

# **NEC Express5800/T110g-S System Configuration Guide**

**Air cooling model**



## **Introduction**

This document contains product and configuration information that will enable you to configure your system. The guide will ensure fast and proper configuration of your NEC Express5800 server.

## Contents

|                                                                |           |
|----------------------------------------------------------------|-----------|
| <b>TECHNICAL SPECIFICATION .....</b>                           | <b>3</b>  |
| Key Features.....                                              | 3         |
| Specification .....                                            | 3         |
| <b>EXTERNAL VIEWS .....</b>                                    | <b>6</b>  |
| Front View .....                                               | 6         |
| Rear Views .....                                               | 6         |
| Dimensions (mm) .....                                          | 7         |
| <b>CONFIGURATION DIAGRAM .....</b>                             | <b>9</b>  |
| Expansion Slots .....                                          | 10        |
| <b>SERVER CONFIGURATION .....</b>                              | <b>11</b> |
| <b>1 Base Models .....</b>                                     | <b>11</b> |
| <b>2 Processor .....</b>                                       | <b>11</b> |
| <b>3 Memory .....</b>                                          | <b>11</b> |
| Maximum Available Memory .....                                 | 12        |
| <b>4 Internal Hard Disk Drives .....</b>                       | <b>13</b> |
| 4.1 RAID Configuration.....                                    | 13        |
| 4.2 2.5-inch Drive Configuration .....                         | 15        |
| 4.3 3.5-inch Drive Configuration .....                         | 26        |
| <b>5 Internal Optical Drive.....</b>                           | <b>30</b> |
| <b>6 Internal RDX Drives .....</b>                             | <b>30</b> |
| <b>7 PCI Card .....</b>                                        | <b>30</b> |
| 7.1 Network Interface Controller .....                         | 30        |
| 7.2 SAS Controller .....                                       | 31        |
| 7.3 Serial Port Adapter .....                                  | 31        |
| <b>8 Other Add-in Components .....</b>                         | <b>32</b> |
| 8.1 Trusted Platform Module Kit .....                          | 32        |
| 8.2 Internal Flash Memory .....                                | 32        |
| 8.3 Flash FDD.....                                             | 32        |
| 8.4 Input Devices .....                                        | 32        |
| <b>9 Add-on Components .....</b>                               | <b>33</b> |
| 9.1 Server Management License.....                             | 33        |
| 9.2 Rack Conversion Kit .....                                  | 33        |
| 9.1 Dust Proof Kit .....                                       | 33        |
| 9.2 Tamper Proof Power Button Covers .....                     | 33        |
| 9.3 Medium and Cartridge .....                                 | 34        |
| <b>REFERENCES.....</b>                                         | <b>35</b> |
| Server Management .....                                        | 35        |
| OS Support Matrix for PCI Cards and Embedded Controllers ..... | 36        |
| Supported PCI cards and Installable Slots.....                 | 36        |
| Copyright Notice and Liability Disclaimer .....                | 37        |
| <b>REVISION HISTORY .....</b>                                  | <b>38</b> |

# Technical Specification

## Key Features

- Ultra compact form of 98 mm in width, 13 liters in volume
- Up to 32 GB of high speed DDR3-1600 memory
- Full manageability by integrated EXPRESSSCOPE Engine 3
- Function in maximum 40° C / 104° F ambient temperature

## Specification

(1 / 2)

| Model             |                       | T110g-S                                                                                                                                                                                                                                                                                    |                                   |                                   |
|-------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| Part Number       |                       | N8100-2195F                                                                                                                                                                                                                                                                                |                                   |                                   |
| Processor         | Type                  | Intel® Pentium® processor G3240                                                                                                                                                                                                                                                            | Intel® Xeon® processor E3-1220 v3 | Intel® Xeon® processor E3-1231 v3 |
|                   | Clock speed           | 3.1 GHz                                                                                                                                                                                                                                                                                    | 3.10 GHz                          | 3.40 GHz                          |
|                   | Number of Processors  | 1                                                                                                                                                                                                                                                                                          |                                   |                                   |
|                   | Cache                 | 3 MB                                                                                                                                                                                                                                                                                       | 8MB                               |                                   |
|                   | Cores and Threads     | 2C / 2T                                                                                                                                                                                                                                                                                    | 4C / 4T                           | 4C / 8T                           |
| Chipset           |                       | Intel® C224 Chipset                                                                                                                                                                                                                                                                        |                                   |                                   |
| Memory            | Type                  | DDR3-1600 ECC Unbuffered DIMM                                                                                                                                                                                                                                                              |                                   |                                   |
|                   | Standard Capacity     | 0 GB                                                                                                                                                                                                                                                                                       |                                   |                                   |
|                   | Maximum Capacity      | 32 GB (4 x 8 GB)                                                                                                                                                                                                                                                                           |                                   |                                   |
| Internal Storage  | Standard Capacity     | 0 GB                                                                                                                                                                                                                                                                                       |                                   |                                   |
|                   | Maximum Capacity      | 10.4 TB (2 x 4 TB plus 2 x 1.2 TB)                                                                                                                                                                                                                                                         |                                   |                                   |
|                   | Disk Controller       | SATA : 6Gb/s (Integrated)                                                                                                                                                                                                                                                                  |                                   |                                   |
|                   | RAID                  | SATA : RAID 0/1/10 (Standard), RAID 5/6/50 (Optional)<br>SAS : RAID 0/1/5/6/10/50 (Optional)                                                                                                                                                                                               |                                   |                                   |
|                   | Hot Plug              | Supported (When using N8154-59F or N8154-59F/-56F)                                                                                                                                                                                                                                         |                                   |                                   |
|                   | Optical Disk Drive    | Optional                                                                                                                                                                                                                                                                                   |                                   |                                   |
|                   | 3.5-inch Media Bays   | 1                                                                                                                                                                                                                                                                                          |                                   |                                   |
|                   | Disk Drive Bays       | 2 or 4 or 6                                                                                                                                                                                                                                                                                |                                   |                                   |
| Expansion Slots   |                       | Total: 4 slots available<br>1 PCIe 3.0 x16 (x16 connector)<br>1 PCIe 2.0 x4 (x8 connector)<br>2 PCIe 2.0 x1 (x8 connector)                                                                                                                                                                 |                                   |                                   |
| Video             | Controller (VRAM)     | Integrated in Server Management Controller (32MB)                                                                                                                                                                                                                                          |                                   |                                   |
|                   | Resolution / Color    | 1280 x 1024 / 16.7M <sup>2</sup>                                                                                                                                                                                                                                                           |                                   |                                   |
| Interfaces        |                       | 1 VGA (15-pin mini D-sub, 1 rear)<br>1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 rear)<br>4 USB3.0 (1 front, 2 rear, 1 internal)<br>4 USB2.0 (1 front, 2 rear, 1 internal)<br>2 1000BASE-T LAN connector (RJ-45, 2 rear)<br>1 100BASE-TX LAN connector for Management (RJ-45, 1 rear) |                                   |                                   |
| Server Management |                       | EXPRESSSCOPE Engine 3                                                                                                                                                                                                                                                                      |                                   |                                   |
| System Fan        |                       | Standard                                                                                                                                                                                                                                                                                   |                                   |                                   |
| Power Consumption | (Max. Config, Idling) | 108 VA / 94 Watt                                                                                                                                                                                                                                                                           | 115 VA / 99 Watt                  | 114 VA / 100 Watt                 |

| Model                                              |                          | T110g-S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                   |
|----------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|
| Power Consumption                                  | (Max. Config, Operating) | 175 VA / 163 Watt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 188 VA / 175 Watt | 222 VA / 211 Watt |
| Acoustic Noise (Sound Pressure Level) <sup>3</sup> | Minimum Config.          | 27 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 30 dB             |                   |
|                                                    | Maximum Config.          | 38 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                   |
| Dimensions (W x D x H )                            |                          | 98.0 x 386.5 x 341.0 mm / 3.9 x 15.2 x 13.4 in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                   |
| Weight (Minimum / Maximum)                         |                          | 8 kg / 11 kg, 17.64 lbs. / 24.25 lbs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                   |
| Temperature, Relative Humidity (non-condensing)    |                          | Operating: 10° to 40° C / 50° to 104° F, 20 to 80%<br>Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                   |
| Regulatory and Safety                              |                          | FCC, CE, UL, CB, RoHS, BSMI, CCC, RCM, WEEE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                   |
| Operating Systems and Virtualization Software      |                          | Microsoft® Windows Server® 2008 x86 Standard<br>Microsoft® Windows Server® 2008 x86 Enterprise<br>Microsoft® Windows Server® 2008 R2 Standard<br>Microsoft® Windows Server® 2008 R2 Enterprise<br>Microsoft® Windows Server® 2012 Standard<br>Microsoft® Windows Server® 2012 Datacenter<br>Microsoft® Windows Server® 2012 R2 Standard<br>Microsoft® Windows Server® 2012 R2 Datacenter<br>Red Hat Enterprise Linux 5.10 or later <sup>4</sup><br>Red Hat Enterprise Linux 5.10 or later (EM64T) <sup>4</sup><br>Red Hat Enterprise Linux 6.5 or later <sup>4</sup><br>Red Hat Enterprise Linux 6.5 or later (EM64T) <sup>4</sup><br>VMware ESXi™ 5.1 Update 1 or later <sup>5</sup><br>VMware ESXi™ 5.5 Update 1 <sup>5</sup> |                   |                   |

<sup>1</sup> Embedded SATA RAID controller is supported only on limited operating systems.

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

<sup>3</sup> Noise emission was measured in accordance with ISO 7779. The actual value may vary by the operating environment.

<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> Support on Xeon and Core processor systems only.

