

NEC Express5800/T120f 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

- High performance with the latest Intel® Xeon® processor E5-2600 v3 product family
- Up to 512 GB of high speed DDR4-2133 memory
- High energy efficiency with power capping feature and 80 PLUS® Platinum or Gold power supply
- Full manageability by integrated EXPRESSSCOPE Engine 3

Specification

(1/2)

Model		T120f				
Processor	Type	Intel® Xeon® Processor E5-2603 v3	Intel® Xeon® Processor E5-2609 v3	Intel® Xeon® Processor E5-2620 v3	Intel® Xeon® Processor E5-2630 v3	
	Clock speed	1.60 GHz	1.90 GHz	2.40 GHz	2.40 GHz	
	Number of Processors	1 or 2				
	Cache	15 MB			20 MB	
	Cores and Threads	6C - 6T		6C - 12T	8C - 16T	
Chipset	Intel® C612 Chipset					
Memory	Type	DDR4-2133 Registered DIMM DDR4-2133 Load Reduced DIMM				
	Standard Capacity	0 GB				
	Maximum Capacity	512 GB (16 x 32 GB)				
	Memory protection	ECC, x4 SDDC, Memory Mirroring, Memory Lockstep, Memory Sparing				
Internal Storage	Standard Capacity	0 GB				
	Maximum Capacity	Hot plug 2.5-inch drive configuration: SAS HDD: 43.2 TB (24 x 1.8 TB) SATA HDD: 48 TB (24 x 2 TB) SAS SSD : 9.6 TB (24 x 400 GB) SATA SSD : 19.2 TB (24 x 800 GB) Hot plug 3.5-inch drive configuration: SATA HDD: 48 TB (8 x 6 TB)				
	Storage Controller	SATA : 6 Gb/s (Integrated) SAS: 12 Gb/s (Optional)				
	RAID	SATA : RAID 0/1/10 ¹ (Standard), RAID 5/6/50/60 (Optional) SAS : RAID 0/1/5/6/10/50/60 (Optional)				
	Hot Plug	Supported				
	Optical Disk Drive	Optional				
	5-inch Media Bays	2				
	Disk Drive Bays	Hot plug 2.5-inch drive configuration: 24 Hot plug 3.5-inch drive configuration: 8				
	Expansion Slots	Total: 4 to 5 slots available				
		2 PCIe x16 Gen 3 (x16 connector) 1 to 2 PCIe x8 Gen 3 (x8 connector) ² 1 PCIe x4 Gen 2 (x8 connector)				

Model		T120f			
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)			
	Resolution / Color	1600 x 1200 / 16.7M ³			
Interfaces		5 USB3.0 (2 x front, 4 x rear, 1 x internal) 2 USB2.0 (2 x front) 1 VGA (15-pin mini D-sub, 1 x rear) 1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 x rear) 2 1000BASE-T LAN connector (RJ-45, 2 x rear) 1 Management LAN connector (RJ-45, 1 x rear)			
Server Management		EXPRESSSCOPE Engine 3			
Redundant Fan		Optional, hot plug with redundant fan kit			
Redundant Power Supply		Optional, hot plug with redundant power supply			
Power Supply		2 x 460 / 800 Watt 80 PLUS® Platinum certified hot plug PSU 1 x 700 Watt 80 PLUS® Gold certified non-hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz			
Power Consumption	(Max. Config, Idling)	320 VA / 317 Watt	321 VA / 318 Watt	318 VA / 316 Watt	321 VA / 319 Watt
	(Max. Config, Operating)	613 VA / 609 Watt	622 VA / 617 Watt	671 VA / 667 Watt	720 VA / 715 Watt
Acoustical Noise (Sound Pressure Level) ⁴	Max. Config, Idling	40.0 dB			
	Max. Config, Operating	44.0 dB			
Dimensions (W x D x H)		200.0 x 599.0 x 438.0 mm / 7.8 x 23.5 x 17.2 in (5U)			
Weight (Minimum / Maximum)		17 kg / 31.0 kg, 37.47 lbs. / 68.34 lbs.			
Temperature, Relative Humidity (non-condensing)		Operating: 10° to 40° C / 50° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%			
Regulatory and Safety		FCC, UL, CB, CE, BSMI, RoHS, WEEE			
Operating Systems and Virtualization Software		Microsoft® Windows Server® 2008 Standard (x86) SP2 or later Microsoft® Windows Server® 2008 Enterprise (x86) SP2 or later 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 6.5 or later (x86) ⁵ Red Hat Enterprise Linux 6.5 or later (x86_64) ⁵ Red Hat Enterprise Linux 7.1 or later ⁵ VMware ESXi 5.1 Update 2 VMware ESXi 5.5 Update 2 VMware ESXi 6.0			

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

² One PCIe x8 Gen 3 slot is available in single processor system.

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

⁴ Noise emission was measured at the operator positions in accordance with ISO 7779. The actual value may vary by the operating environment.

⁵ For Linux support, contact your sales representative or visit the NEC website at:
<http://www.nec.com/en/global/prod/express/linux/index.html>

(2/2)

Model		T120f	
Processor	Type	Intel® Xeon® Processor E5-2650 v3	Intel® Xeon® Processor E5-2680 v3
	Clock speed	2.30 GHz	2.50 GHz
	Number of Processors	1 or 2	
	Cache	25 MB	30 MB
	Cores and Threads	10C - 20T	12C - 24T
Chipset	Intel® C612 Chipset		
Memory	Type	DDR4-2133 Registered DIMM DDR4-2133 Load Reduced DIMM	
	Standard Capacity	0 GB	
	Maximum Capacity	512 GB (16 x 32 GB)	
	Memory protection	ECC, x4 SDDC, Memory Mirroring, Memory Lockstep, Memory Sparing	
Internal Storage	Standard Capacity	0 GB	
	Maximum Capacity	Hot plug 2.5-inch drive configuration: SAS HDD: 43.2 TB (24 x 1.8 TB) SATA HDD: 48 TB (24 x 2 TB) SAS SSD : 9.6 TB (24 x 400 GB) SATA SSD : 19.2 TB (24 x 800 GB) Hot plug 3.5-inch drive configuration: SATA HDD: 48 TB (8 x 6 TB)	
	Storage Controller	SATA : 6 Gb/s (Integrated) SAS: 12 Gb/s (Optional)	
	RAID	SATA : RAID 0/1/10 ¹ (Standard), RAID 5/6/50/60 (Optional) SAS : RAID 0/1/5/6/10/50/60 (Optional)	
	Hot Plug	Supported with hot plug drive bay	
	Optical Disk Drive	Optional	
	5-inch Media Bays	2	
	Disk Drive Bays	Hot plug 2.5-inch drive configuration: 24 Hot plug 3.5-inch drive configuration: 8	
	Expansion Slots	Total: 4 to 5 slots available 2 PCIe x16 Gen 3 (x16 connector) 1 to 2 PCIe x8 Gen 3 (x8 connector) ² 1 PCIe x4 Gen 2 (x8 connector)	
	Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)
1600 x 1200 / 16.7M ³		1280 x 1024 / 16.7M ³	
Interfaces	5 USB3.0 (2 x front, 4 x rear, 1 x internal) 2 USB2.0 (2 x front) 1 VGA (15-pin mini D-sub, 1 x rear) 1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 x rear) 2 1000BASE-T LAN connector (RJ-45, 2 x rear) 1 Management LAN connector (RJ-45, 1 x rear)		
Server Management	EXPRESSSCOPE Engine 3		
Redundant Fan	Optional, hot plug with redundant fan kit		
Redundant Power Supply	Optional, hot plug with redundant power supply		

Model		T120f	
Power Supply		2 x 460 / 800 Watt 80 PLUS® Platinum certified hot plug PSU 1 x 700 Watt 80 PLUS® Gold certified non-hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz	
Power Consumption	(Max. Config, Idling)	322 VA / 320 Watt	322 VA / 320 Watt
	(Max. Config, Operating)	766 VA / 761 Watt	846 VA / 840 Watt
Acoustical Noise (Sound Pressure Level)⁴	Max. Config, Idling	40.0 dB	
	Max. Config, Operating	45.0 dB	44.0 dB
Dimensions (W x D x H)		200.0 x 599.0 x 438.0 mm / 7.8 x 23.5 x 17.2 in (5U)	
Weight (Minimum / Maximum)		17 kg / 31.0 kg, 37.47 lbs. / 68.34 lbs.	
Temperature, Relative Humidity (non-condensing)		Operating: 10° to 40° C / 50° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%	
Regulatory and Safety		FCC, UL, CB, CE, BSMI, RoHS, WEEE	
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 6.5 or later (x86) ⁵ Red Hat Enterprise Linux 6.5 or later (x86_64) ⁵ Red Hat Enterprise Linux 7.1 or later ⁵ VMware ESXi 5.1 Update 2 VMware ESXi 5.5 Update 2 VMware ESXi 6.0	

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² One PCIe x8 Gen 3 slot is available in single processor system.

