

# **NEC Express5800/E120f-M 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 memory capacity, supporting high speed and energy efficient DDR3-1600 memory
- Highly reliable with redundant fan

### Specification

#### Server Module (1/2)

<b>Model</b>		<b>E120f-M</b>			
<b>Part Number</b>		N8100-2239F, N8100-2240F			
<b>Processor</b>	<b>Type</b>	Intel® Xeon® Processor E5-2609 v3	Intel® Xeon® Processor E5-2620 v3	Intel® Xeon® Processor E5-2630 v3	Intel® Xeon® Processor E5-2630L v3
	<b>Clock speed</b>	1.90 GHz	2.40 GHz	2.40 GHz	1.80 GHz
	<b>Number of Processors</b>	1 to 2			
	<b>Cache</b>	15 MB	20 MB		
	<b>Cores and Threads</b>	6C / 6T	6C / 12T	8C / 16T	
<b>Chipset</b>		Intel® C612 Chipset			
<b>Memory</b>	<b>Type</b>	DDR4-2133 Registered DIMM (4/8/16GB) DDR4-2133 Load Reduced DIMM (32GB)			
	<b>Standard Capacity</b>	0 GB			
	<b>Maximum Capacity</b>	512 GB (16 x 32 GB)			
	<b>Memory protection</b>	ECC, x4 SDDC			
<b>Internal Storage</b>	<b>Standard Capacity</b>	0 GB			
	<b>Maximum Capacity</b>	SATA HDD : 8 TB (4 x 2 TB) SAS HDD : 7.2 TB (4 x 1.8 TB) SAS SSD : 1.6 TB (4 x 400 GB) SATA SSD : 3.2 TB (4 x 800 GB)			
	<b>Disk Controller</b>	SATA : 6Gb/s (Integrated) SAS: 12 Gb/s (Optional)			
	<b>RAID</b>	RAID 0/1/5/6/10 (Optional)			
	<b>Hot Plug</b>	Supported			
	<b>Disk Drive Bays</b>	4			
<b>Expansion Slots</b>		Total: 2 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x8 (x8 connector) for a flexible integrated NIC or RAID controller			
<b>Video</b>	<b>Controller (VRAM)</b>	Integrated in Server Management Controller (32MB)			
	<b>Resolution / Color</b>	1600 x 1200 / 16.7M <sup>1</sup>			
<b>Interfaces</b>		1 VGA (15-pin mini D-sub, 1 front) 2 x USB3.0 (2 x front) 1 x USB2.0 (2 x internal) 1 Serial (9-pin mini D-sub, RS232-C, 1 rear) 4 1000BASE-T LAN connector (RJ-45, 4 rear) 1 1000BASE-T LAN connector for Management (RJ-45, 1 rear)			
<b>Server Management</b>		EXPRESSSCOPE Engine 3			

Model	E120f-M					
<b>Redundant Fan</b>	Standard, non-hot plug					
<b>Power Consumption</b>	<b>(Max. Config, Idling)</b>	123 Watt	124 Watt	121 Watt	123 Watt	
	<b>(Max. Config, Operating)</b>	426 Watt	450 Watt	450 Watt	380 Watt	
<b>Acoustic Noise (Sound Pressure Level)<sup>2</sup></b>	<b>Max. Config, Idling</b>	52.3dB				
	<b>Max. Config, Operating</b>	66.8dB				
<b>Dimensions (W x D x H )</b>	220.0 x 780.0 x 40.4 mm / 8.66 x 30.7 x 1.59 in					
<b>Weight (Minimum / Maximum)</b>	5 kg / 7 kg, 11.02 lbs. / 15.43 lbs.					
<b>Temperature, Relative Humidity (non-condensing)</b>	Operating: 10° to 40° C <sup>3</sup> / 50° to 104° F <sup>3</sup> , 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%					
<b>Regulatory and Safety</b>	FCC, CE, UL, CB, BSMI, KC, CCC, RoHS, WEEE					
<b>Operating Systems</b>	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) <sup>4</sup> Red Hat Enterprise Linux 6.5 or later (x86_64) <sup>4</sup> Red Hat Enterprise Linux 7.1 or later <sup>4</sup> VMware ESXi 5.1 Update 2 VMware ESXi 5.5 Update 2 <sup>5</sup> VMware ESXi 6.0 <sup>5</sup>					

<sup>1</sup> Maximum resolution available via EXPRESSSCOPE Engine 3 remote console is 1280 x 1024 / 65K colors.<sup>2</sup> Noise emission was measured at the bystander positions in accordance with ISO 7779. The actual value may vary by the operating environment.<sup>3</sup> Maximum temperature depends on the server configuration. Refer to the [Server Configuration](#) for detail.<sup>4</sup> For Linux support, contact your sales representative or go to the NEC website at:  
<http://www.nec.com/global/prod/express/linux/index.html><sup>5</sup> At least 5 GB of logical memory is required.

## Server Module (2/2)

Model	E120f-M				
<b>Part Number</b>	N8100-2239F, N8100-2240F				
<b>Processor</b>	<b>Type</b>	Intel® Xeon® Processor E5-2640 v3	Intel® Xeon® Processor E5-2650 v3	Intel® Xeon® Processor E5-2650L v3	Intel® Xeon® Processor E5-2660 v3
	<b>Clock speed</b>	2.60 GHz	2.30 GHz	1.80 GHz	2.60 GHz
	<b>Number of Processors</b>	1 to 2			
	<b>Cache</b>	20 MB	25 MB	30 MB	25 MB
	<b>Cores and Threads</b>	8C / 16T	10C / 20T	12C / 24T	10C / 20T
<b>Chipset</b>	Intel® C612 Chipset				
<b>Memory</b>	<b>Type</b>	DDR4-2133 Registered DIMM (4/8/16GB) DDR4-2133 Load Reduced DIMM (32GB)			
	<b>Standard Capacity</b>	0 GB			
	<b>Maximum Capacity</b>	512 GB (16 x 32 GB)			
	<b>Memory protection</b>	ECC, x4 SDDC			
<b>Internal Storage</b>	<b>Standard Capacity</b>	0 GB			
	<b>Maximum Capacity</b>	SATA HDD : 8 TB (4 x 2 TB) SAS HDD : 7.2 TB (4 x 1.8 TB) SAS SSD : 1.6 TB (4 x 400 GB) SATA SSD : 3.2 TB (4 x 800 GB)			

## SYSTEM CONFIGURATION GUIDE – NEC Express5800/E120f-M

<b>Model</b>	<b>E120f-M</b>										
<b>Internal Storage (Continued)</b>	<b>Disk Controller</b>	SATA : 6Gb/s (Integrated) SAS: 12 Gb/s (Optional)									
	<b>RAID</b>	RAID 0/1/5/6/10 (Optional)									
	<b>Hot Plug</b>	Supported									
	<b>Disk Drive Bays</b>	4									
<b>Expansion Slots</b>	Total: 2 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x8 (x8 connector) for a flexible integrated NIC or RAID controller										
<b>Video</b>	<b>Controller (VRAM)</b>	Integrated in Server Management Controller (32MB)									
	<b>Resolution / Color</b>	1600 x 1200 / 16.7M <sup>1</sup>									
<b>Interfaces</b>	1 VGA (15-pin mini D-sub, 1 front) 2 x USB3.0 (2 x front) 1 x USB2.0 (2 x internal) 1 Serial (9-pin mini D-sub, RS232-C, 1 rear) 4 1000BASE-T LAN connector (RJ-45, 4 rear) 1 1000BASE-T LAN connector for Management (RJ-45, 1 rear)										
<b>Server Management</b>	EXPRESSSCOPE Engine 3										
<b>Redundant Fan</b>	Standard, non-hot plug										
<b>Power Consumption</b>	<b>(Max. Config, Idling)</b>	121 Watt	128 Watt	130 Watt	124 Watt						
	<b>(Max. Config, Operating)</b>	470 Watt	481 Watt	417 Watt	492 Watt						
<b>Acoustic Noise (Sound Pressure Level)<sup>2</sup></b>	<b>Max. Config, Idling</b>	52.3dB									
	<b>Max. Config, Operating</b>	66.8dB									
<b>Dimensions (W x D x H )</b>		220.0 x 780.0 x 40.4 mm / 8.66 x 30.7 x 1.59 in									
<b>Weight (Minimum / Maximum)</b>		5 kg / 7 kg, 11.02 lbs. / 15.43 lbs.									
<b>Temperature, Relative Humidity (non-condensing)</b>		Operating: 10° to 40° C <sup>3</sup> / 50° to 104° F <sup>3</sup> , 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%									
<b>Regulatory and Safety</b>		FCC, CE, UL, CB, BSMI <sup>4</sup> , KC <sup>4</sup> , CCC <sup>4</sup> , RoHS, WEEE									
<b>Operating Systems</b>		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) <sup>5</sup> Red Hat Enterprise Linux 6.5 or later (x86_64) <sup>5</sup> Red Hat Enterprise Linux 7.1 or later <sup>5</sup> VMware ESXi 5.1 Update 2 VMware ESXi 5.5 Update 2 <sup>6</sup> VMware ESXi 6.0 <sup>6</sup>									

<sup>1</sup> Maximum resolution available via EXPRESSSCOPE Engine 3 remote console is 1280 x 1024 / 65K colors.