## (2 / 2)

| Model            |                      | T110g-S                            |                                    |                                   |
|------------------|----------------------|------------------------------------|------------------------------------|-----------------------------------|
| Part Number      |                      | N8100-1983F                        |                                    |                                   |
| Processor        | Type                 | Intel® Xeon® processor E3-1240L v3 | Intel® Xeon® processor E3-1275L v3 | Intel® Xeon® processor E3-1271 v3 |
|                  | Clock speed          | 2 GHz                              | 2.70 GHz                           | 3.60GHz                           |
|                  | Number of Processors | 1                                  |                                    |                                   |
|                  | Cache                | 8MB                                |                                    |                                   |
|                  | Cores and Threads    | 4C / 8T                            |                                    |                                   |
| Chipset          |                      | Intel® C224 Chipset                |                                    |                                   |
| Memory           | Type                 | DDR3-1600 ECC Unbuffered DIMM      |                                    |                                   |
|                  | Standard Capacity    | 0 GB                               |                                    |                                   |
|                  | Maximum Capacity     | 32 GB (4 x 8 GB)                   |                                    |                                   |
| Internal Storage | Standard Capacity    | 0 GB                               |                                    |                                   |
|                  | Maximum Capacity     | 10.4 TB (2 x 4 TB plus 2 x 1.2 TB) |                                    |                                   |
|                  | Disk Controller      | SATA : 6Gb/s (Integrated)          |                                    |                                   |

| Model                                                 |                          | T110g-S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                   |
|-------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|
| Internal Storage<br>(Cont.)                           | RAID                     | SATA : RAID 0/1/10 (Standard), RAID 5/6/50 (Optional)<br>SAS : RAID 0/1/5/6/10/50 (Optional)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                   |
|                                                       | Hot Plug                 | Supported (When using N8154-59F or N8154-59F/-56F)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                   |
|                                                       | Optical Disk Drive       | Optional                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                   |
|                                                       | 3.5-inch Media Bays      | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                   |
|                                                       | Disk Drive Bays          | 2 or 4 or 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                   |
| Expansion Slots                                       |                          | Total: 4 slots available<br>1 PCIe 3.0 x16 (x16 connector)<br>1 PCIe 2.0 x4 (x8 connector)<br>2 PCIe 2.0 x1 (x8 connector)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                   |
| Video                                                 | Controller (VRAM)        | Integrated in Server Management Controller (32MB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                   |
|                                                       | Resolution / Color       | 1280 x 1024 / 16.7M <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                   |
| Interfaces                                            |                          | 1 VGA (15-pin mini D-sub, 1 rear)<br>1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 rear)<br>4 USB3.0 (1 front, 2 rear, 1 internal)<br>4 USB2.0 (1 front, 2 rear, 1 internal)<br>2 1000BASE-T LAN connector (RJ-45, 2 rear)<br>1 100BASE-TX LAN connector for Management (RJ-45, 1 rear)                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                   |
| Server Management                                     |                          | EXPRESSSCOPE Engine 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                   |
| System Fan                                            |                          | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                   |
| Power Supply                                          |                          | 1 x 250 Watt 80 PLUS® Platinum certified non-Hot plug PSU<br>100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                   |
| Power                                                 | (Max. Config, Idling)    | 115 VA / 99 Watt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 118 VA / 100 Watt | 114 VA / 100 Watt |
| Consumption                                           | (Max. Config, Operating) | 163 VA / 150 Watt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 190 VA / 177 Watt | 238 VA / 226 Watt |
| Acoustic Noise<br>(Sound Pressure Level) <sup>3</sup> | Minimum Config.          | 30 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                   |
|                                                       | Maximum Config.          | 38 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                   |
| Dimensions (W x D x H )                               |                          | 98.0 x 386.5 x 341.0 mm / 3.9 x 15.2 x 13.4 in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                   |
| Weight (Minimum / Maximum)                            |                          | 8 kg / 11 kg, 17.64 lbs. / 24.25 lbs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                   |
| Temperature, Relative Humidity<br>(non-condensing)    |                          | Operating: 10° to 40° C / 50° to 104° F, 20 to 80%<br>Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                   |
| Regulatory and Safety                                 |                          | FCC, CE, UL, CB, RoHS, BSMI, CCC, RCM, WEEE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                   |
| Operating Systems and Virtualization Software         |                          | Microsoft® Windows Server® 2008 x86 Standard<br>Microsoft® Windows Server® 2008 x86 Enterprise<br>Microsoft® Windows Server® 2008 R2 Standard<br>Microsoft® Windows Server® 2008 R2 Enterprise<br>Microsoft® Windows Server® 2012 Standard<br>Microsoft® Windows Server® 2012 Datacenter<br>Microsoft® Windows Server® 2012 R2 Standard<br>Microsoft® Windows Server® 2012 R2 Datacenter<br>Red Hat Enterprise Linux 5.10 or later <sup>4</sup><br>Red Hat Enterprise Linux 5.10 or later (EM64T) <sup>4</sup><br>Red Hat Enterprise Linux 6.5 or later <sup>4</sup><br>Red Hat Enterprise Linux 6.5 or later (EM64T) <sup>4</sup><br>VMware ESXi™ 5.1 Update 1 or later <sup>5</sup><br>VMware ESXi™ 5.5 Update 1 <sup>5</sup> |                   |                   |

<sup>1</sup> Embedded SATA RAID controller is supported only on limited operating systems.

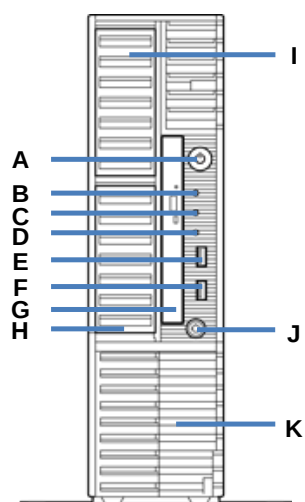
<sup>2</sup> Maximum resolution available via EXPRESSSCOPE Engine 3 remote console is 1280 x 1024 / 65K colors.

<sup>3</sup> Noise emission was measured in accordance with ISO 7779. The actual value may vary by the operating environment.

<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>

## External Views

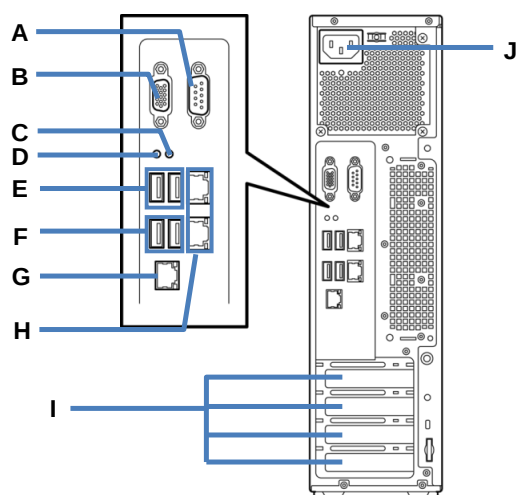
### Front View



#### Legend

|    |                         |    |                      |
|----|-------------------------|----|----------------------|
| A. | Power Button            | G. | Optical Disk Drive   |
| B. | Power LED               | H. | 3.5-inch Media Bay 1 |
| C. | Hard Drive Activity LED | I. | 3.5-inch Media Bay 2 |
| D. | System Status LED       | J. | Drive Bay Cover Key  |
| E. | USB 3.0 Connector       | K. | Drive Bay Cover      |
| F. | USB 2.0 Connector       |    |                      |

### Rear Views



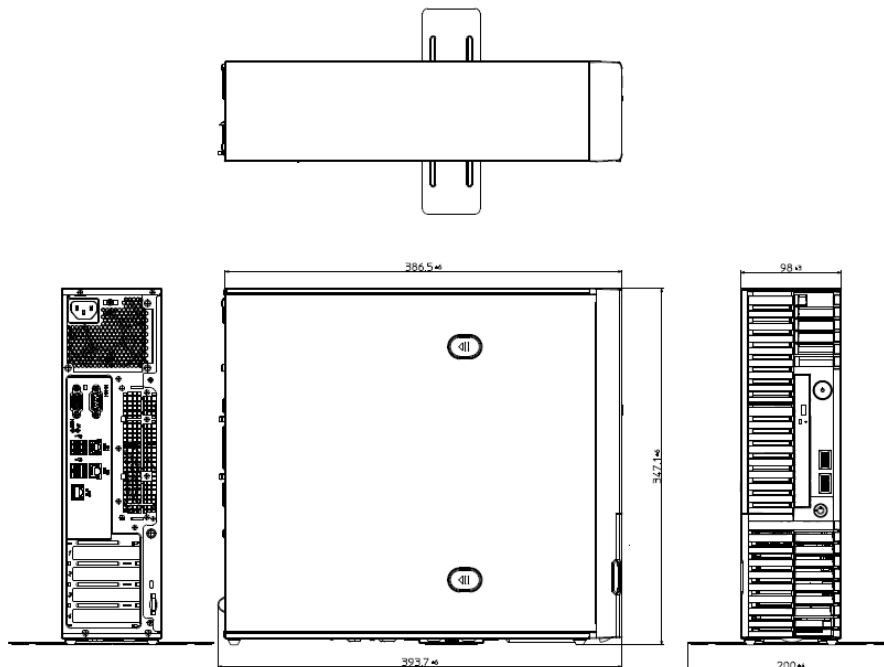
#### Legend

|    |                           |    |                          |
|----|---------------------------|----|--------------------------|
| A. | Serial Port (A) Connector | F. | USB 3.0 Connectors       |
| B. | VGA Connector             | G. | Management LAN Connector |
| C. | BMC Reset Switch          | H. | LAN Connectors           |
| D. | Dump (NMI) Switch         | I. | PCI Slots (Low Profile)  |
| E. | USB 2.0 Connectors        | J. | AC Inlet                 |

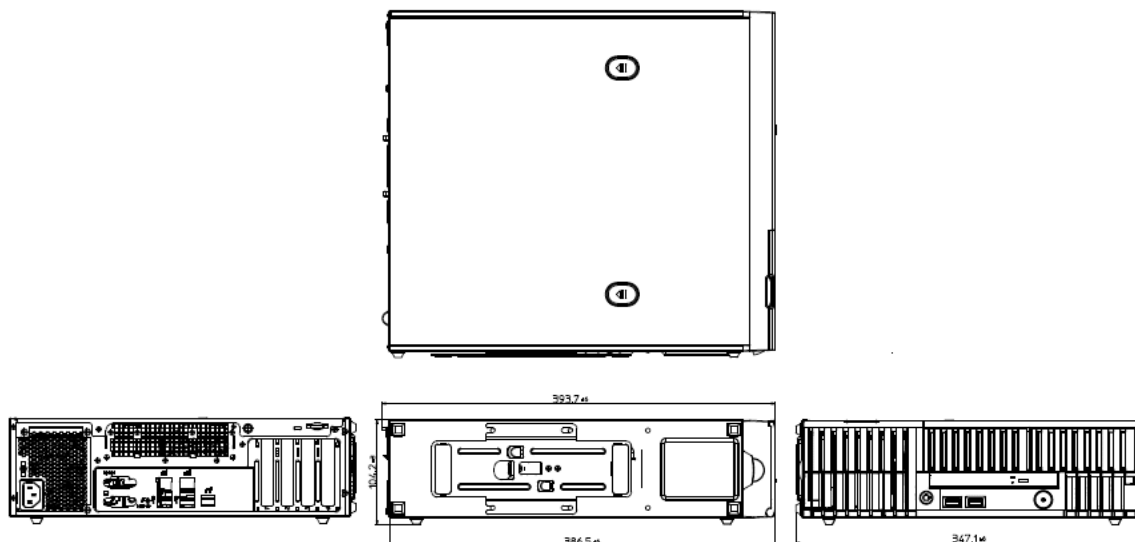
## Dimensions (mm)

