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NEC

NEC Express5800/R110j-1
System Configuration Guide

Introduction

This document contains product and configuration information that will enable you to configure your system. The guide will ensure fast and proper configuration of your NEC Express5800 server.
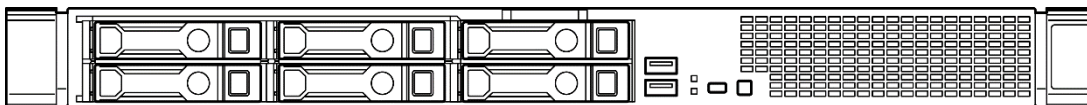
January 25, 2019
Revision 1.0
NEC Corporation

Contents

Model Lineup

4x 2.5-inch Drive Model

2x 3.5-inch Drive Model

Technical Specification

Specification

Model		R110j-1	
		4x 2.5-inch Drive Model	**2x 3.5-inch Drive Model**
Part Number		N8100-2766F	N8100-2767F
Processor	**Type**	Intel® Pentium® Gold Processor G5400 (3.70GHz, 2C/4T, 4MB) Intel® Core™ Processor i3-8300 (3.70GHz, 4C/4T, 8MB) Intel® Xeon® Processor E-2124 (3.30GHz, 4C/4T, 8MB) Intel® Xeon® Processor E-2134 (3.50GHz, 4C/8T, 8MB) Intel® Xeon® Processor E-2144G (3.60GHz, 4C/8T, 8MB) Intel® Xeon® Processor E-2174G (3.80GHz, 4C/8T, 8MB) Intel® Xeon® Processor E-2126G (3.30GHz, 6C/6T, 12MB) Intel® Xeon® Processor E-2136 (3.30GHz, 6C/12T, 12MB) Intel® Xeon® Processor E-2186G (3.80GHz, 6C/12T, 12MB)	
	Number of Processors	1	
Chipset		Intel® C242 Chipset	
Memory	**Type**	DDR4-2666 Unbuffered DIMM (8/16GB)	
	Standard Capacity	0 GB	
	Maximum Capacity	64 GB (4x 16GB)	
	Memory protection	ECC	
Internal Storage	**Standard Capacity**	0 GB	
	Disk Controller	SATA : 6Gb/s, RAID 0/1/5/6/10/50 (Optional) SAS: 12Gb/s, RAID 0/1/5/6/10/50 (Optional)	SATA : 6Gb/s, RAID 0/1 (Optional) SAS: 12Gb/s, RAID 0/1 (Optional)
	Hot Plug	Supported	
	Optical Disk Drive	Optional	
	Optical Drive Bays	1	
	Standard Disk Drive Bays	4	2
Expansion Slots	**Standard**	Total: 3 slots available 1 PCIe 3.0 x8 (x8 connector) or 1x FLOM 1 PCIe 3.0 x8 (x16 connector) 1 PCIe 3.0 x4 for a dedicated RAID card * The slot mix changes by installing an optional riser card.	
Video	**Controller (VRAM)**	Integrated in Server Management Controller (16MB)	
	Resolution	640x480, 800x600, 1,024x768, 1,280x1,024, 1,600x1,200, 1,920x1,200	
Interfaces		Front: 1x USB3.0, 1x USB2.0 (BMC) Rear: 2x USB3.0, 1x VGA (15-pin mini D-sub) 2x Data LAN connector (RJ-45) 1x Management LAN connector (RJ-45, Optional) 1x Serial (9-pin mini D-sub, Optional) Internal: 1x USB3.0	
Redundant Fan		N/A	
Redundant Power Supply		Optional, hot plug	
Power Supply		1x 290 Watt 80 PLUS® Silver certified non-hot plug PSU 1-2 x 500 Watt 80 PLUS® Platinum certified hot plug PSU 290W, 500Watt: 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz	
Dimensions (W x D x H)		434.6 x 382.3 x 43.2 mm	
Temperature, Relative Humidity (non-condensing)		Operating: 10° to 35° C / 50° to 95° F, 8 to 90% (Standard) or 5° to 45° C / 41° to 113° F, 8 to 90% (Limited Configuration) Non-Operating: -30° to 60° C / -22° to 140° F, 5 to 95%	
Regulatory and Safety		FCC, UL/cUL, CB, CE, Mexico (CoC), RCM, RoHS, WEEE, BSMI, Argentina S Mark	
Operating Systems and Virtualization Software		Microsoft® Windows Server® 2016 Standard Microsoft® Windows Server® 2016 Datacenter Red Hat® Enterprise Linux® 7.5 or later VMware ESXi™ 6.5 Update 2[1] VMware ESXi™ 6.7[1]	

[1] Support on Xeon® processor systems only.

Configuration Diagram

4x 2.5-inch Drive Model
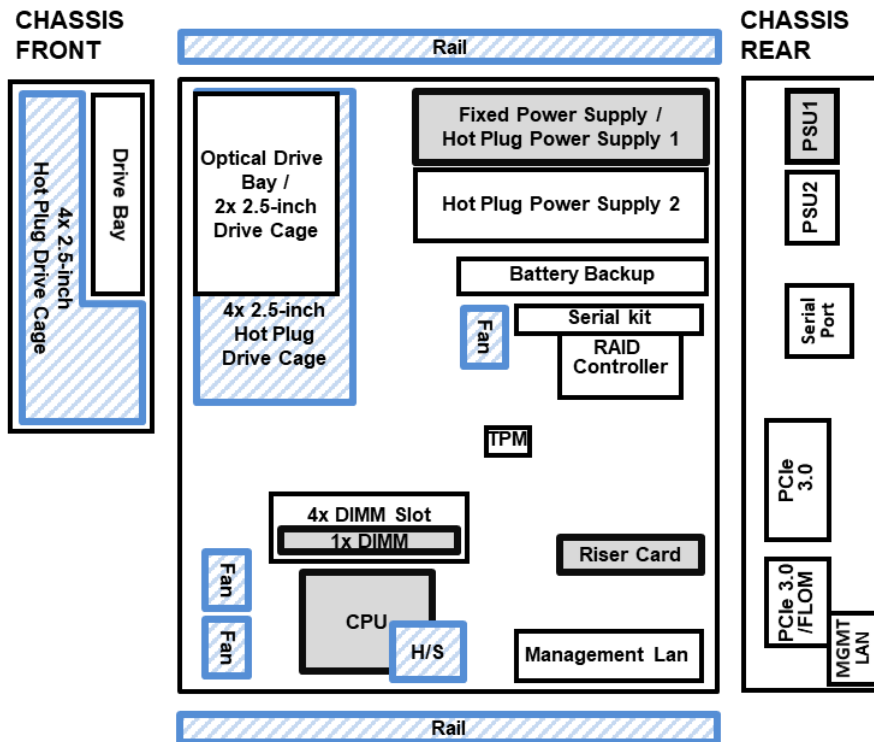
Legend: [///] Standard Components [▯] Mandatory components

2x 3.5-inch Drive Model
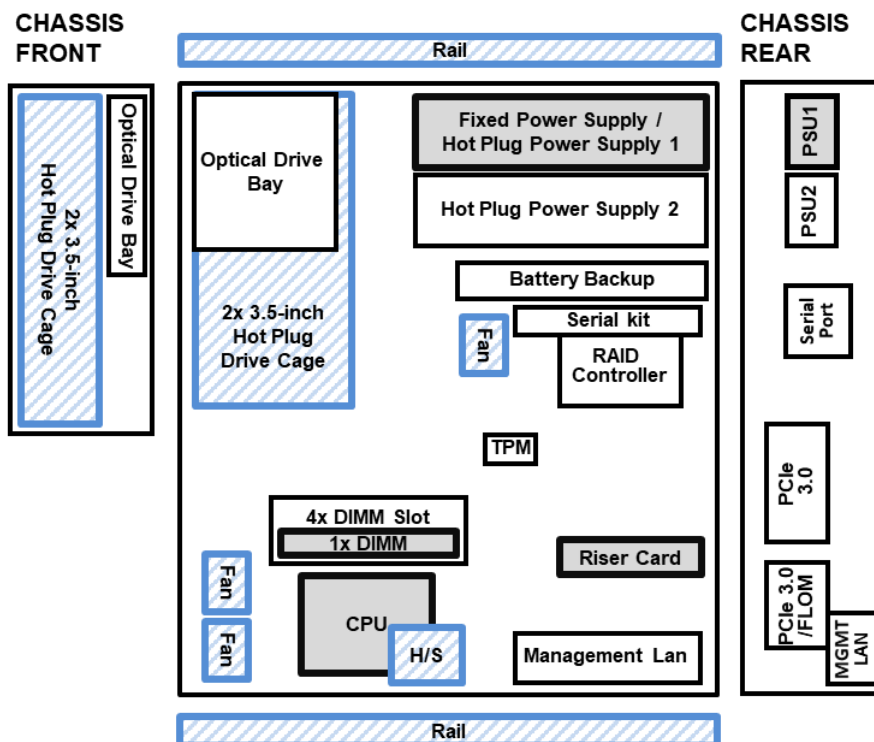
Legend: [///] Standard Components [▯] Mandatory components

Expansion Slots
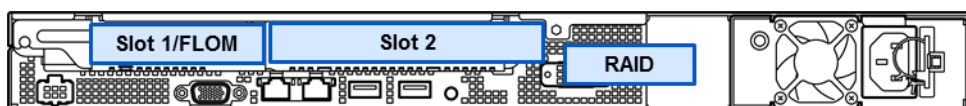
Expansion Slot Map

Legend			
Standard		RAID	PCIe 3.0 x4, for a dedicated RAID controller
Riser Card **Required**	**N8116-90 Riser Card Kit(2xPCI)**	Slot1	PCIe 3.0 x8, x8 connector, Low Profile, 168mm length
		Slot2	PCIe 3.0 x8, x16 connector, Full-height, 168mm length
	N8116-89 Riser Card Kit(1xPCI + FLOM)	Slot1	PCIe 3.0 x8 (FLOM)
		Slot2	PCIe 3.0 x8, x16 connector, Full-height, 168mm length

NOTE:

● Minimum one riser card must be installed.