<sup>2</sup> Noise emission was measured at the bystander positions in accordance with ISO 7779. The actual value may vary by the operating environment.

<sup>3</sup> Maximum temperature depends on the server configuration. Refer to the [Server Configuration](#) for detail.

<sup>4</sup> E5-2650 v3, E5-2640 v3, E5-2650L v3 are excluded.

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

<sup>6</sup> At least 5 GB of logical memory is required.

## Server Module Enclosure

Model	Server Module Enclosure	
<b>Part Number</b>	N8141-71F	N8141-72F
<b>Server Module Bays</b>	4	
<b>Power Supply Bays</b>	2	
<b>Redundant Fan</b>	-	
<b>Redundant Power Supply</b>	Standard, hot plug	
<b>Power Supply</b>	2 x 1,000 Watt 80 PLUS® Platinum certified hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz	2 x 1,600 Watt 80 PLUS® Platinum certified hot plug PSU 200-240 VAC ± 10% 50 / 60 Hz ± 3 Hz
<b>Maximum Power Consumption</b>	100 VAC : 1,247 VA / 1,185 Watt 200 VAC : 1,416 VA / 1,345 Watt	1,896 VA / 1,801 Watt
<b>Heat Dissipation</b>	100 VAC : 4,266 kJ/h 200 VAC : 4,842 kJ/h	6,484 kJ/h
<b>Dimensions (W x D x H )</b>	447.0 x 781.2 x 86.8 mm / 17.6 x 30.76 x 3.42 in (2U)	
<b>Weight <sup>1</sup> (Minimum / Maximum)</b>	13 kg / 41 kg, 28.66 lbs. / 90.38 lbs.	
<b>Temperature, Relative Humidity (non-condensing)</b>	Operating: 10° to 40° C <sup>2</sup> / 50° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%	Operating: 10° to 35° C / 50° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%
<b>Regulatory and Safety</b>	RoHS	

<sup>1</sup> The weight was measured with the following system configurations:

Minimum: Server Module Enclosure with two power supplies

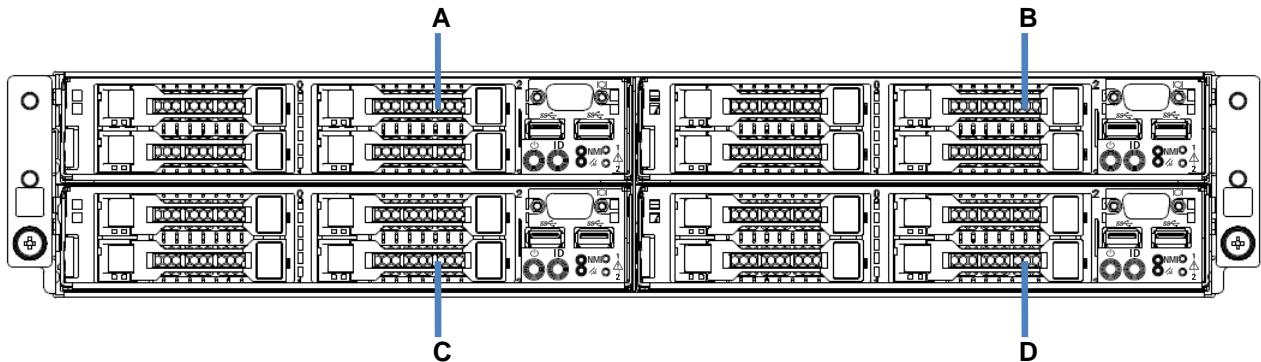
Maximum : Server Module Enclosure with two power supplies and four server modules with maximum configuration

<sup>2</sup> Up to 35° C when a dual processor configuration with E5-2630L v3 or E5-2650L v3. Up to 30° C when PCIe SSD Adapter is installed.

## External Views

### Front and Rear Views for Server Module Enclosure

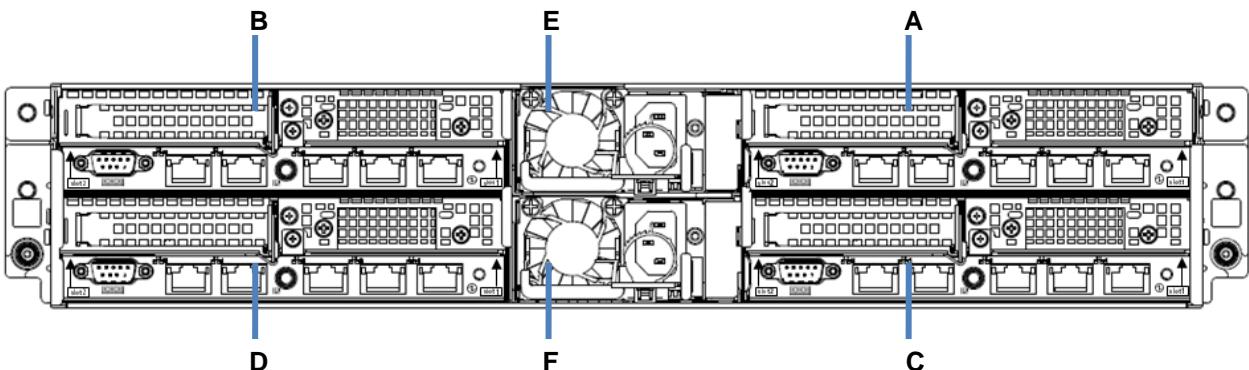
#### Front View



#### Legend

- |                   |                   |
|-------------------|-------------------|
| A. Module Slot #1 | C. Module Slot #3 |
| B. Module Slot #2 | D. Module Slot #4 |

#### Rear View

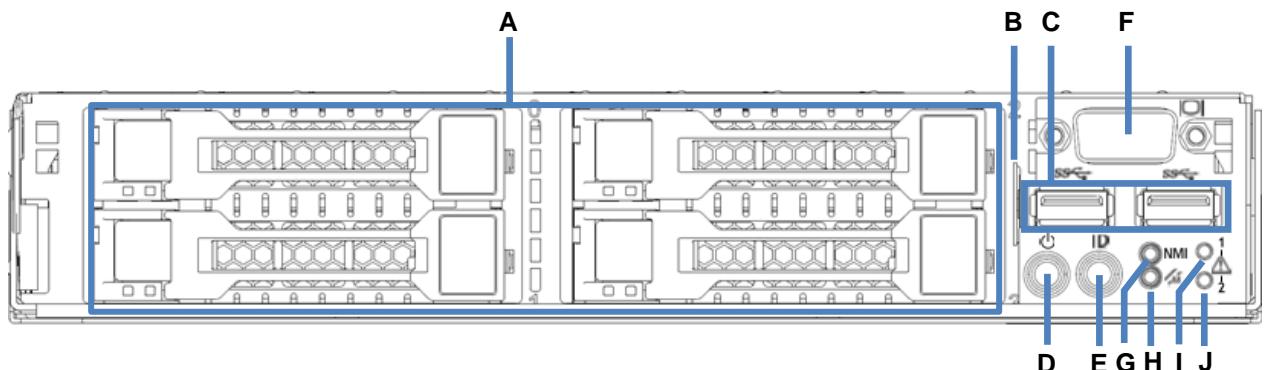


#### Legend

- |                   |                         |
|-------------------|-------------------------|
| A. Module Slot #1 | D. Module Slot #4       |
| B. Module Slot #2 | E. Power Supply Slot #1 |
| C. Module Slot #3 | F. Power Supply Slot #2 |

## Front and Rear Views for Server Module

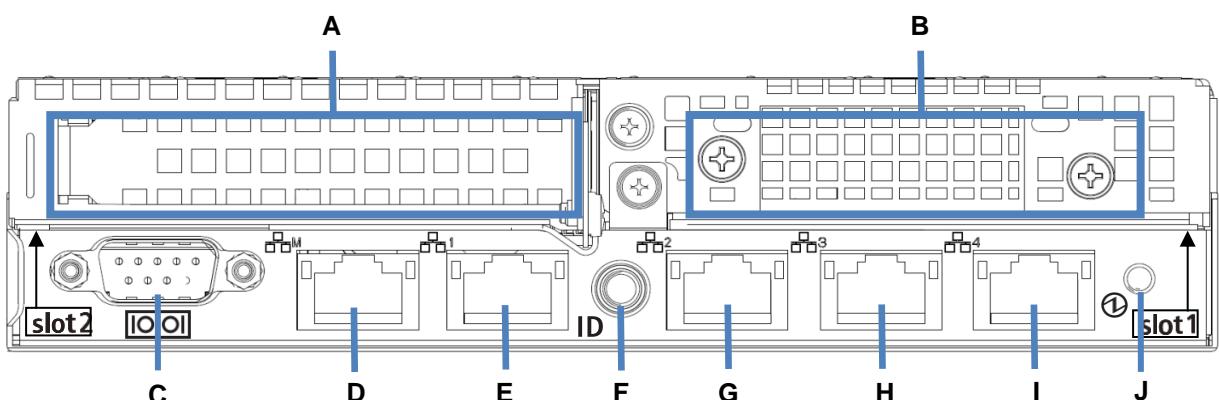
### Front View



#### Legend

- |                             |                        |
|-----------------------------|------------------------|
| A. 2.5-inch Drive Bays      | F. Display Connector   |
| B. Pull-out Tab             | G. Dump (NMI) Button   |
| C. USB Connector            | H. BMC Reset Button    |
| D. Power Button / Power LED | I. System Status LED 1 |
| E. UID LED Button           | J. System Status LED 2 |

