

NEC Express5800/R110f-1E Configuration Guide



Introduction

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

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Technical Specification

Key Features

- High performance with the latest Intel® Xeon® processor E3-1200 v3 product family
- Up to 32 GB of high speed DDR3-1600 memory
- High energy efficiency with intelligent fan control, power capping feature and 80 PLUS® Platinum or Gold power supply
- Full manageability by integrated EXPRESSSCOPE Engine 3

Specification

2.5-inch Drive Model

Model		R110f-1E				
Part Number		N8100-1999F, N8100-2000F				
Processor	Type	Intel® Xeon® Processor E3-1220v3	Intel® Xeon® Processor E3-1230Lv3	Intel® Xeon® Processor E3-1230v3	Intel® Xeon® Processor E3-1265Lv3	Intel® Xeon® Processor E3-1270v3
	Clock Speed	3.10 GHz	1.80 GHz	3.30 GHz	2.50 GHz	3.50 GHz
	Number of Processor	1				
	Cache	8 MB				
	Cores and Threads	4C / 4T	4C / 8T			
Chipset		Intel® C224 Chipset				
Memory	Type	DDR3-1600 ECC Unbuffered DIMM				
	Standard Capacity	0 GB				
	Maximum Capacity	32 GB (4 x 8 GB)				
Internal Storage	Standard Capacity	0 GB				
	Maximum Capacity	SATA HDD: 8 TB (8 x 1 TB) SAS HDD : 9.6 TB (8 x 1.2 TB) SAS SSD 3.2 TB (8 x 400 GB)				
	Disk Controller	SATA : 6 Gb/s (Integrated) SAS : 6 Gb/s (Optional)				
	RAID	SATA : RAID 0/1/10 (Standard ¹), RAID 5/6/50/60 (Optional) SAS : RAID 0/1/5/6/10/50/60 (Optional)				
	Hot Plug	Supported				
	Optical Disk Drive	Optional				
	Optical Drive Bays	1				
	Disk Drive Bays	4				
	Expansion Slots		Total: 2 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 2.0 x4 (x8 connector)			
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)				
	Resolution / Color	1280 x 1024 / 16.7M ²				
Interfaces		1 VGA (15-pin mini D-sub,1 rear) 1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 rear) 3 USB3.0 (1 front, 2 rear) 4 USB2.0 (1 front, 2 rear, 1 internal) 2 1000BASE-T LAN connector (RJ-45, 2 rear) 1 100BASE-TX LAN connector for management (RJ-45, 1 rear)				

Model		R110f-1E				
Server Management		EXPRESSSCOPE Engine 3				
Redundant Fan		Optional, non-hot plug				
Power Supply		1 400 Watt 80 PLUS® Platinum certified non-Hot plug PSU 2 500 Watt 80 PLUS® Gold certified Hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz				
Power Consumption	(Max. Config, Idling)	127VA / 118W	119VA / 110W	127VA / 118W	127VA / 118W	127VA / 118W
	(Max. Config, Operating)	229VA / 222W	168VA / 159W	230VA / 223W	196VA / 187W	230VA / 223W
Acoustic Noise (Sound Pressure Level) ³	Minimum Config.	47.7 dB	44.4 dB	47.7 dB	44.4 dB	47.7 dB
	Maximum Config.	46.8 dB	41.8 dB	46.8 dB	41.8 dB	46.8 dB
Dimensions (W x D x H)		444.0 x 615.2 x 43.6 mm / 17.5 x 24.2 x 1.7 in (1U)				
Weight (Minimum / Maximum)		10 kg / 17.5 kg, 22.05 lbs. / 38.58 lbs.				
Temperature, Relative Humidity (non-condensing)		Operating: 10° to 40° C / 50° to 104° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%				
Regulatory and Safety		FCC, CE, UL, CB, RoHS, WEEE, BSMI, CCC, RCM				
Operating Systems and Virtualization Software		Microsoft® Windows Server® 2008 x86 Standard Microsoft® Windows Server® 2008 x86 Enterprise Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Red Hat Enterprise Linux 5.9 or later ⁴ Red Hat Enterprise Linux 5.9 or later (EM64T) ⁴ Red Hat Enterprise Linux 6.4 or later (x86) ⁴ Red Hat Enterprise Linux 6.4 or later (x86_64) ⁴ VMware ESXi 5.1 update 1				

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

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

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

⁴ For Linux support, contact our sales representative or go to the NEC website at:
<http://www.nec.com/en/global/prod/express/linux/index.html>

3.5-inch Drive Model

Model		R110f-1E				
Part Number		N8100-1986F, N8100-1998F				
Processor	Type	Intel® Xeon® Processor E3-1220v3	Intel® Xeon® Processor E3-1230Lv3	Intel® Xeon® Processor E3-1230v3	Intel® Xeon® Processor E3-1265Lv3	Intel® Xeon® Processor E3-1270v3
	Clock Speed	3.10 GHz	1.80 GHz	3.30 GHz	2.50 GHz	3.50 GHz
	Number of Processor	1				
	Cache	8 MB				
	Cores and Threads	4C / 4T	4C / 8T			
Chipset		Intel® C224 Chipset				
Memory	Type	DDR3-1600 ECC Unbuffered DIMM				
	Standard Capacity	0 GB				
	Maximum Capacity	32 GB (4 x 8 GB)				
Internal Storage	Standard Capacity	0 GB				
	Maximum Capacity	SATA : 16 TB (4 x 4 TB)				
	Disk Controller	SATA : 6Gb/s (Integrated)				
	RAID	SATA : RAID 0/1/10 (Standard ¹), RAID 5/6 (Optional)				
	Hot Plug	Supported				
	Optical Disk Drive	Optional				
	Optical Drive Bays	1				
	Disk Drive Bays	4				
Expansion Slots		Total: 2 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 2.0 x4 (x8 connector)				
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)				
	Resolution / Color	1280 x 1024 / 16.7M ²				
Interfaces		1 VGA (15-pin mini D-sub,1 rear) 1 to 2 Serial (9-pin mini D-sub, RS232-C, 1 to 2 rear) 3 USB3.0 (1 front, 2 rear) 4 USB2.0 (1 front, 2 rear, 1 internal) 2 1000BASE-T LAN connector (RJ-45, 2 rear) 1 100BASE-TX LAN connector for management (RJ-45, 1 rear)				
Server Management		EXPRESSSCOPE Engine 3				
Redundant Fan		Optional, non-hot plug				
Power Supply		1 400 Watt 80 PLUS® Platinum certified non-Hot plug PSU 2 500 Watt 80 PLUS® Gold certified Hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz				
Power Consumption	(Max. Config, Idling)	112VA / 104W	102VA / 94W	112VA / 104W	102VA / 94W	117VA / 108W
	(Max. Config, Operating)	212VA / 204W	148VA / 139W	222VA / 214W	173VA / 164W	225VA / 217W
Acoustic Noise (Sound Pressure Level) ³	Minimum Config.	47.7 dB	44.4 dB	47.7 dB	44.4 dB	47.7 dB
	Maximum Config.	46.8 dB	41.8 dB	46.8 dB	41.8 dB	46.8 dB
Dimensions (W x D x H)		444.0 x 615.2 x 43.6 mm / 17.5 x 24.2 x 1.7 in (1U)				
Weight (Minimum / Maximum)		10 kg / 17.5 kg, 22.05 lbs. / 38.58 lbs.				
Temperature, Relative Humidity (non-condensing)		Operating: 10° to 40 ° C / 50° to 104 ° F, 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%				

