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NEC Express5800/T110h
System Configuration Guide

Introduction

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

January 26, 2017
Revision 5.0
NEC Corporation

Contents

Technical Specification

Key Features

- High performance with the latest Intel® Xeon® processor E3-1200 v5 processor family
- Up to 64 GB of high speed DDR4 memory
- 4 PCIe gen3 slots for various needs and future expansion
- Agent-less management with improved EXPRESSCOPE Engine 3
- Wide range of operating ambient temperature from 5 to 48°C (41 to 118°F)

Specification

(1 / 2)

Model		T110h			
Part Number		N8100-2332F, N8100-2333F			
Processor	**Type**	Intel® Celeron® processor G3900	Intel® Pentium® processor G4400	Intel® Core™ i3-6300 processor	Intel® Xeon® processor E3-1220 v5
	Clock speed	2.80 GHz	3.30 GHz	3.80 GHz	3.00 GHz
	Number of Processors	1			
	Cache	2 MB	3 MB	4 MB	8 MB
	Cores and Threads	2C / 2T		2C / 4T	4C / 4T
Chipset		Intel® C236 Chipset			
Memory	**Type**	DDR4-2133 ECC Unbuffered DIMM			
	Standard Capacity	0 GB			
	Maximum Capacity	64 GB (4 x 16 GB)			
Internal Storage	**Standard Capacity**	0 GB			
	Maximum Capacity	32 TB (4 x 8 TB)			
	Disk Controller	SATA : 6 Gb/s (Integrated) SATA/SAS : 6/12 Gb/s (Optional)			
	RAID	SATA : RAID 0/1/10 (Standard [1]) SATA/SAS : RAID 0/1/5/6/10/50/60 (Optional)			
	Hot Plug	Supported with hot plug drive bay			
	Optical Disk Drive	Optional			
	5-inch Media Bays	2			
	Disk Drive Bays	Hot plug 2.5-inch drive configuration: 8 Hot plug 3.5-inch drive configuration: 4 Non-hot plug 3.5-inch drive configuration: 4			
Expansion Slots		Total: 4 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x4 (x8 connector) 1 PCIe 3.0 x2 (x8 connector) 1 PCIe 3.0 x1 (x8 connector)			
Video	**Controller (VRAM)**	Integrated in Server Management Controller (32MB)			
	Resolution / Color	1600 x 1200 / 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) 6 USB 3.0 (2 front, 4 rear) (plus 1 internal USB 3.0) 2 1000BASE-T LAN connector (RJ-45, 2 rear)			
Interfaces (cont'd)		1 1000BASE-T LAN connector for Management (RJ-45, 1 rear)			
Server Management		EXPRESSSCOPE Engine 3			

Model		T110h			
System Fan		Standard			
Power Supply		1 x 400 Watt 80 PLUS® Gold certified non-hot plug PSU 2 x 460 Watt 80 PLUS® Platinum certified Hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz			
Power Consumption	(Max. Config, Idling)	115 VA / 114 Watt			
	(Max. Config, Operating)	260 VA / 259 Watt	268 VA / 266 Watt	277 VA / 275 Watt	261 VA / 259 Watt
Acoustic Noise (Sound Pressure Level) [3]	Minimum Config.	27.1 dB			
	Maximum Config.	34.7 dB			
Dimensions (W x D x H)		175.0 x 469.3 x 367.0mm / 6.8 x 18.5 x 14.4 in			
Weight (Minimum / Maximum)		11 kg / 19 kg, 24.25 lbs. / 41.88 lbs.			
Temperature, Relative Humidity (non-condensing)		Operating: 5° to 40° C / 41° to 104° F (Standard) or 5° to 48° C / 41° to 118° F (Optional), 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%			
Regulatory and Safety		FCC, c-UL, CE, CB, RoHS, WEEE, BSMI, CCC			
Operating Systems and Virtualization Software		Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Microsoft® Windows Server® 2012 R2 Standard Microsoft® Windows Server® 2012 R2 Datacenter Red Hat Enterprise Linux 6.7 or later (x86_64) [4] Red Hat Enterprise Linux 7.2 or later [4 6] VMware ESXi 5.5 Update 3 [5] VMware ESXi 6.0 Update 1 [5]			

1 Embedded SATA RAID controller is supported only on limited OS.

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, at 25°C. The actual value may vary by the operating environment.

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

5 VMware ESXi is supported only on Xeon processor systems.

(2 / 2)

Model		T110h	
Part Number		N8100-2332F, N8100-2333F	
Processor	Type	Intel® Xeon® processor E3-1230 v5	Intel® Xeon® processor E3-1270 v5
	Clock speed	3.40 GHz	3.60GHz
	Number of Processors	1	