Server Configuration

1   Base Models

Product Name / Description	Part Number
NEC Express5800/R110j-1 4x 2.5-inch Drive Model No CPU, no RAM, no 2.5-inch HDD, no ODD, no PSU, no Riser Including: 2.5-inch Drive Cage, CPU Heat Sink, Cooling FAN, Front bezel, Rail Kit	N8100-2766F
NEC Express5800/R110j-1 2x 3.5-inch Drive Model No CPU, no RAM, no 3.5-inch HDD, no ODD, no PSU, no Riser Including: 3.5-inch Drive Cage, CPU Heat Sink, Cooling FAN, Front bezel, Rail Kit	N8100-2767F

NOTE:

● The base model must be ordered with **a processor kit**, **a memory kit**, **a riser kit**, and **a power supply kit**.

2   Processor

Available sockets: 1

Category	Product Name / Description	Part Number
Processors **Required**	**Pentium G5400 Processor Kit** Intel® Pentium® Gold Processor G5400 (2C/4T, 3.70GHz, TDP54W, 4MB)	N8101-1512
	Core i3-8300 Processor Kit Intel® Core™ Processor i3-8300 (4C/4T, 3.70GHz, TDP62W, 8MB)	N8101-1515
	Xeon E-2124 Processor Kit Intel® Xeon® Processor E-2124 (4C/4T, 3.30GHz, TDP71W, 8MB)	N8101-1504
	Xeon E-2134 Processor Kit Intel® Xeon® Processor E-2134 (4C/8T, 3.50GHz, TDP71W, 8MB)	N8101-1505
	Xeon E-2144G Processor Kit Intel® Xeon® Processor E-2144G (4C/8T, 3.60GHz, TDP71W, 8MB)	N8101-1506
	Xeon E-2174G Processor Kit Intel® Xeon® Processor E-2174G (4C/8T, 3.80GHz, TDP71W, 8MB)	N8101-1507
	Xeon E-2126G Processor Kit Intel® Xeon® Processor E-2126G (6C/6T, 3.30GHz, TDP80W, 12MB)	N8101-1508
	Xeon E-2136 Processor Kit Intel® Xeon® Processor E-2136 (6C/12T, 3.30GHz, TDP80W, 12MB)	N8101-1510
	Xeon E-2186G Processor Kit Intel® Xeon® Processor E-2186G (6C/12T, 3.80GHz, TDP95W, 12MB)	N8101-1518

NOTE:

● The processor kit must be ordered with the base model.
● VMware ESXi is not supported on Pentium and Core i3 processor systems.

3   Memory

Available slots: 4

Product Name / Description	Part Number
8GB DDR4-2666 UNB Memory Kit 8GB Unbuffered ECC DIMM, DDR4-2666	N8102-718
16GB DDR4-2666 UNB Memory Kit 16GB Unbuffered ECC DIMM, DDR4-2666	N8102-719

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 the dual-channel symmetric configuration.

Memory Transfer Speed

See the table below for the actual maximum memory transfer speed.

DDR4 memory speed depends on CPU series.

Processor Type	DIMM Speed
Intel® Xeon® E-2124 Intel® Xeon® E-2126G Intel® Xeon® E-2134 Intel® Xeon® E-2136 Intel® Xeon® E-2144G Intel® Xeon® E-2174G Intel® Xeon® E-2186G	2666 MHz
Intel® Core i3-8300 Intel® Pentium G5400	2400 MHz

Maximum Available Memory

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

Operating Systems	Maximum Memory Size Supported by Operating Systems	Maximum Available Memory
Microsoft Windows Server 2016 Standard [1] Microsoft Windows Server 2016 Datacenter [1]	**24TB**	**64GB**
Red Hat Enterprise Linux 7	**12TB**	**64GB**
VMware ESXi 6.5 [2]	**12TB**	**64GB**
VMware ESXi 6.7 [2]	**16TB**	**64GB**

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

- Windows Server 2016 : 24TB

[2]   Up to 6 TB of the main memory is available to each virtual machine.

4 Internal Storage

Drive Configuration

Choose appropriate drive model and optional drive cages in accordance with the type and number of the drive you want to install.

List of the number that Internal Drives can be mounted

Base Model	Front cage	Inside the server (Mounted on option M.2 mount kit)
4x 2.5-inch Drive Model [1]	**Standard : 4x 2.5-inch SAS/SATA Drive** **Expansion : 2x 2.5-inch SAS/SATA Drive** [4]	**Standard: N/A** **Expansion: 2x M.2 SATA SSD** [3, 4]
2x 3.5-inch Drive Model [2]	**Standard : 2x 3.5-inch Near Line SAS/SATA HDD**	**Standard: N/A** **Expansion: 2x M.2 SATA SSD** [3, 4]

[1]   2.5-inch Drive Model: Up to six drives can be installed.

[2]   3.5-inch Drive Model: Up to two drives can be installed.

[3]   Up to one M.2 SATA SSD can be installed if the system install N8154-134 Internal DVD Drive Installation Kit.

[4]   A RAID Controller (N8103-192/-193) is required when N8154-135 2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) and N8118-312 M.2 SATA SSD installation kit are selected together.

Drive Bay for 2.5-inch Drive Model

Four 2.5-inch drive bays are standard. With an optional 2.5-inch drive cage, up to six 2.5-inch drive bays can be equipped.
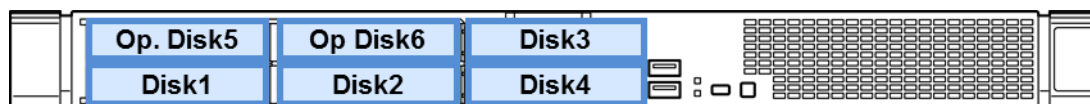
● Standard four drives are available, if add more drives, Expansion Drive Cage is needed.

Drive Bay for 3.5-inch Drive Model

Two 3.5-inch drive bays are equipped as standard.
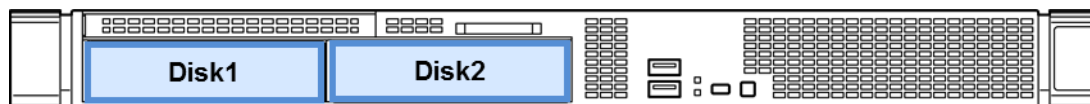
● Standard two drives are available.

Note:

● Up to six drives can be installed in Non-RAID (Embedded SATA) configuration.

● In default factory configuration, there are some conditions of drive types and RAID levels can be installed. Refer to **"Conditions of Internal Drives in the default factory configuration"** in References.

● For more detail, refer to **"Conditions for mixing of Internal Drives after shipment"** in References.

4.1   Drive Cages

4.1.1   4x2.5-inch Drive model

Category	Product Name / Description	Part Number
Drive Cage	**4x 2.5-inch Hot Plug Drive Cage Kit (SAS/SATA)** for 4x 2.5-inch Drive Model	(standard)
Expansion Drive Cage	**2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA)** Including internal cables, for 4x 2.5-inch Drive Model	N8154-135

NOTE:
- Up to one N8154-135 2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) can be installed.
- If equipped with N8154-135 2.5-inch Hot Plug Drive Cage Kit, N8154-134 Internal DVD Drive Installation Kit cannot be mounted.
- A RAID Controller (N8103-192/-193) is required when N8154-135 2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) and N8118-312 M.2 SATA SSD installation kit are selected together.

4.1.2   2x3.5-inch Drive model

Category	Product Name / Description	Part Number
Drive Cage	**2x 3.5-inch Hot Plug Drive Cage Kit (SAS/SATA)** for 2x 3.5-inch Drive Model	(standard)

NOTE:
- If RAID Controller (N8103-192/-193) is selected, internal SAS/SATA cable K410-446(00) is required.

4.2   M.2 SATA SSD Installation kit

Category	Product Name / Description	Part Number
PCIe Card Type Installation Kit **Up to 1**	**M.2 SATA SSD Installation kit** 2x M.2 SATA SSD The kit is installed on PCIe slot (up to 1) for OS boot	N8118-312
Cable **Up to 1**	**Internal SAS/SATA Cable** SATA cable set for R110j-1 2x 3.5-inch Drive Model to RAID controller for dedicated PCI slot and R110j-1 to M.2 SATA SSD Installation Kit and.	K410-446(00)

Note:
- M.2 SATA SSD must be ordered with N8118-312 M.2 SATA SSD Installation kit and K410-446(00) Internal SAS/SATA Cable. K410-446(00) Internal SAS/SATA Cable contains each cables for RAID controller for dedicated PCI slot and M.2 SATA SSD Installation kit.
- N8118-312 M.2 SATA SSD Installation kit is selected, M.2 SATA SSD must be selected.
- M.2 SATA SSD is connected to Embedded SATA controller in Single connection or On-board RAID configuration regardless of whether optional RAID controllers are installed or not.
- If N8151-137/-138 is installed, only one M.2 SATA SSD can be installed.
- A RAID Controller (N8103-192/-193) is required for HDD Cages, when N8154-135 2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) and N8118-312 M.2 SATA SSD installation kit are selected together.

4.3   RAID Configuration

4.3.1   2.5-inch-Drive Model / Embedded SATA Controller

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 6x 6Gb/s SATA	(Standard)
Cable	**Internal SAS/SATA Cable** For 4x 2.5-inch Drive Model, up to four drives are supported 1x [1 x mini-SAS to 1 x mini-SAS]	(Standard)
HDD Cage Kit	**4x 2.5-inch Hot Plug Drive Cage** For 4x 2.5-inch Drive Model, up to four drives are supported	(Standard)
	2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) For 4x 2.5-inch Drive Model, up to two drives are supported Including SAS/SATA Cable	N8154-135

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.
- Hot plug insertion/removal is not supported with the embedded SATA non-RAID controller.
- Embedded SATA Controller configuration supports SATA HDD and SATA SSD only. SAS HDD and SAS SSD does not supported in Embedded SATA Controller configuration.
- M.2 SATA SSD Installation Kit (N8118-312) and 2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) (N8154-135) can't be mixed in Embedded SATA Controller configuration. Please order RAID Controller for those configurations.