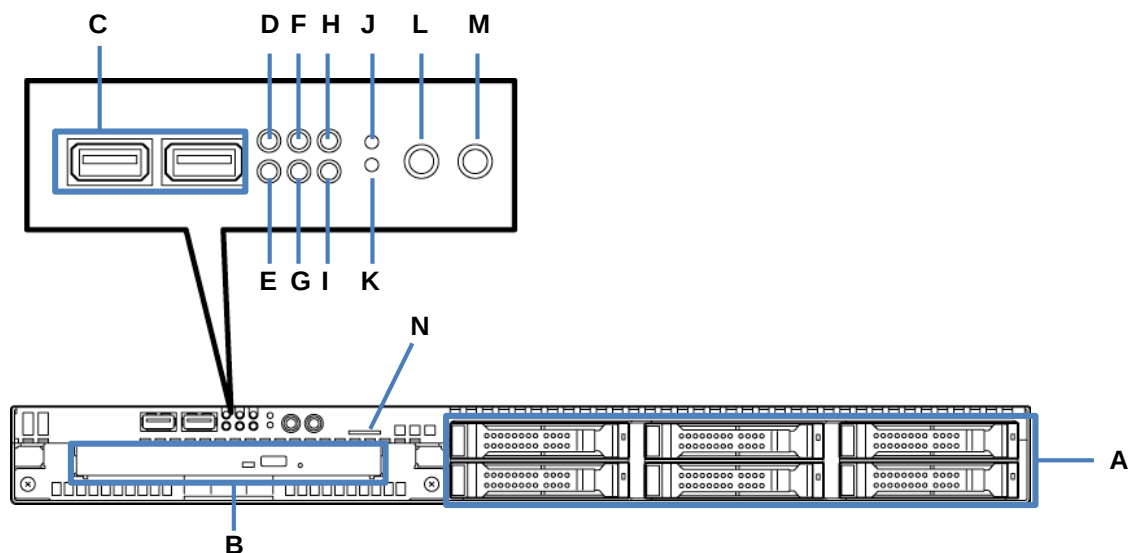
Model	R110f-1E
Regulatory and Safety	FCC, CE, UL, CB, RoHS, WEEE, BSMI, CCC, RCM
Operating Systems and Virtualization Software	Microsoft® Windows Server® 2008 x86 Standard Microsoft® Windows Server® 2008 x86 Enterprise Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Red Hat Enterprise Linux 5.9 or later ⁴ Red Hat Enterprise Linux 5.9 or later (EM64T) ⁴ Red Hat Enterprise Linux 6.4 or later (x86) ⁴ Red Hat Enterprise Linux 6.4 or later (x86_64) ⁴ VMware ESXi 5.1 update 1

- ¹ Embedded SATA RAID controller is supported only on Windows operating systems.
- ² Maximum resolution available via EXPRESSSCOPE Engine 3 remote console is 1280 x 1024 / 65K colors.
- ³ Noise emission was measured in accordance with ISO 7779. The actual value may vary by the operating environment.
- ⁴ For Linux support, contact our sales representative or go to the NEC website at:
<http://www.nec.com/en/global/prod/express/linux/index.html>

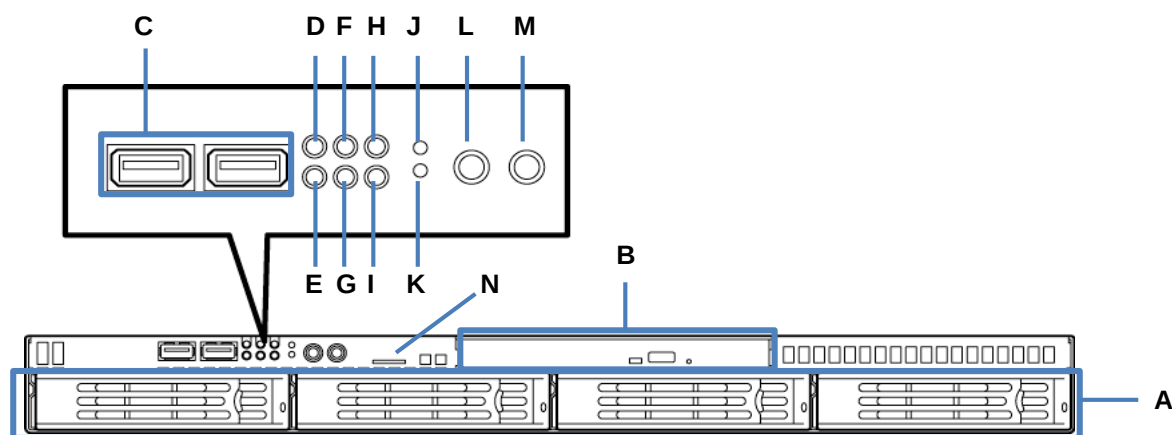
External Views

Front and Rear Views

Front View for 2.5-inch Drive Model



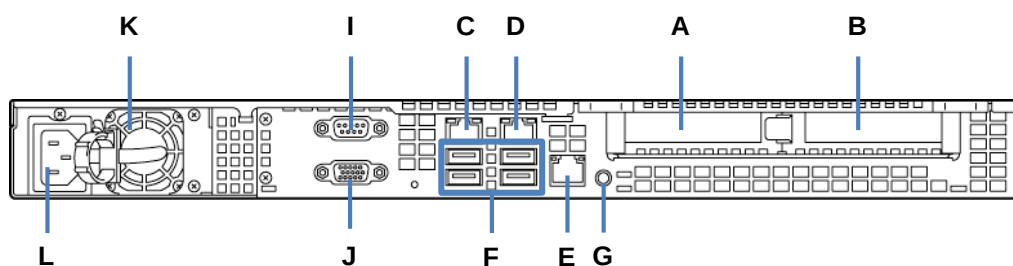
Front View for 3.5-inch Drive Model



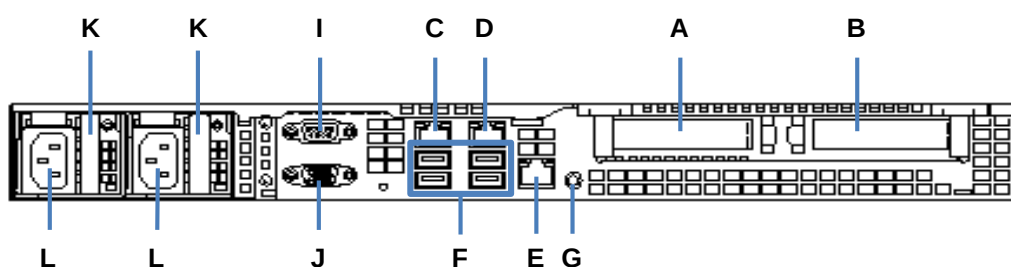
Legend

A.	Drive Bays	H.	UID LED
B.	Optical Drive Bay	I.	System Status LED
C.	USB Connectors	J.	BMC Reset Switch
D.	Power LED	K.	Dump (NMI) Switch
E.	Drive Activity LED	L.	UID LED Button
F.	Data LAN 1 Activity LED	M.	Power Button
G.	Data LAN 2 Activity LED	N.	Pull-out Tab

