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NEC Express5800/R120h-2M System Configuration Guide

Introduction

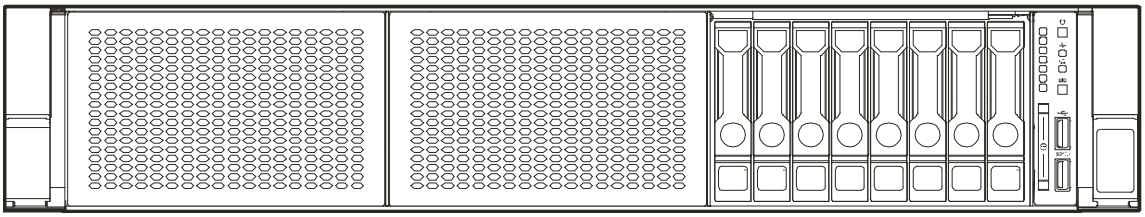
This document contains product and configuration information that will enable you to configure your system. The guide will ensure fast and proper configuration of your NEC Express5800 server.

Jan.25, 2019
Revision 9.0
NEC Corporation

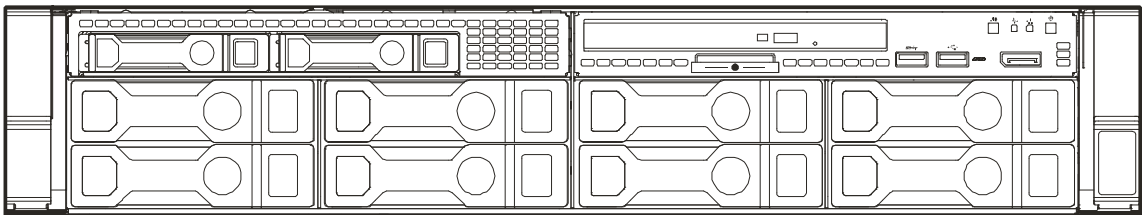
Contents

Model Lineup

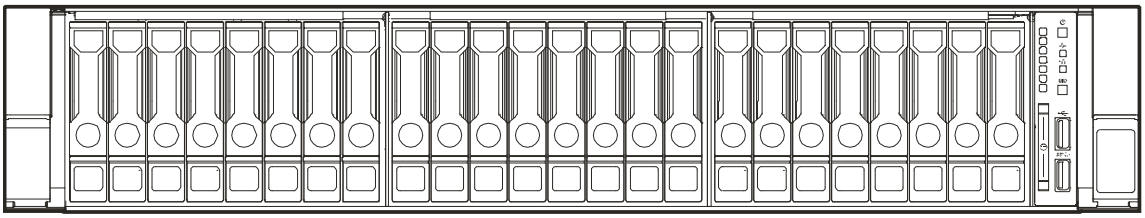
8x2.5-inch Drive Model



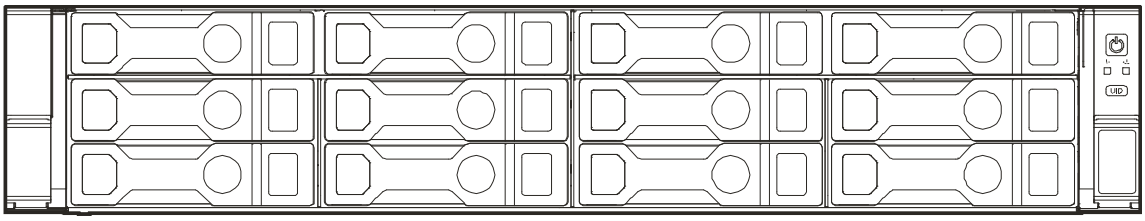
8x3.5-inch Drive Model



24x2.5-inch Drive Model



12x 3.5-inch Drive Model



Technical Specification

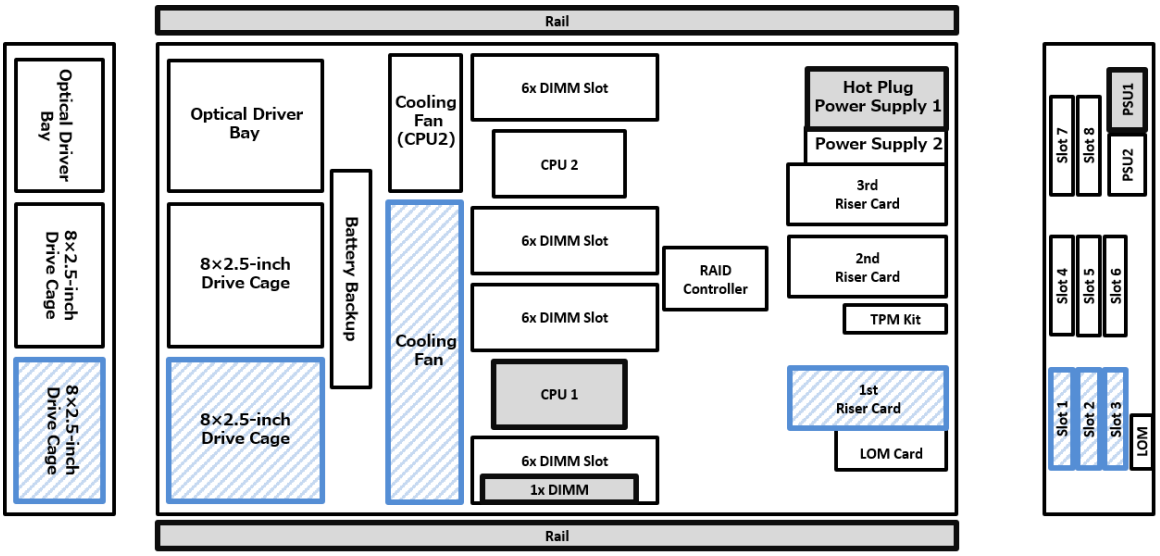
Specification

Model		R120h-2M			
		8x 2.5-inch Drive Model	24x 2.5-inch Drive Model	8x 3.5-inch Drive Model	12x 3.5-inch Drive Model
Part Number		N8100-2562F	N8100-2563F	N8100-2564F	N8100-2565F
Processor	**Type**	Intel® Xeon® Processor Bronze 3104(6C/6T, 1.70 GHz, 8.25MB, TDP 85W) Bronze 3106(8C/8T, 1.70 GHz, 11MB, TDP 85W) Silver 4108(8C/16T, 1.80 GHz, 11MB, TDP 85W) Silver 4110(8C/16T, 2.10 GHz, 11MB, TDP 85W) Silver 4112(4C/8T, 2.60 GHz, 8.25MB, TDP 85W) Silver 4114(10C/20T, 2.20 GHz, 13.75MB, TDP 85W) Silver 4116(12C/24T, 2.10 GHz, 16.50MB, TDP 85W) Gold 5115(10C/20T, 2.40 GHz, 13.75MB, TDP 85W) Gold 5118(12C/24T, 2.30 GHz, 16.50MB, TDP 105W) Gold 5120(14C/28T, 2.20 GHz, 19.25MB, TDP 105W) Gold 5122(4C/8T, 3.60 GHz, 16.50MB, TDP 105W) Gold 6126(12C/24T, 2.60 GHz, 19.25MB, TDP 125W) Gold 6128(6C/12T, 3.40 GHz, 19.25MB, TDP 115W) Gold 6130(16C/32T, 2.10 GHz, 22MB, TDP 125W) Gold 6132(14C/28T, 2.60 GHz, 19.25MB, TDP 140W) Gold 6134(8C/16T, 3.20 GHz, 24.75MB, TDP 130W) Gold 6136(12C/24T, 3 GHz, 24.75MB, TDP 150W) Gold 6138(20C/40T, 2GHz, 27.50MB, TDP 125W) Gold 6140(18C/36T, 2.30 GHz, 24.75MB, TDP 140W) Gold 6142(16C/32T, 2.60 GHz, 22MB, TDP 150W) Gold 6144 (3.50 GHz, 8C/16T, 24.75MB, TDP 150W) Gold 6146 (3.20 GHz, 12C/24T, 24.75MB, TDP 165W) Gold 6148(20C/40T, 2.40 GHz, 27.50MB, TDP 150W) Gold 6150(18C/36T, 2.70 GHz, 24.75MB, TDP 165W) Gold 6152(22C/44T, 2.10 GHz, 30.25MB, TDP 140W) Gold 6154(18C/36T, 3GHz, 24.75MB, TDP 200W) Platinum 8153(16C/32T, 2 GHz, 22MB, TDP 125W) Platinum 8156(4C/8T, 3.60 GHz, 16.50MB, TDP 105W) Platinum 8158(12C/24T, 3GHz, 24.75MB, TDP 150W) Platinum 8160(24C/48T,2.10 GHz, 33MB, TDP 150W) Platinum 8164(26C/52T, 2GHz, 35.75MB, TDP 150W) Platinum 8168(24C/48T, 2.70 GHz, 33MB, TDP 205W) Platinum 8170(26C/52T, 2.10 GHz, 35.75MB, TDP 165W) Platinum 8176(28C/56T, 2.10 GHz, 38.50MB, TDP 165W) Platinum 8180(28C/56T, 2.50 GHz, 38.50MB, TDP 205W) Gold 6134M(8C/16T, 3.20GHz, 24.75MB, TDP 130W) Platinum 8180M(28C/56T, 2.50 GHz, 38.50MB, TDP 205W)			
	Number of Processors	1 or 2			
Chipset		Intel® C621 Chipset			
Memory	**Type**	DDR4-2666 Registered DIMM (8/16/32GB) DDR4-2666 Load Reduced DIMM (64/128GB)			
	Standard Capacity	0 GB			
	Maximum Capacity	3 TB (24 x 128 GB)			
	Memory protection	ECC, x4 SDDC, x4 DDDC, Memory Mirroring, Memory Sparing			
Internal Storage	**Standard Capacity**	0 GB			
	Disk Controller	SATA : 6Gb/s, RAID 0/1/5/6/10/50/60 (Optional) SAS: 12 Gb/s, RAID 0/1/5/6/10/50/60 (Optional)			
	Hot Plug	Supported			
	Optical Disk Drive	Optional	-	Optional	-
	Optical Drive Bays	1	-	1	-
	Standard Disk Drive Bays	8	24	8	12
Expansion Slots	**Standard**	Total: 5 slots available 1 PCIe 3.0 x16 (x16 connector) 2 PCIe 3.0 x8 (x8 connector) 1 PCIe 3.0 x8 (x8 connector) for a dedicated RAID card			

Model		**R120h-2M**			
		8x 2.5-inch Drive Model	**24x 2.5-inch Drive Model**	**8x 3.5-inch Drive Model**	**12x 3.5-inch Drive Model**
		1 PCIe 3.0 x8 (x8 connector) for a dedicated LOM controller * 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)		1x USB3.0 1x USB2.0 (BMC) 1x DisplayPort	-
	Rear	2x USB3.0, 1x VGA (15-pin mini D-sub), 1x Management LAN connector (RJ-45), 4x Data LAN connector (RJ-45), 1x Serial (9-pin mini D-sub, Optional)			
	Internal	2x USB3.0, 2x SATA 2.0			
Redundant Fan		Standard, hot plug			
Redundant Power Supply		Optional, hot plug			
Power Supply		1-2 x 500 Watt, 800 Watt, 1600 Watt 80 PLUS® Platinum certified hot plug PSU 500Watt, 800 Watt : 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz 800Watt, 1600 Watt : 200-240 VAC ± 10% 50 / 60 Hz ± 3 Hz			
Dimensions (W x D x H)		445.5 x 679.4 x 87.3 mm 17.5 x 26.7 x 3.4 in (2U)		445.5 x 730.2 x 87.3 mm 17.5 x 28.7 x 3.4 in (2U)	
Temperature, Relative Humidity (non-condensing)		Operating: 10° to 35° C / 50° to 95° F, 8 to 90% 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			
Operating Systems		Microsoft® Windows Server® 2012 R2 Standard Microsoft® Windows Server® 2012 R2 Datacenter Microsoft® Windows Server® 2016 Standard Microsoft® Windows Server® 2016 Datacenter Red Hat Enterprise Linux 6.9 or later Red Hat Enterprise Linux 7.3 or later VMware ESXi™ 6.0 Update 3 VMware ESXi™ 6.5 Update 1 or later VMware ESXi™ 6.7 or later			

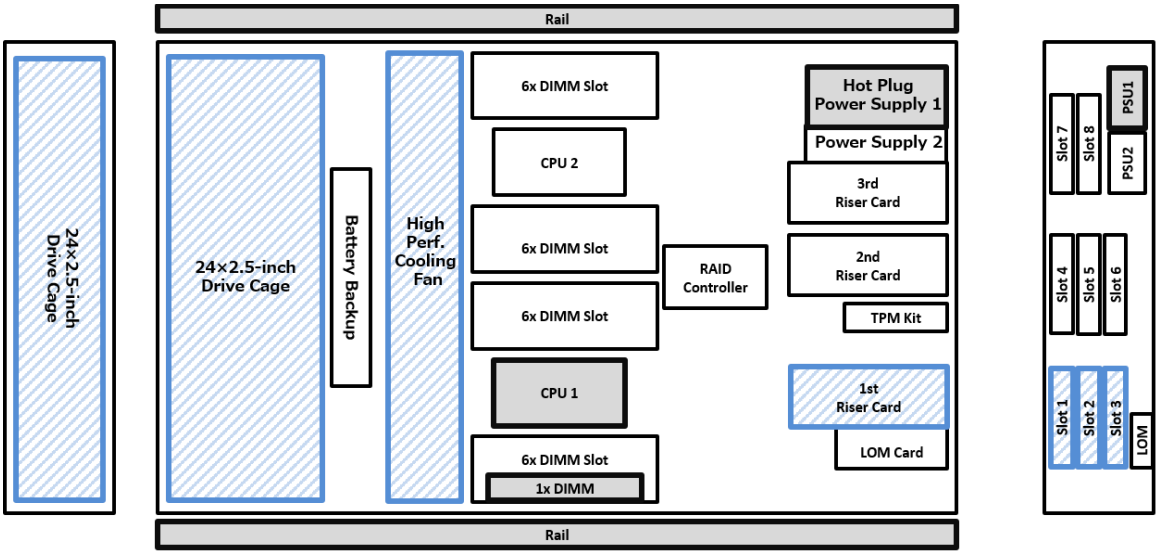
Configuration Diagram

8x 2.5-inch Drive Model



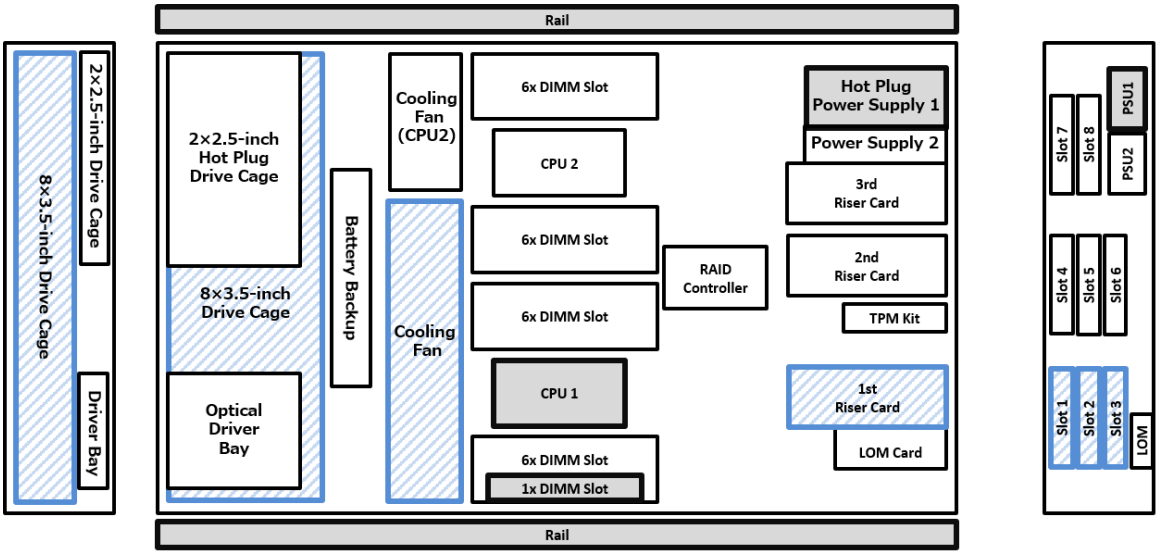
Legend: Standard Components Mandatory Components