### Rear View

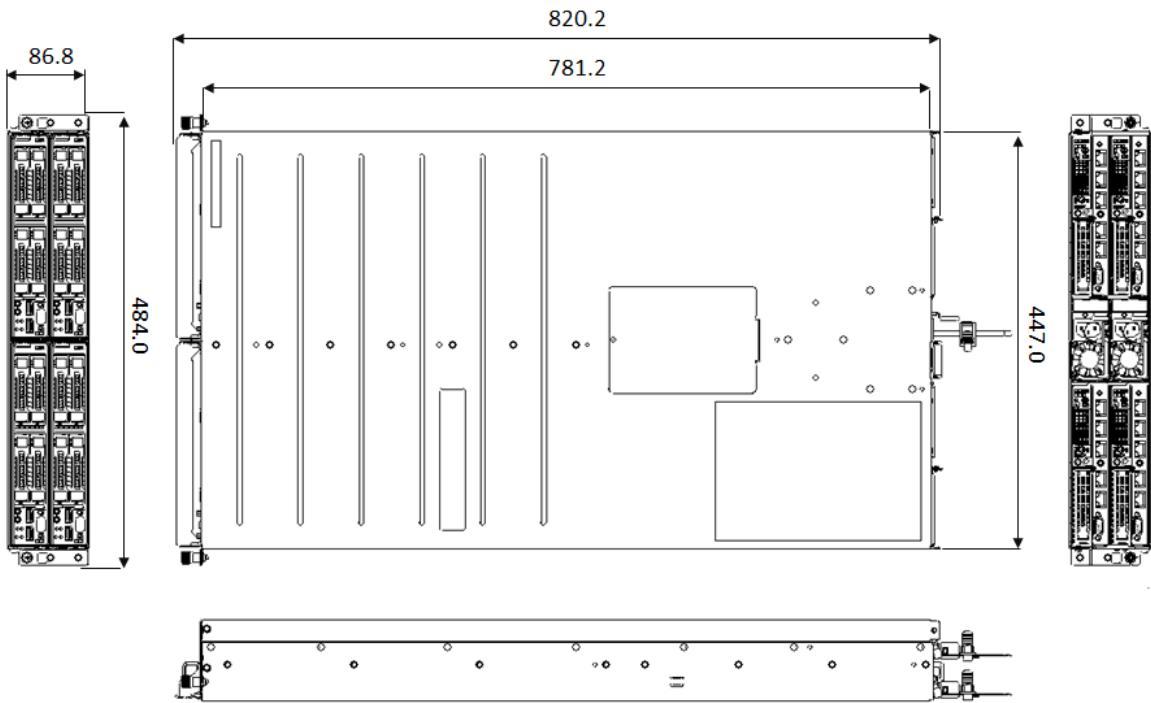


#### Legend

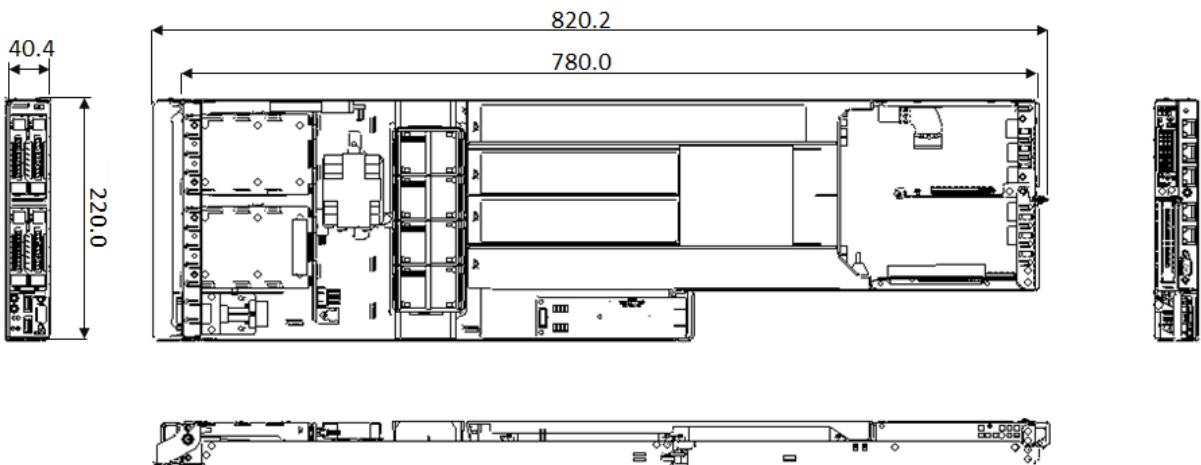
- |                               |                        |
|-------------------------------|------------------------|
| A. PCI Slot2 (Low Profile)    | F. UID Button / LED    |
| B. PCI Slot1 (Dedicated Slot) | G. Data LAN Connector2 |
| C. Serial Port Connector      | H. Data LAN Connector3 |
| D. Management LAN Connector   | I. Data LAN Connector4 |
| E. Data LAN Connector1        | J. Power LED           |