### Standard Bezel

#### Tower Orientation

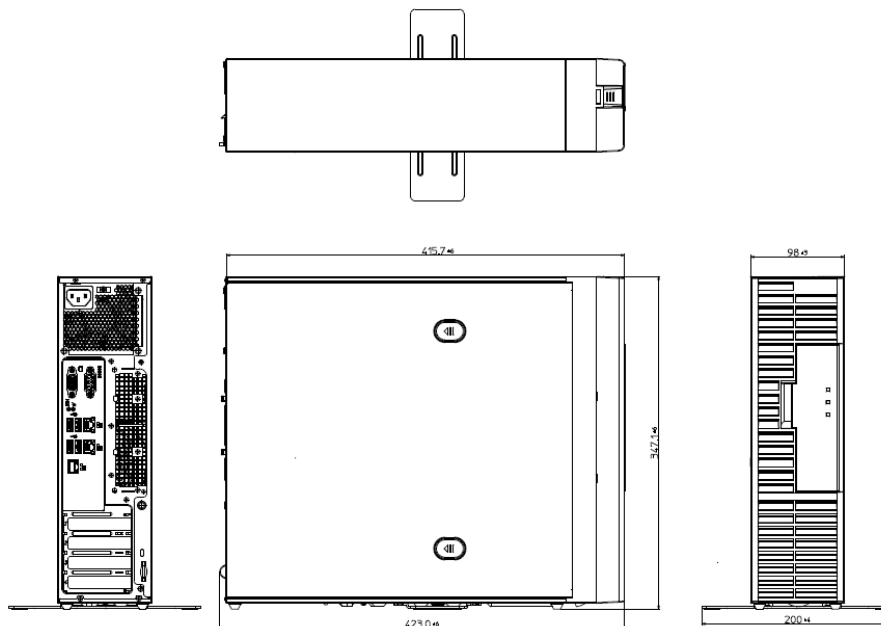


#### Desktop Orientation

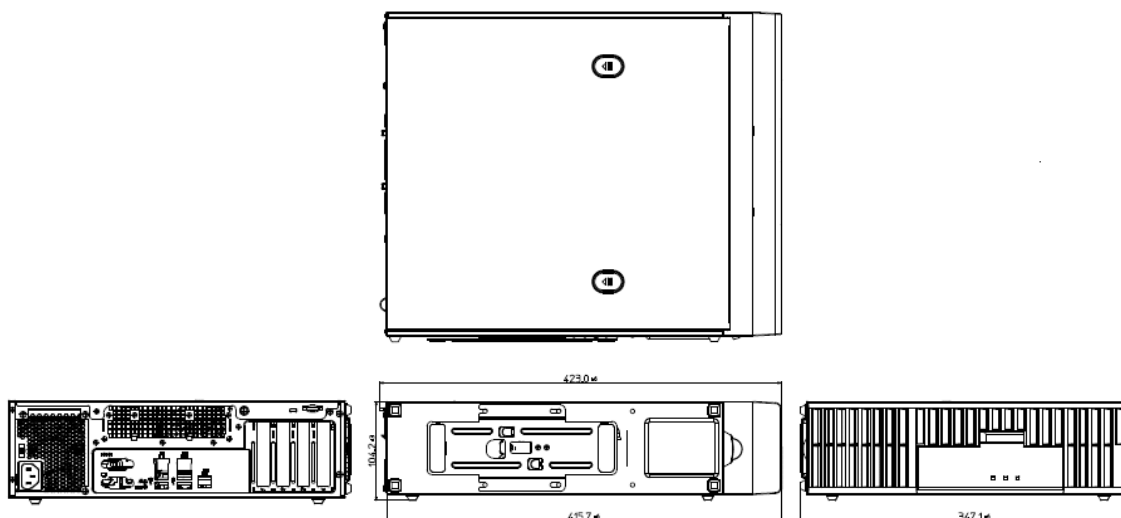


## Dust Proof Bezel

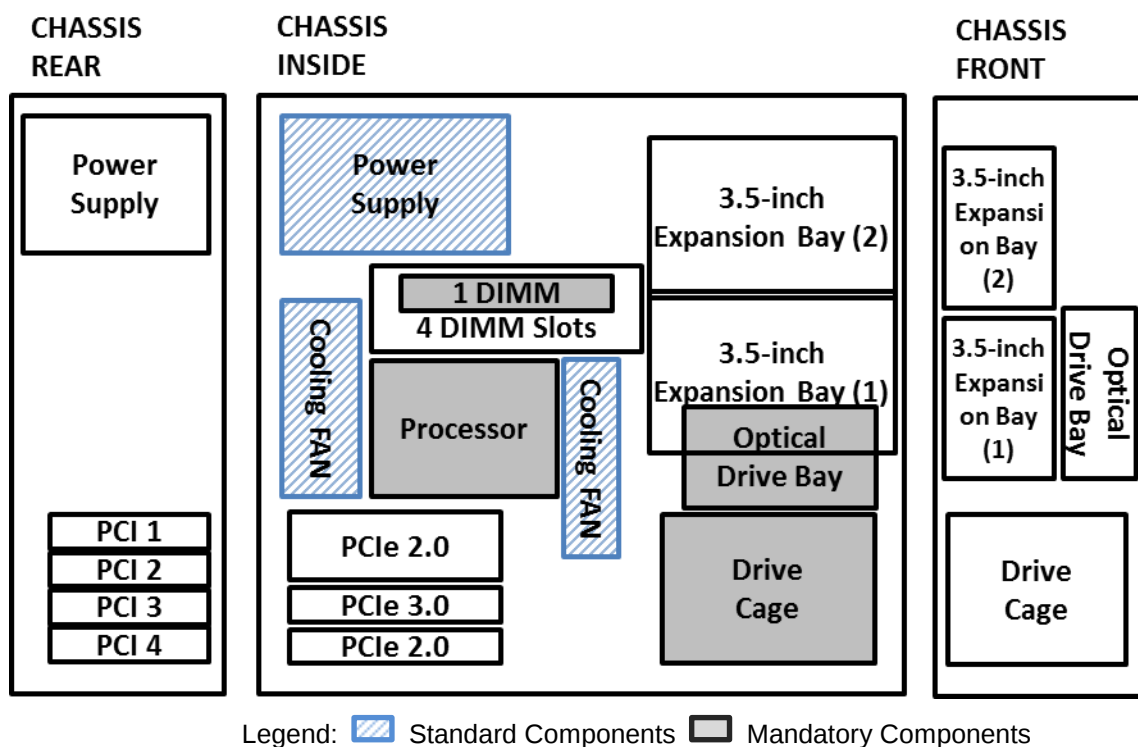
### Tower Orientation



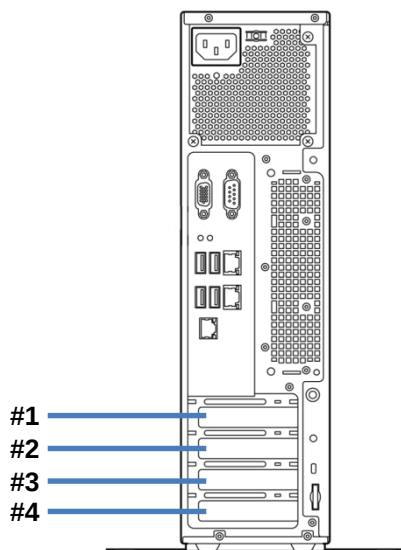
### Desktop Orientation



## Configuration Diagram



## Expansion Slots



### Legend

|    |                                                              |
|----|--------------------------------------------------------------|
| #1 | PCIe 2.0 x1, x8 connector, Low Profile, up to 168mm length   |
| #2 | PCIe 2.0 x1, x8 connector, Low Profile, up to 168mm length   |
| #3 | PCIe 3.0 x16, x16 connector, Low Profile, up to 168mm length |
| #4 | PCIe 2.0 x4, x8 connector, Low Profile, up to 168mm length   |

# Server Configuration

## 1 Base Models

| Product Name / Description                                                                                                                                              | Part Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>NEC Express5800/T110g-S</b><br>no Processor, no RAM, no Drive Cage, no HDD, no Optical Drive<br>Including:<br>250 Watt non-hot plug power supply, EXPRESSBUILDER DVD | N8100-2195F |

## 2 Processor

Available sockets: 1

| Category                      | Product Name / Description                                                                          | Part Number |
|-------------------------------|-----------------------------------------------------------------------------------------------------|-------------|
| Processors<br><b>Required</b> | <b>Pentium G3240 Processor Kit</b><br>Intel® Pentium® Processor G3240 (3.10 GHz, 2C/2T, 3 MB)       | N8101-738F  |
|                               | <b>Xeon E3-1220 v3 Processor Kit</b><br>Intel® Xeon® Processor E3-1220 v3 (3.10 GHz, 4C/4T, 8 MB)   | N8101-626F  |
|                               | <b>Xeon E3-1240L v3 Processor Kit</b><br>Intel® Xeon® Processor E3-1240L v3 (2.0 GHz, 4C/8T, 8 MB)  | N8101-740F  |
|                               | <b>Xeon E3-1231v3 Processor Kit</b><br>Intel® Xeon® Processor E3-1231v3 (3.40 GHz, 4C/8T, 8 MB)     | N8101-741F  |
|                               | <b>Xeon E3-1275L v3 Processor Kit</b><br>Intel® Xeon® Processor E3-1275L v3 (2.70 GHz, 4C/8T, 8 MB) | N8101-742F  |
|                               | <b>Xeon E3-1271 v3 Processor Kit</b><br>Intel® Xeon® Processor E3-1271 v3 (3.60 GHz, 4C/8T, 8 MB)   | N8101-743F  |
|                               |                                                                                                     |             |