Rear View for Non-redundant PSU Configuration



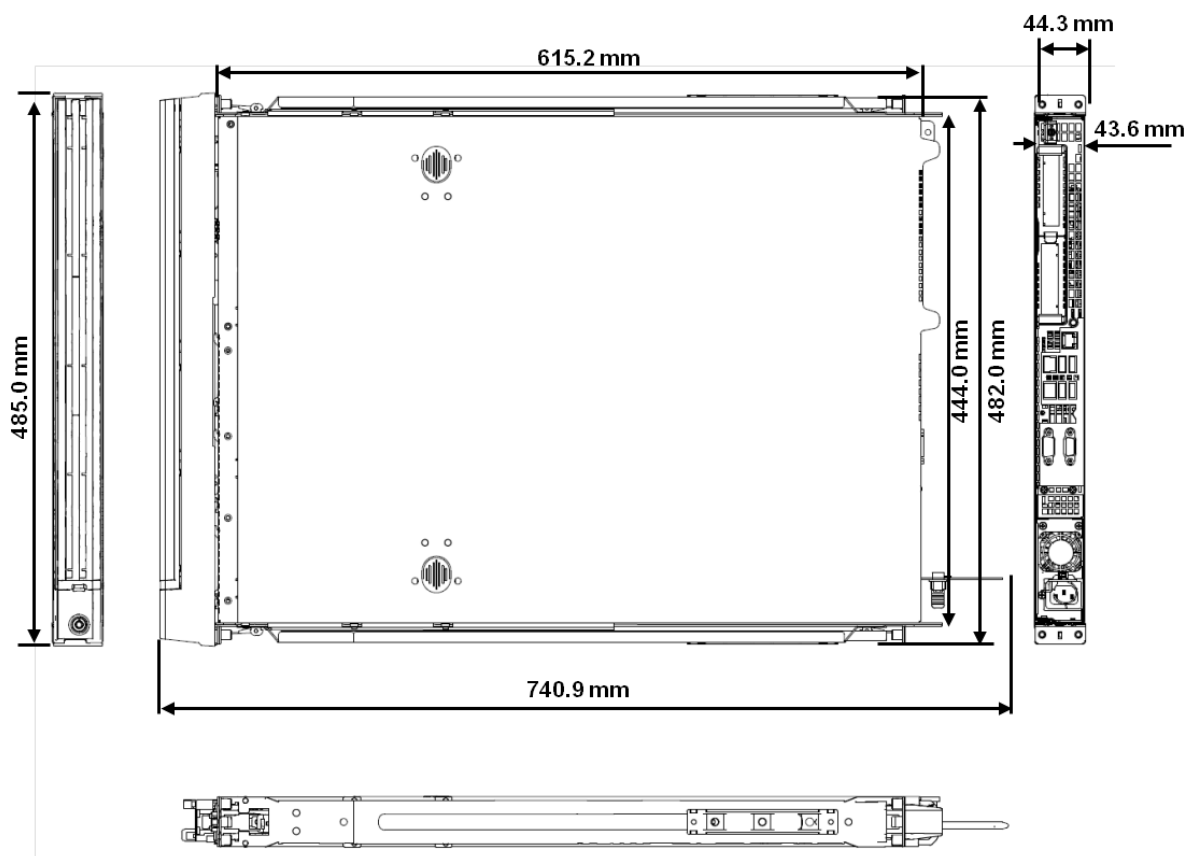
Rear View for Redundant PSU Configuration



Legend

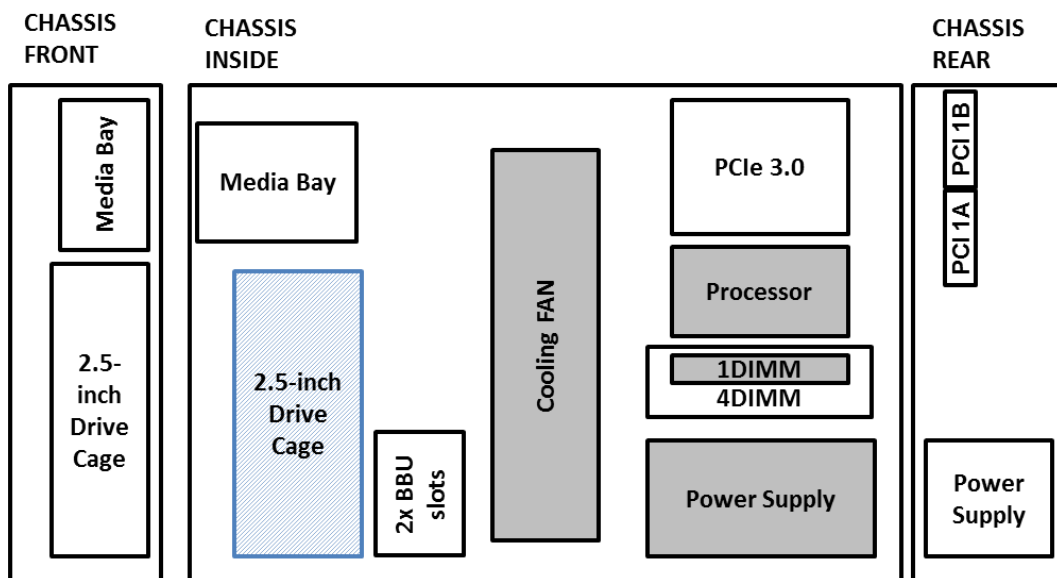
A.	PCI Slot (Low profile)	G.	UID LED / Button
B.	PCI Slot (Low profile)	H.	Power LED
C.	Data LAN 1 Connector	I.	Serial Port Connector
D.	Data LAN 2 Connector	J.	VGA Connector
E.	Management LAN Connector	K.	Power Unit
F.	USB Connectors	L.	AC Inlet

Dimensions (mm)

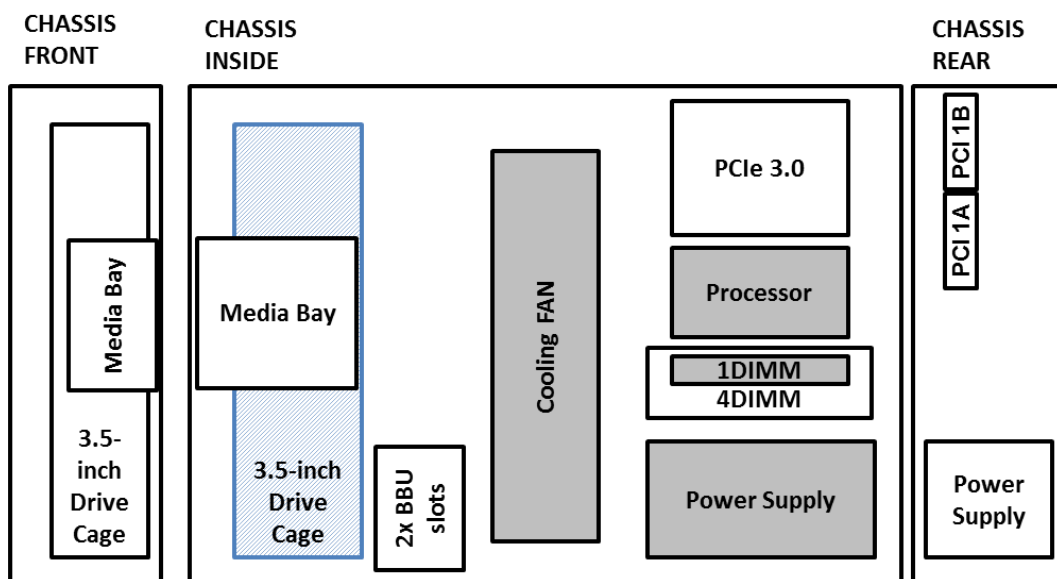


Configuration Diagram

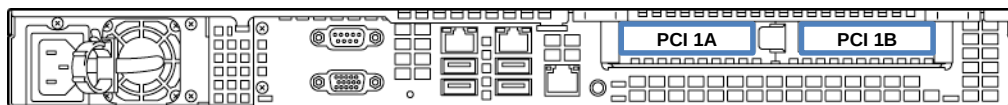
2.5-inch Drive Model



3.5-inch Drive Model



Expansion Slots



Legend

#1A	PCIe 3.0 x8, x16 connector, Low profile, up to 173 mm length
#1B	PCIe 2.0 x4, x8 connector, Low profile, up to 173 mm length