## Dimensions (mm)

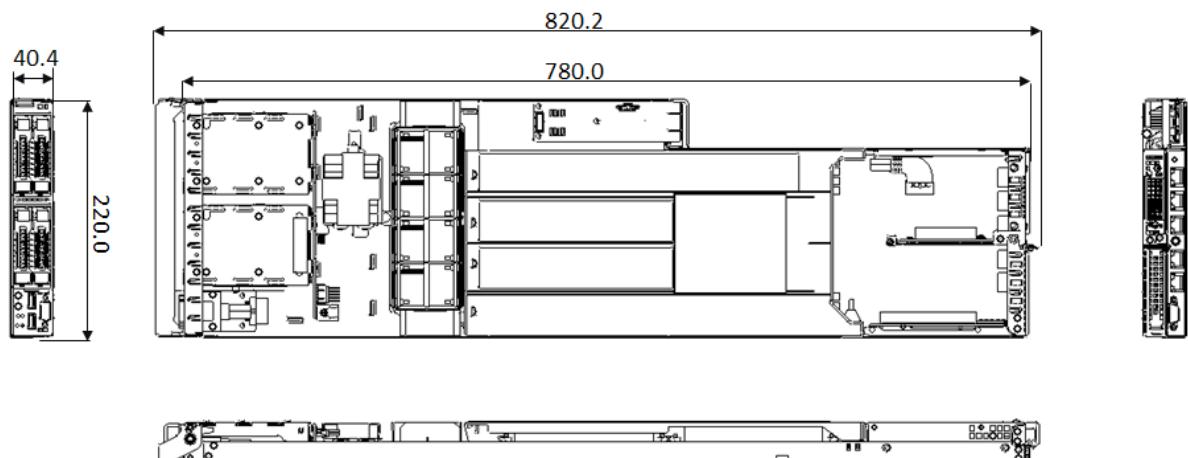
### Server Module Enclosure



### Server Module (Left)

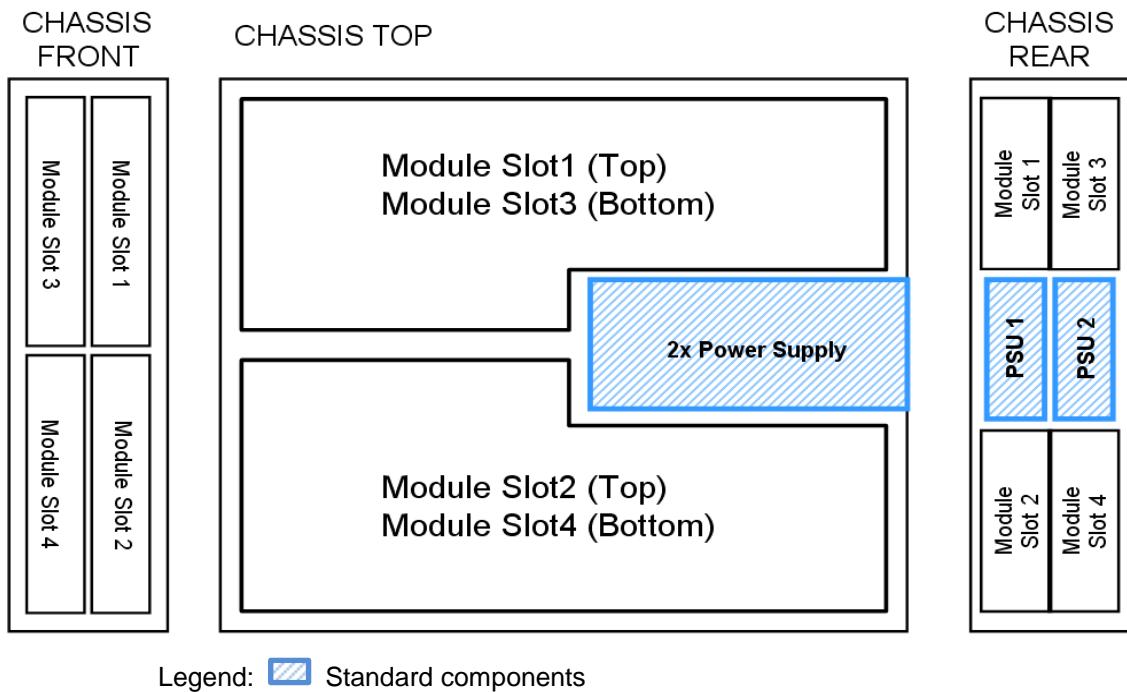


**Server Module (Right)**

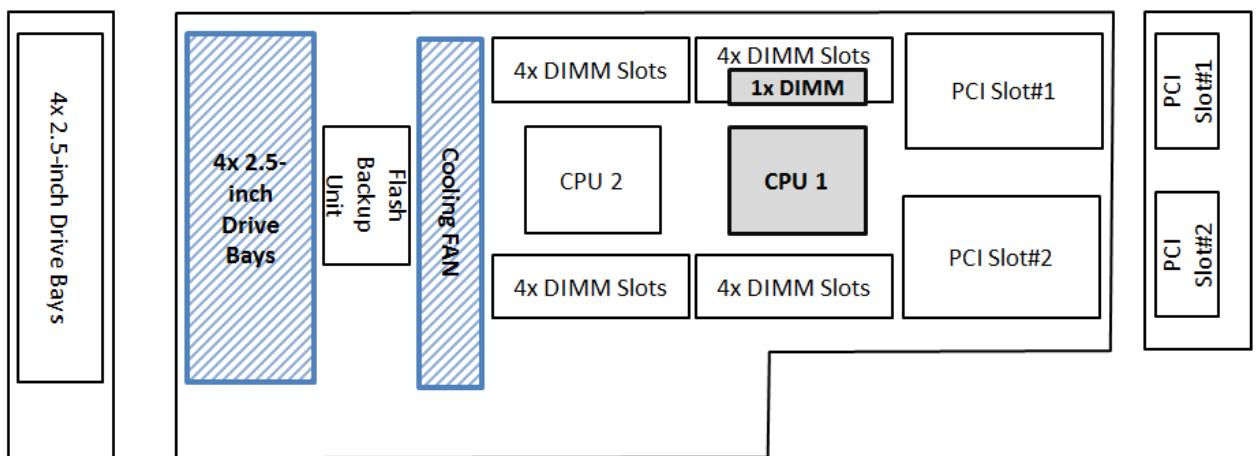


# Configuration Diagram

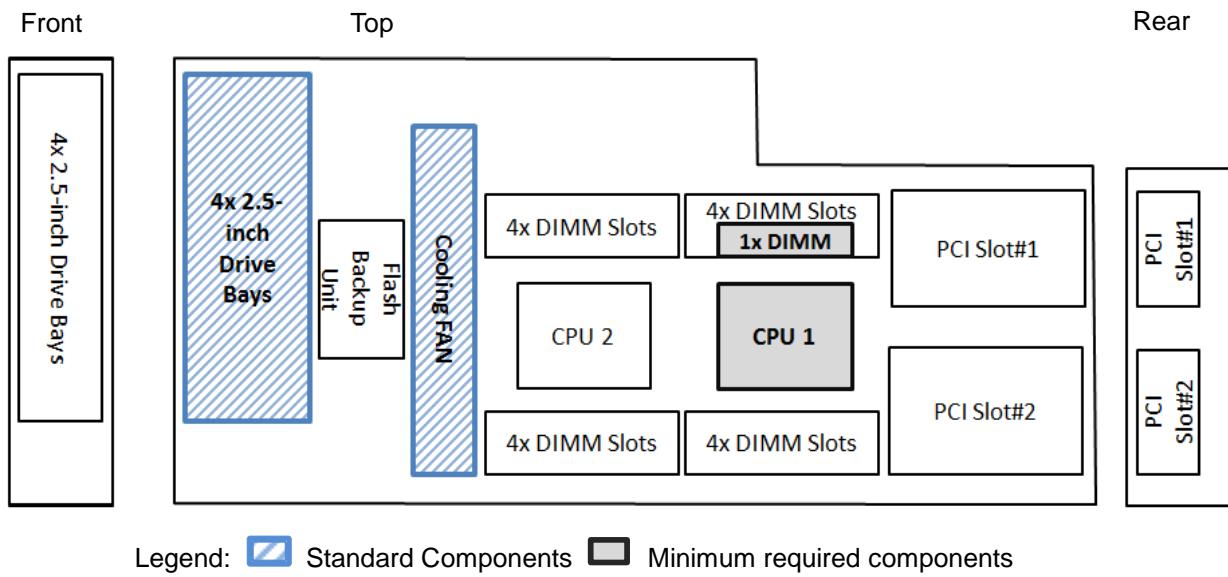
## Server Module Enclosure



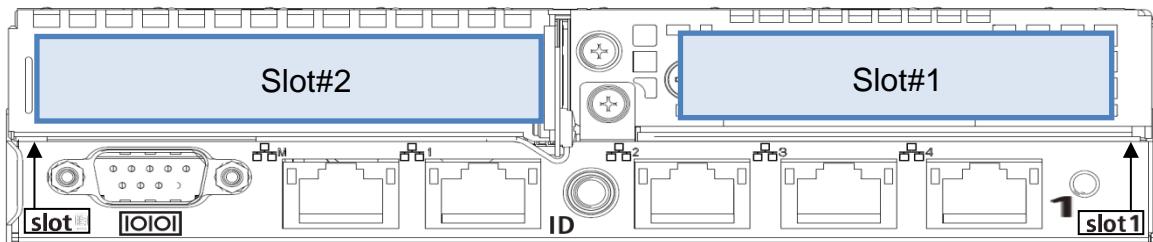
## Server Module (Left)



## Server Module (Right)



## Expansion Slot



### Legend

- |    |   |
|----|---|
| #1 | PCIe 3.0 x8, x8 connector, for a flexible integrated NIC        |
| #2 | PCIe 3.0 x16, x16 connector, Low-profile, up to 167.6 mm length |

### NOTE:

- N8116-36 PCIe x16 Riser Card Kit is required for the slot #2.

# Server Configuration

## 1 Maximum Server Module Configuration with 1600 W PSU

See the table below for the maximum server configuration based on processor configuration, input voltage, and maximum ambient temperature for N8141-72F Module Enclosure with 1600 Watt power supply.

The condition for the maximum server configuration is defined when four servers with the same configuration are installed. For other server configurations, please consult our sales representative.

### 1.1 Configuration (Up to 35° C ambient temp.)

#### 200VAC Input (with RAID controller, PCI riser [N8116-36] and PCI card)

Processor Type	# of Processors	# of 32 GB DIMMs	# of HDD (SAS 600GB, 15000rpm)
E5-2609 v3			No limitation
E5-2620 v3			
E5-2630L v3			
E5-2650L v3			
E5-2630 v3	2	Up to 8 DIMMs 16 DIMMs	4 HDDs Up to 2 HDDs
E5-2640 v3	2	Up to 6 DIMMs 16 DIMMs	4 HDDs Up to 2 HDDs
E5-2650 v3	2	Up to 5 DIMMs 16 DIMMs	3 HDDs Up to 1 HDD
E5-2660v3	2	Up to 8 DIMMs	Up to 1 HDD

#### NOTE:

- Up to 30° C ambient temperature when PCIe SSD Adapter is installed.

## 2 Maximum Server Module Configuration with 1000 W PSU

See the table below for the maximum server configuration based on processor configuration, input voltage, and maximum ambient temperature for N8141-71F Module Enclosure with 1000 Watt power supply.

The condition for the maximum server configuration is defined when four servers with the same configuration are installed. For other server configurations, please consult our sales representative.

### 2.1 Configuration (Up to 40° C ambient temp.)

#### 100VAC Input (with RAID controller, PCI riser [N8116-36] and PCI card)

Processor Type	# of Processors	# of 32 GB DIMMs	# of HDD (SAS 600GB, 15000rpm)
E5-2609 v3	1	Up to 7 DIMMs Up to 8 DIMMs	Up to 3 HDDs Up to 2 HDDs
E5-2620 v3	1	Up to 5 DIMMs 8 DIMMs	Up to 2 HDDs Up to 1 HDD
E5-2630 v3 E5-2640 v3	1	Up to 3 DIMMs	Up to 1 HDD
E5-2630L v3	1		No limitation
E5-2650 v3	1	Up to 1 DIMM	Up to 1 HDD
E5-2650L v3	1	Up to 3 DIMMs 8 DIMMs	Up to 3 HDDs Up to 2 HDD
E5-2660 v3			Not supported

**NOTE:**

- Up to 30° C ambient temperature when PCIe SSD Adapter is installed.

**200VAC Input (with RAID controller, PCI riser [N8116-36] and PCI card)**

<b>Processor Type</b>	<b># of Processors</b>	<b># of 32 GB DIMMs</b>	<b># of HDD (SAS 600GB, 15000rpm)</b>
E5-2609 v3			
E5-2620 v3			
E5-2630 v3			
E5-2630L v3	1		No limitation
E5-2640 v3			
E5-2650 v3			
E5-2650L v3			
E5-2660v3	1	Up to 1 DIMM 8 DIMMs	Up to 4 HDDs Up to 1 HDD

**NOTE:**

- Up to 30° C ambient temperature when PCIe SSD Adapter is installed.