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

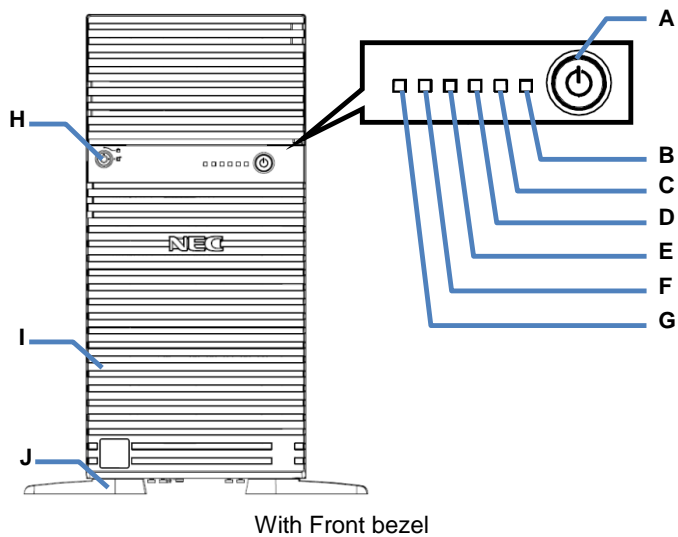
⁴ Noise emission was measured at the operator positions in accordance with ISO 7779. The actual value may vary by the operating environment.

⁵ For Linux support, contact your sales representative or visit the NEC website at:
<http://www.nec.com/en/global/prod/express/linux/index.html>

External Views

Front and Rear Views

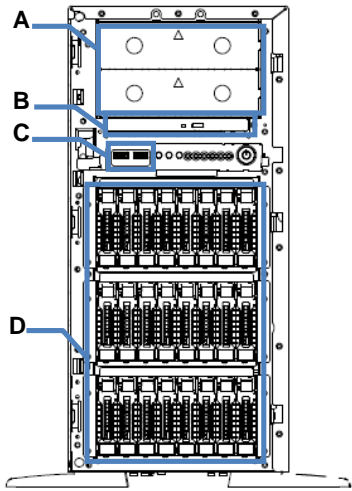
Front View



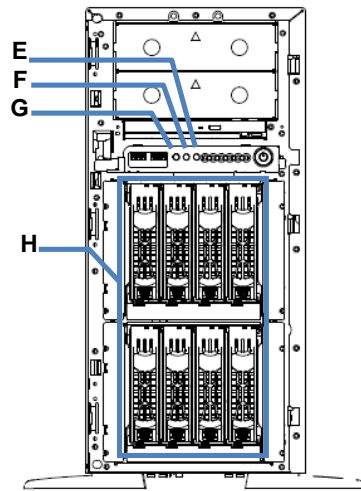
Legend

A.	Power Button	F.	Data LAN 1 Activity LED
B.	Power LED	G.	Data LAN 2 Activity LED
C.	System Status LED 1	H.	Front Bezel Key
D.	System Status LED 2	I.	Front Bezel
E.	Power Capping LED	J.	Stabilizer

Front View



Hot Plug 2.5-inch Drive Configuration

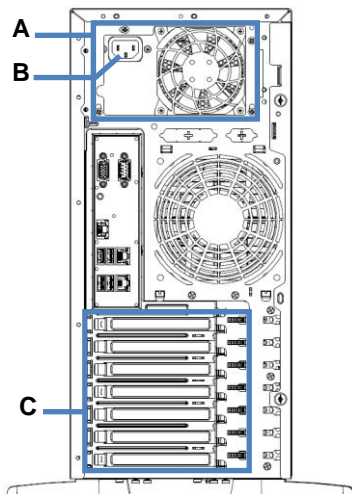


Hot Plug 3.5-inch Drive Configuration

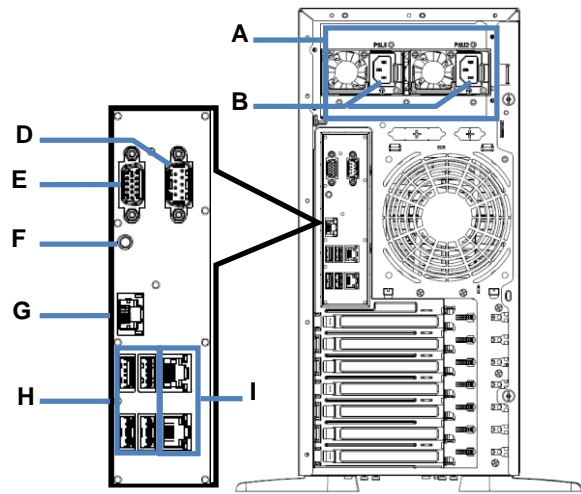
Legend

- | | | | |
|----|---------------------|----|---------------------|
| A. | 5.25-inch Media Bay | E. | System Reset Button |
| B. | Optical Drive Bay | F. | Dump (NMI) Button |
| C. | USB Connectors | G. | BMC Reset Button |
| D. | 2.5-inch Drive Bay | H. | 3.5-inch Drive Bay |