4.3.2   2.5-inch-Drive Model / Embedded SATA RAID Controller (RAID 0/1/10)

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 6x 6Gb/s SATA	(Standard)
Cable	**Internal SAS/SATA Cable** For 4x 2.5-inch Drive Model, up to four drives are supported 1x [1 x mini-SAS to 1 x mini-SAS]	(Standard)
HDD Cage Kit	**4x 2.5-inch Hot Plug Drive Cage** For 4x 2.5-inch Drive Model, up to four drives are supported	(Standard)
	2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) For 4x 2.5-inch Drive Model, up to two drives are supported Including SAS/SATA Cable	N8154-135

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.
- Embedded SATA RAID Controller configuration supports SATA HDD and SATA SSD only. SAS HDD and SAS SSD does not supported in Embedded SATA Controller configuration.
- M.2 SATA SSD Installation Kit (N8118-312) and 2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) (N8154-135) can't be mixed in Embedded SATA Controller configuration. Please chose RAID Controller for those configurations.

4.3.3   2.5-inch-Drive Model / RAID Controller for Dedicated PCI Slot

Choose RAID controller for suitable feature and performance. RAID Controller for Dedicated PCI Slot does not consume PCI card slot.

Category	Product Name / Description	Part Number
Storage Controller **Up to 1**	**RAID Controller (RAID 0/1)** RAID 0/1/5/10 and SAS HBA mode, 0MB, Int. 8 port, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s, Low Profile Heat Sink	N8103-192
	RAID Controller (2GB, RAID 0/1/5/6) RAID 0/1/5/6/10/50/60, 2GB, Int. 8 port, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s, Low Profile Heat Sink	N8103-193
Battery Backup **Required when N8103-193 or N8103-196 are selected**	**Battery Backup Unit** Lithium-ion Battery for N8103-193 / -196 RAID controller	N8103-215
Cable	**Internal SAS/SATA Cable** For 2.5-inch Drive Model, up to four drives are supported 1x [1 x mini-SAS to 1 x mini-SAS]	(Standard)
HDD Cage Kit	**4x 2.5-inch Hot Plug Drive Cage** For 4x 2.5-inch Drive Model, up to four drives are supported	(Standard)
	2x 2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) Including internal cables, for 4x 2.5-inch Drive Model	N8154-135

NOTE:
- RAID Controller for Dedicated PCI Slot is supported only on limited OS. For more details, please see **OS Support Matrix for PCI Cards and Embedded Controllers**.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- N8103-192 supports RAID5 in addition to RAID 0/1 although the product name does not contain "5". If higher performance is needed, choose RAID controller with cache memory.
- Up to two RAID Controller with cache (N8103-193/-196) can be installed.

4.3.4   3.5-inch-Drive Model / Embedded SATA Controller

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 6x 6Gb/s SATA	(Standard)
Cable	**Internal SAS/SATA Cable** For 2x 3.5-inch Drive Model, up to two drives are supported 1x [1 x mini-SAS to 1 x mini-SAS]	(Standard)
HDD Cage Kit	**2x 3.5-inch Hot Plug Drive Cage** For 2x 3.5-inch Drive Model, up to two drives are supported	(Standard)

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.
- Embedded SATA Controller configuration supports SATA HDD and SATA SSD only. SAS HDD and SAS SSD does not supported in Embedded SATA Controller configuration.

4.3.5   3.5-inch-Drive Model / Embedded SATA RAID Controller (RAID 0/1/10)

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 6x 6Gb/s SATA	(Standard)
Cable	**Internal SAS/SATA Cable** For 2x 3.5-inch Drive Model, up to two drives are supported 1x [1 x mini-SAS to 1 x mini-SAS]	(Standard)
HDD Cage Kit	**2x 3.5-inch Hot Plug Drive Cage** For 2x 3.5-inch Drive Model, up to two drives are supported	(Standard)

NOTE
- Embedded SATA RAID controller (RAID 0/1/10) 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.
- Embedded SATA RAID Controller configuration supports SATA HDD and SATA SSD only. SAS HDD and SAS SSD does not supported in Embedded SATA Controller configuration.

4.3.6   3.5-inch-Drive Model / RAID Controller for Dedicated PCI Slot

Choose RAID controller for suitable feature and performance. RAID Controller for Dedicated PCI Slot does not consume PCI card slot.

Category	Product Name / Description	Part Number
Storage Controller **Up to 1**	**RAID Controller (RAID 0/1)** RAID 0/1/5/10 and SAS HBA mode, 0MB, Int. 8 port, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s, Low Profile Heat Sink	N8103-192
	RAID Controller (2GB, RAID 0/1/5/6) RAID 0/1/5/6/10/50/60, 2GB, Int. 8 port, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s, Low Profile Heat Sink	N8103-193
Battery Backup **Required when N8103-193 or N8103-196 are selected**	**Battery Backup Unit** Lithium-ion Battery for N8103-193 / -196 RAID controller	N8103-215
Cable **Required**	**Internal SAS/SATA Cable** For 3.5-inch Drive Model, up to two drives are supported SATA cable set for R110j-1 2x 3.5-inch Drive Model to RAID controller for dedicated PCI slot and R110j-1 to M.2 SATA SSD Installation Kit.	K410-446(00)
HDD Cage Kit	**2x 3.5-inch Hot Plug Drive Cage** For 2x 3.5-inch Drive Model, up to two drives are supported	(Standard)

NOTE:
- RAID Controller for Dedicated PCI Slot is supported only on limited OS. For more details, please see **OS Support Matrix for PCI Cards and Embedded Controllers.**
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two RAID Controller with cache(N8103-193/-196) can be installed.

4.4 Supported Drives

4.4.1 2.5-inch SATA Hard Disk Drives

Category	Product Name / Description	Part Number
512n Sector	**1TB 7.2K Hot Plug 2.5-inch SATA HDD** 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-596
512e Sector	**2TB 7.2K Hot Plug 2.5-inch SATA HDD** 1x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-545

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

4.4.2 2.5-inch SATA Solid State Drives

Category	Product Name / Description	Part Number
Read Intensive DWPD ≈ 1	**240GB Hot Plug 2.5-inch SATA SSD** 1x 240GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive	N8150-1740
	480GB Hot Plug 2.5-inch SATA SSD 1x 480GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive	N8150-1741
	960GB Hot Plug 2.5-inch SATA SSD 1x 960GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive	N8150-1742
	1.92TB Hot Plug 2.5-inch SATA SSD 1x 1.92TB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive	N8150-1743
	3.84TB Hot Plug 2.5-inch SATA SSD 1x 3.84TB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive	N8150-1744
Value Endurance DWPD ≈ 3	**480GB Hot Plug 2.5-inch SATA SSD** 1x 480GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Value Endurance	N8150-1737
	960GB Hot Plug 2.5-inch SATA SSD 1x 960GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Value Endurance	N8150-1738
	1.92TB Hot Plug 2.5-inch SATA SSD 1x 1.92TB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Value Endurance	N8150-1739

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

4.4.3 2.5-inch SAS Hard Disk Drives

Category	Product Name / Description	Part Number
512n Sector / 10,000 rpm	**300GB Hot Plug 2.5-inch SAS HDD** 1x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-546
	600GB Hot Plug 2.5-inch SAS HDD 1x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-547
	1.2TB Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-549
512e Sector / 10,000 rpm	**1.8TB Hot Plug 2.5-inch SAS HDD** 1x 1.8 TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512e sector	N8150-550
	2.4TB Hot Plug 2.5-inch SAS HDD 1x 2.4 TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512e sector	N8150-591
512n Sector / 15,000 rpm	**300GB 15K Hot Plug 2.5-inch SAS HDD** 1x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-551
	600GB 15K Hot Plug 2.5-inch SAS HDD 1x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-552
	900GB 15K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-602

NOTE:

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

4.4.4   2.5-inch SAS Solid State Drives

Category	Product Name / Description	Part Number
Middle Endurance DWPD ≈ 10	**400GB Hot Plug 2.5-inch SAS SSD** 1x 400GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Middle Endurance	N8150-1750
	800GB Hot Plug 2.5-inch SAS SSD 1x 800GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Middle Endurance	N8150-1751
Value Endurance DWPD ≈ 3	**400GB Hot Plug 2.5-inch SAS SSD** 1x 400GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Value Endurance	N8150-1752
	800GB Hot Plug 2.5-inch SAS SSD 1x 800GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Value Endurance	N8150-1753
Read Intensive DWPD ≈ 1	**960GB Hot Plug 2.5-inch SAS SSD** 1x 960GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Read Intensive	N8150-1754
	1.92TB Hot Plug 2.5-inch SAS SSD 1x 1.92TB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Read Intensive	N8150-1755

NOTE:
- All drives within a RAID array should be of the same type, capacity and endurance.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SATA SSDs, SAS SSDs can be mixed.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.
- SAS HDD, SAS SSD are supported with RAID Controller Configuration only.

4.4.5   3.5-inch SATA Hard Disk Drives

Category	Product Name / Description	Part Number
512n Sector/ 7,200 rpm	**1TB 7.2K Hot Plug 3.5-inch SATA HDD** 1 x 1TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-565
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-566
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-568
512e Sector/ 7,200 rpm	**6TB 7.2K Hot Plug 3.5-inch SATA HDD** 1 x 6TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-569
	8TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 8TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-570
	12TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 12TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-588

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

4.4.6   3.5-inch Near Line SAS Hard Disk Drives

Category	Product Name / Description	Part Number
512e Sector	**8TB 7.2K Hot Plug 3.5-inch SAS HDD** 1x 8TB Near Line SAS HDD, 3.5-inch, 12Gb/s, 7,200 rpm, 512e sector	N8150-573 *1
	12TB 7.2K Hot Plug 3.5-inch SAS HDD 1x 12TB Near Line SAS HDD, 3.5-inch, 12Gb/s, 7,200 rpm, 512e sector	N8150-590 *1

*1 : Those are make-to-order products.