24x 2.5-inch Drive Model



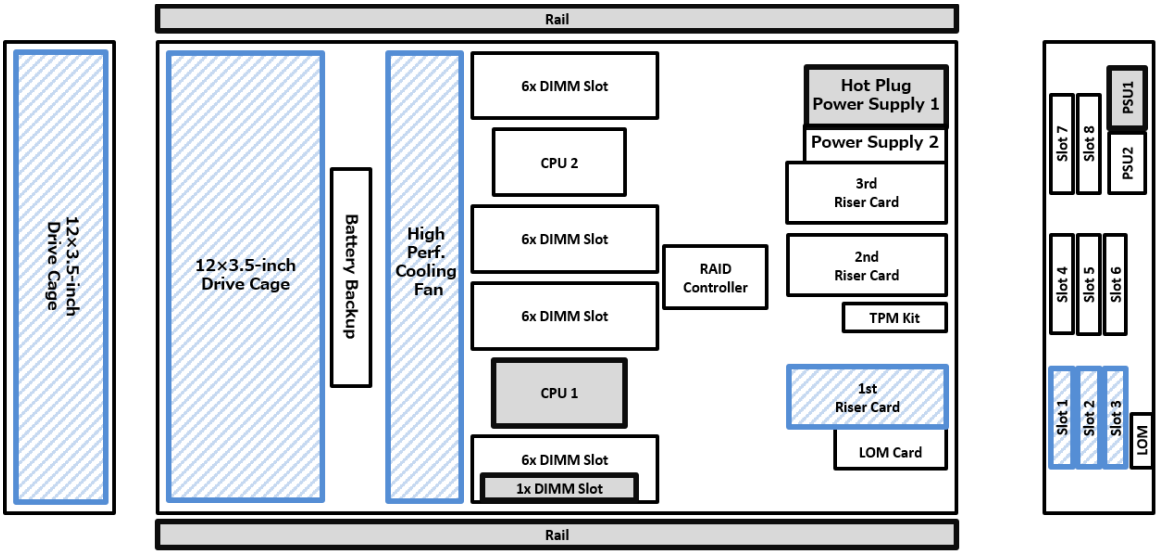
Legend: Standard Components Mandatory Components

8x 3.5-inch Drive Model



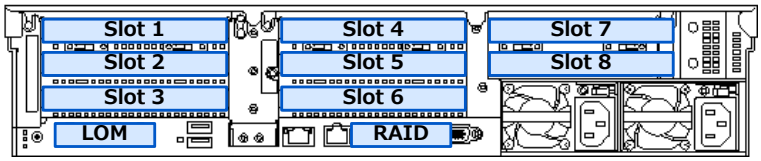
Legend: Standard Components Mandatory Components

12x 3.5-inch Drive Model



Legend: Standard Components Mandatory Components

Expansion slot Map



Legend			Remarks
Standard Riser	LOM	PCIe 3.0 x8, x8 connector, for a dedicated LOM controller	
	RAID	PCIe 3.0 x8, x8 connector, for a dedicated internal RAID card	
	Slot 1	PCIe 3.0 x8, x8 connector, Full-height, Full-length	
	Slot 2	PCIe 3.0 x16, x16 connector, Full-height, Half-length	
	Slot 3	PCIe 3.0 x8, x8 connector, Full-height, Half-length	
(Option) **Add N8116-62** **2nd Riser Card**	Slot 4	PCIe 3.0 x8, x8 connector, Full-height, Full-length	2CPU required
	Slot 5	PCIe 3.0 x16, x16 connector, Full-height, Half-length	2CPU required
	Slot 6	PCIe 3.0 x8, x8 connector, Full-height, Half-length	2CPU required
(Option) **Add N8116-81** **3rd Riser Card**	Slot 7	PCIe 3.0 x8, x8 connector, Full-height, Full-length	2CPU required
	Slot 8	PCIe 3.0 x8, x8 connector, Full-height, Half-length	2CPU required

NOTE:

- By selecting PCI Riser Card, standard Riser can be exchanged and 2nd / 3rd Riser can be expanded. Refer to **"7.1 PCI Riser Card**" for available Riser Card and detailed specifications

Server Configuration

1 Base Models

Product Name / Description	Part Number
NEC Express5800/R120h-2M 8x 2.5-inch Drive Model No processor, no RAM, no HDD, no ODD, no Rail, no Power Supply Unit. Including : Front Bezel, 8x 2.5-inch Drive Cage, 1st Riser Card Kit, Standard Fan Kit	N8100-2562F
NEC Express5800/R120h-2M 8x 3.5-inch Drive Model No processor, no RAM, no HDD, no ODD, no Rail, no Power Supply Unit. Including : Front Bezel, 8x 3.5-inch Drive Cage, 1st Riser Card Kit, Standard Fan Kit	N8100-2564F
NEC Express5800/R120h-2M 24x 2.5-inch Drive Model No processor, no RAM, no HDD, no ODD, no Rail, no Power Supply Unit. Including : Front Bezel, 24x 2.5-inch Drive Cage, 1st Riser Card Kit, High Performance Fan Kit	N8100-2563F
NEC Express5800/R120h-2M 12x 3.5-inch Drive Model No processor, no RAM, no HDD, no ODD, no Rail Including : Front Bezel, 12x 3.5-inch Drive Cage, 1st Riser Card Kit, High Performance Fan Kit	N8100-2565F

NOTE:

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

2 Processors

Available sockets: 2

Category	Product Name / Description	Part Number
Bronze 3100	**Xeon Bronze 3104 Processor Kit** Intel® Xeon ® Bronze 3104 (1.70 GHz, 6C/6T, 8.25MB, TDP 85W)	N8101-1191 (1st) N8101-1192 (2nd)
	Xeon Bronze 3106 Processor Kit Intel® Xeon ® Bronze 3106 (1.70 GHz, 8C/8T, 11MB, TDP 85W)	N8101-1193 (1st) N8101-1194 (2nd)
Silver 4100	**Xeon Silver 4108 Processor Kit** Intel® Xeon ® Silver 4108 (1.80 GHz, 8C/16T, 11MB, TDP 85W)	N8101-1195 (1st) N8101-1196 (2nd)
	Xeon Silver 4110 Processor Kit Intel® Xeon ® Silver 4110 (2.10 GHz, 8C/16T, 11MB, TDP 85W)	N8101-1197 (1st) N8101-1198 (2nd)
	Xeon Silver 4112 Processor Kit Intel® Xeon ® Silver 4112 (2.60 GHz, 4C/8T, 8.25MB, TDP 85W)	N8101-1199 (1st) N8101-1200 (2nd)
	Xeon Silver 4114 Processor Kit Intel® Xeon ® Silver 4114 (2.20 GHz, 10C/20T, 13.75MB, TDP 85W)	N8101-1201 (1st) N8101-1202 (2nd)
	Xeon Silver 4116 Processor Kit Intel® Xeon ® Silver 4116 (2.10 GHz, 12C/24T, 16.50MB, TDP 85W)	N8101-1203 (1st) N8101-1204 (2nd)
Gold 5100	**Xeon Gold 5115 Processor Kit** Intel® Xeon ® Gold 5115 (2.40 GHz, 10C/20T, 13.75MB, TDP 85W)	N8101-1205 (1st) N8101-1206 (2nd)
	Xeon Gold 5118 Processor Kit Intel® Xeon ® Gold 5118 (2.30 GHz, 12C/24T, 16.50MB, TDP 105W)	N8101-1207 (1st) N8101-1208 (2nd)
	Xeon Gold 5120 Processor Kit Intel® Xeon ® Gold 5120 (2.20 GHz, 14C/28T, 19.25MB, TDP 105W)	N8101-1209 (1st) N8101-1210 (2nd)
	Xeon Gold 5122 Processor Kit Intel® Xeon ® Gold 5122 (3.60 GHz, 4C/8T, 16.50MB, TDP 105W)	N8101-1211 (1st) N8101-1212 (2nd)
Gold 6100	**Xeon Gold 6126 Processor Kit** Intel® Xeon ® Gold 6126 (2.60 GHz, 12C/24T, 19.25MB, TDP 125W)	N8101-1213 (1st) N8101-1214 (2nd)
	Xeon Gold 6128 Processor Kit Intel® Xeon ® Gold 6128 (3.40 GHz, 6C/12T, 19.25MB, TDP 115W)	N8101-1215 (1st) N8101-1216 (2nd)
	Xeon Gold 6130 Processor Kit Intel® Xeon ® Gold 6130 (2.10 GHz, 16C/32T, 22MB, TDP 125W)	N8101-1217 (1st) N8101-1218 (2nd)
	Xeon Gold 6132 Processor Kit Intel® Xeon ® Gold 6132 (2.60 GHz, 14C/28T, 19.25MB, TDP 140W)	N8101-1219 (1st) N8101-1220 (2nd)
	Xeon Gold 6134 Processor Kit Intel® Xeon ® Gold 6134 (3.20 GHz, 8C/16T, 24.75MB, TDP 130W)	N8101-1221 (1st) N8101-1222 (2nd)
	Xeon Gold 6136 Processor Kit Intel® Xeon ® Gold 6136 (3 GHz, 12C/24T, 24.75MB, TDP 150W) **NOTE:** - The processor kit is make-to-order product.	N8101-1223 (1st) N8101-1224 (2nd)

	Xeon Gold 6138 Processor Kit Intel® Xeon ® Gold 6138 (2 GHz, 20C/40T, 27.50MB, TDP 125W) **NOTE:** - The processor kit is make-to-order product.	N8101-1225 (1st) N8101-1226 (2nd)
	Xeon Gold 6140 Processor Kit Intel® Xeon ® Gold 6140 (2.30 GHz, 18C/36T, 24.75MB, TDP 140W)	N8101-1227 (1st) N8101-1228 (2nd)
	Xeon Gold 6142 Processor Kit Intel® Xeon ® Gold 6142 (2.60 GHz, 16C/32T, 22MB, TDP 150W)	N8101-1229 (1st) N8101-1230 (2nd)
	Xeon Gold 6144 Processor Kit Intel® Xeon ® Gold 6144 (3.50 GHz, 8C/16T, 24.75MB, TDP 150W) **NOTE:** - The processor kit is make-to-order product.	N8101-1231 (1st) N8101-1232 (2nd)
	Xeon Gold 6146 Processor Kit Intel® Xeon ® Gold 6146 (3.20 GHz, 12C/24T, 24.75MB, TDP 165W) **NOTE:** - The processor kit is make-to-order product.	N8101-1233 (1st) N8101-1234 (2nd)
	Xeon Gold 6148 Processor Kit Intel® Xeon ® Gold 6148 (2.40 GHz, 20C/40T, 27.50MB, TDP 150W)	N8101-1235 (1st) N8101-1236 (2nd)
	Xeon Gold 6150 Processor Kit Intel® Xeon ® Gold 6150 (2.70 GHz, 18C/36T, 24.75MB, TDP 165W) **NOTE:** - The processor kit is make-to-order product.	N8101-1237 (1st) N8101-1238 (2nd)
	Xeon Gold 6152 Processor Kit Intel® Xeon ® Gold 6152 (2.10 GHz, 22C/44T, 30.25MB, TDP 140W)	N8101-1239 (1st) N8101-1240 (2nd)
	Xeon Gold 6154 Processor Kit Intel® Xeon ® Gold 6154 (3 GHz, 18C/36T, 24.75MB, TDP 200W) **NOTE:** - The processor kit is make-to-order product.	N8101-1241 (1st) N8101-1242 (2nd)
Platinum 8100	**Xeon Platinum 8153 Processor Kit** Intel® Xeon ® Platinum 8153 (2 GHz, 16C/32T, 22MB, TDP 125W) **NOTE:** - The processor kit is make-to-order product.	N8101-1243 (1st) N8101-1244 (2nd)
	Xeon Platinum 8156 Processor Kit Intel® Xeon ® Platinum 8156 (3.60 GHz, 4C/8T, 16.50MB, TDP 105W) **NOTE:** - The processor kit is make-to-order product.	N8101-1245 (1st) N8101-1246 (2nd)
	Xeon Platinum 8158 Processor Kit Intel® Xeon ® Platinum 8158 (3 GHz, 12C/24T, 24.75MB, TDP 150W) **NOTE:** - The processor kit is make-to-order product.	N8101-1247 (1st) N8101-1248 (2nd)
	Xeon Platinum 8160 Processor Kit Intel® Xeon ® Platinum 8160 (2.10 GHz, 24C/48T, 33MB, TDP 150W)	N8101-1249 (1st) N8101-1250 (2nd)
	Xeon Platinum 8164 Processor Kit Intel® Xeon ® Platinum 8164 (2 GHz, 26C/52T, 35.75MB, TDP 150W) **NOTE:** - The processor kit is make-to-order product.	N8101-1251 (1st) N8101-1252 (2nd)
	Xeon Platinum 8168 Processor Kit Intel® Xeon ® Platinum 8168 (2.70 GHz, 24C/48T, 33MB, TDP 205W) **NOTE:** - The processor kit is make-to-order product.	N8101-1253 (1st) N8101-1254 (2nd)
	Xeon Platinum 8170 Processor Kit Intel® Xeon ® Platinum 8170 (2.10 GHz, 26C/52T, 35.75MB, TDP 165W) **NOTE:** - The processor kit is make-to-order product.	N8101-1255 (1st) N8101-1256 (2nd)
	Xeon Platinum 8176 Processor Kit Intel® Xeon ® Platinum 8176 (2.10 GHz, 28C/56T, 38.50MB, TDP 165W) **NOTE:** - The processor kit is make-to-order product.	N8101-1257 (1st) N8101-1258 (2nd)
	Xeon Platinum 8180 Processor Kit Intel® Xeon ® Platinum 8180 (2.50 GHz, 28C/56T, 38.50MB, TDP 205W)	N8101-1259 (1st) N8101-1260 (2nd)
Gold 6100	**Xeon Gold 6134M Processor Kit** Intel® Xeon ® Gold 6134M (3.20 GHz, 8C/16T, 24.75MB, TDP 130W) **NOTE:** - The processor kit is make-to-order product.	N8101-1261 (1st) N8101-1262 (2nd)

Platinum 8100	**Xeon Platinum 8180M Processor Kit** Intel® Xeon ® Platinum 8180M (2.50 GHz, 28C/56T, 38.50MB, TDP 205W) **NOTE:** - The processor kit is make-to-order product.	N8101-1273 (1st) N8101-1274 (2nd)

NOTE:

- The processor kit for the 1st CPU must be ordered with a base model.
- The processor models must be the same to configure dual processor system.
- High performance CPU heatsink is shipped with the processor with 130 Watt or higher and Platinum 8156, Gold 6128, 5122. Standard CPU heatsink is shipped with all the other processors.
- Estimated production lead time for the make-to-order processor kits will be approximately 3 months.
- When using 4 slots(Except LOM slot and RAID slot), it is necessary to purchase the 2nd riser card option after setting it to 2 CPU configuration

The maximum number of logical processors supported by OS

See the table below for the maximum number of logical processors that you can actually use on your system.

Operating Systems	Number of Logical Processors Supported by Operating Systems	Maximum Available Number of Logical Processors
Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter	**640** [1]	**112**
Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter	**640** [1]	**112**
Red Hat Enterprise Linux 7	**384**	**112**
VMware ESXi 6.0	**480**	**112**
VMware ESXi 6.5	**576**	**112**
VMware ESXi 6.7	**768**	**112**

[1] The maximum numbers of logical processors when using Hyper-V are below:

- Windows Server 2012 R2: 320
- Windows Server 2016: 512

Maximum memory capacity

Maximum available memory capacity depends on the type of processor, see below.

CPU	Maximum memory capacity per CPU
Processors containing an “M” in the model Xeon ® Platinum, 8180M Xeon ® Gold 6134M	**1.5TB**
Others	**768GB**

3 Memory

3.1 Memory Configuration Feature Comparison

See the table below for feature comparisons of memory configurations supported.

	Independent Channel	Memory Sparing	Memory Mirroring
Performance	Best	Better	Good
Data Protection	No	Multiple single bit error protection	Multiple single bit and multi bit error protection
Redundancy	No	Partly	Fully
Data Correction	ECC, x4 SDDC	ECC, x4 SDDC	ECC, x4 SDDC
Available Memory	Full physical memory	Two ranks of memory per channel : Half physical memory Four ranks of memory per channel : 3/4 physical memory Eight ranks of memory per	Half physical memory

		channel : 7/8 physical memory 16 ranks of memory per channel : 3/4 physical memory	
Available Memory Channels	6	6	6
Notes	-	All DIMMs in the system must be identical. Eight or twelve DIMMs per processor are supported, two DIMMs are populated per channel	All DIMMs in the system must be identical. Twelve DIMMs per processor are supported,

NOTE:

- Single Rank Memory (N8102-708/-709) does not support Memory Mirroring Mode Configuration Service.
- Refer to "9.1 Memory RAS Settings"

3.2 Memory

Available slots: 12 per processor

Category	Product Name / Description	Part Number
Registered DIMM (RDIMM)	**8GB DDR4-2666 REG Memory Kit (1x8GB/SR)** 1 x 8GB Registered ECC DIMM, DDR4-2666(PC4-2666), Single Rank	N8102-708
	8GB DDR4-2666 REG Memory Kit (1x8B/DR) **1 x 8GB Registered ECC DIMM, DDR4-2666(PC4-2666), Dual Rank** **NOTE:** - This is make-to-order product.	N8102-714
	16GB DDR4-2666 REG Memory Kit (1x16GB/SR) 1 x 16GB Registered ECC DIMM, DDR4-2666(PC4-2666), Single Rank	N8102-709
	16GB DDR4-2666 REG Memory Kit (1x16GB/DR) 1 x 16GB Registered ECC DIMM, DDR4-2666(PC4-2666), Dual Rank	N8102-710
	32GB DDR4-2666 REG Memory Kit (1x32GB/DR) 1 x 32GB Registered ECC DIMM, DDR4-2666(PC4-2666), Dual Rank	N8102-711
Load Reduced DIMM (LRDIMM)	**64GB DDR4-2666 LR Memory Kit (1x64GB/QR)** 1 x 64GB Load Reduced ECC DIMM, DDR4-2666(PC4-2666), Quad Rank	N8102-712
	128GB DDR4-2666 LR Memory Kit (1x64GB/OR) 1 x 128GB Load Reduced ECC DIMM, DDR4-2666(PC4-2666), Octal Rank	N8102-713

NOTE:

- Minimum one memory kit per processor must be installed.
- It is recommended to install memory kits in multiples of 6 identical DIMMs for 6-channel symmetric memory configurations to increase memory transfer speed.
- Mix configurations of RDIMM and LRDIMM are not supported. Do NOT mix LRDIMM 64GB with LRDIMM 128GB.
- If you install more than six times N8102-713 128GB DDR4-2666 LR Memory Kit, you require one of the following CPU Processor codes containing an "M" (N8101-1261/-1262/-1263/-1264/-1265/-1266/-1267/-1268/-1269/-1270/-1271/-1272/-1273/-1274)
- See page 43 for additional memory configuration information

Maximum Memory Speed

See the table below for the actual maximum memory transfer speed. DDR4 memory speed depends on the native memory bus speed of the processor.