Rear View



Non-hot Plug Power Supply Configuration



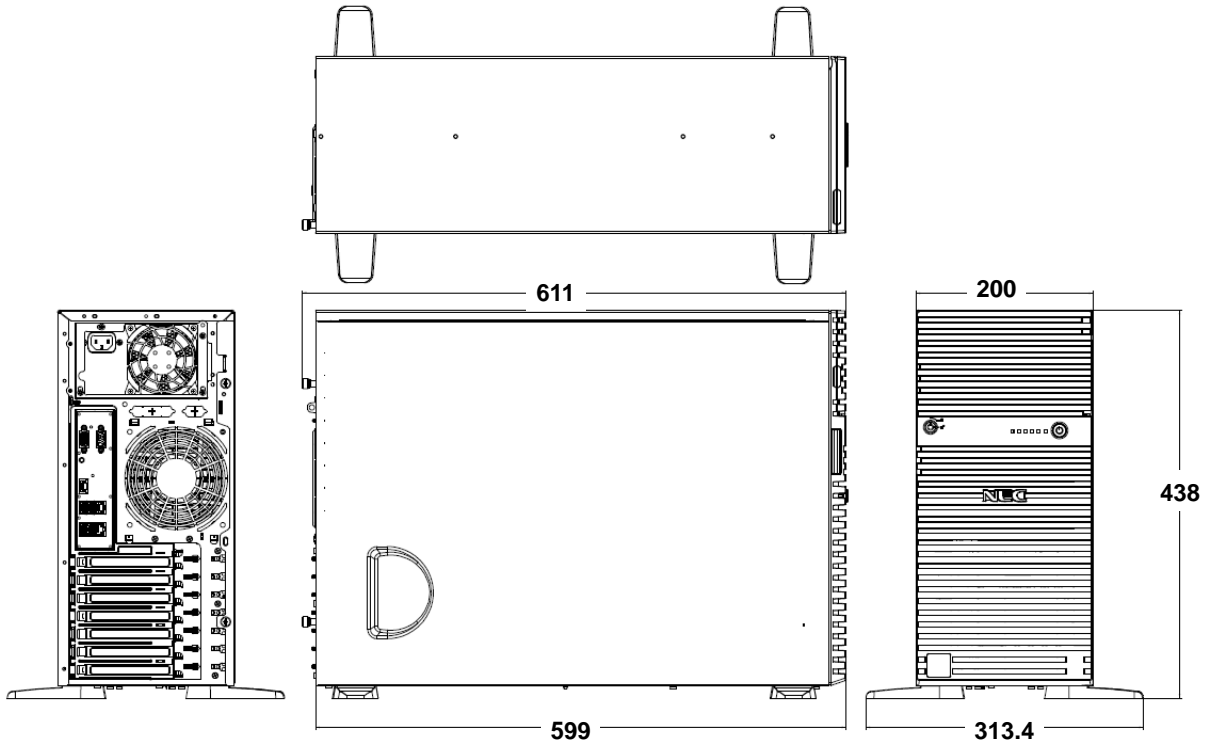
Hot Plug Power Supply Configuration

Legend

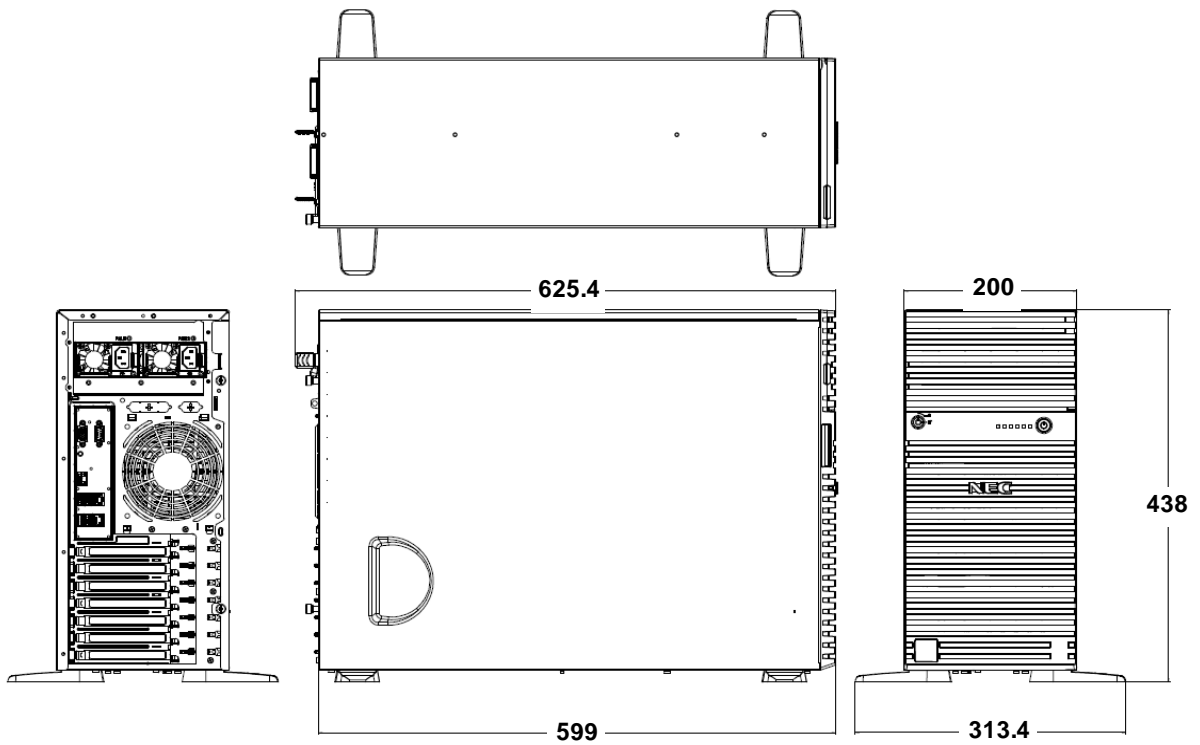
- | | | | |
|----|-----------------------|----|--------------------------|
| A. | Power Supply Unit | F. | UID Button/LED |
| B. | AC Inlet | G. | Management LAN Connector |
| C. | PCI Slots | H. | USB Connectors |
| D. | Serial Port Connector | I. | Data LAN Connectors |
| E. | VGA Connector | | |

Dimensions (mm)

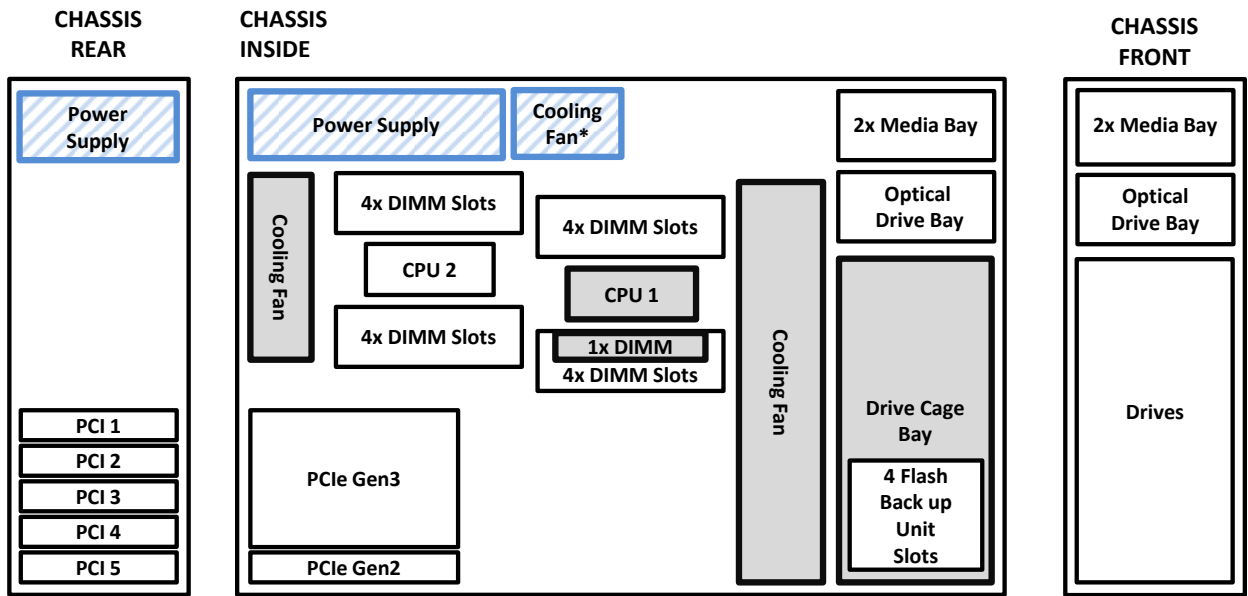
Non-hot Plug Power Supply Configuration



Hot Plug Power Supply Configuration

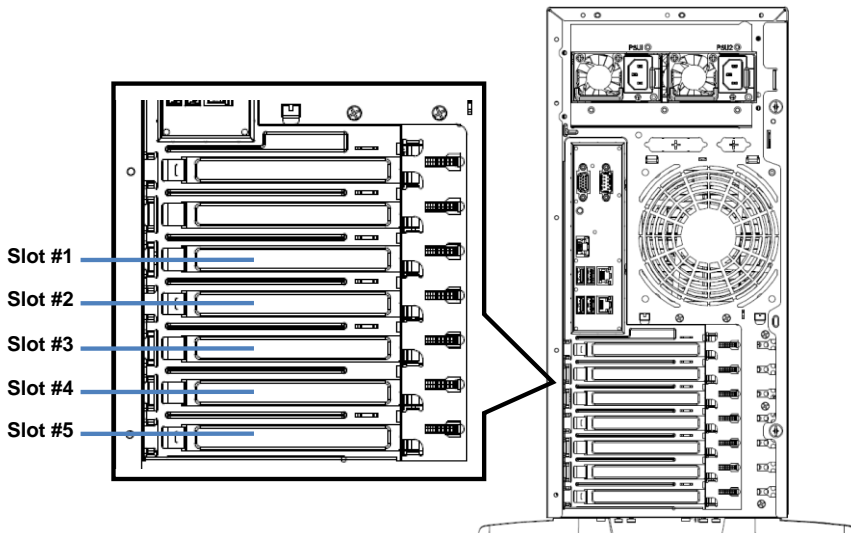


Configuration Diagram



Legend: Standard Components Mandatory Components

Expansion Slots



Legend	
#1	PCIe 3.0 x8, x8 connector, Full height, up to 168 mm length
#2	PCIe 3.0 x16, x16 connector, Full height, up to 290 mm length
#3	PCIe 3.0 x8, x8 connector, Full height, up to 290 mm length
#4	PCIe 3.0 x16, x16 connector, Full height, up to 290 mm length
#5	PCIe 2.0 x4, x8 connector, Full height, up to 168 mm length

NOTE:

- The slot #1 is available in dual processor configuration.