Model		T110h
	Cache	8 MB
	Cores and Threads	4C / 8T
Chipset		Intel® C236 Chipset
Memory	Type	DDR4-2133 ECC Unbuffered DIMM
	Standard Capacity	0 GB
	Maximum Capacity	64 GB (4 x 16 GB)
Internal Storage	Standard Capacity	0 GB
	Maximum Capacity	40 TB (4 x 10 TB)
	Disk Controller	SATA : 6 Gb/s (Integrated) SATA/SAS : 6/12 Gb/s (Optional)
	RAID	SATA : RAID 0/1/10 (Standard [1]) SATA/SAS : RAID 0/1/5/6/10/50/60 (Optional)
	Hot Plug	Supported with hot plug drive bay
	Optical Disk Drive	Optional
	5-inch Media Bays	2
	Disk Drive Bays	Hot plug 2.5-inch drive configuration: 8 Hot plug 3.5-inch drive configuration: 4 Non-hot plug 3.5-inch drive configuration: 4
Expansion Slots		Total: 4 slots available 1 PCIe 3.0 x16 (x16 connector) 1 PCIe 3.0 x4 (x8 connector) 1 PCIe 3.0 x2 (x8 connector) 1 PCIe 3.0 x1 (x8 connector)
Video	Controller (VRAM)	Integrated in Server Management Controller (32MB)
	Resolution / Color	1600 x 1200 / 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) 6 USB 3.0 (2 front, 4 rear) (plus 1 internal USB 3.0) 2 1000BASE-T LAN connector (RJ-45, 2 rear) 1 1000BASE-T LAN connector for Management (RJ-45, 1 rear)
Server Management		EXPRESSSCOPE Engine 3
System Fan		Standard
Power Supply		1 x 400 Watt 80 PLUS® Gold certified non-hot plug PSU 2 x 460 Watt 80 PLUS® Platinum certified Hot plug PSU 100-240 VAC ± 10% 50 / 60 Hz ± 3 Hz
Power Consumption	(Max. Config, Idling)	115 VA / 114 Watt
	(Max. Config, Operating)	295 VA / 293 Watt
Acoustic Noise (Sound Pressure Level) [3]	Minimum Config.	27.1 dB
	Maximum Config.	34.7 dB
Dimensions (W x D x H)		175.0 x 469.3 x 367.0mm / 6.8 x 18.5 x 14.4 in
Weight (Minimum / Maximum)		11 kg / 19 kg, 24.25 lbs. / 41.88 lbs.
Temperature, Relative Humidity (non-condensing)		Operating: 5° to 40° C / 41° to 104° F (Standard) or 5° to 48° C / 41° to 118° F (Optional), 20 to 80% Non-Operating: -10° to 55° C / 14° to 131° F, 20 to 80%
Regulatory and Safety		FCC, c-UL, CE, CB, RoHS, WEEE, BSMI, CCC

Model	T110h
Operating Systems and Virtualization Software	Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Microsoft® Windows Server® 2012 R2 Standard Microsoft® Windows Server® 2012 R2 Datacenter Red Hat Enterprise Linux 6.7 or later (x86_64) [4] Red Hat Enterprise Linux 7.2 or later [4 6] VMware ESXi 5.5 Update 3 [5] VMware ESXi 6.0 Update 1 [5]

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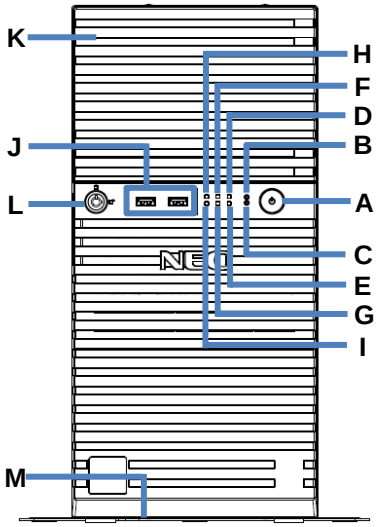
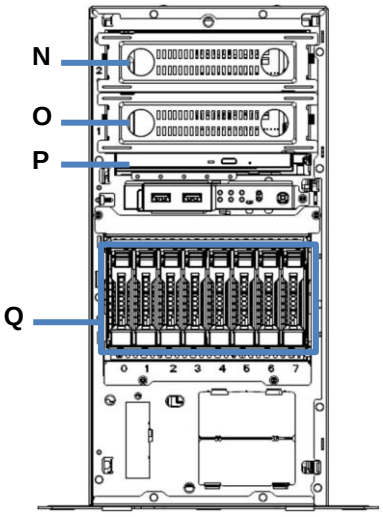
External Views