**NOTE:**

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

## 3 Memory

Available slots: 4

| Product Name / Description                                                              | Part Number |
|-----------------------------------------------------------------------------------------|-------------|
| <b>2GB DDR3L-1600 UNB Memory Kit</b><br>2GB Unbuffered ECC DIMM, DDR3L-1600(PC3L-12800) | N8102-523F  |
| <b>4GB DDR3L-1600 UNB Memory Kit</b><br>4GB Unbuffered ECC DIMM, DDR3L-1600(PC3L-12800) | N8102-524F  |
| <b>8GB DDR3L-1600 UNB Memory Kit</b><br>8GB Unbuffered ECC DIMM, DDR3L-1600(PC3L-12800) | N8102-525F  |

**NOTE:**

- Minimum one memory kit must be installed.
- To install by double of memory kit is recommended in order to increase memory transfer speed by dual-channel symmetric configuration.
- Actual memory speed drops to 1333 MHz when you choose Pentium Processor.
- The memory requirement for installing VMware ESXi™ are below:
  - VMware ESXi 5.1 : at least 3 GB
  - VMware ESXi 5.5 : at least 5 GB

## 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                   | 4 GB  | 4 GB( HW-DEP enabled)<br>App. 3.5 GB (HW-DEP disabled) |
| Microsoft Windows Server 2008 R2 Standard <sup>1</sup>   | 32 GB | 32 GB                                                  |
| Microsoft Windows Server 2008 Enterprise                 | 64 GB | 32 GB                                                  |
| Microsoft Windows Server 2008 R2 Enterprise <sup>1</sup> | 2 TB  | 32 GB                                                  |
| Microsoft Windows Server 2012 Standard <sup>1</sup>      | 4 TB  | 32 GB                                                  |
| 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 5                               | 16 GB | 16 GB                                                  |
| Red Hat Enterprise Linux 6                               |       |                                                        |
| Red Hat Enterprise Linux 5 (EM64T)                       | 1 TB  | 32 GB                                                  |
| Red Hat Enterprise Linux 6 (x86_64)                      | 3 TB  | 32 GB                                                  |
| VMware ESXi 5.1 <sup>2</sup>                             | 2 TB  | 32 GB                                                  |
| VMware ESXi 5.5 <sup>2</sup>                             | 4 TB  | 32 GB                                                  |

<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 : 1TB
- Windows Server 2012, Windows Server 2012 R2 : 4 TB

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

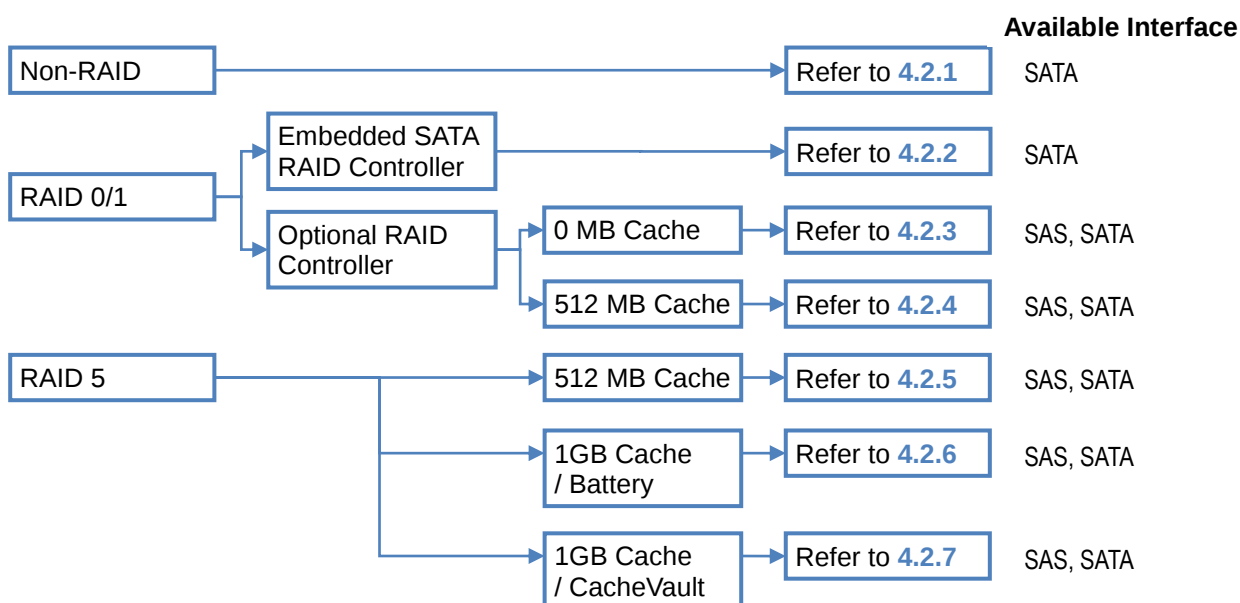
## 4 Internal Hard Disk Drives

### 4.1 RAID Configuration

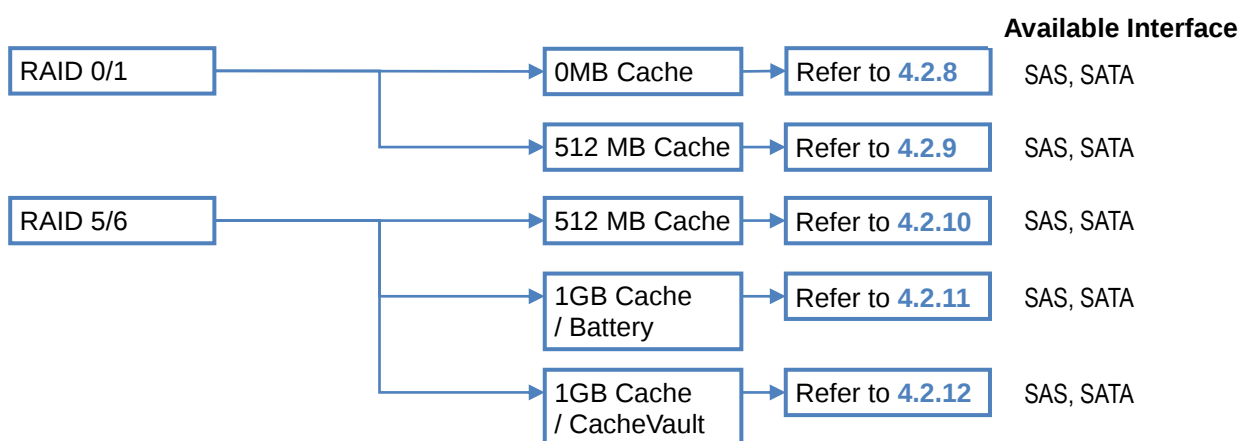
Refer to the section in accordance with your disk form factor and RAID configuration

#### 4.1.1 2.5-inch Drive

##### Up to four Drives



##### Up to six Drives

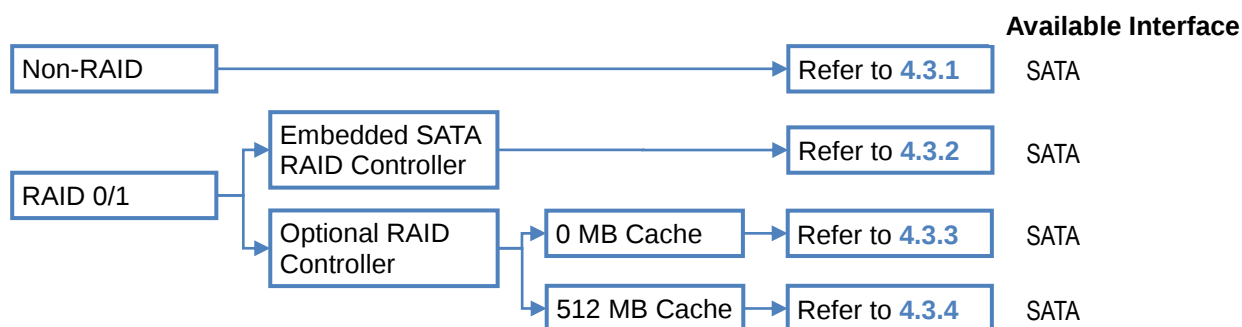


#### NOTE:

- 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](#).
- Up to two kinds of drives can be mixed in a system.
- All drives within a RAID array should be of the same capacity and rotation speed.
- Mixing SAS and SATA hard drives in the same drive cage is not supported.
- All drives in a drive cage should be of the same rotation speed.

## 4.1.2 3.5-inch Drive

### Up to two 3.5-inch Drives



### Up to two 3.5-inch Drives plus two 2.5-inch Drives



**NOTE:**

- Hot plug insertion/removal is not supported on the drive configuration.
- 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 hard drives within a RAID array should be of the same capacity and rotation speed.

## 4.2 2.5-inch Drive Configuration

### 4.2.1 Up to four Drives with Embedded SATA non-RAID Controller

| Category                               | Product Name / Description                                     |                                                                                                 | Part Number |
|----------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------|
| Storage Controller                     | <b>Embedded SATA Controller</b><br>4x 6Gb/s SATA               |                                                                                                 | (Standard)  |
| Cable                                  | <b>Internal SATA Cable</b><br>Mini-SAS to mini-SAS             |                                                                                                 | (Standard)  |
| <b>Drive Cage<br/>Required</b>         | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays |                                                                                                 | N8154-71F   |
| <b>Drive<br/>4 slots<br/>available</b> | <b>SATA<br/>HDD</b>                                            | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm | N8150-452   |
|                                        |                                                                | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm | N8150-453   |
|                                        |                                                                | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm     | N8150-454   |

#### NOTE

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

### 4.2.2 Up to four Drives with Embedded SATA RAID Controller

| Category                               | Product Name / Description                                           |                                                                                                 | Part Number |
|----------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------|
| Storage Controller                     | <b>Embedded SATA Controller</b><br>4x 6Gb/s SATA, RAID0/1/10 capable |                                                                                                 | (Standard)  |
| Cable                                  | <b>Internal SATA Cable</b><br>miniSAS to miniSAS                     |                                                                                                 | (Standard)  |
| <b>Drive Cage<br/>Required</b>         | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays       |                                                                                                 | N8154-71F   |
| <b>Drive<br/>4 slots<br/>available</b> | <b>SATA</b>                                                          | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm | N8150-452   |
|                                        |                                                                      | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm | N8150-453   |
|                                        |                                                                      | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm     | N8150-454   |