Processor Type	DIMM Speed
Xeon ® Platinum 8100 series Xeon ® Gold 6100 series Xeon ® Gold 5122 Processor	2666 MHz
Xeon ® Gold 5100 series excluding Xeon ® Gold 5122 Processor Xeon ® Silver 4100 series	2400 MHz
Xeon ® Bronze 3100 series	2133 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 2012 R2 Standard[1] Microsoft Windows Server 2012 R2 Datacenter[1]	**4 TB**	**3 TB**
Microsoft Windows Server 2016 Standard[1] Microsoft Windows Server 2016 Datacenter[1]	**24 TB**	**3 TB**
Red Hat Enterprise Linux 7	**12 TB**	**3 TB**
VMware ESXi 6.0 [2]	**6 TB**	**3 TB**
VMware ESXi 6.5 [3]	**12 TB**	**3 TB**
VMware ESXi 6.7 [3]	**16 TB**	**3 TB**

[1] The maximum available memory size of Hyper-V systems is below:
- Windows Server 2012 R2 : 4 TB
- Windows Server 2016 : 24 TB

[2] Up to 4 TB of the main memory is available to each virtual machine.

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

4 Internal Storage

4.1 Drive Bay 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

Category	Front Cage	Rear Cage	Middle Cage (Built in standard Riser Card)	Inside the server (Mounted on Standard Riser Card[1,2])
8x 2.5-inch Drive Cage[1]	**Standard :** **8x 2.5-inch SAS/SATA Drive** **Expansion:** **▪8x2.5-inch SAS/SATA Drive (Up to 1)** **▪Internal DVD Drive Kit (Up to 1)**	**Standard: -** **Expansion:** **2x2.5-inch SAS/SATA Drive (Up to 3)**	**Standard: -** **Expansion: -**	**Standard:** **2xM.2 SATA SSD [5]**
24x 2.5-inch Drive Cage[2]	**Standard:** **24x2.5-inch Drive** **Expansion: -**			
8x 3.5-inch Drive Cage[3]	**Standard :** **8x3.5-inch SAS/SATA Drive** **Expansion:** **2x2.5-inch SAS/SATA Drive (Up to 1)**	**Standard: -** **Expansion:** **▪2x2.5-inch SAS/SATA Drive (Up to 3)** **▪3x3.5-inch SAS/SATA Drive (Up to 1)**	**Standard: -** **Expansion:** **4x3.5-inch SAS/SATA Drive (Up to 1)**	
12x 3.5-inch Drive Cage[4]	**Standard:** **12x3.5-inch SAS/SATA Drive** **Expansion: -**			

[1] Up to 24 2.5-inch Drive Cage can be mounted

[2] Up to 30 2.5-inch Drive Cage can be mounted.

[3] Up to 15 3.5-inch Drive Cage can be mounted.In addition, one 2x 2.5-inch Drive Cage can be mounted.

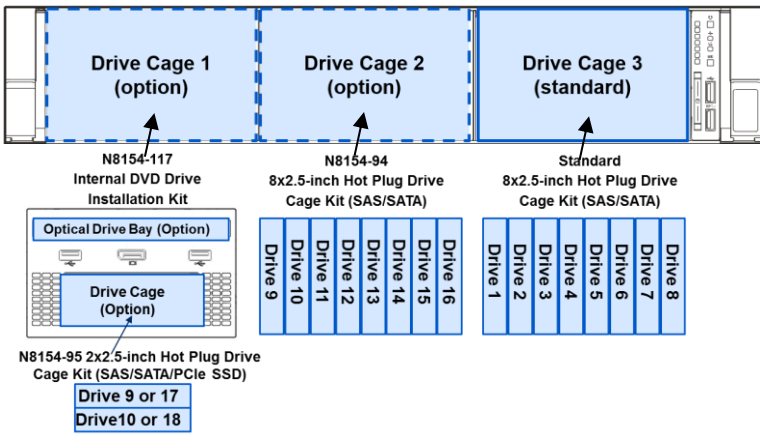
[4] Up to 19 3.5-inch Drive Cage can be mounted.In addition, one 2x 2.5-inch Drive Cage can be mounted.

[5] Up to two M.2 SATA SSDs can be installed using the standard 1st riser card. However, you cannot install M.2 SATA SSD in the optional 1st riser card. Also, it is impossible to connect RAID controller to M.2 SATA SSD.

4.1.1 Front Drive Bay

Drive Bay for 8x 2.5-inch Drive Model

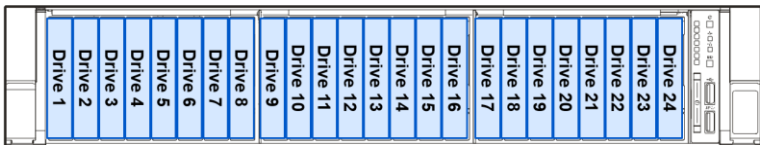
Eight 2.5-inch drive bays are standard. With optional 2.5-inch drive cages, up to 18 2.5-inch drive bays can be equipped.



- The order of mounting the optional Drive Cage is 2 → 1.

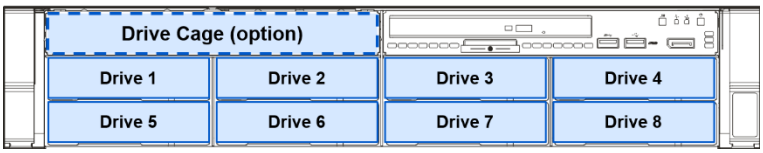
Drive Bay for 24x 2.5-inch Drive Model

24 2.5-inch drive bays are standard.



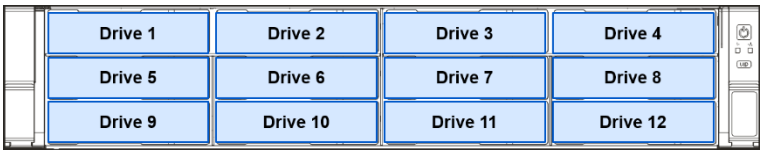
Drive Bay for 8x 3.5-inch Drive Model

Eight 3.5-inch drive bays are standard. With an optional 2.5-inch drive cage, two 2.5-inch drive bays can be added.



Drive Bay for 12x 3.5-inch Drive Model

Twelve 3.5-inch drive bays are standard.



NOTE:

- In default factory configuration, there are some conditions of drive types and RAID levels can be installed. Refer to “Condition of internal drives in default factory configuration.” in References
- Up to 10 drives can be installed in Non-RAID (Embedded SATA) configuration.

Refer to “Conditions for mixing of Internal Drives” in References.

4.1.2 8x 2.5-inch Drive Model

Category		Product Name / Description	Part Number
Front	**Drive Cage 3**	**8x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA)** 8x 2.5-inch SAS/SATA HDD For 8x 2.5-inch Drive Model	(Standard)
	Drive Cage 2	**8x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA)**	N8154-94

		8x 2.5-inch SAS/SATA HDD For 8x 2.5-inch Drive Model **NOTE:** - N8154-94 can be installed in Drive cage 2 only.	
	Drive Cage 1	**Internal DVD Drive Installation Kit** Equipping with one optical drive bay, one drive cage bay for 2x 2.5-inch Drive Cage, two USB connectors, and one Display port. For 8x 2.5-inch Drive Model Only	N8154-117

NOTE:

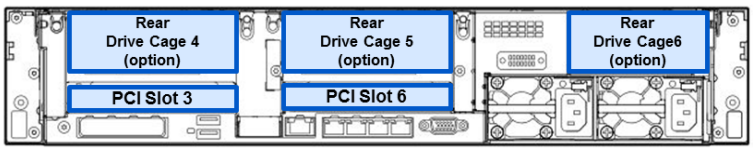
- If N8154-95 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA/PCIe SSD) and N8154-117 Internal DVD Drive Installation Kit are selected, N8154-95 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA/PCIe SSD) is preferentially installed in N8154-117 Internal DVD Drive Installation Kit.
- Up to 8 drives can be installed in Non-RAID (Embedded SATA) configuration.
- Refer to “Conditions for mixing of Internal Drives” in References.

4.1.3 8x 3.5-inch Drive Model

Category	Product Name / Description	Part Number
	2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA) 2x 2.5-inch SAS/SATA HDD For 8x 3.5-inch Drive Model	N8154-96

4.1.4 Optional Rear Drive Bay

Rear Drive Bay for all Drive Models



Category		Product Name / Description	Part Number
Rear (/ Front)	**Drive Cage 6**	**2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA/PCIe SSD)** Drive bay for 2x 2.5-inch SAS/SATA HDD/ PCIe SSD Up to 2 cages can be installed. For all Drive models	N8154-95
Rear	**Drive Cage 4/5**	**2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Rear)** Drive bay for 2x 2.5-inch SAS/SATA HDD, including Riser card for slot 3 or 6 with one PCIe 3.0 (x16) Up to 2 cages can be installed. For all Drive models	N8154-98

NOTE:

- If Rear Drive Cage is selected, N8181-158 High Performance Fan Kit is needed. However, in the configuration where a high -performance fan is attached to CPU, it is unnecessary to select it.
- If you order two N8154-95 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA/PCIe SSD), N8154-117 Internal DVD Drive Installation Kit is required. If one N8154-95 2x2.5-inch Hot Plug Drive Cage Kit is selected with N8154-117 Internal DVD Drive Installation Kit, the Drive Cage is preferentially installed in N8154-117 Internal DVD Drive Installation Kit mounted on Drive Cage 1 (Option). If one N8154-95 2x2.5-inch Hot Plug Drive Cage Kit is selected without N8154-117 Internal DVD Drive Installation Kit, the Drive Cage can be installed in Rear Drive Cage6 instead of 3rd PCI Riser Kit (2nd CPU is NOT required).
- One N8154-98 2x2.5-inch Hot Plug Drive Cage Kit can be installed in Rear Drive Cage 5 instead of 2nd PCI Riser Kit (2nd CPU is required). Two Drive Cage Kits can be installed in Rear Drive Cage 4/5 instead of 1st and 2nd Riser Card Kits.
- If N8154-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) is installed on 2nd Riser, not allowed to install 3rd Riser.

Drive Bay for 3.5-inch Drive Model

With an optional 2.5-inch and 3.5-inch drive cage instead of PCI Riser Card Kit, two 2.5-inch drive bays and three 3.5-inch drive bays can be added.

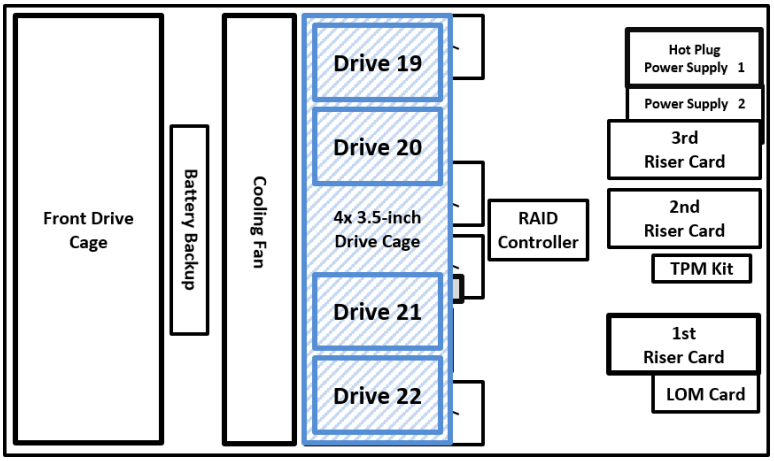
Category		Product Name / Description	Part Number
Rear	**Drive Cage 4**	**2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Rear)** 2x 2.5-inch SAS/SATA HDD, including Riser card for slot 3 with one PCIe 3.0 x16 slot For all Drive Models	N8154-98
	Drive Cage 7	**3x3.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Rear)** 3x 3.5-inch SAS/SATA HDD For 8x3.5-inch Drive Model and 12x3.5-inch Drive Model	N8154-99

NOTE:

- N8154-99 3x3.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) can be installed instead of 2nd, 3rd PCI Riser Kit and N8177-09 Optional RS-232C connector Kit. If the Drive Cage Kit is installed, 2nd, 3rd PCI Riser Kit or N8177-09 Optional RS-232C connecter Kit cannot be installed.
- After mounting N8154-99, N8154-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) can be installed instead of 1st PCI Riser Kit. If the Drive Cage Kit is installed, 1st Riser Card Kit cannot be installed.
- When N8154-99 3x3.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) is installed, only one N8154-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) can be installed.
- If Rear Drive Cage is selected, N8181-158 High Performance Fan is needed. However, in the configuration where a high-performance fan is attached to CPU, it is unnecessary to select it.

4.1.5 Optional Midplane Drive Bay for 3.5-inch Drive Model

With an optional drive cage installed inside chassis, four 3.5-inch drive bay can be equipped.



Category	Product Name / Description	Part Number
Inside	**4x3.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Mid)** Including two low profile heatsink For 8x3.5-inch Drive Model and 12x3.5-inch Drive Model	N8154-100

NOTE:

- Processor with 125 Watt or less are supported and High Performance Fan Kit are required.
- Platinum 8156 and Gold 6128, 5122 processors are not supported.
- Only half-length PCI cards can be installed.
- The heatsink included with the kit must be installed. In default factory configuration the heatsink installed automatically, not allowed to select the high-performance heatsink instead.
- To install the rear drive bay, N8181-158 High Performance Fan Kit must be installed. If this kit is included in the base model or some specific CPUs, it is not necessary to add this.
- To operate drive insertion/removal, the system must be turned off.

4.2 Storage Controllers and Options

4.2.1 Configuration selection of RAID

Please select according to function and performance. The following is an example of the configuration

Configuration	Maximum mountable number	RAID function	Support OS
Single connection	**8**	**Non**	**Windows Server 2012 R2 Windows Server 2016**
On-board RAID	**8**	**RAID 0/1/10**	**Windows Server 2012 R2 Windows Server 2016**
Internal RAID Controller(8 ports)	**8**	**RAID 0/1/5/6/10/50/60**	**Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 6.9 Red Hat Enterprise Linux 7 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7 or later**
Internal RAID Controller (8 ports) + SAS Expander Card	**26**		
Internal RAID Controller (16 ports)	**16**		
Internal RAID Controller (16 ports) + SAS Expander Card	**30**		

List of the configuration for Internal Drive and RAID

Category	Front Cage	Rear Cage	Middle Cage (Inside the server)	Inside the server (Mounted on Standard Riser Card)
8x 2.5-inch Drive Cage[1]	**Standard : 8x 2.5-inch SAS/SATA Drive Expansion: 8x2.5-inch SAS/SATA Drive (Up to 1) Internal DVD Drive Kit (Up to 1)**	**Standard: - Expansion: 2x2.5-inch SAS/SATA Drive (Up to 3) [2 3]**	**Standard: - Expansion: -**	**Standard: 2x M.2 SATA SSD [6]**
24x 2.5-inch Drive Cage[2,4]	**Standard: 24x2.5-inch Drive Expansion: -**			
8x 3.5-inch Drive Cage[7]	**Standard : 8x 3.5-inch SAS/SATA Drive Expansion: 2x2.5-inch SAS/SATA Drive (Up to 1) [7]**	**Standard: - Expansion: 2x2.5-inch SAS/SATA Drive (Up to 3) 3x3.5-inch SAS/SATA Drive (Up to 1) [2]**	**Standard: - Expansion: 4x3.5-inch SAS/SATA Drive (Up to 1) [2]**	
12x 3.5-inch Drive Cage[5]	**Standard: 12x x 3.5-inch SAS/SATA Drive Expansion: -**			

[1] Up to 8 SATA Drive can be connected in the single connection and On-board RAID configurations.

[2] In the factory installation, if Rear Cage or Middle Cage is selected, Internal RAID Controller and SAS Expander Card is necessary. However, when N8103-191 RAID Controller (4GB, RAID 0/1/5/6) is selected for 3.5-inch Drive Models, either of a middle cage or a rear cage can be installed.

[3] In the factory installation, if 24 Drives in Front Cage and 2 or more drives in Rear Cage is selected, Internal RAID Controller with 16 ports and SAS Expander Card are needed.