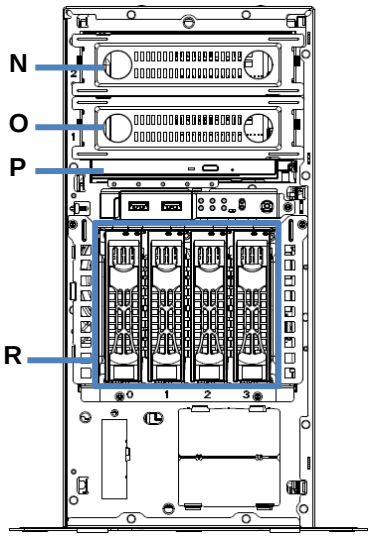
Front View



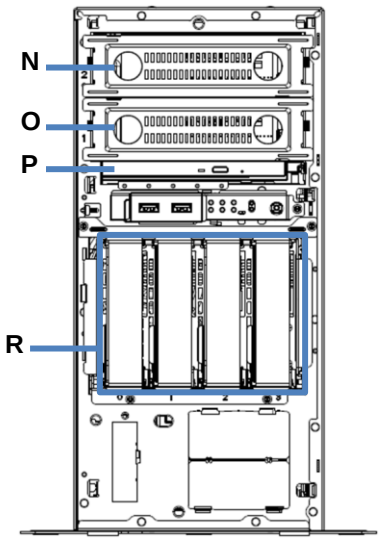
With Front bezel



Hot Plug 2.5-inch Drive Configuration



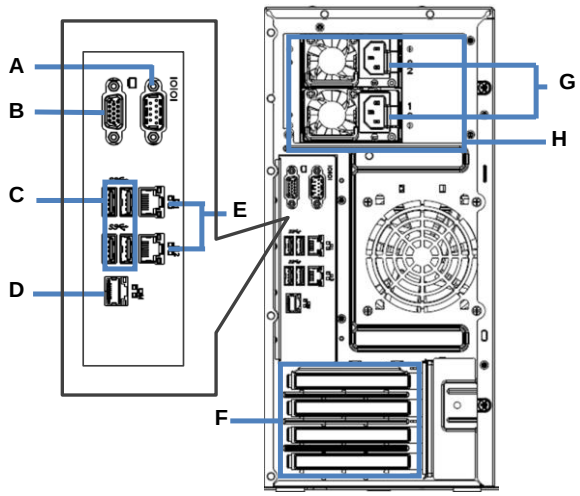
Hot Plug 3.5-inch Drive Configuration



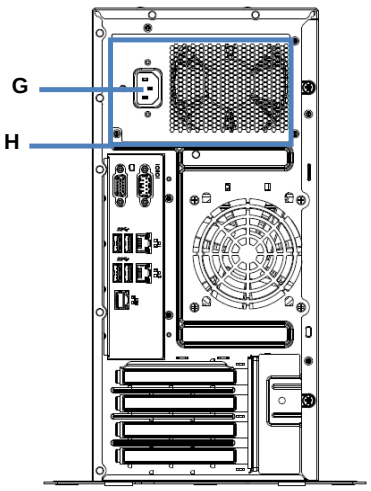
Non-hot Plug 3.5-inch Drive Configuration

Legend			
A.	Power Button	**J.**	USB 3.0 Connectors
B.	Dump (NMI) Button	**K.**	Drive Bay Cover
C.	BMC Reset Button	**L.**	Cover Key
D.	Power LED	**M.**	Stabilizer
E.	Power Capping LED	**N.**	5.25-inch Media Bay 1
F.	System Status LED 1	**O.**	5.25-inch Media Bay 2
G.	System Status LED 2	**P.**	Optical Disk Drive
H.	Global LED 1	**Q.**	2.5-inch Drive Bay
I.	Global LED 2	**R.**	3.5-inch Drive Bay