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

### 4.2.3 Up to four Drives with RAID 0/1 Controller without Cache

| Category                               |                     | Product Name / Description                                                                                                                        | Part Number |
|----------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Storage Controller<br/>Required</b> |                     | <b>RAID Controller (0MB, RAID 0/1)</b><br>LSI MegaRAID SAS 9240-8i<br>RAID0/1/10, no memory cache, Int. 8, PCIe 2.0(x8), SAS 6Gb/s,<br>SATA 6Gb/s | N8103-171   |
| <b>Cable</b>                           |                     | <b>Internal SATA Cable</b><br>Mini-SAS to mini-SAS                                                                                                | (Standard)  |
| <b>Drive Cage<br/>Required</b>         |                     | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                    | N8154-71F   |
| <b>Drive<br/>4 slots<br/>available</b> | <b>SAS<br/>HDD</b>  | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                     | N8150-444   |
|                                        |                     | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                     | N8150-445   |
|                                        |                     | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                     | N8150-446   |
|                                        |                     | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                      | N8150-447   |
|                                        |                     | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                       | N8150-448   |
|                                        |                     | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                  | N8150-449   |
|                                        |                     | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                      | N8150-450   |
|                                        |                     | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                      | N8150-451   |
|                                        |                     | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                      | N8150-522   |
|                                        | <b>SATA<br/>HDD</b> | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm                                                    | N8150-452   |
|                                        |                     | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm                                                    | N8150-453   |
|                                        |                     | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm                                                        | N8150-454   |

**NOTE:**

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

#### 4.2.4 Up to four Drives with RAID 0/1 Controller with 512 MB Cache

| Category                                           | Product Name / Description                                                                                                              |                                                                                                  | Part Number |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
| <b>Storage Controller</b><br><b>Required</b>       | <b>RAID Controller (512MB, RAID 0/1)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/10, 512 MB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s |                                                                                                  | N8103-172   |
| <b>RAID BBU</b><br><b>Recommended</b>              | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                         |                                                                                                  | N8103-155   |
| <b>Cable</b>                                       | <b>Internal SAS/SATA Cable</b><br>Mini-SAS to mini-SAS                                                                                  |                                                                                                  | (Standard)  |
| <b>Drive Cage</b><br><b>Required</b>               | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                          |                                                                                                  | N8154-71F   |
| <b>Drive</b><br><b>4 slots</b><br><b>available</b> | <b>SAS HDD</b>                                                                                                                          | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444   |
|                                                    |                                                                                                                                         | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445   |
|                                                    |                                                                                                                                         | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446   |
|                                                    |                                                                                                                                         | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447   |
|                                                    |                                                                                                                                         | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448   |
|                                                    |                                                                                                                                         | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449   |
|                                                    |                                                                                                                                         | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450   |
|                                                    |                                                                                                                                         | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451   |
|                                                    |                                                                                                                                         | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522   |
|                                                    | <b>SATA HDD</b>                                                                                                                         | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452   |
|                                                    |                                                                                                                                         | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453   |
|                                                    |                                                                                                                                         | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454   |
|                                                    | <b>SAS SSD</b>                                                                                                                          | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711   |
|                                                    |                                                                                                                                         | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712   |

**NOTE:**

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

#### 4.2.5 Up to four Drives with RAID 5/6 Controller with 512 MB Cache

| Category                                           | Product Name / Description                                                                                                                            |                                                                                                  | Part Number |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
| <b>Storage Controller</b><br><b>Required</b>       | <b>RAID Controller (512MB, RAID 0/1/5/6)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/5/6/10/50/60, 512 MB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s |                                                                                                  | N8103-173   |
| <b>RAID BBU</b><br><b>Recommended</b>              | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                                       |                                                                                                  | N8103-155   |
| <b>Cable</b>                                       | <b>Internal SAS/SATA Cable</b><br>Mini-SAS to mini-SAS                                                                                                |                                                                                                  | (Standard)  |
| <b>Drive Cage</b><br><b>Required</b>               | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                        |                                                                                                  | N8154-71F   |
| <b>Drive</b><br><b>4 slots</b><br><b>available</b> | <b>SAS HDD</b>                                                                                                                                        | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444   |
|                                                    |                                                                                                                                                       | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445   |
|                                                    |                                                                                                                                                       | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446   |
|                                                    |                                                                                                                                                       | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447   |
|                                                    |                                                                                                                                                       | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448   |
|                                                    |                                                                                                                                                       | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449   |
|                                                    |                                                                                                                                                       | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450   |
|                                                    |                                                                                                                                                       | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451   |
|                                                    |                                                                                                                                                       | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522   |
|                                                    | <b>SATA HDD</b>                                                                                                                                       | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452   |
|                                                    |                                                                                                                                                       | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453   |
|                                                    |                                                                                                                                                       | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454   |
|                                                    | <b>SAS SSD</b>                                                                                                                                        | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711   |
|                                                    |                                                                                                                                                       | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712   |

**NOTE:**

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

#### 4.2.6 Up to four Drives with RAID 5 Controller with 1 GB Cache/Battery

| Category                                           | Product Name / Description                                                                                                                                                   |                                                                                                  | Part Number |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
| <b>Storage Controller</b><br><b>Required</b>       | <b>RAID Controller (1GB, RAID0/1/5/6)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/5/6/10/50/60, 1 GB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s                             |                                                                                                  | N8103-174   |
| <b>RAID BBU</b><br><b>Recommended</b>              | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                                                              |                                                                                                  | N8103-155   |
| <b>SSD Caching</b><br><b>Recommended</b>           | <b>MegaRAID CacheCade</b><br>for LSI MegaRAID SAS<br><b>NOTE:</b><br>- SSD used for cache is required<br>- The SSD capacity which can be used as read cache is up to 512 GB. |                                                                                                  | N8103-156   |
| <b>Cable</b>                                       | <b>Internal SAS/SATA Cable</b><br>Mini-SAS to mini-SAS                                                                                                                       |                                                                                                  | (Standard)  |
| <b>Drive Cage</b><br><b>Required</b>               | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                                               |                                                                                                  | N8154-71F   |
| <b>Drive</b><br><b>4 slots</b><br><b>available</b> | <b>SAS HDD</b>                                                                                                                                                               | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444   |
|                                                    |                                                                                                                                                                              | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445   |
|                                                    |                                                                                                                                                                              | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446   |
|                                                    |                                                                                                                                                                              | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447   |
|                                                    |                                                                                                                                                                              | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448   |
|                                                    |                                                                                                                                                                              | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449   |
|                                                    |                                                                                                                                                                              | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450   |
|                                                    |                                                                                                                                                                              | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451   |
|                                                    |                                                                                                                                                                              | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522   |
|                                                    | <b>SATA HDD</b>                                                                                                                                                              | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452   |
|                                                    |                                                                                                                                                                              | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453   |
|                                                    |                                                                                                                                                                              | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454   |
|                                                    | <b>SAS SSD</b>                                                                                                                                                               | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711   |
|                                                    |                                                                                                                                                                              | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712   |

**NOTE:**

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

#### 4.2.7 Up to four Drives with RAID 5 Controller with 1 GB Cache/CacheVault

| Category                                                   | Product Name / Description                                                                                                                                                                    |                                                                                                  | Part Number  |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------|
| <b>Storage Controller</b><br><b>Required</b>               | <b>RAID Controller (1GB, RAID 0/1/5/6)</b><br>LSI MegaRAID SAS 9270CV-8i (with CV) RAID0/1/5/6/10/50/60, 1GB Cache, Int. 8ports, PCIe 3.0(x8), 6Gb/s, flash cache protection modules included |                                                                                                  | N8103-168    |
| <b>SSD Caching</b><br><b>Recommended</b>                   | <b>MegaRAID CacheCade</b><br>for LSI MegaRAID SAS<br><b>NOTE:</b><br>- SSD used for cache is required<br>- The SSD capacity which can be used as read cache is up to 512 GB.                  |                                                                                                  | N8103-156    |
| <b>Cable</b>                                               | <b>Internal SATA Cable</b><br>Mini-SAS to mini-SAS                                                                                                                                            |                                                                                                  | (Standard)   |
| <b>RAID Controller Installation Kit</b><br><b>Required</b> | <b>RAID Controller Installation Kit</b><br>For LSI MegaRAID SAS 9270CV-8i                                                                                                                     |                                                                                                  | K410-328(00) |
| <b>Drive Cage</b><br><b>Required</b>                       | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                                                                |                                                                                                  | N8154-71F    |
| <b>Drive</b><br><b>4 slots available</b>                   | <b>SAS HDD</b>                                                                                                                                                                                | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444    |
|                                                            |                                                                                                                                                                                               | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445    |
|                                                            |                                                                                                                                                                                               | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446    |
|                                                            |                                                                                                                                                                                               | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447    |
|                                                            |                                                                                                                                                                                               | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448    |
|                                                            |                                                                                                                                                                                               | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449    |
|                                                            |                                                                                                                                                                                               | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450    |
|                                                            |                                                                                                                                                                                               | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451    |
|                                                            |                                                                                                                                                                                               | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522    |
|                                                            |                                                                                                                                                                                               |                                                                                                  |              |
|                                                            | <b>SATA HDD</b>                                                                                                                                                                               | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452    |
|                                                            |                                                                                                                                                                                               | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453    |
|                                                            |                                                                                                                                                                                               | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454    |
|                                                            | <b>SAS SSD</b>                                                                                                                                                                                | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711    |
|                                                            |                                                                                                                                                                                               | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712    |

**NOTE:**

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

#### 4.2.8 Up to six Drives with RAID 0/1 Controller without Cache

| Category                       |             | Product Name / Description                                                                                                                                | Part Number |
|--------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Storage Controller<br>Required |             | <b>RAID Controller (0MB, RAID 0/1)</b><br>LSI MegaRAID SAS 9240-8i<br>RAID0/1/10, no cache memory, Int. 8, PCIe 2.0(x8), SAS 6Gb/s,<br>SATA 3Gb/s         | N8103-171   |
|                                |             | <b>Cable</b><br><b>Internal SATA Cable</b><br>mini-SAS to mini-SAS, miniSAS – 2x Single SATA                                                              | (Standard)  |
| Drive Cage<br>Required         |             | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                            | N8154-71F   |
|                                |             | <b>Optional Drive Cage</b><br><b>2.5-Inch Hot Plug Drive Cage Kit</b><br>2x 2.5-inch hot plug drive bays<br>Including 1x mini-SAS to 2x Single SATA cable | N8154-72F   |
| Drive<br>6 slots<br>available  | SAS<br>HDD  | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                             | N8150-444   |
|                                |             | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                             | N8150-445   |
|                                |             | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                             | N8150-446   |
|                                |             | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                              | N8150-447   |
|                                |             | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                                                               | N8150-448   |
|                                |             | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                          | N8150-449   |
|                                |             | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                              | N8150-450   |
|                                |             | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                              | N8150-451   |
|                                |             | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                                                              | N8150-522   |
|                                |             | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm                                                            | N8150-452   |
|                                | SATA<br>HDD | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm                                                            | N8150-453   |
|                                |             | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm                                                                | N8150-454   |