NOTE:
● All drives within a RAID array should be of the same type, capacity and rotation speed.
● Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SATA SSDs, SAS SSDs can be mixed.
● Near Line SAS HDD (7200 rpm) and SAS-HDD (10,000rpm / 15,000rpm) are equipped with SAS interface, they have the same maximum transfer speed and error recovery capabilities from the perspective of the interface specification, however Near Line SAS HDDs have the same I/O performance and endurance life as SATA HDDs(7200rpm) have.

4.4.7   M.2 SATA Solid State Drives

Category	Product Name / Description	Part Number
Value Endurance DWPD ≈ 1.5	**240GB Non-hot-plug M.2 SATA SSD** 1 x 240 GB M.2 SATA SSD, Value Endurance	N8150-1709
Read Intensive DWPD ≈ 0.5	**480GB Non-hot-plug M.2 SATA SSD** 1 x 480 GB M.2 SATA SSD, Read Intensive	N8150-1710

NOTE:
● Please order M.2 SATA SSD Installation Kit(N8118-312) and Internal SAS/SATA Cable(K410-446(00)) if you install M.2 SATA SSD.
● M.2 SATA SSD is connected to Embedded SATA controller in Single connection or On-board RAID configuration regardless of whether optional RAID controllers are installed or not.
● If N8151-137/-138 is installed, only one M.2 SATA SSD can be installed.

5   Optical Drive

Category	Product Name / Description	Part Number

Installation Kit	**Internal DVD Drive Installation Kit**
	   Installation kit for 4x2.5-inch Drive Model
	NOTE:
	   - The Installation Kit cannot be installed if N8154-135 2x2.5-inch Hot
	   Plug Drive Cage Kit(SAS/SATA) is installed
		N8154-134

Internal SATA Cable	**Internal SATA Cable for DVD Drive** Internal SATA cable for 2x3.5-inch Drive Model	K410-445(00)
Internal DVD Drive	**Internal DVD-ROM drive** Slim DVD-ROM drive	N8151-137

	Internal DVD-SuperMulti Drive
	   Slim DVD Super Multi drive, not including writing software
	NOTE:
	   - Not supported for Linux or VMware
		N8151-138

External	**External DVD-ROM Drive** Slim DVD-ROM drive, USB bus powered, 1.6A require, USB	N8160-102

NOTE:
- Internal DVD-SuperMulti Drive is supported only on limited OS. For more details, please see **OS Support Matrix for PCI Cards and Embedded Controllers**.
- Internal DVD Drive Installation Kit(N8154-125) is mutually exclusive with N8154-135 2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA).
- N8151-137/-138 can be installed in 4x 2.5-inch Drive Model with N8154-134 or 2x 3.5-inch Drive Model.
- If N8154-134 Internal DVD Drive Installation Kit or K410-445(00) Internal SATA Cable for DVD Drive is selected, an Internal DVD drive must be selected.
- If N8151-137/-138 is installed, only one M.2 SATA SSD can be installed.

6   Flash FDD

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

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

NOTE:
- Flash FDD is supported only on limited OS. For more details, please see **OS Support Matrix for PCI Cards and Embedded Controllers.**
- Up to one drive can be connected.

7   PCI Card

R110j-1 can install up to 2 PCI Card with selectable PCI Riser Card. You can choose PCI Riser Card for you purpose.
Please refer to **Supported PCI Cards and Installable Slots** with regard to the position of PCI slot which can mount PCI card supported.

PCI Riser Card

PCI Slot Configuration

Choose the appropriate configuration in accordance with the number and the type of PCI cards you want to install and whether you need FLOM slot.

PCI Riser Card Kit

Product Name / Description		Part Number

Riser Card Kit(2xPCI)
    Riser card for slot 1 with one PCIe 3.0 x8 slot
    Riser card for slot 2 with one PCIe 3.0 x16 slot
NOTE:
    - The Riser Card Kit is a factory installation option.
	Slot2 — PCIe 3.0 (x16)
	Slot1 — PCIe 3.0 (x8)
		N8116-90

Riser Card Kit(1xPCI + FLOM)
    Riser card for slot 1 with one FLOM
    Riser card for slot 2 with one PCIe 3.0 x16 slot
	Slot2 — PCIe 3.0 (x16)
	Slot1 — FLOM
		N8116-89

Network Interface Controller

Category		Product Name / Description	Part Number

LOM Card (FLOM Slot)
NOTE:
- N8116-89 Riser Card Kit required.
	1GbE	**Quad Port 1000BASE-T LOM Card**
		    Intel Ethernet Controller I350
		    PCIe 2.0(x4)
			N8104-172

	10GbE	**Dual Port 10GBASE-T LOM Card**
		    QLogic 57810S
		    PCIe 2.0(x8)
			N8104-173

Adapter	**GbE**	**Dual Port 1000BASE-T Adapter**
		    Broadcom BCM5720 Gigabit Ethernet Controller
		    PCIe 2.0(x1)
			N8104-178

		Dual Port 1000BASE-T Adapter
		    Intel Ethernet Controller I350
		    PCIe 2.0(x4)
		NOTE:
		    - Network cables with RJ-45 plug covers cannot be used.
			N8104-180

		Quad Port 1000BASE-T Adapter
		    Intel Ethernet Controller I350
		    PCIe 2.0(x4)
		NOTE:
		    - Network cables with RJ-45 plug covers cannot be used.
			N8104-181

	10GbE	**Dual Port 10GBASE-T Adapter**
		    QLogic 57810S
		    PCIe 2.0(x8)
			N8104-182

		Dual Port 10GBASE-T Adapter
		    Cavium QL41401
		    PCIe 3.0(x8)
			N8104-183

		Dual Port 10GBASE SFP+ Adapter
		    QLogic 57810S
		    PCIe 2.0(x8)
		NOTE:
		    - N8104-189 SFP+ Module is required to connect with an optical cable.
		    - Up to 2 SFP+ Modules can be installed.
			N8104-185

Module	**10GbE**	**SFP+ Module (10G-SR)** 1 x SFP+ Module	N8104-189

NOTE:

● The NIC cards must be installed under the maximum configuration limits for networking when running with VMware systems. For more detail, see the Networking Maximum in the Configuration Maximums document for VMware.
  - For VMware ESXi 6.5: https://www.vmware.com/pdf/vsphere6/r65/vsphere-65-configuration-maximums.pdf
  - For VMware ESXi 6.7: https://configmax.vmware.com/home

NIC Teaming feature - NIC Teaming and bonding features

The Express 5800 server supports NIC teaming, which enables you to configure multiple NICs as a virtual single network interface for dual path, load balancing, for fault tolerance and network load balancing respectively.

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

Network Interface	Team	Operating Systems
1GbE NIC On-board LAN Interface N8104-172/-180/-181	Up to four ports per one team	Windows Server 2016 Red Hat Enterprise Linux 7.5 later VMware ESXi 6.5 VMware ESXi 6.7
1GbE NIC N8104-178	Up to four ports per one team	Windows Server 2016 Red Hat Enterprise Linux 7.5 later VMware ESXi 6.5 VMware ESXi 6.7
10GbE NIC N8104-173/-182	Up to four ports per one team	Windows Server 2016 Red Hat Enterprise Linux 7.5 later VMware ESXi 6.5 VMware ESXi 6.7
10GbE NIC N8104-183	Up to four ports per one team	Windows Server 2016 Red Hat Enterprise Linux 7.5 later VMware ESXi 6.5 VMware ESXi 6.7
10GbE NIC N8104-185	Up to four ports per one team	Windows Server 2016 Red Hat Enterprise Linux 7.5 later VMware ESXi 6.5 VMware ESXi 6.7

NOTE:

● NIC Teaming feature is not supported on iSCSI interfaces.

● The network interfaces for each teaming must be the same.

● When 1GbE, 10GbE NIC teaming are mixed, the maximum number of team must be as follows:
  - Windows Server 2016: up to five per one system
  - Red Hat Enterprise Linux: up to five per one system

Using iSCSI

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

Category	Network Interface	Operating Systems
1GbE	N8104-178	Windows Server 2016, Red Hat Enterprise Linux 7, VMware 6.5 / 6.7

NOTE:

● Teaming feature is not supported on iSCSI interfaces.

7.1   External Storage Controller

7.1.1   RAID Controller

Category	Product Name / Description	Part Number
Controller	**RAID Controller (4GB, RAID0/1/5/6)** RAID0/1/5/6/10/50/60, 4GB, 8 External port PCIe 3.0 x8 SAS 12Gb/s, SATA 6Gb/s	N8103-196
Battery Backup **Required**	**Battery Backup Unit** Lithium-ion Battery for RAID controller	N8103-215

NOTE:

● Only one SAS JBOD Enclosure can be connected to one RAID controller.

● 4Kn sector drives are not supported with the RAID controller.

- One battery backup unit must be installed per one system.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.
- It is recommended to set RAID array configuration drives up to eight in order to minimize the risk of becoming multiple hard drives failure.
- Up to two RAID Controller with cache(N8103-193/-196) can be installed.

7.1.2 Fibre Channel / SAS Controller

Quick reference support matrix

OS	Support Storage	16Gb/s Fibre channel		32Gb/s Fibre channel	12Gb/s SAS	
		N8190-163 N8190-164 (Broadcom)	N8190-165 N8190-166 (QLogic)	N8190-171 N8190-172 (Broadcom)	N8103-197	N8103-E184 N8103-184
WS2016	iStorage M	✓	✓	✓	-	✓
	iStorage T	-	✓	-	-	✓
	LTO + DEU	-	-	-	✓	-
	LTO autoldr	-	-	-	–	✓
RHEL 7.5 or later	iStorage M	✓	-	✓	-	✓
	iStorage T	-	✓	-	-	✓
	LTO + DEU	-	-	-	✓	-
	LTO autoldr	-	-	-	–	✓
ESXi 6.5u2 or later	iStorage M	✓	-	✓	-	✓
ESXi 6.7 or later	iStorage M	✓	-	✓	-	✓

✓: Support/Qualified   –: N/A

LTO + DEU: Internal LTO drive on 1U Device Expansion Unit (N8141-69F)

LTO autoldr: LTO Autoloder (LL009F, T30A, T60A)

NOTE:
- iStorage T, LTO drives doesn't support VMware ESXi.
- For details such as OS support, function, etc, please refer to NEC Storage website.
- Quick reference support matrix shows compatibility with storage data connection function. For FC-SAN boot, please refer to "FC SAN Boot Configuration Guide.