Rear Views



Hot Plug Power Supply Configuration

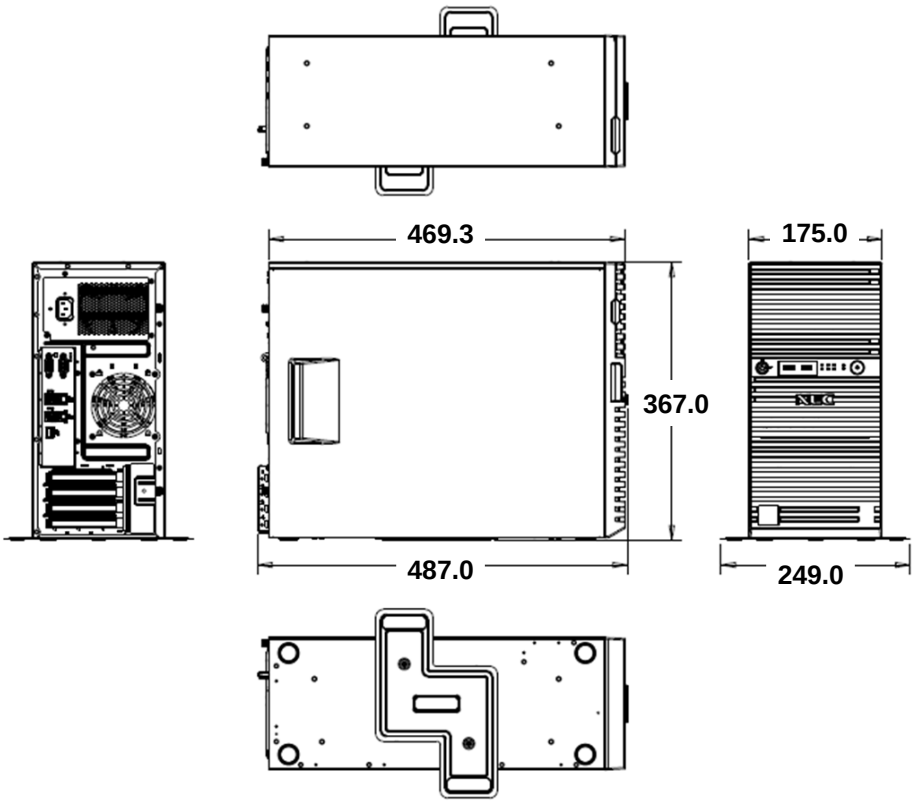


Non-hot Plug Power Supply Configuration

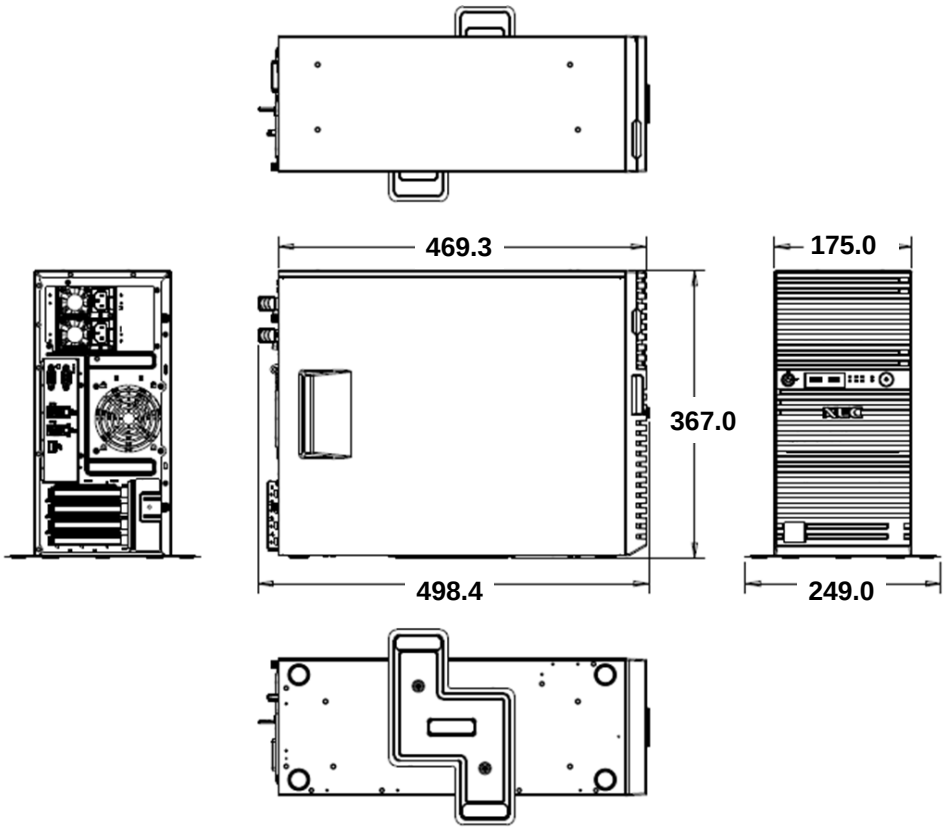
Legend			
A.	Serial Port Connector	**E.**	Data LAN Connectors
B.	VGA Connector	**F.**	PCI Slots
C.	USB Connectors	**G.**	AC Inlet
D.	Management LAN Connector	**H.**	Power Supply Unit

Dimensions (mm)

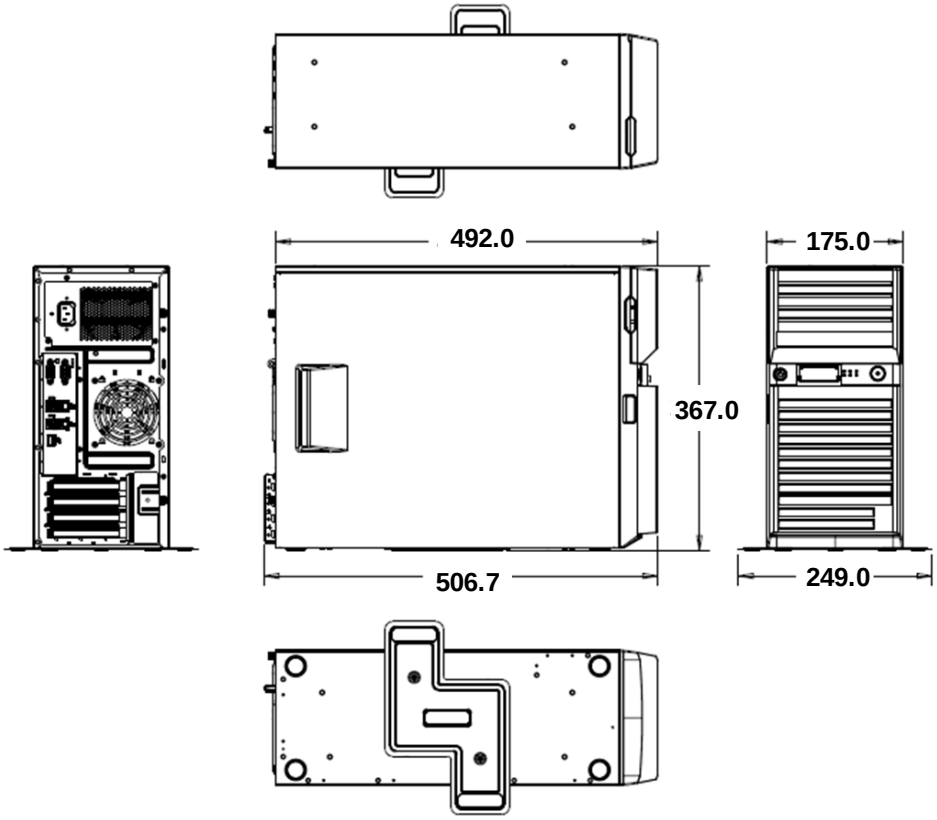
Standard Bezel / Non-redundant Power Configuration