[4] In factory installation for 24x 2.5-inch Drive Model, Internal RAID Controller and SAS Expander Card are needed. However, it is unnecessary in the case under the following conditions,

* No OS pre-installation
* No Rear Cage installed
* N8103-191 RAID Controller (4GB, RAID 0/1/5/6) is selected.
* 16 or fewer Drives
* 2 sets of K410-378(00) Internal SAS/SATA Cable are selected.

[5] In factory installation of 12x3.5-inch Drive Model, if 16 ports RAID controller (N8103-191) or 8 ports RAID controller (N8103-189/ -190) with a SAS Expander Card (N8116-51) is selected, all drives in the front bay can be connected to one RAID controller, however when only 8 ports RAID controller (N8103-189/ -190) is selected, the RAID controller can be connecting to up to eight drives in the front bay, and other drive slots in the front bay are connected to Embedded SATA Controller which supports SATA drives only. The additional drives under Embedded SATA Controller must be installed after shipment.

[6] M.2 SATA SSD is connected to Embedded SATA Controller in single connection or On-board RAID configurations, not connected to other RAID Controllers.

[7] In factory installation of 2x2.5-inch SAS/SATA Drive in front cage, 16 ports RAID controller (N8103-191) or 8 ports RAID controller (N8103-189/ -190) with a SAS Expander Card (N8116-51) is needed.

4.2.2 Embedded SATA Controller

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 8 x 6Gb/s SATA drive, 2x M.2 drive(available soon)	(Standard)
Cable	**Internal SATA Cable**	(Standard)

NOTE:

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

4.2.3 Embedded SATA RAID Controller (RAID 0/1/10)

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 8 x 6Gb/s SATA, 2x M.2 drive	(Standard)
Cable	**Internal SATA Cable**	(Standard)

NOTE:

- For factory installation, up to 8 drives can be installed in the system.
- The Embedded SATA RAID Controller is available for Windows operating system only.

4.2.4 RAID Controller for Dedicated PCI Slot

Choose the appropriate RAID controller in accordance with RAID feature required, the number of drives to install.

Category		Product Name / Description	Part Number
Storage Controller	**8 Ports / Standard Heatsink**	**RAID Controller (RAID 0/1)** RAID 0/1/5/10 and SAS HBA mode, 0MB, Int. 8 ports, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s, Standard Heatsink	N8103-189
		RAID Controller (2GB, RAID 0/1/5/6) RAID 0/1/5/6/10/50/60, 2GB, Int. 8 ports, PCIe 3.0 x8, SAS 12Gb/s, SATA, 6Gb/s, Standard Heat Sink	N8103-190
	16 Ports / Standard Heatsink	**RAID Controller (4GB, RAID 0/1/5/6)** RAID 0/1/5/6/10/50/60, 4GB, Int. 16 ports, PCIe 3.0 x8, SAS 12Gb/s, SATA, 6Gb/s, Standard Heatsink	N8103-191
Battery Backup		**Battery Backup Unit** Lithium-ion Battery is needed for N8103-190/-191/-196/-201 RAID controller.	N8103-198
Expander Card		**SAS Expander Card** PCI card form factor, Int. 36, SAS 12Gb/s **NOTE:** - The card is required when you install the number of SAS drives that exceeds the number of the internal ports of a RAID controller. - Up to 26 drives can be connected with a SAS Expander Card. N8103-191 RAID controller is required to install 27 drives and more.	N8116-51

NOTE:

- One battery backup unit must be installed per system.
- N8103-189 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.

4.2.5 RAID Controller for Standard PCI Slot

Category	Product Name / Description	Part Number

Storage Controller	**RAID Controller (RAID 0/1)** RAID 0/1/5/10 and SAS HBA mode, 0MB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s **RAID Controller (2GB, RAID 0/1/5/6)** RAID 0/1/5/6/10/50/60, 2GB, Int. 8, PCIe 3.0 x8, SAS 12Gb/s, SATA 6Gb/s	N8103-195 N8103-201
Battery Backup	**Battery Backup Unit** Lithium-ion Battery for N8103-190/-191/-196/-201 RAID controller. 1 battery provides power to all RAID controller.	N8103-198
Expander Card	**SAS Expander Card** PCI card form factor, Int. 36, SAS 12Gb/s, SATA 6Gb/s **NOTE:** - The card is required when you install the number of SAS drives that exceeds the number of the internal ports of a RAID controller.	N8116-51
Cable	**Internal SAS/SATA Cable** **NOTE:** Cable for RAID controller (PCI slot) to front Drive Cage and Expander Card.	K410-378(00)

NOTE:

- The RAID controller must be installed after shipment.
- One battery backup unit must be installed per system.
- N8103-195 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.

4.3 Internal Drives

4.3.1 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** 1 x 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** 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-545

NOTE:

- 512e sector drives are not available for VMware ESXi 6.0 system.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.

4.3.2 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** 1 x 240GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive **480GB Hot Plug 2.5-inch SATA SSD** 1 x 480GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive **960GB Hot Plug 2.5-inch SATA SSD** 1 x 960GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive **1.92TB Hot Plug 2.5-inch SATA SSD** 1 x 1.92TB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive **3.84TB Hot Plug 2.5-inch SATA SSD** 1 x 3.84TB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Read Intensive	N8150-1740 N8150-1741 N8150-1742 N8150-1743 N8150-1744
Value Endurance **DWPD ≈ 3**	**480GB Hot Plug 2.5-inch SATA SSD** 1 x 480GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Value Endurance **960GB Hot Plug 2.5-inch SATA SSD** 1 x 960GB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Value Endurance **1.92TB Hot Plug 2.5-inch SATA SSD** 1 x 1.92TB SATA SSD, 2.5-inch, 6Gb/s, 512n sector, Value Endurance	N8150-1737 N8150-1738 N8150-1739

NOTE:

- All drives within a RAID array should be of the same capacity.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.

4.3.3 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** 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-546
	600GB Hot Plug 2.5-inch SAS HDD 1 x 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 1 x 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** 1 x 1.8TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512e sector	N8150-550
	2.4TB Hot Plug 2.5-inch SAS HDD 1 x 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:

- 512e sector drives are not available for VMware ESXi 6.0 system.
- All drives within a RAID array should be the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SATA SSDs and SAS SSDs can be mixed.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.

4.3.4 2.5-inch SAS Solid State Drives

Category	Product Name / Description	Part Number
Middle Endurance DWPD ≈ 10	**400GB Hot Plug 2.5-inch SAS SSD** 1 x 400GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Middle Endurance	N8150-1750
	800GB Hot Plug 2.5-inch SAS SSD 1 x 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** 1 x 400GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Value Endurance	N8150-1752
	800GB Hot Plug 2.5-inch SAS SSD 1 x 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** 1 x 960GB SAS SSD, 2.5-inch, 12Gb/s, 512n sector, Read Intensive	N8150-1754
	1.92TB Hot Plug 2.5-inch SAS SSD 1 x 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 capacity.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.

4.3.5 3.5-inch SATA Hard Disk Drives

Category	Product Name / Description	Part Number
512n Sector	**1TB 7.2K Hot Plug 3.5-inch SATA HDD** 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-554
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-555
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-557
512e Sector	**6TB 7.2K Hot Plug 3.5-inch SATA HDD** 1 x 6 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-558
	8TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 8 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-559
	10TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 10 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-560

	12TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 12 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-587

NOTE:

- 512e sector drives are not available for VMware ESXi 6.0 system.
- All drives within a RAID array should be the same type, capacity.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.

4.3.6 3.5-inch Near Line SAS Hard Disk Drives

Category	Product Name / Description	Part Number
512e Sector	**4TB 7.2K Hot Plug 3.5-inch SAS HDD** 1 x 4 TB Near Line SAS HDD, 3.5-inch, 12Gb/s, 7,200 rpm, 512e sector NOTE: - This HDD is make-to-order product.	N8150-597
	8TB 7.2K Hot Plug 3.5-inch SAS HDD 1 x 8 TB Near Line SAS HDD, 3.5-inch, 12Gb/s, 7,200 rpm, 512e sector	N8150-562
	10TB 7.2K Hot Plug 3.5-inch SAS HDD 1 x 10 TB Near Line SAS HDD, 3.5-inch, 12Gb/s, 7,200 rpm, 512e sector NOTE: - This HDD is make-to-order product.	N8150-563
	12TB 7.2K Hot Plug 3.5-inch SAS HDD 1 x 12 TB Near Line SAS HDD, 3.5-inch, 12Gb/s, 7,200 rpm, 512e sector	N8150-589

NOTE:

- 512e sector drives are not available for VMware ESXi 6.0 system.
- All drives within a RAID array should be of the same capacity.
- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.
- Near Line SAS HDDs (7200 rpm) and SAS-HDDs (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.

4.3.7 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:

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.

5 Optical Drive

Category		Product Name / Description	Part Number
Internal	**Installation Kit**	**Internal DVD Drive Installation Kit** Equipping with one optical drive bay, one drive cage bay for 2x 2.5-inch Drive Cage, two USB connectors, and one VGA connector. For 8x 2.5-inch Drive Model only NOTE: - The kit must be installed in the drive cage 1.	N8154-117
	Drive	**Internal Slim DVD-ROM drive** Slim DVD-ROM drive,	N8151-137
		Internal DVD-Super Multi Drive Slim DVD Super Multi drive, including writing software, SATA 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:

- If N8151-137/-138 Internal Slim DVD-ROM drive/ Internal DVD-Super Multi Drive selected, N8154-117 Internal DVD Drive Installation Kit is needed.
- Internal DVD drive cannot be installed in 24x2.5-inch Drive Model or 12x3.5-inch Drive Model, choose an external DVD-ROM drive.

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:

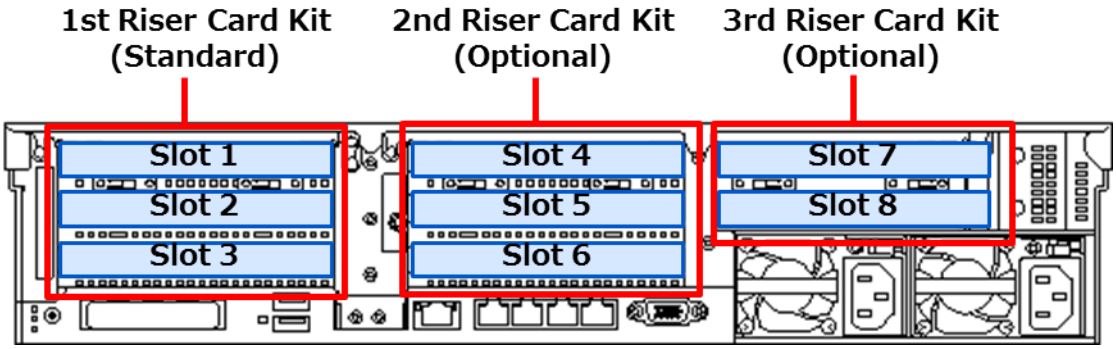
- Up to one drive can be connected.

7 PCI Riser Card /PCI Card

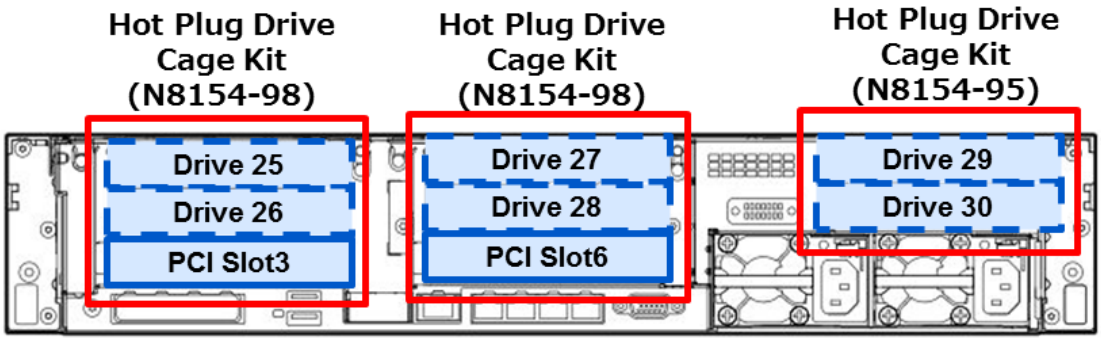
Up to three PCI riser cards can be installed in the system and 1st riser card is installed as standard. Up to three PCI cards can be mounted on the 1st riser card. To install four or more PCI cards, 2nd and 3rd PCI riser card is required. HDD cage is required for HDD installation

Please refer to "Supported PCI Cards and Installable Slots" with regards to the position of PCI slot。

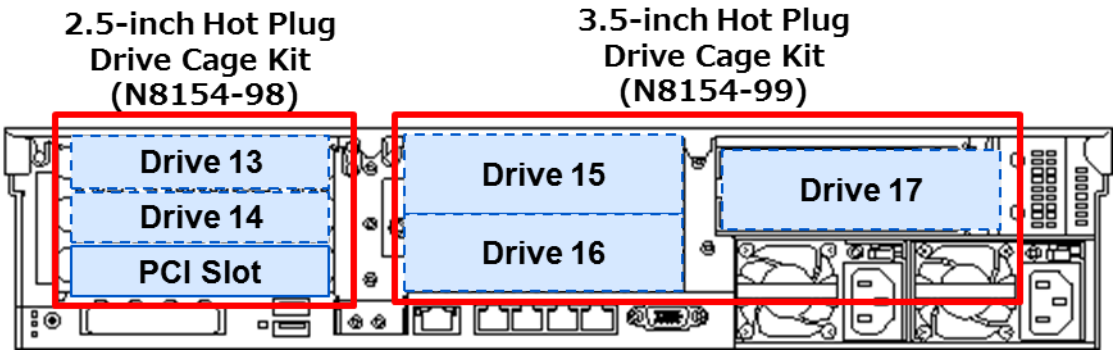
Rear Image (with PCI Riser only)



Rear Image (with 3x2.5"drive cage)



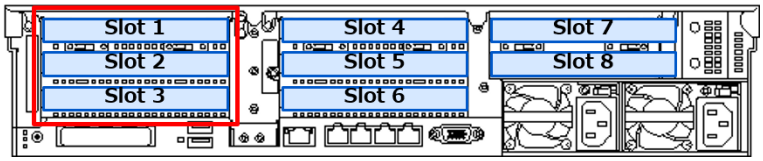
Rear Image (with 1x2.5"drive cage and 1x3.5" drive cage)

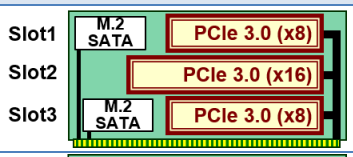
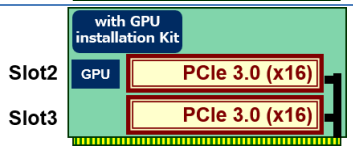
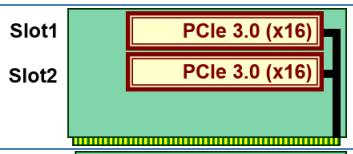


7.1 PCI Riser Card

The system supports many kind of the PCI slot configuration. Choose the appropriate configuration in accordance with the type of PCI cards you want to install and whether you need M.2 .slots.

7.1.1 1st PCI Riser Card Kit

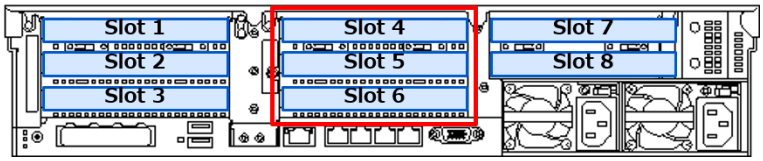


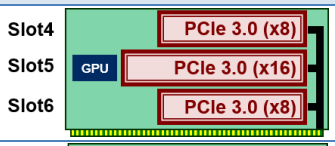
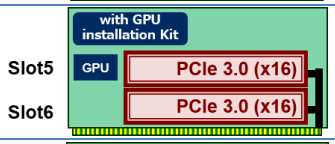
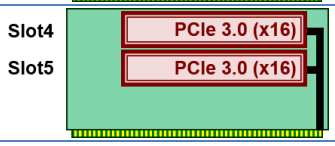
Product Name / Description	Figure	Part Number
1st Riser Card(3xPCI) Riser card for slot 1 to 3 with one PCIe 3.0 x16 slot, two PCIe 3.0 x8 slots, and two M.2 SATA connectors		(Standard)
1st Riser Card Kit (2xPCI + 1xGPU Installation Kit) Riser card for slot 2 to 3 with two PCIe 3.0 x16 slots, one power connector for GPU, and support bracket for a dual-slot PCI card. **NOTE:** - The Riser Card Kit is a factory installation option.		N8116-66
1st Riser Card Kit(2xPCI) Riser card for slot 1 to 2 with two PCIe 3.0 x16 slots **NOTE:** - The Riser Card Kit is a factory installation option.		N8116-64
2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Rear) Riser card for slot 3 or 6 with one PCIe 3.0 x16 slot, including 2x 2.5-inch drive bay to install into slot 1 to 2 or 4 to 5		N8154-98

NOTE:

- N8116-66/-64 are factory installation options, not allow to be ordered after shipment.
- If N8154-98 cage is selected, it must be installed in 1st PCI slot by factory installation. Refer to “Optional Rear Drive Bay“ in detail

7.1.2 2nd PCI Riser Card Kit



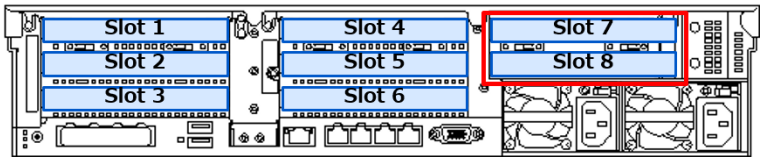
Product Name / Description	Figure	Part Number
2nd Riser Card Kit(3xPCI + 1xGPU Installation Kit) Riser card for slot 4 to 6 with one PCIe 3.0 x16 slot, two PCIe 3.0 x8 slot, and one power connector for GPU		N8116-62
2nd Riser Card Kit (2xPCI + 1xGPU Installation Kit) Riser card for slot 5 to 6 with two PCIe 3.0 x16 slot, one power connector for GPU, and support bracket for a dual-slot PCI card.		N8116-67
2nd Riser Card Kit(2xPCI) Riser card for slot 4 to 5 with two PCIe 3.0 x16 slots		N8116-56

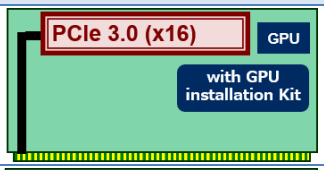
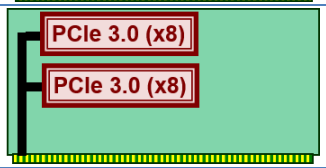
2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Rear) Riser card for slot 3 or 6 with one PCIe 3.0 x16 slot, including 2x 2.5-inch drive bay to install into slot 1 to 2 or 4 to 5	**Slot6**		N8154-98

NOTE:

- To use PCI slot 4 to 6, dual-processor configuration is required.
- If the N8154-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) is installed on 2nd Riser, it is not allowed to install 3rd Riser. Refer to 4.1.4Optional Rear Drive Bay" in detail.