Server Configuration

1 Base Models

Product Name / Description	Part Number
NEC Express5800/R110f-1E No CPU, no RAM, no 3.5-inch HDD, no Cooling FAN, no Front bezel Including: 3.5-inch Drive Cage, 400 Watt non-hot plug power supply, EXPRESSBUILDER DVD	N8100-1986F
NEC Express5800/R110f-1E No CPU, no RAM, no 3.5-inch HDD, no Cooling FAN, no Front bezel Including: 3.5-inch Drive Cage, 500 Watt hot plug power supply, EXPRESSBUILDER DVD	N8100-1998F
NEC Express5800/R110f-1E No CPU, no RAM, no 2.5-inch HDD, no Cooling FAN, no Front bezel Including: 2.5-inch Drive Cage, 400 Watt non-hot plug power supply, EXPRESSBUILDER DVD	N8100-1999F
NEC Express5800/R110f-1E No CPU, no RAM, no 2.5-inch HDD, no Cooling FAN, no Front bezel Including: 2.5-inch Drive Cage, 500 Watt hot plug power supply, EXPRESSBUILDER DVD	N8100-2000F

NOTE:

- The base model must be ordered with a processor kit and a cooling fan kit.

2 Processor

Available sockets: 1

Category	Product Name / Description	Part Number
Processors Required	Xeon E3-1220 v3 Processor Kit Intel® Xeon® Processor E3-1220 v3 (3.10 GHz, 4C/4T, 8 MB)	N8101-626F
	Xeon E3-1230L v3 Processor Kit Intel® Xeon® Processor E3-1230L v3 (1.80 GHz, 4C/8T, 3 MB)	N8101-627F
	Xeon E3-1230 v3 Processor Kit Intel® Xeon® Processor E3-1230 v3 (3.30 GHz, 4C/8T, 8 MB)	N8101-628F
	Xeon E3-1265L v3 Processor Kit Intel® Xeon® Processor E3-1265L v3 (2.50 GHz, 4C/8T, 8 MB)	N8101-629F
	Xeon E3-1270 v3 Processor Kit Intel® Xeon® Processor E3-1270 v3 (3.50 GHz, 4C/8T, 8 MB)	N8101-639F

NOTE:

- The processor kit must be ordered with the base model.

3 Memory

Available slots: 4

Product Name / Description	Part Number
2GB DDR3-1600 UNB Memory Kit 2GB Unbuffered ECC DIMM, DDR3L-1600(PC3-12800)	N8102-523F
4GB DDR3-1600 UNB Memory Kit 4GB Unbuffered ECC DIMM, DDR3L-1600(PC3-12800)	N8102-524F
8GB DDR3-1600 UNB Memory Kit 8GB Unbuffered ECC DIMM, DDR3L-1600(PC3-12800)	N8102-525F

NOTE:

- Minimum one memory kit must be installed.
- To install by double of memory kit is recommended in order to increase memory transfer speed by the dual-channel symmetric configuration.

Maximum Available Memory

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

The maximum available memory is less than the maximum physical memory supported by your system because some chipsets require PCI resource space of about 750MB. PCI resource requirements vary depending on the type and the number of PCI cards you are using.

Maximum Memory Size Supported by Operating Systems	Maximum Available Memory
Microsoft Windows Server 2008 Standard	4 GB
Microsoft Windows Server 2008 R2 Standard	32 GB
Microsoft Windows Server 2008 Enterprise	64 GB
Microsoft Windows Server 2008 R2 Enterprise	2 TB
Microsoft Windows Server 2012 Standard	4 TB
Microsoft Windows Server 2012 Datacenter	16 GB
Red Hat Enterprise Linux 5	16 GB
Red Hat Enterprise Linux 6	16 GB
Red Hat Enterprise Linux 5 (EM64T)	1 TB
Red Hat Enterprise Linux 6 (x86_64)	3 TB
VMware ESXi 5.1 ¹	2 TB

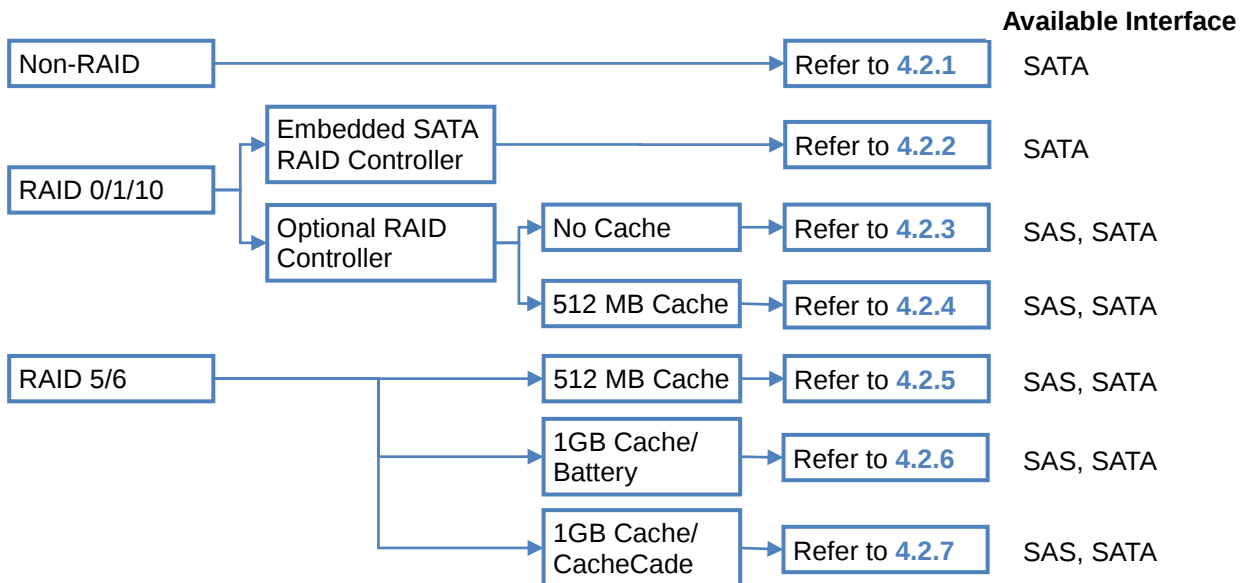
¹ Up to 1 TB of the main memory is available to each virtual machine.