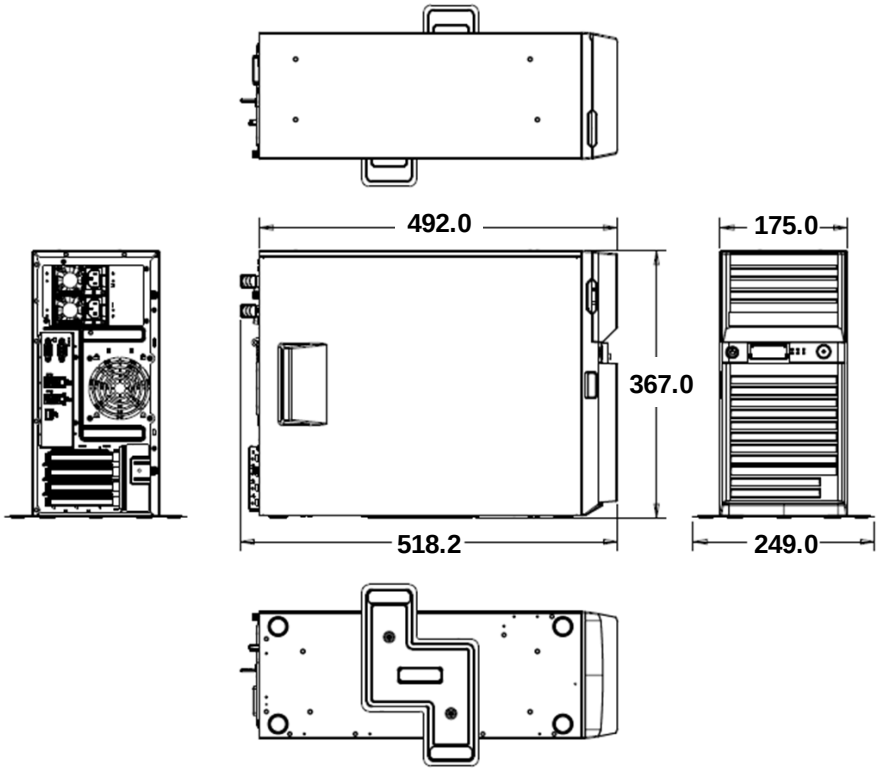
Standard Bezel / Redundant Power Configuration



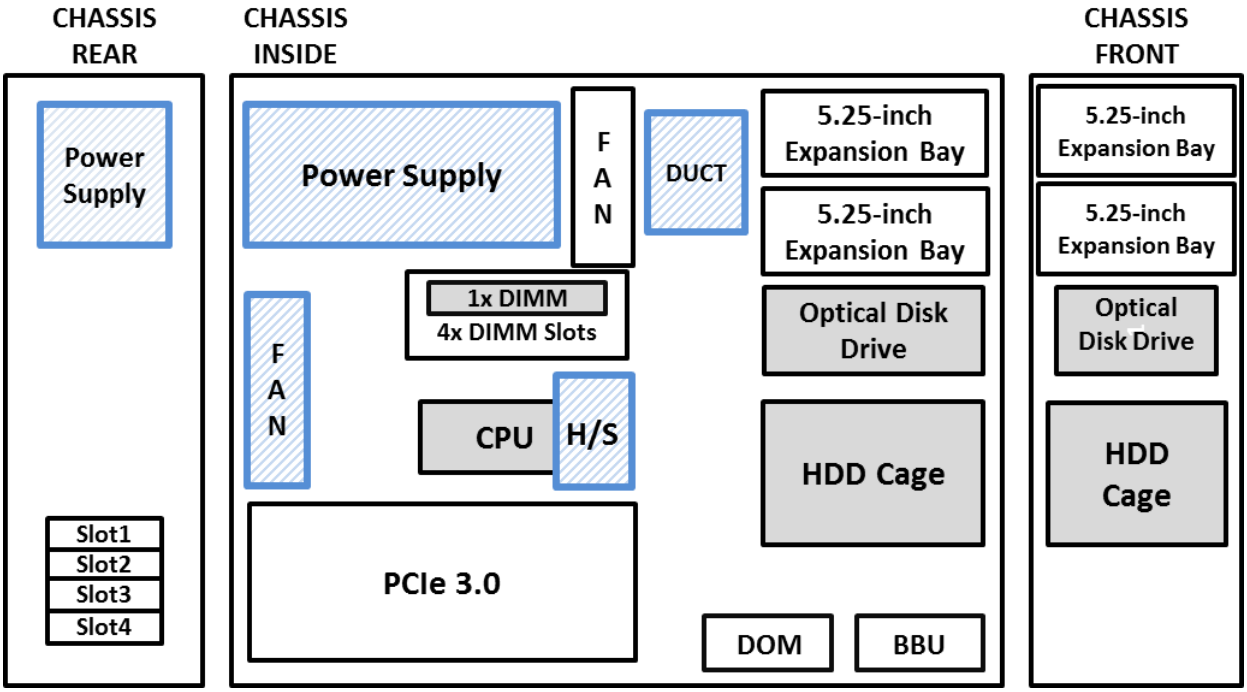
Dust Proof Bezel / Non-redundant Power Configuration