**2.2 Configuration (Up to 35° C ambient temp.)****100VAC Input (with RAID controller, PCI riser [N8116-36] and PCI card)**

<b>Processor Type</b>	<b># of Processors</b>	<b># of 32 GB DIMMs</b>	<b># of HDD (SAS 600GB, 15000rpm)</b>
E5-2609 v3	1	8 DIMMs	Up to 3 HDDs
E5-2620 v3	1	8 DIMMs	Up to 1 HDD
E5-2630 v3			
E5-2640 v3	1	Up to 4 DIMMs	Up to 1 HDD
E5-2630L v3	1		No limitation
E5-2650 v3	1	Up to 1 DIMM	Up to 1 HDD
E5-2650L v3	1	Up to 3 DIMMs 8 DIMMs	Up to 3 HDD Up to 2 HDD
E5-2660 v3			Not supported

**NOTE:**

- Up to 30° C ambient temperature when PCIe SSD Adapter is installed.

**200VAC Input (with RAID controller, PCI riser [N8116-36] and PCI card)**

<b>Processor Type</b>	<b># of Processors</b>	<b># of 32 GB DIMMs</b>	<b># of HDD (SAS 600GB, 15000rpm)</b>
E5-2609 v3			
E5-2620 v3			
E5-2630 v3			
E5-2640 v3	1		No limitation
E5-2650 v3			
E5-2650L v3			
E5-2660 v3			
E5-2630L v3	2	Up to 2 DIMMs 8 DIMMs	Up to 2 HDDs Up to 1 HDD

**NOTE:**

- Up to 30° C ambient temperature when PCIe SSD Adapter is installed.

## 3 Server Module Enclosure

### 3.1 Server Module Enclosure

Product Name / Description	Part Number
<b>Module Enclosure</b> no server module, no PSU cable Including: 1000 Watt power supply, EXPRESSBUILDER DVD For E120f-M	N8141-71F
<b>Module Enclosure</b> no server module, no PSU cable Including: 1600 Watt power supply (200V only), EXPRESSBUILDER DVD For E120f-M	N8141-72F

**NOTE:**

- Up to four server modules can be installed.

### 3.2 Options for Server Module Enclosure

#### 3.2.1 Blank Panel

Product Name / Description	Part Number
<b>Blank Panel</b> 1pc of filler panel for server module slots	N8141-61F

**NOTE:**

- The blank panels must be installed into the vacant server module slots.

## 4 Server Module

Product Name / Description	Part Number
<b>NEC Express5800/E120f-M</b> Server Module(Left) No processor, no RAM, no HDD, no ODD	N8100-2239F
<b>NEC Express5800/E120f-M</b> Server Module(Right) No processor, no RAM, no HDD, no ODD	N8100-2240F

**NOTE:**

- The base model must be ordered with a processor kit and a memory kit.
- The server module for left must be installed into slot #1 and #3, and that for right must be installed into slot #2 and #4.
- The server modules must be installed in an order from server module slot #1.
- E120f-M server modules cannot be installed in N8141-62F/-65F/-66F/-68F module enclosure

## 5 Processors and Heat Sink

Available sockets: 2

Category	Product Name / Description	Part Number
<b>Processors</b> <b>1 Processor Required</b>	<b>Xeon E5-2609 v3 Processor Kit</b> Intel® Xeon® Processor E5-2609 v3 (1.90 GHz, 6C/6T, 15 MB)	N8101-787F
	<b>Xeon E5-2620 v3 Processor Kit</b> Intel® Xeon® Processor E5-2620 v3 (2.40 GHz, 6C/12T, 15 MB)	N8101-788F
	<b>Xeon E5-2630 v3 Processor Kit</b> Intel® Xeon® Processor E5-2630 v3 (2.40 GHz, 8C/16T, 20 MB)	N8101-789F
	<b>Xeon E5-2630L v3 Processor Kit</b> Intel® Xeon® Processor E5-2630L v3 (1.80 GHz, 8C/16T, 20 MB)	N8101-790F
	<b>Xeon E5-2640 v3 Processor Kit</b> Intel® Xeon® Processor E5-2640 v3 (2.60 GHz, 8C/16T, 20 MB)	N8101-949F
	<b>Xeon E5-2650 v3 Processor Kit</b> Intel® Xeon® Processor E5-2650 v3 (2.30 GHz, 10C/20T, 25 MB)	N8101-955F
	<b>Xeon E5-2650L v3 Processor Kit</b> Intel® Xeon® Processor E5-2650L v3 (1.80 GHz, 12C/24T, 30 MB)	N8101-953F
	<b>Xeon E5-2660 v3 Processor Kit</b> Intel® Xeon® Processor E5-2660 v3 (2.60 GHz, 10C/20T, 25 MB)	N8101-791F
Heat Sink	1st <b>Processor Heat Sink</b> For 1 <sup>st</sup> Processor	(Standard)
	2nd <b>Processor Heat Sink</b> For 2 <sup>nd</sup> Processor	N8101-792F

**NOTE:**

- One processor kit from above must be installed.
- The processors must be the same to configure dual processor system.
- Up to 35° C ambient temperature when a dual processor configuration with E5-2630L v3 or E5-2650L v3.
- E5-2640 v3, E5-2650 v3 and E5-2650L v3 are available in limited countries. Contact your sales representative for availability

### 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 R2 Standard (x64) Microsoft Windows Server 2008 R2 Enterprise (x64)	256 <sup>1</sup> 48
Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter	640 <sup>1</sup> 48
Red Hat Enterprise Linux 6	32 32
Red Hat Enterprise Linux 6 (x86_64) Red Hat Enterprise Linux 7	240 48
VMware ESXi 5.1	160 48
VMware ESXi 5.5	320 48
VMware ESXi 6.0	480 48

<sup>1</sup> The maximum numbers of logical processors when using Hyper-V are below

- Windows Server 2008 R2 : 64  
- Windows Server 2012, Windows Server 2012 R2 : 320

## 6 Memory

**Available slots: 8 per processor**

Category	Product Name / Description	Part Number
<b>Registered DIMM (RDIMM)</b>	<b>4GB DDR4-2133 REG Memory Kit (1x4GB)</b> 1 x 4GB Registered ECC DIMM, DDR4-2133(PC4-17000)	N8102-625F
	<b>8GB DDR4-2133 REG Memory Kit (1x8GB)</b> 1 x 8GB Registered ECC DIMM, DDR4-2133(PC4-17000)	N8102-626F
	<b>16GB DDR4-2133 REG Memory Kit (1x16GB)</b> 1 x 16GB Registered ECC DIMM, DDR4-2133(PC4-17000)	N8102-628F
<b>Load Reduced DIMM (LRDIMM)</b>	<b>32GB DDR4-2133 LR Memory Kit (1x32GB)</b> 1 x 32GB Load Reduced ECC DIMM, DDR4-2133(PC4-17000)	N8102-629F

**NOTE:**

- Minimum one memory kit per processor must be installed.
- It is recommended to install memory kits in multiples of two (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 ESXi5.5 and VMware ESXi 6.0.
- N8102-625F does not support x4 SDDC.

### Maximum Memory Speed

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

The maximum memory transfer rate is 1600 MHz with Memory Sparring Configuration.

Processor Type	Populated DIMMs	DIMM Speed
E5-2609 v3	RDIMM (4, 8, 16GB)	1600 MHz
	LRDIMM (32GB)	1600 MHz
E5-2620 v3	RDIMM(4, 8, 16GB)	1866 MHz
E5-2630 v3		
E5-2630L v3		
E5-2640 v3	LRDIMM (32GB)	1866 MHz
E5-2650 v3	RDIMM(4, 8, 16GB)	2133 MHz
E5-2650L v3		
E5-2660 v3	LRDIMM (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 R2 Standard <sup>1</sup>	32 GB
Microsoft Windows Server 2008 R2 Enterprise <sup>1</sup>	2 TB
Microsoft Windows Server 2012 Standard <sup>1</sup>	4 TB
Microsoft Windows Server 2012 Datacenter <sup>1</sup>	
Microsoft Windows Server 2012 R2 Standard <sup>1</sup>	
Microsoft Windows Server 2012 R2 Datacenter <sup>1</sup>	
Red Hat Enterprise Linux 6	16 GB
Red Hat Enterprise Linux 6 (x86_64)	6 TB
Red Hat Enterprise Linux 7	
VMware ESXi 5.1 <sup>2</sup>	2 TB
VMware ESXi 5.5 <sup>2</sup>	4 TB
VMware ESXi 6.0 <sup>3</sup>	6 TB
	512GB
	512GB
	512GB

<sup>1</sup> The maximum available memory size of Hyper-V systems are below:

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

<sup>2</sup> Up to 1TB of main memory is available to each virtual machine.

<sup>3</sup> Up to 4TB of main memory is available to each virtual machine.

## 7 Internal Hard Disk Drives

### 7.1 RAID 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 [7.2.2](#) for the required components and then refer to the section [7.3.3](#) for the hard drives.