7.1.3 3rd PCI Riser Card Kit



Product Name / Description	Figure		Part Number
3rd Riser Card Kit(1xPCI, 1xGPU Installation Kit) Riser card for slot 7 with one PCIe 3.0 x16, one power connector for GPU, and support bracket for a dual-slot PCI card	**Slot7**		N8116-78
3rd Riser Card Kit(2xPCI) Riser card for slot 7 to 8 with two PCIe 3.0 x8 slots	**Slot7** **Slot8**		N8116-81

NOTE:

- Dual-processor configuration is required.
- 2nd PCI Riser Card Kit (N8116-62/-67/-56) is required to install 3rd Riser Card Kit.
- If you order two N8154-95 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA/PCIe SSD), N8154-117 Internal DVD Drive Installation Kit is required. If one N8154-95 2x2.5-inch Hot Plug Drive Cage Kit is selected with N8154-117 Internal DVD Drive Installation Kit, the Drive Cage is preferentially installed in N8154-117 Internal DVD Drive Installation Kit mounted on Drive Cage 1 (Option). If one N8154-95 2x2.5-inch Hot Plug Drive Cage Kit is selected without N8154-117 Internal DVD Drive Installation Kit, the Drive Cage can be installed in Rear Drive Cage6 instead of 3rd PCI Riser Kit.
- The 3rd PCI Riser Card Kit is not available if the N8154-95 2x 2.5-inch Drive Cage Kit is installed into slot 7 to 8.
- If N8154-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) are selected in 2nd Riser, 3rd Riser Card kit can't be installed.

7.2 Network Interface Controller

Category		Product Name / Description	Part Number
LOM Card	**1GbE**	**Quad Port 1000BASE-T LOM Card** Broadcom BCM5719 PCIe 2.0(x4)	N8104-171
		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
		Dual Port 10GBASE-T LOM Card Intel X550 PCIe 3.0(x4)	N8104-175
		Dual Port 10GBASE SFP+ LOM Card Intel Ethernet Controller X710 PCIe 3.0(x8) **NOTE:** - N8104-189 SFP+ Module is required to connect with an optical cable. - Up to two SFP+ Modules can be installed. - Twinax cable can be installed.	N8104-176
	25GbE	**Dual Port 25GBASE SFP28 LOM Card**	N8104-177

		Cavium 45604 PCIe 3.0(x16) **NOTE:** - N8104-190 SFP28 Module is required to connect with an optical cable. - Up to 2 SFP28 Modules can be installed. - Twinax cable can be installed - 6 or more memories per processor are needed for maximum performance.	
Adapter	**1GbE**	**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 Broadcom BCM5719 Gigabit Ethernet Controller PCIe 2.0(x4) **NOTE:** - Network cables with RJ-45 plug covers cannot be used.	N8104-179
		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, PCIe3.0(x8)	N8104-183
		Dual Port 10GBASE-T Adapter Intel X550-AT2, PCIe3.0(x4)	N8104-184
		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. - Twinax cable can be installed	N8104-185
		Dual Port 10GBASE SFP+ Adapter Intel Ethernet Controller X710 PCIe 3.0(x8) **NOTE:** - N8104-189 SFP+ Module is required to connect with an optical cable. - Up to 2 SFP+ Modules can be installed. - Twinax cable can be installed	N8104-186
	25GbE	**Dual Port 25GBASE SFP28 Adapter** Cavium QL41401, PCIe3.0(x8) NOTE: - N8104-190 SFP28 Module is required to connect with an optical cable. - Up to 2 SFP28 Modules can be installed. - 6 or more memories per processor are needed for maximum performance.	N8104-187
SFP Module	**10GbE**	**SFP+ Module (10G-SR)** 1 x SFP+ Module	N8104-189
	25GbE	**SFP28 Module (25G-SR)** 1x SFP28 Module SFP28 can be connected to 25G BASE adapter **NOTE:** It is not factory installation option.	N8104-190

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.

  https://configmax.vmware.com/
- When 10G LAN and 1000BASE-T are installed in VMware ESXi 6.0/6.5/6.7 systems, up to 16 ports for 10G LAN and up to 4 ports for 1000BASE-T are available. R120h-2M is equipped with 4 ports 1000BASE-T as standard, no more 1000BASE-T port is added.

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 N8104-171/-178/-179	Up to four ports per one team	Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 7.3 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7
1GbE NIC N8104-172/-180/-181	Up to four ports per one team	Windows Server 2016 Red Hat Enterprise Linux 7.3 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7
10GbE NIC N8104-173/-182	Up to four ports per one team	Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 7.3 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7
10GbE NIC N8104-175/-184	Up to four ports per one team	Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 7.3 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7
10GbE NIC N8104-183	Up to four ports per one team	Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 7.3 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7
10GbE NIC N8104-185	Up to four ports per one team	Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 7.3 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7
10GbE NIC N8104-176/-186	Up to four ports per one team	Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 7.3 VMware ESXi 6.0 Update3 VMware ESXi 6.5 Update1 or later VMware ESXi 6.7
25GbE NIC N8104-177/-187	Up to four ports per one team	Windows Server 2012 R2 Windows Server 2016 Red Hat Enterprise Linux 7.3

NOTE:

- The Bonding function of 10GBASE is available for mode 1 (active-backup) and mode 4 (802.3 ad).
- Mixing 1000 BASE teaming, 10 GBASE teaming, and 25 GBASE teaming in one system is supported. For Windows Server 2012 R2, Windows Server 2016, Red Hat Enterprise Linux, up to 5 teams per system can be installed.

7.3 External Storage Controller

7.3.1 External 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	**Battery Backup Unit** Lithium-ion Battery for RAID controller.	N8103-198

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 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.

7.3.2 Fibre Channel / SAS Controller

It is connected to tape device, device expansion unit and NEC Storage. The controller varies by different device connected

Category	Product Name / Description	Part Number
Fibre Channel	**Fibre Channel Controller (1ch)** Cavium QLogic, QLE2690 16Gb/s, Optical, PCIe 3.0 x8 **NOTE:** - The controller is qualified with NEC Storage M series, OS support WS2012R2 and WS2016 - The controller is qualified with NEC Storage T series, OS support WS2012R2, WS2016 and RHEL7.3	N8190-165
	Fibre Channel Controller (2ch) Cavium QLogic, QLE2692 16Gb/s, Optical, PCIe 3.0 x8 **NOTE:** - The controller is qualified with NEC Storage M series, OS support WS2012R2 and WS2016. - The controller is qualified with NEC Storage T series, OS support WS2012R2, WS2016 and RHEL7.3	N8190-166
	Fibre Channel Controller (1ch) Broadcom, LPe31000 16Gb/s, Optical, PCIe 3.0 x8 **NOTE:** - The controller is qualified with NEC Storage M series. - The controller is not qualified with NEC Storage T series	N8190-163
	Fibre Channel Controller (2ch) Broadcom, LPe31002 16Gb/s, Optical, PCIe 3.0 x8 **NOTE:** - The controller is qualified with NEC Storage M series. - The controller is not qualified with NEC Storage T series	N8190-164
	Fibre Channel Controller (1ch) Broadcom, LPe32000 32Gb/s, Optical, PCIe 3.0 x8 **NOTE:** - The controller is qualified with NEC Storage M series. - The controller is not qualified with NEC Storage T series	N8190-171
	Fibre Channel Controller (2ch) Broadcom, LPe32002 32Gb/s, Optical, PCIe 3.0 x8 **NOTE:** - The controller is qualified with NEC Storage M series	N8190-172

	- The controller is not qualified with NEC Storage T series	
SAS	**SAS Controller** 12Gb/s SAS, ext. 8(SFF-8644 x2), PCIe 3.0 x8 **NOTE:** - Support tape connection via Device Expansion Unit only	N8103-197
	SAS Controller LSI SAS9300-8e Host Bus Adapter 12Gb/s SAS, ext. 8(SFF-8644 x2), PCIe 3.0(x8) **NOTE:** - Support for connection to NEC Storage T series and M series and LTO - The controller is not qualified with Tape drive connection via Device Expansion Unit. - Please download the driver kit from Express5800 website - This controller is an factory installation option. Select N8103-184 for the field upgrade use after shipment.	N8103-E184

NOTE:

- Please refer to the NEC Storage website for supported OS and device
- 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.

7.4 GPU Computing Card

Product Name / Description	Part Number
GPU Computing Card NVIDIA Tesla P4	N8105-51

NOTE:

- When installing N8105-51 GPU Computing Card, select items below.
  - N8101-1286 High Performance CPU Heatsink Kit (In some CPU Processor kits, a high-performance CPU heat sink is attached as standard)
  - N8181-158 High Performance Fan Kit (In some Base Models, High Performance Fans are attached as standard)
  - One riser card from among N8116-66/-62/-67/-78
- When installing N8105-51 GPU Computing Card, meet the following conditions.
  - System memory under 1TB in total
  - Up to one N8105-51 GPU can be installed
  - Operating under 35 degrees Celsius
  - Optional drive cage is not supported

7.5 Serial Port Adapter

Product Name / Description	Part Number
Additional Serial Port Kit Serial port Connector, PCIe bracket	N8117-09

NOTE:

- Up to one serial port adapter can be installed.
- When 3rd Riser Card is installed, the kit can be installed occupying a PCIe slot (Slot6) on 2nd Riser Card. If the 2nd Riser Card is N8116-56, no PCIe slot on the 2nd Riser Card is being used.
- If you need to install N8154-99 3.5-inch Rear HDD Cage, an additional serial port kit is not available.

7.6 ExpEther Board

It is connected to ExpEther I/O Expasion Unit(40G)

Product Name / Description	Part Number
ExpEther Board PCIe 3.0(x8), 2x40G QSFP+ port	N8104-165

NOTE:

- Up to two ExpEther Board can be installed.
- QSFP+ module is required.

- It is supported to directly connect to ExpEther I/O Expansion Unit.
- Please contact your sales representative for further information.

8 Other Add-in Components

8.1 Power Supply

Category	Product Name / Description	Part Number
1 PSU Required Up to 2 PSU	**500W Hot Plug Power Supply** 1 x 500 Watt 80 PLUS® Platinum	N8181-159
	800W Platinum Hot Plug Power Supply 1 x 800 Watt 80 PLUS® Platinum	N8181-160
	800W Titanium Hot Plug Power Supply 1 x 800 Watt 80 PLUS® Titanium NOTE: - Support 200 VAC inlet only	N8181-161
	1600W Hot Plug Power Supply 1 x 1600 Watt 80 PLUS® Platinum NOTE: - Support 200 VAC inlet only	N8181-162
	800W -48VDC Hot Plug Power Supply 1 x 800 Watt 80 PLUS® Platinum NOTE: - Support -48 VDC inlet only - This is make-to-order product.	N8181-163

NOTE:

- Minimum one power supply kit must be installed.
- The power units must be the same to configure redundancy.

Available Power Supplies

See the table below for available power supplies based on the number of drives, the number and type of processors, and the type and number of DIMMs.

24x2.5-inch Drive Model and 12x3.5-inch Drive Model

Number of Processors	Type of Processor	Type of DIMMs	Number of DIMMs	Available Power Supply
1CPU	Processor with 150 Watt or less	-	-	800W, 1600W
	Processor with 165 Watt or more	-	-	1600W
2CPU	Processor with 85 Watt	RDIMM	Up to 6	800W, 1600W
			7 or more	1600W
		LRDIMM	-	1600W
	Processor with 105 Watt or more	-	-	1600W

- 128GB LRDIMM requires 1600W power supply.

8x2.5-inch Drive Model (without Optional Drive Cage) and 8x3.5-inch Drive Model (without Optional Drive Cage)

Number of Processors	Type of Processor	Type of DIMMs	Number of DIMMs	Number of PCI Cards	Number of Internal Disks	Available Power Supply
1CPU	Processor with 150 Watt or less	RDIMM	Up to 6	-	-	500W, 800W, 1600W
			7 or more	-	-	800W, 1600W
		64GB LRDIMM	-	-	-	800W, 1600W
		128GB LRDIMM	-	-	-	1600W
	Processor with 165 Watt or more	-	-	-	-	800W, 1600W
2CPU	Processor with 115 Watt or less	RDIMM	-	-	-	800W, 1600W
		64GB LRDIMM	Up to 14	-	-	800W, 1600W
			15 or more	-	-	1600W

		128GB LRDIMM	-	-	-	1600W
	Processor with 125 Watt and 130 Watt	RDIMM	Up to 16	-	-	800W, 1600W
			17 or more	-	-	1600W
		64GB LRDIMM	Up to 12	Up to 6	-	800W, 1600W
				7 or more	-	1600W
			13 or more	-	-	1600W
		128GB LRDIMM	-	-	-	1600W
	Processor with 140 Watt and 150 Watt	RDIMM	Up to 16	Up to 4	-	800W, 1600W
				5 or more	-	1600W
			17 or more	-	-	1600W
		64GB LRDIMM	Up to 12	Up to 6	Up to 4	800W, 1600W
					5 or more	1600W
				7 or more	-	1600W
			13 or more	-	-	1600W
		128GB LRDIMM	-	-	-	1600W
	Processor with 165 Watt or more	-		-	-	1600W

NOTE:

- 128GB LRDIMM requires 1600W power supply.
- Number of PCI Cards do NOT include a dedicated RAID card or a dedicated LOM controller.

8x2.5-inch Drive Model (with Optional Drive Cage) and 8x3.5-inch Drive Model (with Optional Drive Cage)

Number of Processors	Type of Processor	Type of DIMMs	Number of DIMMs	Number of PCI Cards	Available Power Supply
1CPU	-	-	-	-	800W, 1600W
2CPU	Processor with 85 Watt	RDIMM	Up to 12	-	800W, 1600W
			13 or more	-	1600W
		LRDIMM	-	-	1600W
	Processor with 105 Watt	RDIMM	Up to 6	Up to 6	800W, 1600W
				7 or more	1600W
			7 or more	-	1600W
		LRDIMM	-	-	1600W
	Processor with 115 Watt or more	-	-	-	1600W

NOTE:

- 128GB LRDIMM requires 1600W power supply.
- Number of PCI Cards do NOT include a dedicated RAID card or a dedicated LOM controller.

8x2.5-inch Drive Model and 8x3.5-inch Drive Model with GPU installation

Number of Processors	Type of Processor	Type of DIMMs	Number of DIMMs	Number of PCI Cards	Available Power Supply
1CPU	-	-	-	-	800W, 1600W
2CPU	Processor with 115 Watt or less	RDIMM	Up to 12	-	800W, 1600W
			13 or more	-	1600W
		64GB LRDIMM	Up to 6	-	800W, 1600W
			7 or more	-	1600W
		128GB LRDIMM	-	-	1600W
	Processor with 125 Watt and 130W	RDIMM	Up to 6	Up to 6	800W, 1600W
				7 or more	1600W
			7 or more	-	1600W
		LRDIMM	-	-	1600W
	Processor with 140 Watt and 150 Watts	RDIMM	Up to 6	Up to 2	800W, 1600W

				3 or more	1600W
			7 or more	-	1600W
		LRDIMM	-	-	1600W
	Processor with 165 Watt or more	-	-	-	1600W

NOTE:

- 128GB LRDIMM requires 1600W power supply.
- Number of PCI Cards do NOT include a dedicated RAID card or a dedicated LOM controller.