Dust Proof Bezel / Redundant Power Configuration

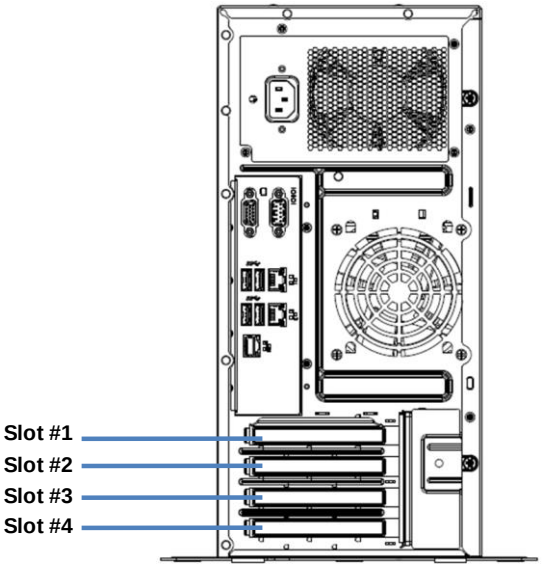


Configuration Diagram



Legend: Standard components Minimum required components

Expansion Slots



Legend	
#1	PCIe 3.0 x2, x8 connector, Full Height, up to 173mm length
#2	PCIe 3.0 x1, x8 connector, Full Height, up to 173mm length
#3	PCIe 3.0 x16, x16 connector, Full Height, up to 312mm length
#4	PCIe 3.0 x4, x8 connector, Full Height, up to 173mm length

Server Configuration

Base Models

Product Name / Description	Part Number
NEC Express5800/T110h no CPU, no RAM, no Drive Cage, no HDD, no Optical Drive, no Keyboard, no Mouse Including: 400 Watt 80 PLUS® Gold certified non-hot plug power supply	N8100-2332F
NEC Express5800/T110h no CPU, no RAM, no Drive Cage, no HDD, no Optical Drive, no Keyboard, no Mouse Including: 2x 460 Watt 80 PLUS® Platinum certified hot plug power supply	N8100-2333F

NOTE:

- The base model must be ordered with a processor kit, memory, a drive cage, and an optical drive.
- Keyboard and mouse are not included in the base models. Please order separately if necessary.
- For Windows Server 2008 R2 installation, EXPRESSBUILDER DVD is required.

Processor

Available sockets: 1

Category	Product Name / Description	Part Number
Processors Required	**Celeron G3900 Processor Kit** Intel® Celeron ® Processor G3900 (2.8 GHz, 2C/2T, 2 MB)	N8101-938F
	Pentium G4400 Processor Kit Intel® Pentium ® Processor G4400 (3.3 GHz, 2C/2T, 3 MB)	N8101-939F
	Core i3-6300 Processor Kit Intel® Core™ i3-6300 Processor (3.8 GHz, 2C/4T, 4 MB)	N8101-940F
	Xeon E3-1220 v5 Processor Kit Intel® Xeon ® Processor E3-1220 v5 (3.0 GHz, 4C/4T, 8 MB)	N8101-941F
	Xeon E3-1230 v5 Processor Kit Intel® Xeon ® Processor E3-1230 v5 (3.4 GHz, 4C/8T, 8 MB)	N8101-942F
	Xeon E3-1270 v5 Processor Kit Intel® Xeon ® Processor E3-1270 v5 (3.6 GHz, 4C/8T, 8 MB)	N8101-945F

NOTE:

- One processor kit from above must be installed.
- VMware ESXi is not supported on Celeron processor systems, Pentium processor or Core i3 processor systems.

Memory

Available slots: 4

Product Name / Description	Part Number
4GB DDR4-2133 UNB Memory Kit 1 x 4GB Unbuffered ECC DIMM, DDR4-2133	N8102-656F
8GB DDR4-2133 UNB Memory Kit 1 x 8GB Unbuffered ECC DIMM, DDR4-2133	N8102-657F
16GB DDR4-2133 UNB Memory Kit 1 x 16GB Unbuffered ECC DIMM, DDR4-2133	N8102-658F

NOTE:

- Minimum one memory kit must be installed.
- It is recommended to install memory kits in pairs of two identical DIMMs for dual-channel symmetric memory configurations to increase memory transfer speed.
- The memory requirement for installing VMware ESXi™ are below:
  - VMware ESXi 5.5 : at least 5 GB
  - VMware ESXi 6.0 : at least 5 GB

Maximum Available Memory

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

Maximum Memory Size Supported by Operating Systems		Maximum Available Memory
Microsoft Windows Server 2008 R2 Standard [1]	**32 GB**	**32 GB**
Microsoft Windows Server 2008 R2 Enterprise[1]	**2 TB**	**64 GB**
Microsoft Windows Server 2012 Standard [1] Microsoft Windows Server 2012 Datacenter [1] Microsoft Windows Server 2012 R2 Standard [1] Microsoft Windows Server 2012 R2 Datacenter [1]	**4 TB**	**64 GB**
Red Hat Enterprise Linux 6 (x86_64) Red Hat Enterprise Linux 7	**6 TB**	**64 GB**
VMware ESXi 5.5 [2]	**4 TB**	**64 GB**
VMware ESXi 6 [3]	**6TB**	**64 GB**

[1] The maximum available memory size of Hyper-V systems are below:
- Windows Server 2008 R2 Standard : 32 GB
- Windows Server 2008 R2 Enterprise : 1TB
- Windows Server 2012 and Windows Server 2012 R2 : 4 TB

[2] Up to 1TB of main memory is available to each virtual machine.