Server Configuration

1 Base Models

Product Name / Description	Part Number
EXPRESS5800/T120f Server no processor, no RAM, no Drive Cage, no HDD, no DVD, no FAN Including: 700W 80 PLUS® Gold non-hot plug PSU, keyboard, mouse, EXPRESSBUILDER DVD	N8100-2289F
EXPRESS5800/T120f Server no processor, no RAM, no Drive Cage, no HDD, no DVD, no FAN Including: 2 x 460W 80 PLUS® Platinum hot plug PSU, keyboard, mouse, EXPRESSBUILDER DVD	N8100-2290F
EXPRESS5800/T120f Server no processor, no RAM, no Drive Cage, no HDD, no DVD, no FAN Including: 2 x 800W 80 PLUS® Platinum hot plug PSU, keyboard, mouse, EXPRESSBUILDER DVD	N8100-2291F
EXPRESS5800/T120f Server no processor, no RAM, no Drive Cage, no HDD, no DVD, no FAN, no keyboard, no mouse Including: 700W 80 PLUS® Gold non-hot plug PSU, EXPRESSBUILDER DVD	N8100-2295F
EXPRESS5800/T120f Server no processor, no RAM, no Drive Cage, no HDD, no DVD, no FAN, no keyboard, no mouse Including: 2 x 460W 80 PLUS® Platinum hot plug PSU, EXPRESSBUILDER DVD	N8100-2296F
EXPRESS5800/T120f Server no processor, no RAM, no Drive Cage, no HDD, no DVD, no FAN, no keyboard, no mouse Including: 2 x 800W 80 PLUS® Platinum hot plug PSU, , EXPRESSBUILDER DVD	N8100-2297F

NOTE:

- The base model must be ordered with a processor kit and memory, a drive cage.
- Use the NEC Power Supply Selector to select appropriate size for power units. For details, please visit the NEC website at:

http://www.nec.com/en/global/prod/express/collateral/tools/PowerSelector_G01.xls

2 Processors and Heat Sink

Available sockets: 2

Category	Product Name / Description	Part Number
Processors 1 Processor Required	Xeon E5-2603 v3 Processor Kit Intel® Xeon® Processor E5-2603 v3 (1.60 GHz, 6C/6T, 15 MB)	N8101-919F
	Xeon E5-2609 v3 Processor Kit Intel® Xeon® Processor E5-2609 v3 (1.90 GHz, 6C/6T, 15 MB)	N8101-920F
	Xeon E5-2620 v3 Processor Kit Intel® Xeon® Processor E5-2620 v3 (2.40 GHz, 6C/12T, 15 MB)	N8101-921F
	Xeon E5-2630 v3 Processor Kit Intel® Xeon® Processor E5-2630 v3 (2.40 GHz, 8C/16T, 20 MB)	N8101-922F
	Xeon E5-2650 v3 Processor Kit Intel® Xeon® Processor E5-2650 v3 (2.30 GHz, 10C/20T, 25 MB)	N8101-924F
	Xeon E5-2680 v3 Processor Kit Intel® Xeon® Processor E5-2680 v3 (2.50 GHz, 12C/24T, 30 MB)	N8101-926F

Heat Sink	1st	Processor Heat Sink For 1 st Processor	(Standard)
	2nd	Processor Heat Sink For 2 nd Processor	N8101-928F

NOTE:

- Minimum one processor kit from above must be installed.
- The processors must be the same to configure dual processor system.
- The 32-bit operating systems, Microsoft Windows Server 2008 and Red Hat Enterprise Linux 6 (x86), are supported only on Xeon E5-2603 v3, E5-2609 v3, Xeon E5-2620 v3 and Xeon E5-2630 v3 systems.

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 Available Number of Logical Processors
Microsoft Windows Server 2008 Standard (x86)	32 ¹	32
Microsoft Windows Server 2008 Enterprise (x86)		
Microsoft Windows Server 2008 R2 Standard (x64)	256 ¹	48
Microsoft Windows Server 2008 R2 Enterprise (x64)		
Microsoft Windows Server 2012 Standard	640 ¹	48
Microsoft Windows Server 2012 Datacenter		
Microsoft Windows Server 2012 R2 Standard		
Microsoft Windows Server 2012 R2 Datacenter		
Red Hat Enterprise Linux 6	32	32
Red Hat Enterprise Linux 6 (x86_64)	240	48
Red Hat Enterprise Linux 7		
VMware ESXi 5.1	160	48
VMware ESXi 5.5	320	48
VMware ESXi 6.0	480	48

¹ The maximum numbers of logical processors when using Hyper-V are below :
 - Windows Server 2008 : 24
 - Windows Server 2008 R2 : 64
 - Windows Server 2012 and Windows Server 2012 R2 : 320

3 Memory

3.1 Memory Configuration

Refer to the section in accordance with your operating system and memory configuration:

Other OS than Windows Server 2008 Standard

- Independent channel / Memory Sparing Configuration: Refer to **3.2.1**
- Memory Sparing Configuration: Refer to **3.2.2**
- Memory Mirroring / Memory Lockstep Configuration: Refer to **3.2.3**

Windows Server 2008 Standard

- Independent Channel: Refer to **3.3.1**

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 (16GB DIMM)	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.

3.2 Other OS than Windows Server 2008 Standard

3.2.1 Independent Channel Configuration

Available slots: 8 per processor

Category	Product Name / Description	Part Number
Registered DIMM (RDIMM)	4GB DDR4-2133 REG Memory Kit (1x4GB) 1x 4GB Registered ECC DIMM, DDR4-2133(PC4-2133)	N8102-644F
	8GB DDR4-2133 REG Memory Kit (1x8GB) 1x 8GB Registered ECC DIMM, DDR4-2133(PC4-2133)	N8102-645F
	16GB DDR4-2133 REG Memory Kit (1x16GB) 1x 16GB Registered ECC DIMM, DDR4-2133(PC4-2133)	N8102-646F
Load Reduced DIMM (LRDIMM)	32GB DDR4-2133 LR Memory Kit (1x32GB) 1x 32GB Load Reduced ECC DIMM, DDR4-2133(PC4-2133)	N8102-647F

NOTE:

- Minimum one memory kit per processor must be installed.
- It is recommended to install memory kits in multiples of 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 LRDIMM are not supported.
- At least 5 GB of memory is required for VMware ESXi™ 5.5 and ESXi™ 6.0

3.2.2 Memory Sparing Configuration

Available slots: 8 per processor

Product Name / Description	Part Number
32GB DDR4-2133 REG Memory Kit (2x16GB) 2x 16GB Registered ECC DIMM, DDR4-2133(PC4-2133)	N8102-655

NOTE:

- Minimum one memory kit per processor must be installed.
- The memory kits must be identical.
- The logical memory capacity at the time of memory sparing becomes three-fourths of physical

capacity.