4 Internal Hard Disk Drives

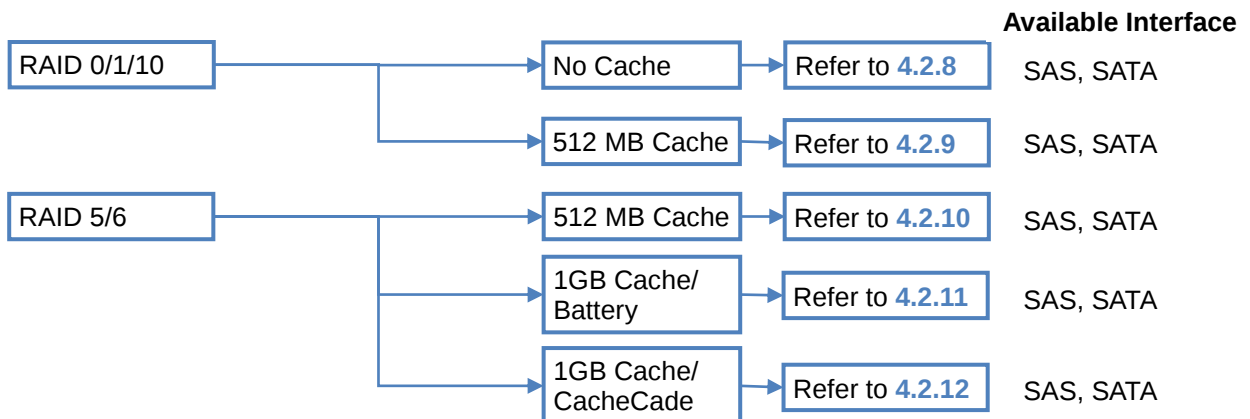
4.1 RAID Configuration

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

4.1.1 Up to six 2.5-inch Drive



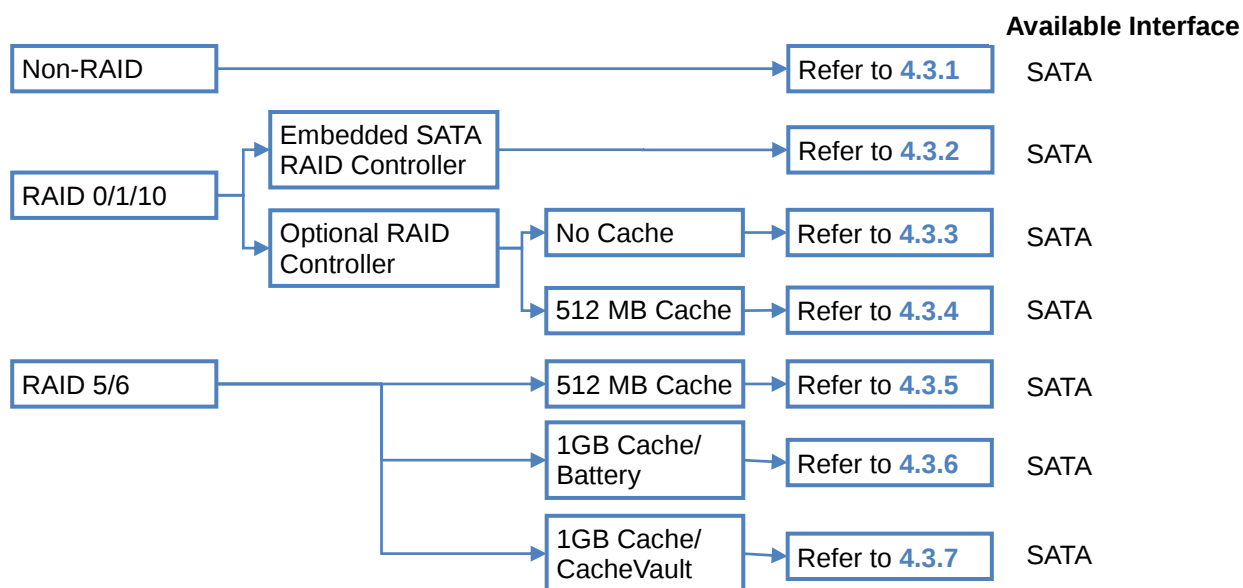
4.1.2 Up to eight 2.5-inch Drive



NOTE:

- Embedded SATA RAID controller is supported only on Windows operating systems. An optional RAID controller is required to configure RAID array for other operating systems.
- Hot plug insertion/removal is not supported with the Embedded SATA non-RAID controller.
- Internal optical drive cannot be installed when N8154-52 2.5-inch Hot Plug Drive Cage Kit is installed.
- 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.
- All drives within a RAID array should be of the same type, capacity and rotation speed.
- All SAS hard drives within a system should be of the same rotation speed.
- Mixing SAS and SATA hard drives in the same system is not supported.

4.1.3 3.5-inch Drive



NOTE:

- Embedded SATA RAID controller is supported only on Windows operating systems. An optional RAID controller is required to configure RAID array for other operating systems.
- Hot plug insertion/removal is not supported with the Embedded SATA non-RAID controller.
- All hard drives within a RAID array should be of the same capacity.

4.2 2.5-inch Drive Configuration

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

Category	Product Name / Description		Part Number
Storage Controller	Embedded SATA Controller 4x 6Gb/s SATA		(Standard)
Cable Required	Internal SAS/SATA Cable MiniSAS to 4x Single SATA		K410-289(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays		(Standard)
Drive 4 slots available	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358

NOTE:

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

4.2.2 Up to four Drives with Embedded SATA RAID Controller

Category	Product Name / Description		Part Number
Storage Controller	Embedded SATA Controller 4x 6Gb/s SATA		(Standard)
Cable Required	Internal SAS/SATA Cable MiniSAS to 4x Single SATA		K410-289(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays		(Standard)
Drive 4 slots available	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358

NOTE

- Embedded SATA RAID controller is supported only on Windows operating systems. An optional RAID controller is required to configure RAID array for other operating systems.
- All hard drives within a RAID array should be of the same capacity.

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

Category	Product Name / Description		Part Number
Storage Controller Required	RAID Controller (0MB, RAID 0/1) LSI MegaRAID SAS 9240-8i RAID0/1/10, 0MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s		N8103-171
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-240(00)
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA, for 5th and 6th hard drives NOTE: To install five drives or more, the cable is required.		K410-204(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays		(Standard)
Drive 4 to 6 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358

NOTE:

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

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

Category		Product Name / Description	Part Number
Storage Controller Required		RAID Controller (512MB, RAID 0/1) LSI MegaRAID SAS 9267-8i RAID0/1/10, 512MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-149
RAID BBU Recommended		RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i	N8103-154
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA, for 5th and 6th hard drives NOTE: To install five drives or more, the cable is required.	K410-204(00)
Drive Cage		2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays	(Standard)
Drive 4 to 6 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

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

Category	Product Name / Description		Part Number
Storage Controller Required	RAID Controller (512MB, RAID 0/1/5/6) LSI MegaRAID SAS 9267-8i RAID0/1/5/6/10/50/60, 512 MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s		N8103-150
RAID BBU Recommended	RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i		N8103-154
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-240(00)
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA, for 5th and 6th hard drives NOTE: To install five drives or more, the cable is required.		K410-204(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays		(Standard)
Drive 4 to 6 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

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

Category	Product Name / Description		Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9267-8i RAID0/1/5/6/10/50/60, 1 GB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s		N8103-151
RAID BBU Recommended	RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i		N8103-154
SSD Caching Recommended	MegaRAID CacheCade for LSI MegaRAID SAS NOTE: - SSD used for cache is required - The SSD capacity which can be used as read cache is up to 512 GB.		N8103-156
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-240(00)
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA, for 5th and 6th hard drives NOTE: To install five drives or more, the cable is required.		K410-204(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays		(Standard)
Drive 4 to 6 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