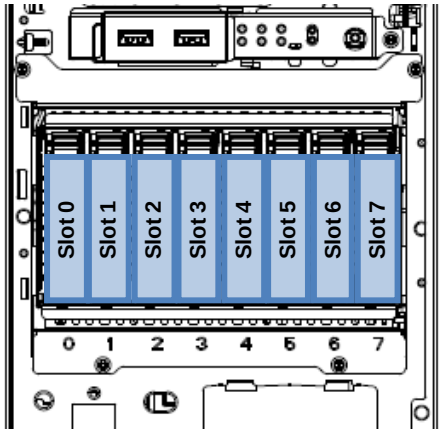
[3] Up to 4TB of main memory is available to each virtual machine.

Internal Hard Disk Drives

RAID Configuration

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

1.1.1 2.5-inch Drive

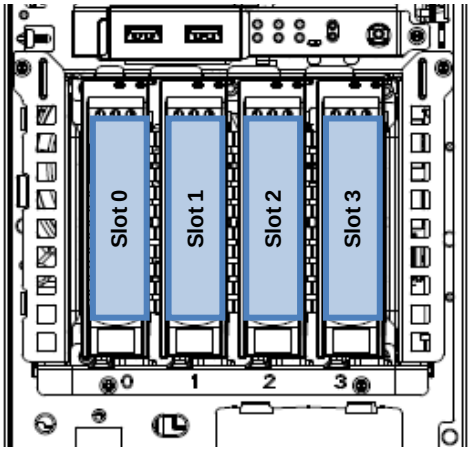


Operating System	Supported RAID configuration			Supported HDD/SSD
	RAID and Cache		Section	
Windows Server 2008 R2 VMware ESXi 5.5 VMware ESXi 6	Non-RAID (Embedded SATA)		1.1.4	1.1.22
	RAID 0/1 (Embedded SATA RAID) (WS2008R2 only)		1.1.5	1.1.23
	RAID 0/1/10	No Cache	1.1.6	1.1.24
	RAID 0/1/10	1GB Cache	1.1.7	
	RAID 5/6/50/60	1GB Cache	1.1.8	
	RAID 5/6/50/60	2GB Cache	1.1.9	
Windows Server 2012 Windows Server 2012 R2	Non-RAID (Embedded SATA)		1.1.4	1.1.22
	RAID 0/1 (Embedded SATA RAID)		1.1.5	1.1.23
	RAID 0/1/10	No Cache	1.1.6	1.1.25
	RAID 0/1/10	1GB Cache	1.1.7	
	RAID 5/6/50/60	1GB Cache	1.1.8	
	RAID 5/6/50/60	2GB Cache	1.1.9	
Red Hat Enterprise Linux 6 Red Hat Enterprise Linux 7	Non-RAID (Embedded SATA)		1.1.4	1.1.22
	RAID 0/1/10	No Cache	1.1.6	1.1.25
	RAID 0/1/10	1GB Cache	1.1.7	
	RAID 5/6/50/60	1GB Cache	1.1.8	
	RAID 5/6/50/60	2GB Cache	1.1.9	

NOTE:

- Up to four drives can be installed when you choose the Embedded SATA Non-RAID controller.
- All drives within a RAID array should be of the same capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs (512n), SAS 10K HDDs (512e), SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME), and SATA SSDs (VE) can be mixed in a 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.

1.1.2 Hot plug 3.5-inch Drive

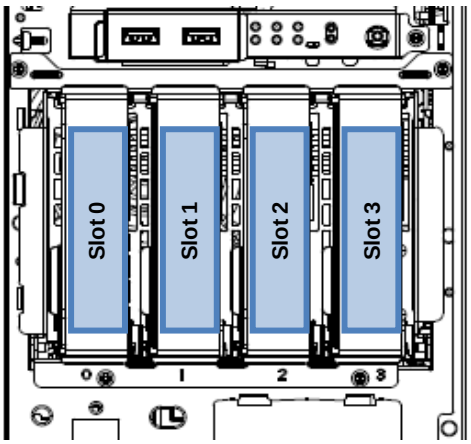


Operating System	Supported RAID configuration			Supported HDD/SSD
	RAID and Cache		Section	
Windows Server 2008 R2 VMware ESXi 5.5 VMware ESXi 6	Non-RAID (Embedded SATA)		1.1.10	1.1.26
	RAID 0/1 (Embedded SATA RAID) (WS2008R2 only)		1.1.11	
	RAID 0/1/10	No Cache	1.1.12	
	RAID 0/1/10	1GB Cache	1.1.13	
	RAID 5/6/50/60	1GB Cache	1.1.14	
	RAID 5/6/50/60	2GB Cache	1.1.15	
Windows Server 2012 Windows Server 2012 R2	Non-RAID (Embedded SATA)		1.1.10	1.1.26
	RAID 0/1 (Embedded SATA RAID)		1.1.11	
	RAID 0/1/10	No Cache	1.1.12	1.1.27
	RAID 0/1/10	1GB Cache	1.1.13	
	RAID 5/6/50/60	1GB Cache	1.1.14	
	RAID 5/6/50/60	2GB Cache	1.1.15	
Red Hat Enterprise Linux 6 Red Hat Enterprise Linux 7	Non-RAID (Embedded SATA)		1.1.10	1.1.26
	RAID 0/1/10	No Cache	1.1.12	1.1.27
	RAID 0/1/10	1GB Cache	1.1.13	
	RAID 5/6/50/60	1GB Cache	1.1.14	
	RAID 5/6/50/60	2GB Cache	1.1.15	