3.2.3 Memory Mirroring / Memory Lockstep Configuration

Available slots: 8 per processor

Product Name / Description	Part Number
16GB DDR4-2133 REG Memory Kit (2x 8GB) 2x 8GB Registered ECC DIMM, DDR4-2133(PC4-2133)	N8102-650
32GB DDR4-2133 REG Memory Kit (2x 16GB) 2x 16GB Registered ECC DIMM, DDR4-2133(PC4-2133)	N8102-651

NOTE:

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

3.3 Windows Server 2008 Standard

3.3.1 Independent Channel Configuration

Available slots: 1

Product Name / Description	Part Number
4GB DDR4-2133 REG Memory Kit (1x4GB) 1x 4GB Registered ECC DIMM, DDR4-2133(PC4-2133)	N8102-644F

NOTE:

- Only one Memory Kit can be installed regardless of the number of processors.

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	Memory Power Setting	DIMM Speed
E5-2603 v3 E5-2609 v3	4 GB, 8 GB, 16 GB, 32GB	-	1600 MHz
E5-2620 v3 E5-2630 v3	4 GB, 8 GB, 16 GB, 32GB	-	1866 MHz
E5-2650 v3 E5-2680 v3	4 GB, 8 GB, 16 GB, 32GB	-	2133 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 Operating Systems	Maximum Available Memory
Microsoft Windows Server 2008 Standard (x86) ¹	4 GB 4 GB (HW-DEP enabled) App. 2 GB(HW-DEP disabled)
Microsoft Windows Server 2008 R2 Standard ¹	32 GB 32 GB

Microsoft Windows Server 2008 Enterprise (x86) ¹	64 GB	64 GB
Microsoft Windows Server 2008 R2 Enterprise ¹	2 TB	512 GB
Microsoft Windows Server 2012 Standard ¹	4 TB	512 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	16 GB	16 GB
Red Hat Enterprise Linux 6 (x86_64)	6 TB	512 GB
Red Hat Enterprise Linux 7		
VMware ESXi 5.1 ²	2 TB	512 GB
VMware ESXi 5.5 ²	4 TB	512 GB
VMware ESXi 6.0 ³	6 TB	512 GB

- ¹ The maximum available memory size of Hyper-V systems are below:
- Windows Server 2008 Standard (x64) and Windows Server 2008 R2 Standard : 32 GB
 - Windows Server 2008 Enterprise (x64) and Windows Server 2008 R2 Enterprise : 1TB
 - Windows Server 2012 and Windows Server 2012 R2 : 4 TB
- ² Up to 1 TB of the main memory is available to each virtual machine.
- ³ Up to 4 TB of the 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.

4.1.1 Hot Plug 2.5-inch Drive Configuration

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 4.2.3 for the required components and then refer to the section 4.3.2 for the hard drives.

Operating System	Supported RAID configuration		Supported Drives
	RAID and Cache	Section	
Windows Server 2008 Standard	Non-RAID (Embedded SATA)	4.2.1	4.3.1
Windows Server 2008 Enterprise	RAID 0/1 (Embedded SATA RAID)	4.2.2	4.3.2
Windows Server 2008 R2 Standard	RAID 0/1/10 1GB Cache	4.2.3	4.3.3
Windows Server 2008 R2 Enterprise	RAID 5/6/50/60 1GB Cache	4.2.4	
Red Hat Enterprise Linux 6	RAID 5/6/50/60 2GB Cache	4.2.5	
KVM in Red Hat Enterprise Linux 6 (x86_64)			
Windows Server 2012 Standard	Non-RAID (Embedded SATA)	4.2.1	4.3.1
Windows Server 2012 Datacenter	RAID 0/1 (Embedded SATA RAID)	4.2.2	4.3.2
Windows Server 2012 R2 Standard	RAID 0/1/10 1GB Cache	4.2.3	4.3.4
Windows Server 2012 R2 Datacenter	RAID 5/6/50/60 1GB Cache	4.2.4	
Red Hat Enterprise Linux 6 (x86_64) without KVM feature	RAID 5/6/50/60 2GB Cache	4.2.5	
Red Hat Enterprise Linux 7			
VMware ESXi 5.1	Non-RAID (Embedded SATA)	4.2.1	4.3.1
VMware ESXi 5.5	RAID 0/1/10 1GB Cache	4.2.3	4.3.3
VMware ESXi 6.0	RAID 5/6/50/60 1GB Cache	4.2.4	
	RAID 5/6/50/60 2GB Cache	4.2.5	

NOTE:

- Up to four hard drives can be installed in the Embedded SATA configuration.

- Hot plug insertion/removal is not supported with the Embedded SATA non-RAID controller.
- Embedded SATA RAID controller is supported only on limited OS. For more details, please see [OS Support Matrix for PCI Cards and Embedded Controllers](#).
- 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.

4.1.2 Hot Plug 3.5-inch Drive Configuration

Refer to the section in accordance with your OS and RAID configuration.

Operating System	Supported RAID configuration		Supported Drives
	RAID and Cache	Section	
Windows Server 2008 Standard	Non-RAID (Embedded SATA)	4.2.6	4.3.5
Windows Server 2008 Enterprise	RAID 0/1 (Embedded SATA RAID)	4.2.7	4.3.7
Windows Server 2008 R2 Standard	RAID 0/1/10 1GB Cache	4.2.8	4.3.8
Windows Server 2008 R2 Enterprise	RAID 5/6/50/60 1GB Cache	4.2.9	
Red Hat Enterprise Linux 6	RAID 5/6/50/60 2GB Cache	4.2.10	
KVM in Red Hat Enterprise Linux 6 (x86_64)			
Windows Server 2012 Standard	Non-RAID (Embedded SATA)	4.2.6	4.3.6
Windows Server 2012 Datacenter	RAID 0/1 (Embedded SATA RAID)	4.2.7	4.3.7
Windows Server 2012 R2 Standard	RAID 0/1/10 1GB Cache	4.2.8	4.3.9
Windows Server 2012 R2 Datacenter	RAID 5/6/50/60 1GB Cache	4.2.9	
Red Hat Enterprise Linux 6 (x86_64) without KVM feature	RAID 5/6/50/60 2GB Cache	4.2.10	
Red Hat Enterprise Linux 7			
VMware ESXi 5.1	Non-RAID (Embedded SATA)	4.2.6	4.3.5
VMware ESXi 5.5	RAID 0/1/10 1GB Cache	4.2.8	4.3.8
VMware ESXi 6.0	RAID 5/6/50/60 1GB Cache	4.2.9	
	RAID 5/6/50/60 2GB Cache	4.2.10	

NOTE:

- Up to four hard drives can be installed in the Embedded SATA configuration.
- Hot plug insertion/removal is not supported with the Embedded SATA non-RAID controller.
- Embedded SATA RAID controller is supported only on limited OS. For more details, please see [OS Support Matrix for PCI Cards and Embedded Controllers](#).
- All drives within a RAID array should be of the same capacity.
- 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.

4.2 Required Components for RAID Configuration

4.2.1 2.5-inch Drive Cage with Embedded SATA non-RAID Controller

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4 x 6Gb/s SATA	(Standard)
Drive Cage/ Cable Required	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug hard drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-77F

NOTE:

- Up to 4 SATA drives are supported.
- For supported HDD/SSD, refer to [4.3.1](#)
- Hot plug insertion/removal are not supported in the configuration.

4.2.2 2.5-inch Drive Cage with Embedded SATA RAID Controller

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4 x 6Gb/s SATA	(Standard)
Drive Cage/ Cable Required	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug hard drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-77F

NOTE:

- Embedded SATA RAID controller is supported only on limited OS. For more details, please see [OS Support Matrix for PCI Cards and Embedded Controllers](#).
- For supported HDD/SSD, refer to [4.3.2](#)

4.2.3 2.5-inch Drive Cage with RAID 0/1 Controller with 1 GB 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, 12Gb/s	N8103-176
SAS Expander Card	SAS Expander Card SAS Expander Card Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable NOTE: - Required when more than 1 drive cage	N8103-186
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Drive Cage/ Cable 1 to 3 Required	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug hard drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-77F

NOTE:

- For supported HDD/SSD, refer to [4.3.3](#) for Windows Server 2008/2008R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6(x86_64) with KVM feature, or VMware. Refer to [4.3.4](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM feature, 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, SATA SSD and SAS SSDs can be mixed.