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

Category	Product Name / Description		Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9270CV-8i(with CV) RAID0/1/5/6/10/50/60, 1GB Cache, Int. 8ports, PCIe 3.0(x8), 6Gb/s, flash cache protection modules included		N8103-152
SSD Caching Recommended	MegaRAID CacheCade for LSI MegaRAID SAS NOTE: - SSD used for cache is required - The SSD capacity which can be used as read cache is up to 512 GB.		N8103-156
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-240(00)
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA, for 5th and 6th hard drives NOTE: To install five drives or more, the cable is required.		K410-204(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays		(Standard)
Drive 4 to 6 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

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

Category		Product Name / Description	Part Number
Storage Controller Required		RAID Controller (0MB, RAID 0/1) LSI MegaRAID SAS 9240-8i RAID 0/1/10, 0MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-171
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-204(00)
Drive Cage		2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays	(Standard)
Drive Cage Required		2.5-inch Drive Cage Kit 2 x 2.5-inch hot plug drive bays	N8154-52F
Drive 8 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358

NOTE:

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

4.2.9 Up to eight Drives with RAID 0/1 Controller with 512 GB Cache

Category		Product Name / Description	Part Number
Storage Controller Required		RAID Controller (512MB, RAID 0/1) LSI MegaRAID SAS 9267-8i RAID 0/1/10, 512MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-149
RAID BBU Recommended		RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i	N8103-154
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-204(00)
Drive Cage		2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays	(Standard)
Drive Cage Required		2.5-inch Drive Cage Kit 2 x 2.5-inch hot plug drive bays	N8154-52F
Drive 8 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
		250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

4.2.10 Up to eight Drives with RAID 5/6 Controller with 512 GB Cache

Category		Product Name / Description	Part Number
Storage Controller Required		RAID Controller (512MB, RAID 0/1/5/6) LSI MegaRAID SAS 9267-8i RAID0/1/5/6/10/50/60, 512 MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-150
RAID BBU Recommended		RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i	N8103-154
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Cable Required		Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-204(00)
Drive Cage		2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays	(Standard)
Drive Cage Required		2.5-inch Drive Cage Kit 2 x 2.5-inch hot plug drive bays	N8154-52F
Drive 8 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

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

Category	Product Name / Description		Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9267-8i RAID0/1/5/6/10/50/60, 1 GB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s		N8103-151
RAID BBU Recommended	RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i		N8103-154
SSD Caching Recommended	MegaRAID CacheCade for LSI MegaRAID SAS NOTE: - SSD used for cache is required - The SSD capacity which can be used as read cache is up to 512 GB.		N8103-156
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-240(00)
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-204(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug drive bays		(Standard)
Drive Cage Required	2.5-inch Drive Cage Kit 2 x 2.5-inch hot plug drive bays		N8154-52F
Drive 8 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
	SATA HDD	250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

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

Category	Product Name / Description		Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9270CV-8i(with CV) RAID0/1/5/6/10/50/60, 1GB Cache, Int. 8ports, PCIe 3.0(x8), 6Gb/s, flash cache protection modules included		N8103-152
SSD Caching Recommended	MegaRAID CacheCade for LSI MegaRAID SAS NOTE: - SSD used for cache is required - The SSD capacity which can be used as read cache is up to 512 GB.		N8103-156
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-240(00)
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA		K410-204(00)
Drive Cage	2.5-inch Drive Cage 6 x 2.5-inch hot plug hard drive bays		(Standard)
Drive Cage Required	2.5-inch Drive Cage Kit 2 x 2.5-inch hot plug hard drive bays		N8154-52F
Drive 8 slots available	SAS HDD	300GB 10K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-301
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-322
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-304
		900GB 10K Hot Plug 2.5-inch SAS HDD 1x 900 GB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-332
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1x 1.2TB SAS HDD, 2.5-inch, 6Gb/s, 10,000 rpm	N8150-408
		146.5GB 15K Hot Plug 2.5-inch SAS HDD 1x 146.5 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-303
		300GB 15K Hot Plug 2.5-inch SAS HDD 1x 300 GB SAS HDD, 2.5-inch, 6Gb/s, 15,000 rpm	N8150-331
		250GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-356
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-357
		1TB 7.2K Hot Plug 2.5-inch SATA HDD 1x 1 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm	N8150-358
	SAS SSD	200GB Hot Plug 2.5-inch SAS SSD 1x 200 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-711
		400GB Hot Plug 2.5-inch SAS SSD 1x 400 GB SAS SSD, eMLC, 2.5-inch, 6Gb/s	N8150-712

NOTE:

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

4.3 3.5-inch Drive Configuration

4.3.1 Up to four Drives with Embedded SATA non-RAID Controller

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller MiniSAS, 6Gb/s SATA	(Standard)
Cable Required	Internal SAS/SATA Cable MiniSAS to 4x Single-SATA	K410-288(00)
Drive Cage	3.5-inch Drive Cage 4 x 3.5-inch hot plug drive bays	(Standard)
Drive 4 slots available	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-363
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-364
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-354

NOTE

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

4.3.2 Up to four Drives with Embedded SATA RAID Controller

Category	Product Name / Description	Part Number
Storage Controller	Embedded SATA Controller 4x 6Gb/s SATA, 6Gb/s SATA	(Standard)
Cable Required	Internal SAS/SATA Cable MiniSAS to 4x Single-SATA	K410-288(00)
Drive Cage	3.5-inch Drive Cage 4 x 3.5-inch hot plug hard drive bays	(Standard)
Drive 4 slots available	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-363
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-364
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-354
	3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-355
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-395

NOTE:

- Embedded SATA RAID controller is supported only on Windows operating systems. An optional RAID controller is required to configure RAID array for other operating systems.
- Embedded SATA RAID Controller does not support RAID 10 configured with 2TB or more HDDs.
- All hard drives within a RAID array should be of the same capacity.

4.3.3 Up to four Drives with RAID 0/1 Controller with 0 MB Cache

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (0MB, RAID 0/1) LSI MegaRAID SAS 9240-8i RAID0/1/10, 0MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-171
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Drive Cage	3.5-inch Drive Cage 4 x 3.5-inch hot plug drive bays	(Standard)
Drive 4 slots available	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-363
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-364
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-354

NOTE:

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

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

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (512MB, RAID 0/1) LSI MegaRAID SAS 9267-8i RAID 0/1, 512 MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-149
RAID BBU Recommended	RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i	N8103-154
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Drive Cage	3.5-inch Drive Cage 4 x 3.5-inch hot plug drive bays	(Standard)
Drive 4 slots available	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-363
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-364
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-354
	3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-355
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-395

NOTE:

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

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

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (512MB, RAID 0/1) LSI MegaRAID SAS 9267-8i RAID0/1/5/6/10/50/60, 512 MB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-150
RAID BBU Recommended	RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i	N8103-154
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Drive Cage	3.5-inch Drive Cage 4 x 3.5-inch hot plug drive bays	(Standard)
Drive 4 slots available	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-363
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-364
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-354
	3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-355
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-395

NOTE:

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

4.3.6 Up to four Drives with RAID 5/6 Controller with 1 GB Cache/Battery

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9267-8i RAID0/1/5/6/10/50/60, 1 GB, Int. 8, PCIe 2.0(x8), SAS 6Gb/s, SATA 6Gb/s	N8103-151
RAID BBU Recommended	RAID Battery Backup Unit for LSI MegaRAID SAS 9267-8i	N8103-154
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Drive Cage	3.5-inch Drive Cage 4 x 3.5-inch hot plug drive bays	(Standard)
Drive 4 slots available	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-363
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-364
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-354
	3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-355
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-395