Category		Product Name / Description	Part Number
Fibre Channel	16Gb/s	**Fibre Channel Controller (1ch)** Cavium QLogic, QLE2690 16Gb/s, Optical, PCIe 3.0 x8	N8190-165
		Fibre Channel Controller (2ch) Cavium QLogic, QLE2692 16Gb/s, Optical, PCIe 3.0 x8	N8190-166
		Fibre Channel Controller (1ch) Broadcom, LPe31000 16Gb/s, Optical, PCIe 3.0 x8	N8190-163
		Fibre Channel Controller (2ch) Broadcom, LPe31002 16Gb/s, Optical, PCIe 3.0 x8	N8190-164
	32Gb/s	**Fibre Channel Controller (1ch)** Broadcom, LPe32000 32Gb/s, Optical, PCIe 3.0 x8	N8190-171
		Fibre Channel Controller (2ch) Broadcom, LPe32002 32Gb/s, Optical, PCIe 3.0 x8	N8190-172

SAS	SAS Controller LSI SAS9300-8e Host Bus Adapter 12Gb/s SAS, ext. 8(SFF-8644 x2), PCIe 3.0(x8) **NOTE:** - Please download the driver kit from Express5800 web site. - Up to one card can be installed. - This controller is an factory installation option. Select N8103-184 for the field upgrade use after shipment.	N8103-E184
	SAS Controller 12Gb/s SAS, ext. 8(SFF-8644 x2), PCIe 3.0 x8	N8103-197

NOTE:
● Please refer to the NEC Storage website for supported OS and device
● Please refer to the Individual note for supported OS and device, when connect LTO or tape drive connection via Device Expansion Unit.
● For FC-SAN boot, please refer to "FC SAN Boot Configuration Guide"
● For the cluster configuration, please refer to the Express Cluster website
● Fibre Channel (FC) link speed varies by types and length of cables
● Please refer to the device's System Configuration Guide for supported SAS cable.

8 Other Add-in Components

8.1 Power Supply

Category		Product Name / Description	Part Number
Non Redundant		**290W Non-hot Plug Power Supply** **NOTE:** - This controller is a factory installation option. - No AC power cord is included.	N8181-179
Redundant	Power Unit	**500W Platinum Hot Plug Power Supply** 1 x 500 Watt 80 PLUS® Platinum, including one 2m IEC320 C14 power cord	N8181-159
	Power Cage	**Redundant PSU Cage** Up to two N8181-159 500W Platinum Hot Plug Power Supplies can be installed. **NOTE:** - This controller is a factory installation option.	N8181-180

NOTE:
● Minimum one power supply kit(N8181-159) and Power Cage(N8181-180) must be installed.

Available Power Supplies

See the table below for available power supplies based on the number and type of processor, the number and type of Disk and FLOM.

4x2.5-inch Drive Model

Type of Processor	Number of Disk	FLOM	Available Power Supply
Processor with 71 Watt or less	Up to 4	No	290W, 500W
		Yes	500W
	5 or more	-	500W
Processor with 80 Watt or more	-	-	500W

2x3.5-inch Drive Model

Type of Processor	FLOM	Available Power Supply
Processor with 71 Watt or less	No	290W, 500W

	Yes	500W
Processor with 80 Watt or more	-	500W

Guideline of Maximum Power Consumption

CPU TDP		54 Watt	62 Watt	71 Watt	80 Watt	95 Watt
100V	W	365W	370W	381W	392W	411W
	VA	372VA	377VA	389VA	400VA	419VA
200V	W	357W	362W	372W	383W	401W
	VA	364VA	369VA	380VA	391VA	409VA

8.2 Trusted Platform Module Kit

Product Name / Description	Part Number
Trusted Platform Module Kit TPM 2.0 module	N8115-35

NOTE:

● The kit is not available in China.

● The kit is not removable after attachment.

● The kit supports only with Windows operating system configured with UEFI boot mode.

● To use Windows BitLocker drive encryption, be sure to keep the "recovery password" of BitLocker function. The recovery password is required to restore data for hardware replacement during a system error.

8.3 USB Memory Kit

Product Name / Description	Part Number
8GB USB Memory	N8106-017
Dual 8GB microSD Kit(USB) Including 2x 8GB microSD, USB dual microSD memory card reader, RAID1 Support	N8106-016

NOTE:

● The USB Memory Kit is installed in the system when you order it with the base model.

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

8.4 Boot Mode Setting

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

Operating System	Supported Boot Mode	Supported X2APIC Setting
Windows Server 2016	UEFI	Enabled
Red Hat Enterprise Linux 7	UEFI	Enabled
VMware ESXi 6.5	UEFI	Enabled
VMware ESXi 6.7	UEFI	Enabled

NOTE:

● When setting Legacy Mode, Embedded SATA Controller and M.2 SATA SSD are not supported.

8.5 Management LAN with Serial kit

Product Name / Description	Part Number
Management LAN with Serial kit Including 1x dedicated Management LAN port(RJ-45) and 1x serial port(RS-232C) Up to 1 Management LAN with Serial kit can be installed	N8117-12

NOTE:

● R110j-1 does not have management LAN port nor serial port as standard. Please order Management Lan with Serial Kit(N8117-12) if you need those ports.

9   Add-on Components

9.1   17-inch LCD Console Drawer

Category		Product Name / Description	Part Number
Drawer w/ KVM	Drawer	**17-inch LCD Console Drawer (8 port)** 17-inch LCD, US 83-keys Keyboard, Optical mouse, 8 port KVM switch, 1U height	N8143-106F
	Cable	**Switch Unit Connection Cable Set (USB, 1.8m)** 1.8 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(1A)
		Switch Unit Connection Cable Set (USB, 3m) 3 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(03)
		Switch Unit Connection Cable Set (USB, 5m) 5 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(05)
Drawer w/o KVM	Drawer	**17inch LCD Console Unit 1U** 17-inch LCD, US 83-keys Keyboard, Optical mouse, 1U height, 4-pin USB B to 4-pin USB A cable 2 m, PS/2 Y-splitter cable 2m, 15-pin mini D-sub VGA cable 2 m	N8143-105F
		17inch LCD Console Drawer (1 port) 17-inch LCD, US 103-keys Keyboard with 10-key, Touch pad with 3-button, 1U height, 4-pin USB B to 4-pin USB A cable 1.8 m, Two PS/2 cable 1.8 m, 15-pin mini D-sub VGA cable 1.8 m	N8143-108F
		17.3inch LCD Console Drawer (1port) 17.3-inch wide Full HD LCD, US 103-keys Keyboard with 10-key, Touch pad with 2-button, 1U height, 4-pin USB B to 4-pin USB A cable 1.8 m, 15-pin mini D-sub VGA cable 1.8 m, DVI-D cable 1.8m	N8143-122F
	Keypad	**Keyboard Unit (JP)** JP 108-keys Keyboard with 10-key for N8143-108F 17inch LCD Console Drawer (1 port)	N8143-109
		Keyboard Unit (UK) UK 104-keys Keyboard with 10-key, for N8143-108F 17inch LCD Console Drawer (1 port)	N8143-111

NOTE:

● Keyboard of N8143-105F/-106F does not have 10-key.

9.2   KVM Switch

Category		Product Name / Description	Part Number
KVM Switch		**Server Switch Unit (8 server)** 1U USB 8 port KVM switch	N8191-14F
Cable	KVM	**Switch Unit Connection Cable Set (USB,1.8m)** 1.8 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(1A)
		Switch Unit Connection Cable Set (USB,3m) 3 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(03)
		Switch Unit Connection Cable Set (USB,5m) 5 m, 1 x 15-pin mini D-sub to 1 x 15-pin mini D-sub / 1 x 4-pin USB A	K410-118(05)
	Cascading	**Switch Unit Connection Cable 1.8 m** 1.8 m, 1 x 15-pin mini D-sub - 1x 15-pin mini D-Sub / 2x PS/2	K410-119(1A)

NOTE:

● Order Switch Unit Connection Cable Set as same sets as servers to be connected to. (N8191-14F: max 8 servers).

9.3   Server Management License

Product Name / Description	Part Number
License for Remote Management (Advanced) License per server Remote console:	N8115-33

- Integrated Remote Console (IRC) with full functionality Remote media: - Virtual media access via Integrated Remote Console (IRC) - Scripted virtual media access System management: - Global team collaboration for up to six consoles - Integrated Remote Console (IRC) recording and playback	
License for Remote Management (Essentials) License per server Remote console: - Integrated Remote Console (IRC) Remote media: - Virtual media access via Integrated Remote Console (IRC) System management: - Email alert	N8115-36

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

9.4   Dust Proof Filter Kit

Product Name / Description	Part Number
Dust Proof Filter Kit Including the filter attachment kit and 10 sets of dust proof filters	N8147-32

NOTE:
● The Dust Proof Filter Kit is make-to-order products. Please consult your sales representative in regard to the production lead time.

9.5   Starter Pack DVD

The starter pack DVD includes the software and driver qualified by NEC. In order to obtain technical support from NEC, please be sure to install the software and drivers provided with the starter pack. The latest DVD image can be downloaded for free from NEC website during the warranty or maintenance contract period.