Operating System	Supported RAID configuration		Supported HDD/SSD
	RAID and Cache	Section	
Windows Server 2008 Standard	Non-RAID (Embedded SATA)	<a href="#">7.2.1</a>	<a href="#">7.3.1</a>
Windows Server 2008 Enterprise	RAID 0/1/10 1GB Cache	<a href="#">7.2.2</a>	<a href="#">7.3.2</a>
Windows Server 2008 R2 Standard	RAID 5/6/50/60 1GB Cache	<a href="#">7.2.3</a>	
Windows Server 2008 R2 Enterprise	RAID 5/6/50/60 2GB Cache	<a href="#">7.2.4</a>	
Red Hat Enterprise Linux 6			
KVM in Red Hat Enterprise Linux 6 (x86_64)			
VMware ESXi			
Windows Server 2012 Standard	Non-RAID (Embedded SATA)	<a href="#">7.2.1</a>	<a href="#">7.3.1</a>
Windows Server 2012 Datacenter	RAID 0/1/10 1GB Cache	<a href="#">7.2.2</a>	<a href="#">7.3.3</a>
Windows Server 2012 R2 Standard	RAID 5/6/50/60 1GB Cache	<a href="#">7.2.3</a>	
Windows Server 2012 R2 Datacenter	RAID 5/6/50/60 2GB Cache	<a href="#">7.2.4</a>	
Red Hat Enterprise Linux 6 (x86_64) without KVM feature			
Red Hat Enterprise Linux 7			

**NOTE:**

- Up to four hard drives can be installed.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs and SATA SSDs can be mixed in each drive cage.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.

### 7.2 Internal Drive Configuration

#### 7.2.1 Embedded SATA Controller

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4 x 6Gb/s SATA	(Standard)
Cable Required	Internal SATA Cable 1x Mini SAS - 1x Mini SAS HD, 1 本	K410-325(00)
Drive Cage	2.5-inch Drive Cage 4 x 2.5-inch Hot-plug hard drive bays	(Standard)

**NOTE:**

- Up to 4 SATA drives are supported.
- For supported HDD/SSD, refer to [7.3.1](#)
- Hot plug insertion/removal are not supported in the configuration.

### 7.2.2 RAID 0/1 Controller with 1 GB Cache

Category	Product Name / Description	Part Number
<b>Storage Controller Required</b>	<b>RAID Controller (1GB, RAID 0/1)</b> LSI MegaRAID SAS 9362-8i RAID 0/1/10, 1GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-176
<b>Flash Backup Recommended</b>	<b>Flash Backup Unit</b> for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
<b>Cable Required</b>	<b>Internal SAS/SATA Cable</b> 1 x Mini SAS HD to 1 x Mini SAS HD, 1 sets	K410-334(00)
<b>Drive Cage</b>	<b>2.5-inch Drive Cage</b> 4 x 2.5-inch hot plug drive bays	(Standard)

**NOTE:**

- For Supported HDD/SSD, refer to [7.3.2](#) for Windows Server 2008R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6(x86\_64) with KVM feature, or VMware ESXi. Refer to [7.3.3](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 7 or Red Hat Enterprise Linux 6(x86\_64) without KVM feature.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs and SATA SSDs can be mixed.

### 7.2.3 RAID 5/6 Controller with 1 GB Cache

Category	Product Name / Description	Part Number
<b>Storage Controller Required</b>	<b>RAID Controller (1GB, RAID 0/1/5/6)</b> 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
<b>Flash Backup Recommended</b>	<b>Flash Backup Unit</b> for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
<b>Cable Required</b>	<b>Internal SAS/SATA Cable</b> 1 x Mini SAS HD to 1 x Mini SAS HD, 1 sets	K410-334(00)
<b>Drive Cage</b>	<b>2.5-inch Drive Cage</b> 4 x 2.5-inch hot plug drive bays	(Standard)

**NOTE:**

- For Supported HDD/SSD, refer to [7.3.2](#) for Windows Server 2008R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6(x86\_64) with KVM feature, or VMware ESXi. Refer to [7.3.3](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 7 or Red Hat Enterprise Linux 6(x86\_64) without KVM feature.
- 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.

### 7.2.4 RAID 5/6 Controller with 2 GB Cache

Category	Product Name / Description	Part Number
<b>Storage Controller Required</b>	<b>RAID Controller (2GB, RAID 0/1/5/6)</b> LSI MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 2GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-178
<b>Flash Backup Recommended</b>	<b>Flash Backup Unit</b> for LSI MegaRAID SAS 9362-8i 650mm Cable for Flash Backup Unit included	N8103-181
<b>Cable Required</b>	<b>Internal SAS/SATA Cable</b> 1 x Mini SAS HD to 1 x Mini SAS HD, 1 sets	K410-334(00)
<b>Drive Cage</b>	<b>2.5-inch Drive Cage</b> 4 x 2.5-inch hot plug drive bays	(Standard)

**NOTE:**

- For Supported HDD/SSD, refer to [7.3.2](#) for Windows Server 2008R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6(x86\_64) with KVM feature, or VMware ESXi. Refer to [7.3.3](#) for Windows Server 2012/2012R2, Red Hat Enterprise Linux 7 or Red Hat Enterprise Linux 6(x86\_64) without KVM feature.
- 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.

## 7.3 Supported HDD/SDD

### 7.3.1 For Embedded SATA Controller

Category	Product Name / Description		Part Number
<b>Drive 4 slots available</b>	<b>SATA HDD</b>	<b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b> 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	N8150-487
		<b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b> 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	N8150-488
		<b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b> 1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	N8150-489

### 7.3.2 For RAID Controller Configuration (1)

For Windows Server 2008R2, Red Hat Enterprise Linux 6, VMware ESXi, or KVM in Red Hat Enterprise Linux 6(x86\_64)

Category	Product Name / Description		Part Number
<b>Drive 4 slots available</b>	<b>SAS HDD</b>	<b>300GB 10K Hot Plug 2.5-inch SAS HDD</b> 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-479
		<b>450GB 10K Hot Plug 2.5-inch SAS HDD</b> 1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-480
		<b>600GB 10K Hot Plug 2.5-inch SAS HDD</b> 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-481
		<b>900GB 10K Hot Plug 2.5-inch SAS HDD</b> 1x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-482

<b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b>	1 x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-483
<b>300GB 15K Hot Plug 2.5-inch SAS HDD</b>	1x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512B sector	N8150-485
<b>450GB 15K Hot Plug 2.5-inch SAS HDD</b>	1x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512B sector	N8150-486
<b>600GB 15K Hot Plug 2.5-inch SAS HDD</b>	1x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512B sector	N8150-518
<b>SATA HDD</b>	<b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b> 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	N8150-487
	<b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b> 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	N8150-488
	<b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b> 1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	N8150-489
<b>SAS SSD</b>	<b>200GB Hot Plug 2.5-inch SAS SSD</b> 1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	N8150-721
	<b>400GB Hot Plug 2.5-inch SAS SSD</b> 1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	N8150-722
<b>SATA SSD</b>	<b>100GB Hot Plug 2.5-inch SATA SSD</b> 1 x 100 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-724
	<b>200GB Hot Plug 2.5-inch SATA SSD</b> 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-725
	<b>400GB Hot Plug 2.5-inch SATA SSD</b> 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	N8150-726
	<b>800GB Hot Plug 2.5-inch SATA SSD</b> 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, SAS SSDs and SATA SSDs can be mixed.
- For monitoring SATA SSD life on VMware, NEC ESMPRO Manager Ver.6.05 or later is required. Please download the latest version on the NEC web site.

**7.3.3 For RAID Controller Configuration (2)**

For Windows Server 2012/2012R2, Red Hat Enterprise Linux 7, or Red Hat Enterprise Linux 6(x86\_64) without KVM

Category	Product Name / Description	Part Number
<b>Drive 4 slots available</b>	<b>SAS HDD (512B)</b> <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b> 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-479
	<b>450GB 10K Hot Plug 2.5-inch SAS HDD</b> 1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-480
	<b>600GB 10K Hot Plug 2.5-inch SAS HDD</b> 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	N8150-481

<b>900GB 10K Hot Plug 2.5-inch SAS HDD</b>	N8150-482
1x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	
<b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b>	N8150-483
1 x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512B sector	
<b>300GB 15K Hot Plug 2.5-inch SAS HDD</b>	N8150-485
1x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512B sector	
<b>450GB 15K Hot Plug 2.5-inch SAS HDD</b>	N8150-486
1x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512B sector	
<b>600GB 15K Hot Plug 2.5-inch SAS HDD</b>	N8150-518
1x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512B sector	
<b>SAS HDD (4KB) 1.8TB 10K Hot Plug 2.5-inch SAS HDD</b>	N8150-490
1 x 1.8TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 4KB sector	
<b>SATA HDD (512B) 250GB 7.2K Hot Plug 2.5-inch SATA HDD</b>	N8150-487
1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	
<b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b>	N8150-488
1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	
<b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b>	N8150-489
1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512B sector	
<b>SATA HDD (4KB) 2TB 7.2K Hot Plug 2.5-inch SATA HDD</b>	N8150-521
1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 4KB sector	
<b>SAS SSD 200GB Hot Plug 2.5-inch SAS SSD</b>	N8150-721
1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	
<b>400GB Hot Plug 2.5-inch SAS SSD</b>	N8150-722
1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512B sector	
<b>SATA SSD 100GB Hot Plug 2.5-inch SATA SSD</b>	N8150-724
1 x 100 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	
<b>200GB Hot Plug 2.5-inch SATA SSD</b>	N8150-725
1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	
<b>400GB Hot Plug 2.5-inch SATA SSD</b>	N8150-726
1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	
<b>800GB Hot Plug 2.5-inch SATA SSD</b>	N8150-727
1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512B sector	

**NOTE:**

- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs and SATA SSDs can be mixed.
- 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/svropthdd/collateral/4KHDD\\_Precautions\\_EN.pdf](http://www.nec.com/en/global/prod/express/svropthdd/collateral/4KHDD_Precautions_EN.pdf)
- 4KB sector HDD and 512B sector HDD cannot be mixed.