4.2.4 2.5-inch Drive Cage with RAID 5/6 Controller with 1 GB 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
SAS Expander Card	SAS Expander Card SAS Expander Card Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable NOTE: - Required when more than 1 drive cage	N8103-186
Flash Backup	Flash Backup Unit	N8103-181

Recommended	for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	
Drive Cage/ Cable 1 to 3 Required	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug hard drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-77F

NOTE:

- For supported HDD/SSD, refer to [4.3.3](#) for Windows Server 2008/2008R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6(x86_64) with KVM feature, or VMware. Refer to [4.3.4](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM feature, 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, SATA SSD and SAS SSDs can be mixed.
- 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.

4.2.5 2.5-inch Drive Cage 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, 12Gb/s	N8103-178
SAS Expander Card	SAS Expander Card SAS Expander Card Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable NOTE: - Required when more than 1 drive cage	N8103-186
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Drive Cage/ Cable 1 to 3 Required	2.5-inch Hot Plug Drive Cage Kit 8 x 2.5-inch hot plug hard drive bays Including 2 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-77F

NOTE:

- For supported HDD/SSD, refer to [4.3.3](#) for Windows Server 2008/2008R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6(x86_64) with KVM feature, or VMware. Refer to [4.3.4](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM feature, 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, SATA SSD and SAS SSDs can be mixed.
- 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

4.2.6 3.5-inch Drive Cage with Embedded SATA non-RAID Controller

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4 x 6Gb/s SATA	(Standard)
Drive Cage/ Cable Required	3.5-inch Hot Plug Drive Cage Kit 4 x 3.5-inch hot plug hard drive bays Including 1 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-78F

NOTE:

- Up to 4 SATA drives are supported
- For supported HDD/SSD, refer to [4.3.5](#) for Windows Server 2008/2008R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 6(x86_64) with KVM feature. Refer to [4.3.6](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM feature. Refer to [4.3.5](#) for VMware.

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

4.2.7 3.5-inch Drive Cage with Embedded SATA RAID Controller

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4 x 6Gb/s SATA	(Standard)
Drive Cage/ Cable Required	3.5-inch Hot Plug Drive Cage Kit 4 x 3.5-inch hot plug hard drive bays Including 1 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-78F

NOTE:

- Up to 4 SATA drives are supported
- For supported HDD/SSD, refer to [4.3.7](#)

4.2.8 3.5-inch Drive Cage with RAID 0/1 Controller with 1 GB 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, 12Gb/s	N8103-176
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Drive Cage/ Cable 1 to 2 Required	3.5-inch Drive Cage 4 x 3.5-inch hot plug hard drive bays Including 1 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-78F

NOTE:

- For supported HDD/SSD, refer to [4.3.8](#) for Windows Server 2008/2008R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 6(x86_64) with KVM feature. Refer to [4.3.9](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM feature. Refer to [4.3.8](#) for VMware.
- All drives within a RAID array should be of the same capacity.

4.2.9 3.5-inch Drive Cage with RAID 5/6 Controller with 1 GB 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
Drive Cage/ Cable 1 to 2 Required	3.5-inch Drive Cage 4 x 3.5-inch hot plug hard drive bays Including 1 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-78F

NOTE:

- For supported HDD/SSD, refer to [4.3.8](#) for Windows Server 2008/2008R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 6(x86_64) with KVM feature. Refer to [4.3.9](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM feature. Refer to [4.3.8](#) for VMware.
- All drives within a RAID array should be of the same capacity.
- 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.

4.2.10 3.5-inch Drive Cages 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, 12Gb/s	N8103-178
Flash Backup Recommended	Flash Backup Unit for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
Drive Cage/ Cable 1 to 2 Required	3.5-inch Drive Cage 4 x 3.5-inch hot plug hard drive bays Including 1 sets of 1 x Mini SAS HD to 1 x Mini SAS HD cable	N8154-78F

NOTE:

- For supported HDD/SSD, refer to [4.3.8](#) for Windows Server 2008/2008R2, Red Hat Enterprise Linux 6 or Red Hat Enterprise Linux 6(x86_64) with KVM feature. Refer to [4.3.9](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM feature. Refer to [4.3.8](#) for VMware.
- All drives within a RAID array should be of the same capacity.
- 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.

4.3 Supported Drives

4.3.1 2.5-inch Drives for Embedded SATA Controller

Category	Product Name / Description	Part Number
Drive 4 slots available	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B 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, 512B 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, 512B sector	N8150-489

NOTE:

- Hot plug insertion/removal is not supported with the configuration.

4.3.2 2.5-inch Drives for Embedded SATA RAID Controller

Category	Product Name / Description	Part Number
Drive 4 slots available	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B 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, 512B 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, 512B sector	N8150-489

NOTE:

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

4.3.3 2.5-inch Drives for RAID Controller Configuration (1)

For Windows Server 2008/2008R2, Red Hat Enterprise Linux 6, KVM in Red Hat Enterprise Linux 6(x86_64), or VMware

Category	Product Name / Description	Part Number
Drive Standard:8 slots available Max : 24 slots available	2.5-inch SAS HDD 300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B 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, 512B 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, 512B 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, 512B 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, 512B 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, 512B 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, 512B 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, 512B sector	N8150-518
	2.5-inch 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, 512B 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, 512B 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, 512B sector	N8150-489	
2.5-inch SAS SSD (eMLC)	200GB Hot Plug 2.5-inch SAS SSD 1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	N8150-721
	400GB Hot Plug 2.5-inch SAS SSD 1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	N8150-722
2.5-inch SATA SSD (MLC)	200GB Hot Plug 2.5-inch SATA SSD 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-725
	400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-726
	800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-727

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, SATA SSDs and SAS SSDs can be mixed.
- 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.

4.3.4 2.5-inch Drives for RAID Controller Configuration (2)

For Windows Server 2012/2012R2, Red Hat Enterprise Linux 6(x86_64) without KVM, or Red Hat Enterprise Linux 7

Category	Product Name / Description	Part Number
Drive Standard : 8 slots available Max : 24 slots available	2.5-Inch SAS HDD (512B) 300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B 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, 512B 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, 512B 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, 512B 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, 512B 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, 512B 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, 512B 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, 512B sector	N8150-518
	SAS HDD (4KB) 1.8TB 10K Hot Plug 2.5-inch SAS HDD 1 x 1.8TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 4KB sector	N8150-490
	2.5-Inch SATA HDD (512B) 250GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B 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, 512B 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, 512B sector	N8150-489	
SATA HDD (4KB) 2TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 4KB sector	N8150-521	
2.5-Inch SAS SSD (eMLC) 200GB Hot Plug 2.5-inch SAS SSD 1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	N8150-721	
400GB Hot Plug 2.5-inch SAS SSD 1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	N8150-722	
2.5-Inch SATA SSD (MLC) 200GB Hot Plug 2.5-inch SATA SSD 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-725	
400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-726	

800GB Hot Plug 2.5-inch SATA SSD
 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s,
 512B sector

N8150-727

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, SATA SSDs and SAS SSDs can be mixed.
- 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 4KB sector drives are make-to-order products. Please consult your sales representative in regard to production lead time.
- When you select 4KB sector HDD, confirm whether your applications support hard drives with 4 KB sector size. For more information, visit the NEC website at:
http://www.nec.com/en/global/prod/express/svropt/hdd/collateral/4KHDD_Precautions_EN.pdf
- Mix configurations of 4KB sector HDDs and 512B sector HDDs are not supported.

4.3.5 3.5-inch Drives for Embedded SATA Controller

For Windows Server 2008/2008R2, Red Hat Enterprise Linux 6, or VMware

Category	Product Name / Description		Part Number
Drive 4slots available	3.5-Inch SATA HDD	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512B 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, 512B 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, 512B Sector	N8150-505

NOTE:

- Hot plug insertion/removal are not supported in the configuration.