Product Name / Description	Part Number
Express5800/R110j-1 Starter Pack	UL9020-B123

NOTE:
● By applying Starter Pack, Driver software qualified by NEC can be installed. To use servers, UL9020-B123 Starter Pack or Starter Pack downloaded from Web site must be installed.
● Starter Pack may be updated without notice. The latest version of Start Pack is available in Web site. Starter Pack can be downloaded within Warranty term.
● User Guide of this product is supplied as PDF file in NEC Web site.

References

External Views

Front and Rear Views

4x 2.5 Drive Model Front View
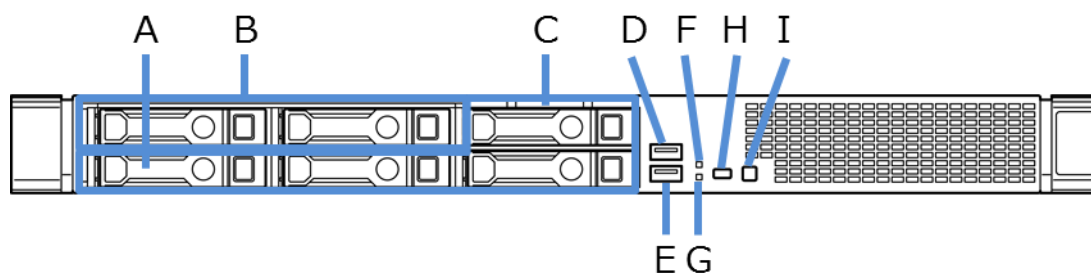
Legend			
A.	2.5-inch Drive Bays	**F.**	Health LED
B.	2.5-inch Drive Bays/Optical Drive Bay (Optional)	**G.**	LINK/ACT LED
C.	Pull-out Tab	**H.**	Power On/standby button/LED
D.	Service port	**I.**	UID button/LED
E.	USB 3.0 port		

2x 3.5 Drive Model Front View
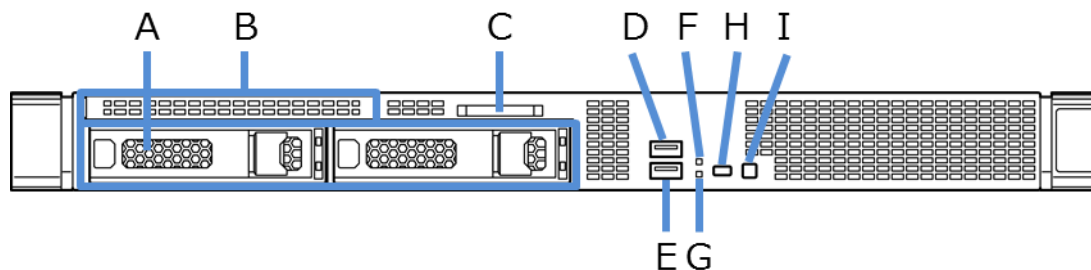
Legend			
A.	3.5-inch Drive Bays	**F.**	Health LED
B.	Optical Drive Bay (Optional)	**G.**	LINK/ACT LED
C.	Pull-out Tab	**H.**	Power On/standby button/LED
D.	Service port	**I.**	UID button/LED
E.	USB 3.0 port		

Rear View for Non-redundant PSU Configuration
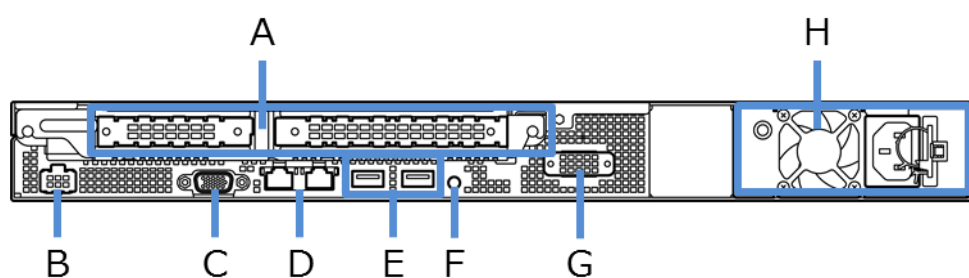
Rear View for Redundant PSU Configuration
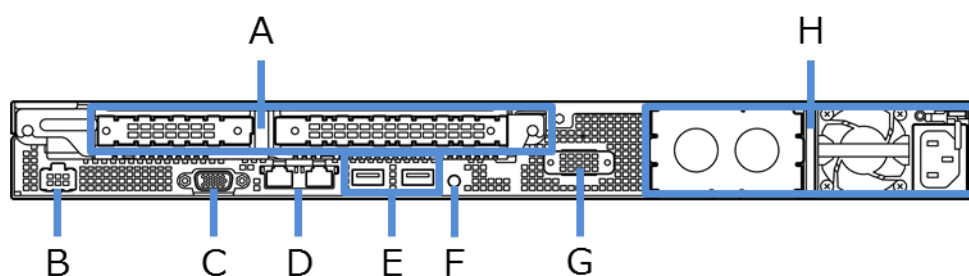
Legend				
A.	PCI Slot(Optional)		**E.**	2x USB 3.0 port
B.	Management LAN Connector(Optional)		**F.**	UID LED
C.	VGA Connector		**G.**	Serial port(Optional)
D.	NIC Connector		**H.**	Power Supply Unit(Optional)

Dimensions (mm)

43.18 mm

423.0 mm

382.27 mm

482.6 mm

434.6 mm
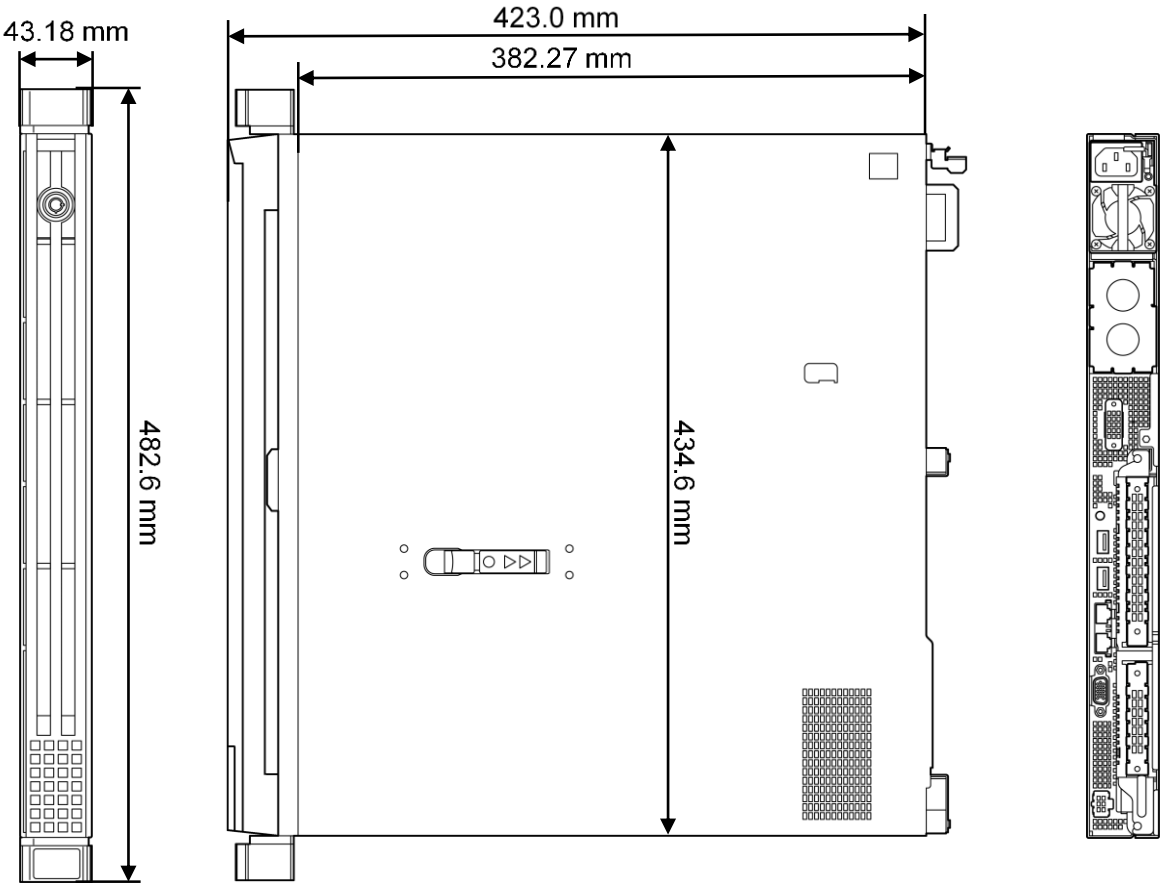
General Supplementary Matters

HDD

- The Capacity of Hard disk drive is indicated in decimal not binary. 1GB＝1000^3B、1TB=1000^4B.

PCI expansion slot

- Transfer speed of PCI Express
  - PCI Express (PCIe):   2.5Gb/s (simplex) per lane
  - PCI Express 2.0 (PCIe 2.0):   5Gb/s (simplex) per lane
  - PCI Express 3.0 (PCIe 3.0):   8Gb/s (simplex) per lane

Time display

- A system clock is affected by temperature conditions in storage. If high accuracy of the system clock is required, use of NTP servers is recommended.

Memory Supplementary Matters

Installation rule

- The number of memory which can be installed varies depending on number of installed CPUs.
- This installation rule is defined to maximize performance efficiently in multiple cores and tasks operation.
- Registered DIMM (RDIMM) can be installed up to 4.

When installing DIMMs, higher capacity memory must be installed preferentially, if this rule is ignored, it may cause failures of DIMMs. This rule applies to the factory installation.
Memory population varies with number of installed DIMMs. In installation of 1 or 3 DIMMs per CPU, optimal performance might NOT be obtained. Other memory populations are recommended.