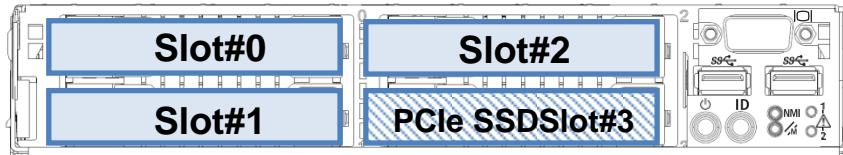
## 8 2.5-inch PCIe SSD

### 8.1 2.5-inch PCIeSSD Installation Kit

Product Name / Description	Part Number
2.5-inch PCIeSSD Installation Kit Backplane board, PCIe SSD switch card, and PCIe cable	N8118-305

**NOTE:**

- One PCIe slot is required to install the PCIe SSD switch card.
- One 2.5-inch drive bay is used to install a 2.5-inch PCIeSSD.



- The PCIe SSD slot does not support hot-plug.
- Operating system cannot be installed on the PCIe SSD.

### 8.2 PCIe SSD

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

**NOTE:**

- 2.5-inch PCIeSSD Installation Kit is required to install this product.
- Download the drivers and ESMPPRO/ServerAgentService1.2 or later from NEC web site.
- Warranty period is 3 years (36 months) or until the total bytes of written value (TBW) exceeds the limit value, whichever occurs first. It is recommended to check the TBW periodically.
- Operating system cannot be installed on the PCIe SSD.

## 9 Optical Drive

Category	Product Name / Description	Part Number
External	External DVD Super MULTI Drive USB, Slim DVD Super Multi drive, not including writing software	N8160-97F

## 10 PCI Riser Card / 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.

### 10.1 PCI Riser Card

Product Name / Description	Part Number
PCIe Riser Card Kit PCI Slot#1 : 1 x PCIe 3.0 x8	(Standard)
PCIe x16 Riser Card Kit PCI Slot#2 : 1 x PCIe 3.0 x16	N8116-36

**NOTE:**

- Required for installing a PCI card in the PCI slot #2

## 10.2 Network Interface Controller

Category	Product Name / Description	Part Number
Adapter	<b>1GbE</b>	
	<b>1000BASE-T Adapter</b> Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-150
	<b>Dual Port 1000BASE-T Adapter</b> Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-151
	<b>Dual Port 1000BASE-T Adapter</b> Intel® 82580 Gigabit Ethernet Controller PCIe 2.0 x4	N8104-145
	<b>NOTE:</b> - PXE boot is not supported on UEFI environment.	
10GbE	<b>Quad Port 1000BASE-T Adapter</b> Broadcom ® BCM5719 Gigabit Ethernet Controller PCIe 2.0 x4	N8104-152
	<b>NOTE:</b> - Network cables with RJ-45 plug covers cannot be used.	
	<b>Dual Port 10GBASE SFP+ Adapter (SFP+/2ch)</b> Intel 82599ES 10 Gigabit Ethernet Controller PCIe 2.0 x8, Low Profile / Full Height	N8104-148
	<b>NOTE:</b> - N8104-129 SFP+ Module is required to connect with an optical cable. - Up to 2 SFP+ Modules can be installed.	
	<b>10GBASE SFP+ Adapter (SFP+/2ch)</b> Qlogic NetXtreme II BCM57810S PCIe 2.0 x8, Low Profile / Full Height	N8104-149
SFP+ Module	<b>NOTE:</b> - N8104-129 SFP+ Module is required to connect with an optical cable.	
	<b>Dual Port 10GBASE-T Adapter</b> Intel Ethernet Controller X540-BT2 PCIe 2.1 x8, Low Profile / Full Height	N8104-153
	<b>SFP+ Module (10G-SR)</b> 1 x SFP+ Module for N8104-148and N8104-149	N8104-129
	<b>NOTE:</b>	
	● When using ESXi 6.0, mix configuration of N8104-149 and N8104-150/151/152/145 is not supported.	

### NIC Teaming feature – NIC Teaming and bonding features

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

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

Network Interface	Team	Operating Systems
<b>1GbE NIC</b> N8104-150/-151/-152	Up to four teams per one system	Windows Server 2008 R2
	Up to four ports per one team	Windows Server 2012
		Windows Server 2012 R2
<b>1GbE NIC</b> N8104-145	Up to four teams per one system	Windows Server 2008 R2
	Up to four ports per one team	
<b>10GbE NIC</b> N8104-149	Up to two teams per one system	Windows Server 2008 R2
	Up to two ports per one team	Windows Server 2012
		Windows Server 2012 R2

<b>10GbE NIC</b>	Up to two teams per one system	Windows Server 2012
N8104-153	Up to two ports per one team	Windows Server 2012 R2

**NOTE:**

- NIC Teaming feature is not supported on iSCSI interfaces.
- The network interfaces for each NIC teaming must be the same.
- Up to five teams per one system are supported.
- When using Windows Server 2008 R2, 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
<b>1GbE</b>	<b>Embedded 1Gb NIC</b> <b>N8104-150/-151/-152</b>	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux, VMware
	<b>N8104-145</b>	Windows Server 2008 R2, VMware
<b>10GbE</b>	<b>N8104-149</b>	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux, VMware
<b>10GbE</b>	<b>N8104-153</b>	Windows Server 2012, Windows Server 2012 R2, VMware

**NOTE:**

- NIC Teaming feature is not supported on iSCSI interfaces.

## 10.3 InfiniBand

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

**NOTE:**

- The InfiniBand adapters and other options are make-to-order products. Please consult our sales representative in regards to production lead time.

## 10.4 External Storage Controller

### 10.4.1 RAID Controller

Category	Product Name / Description	Part Number
Controller	<b>RAID Controller (2GB, RAID0/1/5/6)</b> 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.

### 10.4.2 Fibre Channel / SAS Controller

Category	Product Name / Description	Part Number
Fibre Channel	<b>Fibre Channel Controller (1ch)</b> Emulex LightPulse LPe1250-F8 Host Bus Adapter 8Gb/s, Optical, PCIe 2.0 x8	N8190-159
	<b>Fibre Channel Controller (2ch)</b> Emulex LightPulse LPe12002-M8 Host Bus Adapter 8Gb/s, Optical, PCIe 2.0 x8	N8190-160
	<b>Fibre Channel Controller (1ch)</b> Emulex LightPulse LPe16000B-M6 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0 x8	N8190-157A
	<b>Fibre Channel Controller (2ch)</b> Emulex LightPulse LPe16002B-M6 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0 x8	N8190-158A
SAS	<b>SAS Controller</b> LSI SAS9212-4i4e Host Bus Adapter 6Gb/s SAS, Int. 4 / Ext. 4, 7-pin SATA / SFF-8088, PCIe 2.0 x8	N8103-142
	<b>SAS Controller</b> LSI SAS9300-8e Host Bus Adapter 12Gb/s SAS, ext. 8(SFF-8644 x2), PCIe 3.0 x8	N8103-184
<b>NOTE:</b>		- For Windows, install the drivers from the attached CD.

## 11 Other Add-in Components

### 11.1 Internal Flash Memory

Product Name / Description	Part Number
<b>VMware ESXi support kit</b> Internal USB flash memory to install VMware ESXi system	N8106-010

**NOTE:**

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

### 11.2 Flash FDD

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

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

**NOTE:**

- Up to one drive can be connected.