Guideline of Maximum Power Consumption

See the following table for the guideline of the maximum power consumption based on the TDP and Input voltage. The actual maximum power consumption varies depend on the type of processor while the TDP of processor is the same.

200VAC Input

CPU TDP	8 x 2.5-inch	24 x 2.5-inch	8 x 3.5-inch	12 x 3.5-inch
85 Watt	991W / 992VA	1036W / 1038VA	983W / 984VA	1013W / 1015VA
105 Watt	1048W / 1049VA	1093W / 1094VA	1039W / 1041VA	1070W / 1071VA
115 Watt	1045W / 1047VA	1100W / 1101VA	1046W / 1047VA	1077W / 1078VA
125 Watt	1094W / 1097VA	1150W / 1152VA	1096W / 1097VA	1127W / 1128VA
130 Watt	1086W / 1088VA	1141W / 1142VA	1087W / 1088VA	1118W / 1119VA
140 Watt	1134W / 1135VA	1189W / 1191VA	1135W / 1136VA	1166W / 1167VA
150 Watt	1153W / 1154VA	1208W / 1209VA	1153W / 1155VA	1184W / 1186VA
165 Watt	1201W / 1202VA	1254W / 1255VA	1152W / 1154VA	1183W / 1184VA
200 Watt	1270W / 1271VA	1326W / 1329VA	1217W / 1217A	1244W / 1247VA
205 Watt	1270W / 1271VA	1326W / 1329VA	1217W / 1217A	1244W / 1247VA

NOTE:

- This table shows maximum power consumption with 64GB LRDIMM.

8.2 High Performance CPU Heatsink

Product Name / Description	Part Number
High Performance CPU Heatsink Kit Including two high performance CPU heat sink	N8101-1286

NOTE:

- The kit is required if you need to replace the standard CPU Heatsink.

Type of CPU Heatsink

The Heatsink attached varies depending on the processor type.

CPU	Type of CPU Heatsink
130W or higher TDP CPU, Intel® Xeon® Processor Platinum 8156, Gold 6128, and Gold 5122	**High Performance CPU Heatsink**
Others	**Standard CPU Heatsink**

8.3 Fan Kit

Product Name / Description	Part Number
Standard Fan Kit 4x Hot-plug redundant cooling fans	(Standard)
High Performance Fan Kit 6x Hot-plug redundant cooling fans	N8181-158

NOTE:

- High Performance Fan kit is standard on 24x2.5-inch Drive Model and 12x3.5-inch Drive Model
- High Performance Fan kit is required when the following options are installed on 8x2.5-inch Drive Model and 8x3.5-inch Drive Model:
  - N8154-100 4x3.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Mid)
  - N8154-95 2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA/PCIe SSD)
  - N8154-98 2x2.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Rear)
  - N8154-99 3x3.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Rear)
  - Graphics Card
- The cable management arm is required if you want to replace a fan unit while the system is running

8.4 Front Panel Kit

Product Name / Description	Part Number
Status LED LED indicator for power, system status and aggregate NIC activity	(Standard)
Status LED Panel Kit Standard LED indicator plus LED indicator for CPU, Memory, Fan, Power supply, PCI Riser, individual NIC activity For 8x 2.5-inch Drive Model and 24x 2.5-inch Drive Model	N8117-06

NOTE:

You can monitor the status of each part from BMC management console or NEC ESMPRO. Ordering the Status LED Panel Kit, you can check the detailed status of devices directly.

8.5 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.
- "Chipset-TPM" in BIOS setup menu must be activated prior to use of this product.
- 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.

8.6 USB Memory Kit

Product Name / Description	Part Number
8GB USB Memory Support boot VMware ESXi from 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.
- The USB Memory Kit cannot be installed if M.2 SATA Solid State Drives are installed.

- To use VMware vSAN, combination of vSAN certified hardware is required.
- If you are using VMware vSAN and cannot boot from USB Memory Kit, please order M.2 SATA SSD.

8.7 Power Cable for GPU

Product Name / Description	Part Number
Graphics Card Power Cable (8Pin. Type A) Power cable for video card (PCIe 8Pin), for NVIDIA Quadro P6000	K410-386(00)
Graphics Card Power Cable (8Pin. Type B) Power cable for video card (CPU 8Pin) , for NVIDIA P40/P100	K410-387(00)
Graphics Card Power Cable (8+6Pin) Power cable for video card (8Pin + 6Pin), for AMD Radeon Instinct MI25	K410-388(00)
Graphics Card Power Cable (6+6Pin) Power cable for video card (6Pin + 6Pin) , for NVIDIA Quadro P4000	K410-391(00)

NOTE:

- To install GPU cards, the riser card with a power connector for GPU, High Performance CPU Heatsink, and High Performance Fan kit must be installed. Refer to PCI Riser Card /PCI Card, High performance CPU heatsink, and Fans in detail
- Cable varies depending on the GPU card installed. Please check the specifications of the GPU card and select the cable.
- Default factory configuration is available.

9 Factory Server Setting Service

9.1 Memory RAS Settings

If you need to change the BIOS settings for the memory RAS feature at the factory, select the appropriate configuration service.

Product Name / Description	Part Number
Memory Mirroring Mode Configuration Service Setup option to change the Memory RAS of BIOS menu to Memory Mirroring Mode	NESV16-013
Memory Sparing Mode Configuration Service Setup option to change the Memory RAS of BIOS menu to Memory Sparing Mode	NESV16-014

NOTE:

- It is an option only for factory setup
- Single Rank Memory (N8102-708/-709) does not support Memory Mirroring Mode Configuration Service (NESV16-013)

9.2 RAID Configuration Service

If RAID configuration setup is NOT needed when a RAID controller is installed at the factory, select this option service.

Product Name / Description	Part Number
RAID Config Option(None) Server setting option service without RAID configuration setup when a RAID controller is installed.	NESV16-039

10 Add-on Components

10.1 17-inch LCD Console Drawer

Category		Product Name / Description	Part Number
Drawer w/ KVM	**Drawer**	**17-inch LCD Console Drawer (8port)** 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 (1port) 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 (1port)	N8143-109
		Keyboard Unit (UK) UK 104-keys Keyboard with 10-key, for N8143-108F 17inch LCD Console Drawer (1port)	N8143-111

NOTE:

- Keyboard of N8143-105F/-106F does not have 10-key.
- Order Switch Unit Connection Cable Set as same number of sets as servers to be connected to. (max 8 servers)

10.2 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)

10.3 Server Management License

Choose the following license kit to use additional remote and system management features.

Product Name / Description	Part Number
License for Remote Management (Advanced) License per server Remote console: - 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	N8115-33
License for Remote Management (Scale-Out) License per server Remote console: - Text-based remote console via SSH - Integrated Remote Console (IRC) under Pre-OS System management: - Email alert - Remote Syslog feature - Virtual Serial Port recording and playback	N8115-34

NOTE:

- Remote management features are not available for virtual machines.

10.4 Dust Proof Filter Kit

Product Name / Description	Part Number
Dust Proof Filter Kit It is used for 2U Rack model. Including the filter attachment kit and 10 sets of dust proof filters When attached to standard bezel can support dust proof function. Suggested replacement: Every three months (depending on environment).	N8147-33

NOTE:

- The Dust Proof filter kit is make-to-order products. Please consult your sales representative in regard to the production lead time.

10.5 Slide Rail Kit

Rail	Product Name / Description	Part Number
1 Rail kit Required	**Tool-free Slide Rail Kit for 2U-2.5inch Server**	N8143-133
	Tool-free Slide Rail Kit for 2U-3.5inch Server	N8143-134
	Slide Rail Kit for 2U-2.5inch Server NOTE: Inner rails are not necessary.	N8143-129
	Slide Rail Kit for 2U-3.5inch Server NOTE: Inner rails are not necessary.	N8143-130

NOTE:

- The slide rail kit must be ordered with a base model.

10.6 Cable Management Arm

Product Name / Description	Part Number
Cable Management Arm for 2U Server Cable Arm for Tool-free Slide Rail Kit	N8143-126
Cable Management Arm for 2U Server Cable Arm for Slide Rail Kit	N8143-124

NOTE:

- The cable management arm install in the rear of system to manage cables.
- The cable management arm must be ordered with a base model.
- The cable management arm is required if you want to replace a fan unit while the system is running.

10.7 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/R120h-1M, R120h-2M Starter Pack	UL9020-B108

NOTE:

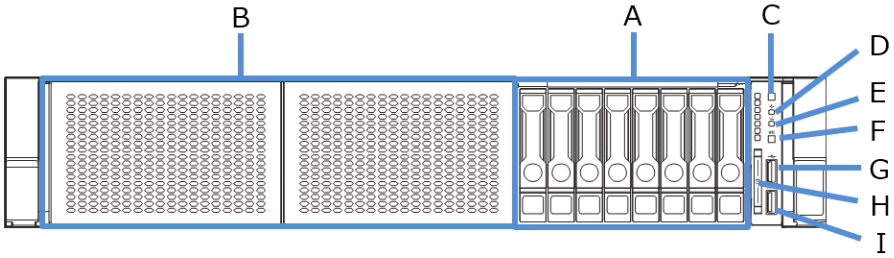
- By applying Starter Pack, Driver software qualified by NEC can be installed. To use servers, UL9020-B108 Starter Pack or Starter Pack downloaded from Web site must be installed.
- Starter Pack may be updated without notice. The latest version of Starter Pack is available in Web site. Starter Pack can be downloaded within Warranty term.
- User Guide of this product is supplied as PDF file in NEC Web site.

References

External Views

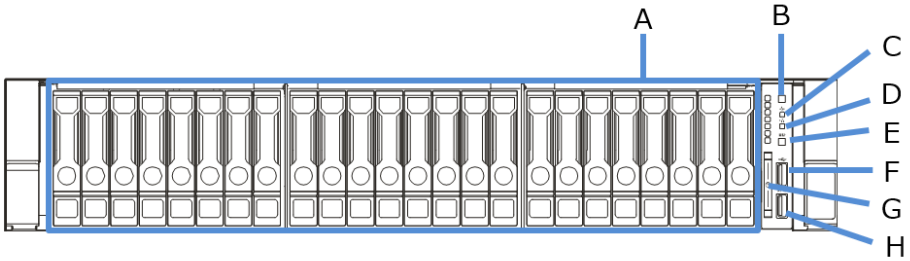
Front and Rear Views

Front View for 8x 2.5-inch Drive Model



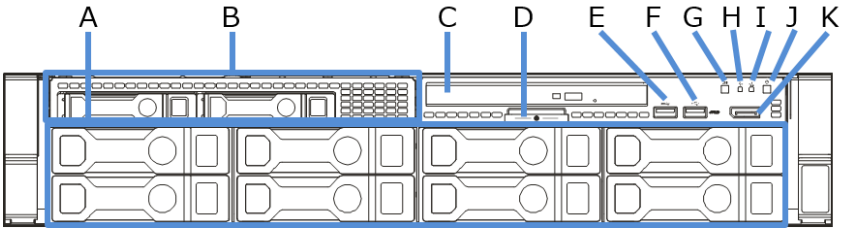
Legend			
A.	2.5-inch Drive Bays	**F.**	UID button/LED
B.	Drives or optical/video /USB (optional)	**G.**	iLO Service Connector
C.	Power On/standby button/LED	**H.**	Pull-out Tab
D.	Health LED	**I.**	USB 3.0 Connector
E.	Network Link/Activity LED		

Front View for 24x 2.5-inch Drive Model



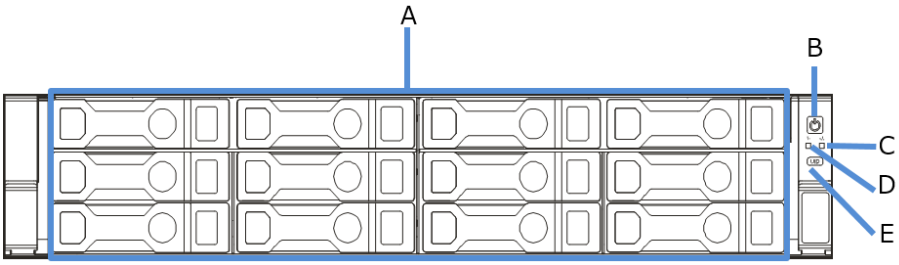
Legend			
A.	2.5-inch Drive Bays	**E.**	UID button/LED
B.	Power On/standby button/LED	**F.**	iLO Service Connector
C.	Health LED	**G.**	Pull-out Tab
D.	Network Link/Activity LED	**H.**	USB 3.0 Connector

Front View for 8x 3.5-inch Drive Model



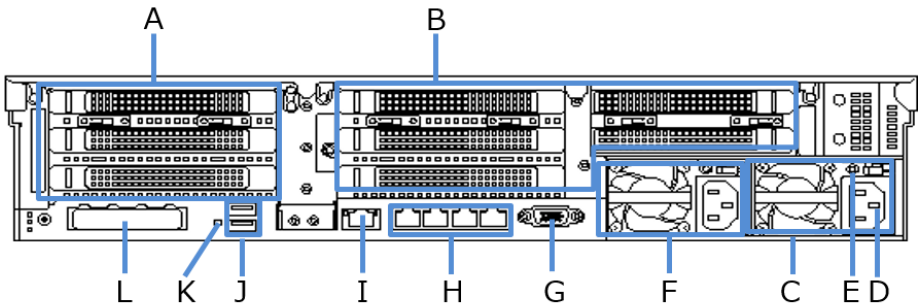
Legend			
A.	3.5-inch Drive Bays	G.	UID button LED
B.	2.5-inch Drive Cage Bay	H.	Health LED
C.	Optical Drive Bay	I.	Network Link/Activity LED
D.	Pull-out Tab	J.	Power On/standby button/LED
E.	USB 3.0 Connector	K.	DisplayPort Connector
F.	iLO Service Connector		

Front View for 12x 3.5-inch Drive Model



Legend			
A.	3.5-inch Drive Bays	**D.**	Health LED
B.	Power On/standby button/LED	**E.**	UID LED Button
C.	Network Link/Activity LED		

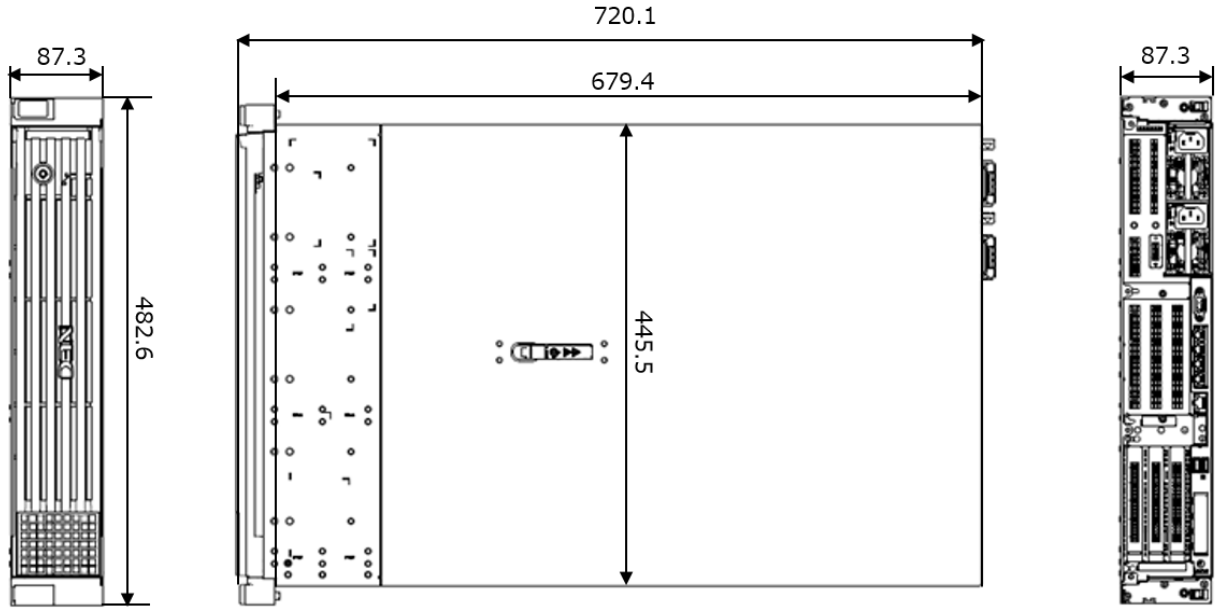
Rear View



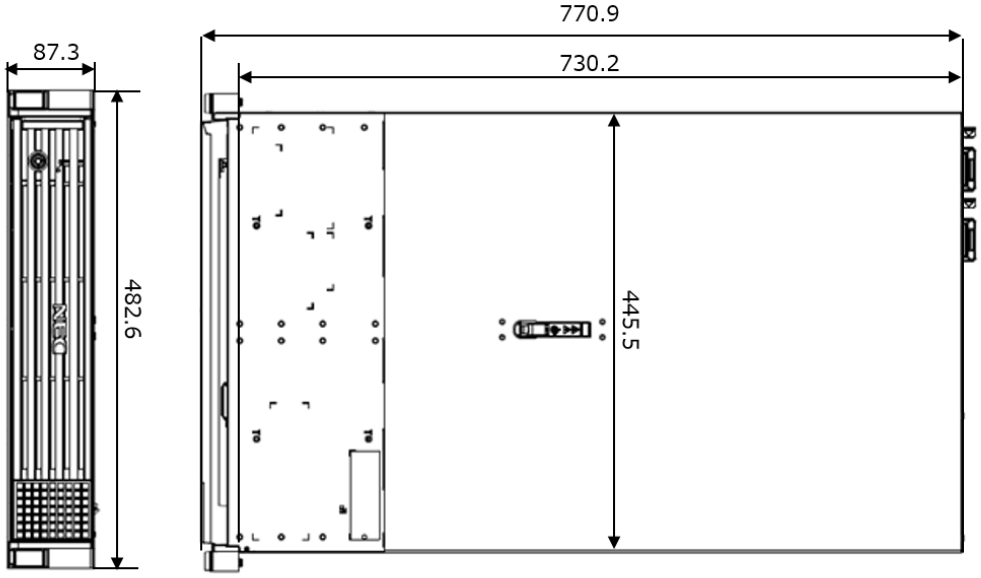
Legend			
A.	PCI Slots (Standard)	**G.**	VGA Connector
B.	PCI Slots (option)	**H.**	NIC Connectors 1-4 (1Gb)
C.	Power Supply	**I.**	Management Port
D.	AC Inlet	**J.**	USB 3.0 Connectors
E.	AC Power LED	**K.**	Rear UID LED
F.	Power Supply (optional)	**L.**	Flexible LOM (optional)

Dimensions (mm)

8x and 24x 2.5-inch Drive Model



8x and 12x 3.5-inch Drive Model



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 NPT servers is recommended.**

Memory Supplementary Matters

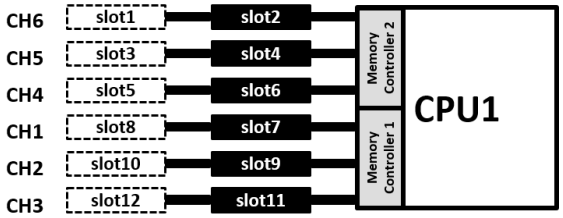
Installation rule

- 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), Load Reduced DIMM (LRDIMM) can be installed up to 12 per 1CPU.
- Mixing of RDIMM and LRDIMM is not allowed to be installed.