**NOTE:**

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

#### 4.2.9 Up to six Drives with RAID 0/1 Controller with 512 MB Cache

| Category                                           | Product Name / Description                                                                                                              |                                                                                                  | Part Number |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
| <b>Storage Controller</b><br><b>Required</b>       | <b>RAID Controller (512MB, RAID 0/1)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/10, 512 MB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s |                                                                                                  | N8103-172   |
| <b>RAID BBU</b><br><b>Recommended</b>              | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                         |                                                                                                  | N8103-155   |
| <b>Cable</b>                                       | <b>Internal SATA Cable</b><br>mini-SAS to mini-SAS, miniSAS – 2x Single SATA                                                            |                                                                                                  | (Standard)  |
| <b>Drive Cage</b><br><b>Required</b>               | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                          |                                                                                                  | N8154-71F   |
| <b>Optional Drive Cage</b><br><b>Required</b>      | <b>2.5-Inch Hot Plug Drive Cage Kit</b><br>2x 2.5-inch hot plug drive bays<br>Including 1x mini-SAS to 2x Single SATA cable             |                                                                                                  | N8154-72F   |
| <b>Drive</b><br><b>6 slots</b><br><b>available</b> | <b>SAS HDD</b>                                                                                                                          | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444   |
|                                                    |                                                                                                                                         | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445   |
|                                                    |                                                                                                                                         | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446   |
|                                                    |                                                                                                                                         | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447   |
|                                                    |                                                                                                                                         | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448   |
|                                                    |                                                                                                                                         | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449   |
|                                                    |                                                                                                                                         | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450   |
|                                                    |                                                                                                                                         | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451   |
|                                                    |                                                                                                                                         | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522   |
|                                                    | <b>SATA HDD</b>                                                                                                                         | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452   |
|                                                    |                                                                                                                                         | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453   |
|                                                    |                                                                                                                                         | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454   |
|                                                    | <b>SAS SSD</b>                                                                                                                          | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711   |
|                                                    |                                                                                                                                         | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712   |

**NOTE:**

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

#### 4.2.10 Up to six Drives with RAID 5/6 Controller with 512 MB Cache

| Category                                           | Product Name / Description                                                                                                                            |                                                                                                  | Part Number |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
| <b>Storage Controller</b><br><b>Required</b>       | <b>RAID Controller (512MB, RAID 0/1/5/6)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/5/6/10/50/60, 512 MB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s |                                                                                                  | N8103-173   |
| <b>RAID BBU</b><br><b>Recommended</b>              | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                                       |                                                                                                  | N8103-155   |
| <b>Cable</b>                                       | <b>Internal SATA Cable</b><br>mini-SAS to mini-SAS, miniSAS – 2x Single SATA                                                                          |                                                                                                  | (Standard)  |
| <b>Drive Cage</b><br><b>Required</b>               | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                        |                                                                                                  | N8154-71F   |
| <b>Optional Drive Cage</b><br><b>Required</b>      | <b>2.5-Inch Hot Plug Drive Cage Kit</b><br>2x 2.5-inch hot plug drive bays<br>Including 1x mini-SAS to 2x Single SATA cable                           |                                                                                                  | N8154-72F   |
| <b>Drive</b><br><b>6 slots</b><br><b>available</b> | <b>SAS</b><br><b>HDD</b>                                                                                                                              | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444   |
|                                                    |                                                                                                                                                       | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445   |
|                                                    |                                                                                                                                                       | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446   |
|                                                    |                                                                                                                                                       | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447   |
|                                                    |                                                                                                                                                       | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448   |
|                                                    |                                                                                                                                                       | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449   |
|                                                    |                                                                                                                                                       | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450   |
|                                                    |                                                                                                                                                       | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451   |
|                                                    |                                                                                                                                                       | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522   |
|                                                    |                                                                                                                                                       |                                                                                                  |             |
|                                                    | <b>SATA</b><br><b>HDD</b>                                                                                                                             | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452   |
|                                                    |                                                                                                                                                       | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453   |
|                                                    |                                                                                                                                                       | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454   |
|                                                    | <b>SAS</b><br><b>SSD</b>                                                                                                                              | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711   |
|                                                    |                                                                                                                                                       | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712   |

#### NOTE:

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

#### 4.2.11 Up to six Drives with RAID 5/6 Controller with 1 GB Cache/Battery

| Category                                           | Product Name / Description                                                                                                                                                   |                                                                                                  | Part Number |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
| <b>Storage Controller</b><br><b>Required</b>       | <b>RAID Controller (1GB, RAID0/1/5/6)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/5/6/10/50/60, 1 GB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s                             |                                                                                                  | N8103-174   |
| <b>RAID BBU</b><br><b>Recommended</b>              | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                                                              |                                                                                                  | N8103-155   |
| <b>SSD Caching</b><br><b>Recommended</b>           | <b>MegaRAID CacheCade</b><br>for LSI MegaRAID SAS<br><b>NOTE:</b><br>- SSD used for cache is required<br>- The SSD capacity which can be used as read cache is up to 512 GB. |                                                                                                  | N8103-156   |
| <b>Cable</b>                                       | <b>Internal SATA Cable</b><br>mini-SAS to mini-SAS, miniSAS – 2x Single SATA                                                                                                 | (Standard)                                                                                       |             |
| <b>Drive Cage</b><br><b>Required</b>               | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                                               | N8154-71F                                                                                        |             |
| <b>Optional Drive Cage</b><br><b>Required</b>      | <b>2.5-Inch Hot Plug Drive Cage Kit</b><br>2x 2.5-inch hot plug drive bays<br>Including 1x mini-SAS to 2x Single SATA cable                                                  | N8154-72F                                                                                        |             |
| <b>Drive</b><br><b>6 slots</b><br><b>available</b> | <b>SAS HDD</b>                                                                                                                                                               | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444   |
|                                                    |                                                                                                                                                                              | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445   |
|                                                    |                                                                                                                                                                              | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446   |
|                                                    |                                                                                                                                                                              | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447   |
|                                                    |                                                                                                                                                                              | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448   |
|                                                    |                                                                                                                                                                              | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449   |
|                                                    |                                                                                                                                                                              | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450   |
|                                                    |                                                                                                                                                                              | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451   |
|                                                    |                                                                                                                                                                              | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522   |
|                                                    | <b>SATA HDD</b>                                                                                                                                                              | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452   |
|                                                    |                                                                                                                                                                              | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453   |
|                                                    |                                                                                                                                                                              | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454   |
|                                                    | <b>SAS SSD</b>                                                                                                                                                               | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711   |
|                                                    |                                                                                                                                                                              | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712   |

**NOTE:**

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

## 4.2.12 Up to six Drives with RAID 5/6 Controller with 1 GB Cache/CacheVault

| Category                                                   | Product Name / Description                                                                                                                                                                    |                                                                                                  | Part Number  |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------|
| <b>Storage Controller</b><br><b>Required</b>               | <b>RAID Controller (1GB, RAID 0/1/5/6)</b><br>LSI MegaRAID SAS 9270CV-8i (with CV) RAID0/1/5/6/10/50/60, 1GB Cache, Int. 8ports, PCIe 3.0(x8), 6Gb/s, flash cache protection modules included |                                                                                                  | N8103-168    |
| <b>SSD Caching</b><br><b>Recommended</b>                   | <b>MegaRAID CacheCade</b><br>for LSI MegaRAID SAS<br><b>NOTE:</b><br>- SSD used for cache is required<br>- The SSD capacity which can be used as read cache is up to 512 GB.                  |                                                                                                  | N8103-156    |
| <b>Cable</b>                                               | <b>Internal SATA Cable</b><br>mini-SAS to mini-SAS, miniSAS – 2x Single SATA                                                                                                                  |                                                                                                  | (Standard)   |
| <b>RAID Controller Installation Kit</b><br><b>Required</b> | <b>RAID Controller Installation Kit</b><br>For LSI MegaRAID SAS 9270CV-8i                                                                                                                     |                                                                                                  | K410-328(00) |
| <b>Drive Cage</b><br><b>Required</b>                       | <b>2.5-inch Drive Cage</b><br>4 x 2.5-inch hot plug drive bays                                                                                                                                |                                                                                                  | N8154-71F    |
| <b>Optional Drive Cage</b><br><b>Required</b>              | <b>2.5-Inch Hot Plug Drive Cage Kit</b><br>2x 2.5-inch hot plug drive bays<br>Including 1x mini-SAS to 2x Single SATA cable                                                                   |                                                                                                  | N8154-72F    |
| <b>Drive</b><br><b>6 slots</b><br><b>available</b>         | <b>SAS HDD</b>                                                                                                                                                                                | <b>300GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-444    |
|                                                            |                                                                                                                                                                                               | <b>450GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-445    |
|                                                            |                                                                                                                                                                                               | <b>600GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm    | N8150-446    |
|                                                            |                                                                                                                                                                                               | <b>900GB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm     | N8150-447    |
|                                                            |                                                                                                                                                                                               | <b>1.2TB 10K Hot Plug 2.5-inch SAS HDD</b><br>1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm      | N8150-448    |
|                                                            |                                                                                                                                                                                               | <b>146.5GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm | N8150-449    |
|                                                            |                                                                                                                                                                                               | <b>300GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-450    |
|                                                            |                                                                                                                                                                                               | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-451    |
|                                                            |                                                                                                                                                                                               | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm     | N8150-522    |
|                                                            | <b>SATA HDD</b>                                                                                                                                                                               | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-452    |
|                                                            |                                                                                                                                                                                               | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm   | N8150-453    |
|                                                            |                                                                                                                                                                                               | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm       | N8150-454    |
|                                                            | <b>SAS SSD</b>                                                                                                                                                                                | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-711    |
|                                                            |                                                                                                                                                                                               | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s               | N8150-712    |