NOTE:

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

4.3.7 Up to four Drives with RAID 5/6 Controller with 1 GB Cache/CacheVault

Category	Product Name / Description	Part Number
Storage Controller Required	RAID Controller (1GB, RAID 0/1/5/6) LSI MegaRAID SAS 9270CV-8i(with CV) RAID0/1/5/6/10/50/60, 1GB Cache, Int. 8ports, PCIe 3.0(x8), 6Gb/s, flash cache protection modules included	N8103-152
Cable Required	Internal SAS Cable 1x Mini-SAS to 4x Single SATA	K410-240(00)
Drive Cage	3.5-inch Drive Cage 4 x 3.5-inch hot plug drive bays	(Standard)
Drive 4 slots available	500GB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-363
	1TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-364
	2TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-354
	3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-355
	4TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm	N8150-395

NOTE:

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

5 Optical Drive

Category	Product Name / Description	Part Number
Internal 1 slot available	Internal Slim DVD-ROM drive Slim DVD-ROM drive	N8151-119
	Internal DVD Super Multi Drive Slim DVD Super Multi drive, not including writing software	N8151-107F
External	External DVD-ROM drive DVD-ROM drive, Bus powered, 1.2 A required	N8160-91

NOTE:

- Up to 1 optical drive can be connected.
- N8154-52 2.5-inch Hot Plug Drive Cage Kit cannot be installed when an internal optical drive is installed.

6 PCI Card

Please refer to [Supported PCI cards and Installable Slots](#) with regard to the position of PCI slot which can mount PCI card supported.

6.1 Network Interface Controller

Category		Product Name / Description	Part Number
Adapter	GbE	1000BASE-T Adapter Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-138
		Dual Port 1000BASE-T Adapter Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-132
		Dual Port 1000BASE-T Adapter Intel® 82580 Gigabit Ethernet Controller PCIe 2.0 x4	N8104-145
	10GbE	10GBASE Adapter (SFP+/2ch) Broadcom NetXtreme II BCM957711 10G SFP+ Dual Port Network Interface Card PCIe 2.0 x8 NOTE: - N8104-129 SFP+ Module is required to connect with an optical cable. - Up to 2 SFP+ Modules can be installed. - Supports either 10Gb Converged Network Adapter or 10Gb Network Adapter in RHEL 6 operating systems.	N8104-128
		Dual Port 10Gb Converged Network Adapter BROCADE 1020 Dual Port 10Gbps Converged Network Adapter PCIe 2.0 x8, 2 x SFP modules, Max. one adapter NOTE: - Supports either 10Gb Converged Network Adapter or 10Gb Network Adapter in RHEL 6 operating systems.	N8104-131
SPF+ Module		SFP+ Module (10G-SR) 1 x SFP+ Module for N8104-128	N8104-129

NIC Teaming feature - NIC Teaming and bonding features

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

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

Network Interface	Team	Operating Systems
1GbE NIC Embedded 1GbE NIC and N8104-138/-132	Up to four teams per one system Up to four ports per one team	Windows Server 2008 Windows Server 2008 R2 Windows Server 2012 Red Hat Enterprise Linux
1GbE NIC N8104-145	Up to four teams per one system Up to four ports per one team	Windows Server 2008 Windows Server 2008 R2
10GbE NIC N8104-128	Up to two teams per one system Up to two ports per one team	Windows Server 2008 Windows Server 2008 R2 Windows Server 2012 RHEL5.9(EM64T)* or later RHEL6.4(x86_64)* or later

* RHEL : Red Hat Enterprise Linux

NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.
- The network interfaces for teaming must be the same.
- When 10GbE and 1GbE NIC teaming are mixed, the teams must be up to four per one system.

Using iSCSI

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

Categor	Network Interface	Operating Systems
1GbE	Embedded 1GbE NIC	Windows Server 2008 R2, Windows Server 2012, Red Hat Linux, VMware
	N8104-138	Windows Server 2008 R2, Windows Server 2012, Red Hat Linux, VMware
	N8104-132	Windows Server 2008 R2, Windows Server 2012, Red Hat Linux, VMware
10GbE	N8104-128	Windows Server 2008, Windows Server 2008 R2, Red Hat Linux, VMware

NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.

6.2 External Storage Controller

6.2.1 RAID Controller

Category	Product Name / Description	Part Number
Controller	RAID Controller (1GB, RAID0/1/5/6) LSI MegaRAID SAS 9285-8e RAID0/1/5/6/10/50/60, 1GB, Ext. 8, PCIe 2.0 x8, SAS 6Gb/s, SATA 6Gb/s	N8103-160
RAID BBU	RAID Battery Backup Unit for LSI MegaRAID SAS 9285-8e	N8103-162

NOTE:

- To configure a large-capacity RAID array, it is recommended to configure in RAID 6 or RAID 60 in order to minimize the risk of becoming multiple hard drives failure during the RAID rebuilding process.
- It is recommended to set RAID array configuration drives less than eight in order to minimize the risk of becoming multiple hard drives failure.

6.2.2 Fibre Channel / SAS Controller

Category	Product Name / Description	Part Number
Fibre Channel	Fibre Channel Controller (1ch) Emulex LightPulse LPe1250-F8 Host Bus Adapter 8Gb/s, Optical, PCIe 2.0 x8	N8190-153
	Fibre Channel Controller (2ch) Emulex LightPulse LPe12002-M8 Host Bus Adapter 8Gb/s, Optical, PCIe 2.0 x8	N8190-154
	Fibre Channel Controller (1ch) Emulex LightPulse LPe16000B-M6 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0 x8	N8190-157
	Fibre Channel Controller (2ch) Emulex LightPulse LPe16002B-M6 Host Bus Adapter 16Gb/s, Optical, PCIe 3.0 x8	N8190-158
SAS	SAS Controller LSI SAS9212-4i4e Host Bus Adapter 6Gb/s SAS, Int. 4 / Ext. 4, 7-pin SATA / SFF-8088, PCIe 2.0 x8	N8103-142

6.3 Serial Port Adapter

Product Name / Description	Part Number
Serial Port Adapter Serial port fixed to PCI bracket	N8117-01A

NOTE:

- Up to one Serial Port Adapter can be installed.

7 Other Add-in Components

7.1 Cooling Fan Kit

Product Name / Description	Part Number
Redundant Fan Kit Non-hot plug cooling fan for R110f-1E	N8181-111F
Non-redundant Fan Kit Non-hot plug cooling fan for R110f-1E	N8181-115F

NOTE:

- One of the fan kits must be installed.

7.2 Trusted Platform Module Kit

Product Name / Description	Part Number
Trusted Platform Module Kit TPM 1.2 module	N8115-15

NOTE:

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

7.3 Internal Flash Memory

Available socket: 1

Product Name / Description	Part Number
Internal Flash Memory Internal flash memory to enable software and tools in the EXPRESSBUILDR DVD without DVD media	N8115-14

NOTE:
Before use, software and tools must be copied from the EXPRESSBUILDER DVD to the flash memory.
The following operations can be performed with the flash memory:

- Installation of Windows server with express setup
- Installation of Starter Pack—the package of NEC qualified drivers and system setting tools
- Installation of NEC ESMPRO Agent and Universal RAID Utility
- Performance of the Test and Diagnosis Tool

7.4 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	N8160-86

NOTE:

- Up to one drive can be connected.