1-4x DIMM(s)
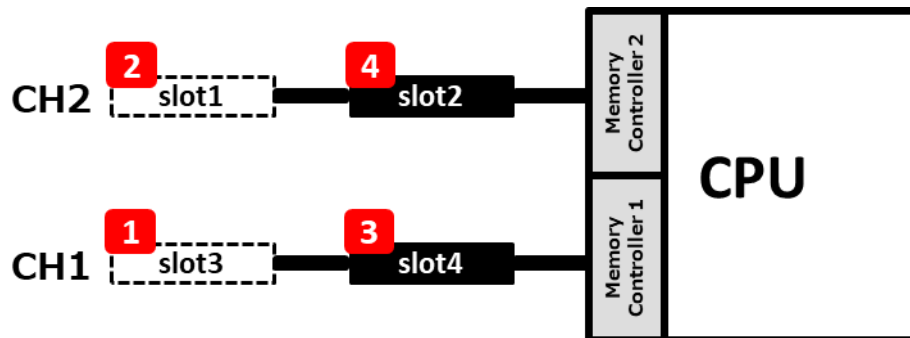
Internal drive supplementary matters

Conditions of Internal Drives in the default factory configuration

In BTO configuration, there are some conditions of drive types and RAID levels can be installed as below.

Common

- All drives in BTO shipment should be of the same type, sector and rotation speed.
- For the shipment with RAID array, arrange the drives in the same capacity as many as needed.

RAID controller configuration

- RAID level 0, 1, 5, 6, 10 can be installed for BTO shipment. Selectable RAID levels are depending on the RAID controller.
- Capacity of Logical drive can be within 2TB with legacy boot mode, capacity of logical drive can be within the total capacity of logical disks with UEFI boot mode.
- As factory shipment, Initial cache policy of RAID controllers is Write Through for N8103-192, Write back for N8103-193.

RAID configuration for shipment

RAID configuration for shipment	Number of Drives	Number of Drives in RAID levels
Non RAID	1~6	Non
Embedded RAID configuration (RAID 0/1/10)	1	RAID0(Single drive)
	2	RAID1
	3	2 in RAID1、1 for hotspare
	4/6	4/6 in RAID10
	5	4 in RAID10, 1 for a hotspare
RAID controller configuration(RAID 0/1/10)	1	RAID0(Single drive)
	2	RAID1
	3	2 in RAID1, 1 for a hotspare
	4/6	4/6 in RAID10
	5	4 in RAID10, 1 for a hotspare
RAID controller configuration (RAID 0/1/5/6/10)	1	RAID0(Single drive)
	2	RAID1
	3~6	RAID5

Conditions for mixing of Internal Drives after shipment

- RAID controller is required for mixing of Internal Drives
- Mixed Internal Drives cannot be installed in the same RAID array.
- When using hotspare disk for different RAID arrays which consist of various type of drives, assign "Dedicated Hot Spare" to each RAID arrays with the same type of drive, to prevent from mixing different type of drives in a RAID array. "Global Hot Spare" cannot be used.

Mixing of different type of drives

Two types of drive can be installed in standard drive cage (4slots) and optional drive cage (2slots). Same type between different drive cages is not necessary.

There is 11 "type", such as SAS HDD 10,000rpm(512n)、SAS HDD 10,000rpm(512e)、SAS HDD 15,000rpm(512n)、SAS HDD 15,000rpm(512e)、SATA HDD 7,200rpm(512n)、SATA HDD 7,200rpm(512e)、SATA SSD(VE/RI) 、SAS SSD(ME/VE/RI).

See some examples as below.

OK

Up to two types of drives can be installed in the
drive cage. Any of combination of drives is ok
(Ex. 2 SATA HDDs and 2 SAS HDDs)
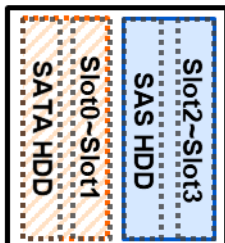
N/A

More than two types of drives
cannot be installed in the drive cage

N/A

Same type drives cannot be put
in 2 places or more separately in
the drive cage
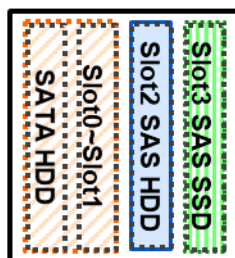
Server Management

The integrated server management controller provides superior remote control and system management features listed in the table below.

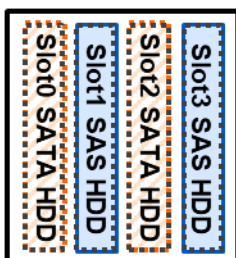|	Standard	Remote Management License (Essentials) N8115-36	Remote Management License (Advanced) N8115-33
Authentication with Active Directory and LDAP	-	-	✔
Two-factor and Kerberos authentication	-	-	✔
Virtual media access via Integrated Remote Console (IRC)	-	✔	✔
Scripted virtual media access	-	-	✔
Integrated Remote Console (IRC)	Pre-OS Only	✔	✔
Global team collaboration for up to six consoles	-	-	✔
Integrated Remote Console (IRC) recording and playback	-	-	✔
Virtual Serial Port recording and playback	-	-	✔
Text-based remote console via SSH	-	-	✔
Email alert	-	✔	✔
Remote Syslog feature		-	✔
Advanced power management (power history graph)	-	-	✔
BMC federation management	-	-	✔
BMC detection for BMC federation	✔	✔	✔
Remote serial console (Virtual Serial Port)	✔	✔	✔
Server Health Summary	✔	✔	✔
Restart BMC form web-based management console	✔	✔	✔
Redfish™API	✔	✔	✔
Agentless Management	✔	✔	✔
Server Health monitoring	✔	✔	✔
Web-based GUI	✔	✔	✔
Virtual power buttons	✔	✔	✔
SSH / SMASH Command-Line Protocol (including serial console redirection)	✔	✔	✔
IPMI / DCMI (including serial console redirection)	✔	✔	✔
SMTP Authentication (SMTP-AUTH)	✔	✔	✔

NOTE:
● Power capping feature isn't available in R110j-1.

OS Support Matrix for PCI Cards and Embedded Controllers

R110j-1 Support OS Matrix

OS	Support
Windows Server 2016	✓
Red Hat Enterprise Linux 7	✓
VMware ESXi 6.5	✓
VMware ESXi 6.7	✓

PCI Cards and Embedded Controllers Support OS Matrix

Part number	Product Name	Support OS				Order	
		WS 2016	RHEL 7	ESXi 6.7	ESXi 6.5	BTO	Standalone
N8101-1512	Pentium G5400 Processor Kit	✓	✓	–	–	✓	–
N8101-1515	Core i3-8300 Processor Kit	✓	✓	–	–	✓	–
N8101-1504	Xeon E-2124 Processor Kit	✓	✓	✓	✓	✓	–
N8101-1505	Xeon E-2134 Processor Kit	✓	✓	✓	✓	✓	–
N8101-1506	Xeon E-2144G Processor Kit	✓	✓	✓	✓	✓	–
N8101-1507	Xeon E-2174G Processor Kit	✓	✓	✓	✓	✓	–
N8101-1508	Xeon E-2126G Processor Kit	✓	✓	✓	✓	✓	–
N8101-1510	Xeon E-2136 Processor Kit	✓	✓	✓	✓	✓	–
N8101-1518	Xeon E-2186G Processor Kit	✓	✓	✓	✓	✓	–
N8102-718	8GB DDR4-2666 UNB Memory Kit	✓	✓	✓	✓	✓	✓
N8102-719	16GB DDR4-2666 UNB Memory Kit	✓	✓	✓	✓	✓	✓
N8154-135	2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA)	✓	✓	✓	✓	✓	✓
N8118-312	M.2 SATA SSD Installation kit	✓	✓	✓	✓	✓	✓
K410-446(00)	Internal SAS/SATA Cable	✓	✓	✓	✓	✓	✓
-	Embedded SATA non-RAID Controller	✓	✓	✓	✓	✓	–
-	Embedded SATA RAID Controller	✓	–	–	–	✓	–
N8103-192	RAID Controller (RAID 0/1)	✓	✓	✓	✓	✓	✓
N8103-193	RAID Controller (2GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓
N8103-215	Battery Backup Unit	✓	✓	✓	✓	✓	✓
N8150-596	1TB 7.2K Hot Plug 2.5-inch SATA HDD	✓	✓	✓	✓	✓	✓
N8150-545	2TB 7.2K Hot Plug 2.5-inch SATA HDD	✓	✓	✓	✓	✓	✓
N8150-1740	240GB Hot Plug 2.5-inch SATA SSD	✓	✓	✓	✓	✓	✓
N8150-1741	480GB Hot Plug 2.5-inch SATA SSD	✓	✓	✓	✓	✓	✓
N8150-1742	960GB Hot Plug 2.5-inch SATA SSD	✓	✓	✓	✓	✓	✓
N8150-1743	1.92TB Hot Plug 2.5-inch SATA SSD	✓	✓	✓	✓	✓	✓
N8150-1744	3.84TB Hot Plug 2.5-inch SATA SSD	✓	✓	✓	✓	✓	✓
N8150-1737	480GB Hot Plug 2.5-inch SATA SSD	✓	✓	✓	✓	✓	✓
N8150-1738	960GB Hot Plug 2.5-inch SATA SSD	✓	✓	✓	✓	✓	✓