**NOTE:**

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

## 4.3 3.5-inch Drive Configuration

### 4.3.1 Embedded SATA non-RAID Controller

| Category                           | Product Name / Description                                                                          | Part Number  |
|------------------------------------|-----------------------------------------------------------------------------------------------------|--------------|
| Storage Controller                 | <b>Embedded SATA Controller</b><br>4x 6Gb/s SATA                                                    | (Standard)   |
| <b>Cable<br/>Required</b>          | <b>Internal SAS/SATA Cable</b><br>miniSAS to 2x Single SATA                                         | K410-278(00) |
| <b>Drive Cage<br/>Required</b>     | <b>3.5-inch Drive Cage</b><br>2 x 3.5-inch non hot plug (fixed) drive bays                          | N8154-65F    |
| <b>Drive<br/>2 slots available</b> | <b>500GB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm | N8150-460    |
|                                    | <b>1TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm     | N8150-461    |
|                                    | <b>2TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm     | N8150-462    |
|                                    |                                                                                                     |              |

### 4.3.2 Embedded SATA RAID Controller

| Category                           | Product Name / Description                                                                          | Part Number  |
|------------------------------------|-----------------------------------------------------------------------------------------------------|--------------|
| Storage Controller                 | <b>Embedded SATA Controller</b><br>4x 6Gb/s SATA, RAID0/1/10 capable                                | (Standard)   |
| <b>Cable<br/>Required</b>          | <b>Internal SATA Cable</b><br>mini-SAS to 2x Single SATA                                            | K410-278(00) |
| <b>Drive Cage<br/>Required</b>     | <b>3.5-inch Drive Cage</b><br>2 x 3.5-inch non hot plug (fixed) drive bays                          | N8154-65F    |
| <b>Drive<br/>2 slots available</b> | <b>500GB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm | N8150-460    |
|                                    | <b>1TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm     | N8150-461    |
|                                    | <b>2TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm     | N8150-462    |
|                                    | <b>3TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 3TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm      | N8150-463    |
|                                    | <b>4TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm     | N8150-464    |
|                                    |                                                                                                     |              |

**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](#).
- All hard drives within a RAID array should be of the same capacity.

### 4.3.3 Up to two Drives with RAID 0/1 Controller without Cache

| Category                                     | Product Name / Description                                                                                                                     | Part Number  |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Storage Controller</b><br><b>Required</b> | <b>RAID Controller (0MB, RAID 0/1)</b><br>LSI MegaRAID SAS 9240-8i<br>RAID0/1/10, no cache memory, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s | N8103-171    |
| <b>Cable</b><br><b>Required</b>              | <b>Internal SATA Cable</b><br>mini-SAS to 2x Single SATA                                                                                       | K410-277(00) |
| <b>Drive Cage</b><br><b>Required</b>         | <b>3.5-inch Drive Cage</b><br>2 x 3.5-inch non hot plug (fixed) drive bays                                                                     | N8154-65F    |
| <b>Drive</b><br><b>2 slots available</b>     | <b>500GB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                            | N8150-460    |
|                                              | <b>1TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                                | N8150-461    |
|                                              | <b>2TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                                | N8150-462    |

**NOTE:**

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

### 4.3.4 Up to two Drives with RAID 0/1 Controller with 512 MB Cache

| Category                                     | Product Name / Description                                                                                                              | Part Number  |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Storage Controller</b><br><b>Required</b> | <b>RAID Controller (512MB, RAID 0/1)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/10, 512 MB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s | N8103-172    |
| <b>RAID BBU</b><br><b>Recommended</b>        | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                         | N8103-155    |
| <b>Cable</b><br><b>Required</b>              | <b>Internal SATA Cable</b><br>mini-SAS to 2x Single SATA                                                                                | K410-277(00) |
| <b>Drive Cage</b><br><b>Required</b>         | <b>3.5-inch Drive Cage</b><br>2 x 3.5-inch non hot plug (fixed) drive bays                                                              | N8154-65F    |
| <b>Drive</b><br><b>2 slots available</b>     | <b>500GB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                     | N8150-460    |
|                                              | <b>1TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                         | N8150-461    |
|                                              | <b>2TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                         | N8150-462    |
|                                              | <b>3TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 3TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                          | N8150-463    |
|                                              | <b>4TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                         | N8150-464    |

**NOTE:**

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

#### 4.3.5 3.5-inch and 2.5-inch Drives with RAID 0/1 Controller with 512 MB Cache

| Category                                          | Product Name / Description                                                                                                              |                                                                                                | Part Number  |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------|
| <b>Storage Controller</b><br><b>Required</b>      | <b>RAID Controller (512MB, RAID 0/1)</b><br>LSI MegaRAID SAS 9272-8i<br>RAID0/1/10, 512 MB, Int. 8, PCIe 3.0(x8), SAS 6Gb/s, SATA 6Gb/s |                                                                                                | N8103-172    |
| <b>RAID BBU</b><br><b>Recommended</b>             | <b>RAID Battery Backup Unit</b><br>for LSI MegaRAID SAS 9272-8i                                                                         |                                                                                                | N8103-155    |
| <b>Cable</b><br><b>Required</b>                   | <b>Internal SATA Cable</b><br>mini-SAS to 2x Single SATA, for 3.5-inch drive cage                                                       |                                                                                                | K410-277(00) |
| <b>Cable</b><br><b>Required</b>                   | <b>Internal SAS/SATA Cable</b><br>mini-SAS to 2x Single SATA, for 2.5-inch drive cage                                                   |                                                                                                | K410-287(00) |
| <b>3.5-inch Drive Cage</b><br><b>Required</b>     | <b>3.5-inch Drive Cage</b><br>2 x 3.5-inch non hot plug (fixed) drive bays                                                              |                                                                                                | N8154-65F    |
| <b>2.5-inch Drive Cage</b><br><b>Required</b>     | <b>2.5-inch Drive Cage</b><br>2 x 2.5-inch non hot plug (fixed) drive bays                                                              |                                                                                                | N8154-72F    |
| <b>3.5-inch Drive</b><br><b>2 slots available</b> | <b>500GB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                     |                                                                                                | N8150-460    |
|                                                   | <b>1TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                         |                                                                                                | N8150-461    |
|                                                   | <b>2TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                         |                                                                                                | N8150-462    |
|                                                   | <b>3TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 3TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                          |                                                                                                | N8150-463    |
|                                                   | <b>4TB 7.2K non-Hot Plug 3.5-inch SATA HDD</b><br>1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm                                         |                                                                                                | N8150-464    |
|                                                   |                                                                                                                                         |                                                                                                |              |
|                                                   |                                                                                                                                         |                                                                                                |              |
|                                                   |                                                                                                                                         |                                                                                                |              |
|                                                   |                                                                                                                                         |                                                                                                |              |
|                                                   |                                                                                                                                         |                                                                                                |              |
| <b>2.5-inch Drive</b><br><b>2 slots available</b> | <b>SAS HDD</b>                                                                                                                          | <b>300GB HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                             | N8150-444    |
|                                                   |                                                                                                                                         | <b>450GB HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                             | N8150-445    |
|                                                   |                                                                                                                                         | <b>600GB HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                             | N8150-446    |
|                                                   |                                                                                                                                         | <b>900GB HDD</b><br>1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                             | N8150-447    |
|                                                   |                                                                                                                                         | <b>1.2TB HDD</b><br>1x 1.2 TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm                             | N8150-448    |
|                                                   |                                                                                                                                         | <b>146.5GB HDD</b><br>1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                         | N8150-449    |
|                                                   |                                                                                                                                         | <b>300GB HDD</b><br>1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm                             | N8150-450    |
|                                                   |                                                                                                                                         | <b>450GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm   | N8150-451    |
|                                                   |                                                                                                                                         | <b>600GB 15K Hot Plug 2.5-inch SAS HDD</b><br>1x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm   | N8150-522    |
|                                                   |                                                                                                                                         |                                                                                                |              |
|                                                   | <b>SATA HDD</b>                                                                                                                         | <b>250GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm | N8150-452    |
|                                                   |                                                                                                                                         | <b>500GB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm | N8150-453    |
|                                                   |                                                                                                                                         | <b>1TB 7.2K Hot Plug 2.5-inch SATA HDD</b><br>1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm     | N8150-454    |
|                                                   | <b>SAS SSD</b>                                                                                                                          | <b>200GB Hot Plug 2.5-inch SAS SSD</b><br>1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s             | N8150-711    |
|                                                   |                                                                                                                                         | <b>400GB Hot Plug 2.5-inch SAS SSD</b><br>1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s             | N8150-712    |

#### NOTE

## SYSTEM CONFIGURATION GUIDE – NEC Express5800/T110g-S / Air cooling model

- Hot plug insertion/removal is not supported on the drive configuration.
- All hard drives within a RAID array should be of the same form factor, capacity and rotation speed.

## 5 Internal Optical Drive

| Category                                        | Product Name / Description                                                                          | Part Number |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------|
| <b>Internal</b><br>1 slot available<br>Required | <b>Internal Slim DVD-ROM drive</b><br>Slim DVD-ROM drive                                            | N8151-122   |
|                                                 | <b>Internal DVD Super Multi Drive</b><br>Slim DVD Super Multi drive, not including writing software | N8151-107F  |
|                                                 | <b>Optical Drive Bay Cover</b><br>Blank panel                                                       | N8151-121   |
| <b>External</b>                                 | <b>External DVD-ROM drive</b><br>DVD-ROM drive, Bus powered, 1.2 A required                         | N8160-91    |

### NOTE:

- Up to 1 optical drive can be connected.
- N8151-121 Optical Drive Bay Cover must be installed when not installing any internal optical drives.

## 6 Internal RDX Drives

| Category                         | Product Name / Description                                           | Part Number  |
|----------------------------------|----------------------------------------------------------------------|--------------|
| <b>Controller</b>                | <b>Internal USB Controller</b><br>1 x USB port                       | (Standard)   |
| <b>Cable</b><br>Required         | <b>Internal USB cable</b><br>1x Internal USB3.0 to 1x USB 3.0 device | K410-276(00) |
| <b>Drive</b><br>1 bays available | <b>Internal RDX (USB)</b>                                            | N8151-105    |

### NOTE:

- The USB bus operates in USB 2.0 mode if the system is running with Windows Server 2008 or Red Hat Enterprise Linux 5 operating system.