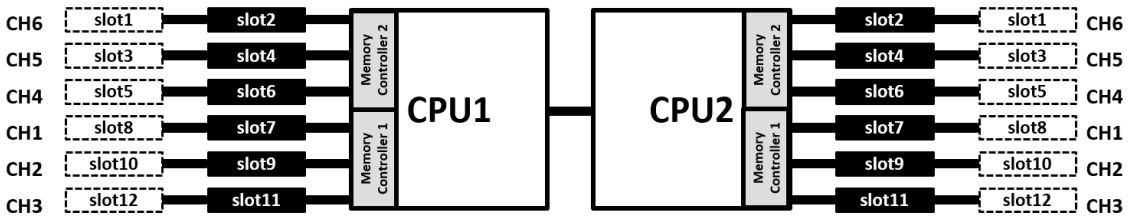
When installing DIMMs, higher capacity memory must be installed preferentially, if this rule is ignored, it may cause failures of DIMMs. This rule applies to the factory installation.

For dual CPU system, install DIMM to CPU1 firstly and then to CPU2 alternately.
Memory population varies with number of installed DIMMs. In installation of 5, 7, 9 or 11 DIMMs per CPU, optimal performance might NOT be obtained. Other memory populations are recommended.

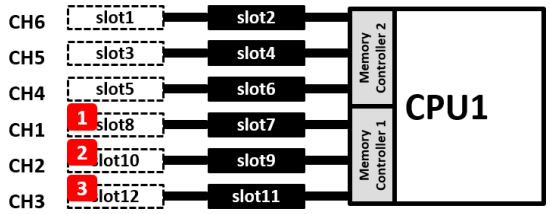
Single CPU system



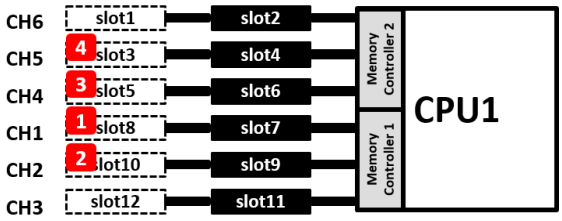
Dual CPU system



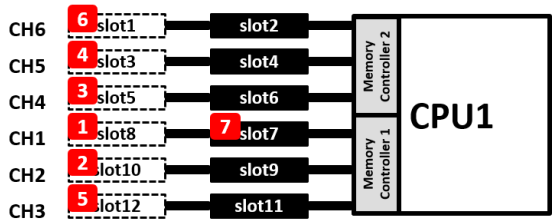
1-3x DIMM(s)



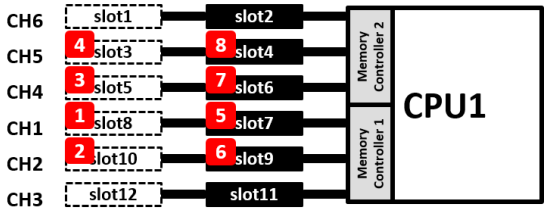
4x DIMMs



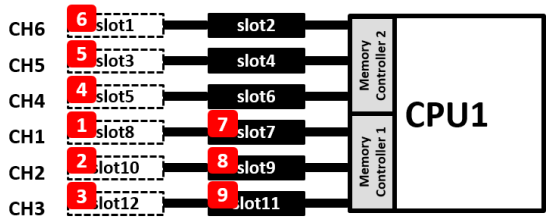
5-7x DIMMs



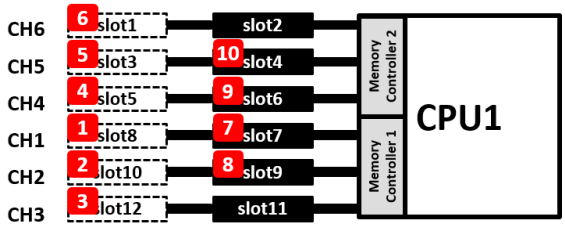
8x DIMMs



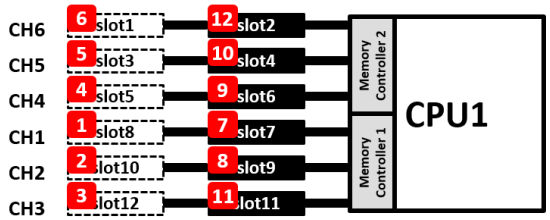
9x DIMMs



10x DIMMs



11-12x DIMMs



Internal Drive Supplementary Matters

Conditions of Internal Drives in the default factory configuration

In the default factory configuration, there are some conditions of drive types and RAID levels that can be installed as below.

Common

- For the shipment with a RAID array, select the drives in the same capacity as many as needed.
- In the default factory configuration, up to two types of Internal Drives can be installed in accordance with the following conditions and restrictions.

Conditions for mixing Internal Drives in the default factory configuration

- Up to two types of Internal Drives can be installed in the default factory configuration.
- M.2 SATA SSD can be installed at the factory regardless of mixing Internal Drives.
- The type of Internal Drives is classified according to form factors (2.5”/3.5”), interfaces (SAS/SATA), devices (HDD/SSD), Data transfer speeds, and rotational speeds. The current categories are below.
  - 3.5 inch SAS HDD, 12Gb/s, 7,200rpm
  - 3.5 inch SATA HDD, 6Gb/s, 7,200rpm
  - 2.5 inch SAS HDD, 12Gb/s, 10,000rpm
  - 2.5 inch SAS HDD, 12Gb/s, 15,000rpm
  - 2.5 inch SAS SSD, 12Gb/s
  - 2.5 inch SATA HDD, 6Gb/s, 7,200rpm
  - 2.5 inch SATA SSD, 6Gb/s

  For example, 2.5 inch SATA HDD, 1TB, 7,200rpm 512n sector and 2.5 inch SATA HDD, 2TB, 7,200rpm 512n sector are regarded as the same type of Internal Drives.

Common restrictions of mixing Internal Drives in the default factory configuration

- Internal Drives with a different sector size cannot be mixed, even if they are the same type.
  For example, a mixing of 2.5 inch SATA HDD, 1TB, 7,200rpm 512n sector and 2.5 inch SATA HDD, 2TB, 7,200rpm 512e sector is NOT supported in the default factory configuration.
- SSDs of different Endurance (ME, VE, RI) cannot be mixed, even if they are the same type.
  For example, a mixing of 2.5 inch SATA SSD, 400GB, 6Gb/s VE (Value Endurance) and 2.5 inch SATA HDD, 800GB, 6Gb/s RI (Read Intensive) is NOT supported in the default factory configuration.

Mounting order of mixing Internal Drives in the default factory configuration

- In the default factory configuration, the drive mounting order is defined as below.
- The Internal drives is installed in the order of Front Cage, Middle Cage and Rear Cage.

Order	2.5 inch Drives
1	2.5 inch SAS HDD
2	2.5 inch SAS SSD
3	2.5 inch SATA HDD
4	2.5 inch SATA SSD

Order	3.5 inch Drives
1	3.5 inch SAS HDD
2	3.5 inch SATA HDD
-	-
-	-

- The Internal drives are installed in the ascending order of a slot number, when the same type of the drives are selected, the drives are installed according to the order below.

Order	Factors	Priority; high	Priority; middle	Priority; low
1	Drive capacity	Smaller	Bigger	-
2	Data transfer speed	6Gb/s	12Gb/s	-
3	Rotational speed	7,200rpm	10,000rpm	15,000rpm

RAID controller configuration

- 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 the factory shipment, initial cache policy of RAID controllers is Write Through for N8103-189, Write back for N8103-190/191.

RAID configuration for the default factory shipment

Available RAID level is determined by the RAID configurations and the number of drives as below.

RAID configuration for shipment	Number of Drives	Number of Drives in RAID levels
Non RAID	1-8	Non
Embedded RAID(On-board RAID) configuration (RAID 0/1/10)	1	RAID0 (Single drive)
	2	RAID1
	3	2 in RAID1、1 for hot spare
	4/6/8	4/6/8 in RAID10
	5/7	4/6/8 in RAID10, 1 for a hot spare
RAID controller configuration(RAID 0/1/10) **N8103-189/-195**	1	RAID0(Single drive)
	2	RAID1
	3	2 in RAID1, 1 for a hot spare
	4/6/8	4/6/8 in RAID10
	5/7/9	4/6/8 in RAID10, 1 for a hot spare
	10	8 in RAID10, 2 in RAID1
	11	8 in RAID10, 2 in RAID1, 1 for a hot spare
	12/14/16	8 in RAID10, 4/6/8 in RAID10
	13/15/17	8 in RAID10, 4/6/8 in RAID10, 1 for a hot spare
	18	2x 8 in RAID10, 2 in RAID1
	19	2x 8 in RAID10, 2 in RAID1, 1 for a hot spare
	20/22/24	2x 8 in RAID10, 4/6/8 in RAID10
	21/23/25	2x 8 in RAID10, 4/6/8 in RAID10, 1 for a hot spare
	26	3x 8 in RAID10, 2 in RAID1
RAID controller configuration (RAID 0/1/5/6/10) **N8103-190/-191/-201**	1	RAID0(Single drive)
	2	RAID1
	3-8	RAID5
	9	8 in RAID 5, 1 in RAID0 (Single drive)
	10	8 in RAID 5, 2 in RAID 1
	11-16	8 in RAID 5, 3-8 in RAID5
	17	2x 8 in RAID 5, 1 in RAID0 (Single drive)
	18	2x 8 in RAID 5, 2 in RAID 1
	19-24	2x 8 in RAID 5, 3-8 in RAID5
	25	3x 8 in RAID 5, 1 in RAID0 (Single drive)
	26	3x 8 in RAID 5, 2 in RAID 1
	27-30	3x 8 in RAID 5, 3-8 in RAID5

Restrictions of mixing Internal Drives in the default factory configuration for R120h-2M 12x 3.5-inch Drive Model

- Internal Drives cannot be installed in the Rear Cage in default factory configuration in the following conditions. However, up to twelve drives in the Front Cage and up to four drives in the Middle Cage can be installed.
  - N8154-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) is installed
  - N8154-99 3x3.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear) is installed

Restrictions of mixing Internal Drives in the default factory configuration for R120h-2M 8x 2.5-inch Drive Model without N8154-96 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA)

N8154-96 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA)	N8154-100 4x3.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Mid)	N8154-95/-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear)	N8154-99 3x3.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear)	Restriction and maximum drive number
No	Yes	Yes	Yes	Drives cannot be installed in the Rear Cage. Up to 12x 3.5-inch drives
			No	Up to 12x 3.5-inch drives Up to 6x 2.5-inch drives
		No	Yes	Up to 15x 3.5-inch drives
			No	Up to 12x 3.5-inch drives
	No	Yes	Yes	Drives cannot be installed in the Rear Cage. Up to 8x 3.5-inch drives
			No	Up to 8x 3.5-inch drives Up to 6x 2.5-inch drives
		No	Yes	Up to 11x 3.5-inch drives
			No	Up to 8x 3.5-inch drives

Restrictions of mixing Internal Drives in the default factory configuration for R120h-2M 8x 2.5-inch Drive Model with N8154-96 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA)

N8154-96 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA)	N8116-51 SAS Expander	N8154-100 4x3.5-inch Hot Plug Drive Cage Kit(SAS/SATA, Mid)	N8154-95/-98 2x2.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear)	N8154-99 3x3.5-inch Hot Plug Drive Cage Kit (SAS/SATA, Rear)	Restriction and maximum drive number
Yes	No	Yes	-	-	Drives cannot be installed in the Rear Cage or the Middle Cage. Up to 8x 3.5-inch drives Up to 2x 2.5-inch drives
		No	Yes	Yes	Drives cannot be installed in the Rear Cage. Up to 8x 3.5-inch drives Up to 2x 2.5-inch drives
				No	Up to 8x 3.5-inch drives Up to 8x 2.5-inch drives
			No	Yes	Drives cannot be installed in the Rear Cage. Up to 8x 3.5-inch drives Up to 2x 2.5-inch drives
				No	Up to 8x 3.5-inch drives Up to 2x 2.5-inch drives
	Yes	-	-	-	Only one type of internal drive is available.

Conditions for mixing of Internal Drives after shipment

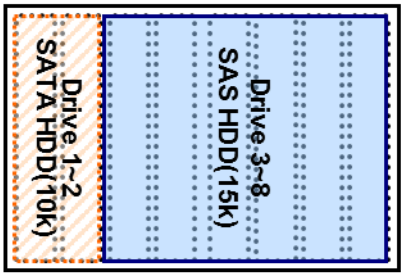
- RAID controller is required for mixing of Internal Drives
- Mixed Internal Drives cannot be installed in the same RAID array.
- When using hot spare disk for different RAID arrays which consist of various type of drives, assign “Dedicated Hot Spare” to each RAID array with the same type of drive, to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

Mixing of different type of drives

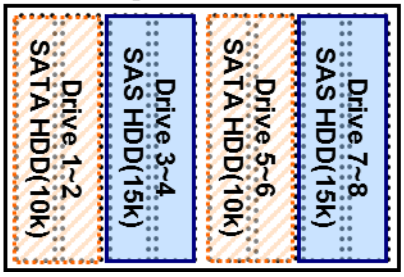
Two types of drive can be installed in standard drive cage (8slots) and optional drive cage (8slots), in total, up to four types of drive using both cages. There is nine “type”, such as SAS HDD 10,000rpm(512n), SAS HDD 10,000rpm(512e), SAS HDD 15,000rpm(512n), SAS HDD 7,200rpm(512e), SATA HDD 7,200rpm(512n), SATA HDD 7,200rpm(512e), SATA SSD(ME/VE/RI).

See some examples as below.

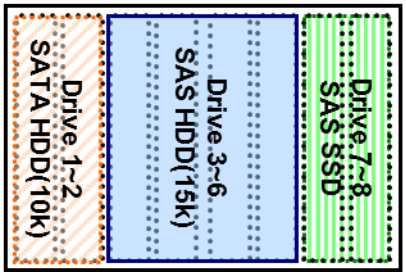
OK
Up to two types of drives can be installed in the drive cage. Any combination of drives is ok.
(Ex. 2 SATA HDD and 6 SAS HDDs)



N/A
Same type drives cannot be put in 2 places or more separately in the drive cage



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



Server Management

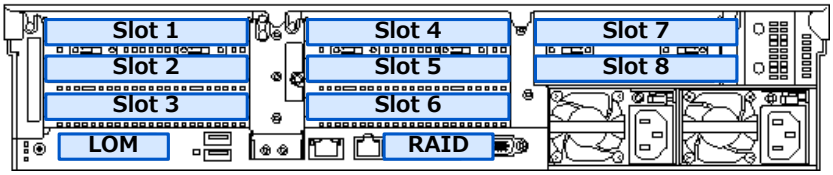
The integrated server management controller provides superior remote control and system management features listed in the table below.

