating systems and/or software.

Supported OS and Software for Secure Boot Mode

Operating System	Supported Boot Mode	Secure Boot Mode
Windows Server 2012	UEFI	✓
Windows Server 2012 R2	UEFI	✓
Software Related to Boot	Supported Boot Mode	Secure Boot Mode
System Diagnostics Utility	UEFI	✓
EXPRESSBUILDER	UEFI	✓

Supported Boot Device for Secure Boot Mode

Supported Boot Device	Part Number
RAID controller (RAID0/1)	N8103-188
RAID controller (1GB, RAID0/1)	N8103-176
RAID controller (1GB, RAID0/1/5/6)	N8103-177
RAID controller (2GB, RAID0/1/5/6)	N8103-178
RAID controller (2GB, RAID0/1/5/6)	N8103-179

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

The USB interface is not guaranteed to work properly for all USB devices.

Revision History

Revision	Date	Description
5.0	January 26, 2017	<p>New products added: 10TB 7.2K non-Hot Plug 3.5-inch SATA HDD / N8150-542 RDX Cartridge (4TB) / N8153-11 Trusted Platform Module Kit / N8115-23A</p> <p>Discontinued product deleted: Trusted Platform Module Kit / N8115-23</p>
4.0	October 12, 2016	<p>New products added: 6TB 7.2K non-Hot Plug 3.5-inch SATA HDD / N8150-538 1.8TB 10K Hot Plug 2.5-inch SAS HDD / N8150-541 Dual Port 10GBASE-T Adapter / N8104-157 RDX Cartridge (3TB) N8153-10</p> <p>Discontinued product deleted: 6TB 7.2K non-Hot Plug 3.5-inch SATA HDD / N8150-513 1.8TB 10K Hot Plug 2.5-inch SAS HDD / N8150-490 RDX Cartridge (320GB) N8153-01</p> <p>Others: Removed 4Kn sector HDD descriptions</p>
3.1	August 19, 2016	<p>Others: Added PCI slot limitations.</p>
3.0	July 20, 2016	<p>New products added: 8TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-539 External DVD Super Multi Drive / N8160-98F</p> <p>Discontinued product deleted: External DVD Super MULTI Drive / N8160-97F USB Extension Cable / K410-351(00)</p> <p>Others: Corrected the references of Supported HDD/SSD for 3.5-inch drive configuration.</p>
2.0	April 26, 2016	<p>New products added: Dust Proof Bezel N8146-75 Filter replacement Sensor N8146-76</p> <p>Others: N8103-184 and N8104-153 cannot be installed at the same time Changed the Installable slot information for N8103-184 Added a note for Windows Server 2008 R2 installation Added SATA SSDs for the RAID configuration for RAID 0/1 (Embedded SATA RAID) (4.3.2) Added a note for Graphics Accelerator N8105-48</p>
1.1	February 2, 2016	Corrected typos and errors.
1.0	January 22, 2016	Initial release