## 7 PCI Card

### 7.1 Network Interface Controller

| Category                                                                | Product Name / Description                                                                           | Part Number |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------|
| <b>GbE</b>                                                              | <b>1000BASE-T Adapter</b><br>Broadcom ® BCM5718 Gigabit Ethernet Controller<br>PCIe 2.0 x1           | N8104-138   |
|                                                                         | <b>Dual Port 1000BASE-T Adapter</b><br>Broadcom ® BCM5718 Gigabit Ethernet Controller<br>PCIe 2.0 x1 | N8104-132   |
|                                                                         | <b>Quad Port 1000BASE-T Adapter</b><br>Broadcom ® BCM5719 Gigabit Ethernet Controller<br>PCIe 2.0 x4 | N8104-133   |
| <b>NOTE:</b><br>- Network cables with RJ-45 plug covers cannot be used. |                                                                                                      |             |

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

| Network Interface                                              | Team                                                             | OS                                                                                                             |
|----------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>GbE NIC</b><br>Embedded 1GbE NIC and<br>N8104-138/-132/-133 | Up to four teams per one system<br>Up to four ports per one team | Windows Server 2008<br>Windows Server 2008 R2<br>Window Server 2012<br>Windows Server 2012 R2<br>Red Hat Linux |

## Using iSCSI

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

| Category   | Network Interface | Operating Systems                                                                 |
|------------|-------------------|-----------------------------------------------------------------------------------|
| <b>GbE</b> | Embedded 1GbE NIC | Windows Server 2008 R2, Windows Serer 2012, Windows Server 2012 R2, RHEL*, VMware |
|            | N8104-138         | Windows Server 2008 R2, Windows Serer 2012, Windows Server 2012 R2; RHEL*, VMware |
|            | N8104-132         | Windows Server 2008 R2, Windows Serer 2012, Windows Server 2012 R2, RHEL*, VMware |
|            | N8104-133         | Windows Server 2008 R2, Windows Serer 2012, Windows Server 2012 R2, RHEL*, VMware |

\* RHEL: Red Hat Enterprise Linux

### NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.

## 7.2 SAS Controller

| Product Name / Description                                                                                                   | Part Number |
|------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>SAS Controller</b><br>LSI SAS9212-4i4e Host Bus Adapter<br>6Gb/s SAS, Int. 4 / Ext. 4, 7-pin SATA / SFF-8088, PCIe 2.0 x8 | N8103-142   |

## 7.3 Serial Port Adapter

| Product Name / Description                                     | Part Number |
|----------------------------------------------------------------|-------------|
| <b>Serial Port Adapter</b><br>Serial port fixed to PCI bracket | N8117-01A   |

### NOTE:

- Up to one Serial Port Adapter can be installed.

## 8 Other Add-in Components

### 8.1 Trusted Platform Module Kit

| Product Name / Description                           | Part Number |
|------------------------------------------------------|-------------|
| <b>Trusted Platform Module Kit</b><br>TPM 1.2 module | N8115-15    |

**NOTE:**

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

### 8.2 Internal Flash Memory

Available socket: 1

| Product Name / Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Part Number |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Internal Flash Memory</b><br>Internal flash memory to enable software and tools in the EXPRESSBUILDER DVD without DVD media                                                                                                                                                                                                                                                                                                                                                                                                                     | N8115-14    |
| <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>- Before use, software and tools must be copied from the EXPRESSBUILDER DVD to the flash memory.</li> <li>- The following operations can be performed with the flash memory:</li> <li>- Installation of Windows server with express setup</li> <li>- Installation of Starter Pack—the package of NEC qualified drivers and system setting tools</li> <li>- Installation of NEC ESMPRO Agent and Universal RAID Utility</li> <li>- Performance of the Test and Diagnosis Tool</li> </ul> |             |

### 8.3 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><br>USB flash emulating USB floppy disk, Native capacity 1.44 MB | N8160-86    |

**NOTE:**

- Up to one drive can be connected

### 8.4 Input Devices

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

## 9 Add-on Components

### 9.1 Server Management License

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

| Product Name / Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Part Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Remote KVM and Media License Kit</b><br>License for one server.<br>Remote KVM and remote media are enabled regardless of OS status.<br>Remote KVM:<br><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:<br>Enables the user to use the CD / DVD / FD / Flash memory of the remote terminals (PC/server) as if accessing the local drives. | N8115-04    |

**NOTE:**

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

### 9.2 Rack Conversion Kit

| Product Name / Description                              | Part Number |
|---------------------------------------------------------|-------------|
| <b>Rack Conversion Kit</b><br>Convert to 3U form factor | N8143-94    |

### 9.1 Dust Proof Kit

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

| Category    | Product Name / Description                                                                                              | Part Number |
|-------------|-------------------------------------------------------------------------------------------------------------------------|-------------|
| Front Bezel | <b>Dust Proof Bezel with Sensor</b><br>Including 1 set of filter replacement sensors, 1 set of dust proof filters       | N8146-59    |
| Filter      | <b>Dust proof filter (5 pcs.)</b><br>For N8146-59 Dust Proof filter<br>Removal capacity of particles : Up to 1 µm-sized | N8147-23    |

### 9.2 Tamper Proof Power Button Covers

| Product Name / Description                                                                                             | Part Number |
|------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Tamper Proof Cover</b><br>For Standard Bezel<br>Tamper proof cover to prevent erroneous operation of a power button | N8146-42    |

**NOTE:**

- The Tamper Proof Cover is not available for N8146-59 Dust Proof Bezel.

### 9.3 Medium and Cartridge

| Category |     | Product Name              | Drive supported | Part Number |
|----------|-----|---------------------------|-----------------|-------------|
| RDX      | HDD | RDX Cartridge (320GB)     | N8151-105       | N8153-01    |
|          |     | RDX Cartridge (500GB)     | N8151-105       | N8153-02    |
|          |     | RDX Cartridge (1TB)       | N8151-105       | N8153-03    |
|          |     | RDX Cartridge (1.5TB)     | N8151-105       | N8153-04    |
|          |     | RDX Cartridge (2TB)       | N8151-105       | N8153-08    |
|          | SSD | RDX Cartridge (SSD/128GB) | N8151-105       | N8153-06    |
|          |     | RDX Cartridge (SSD/256GB) | N8151-105       | N8153-07    |

# 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/hard drive <sup>1</sup> /fan/voltage/power consumption/ System LAN/degeneration/ (memory/hard drive <sup>1</sup> ) | ✓                  | ✓                                     |
|                                 | Hardware configuration information collection                                                                                  | ✓                  | ✓                                     |
|                                 | Hardware event log collection                                                                                                  | ✓                  | ✓                                     |
| <b>Boot monitoring</b>          | BIOS/POST stall, Booting, OS stall, shutdown                                                                                   | ✓ <sup>3</sup>     | ✓ <sup>3</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>2,4,5</sup> | ✓                                     |
|                                 | CUI-based screen (OS console)                                                                                                  | ✓ <sup>2,5</sup>   | ✓                                     |
|                                 | GUI-based screen (OS console)                                                                                                  | -                  | ✓                                     |
|                                 | Remote Screen Video Capture                                                                                                    | -                  | ✓                                     |
| <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>3</sup>     | ✓ <sup>3</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)                                                             | ✓                  | ✓                                     |
| <b>Maintenance</b>              | Scheduling (without UPS, require NEC ESMPRO Manager)                                                                           | ✓ <sup>3</sup>     | ✓ <sup>3</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                                                                                                          | ✓                  | ✓                                     |
| <b>Industry Standard</b>        | IPMI support                                                                                                                   | 2.0                | 2.0                                   |

<sup>1</sup> The feature is not supported on non-hot plug 3.5-inch drive.

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

<sup>3</sup> The feature is not supported on VMware systems.

<sup>4</sup> Monitoring boot screens is not supported on VMware systems.

<sup>5</sup> 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 | RHEL 6 | RHEL 6 x64 | RHEL 5 | RHEL 5 x64 | ESXi 5.5 | ESXi 5.1 |
| -           | Embedded SATA non-RAID Controller     | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| -           | Embedded SATA RAID Controller         | ✓          | ✓       | ✓          | ✓       | -      | -          | -      | -          | -        | -        |
| -           | Embedded 1GbE NIC                     | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| N8103-142   | SAS Controller                        | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | -        | ✓        |
| N8103-171   | RAID Controller (0MB,RAID 0/1)        | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | -        | -        |
| N8103-172   | RAID Controller (512MB, RAID 0/1)     | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| N8103-173   | RAID Controller (512MB, RAID 0/1/5/6) | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| N8103-174   | RAID Controller (1GB, RAID 0/1/5/6)   | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| N8103-168   | RAID Controller (1GB, RAID 0/1/5/6)   | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| N8104-138   | 1000BASE-T Adapter (1ch)              | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| N8104-132   | Quad Port 1000BASE-T Adapter          | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |
| N8104-133   | 1000BASE-T Adapter (2ch)              | ✓          | ✓       | ✓          | ✓       | ✓      | ✓          | ✓      | ✓          | ✓        | ✓        |

## Supported PCI cards and Installable Slots

| Part Number | Product Name                         | Slots |    |    |    |
|-------------|--------------------------------------|-------|----|----|----|
|             |                                      | #1    | #2 | #3 | #4 |
| N8103-142   | SAS Controller                       | -     | ✓  | ✓  | ✓  |
| N8103-171   | RAID Controller (0MB,RAID 0/1)       | -     | -  | -  | ✓  |
| N8103-172   | RAID Controller (512MB,RAID 0/1)     | -     | -  | -  | ✓  |
| N8103-173   | RAID Controller (512MB,RAID 0/1/5/6) | -     | -  | -  | ✓  |
| N8103-174   | RAID Controller (1GB,RAID 0/1/5/6)   | -     | -  | -  | ✓  |
| N8103-168   | RAID Controller (1GB,RAID 0/1/5/6)   | -     | -  | -  | ✓  |
| N8104-138   | 1000BASE-T Adapter (1ch)             | ✓     | ✓  | ✓  | ✓  |
| N8104-132   | 1000BASE-T Adapter (2ch)             | ✓     | ✓  | ✓  | ✓  |
| N8104-133   | Quad Port 1000BASE-T Adapter         | ✓     | ✓  | ✓  | ✓  |
| N8117-01A   | Serial Port Adapter                  | ✓     | ✓  | ✓  | ✓  |

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

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

## Revision History

| Revision | Date          | Description     |
|----------|---------------|-----------------|
| 1.0      | July 18, 2014 | Initial release |