	Standard	Remote Management License (Scale-out)	Remote Management License (Advanced)
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	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, power capping)	-	✓	✓
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)	✓	✓	✓

OS Support Matrix for PCI Cards and Embedded Controllers

Part number	Product Name	WS 2016	WS 2012 R2	RHEL 7	ESXi 6.7	ESXi 6.5	ESXi 6.0
-	Embedded SATA non-RAID Controller	✓	✓	✓	✓	✓	✓
-	Embedded SATA RAID Controller	✓	✓	-	-	-	-
N8103-189	RAID Controller (RAID 0/1)	✓	✓	✓	✓	✓	✓
N8103-190	RAID Controller (2GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓
N8103-191	RAID Controller (4GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓
N8103-195	RAID Controller (4GB, RAID 0/1)	✓	✓	✓	✓	✓	✓
N8103-201	RAID Controller (2GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓
N8103-196	RAID Controller (4GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓
N8103-197	SAS Controller	✓	✓	✓	-	-	-
N8103-E184	SAS Controller	✓	✓	✓	✓	✓	✓
N8104-171	Quad Port 1000BASE-T LOM Card	✓	✓	✓	✓	✓	✓
N8104-172	Quad Port 1000BASE-T LOM Card	✓	-	✓	✓	✓	✓
N8104-173	Quad Port 10GBASE-T LOM Card	✓	✓	✓	✓	✓	✓
N8104-175	Dual Port 10GBASE-T LOM Card	✓	✓	✓	✓	✓	✓
N8104-176	Quad Port 10BASE SFP+ LOM Card	✓	✓	✓	✓	✓	✓
N8104-177	Dual Port 25GBASE SFP28 LOM Card	✓	✓	✓	✓	✓	-
N8104-178	Dual Port 1000BASE-T Adapter	✓	✓	✓	✓	✓	✓
N8104-179	Quad 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	✓	✓	✓	✓	✓	✓
N8104-184	Dual Port 10GBASE-T Adapter	✓	✓	✓	✓	✓	✓
N8104-185	Dual Port 10GBASE SFP+ Adapter	✓	✓	✓	✓	✓	✓
N8104-186	Dual Port 10GBASE SFP+ Adapter	✓	✓	✓	✓	✓	✓
N8104-187	Dual Port 10GBASE SFP28 Adapter	✓	✓	✓	✓	✓	-
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)	✓	✓	✓	✓	-	-

Supported PCI Cards and Installable Slots

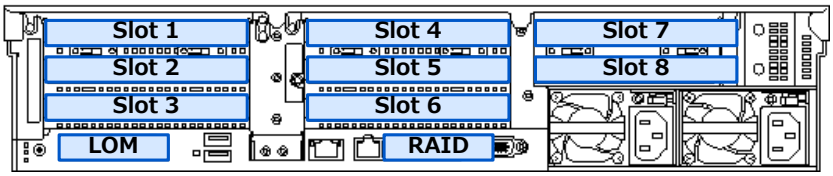


Each card in the table below is installed in order from the top in the factory installation. The number in the table shows priority of installable slot.

Part Number	Product Name	RAID	LOM	SLOT1	SLOT2	SLOT3	SLOT4	SLOT5	SLOT6	SLOT7	SLOT8
N8103-189	RAID Controller (RAID 0/1)	1	-	-	-	-	-	-	-	-	-
N8103-190	RAID Controller (2GB, RAID 0/1/5/6)	1	-	-	-	-	-	-	-	-	-
N8103-191	RAID Controller (4GB, RAID 0/1/5/6)	1	-	-	-	-	-	-	-	-	-
N8104-171	Quad Port 1000BASE-T LOM Card	-	1	-	-	-	-	-	-	-	-
N8104-172	Quad Port 1000BASE-T LOM Card	-	1	-	-	-	-	-	-	-	-
N8104-173	Quad Port 10GBASE-T LOM Card	-	1	-	-	-	-	-	-	-	-
N8104-175	Dual Port 10GBASE-T LOM Card	-	1	-	-	-	-	-	-	-	-
N8104-176	Quad Port 10GBASE-SFP+ LOM Card	-	1	-	-	-	-	-	-	-	-
N8104-177	Dual port 25GBASE-SFP28 LOM Card	-	1	-	-	-	-	-	-	-	-
N8105-51 [1]	GPU Computing Card	-	-	1	3	5	2	4	6	7	8
N8116-51	SAS Expander Card	-	-	1	3	5	2	4	6	7	8
N8103-201	RAID Controller (2GB, RAID 0/1/5/6)	-	-	1	3	5	2	4	6	7	8
N8103-195	RAID Controller (4GB, RAID 0/1/5/6)	-	-	1	3	5	2	4	6	7	8
N8103-(E)184	SAS Controller	-	-	1	3	5	2	4	6	7	8
N8103-196	RAID Controller (4GB, RAID 0/1/5/6)	-	-	1	3	5	2	4	6	7	8
N8103-197	SAS Controller	-	-	1	3	5	2	4	6	7	8
N8190-165	Fibre Channel Controller (1ch)	-	-	1	3	5	2	4	6	7	8
N8190-166	Fibre Channel Controller (2ch)	-	-	1	3	5	2	4	6	7	8
N8190-171	Fibre Channel Controller (1ch)	-	-	1	3	5	2	4	6	7	8
N8190-172	Fibre Channel Controller (2ch)	-	-	1	3	5	2	4	6	7	8
N8190-163	Fibre Channel Controller (1ch)	-	-	1	3	5	2	4	6	7	8
N8190-164	Fibre Channel Controller (2ch)	-	-	1	3	5	2	4	6	7	8
N8104-185	Dual Port 10GBASE-SFP+ Adapter	-	-	1	3	5	2	4	6	7	8
N8104-182	Dual Port 10GBASE-T Adapter	-	-	1	3	5	2	4	6	7	8
N8104-186	Dual Port 10GBASE-SFP+ Adapter	-	-	1	3	5	2	4	6	7	8
N8104-184	Dual Port 10GBASE-T Adapter	-	-	1	3	5	2	4	6	7	8
N8104-187	Dual port 25GBASE-SFP28 Adapter	-	-	1	3	5	2	4	6	7	8
N8104-183	Dual Port 10GBASE-T Adapter	-	-	1	3	5	2	4	6	7	8
N8104-179	Quad Port 1000BASE-T Adapter	-	-	1	3	5	2	4	6	7	8
N8104-181	Quad Port 1000BASE-T Adapter	-	-	1	3	5	2	4	6	7	8
N8104-178	Dual Port 1000BASE-T Adapter	-	-	1	3	5	2	4	6	7	8
N8104-180	Dual Port 1000BASE-T Adapter	-	-	1	3	5	2	4	6	7	8

[1] PCIe x16 slot is required for N8105-51, select appropriate PCI Riser Card.

Expansion Slots



	Slot Name	Standard	Bus Width	Connector Width	Height	Length	Processor	Other Connector
Dedicated Slots	LOM	PCIe 3.0	x8	x8	-	-	CPU1	-
	RAID	PCIe 3.0	x8	x8	-	-	CPU1	-
1st Riser Card (Standard)	Slot 1	PCIe 3.0	x8	x8	Full-height	Full Length	CPU1	2x M.2
	Slot 2	PCIe 3.0	x16	x16	Full-height	Full Length	CPU1	
	Slot 3	PCIe 3.0	x8	x8	Full-height	Up to 1/2 length	CPU1	
1st Riser Card (Optional) N8116-66	Slot 1	-	-	-	-	-	-	GPU Power
	Slot 2	PCIe 3.0	x16	x16	Full-height	Full Length	CPU1	
	Slot 3	PCIe 3.0	x16	x16	Full-height	Up to 1/2 length	CPU1	
1st Riser Card (Optional) N8116-64	Slot 1	PCIe 3.0	x16	x16	Full-height	Full Length	CPU1	-
	Slot 2	PCIe 3.0	x16	x16	Full-height	Full Length	CPU1	
	Slot 3	-	-	-	-	-	-	
Drive Cage Kit (Optional) N8154-98	Slot 1	-	-	-	-	-	-	-
	Slot 2	-	-	-	-	-	-	
	Slot 3	PCIe 3.0	x16	x16	Full-height	Up to 1/2 length	CPU1	
2nd Riser Card (Optional) N8116-62	Slot 4	PCIe 3.0	x8	x8	Full-height	Full Length	CPU2	GPU Power
	Slot 5	PCIe 3.0	x16	x16	Full-height	Full Length	CPU2	
	Slot 6	PCIe 3.0	x8	x8	Full-height	Up to 1/2 length	CPU2	
2nd Riser Card (Optional) N8116-67	Slot 4	-	-	-	-	-	-	GPU Power
	Slot 5	PCIe 3.0	x16	x16	Full-height	Full Length	CPU2	
	Slot 6	PCIe 3.0	x16	x16	Full-height	Up to 1/2 length	CPU2	
2nd Riser Card (Optional) N8116-56	Slot 4	PCIe 3.0	x16	x16	Full-height	Full Length	CPU2	-
	Slot 5	PCIe 3.0	x16	x16	Full-height	Full Length	CPU2	
	Slot 6	-	-	-	-	-	-	
Drive Cage Kit (Optional) N8154-98	Slot 4	-	-	-	-	-	-	-
	Slot 5	-	-	-	-	-	-	
	Slot 6	PCIe 3.0	x16	x16	Full-height	Up to 1/2 length	CPU2	
3rd Riser Card (Optional) N8116-78	Slot 7	PCIe 3.0	x8	x8	Full-height	Full Length	CPU2	-
	Slot 8	PCIe 3.0	x8	x8	Full-height	Up to 1/2 length	CPU2	
3rd Riser Card (Optional) N8116-81	Slot 7	PCIe 3.0	x16	x16	Full-height	Full Length	CPU2	GPU Power
	Slot 8	-	-	-	-	-	-	

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

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Revision History

Revision	Date	Description
9.0	January 25, 2019	**New products added:** ● 400GB Hot Plug 2.5-inch SAS SSD / N8150-1750 ● 800GB Hot Plug 2.5-inch SAS SSD / N8150-1751 ● 400GB Hot Plug 2.5-inch SAS SSD / N8150-1752 ● 800GB Hot Plug 2.5-inch SAS SSD / N8150-1753 ● 900GB 15K Hot Plug 2.5-inch SAS HDD / N8150-602 **Discontinued products deleted:** ● 400GB Hot Plug 2.5-inch SAS SSD / N8150-748 ● 800GB Hot Plug 2.5-inch SAS SSD / N8150-749 ● 400GB Hot Plug 2.5-inch SAS SSD / N8150-750 ● 800GB Hot Plug 2.5-inch SAS SSD / N8150-751 ● 900GB 15K Hot Plug 2.5-inch SAS HDD / N8150-553 **Others:** Description related to VMware ESXi is updated. **Correction of errors**
8.0	November 12, 2018	**New products added:** ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-1737 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-1738 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-1739 ● 240GB Hot Plug 2.5-inch SATA SSD / N8150-1740 ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-1741 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-1742 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-1743 ● 3.84TB Hot Plug 2.5-inch SATA SSD / N8150-1744 ● 960GB Hot Plug 2.5-inch SAS SSD / N8150-1754 (To be released in December 2018) ● 1.92TB Hot Plug 2.5-inch SAS SSD / N8150-1755 (To be released in December 2018) **Discontinued products deleted:** ● Xeon Gold 6140M Processor Kit / N8101-1453 (1st), N8101-1454 (2nd) ● Xeon Gold 6142M Processor Kit / N8101-1455 (1st), N8101-1456 (2nd) ● Xeon Platinum 8160M Processor Kit / N8101-1457 (1st), N8101-1458 (2nd) ● Xeon Platinum 8170M Processor Kit / N8101-1459 (1st), N8101-1460 (2nd) ● Xeon Platinum 8176M Processor Kit / N8101-1461 (1st), N8101-1462 (2nd) ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-1701 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-1702 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-1703 ● 240GB Hot Plug 2.5-inch SATA SSD / N8150-1704 ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-1705 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-1706 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-1707 ● 3.84TB Hot Plug 2.5-inch SATA SSD / N8150-1708 ● 480GB Hot Plug 2.5-inch SAS SSD / N8150-752 ● 960GB Hot Plug 2.5-inch SAS SSD / N8150-753 **Others:** ● Description related to VMware ESXi is updated. ● Available power supply unit tables are updated. ● PCIe card installable slot table is updated. **Correction of errors**
7.0	July 12, 2018	**New products added:** ● 240GB Hot Plug 2.5-inch SATA SSD / N8150-1700 ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-1701 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-1702 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-1703 ● 240GB Hot Plug 2.5-inch SATA SSD / N8150-1704 ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-1705 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-1706 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-1707 ● 3.84TB Hot Plug 2.5-inch SATA SSD / N8150-1708 ● 2.4TB Hot Plug 2.5-inch SAS HDD / N8150-591 ● 12TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-587 ● 12TB 7.2K Hot Plug 3.5-inch NLSAS HDD / N8150-589 ● 240GB Non-Hot Plug M.2 SATA SSD / N8150-1709 ● 480GB Non-Hot Plug M.2 SATA SSD / N8150-1710

		● 8GB DDR4-2666 REG Memory Kit (1x8B/DR) / N8102-714 **Discontinued products deleted:** ● 240GB Hot Plug 2.5-inch SATA SSD / N8150-739 ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-740 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-741 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-742 ● 240GB Hot Plug 2.5-inch SATA SSD / N8150-743 ● 480GB Hot Plug 2.5-inch SATA SSD / N8150-744 ● 960GB Hot Plug 2.5-inch SATA SSD / N8150-745 ● 1.92TB Hot Plug 2.5-inch SATA SSD / N8150-746 ● 3.84TB Hot Plug 2.5-inch SATA SSD / N8150-747 **Others:** ● Enable to support Internal DVD-ROM drive in the default factory configuration **Correction of errors**
6.0	April 27, 2018	**New products / service added:** ● 1TB 7.2K Hot Plug 2.5-inch SATA HDD / N8150-596 ● 4TB 7.2K Hot Plug 3.5-inch SAS HDD / N8150-597 ● SAS Controller / N8103-E184 (Factory Installation only) ● RAID Config Option(None) / NESV16-039 **Discontinued products deleted:** ● 150GB Non-hot-plug M.2 SATA SSD / N8150-778 (Replacement part number to be released soon.) **Others:** ● Enable to mix Internal devices in the default factory configuration ● Enable to use Internal DVD-ROM drive when the Embedded SATA Controller is used **Correction of errors**
5.1	March 26, 2018	**Others:** ● Expansion of RAID selection for 12x3.5-inch Drive Model ● N8103-184 connects to NEC Storage M series ● Some improvement in description Correction of errors
5.0	January 25, 2018	**Discontinued products deleted:** ● 1TB 7.2K Hot Plug 2.5-inch SATA HDD / N8150-544 (Replacement part number to be released soon.) ● 4TB 7.2K Hot Plug 3.5-inch SAS HDD / N8150-561 (Replacement part number to be released soon.) ● 3TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-556 (No replacement planed) ● Quad Port 25GBASE QSPF28 Adapter / N8104-188 **Others:** Correction of errors
4.0	December 22, 2017	**New products added:** ● 400GB Hot Plug 2.5-inch SAS SSD / N8150-748 ● 800GB Hot Plug 2.5-inch SAS SSD / N8150-749 ● 400GB Hot Plug 2.5-inch SAS SSD / N8150-750 ● 800GB Hot Plug 2.5-inch SAS SSD / N8150-751 ● 480GB Hot Plug 2.5-inch SAS SSD / N8150-752 ● 960GB Hot Plug 2.5-inch SAS SSD / N8150-753 ● Dual Port 25GBASE SFP28 Adapter / N8104-187 ● Dual Port 25GBASE SFP28 LOM Card / N8104-177 ● SFP28 Module(25G-SR) / N8104-190 ● SAS Controller / N8103-184 **Others:** ● Updated the table of the Available Power Supplies ● SAS Expander supported SATA drives ● Information in References is updated
3.0	November 22, 2017	**New products added:** ● Xeon Gold 6144 Processor Kit / N8101-1231, N8101-1232 ● Xeon Gold 6146 Processor Kit / N8181-1233, N8101-1234 ● 3.84TB Hot Plug 2.5-inch SATA SSD / N8150-747 ● 240GB Hot Plug 2.5-inch SATA SSD / N8150-739 ● Dual Port 10GBASE-T Adapter / N8104-183 ● Dual Port 10GBASE-T Adapter / N8104-184 **Others:** ● Added the table of guideline of the maximum power consumption ● Added VMware ESXi 6.5 to the list of operating system supported ● Updated OS support matrix
2.0	October 19, 2017	**New products added:** ● 4TB 7.2K Hot Plug 3.5-inch SAS HDD / N8150-561 ● 8TB 7.2K Hot Plug 3.5-inch SAS HDD / N8150-562

		● 10TB 7.2K Hot Plug 3.5-inch SAS HDD / N8150-563 ● 150GB Non-hot-plug M.2 SATA SSD / N8150-778 ● Fibre Channel Controller (1ch) / N8190-171 ● Fibre Channel Controller (2ch) / N8190-172 **Discontinued product deleted:** ● 120GB Non-hot plug M.2 SATA SSD / N8150-754 **Others:** ● Updated the OS support matrix ● Updated Supported PCI Cards and Installable Slots matrix ● Added the table of maximum power consumption
1.1	September 20, 2017	**Others:** ● Added note for the number of SATA ports available on 8x 2.5-inch Drive Model using with embedded SATA controller ● Added note when ordering an optical drive with 8x 3.5-inch Drive Model ● Added note when ordering M.2 SATA SSD ● Updated the table of available power supplies
1.0	August 29, 2017	Initial release