4.3.6 3.5-inch Drives for Embedded SATA Controller

For Windows Server 2012/2012R2, Red Hat Enterprise Linux 6 (x86_64), or Red Hat Enterprise Linux 7

Category	Product Name / Description		Part Number
Drive 4slots available	3.5-inch SATA HDD	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512B 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, 512B 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, 512B 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, 512B 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, 512B Sector	N8150-507

NOTE:

- Hot plug insertion/removal are not supported in the configuration.

4.3.7 3.5-inch Drives for Embedded SATA RAID Controller

Category	Product Name / Description		Part Number
Drive 4 slots available	3.5-inch SATA HDD	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512B 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, 512B 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, 512B 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, 512B 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, 512B Sector	N8150-507

NOTE:

- All drives within a RAID array should be of the same capacity.
- Embedded SATA RAID Controller does not support RAID 10 configured with 2 TB, 3 TB, and 4 TB HDDs.

4.3.8 3.5-inch Drives for RAID Controller Configuration (1)

For Windows Server 2008/2008R2, Red Hat Enterprise Linux 6, KVM in Red Hat Enterprise Linux 6(x86_64), or VMware

Category	Product Name / Description	Part Number
Drive Standard:4 slots available Max : 8 slots available	3.5-inch SATA HDD 500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512B 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, 512B 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, 512B 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, 512B 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, 512B Sector	N8150-507

NOTE:

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

4.3.9 3.5-inch Drives for RAID Controller Configuration (2)

Category	Product Name / Description	Part Number
Drive Standard : 4 slots available Max : 8 slots available	3.5-inch SATA HDD 2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 4K Sector	N8150-499
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 4K Sector	N8150-501
	6TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 6 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 4K Sector	N8150-503
3.5-inch SATA HDD (512B)	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512 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, 512 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, 512 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, 512 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, 512 Sector	N8150-507

NOTE:

- All hard drives within a RAID array should be of the same capacity.
- When you select 4KB sector HDD, confirm whether your applications support hard drives with 4 KB sector size. For more information, visit the NEC website at: http://www.nec.com/en/global/prod/express/svrop/hdd/collateral/4KHDD_Precautions_EN_Rev01.pdf
- Mix configurations of 4KB sector HDDs and 512B sector HDDs are not supported.

5 Optical Drive

Available bay: 1

Product Name / Description	Part Number
Internal Slim DVD-ROM drive Slim DVD-ROM drive	N8151-123
Internal DVD Super Multi Drive Slim DVD Super Multi drive, not including writing software	N8151-124F

6 Internal Tape / RDX Drives

6.1 Tape / RDX Drive Selection

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

- RDX: Refer to [6.2.1](#)
- LTO: Refer to [6.2.2](#)

NOTE:

- Tape devices cannot be directly connected to VMware ESXi servers. For an ESXi environment, it is recommended to connect and configure an additional backup server via network.

6.2 Tape / RDX Configuration

6.2.1 RDX Drive

Category	Product Name / Description	Part Number
Controller	Internal USB Controller 1 x USB port	(Standard)
Cable	Internal USB cable 1 x Internal USB to 1 x USB device, USB 3.0	K410-275(00)
Drive 1 drive available	Internal RDX (USB)	N8151-125

NOTE:

- The USB bus operates in USB 2.0 mode if the system is running with Windows Server 2008 operating system.

6.2.2 LTO Drive

Category	Product Name / Description	Part Number
Controller Required	SAS Controller LSI SAS9212-4i4e Host Bus Adapter 6Gbps SAS, Int. 4, Ext. 4, 7-pin SATA / SFF-8088, PCIe 2.0 x8 NOTE: - For using this product in Windows Server 2012 R2 environment, download the driver from the NEC website.	N8103-142
Cable Required	Internal SAS Cable 1x 7-pin Single SATA to 1x SFF-8482 SAS	K410-217(00)
Drive 1 drive available	Internal LTO (SAS) LTO3, Half height, Native capacity 400 GB	N8151-126
	Internal LTO (SAS) LTO4, Half height, Native capacity 800 GB	N8151-127

Internal LTO (SAS) LTO5, Half height, Native capacity 1.5 TB	N8151-128
Internal LTO (SAS) LTO6, Half height, Native capacity 2.5 TB	N8151-129

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	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
		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. - The latest driver is required for Window Server 2008 and Windows Server 2008 R2.	
		Dual Port 10GBASE-T Adapter Intel® Ethernet Controller X540 PCIe 2.0(x8) , Low Profile / Full Height	N8104-153
SFP+ Module		SFP+ Module (10G-SR) 1 x SFP+ Module for N8104-149	N8104-129

NOTE:

- Supports up to three 10GbE network adapters in a single-processor configuration, and up to five in a dual-processor configuration. However, up to two when WS2008(x86) is installed, and up to one when RHEL 6(x86) is installed.
- Network performance may be reduced depending on the applications and memory performance when three or more 10Gb Network Adapters are installed.

Types and Number of Available NICs and FC HBAs when Running with VMware ESXi

See the table below for the types and number of available NICs and FC HBAs when running with VMware ESXi.

The condition depends on interrupt processes managed by the operating system and insufficient interrupt resources may lead to system failure.

NICs and FC HBAs Type	Number of Available Adapters	Total Number of Available Adapters
N8104-152 Quad Port 1000BASE-T Adapter	Up to two adapter	Up to three adapters
N8104-145 Dual Port 1000BASE-T Adapter	Up to four adapters	
N8104-151 Dual Port 1000BASE-T Adapter		
N8104-150 1000BASE-T Adapter		
N8104-153 Dual Port 10GBASE-T Adapter	Up to four adapters	
N8104-149 10GBASE SFP+ Adapter (SFP+/2ch)		
N8104-158A Fibre Channel Controller (2ch)	Up to four adapters	
N8104-160 Fibre Channel Controller		

NOTE:

- There are following limitations when using ESXi 6.0;
 - N8104-152 cannot be installed when using N8104-149/153.
 - Up to one adapter can be selected from N8104-150/151/145

NIC Teaming feature – NIC Teaming and bonding features

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

Windows Server 2008 support 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 ports per one team	Windows Server 2008 Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux
1GbE NIC N8104-145	Up to four ports per one team	Windows Server 2008 R2
10GbE NIC N8104-149	Up to four ports per one team	Windows Server 2008 Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux 6.5 or later (x86_64) Red Hat Enterprise Linux 7.1 or later
10GbE NIC N8104-153	Up to four ports per one team	Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux 6.5 or later (x86_64) Red Hat Enterprise Linux 7.1 or later

NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.
- The network interfaces for each teaming must be the same.
- When 10GbE and 1GbE NIC teaming are mixed, the maximum number of team must be as follows:
 - Windows Server 2008, Windows Server 2008 R2 : up to four per one system
 - Windows Server 2012, Windows Server 2012 R2 : up to five per one system

- Red Hat Enterprise Linux : up to five 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, VMware
	N8104-145	Windows Server 2008 R2, VMware
10GbE	N8104-149	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux, VMware
	N8104-153	Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux 6.5 (x86_64) or later, Red Hat Enterprise Linux 7.1 or later, VMware

NOTE:

- Teaming feature is not supported on iSCSI interfaces.

7.2 External Storage Controller

7.2.1 External 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 Backup Unit 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.

Types and Number of Available RAID Controllers when Running with VMware ESXi

See the table below for the types and number of available RAID Controllers and SAS Controller when running with VMware ESXi.

The condition depends on interrupt processes managed by the operating system and insufficient interrupt resources may lead to system failure

Processor Type	Controller Type	Number of available controllers	Total Number of available controllers
E5-2603 v3	N8103-176 RAID Controller (1 GB, RAID 0/1)	Up to one controller	Up to three controllers
E5-2609 v3	N8103-177 RAID Controller (1 GB, RAID 0/1/5/6)		
E5-2620 v3	N8103-178 RAID Controller (2 GB,RAID 0/1/5/6)		
E5-2630 v3	N8103-179 RAID Controller (2 GB,RAID 0/1/5/6)	Up to two controllers	
E5-2650 v3			
E5-2680 v3	N8103-176 RAID Controller (1 GB, RAID 0/1)	Up to one controller	Up to two controllers
	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)	Up to two controllers	
	N8103-184 SAS Controller ¹	Up to two controllers ¹	

¹ When ESXi 5.1/5.5 is installed.