N8150-1739	1.92TB Hot Plug 2.5-inch SATA SSD	✔	✔	✔	✔	✔	✔
N8150-546	300GB Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-547	600GB Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-549	1.2TB Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-550	1.8TB Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-591	2.4TB Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-551	300GB 15K Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-552	600GB 15K Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-602	900GB 15K Hot Plug 2.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-1750	400GB Hot Plug 2.5-inch SAS SSD	✔	✔	✔	✔	✔	✔
N8150-1751	800GB Hot Plug 2.5-inch SAS SSD	✔	✔	✔	✔	✔	✔
N8150-1752	400GB Hot Plug 2.5-inch SAS SSD	✔	✔	✔	✔	✔	✔
N8150-1753	800GB Hot Plug 2.5-inch SAS SSD	✔	✔	✔	✔	✔	✔
N8150-1754	960GB Hot Plug 2.5-inch SAS SSD	✔	✔	✔	✔	✔	✔
N8150-1755	1.92TB Hot Plug 2.5-inch SAS SSD	✔	✔	✔	✔	✔	✔
N8150-565	1TB 7.2K Hot Plug 3.5-inch SATA HDD	✔	✔	✔	✔	✔	✔
N8150-566	2TB 7.2K Hot Plug 3.5-inch SATA HDD	✔	✔	✔	✔	✔	✔
N8150-568	4TB 7.2K Hot Plug 3.5-inch SATA HDD	✔	✔	✔	✔	✔	✔
N8150-569	6TB 7.2K Hot Plug 3.5-inch SATA HDD	✔	✔	✔	✔	✔	✔
N8150-570	8TB 7.2K Hot Plug 3.5-inch SATA HDD	✔	✔	✔	✔	✔	✔
N8150-588	12TB 7.2K Hot Plug 3.5-inch SATA HDD	✔	✔	✔	✔	✔	✔
N8150-573	8TB 7.2K Hot Plug 3.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-590	12TB 7.2K Hot Plug 3.5-inch SAS HDD	✔	✔	✔	✔	✔	✔
N8150-1709	240GB Non-Hot Plug M.2 SATA SSD	✔	✔	✔	✔	✔	✔
N8150-1710	480GB Non-Hot Plug M.2 SATA SSD	✔	✔	✔	✔	✔	✔
N8154-134	Internal DVD Drive Installation Kit	✔	✔	✔	✔	✔	✔
K410-445(00)	Internal SATA Cable for DVD Drive	✔	✔	✔	✔	✔	✔
N8151-137	Internal DVD-ROM drive	✔	✔	✔	✔	✔	✔
N8151-138	Internal DVD-SuperMulti Drive	✔	–	–	–	✔	✔
N8160-102	External DVD-ROM Drive	✔	✔	✔	✔	✔	✔
N8160-96	Flash FDD	✔	–	–	–	–	✔
N8116-90	Riser Card Kit(2xPCI)	✔	✔	✔	✔	✔	✔
N8116-89	Riser Card Kit(1xPCI + FLOM)	✔	✔	✔	✔	✔	–
-	Standard 1000BASE-T LAN (2port)	✔	✔	✔	✔	✔	–
N8104-172	Quad Port 1000BASE-T LOM Card	✔	✔	✔	✔	✔	✔
N8104-173	Dual Port 10GBASE-T LOM Card	✔	✔	✔	✔	✔	✔
N8104-178	Dual Port 1000BASE-T Adapter	✔	✔	✔	✔	✔	✔
N8104-180	Dual Port 1000BASE-T Adapter	✔	✔	✔	✔	✔	✔
N8104-181	Quad Port 1000BASE-T Adapter	✔	✔	✔	✔	✔	✔
N8104-182	Dual Port 10GBASE-T Adapter	✔	✔	✔	✔	✔	✔
N8104-183	Dual Port 10GBASE-T Adapter	✔	✔	✔	✔	✔	✔
N8104-185	Dual Port 10GBASE SFP+ Adapter	✔	✔	✔	✔	✔	✔
N8104-189	SFP+ Module(10G-SR)	✔	✔	✔	✔	✔	✔
N8103-196	RAID Controller (4GB, RAID 0/1/5/6)	✔	✔	✔	✔	✔	✔
N8190-165	Fibre Channel Controller (1ch)	✔	✔	–	–	✔	✔

N8190-166	Fibre Channel Controller (2ch)	✔	✔	–	–	✔	✔
N8190-163	Fibre Channel Controller (1ch)	✔	✔	✔	✔	✔	✔
N8190-164	Fibre Channel Controller (2ch)	✔	✔	✔	✔	✔	✔
N8190-171	Fibre Channel Controller (1ch)	✔	✔	✔	✔	✔	✔
N8190-172	Fibre Channel Controller (2ch)	✔	✔	✔	✔	✔	✔
N8103-197	SAS Controller	✔	✔	–	–	✔	✔
N8103-E184	SAS Controller	✔	✔	✔	✔	✔	–
N8103-184	SAS Controller	✔	✔	✔	✔	–	✔
N8181-179	290W Non-hot Plug Power Supply	✔	✔	✔	✔	✔	–
N8181-159	500W Hot Plug Power Supply	✔	✔	✔	✔	✔	✔
N8181-180	Redundant PSU Cage	✔	✔	✔	✔	✔	–
N8115-35	Trusted Platform Module Kit	✔	–	–	–	✔	✔
N8106-017	8GB USB Memory	–	–	✔	✔	✔	✔
N8106-016	Dual 8GB microSD Kit(USB)	–	–	✔	✔	✔	✔
N8117-12	Management Lan with Serial kit	✔	✔	✔	✔	✔	✔

Supported PCI cards and Installable Slots

priority of factory mounted	Part Number	Product Name	Slot Number	RAID	FLOM *3	Slot1 *4	Slot2	Supplement
			PCI Express	PCIe 3.0				
			PCI Slot *1	x4 Lane	x8 Lane	x8 Lane	x8 Lane	
			Transfer Band per Lane *1	8Gb/s				
			PCI Board Type *2	-	-	x8 Socket	x16 Socket	
			Slot Size	Dedicated for RAID	Dedicated for FLOM	LP	FH	
			Card Size	RAID	FLOM	HL	HL	
High	N8103-193	RAID Controller (RAID 0/1) [PCI Express 3.0(x8)]		①	—	—	—	Up to two RAID card with cache [N8103-193/-196] can be installed. Need one Battery Backup Unit [N8103-215] per server.
↑	N8103-192	RAID Controller (2GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]		①	—	—	—	
	N8104-172	Quad Port 1000BASE-T LOM Card [PCI Express 3.0(x8)]		—	①	—	—	
	N8104-173	Dual Port 10GBASE-T LOM Card [PCI Express 3.0(x8)]		—	①	—	—	
	N8103-E184 N8103-184	SAS Controller [PCI Express 3.0(x8)]		—	—	①	—	
	N8103-196	RAID Controller (4GB, RAID0/1/5/6) [PCI Express 3.0(x8)]		—	—	②	①	For external storage. Up to two RAID card with cache [N8103-193/-196] can be installed. Need one Battery Backup Unit [N8103-215] per server.
	N8103-197	SAS Controller [PCI Express 3.0(x8)]		—	—	②	①	
	N8190-165	Fibre Channel Controller (1ch) [PCI Express 3.0(x8)]		—	—	②	①	
	N8190-166	Fibre Channel Controller (2ch) [PCI Express 3.0(x8)]		—	—	②	①	
	N8190-167	Fibre Channel Controller (1ch) [PCI Express 3.0(x8)]		—	—	②	①	
	N8190-171	Fibre Channel Controller (1ch) [PCI Express 3.0(x8)]		—	—	②	①	
	N8190-172	Fibre Channel Controller (2ch) [PCI Express 3.0(x8)]		—	—	②	①	Up to one FC 2ch card[N8190-164/172] can be installed on 4-thread CPU system. (*5)
	N8190-163	Fibre Channel Controller (1ch) [PCI Express 3.0(x8)]		—	—	②	①	
	N8190-164	Fibre Channel Controller (2ch) [PCI Express 3.0(x8)]		—	—	②	①	
	N8104-185	Dual Port 10GBASE SFP+ Adapter [PCI Express 2.0(x8)]		—	—	②	①	
	N8104-182	Dual Port 10GBASE-T Adapter [PCI Express 2.0(x8)]		—	—	②	①	
	N8104-183	Dual Port 10GBASE-T Adapter [PCI Express 3.0(x8)]		—	—	②	①	
	N8118-312	M.2 SATA SSD Installation kit		—	—	②	①	
	N8104-178	Dual Port 1000BASE-T Adapter [PCI Express 2.0(x1)]		—	—	②	①	
	N8104-180	Dual Port 1000BASE-T Adapter [PCI Express 2.0(x1)]		—	—	②	①	
Low	N8104-181	Quad Port 1000BASE-T Adapter [PCI Express 2.0(x4)]		—	—	—	①	Network cables with RJ-45 plug covers cannot be used.

Legends: ○ able to mount　　　─ unable to mount

Numbers indicate priority ranking. You can mount the card in ascending order of priority ranking numbers.

*1　　　The data transfer rate is the transfer bandwidth multiplied by the number of lanes.

Ex. x8 Lane = 64Gbps

*2　　　Represents the connector size. The number of cards below the number of sockets can be connected.

Ex. x8 Socket → x1 Card、x4 Card、x8 Card can be installed。x16 Card cannot be installed. N8116-89 Riser Card Kit is required

*3　　　N8116-89 Riser Card Kit is required

*4　　　N8116-90 Riser Card Kit is required

*5　　　4-thread CPUs are as follows

N8101-1504 Xeon E-2124 Processor Kit, N8101-1512 Pentium G5400 Processor Kit, N8101-1515 Core i3-8300 Processor Kit

FH：Full height　　　　　　　LP: Low Profile

FL：Hull Length　　　　　　　HL: Half Length

Supported Tape and Removal Disk Backup Drive List

See the following table for supported tape and removal disk backup drives. An optional tape drive enclosure is needed to connect the backup drives to the server.

Category	Product Name / Description	Part Number
LTO	**Internal LTO (SAS)** LTO5, Half height, Native capacity 1.5 TB	N8151-141
	Internal LTO (SAS) LTO6, Half height, Native capacity 2.5 TB	N8151-142
	Internal LTO (SAS) LTO7, Half height, Native capacity 6 TB	N8151-143
RDX	**Internal RDX (USB)**	N8151-139

Boot Mode Setting

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

Operating System	Supported Boot Mode	Supported X2APIC Setting
Windows Server 2016	UEFI	Enabled
VMware ESXi 6.5 Update 2	UEFI	Enabled
VMware ESXi 6.7	UEFI	Enabled

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

Revision History

Revision	Date	Description
1.0	January 25, 2018	Initial release