7.5 Front Bezel

Product Name / Description	Part Number
Front Bezel Front bezel for R110f-1E	N8146-38F

8 Add-on Components

8.1 17-inch LCD Console Drawer

Category		Product Name / Description	Part Number
Drawer w/ KVM	Drawer	17-inch LCD Console Drawer (8 port) 17-inch LCD, US 83-keys Keyboard, Optical mouse, 8 port KVM switch, 1U height	N8143-77F
	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	N8143-76F
		17inch LCD Console Drawer (1 port) 17-inch LCD, US 103-keys Keyboard with 10-key, Touch pad with 3-button, 1U height, 4-pin USB B to 4-pin USB A cable 1.8 m, Two PS/2 cable 1.8 m, 15-pin mini D-sub VGA cable 1.8 m	N8143-84F
	Keypad	Keyboard Unit (JP) JP 108-keys Keyboard with 10-key for N8143-84F 17inch LCD Console Drawer (1 port)	N8143-85
		Keyboard Unit (UK) UK 104-keys Keyboard with 10-key, for N8143-84F 17inch LCD Console Drawer (1 port)	N8143-87

8.2 KVM Switch

Category		Product Name / Description	Part Number
KVM Switch		Server Switch Unit (8 server) 1U USB 8 port KVM switch	N8191-12F
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,3m) 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)

8.3 Server Management License

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

Product Name / Description	Part Number
Remote KVM and Media License kit License for one server. Remote console and remote media are enabled regardless of OS status. Remote KVM: - Displays a graphics console on the web browser of the remote terminal (PC/server). - Controls keyboard and mouse via the remote terminals' web browser Remote media: Enables the user to use the CD / DVD / FD / Flash memory of the remote terminals (PC/server) as if accessing the local drives.	N8115-04

NOTE:

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

8.4 Dust Proof Filter Kit

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

Product Name / Description	Part Number
Dust Proof Filter 10 sheets, dust proof filter for R110f-1E	N8147-07

NOTE:

- The filter kit is make-to-order product. Please consult our sales representative in regards to production lead time.

References

Server Management

The EXPRESSSCOPE Engine 3, integrated into the server, provides superior remote control and system management features listed in the table below.

		Standard	With Remote KVM and Media License kit
Hardware monitoring	Temperature/fan/voltage/power consumption/SystemLAN/degeneration(memory)	✓	✓
	Hardware configuration information collection	✓	✓
	Hardware event log collection	✓	✓
Boot monitoring	BIOS/POST stall, Booting, OS stall, shutdown	✓ ²	✓ ²
Alerting	HW error, Boot error and OS panic (by SNMP, E-Mail)	✓	✓
Remote KVM (via LAN)	POST/BIOS setup, ROM utility	✓ ¹	✓
	Panic screen, Boot screen	✓ ^{1,3}	✓
	CUI-based screen (OS console)	✓ ^{1,4}	✓
	GUI-based screen (OS console)	-	✓
	Remote screen recording	-	✓
Remote control (via LAN)	Remote reset/power on-off/ dump	✓	✓
	Remote power capping	✓	✓
	BIOS/BMC FW update	✓	✓
	Remote BIOS setup(partial configuration only)	✓	✓
	OS shutdown	✓ ²	✓ ²
	Remote media (CD/DVD/FD/USB)	-	✓
	CLP (Command Line Protocol) (DMTF compliant)	✓	✓
	Remote control via web browser (multi user login at the same time)	✓	✓
Maintenance	Scheduling (without UPS, require NEC ESM PRO Manager)	✓ ²	✓ ²
	EXPRESSSCOPE® Profile key (Backup/restore BIOS/BMC setup information)	✓	✓
Others	Set automatic IP address via DNS/DHCP	✓	✓
	LDAP/Active Directory verification/user control	✓	✓
	Clock synchronization of main unit and the RTC	✓	✓
	Access log collection	✓	✓
Industry Standard	IPMI support	2.0	2.0

¹ The optional serial port is not available for the feature

² The feature is not supported on VMware systems

³ Monitoring boot screens is not supported on VMware systems.

⁴ In VMware systems, only the direct console user interface is supported.

OS Support Matrix for PCI Cards and Embedded Controllers

		WS 2012	WS 2008R2	WS 2008	WS 2008 x64	RHEL 6	RHEL 6 x64	RHEL 5	RHEL 5 x64	ESXi 5.1
Part Number	Product Name									
-	Embedded SATA non-RAID Controller	✓	✓	✓	-	✓	✓	✓	✓	✓
-	Embedded SATA RAID Controller	✓	✓	✓	-	-	-	-	-	-
-	Embedded 1GbE NIC	✓	✓	✓	-	✓	✓	✓	✓	✓
N8103-142	SAS Controller	✓	✓	✓	-	✓	✓	✓	✓	✓
N8103-171	RAID Controller (0MB, RAID 0/1)	✓	✓	✓	-	✓	✓	✓	✓	-
N8103-149	RAID controller (512MB, RAID 0/1)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8103-150	RAID controller (512MB, RAID 0/1/5/6)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8103-151	RAID controller (1GB, RAID 0/1/5/6)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8103-152	RAID controller (1GB, RAID 0/1/5/6)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8103-160	RAID controller (1GB, RAID 0/1/5/6)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8190-153	Fibre Channel Controller	✓	✓	✓	-	✓	✓	✓	✓	✓
N8190-154	Fibre Channel Controller (2ch)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8190-157	Fibre Channel Controller	✓	✓	-	-	-	✓	-	-	-
N8190-158	Fibre Channel Controller (2ch)	✓	✓	-	-	-	✓	-	-	-
N8104-138	1000BASE-T Adapter (1ch)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8104-132	1000BASE-T Adapter (2ch)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8104-145	1000BASE-T Adapter (2ch)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8104-128	10GBASE Adapter (SFP+/2ch)	✓	✓	✓	-	✓	✓	✓	✓	✓
N8104-131	Dual Port 10Gb Converged Network Adapter	-	✓	✓	-	✓	✓	✓	✓	-

Supported PCI cards and Installable Slots

Part Number	Product Name	Slots	
		#1	#2
N8103-142	SAS Controller	✓	✓
N8103-171	RAID Controller (0MB, RAID 0/1)	-	✓
N8103-149	RAID Controller (512MB,RAID 0/1)	-	✓
N8103-150	RAID Controller (512MB,RAID 0/1/5/6)	-	✓
N8103-151	RAID Controller (1GB,RAID 0/1/5/6)	-	✓
N8103-152	RAID Controller (1GB,RAID 0/1/5/6)	-	✓
N8103-160	RAID Controller (1GB,RAID 0/1/5/6)	✓	✓
N8190-153	Fibre Channel Controller	✓	✓
N8190-154	Fibre Channel Controller (2ch)	✓	✓
N8190-157	Fibre Channel Controller	✓	✓
N8190-158	Fibre Channel Controller (2ch)	✓	✓
N8104-138	1000BASE-T Adapter (1ch)	✓	✓
N8104-132	1000BASE-T Adapter (2ch)	✓	✓
N8104-145	1000BASE-T Adapter (2ch)	✓	✓
N8104-128	10GBASE Adapter (SFP+/2ch)	✓	✓
N8104-131	Dual Port 10Gb Converged Network Adapter	✓	✓
N8117-01A	Serial Port Adapter	✓	✓

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

Revision History

Revision	Date	Description
1.0	July 17, 2013	Initial release