7.2.2 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
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: - There is a PCI slot limitation when configured with Xeon E5-2680 v3 and VMware ESXi 5.1/5.5. Refer to Types and Number of Available RAID Controllers when Running with VMware ESXi in the previous section for details.		

NOTE:

- With regard to 16Gb/s Fiber Channel Controllers, up to two ports in a single processor configuration with Xeon E5-2603 v3 and Xeon E5-2609 v3, and up to six ports in a dual processor configuration with Xeon E5-2603 v3 and Xeon E5-2609 v3 are allowed in the system.
- Refer to **Types and Number of Available NICs and FC HBAs when Running with VMware ESXi** with regard to the number of available FC HBAs on VMware ESXi systems.
- Up to three SAS Controllers can be installed.

7.3 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 Fan

Product Name / Description	Part Number
Redundant Fan Kit Hot plug Cooling Fan for T120f NOTE: - The Cooling fan for 700W non-hot plug PSU does not support hot-plug feature.	N8181-130F
Non-redundant Fan Kit Non-hot plug Cooling Fan for T120f	N8181-131F

NOTE:

- One of the fan kits must be installed.

8.2 Trusted Platform Module Kit

Product Name / Description	Part Number
Trusted Platform Module Kit TPM 1.2 module	N8115-21

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.

8.3 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.

8.4 Flash FDD

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

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

NOTE:

- Up to one drive can be connected.

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 with some base model)

9 Add-on Components

9.1 Server Management License

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: - 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: Enables the user to use the CD / DVD / FD / Flash memory of the remote terminals (PC/server) as if accessing the local drives. NOTE: Remote KVM and remote media features are not available for virtual machines.	N8115-04

9.2 Rack Conversion Kit

The following rack conversion kit is required to install the server into a 19-inch rack system:

Product Name / Description	Part Number
Rack Conversion Kit Convert to 5U form factor	N8143-119

9.3 Dust / Insect 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 with Sensor Including 1 set of filter replacement sensors, 1 set of dust proof filters	N8146-69
	Dust Proof Bezel 1 set of dust proof filters	N8146-68
Filter	Dust proof filter (5 pcs.) For N8146-68 and N8146-69 Dust Proof Bezel Removal capacity of particles : Up to 1 µm-sized	N8147-28
Sensor	Filter Replacement Sensor For N8146-68 Dust Proof Bezel, Including 1 set of filter replacement sensors	N8146-70

NOTE:

- Dust Proof Bezel is supported on the tower configuration only.

9.4 Medium and Cartridge

Category	Product Name	Drive supported	Part Number
RDX	RDX Cartridge (320GB)	N8151-125	N8153-01
	RDX Cartridge (500GB)	N8151-125	N8153-02
	RDX Cartridge (1TB)	N8151-125	N8153-03
	RDX Cartridge (2TB)	N8151-125	N8153-09

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(x86)	Legacy	Disabled
Windows Server 2008 R2 (x64)	Legacy	Disabled
Windows Server 2012	UEFI	Enabled
Windows Server 2012 R2	UEFI	Enabled
Red Hat Enterprise Linux 6	Legacy	Disabled
Red Hat Enterprise Linux 6(x86_64)	UEFI	Enabled
Red Hat Enterprise Linux 7	UEFI	Enabled
VMware ESXi 5.1 Update2	Legacy	Disabled
VMware ESXi 5.5 Update2	Legacy	Disabled
VMware ESXi 6.0	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/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	-	✓
	Video recording	-	✓
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)	✓	✓
Maintenance	Scheduling (without UPS)	✓ ¹	✓ ¹
	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.

OS Support Matrix for PCI Cards and Embedded Controllers

Part number	Product Name	WS 2012 R2	WS 2012	WS 2008 R2	WS 2008 (x86)	RHEL 7	RHEL 6	RHEL 6 x64	ESXi 6.0	ESXi 5.5	ESXi 5.1
-	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)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8103-186	SAS Expander Card	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8103-179	RAID Controller (2 GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N8190-158A	Fibre Channel Controller (2ch)	✓	✓	✓	-	✓	✓	✓	✓	✓	-
N8190-157A	Fibre Channel Controller	✓	✓	✓	-	✓	✓	✓	✓	✓	-
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 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	#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)	N8103-186	SAS Expander Card	-	-	-	-	(2)
(5)	N8103-179	RAID Controller (2 GB, RAID 0/1/5/6)	(4)	(2)	(1)	(3)	-
(6)	N8190-158A	Fibre Channel Controller (2ch)	(4)	(2)	(1)	(3)	-
(7)	N8190-157A	Fibre Channel Controller	(4)	(2)	(1)	(3)	-
(8)	N8103-184	SAS Controller	(4)	(2)	(1)	(3)	-
(9)	N8190-160	Fibre Channel Controller (2ch)	(4)	(2)	(1)	(3)	-
(10)	N8190-159	Fibre Channel Controller	(4)	(2)	(1)	(3)	-
(11)	N8104-153	Dual Port 10GBASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(12)	N8104-149	10GBASE adapter (SFP+/2ch)	(4)	(2)	(1)	(3)	(5)
(13)	N8103-142	SAS Controller	(4)	(2)	(1)	(3)	(5)
(14)	N8104-152	Quad Port 1000BASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(15)	N8104-145	Dual Port 1000BASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(16)	N8104-151	Dual Port 1000BASE-T Adapter	(4)	(2)	(1)	(3)	(5)
(17)	N8104-150	1000BASE-T adapter	(4)	(2)	(1)	(3)	(5)
(18)	N8117-01A	Serial Port Adapter	-	-	(1)	(2)	(3)

NOTE:

- The slot #1 is available in a dual-processor system.
- The number between parentheses shows the population priority (recommendation). For example, install N8103-176 (1) in the slot #3, N8190-160 (9) in the slot #2 and N8104-153 (11) in the slot #4 when you have those cards.
- For the configuration limitation for VMware ESXi, refer to the following documents.

VMware ESXi5.1

<https://www.vmware.com/pdf/vsphere5/r51/vsphere-51-configuration-maximums.pdf>

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>

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

Revision History

Revision	Date	Description
7.0	October 23, 2015	<p>New products added: RDX Cartridge (2TB) / N8153-09</p> <p>Discontinued product deleted: RDX Cartridge (2TB) / N8153-08 RDX Cartridge (SSD/128GB) / N8153-06 RDX Cartridge (SSD/256GB) /N8153-07</p>
6.0	July 16, 2015	<p>Discontinued product deleted: 100GB Hot Plug 2.5-inch SATA SSD N8150-724</p> <p>Others: Added RHEL 7 to the list of operating system supported Changed the number of logical processors and maximum memory size supported by Red Hat Enterprise Linux 6 (x86_64) 2.5-inch SATA SSD(MLC) is supported on VMware ESXi Added URL links to VMware documents for the configuration limitation</p>
5.0	June 25, 2015	<p>Discontinued product deleted: 4KB sector drives other than N8150-490 and N8150-521</p> <p>Others: Added a note for 4KB sector drives</p>
4.0	May 29, 2015	<p>Others: SAS Controller N8103-184 supports ESXi 5.5 Added PCI slot limitation for VMware ESXi 5.1/5.5 Corrected description of N8104-149 Added note for N8104-145 Dual Port 1000BASE-T Adapter</p>
3.0	April 17, 2015	<p>New products added: 1TB 7.2K Hot Plug 2.5-inch SATA HDD / N8150-520 2TB 7.2K Hot Plug 2.5-inch SATA HDD / N8150-521 Dust Proof Bezel with Sensor / N8146-69 Filter Replacement Sensor / N8146-70</p> <p>Others: Added ESXi 6 to the list of operating system supported</p>
2.0	February 18, 2015	<p>New products added: VMware ESXi support kit / N8106-009</p> <p>Others: Added note to configure with VMware Systems</p>
1.0	January 16, 2015	Initial release