### 11.3 Boot Mode Setup Option

Product Name / Description	Part Number
<b>Boot Mode Setup Option (Legacy Mode)</b> Setup option to change the OS Boot Mode to Legacy mode	NESV16-001

**NOTE:**

- The server supports Legacy mode and UEFI mode (default) as an OS Boot Mode.
- See the table below for the Boot Mode setting for each Operating System.
- As the default settings at the factory, UEFI mode is set as OS Boot mode. Order NESV16-001 Boot Mode Setup Option (Legacy Mode) for the Operating Systems 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	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

## 12 Add-on Components

### 12.1 17-inch LCD Console Drawer

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

### 12.2 KVM Switch

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

## 12.3 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
<b>Remote KVM and Media License Kit</b>  License for one server.  Remote KVM and remote media are enabled regardless of OS status.  Remote KVM: <ul style="list-style-type: none"><li>- Displays a graphics console on the web browser of the remote terminal (PC/server).</li><li>- Controls keyboard and mouse via the remote terminals' web browser</li></ul> Remote media: <ul style="list-style-type: none"><li>- Enables the user to use the CD / DVD / FD / Flash memory of the remote terminals (PC/server) as if accessing the local drives.</li></ul>	N8115-04

**NOTE:** Remote KVM and remote media features are not available for virtual machines.

# References

## 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
<b>Hardware monitoring</b>	Temperature/voltage/power/RAID/standard LANfan /degeneration (memory/hard drive)	✓	✓
	Hardware configuration information collection	✓	✓
<b>Boot monitoring</b>	Hardware event log collection	✓	✓
	BIOS/POST stall, Booting, OS stall, shutdown	✓ <sup>1</sup>	✓ <sup>1</sup>
<b>Alerting</b>	HW error, Boot error , and OS panic (by SNMP, E-Mail)	✓	✓
<b>Remote KVM (via LAN)</b>	POST/BIOS setup, ROM utility	✓ <sup>2</sup>	✓
	Panic screen, Boot screen	✓ <sup>2, 3, 4</sup>	✓
	CUI-based screen (OS console)	✓ <sup>2, 4</sup>	✓
	GUI-based screen (OS console)	-	✓
	Remote console recording function	-	✓
	Video recording	-	✓
<b>Remote control (via LAN)</b>	Remote reset/power on-off/ dump	✓	✓
	Remote power capping	✓	✓
	BIOS/BMC FW update	✓	✓
	Remote BIOS setup(partial configuration only)	✓	✓
	OS shutdown	✓ <sup>1</sup>	✓ <sup>1</sup>
	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)	✓ <sup>1</sup>	✓ <sup>1</sup>
	EXPRESSSCOPE® Profile key (Backup/restore BIOS/BMC setup information)	✓	✓
<b>Others</b>	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)	✓	✓

<sup>1</sup> The feature is not supported on VMware ESXi systems.

<sup>2</sup> The optional serial port is not available for the feature.

<sup>3</sup> Monitoring boot screens is not supported on VMware systems.

<sup>4</sup> In VMware systems, only the direct console user interface is supported.

## OS Support Matrix for PCI Cards and Embedded Controller

Part number	Product Name	WS 2012 R2	RHEL 7	RHEL 6	RHEL 6 x64	ESXi 6.0	ESXi 5.5	ESXi 5.1
-	Embedded SATA non-RAID Controller	✓	✓	✓	✓	✓	✓	✓
-	Embedded 1GbE NIC	✓	✓	✓	✓	✓	✓	✓
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)	✓	✓	✓	✓	✓	✓	✓
N8103-179	RAID Controller (2GB, RAID0/1/5/6)	✓	✓	✓	✓	✓	✓	-
N8118-305	2.5-inch PCIeSSD Installation Kit	✓	✓	-	-	✓	✓	-
N8118-01	PCIe SSD Adapter 365GB	✓	✓	-	-	-	-	-
N8190-158A	Fibre Channel Controller (2ch)	✓	✓	✓	✓	-	✓	✓
N8190-157A	Fibre Channel Controller (1ch)	✓	✓	✓	✓	-	✓	✓
N8104-147	Dual Port InfiniBand Adapter	✓	✓	-	✓	-	✓	-
N8104-146	Single Port InfiniBand Adapter	✓	✓	-	✓	-	✓	-
N8103-184	SAS Controller	✓	✓	-	✓	-	✓	✓
N8104-153	Dual Port 10GBASE-T Adapter	✓	✓	-	✓	✓	✓	✓
N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	✓	✓	✓	✓	✓	✓	✓
N8104-148	Dual Port 10GBASE SFP+ Adapter (SFP+/2ch)	-	-	-	✓	✓	✓	-
N8190-160	Fibre Channel Controller (2ch)	✓	✓	✓	✓	✓	✓	✓
N8190-159	Fibre Channel Controller (1ch)	✓	✓	✓	✓	✓	✓	✓
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

Part Number	Product Name	Slots	
		#1	#2
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)	✓	-
N8103-179	RAID Controller (2GB, RAID0/1/5/6)	-	✓
N8118-305	2.5-inch PCIeSSD Installation Kit	-	✓
N8118-01	PCIe SSD Adapter 365GB	-	✓
N8190-158A	Fibre Channel Controller (2ch)	-	✓
N8190-157A	Fibre Channel Controller (1ch)	-	✓
N8104-147	Dual Port InfiniBand Adapter	-	✓
N8104-146	Single Port InfiniBand Adapter	-	✓
N8103-184	SAS Controller	-	✓
N8104-153	Dual Port 10GBASE-T Adapter	-	✓
N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	✓	✓
N8104-148	Dual Port 10GBASE SFP+ Adapter (SFP+/2ch)	-	✓
N8190-160	Fibre Channel Controller (2ch)	-	✓
N8190-159	Fibre Channel Controller (1ch)	-	✓
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	-	✓

**NOTE:**

- 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>

## Tested Linux Operating Systems

Operating Systems
<a href="#">Red Hat Enterprise Linux 6.5 (x86)</a>
<a href="#">Red Hat Enterprise Linux 6.5 (x86_64)</a>
<a href="#">Red Hat Enterprise Linux 6.6 (x86)</a>
<a href="#">Red Hat Enterprise Linux 6.6 (x86_64)</a>
<a href="#">Red Hat Enterprise Linux 7.1</a>
<a href="#">CentOS 6.5 (x86)</a>
<a href="#">CentOS 6.5 (x86_64)</a>
<a href="#">CentOS 6.6 (x86)</a>
<a href="#">CentOS 6.6 (x86_64)</a>
<a href="#">CentOS 7.1</a>
<a href="#">Scientific Linux 6.5 (x86_64)</a>
<a href="#">Scientific Linux 6.6 (x86_64)</a>
<a href="#">Scientific Linux 7.1</a>
<a href="#">Ubuntu 12.04.5 LTS (amd64)</a>
<a href="#">Ubuntu 14.04.1 LTS (amd64)</a>

**NOTE:**

- For the latest information, go to the NEC website at:  
<http://www.nec.com/global/prod/express/linux/index.html>

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

## Revision History

Revision	Date	Description
9.1	February 8, 2016	<p><b>Others:</b>            Corrected the memory description            Updated the Tested Linux Operating Systems</p>
9.0	October 23, 2015	<p><b>New products added:</b>            External DVD Super MULTI Drive / N8160-97F  <b>Discontinued product deleted:</b>            External DVD-ROM drive / N8160-91</p>
8.0	July 16, 2015	<p><b>New products added:</b>            2.5-inch PCIeSSD Installation Kit N8118-305            800GB Non-Hot Plug 2.5-inch PCIe SSD N8118-500  <b>Discontinued product deleted:</b>            PCIe SSD Adapter 365GB N8118-01  <b>Others:</b>            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            Removed K410-118(05)            Added URL links to VMware documents for the configuration limitation            Updated the Tested Linux Operating Systems</p>
7.0	June 25, 2015	<p><b>Discontinued product deleted:</b>            4KB sector drives other than N8150-490 and N8150-521  <b>Others:</b>            Added a note for 4KB sector drives</p>
6.0	May 29, 2015	<p><b>Others:</b>            SAS Controller N8103-184 supports ESXi 5.5            Corrected description of N8104-149            Added note for N8104-145 Dual Port 1000BASE-T Adapter</p>
5.0	April 17, 2015	<p><b>New products added:</b>            1TB 7.2K Hot Plug 2.5-inch SATA HDD / N8150-520            2TB 7.2K Hot Plug 2.5-inch SATA HDD / N8150-521  <b>Others:</b>            Added ESXi 6 to the list of operating system supported            Updated the Tested Linux Operating Systems</p>
4.2	March 9, 2015	<p><b>Others:</b>            Added CCC and KC in the Regulatory and Safety list            Corrected the notes for Processors and Heat Sink</p>
4.1	February 25, 2015	<p><b>Others:</b>            Added X2APIC Setting information for the Boot Mode Setup Option            Updated the OS Support Matrix for PCI Cards and Embedded Controller</p>
4.0	February 18, 2015	<p><b>New products added:</b>            Xeon E5-2650 v3 Processor Kit / N8101-955F            VMware ESXi support kit / N8106-010</p>
3.0	January 28, 2015	<p><b>New products added:</b>            Xeon E5-2640 v3 Processor Kit / N8101-949F            Xeon E5-2650L v3 Processor Kit / N8101-953F            SAS Controller / N8103-184  <b>Part number changed:</b>            Flash FDD / N8160-96            17-inch LCD Console Drawer (1port) / N8143-108F            Keyboard Unit (JP) / N8143-109            Keyboard Unit (UK) / N8143-111</p>
2.0	November 17, 2014	<p><b>Others:</b>            512B sector SAS HDDs supported on UEFI Boot OS            250GB SATA HDD supported on UEFI Boot OS            VMware supported</p>

## SYSTEM CONFIGURATION GUIDE – NEC Express5800/E120f-M

		N8103-142 SAS controller supported on ESXi N8104-153 Dual Port 10GBASE-T Adapter supported on Windows/ESXi Notes for NIC Teaming feature changed
1.0	October 16, 2014	Initial release