NOTE:

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

1.1.3 Non-hot plug 3.5-inch Drive



Operating System	Supported RAID configuration			Supported HDD/SSD
	RAID and Cache		Section	
Windows Server 2008 R2 VMware ESXi 5.5 VMware ESXi 6 KVM in Red Hat Enterprise Linux 6 (x86_64)	Non-RAID (Embedded SATA)		1.1.16	1.1.28
	RAID 0/1 (Embedded SATA RAID)		1.1.17	
	RAID 0/1/10	No Cache	1.1.18	
	RAID 0/1/10	1GB Cache	1.1.19	
	RAID 5/6/50/60	1GB Cache	1.1.20	
	RAID 5/6/50/60	2GB Cache	1.1.21	
Windows Server 2012 Windows Server 2012 R2	Non-RAID (Embedded SATA)		1.1.16	1.1.28
	RAID 0/1 (Embedded SATA RAID)		1.1.17	
	RAID 0/1/10	No Cache	1.1.18	1.1.29
	RAID 0/1/10	1GB Cache	1.1.19	
	RAID 5/6/50/60	1GB Cache	1.1.20	
	RAID 5/6/50/60	2GB Cache	1.1.21	
Red Hat Enterprise Linux 6 (x86_64) without KVM Red Hat Enterprise Linux 7	Non-RAID (Embedded SATA)		1.1.16	1.1.28
	RAID 0/1/10	No Cache	1.1.18	1.1.29
	RAID 0/1/10	1GB Cache	1.1.19	
	RAID 5/6/50/60	1GB Cache	1.1.20	
	RAID 5/6/50/60	2GB Cache	1.1.21	

NOTE:

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

Required Components for RAID Configuration

1.1.4 Embedded SATA Non-RAID Controller for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 4 x 6Gb/s SATA	(Standard)
Cable	**Internal SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage **Required**	**2.5-inch Hot Plug Drive Cage Kit** 8 x 2.5-inch hot plug hard drive bays	N8154-80F

NOTE

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

1.1.5 Embedded SATA RAID Controller for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 4 x 6Gb/s SATA, RAID0/1/10 capable	(Standard)
Cable	**Internal SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage **Required**	**2.5-inch Drive Cage** 8 x 2.5-inch hot plug drive bays	N8154-80F

NOTE

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

1.1.6 RAID 0/1 Controller without Cache for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller **Required**	**RAID Controller (RAID 0/1)** Avago(LSI) MegaRAID SAS 9341-8i RAID0/1/10, no memory cache, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-188
Cable	**Internal SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
	Internal SAS/SATA Cable 1 x Mini SAS HD to 1 x Mini SAS HD, for 5th - 8th hard drives	K410-340(00)
Drive Cage **Required**	**2.5-inch Drive Cage** 8 x 2.5-inch hot plug drive bays	N8154-80F

NOTE:

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

1.1.7 RAID 0/1 Controller with 1 GB Cache for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller **Required**	**RAID Controller (1GB, RAID 0/1)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/10, 1GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-176
Flash Backup **Recommended**	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
	Internal SAS/SATA Cable 1 x Mini SAS HD to 1 x Mini SAS HD, for 5th - 8th hard drives	K410-340(00)
Drive Cage	**2.5-inch Drive Cage**	N8154-80F

Required	8 x 2.5-inch hot plug drive bays

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME), and SATA SSDs (VE) can be mixed in a system.

1.1.8 RAID 5/6 Controller with 1 GB Cache for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller **Required**	**RAID Controller (1GB, RAID 0/1/5/6)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 1GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-177
Flash Backup **Recommended**	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
	Internal SAS/SATA Cable 1 x Mini SAS HD to 1 x Mini SAS HD, for 5th - 8th hard drives	K410-340(00)
Drive Cage **Required**	**2.5-inch Drive Cage** 8 x 2.5-inch hot plug drive bays	N8154-80F

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME), and SATA SSDs (VE) can be mixed in a system.

1.1.9 RAID 5/6 Controller with 2 GB Cache for 2.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller **Required**	**RAID Controller (2GB, RAID 0/1/5/6)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 2 GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-178
Flash Backup **Recommended**	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
	Internal SAS/SATA Cable 1 x Mini SAS HD to 1 x Mini SAS HD, for 5th - 8th hard drives	K410-340(00)
Drive Cage **Required**	**2.5-inch Drive Cage** 8 x 2.5-inch hot plug drive bays	N8154-80F

NOTE:

- All drives within a RAID array should be of the same type, capacity and rotation speed.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME), and SATA SSDs (VE) can be mixed in a system.

1.1.10 Embedded SATA Non-RAID Controller for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 4 x 6Gb/s SATA	(Standard)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage **Required**	**3.5-inch Drive Cage** 4 x 3.5-inch hot plug drive bays	N8154-79F

NOTE

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

1.1.11 Embedded SATA RAID Controller for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 4 x 6Gb/s SATA, RAID0/1/10 capable	(Standard)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage **Required**	**3.5-inch Drive Cage** 4 x 3.5-inch hot plug drive bays	N8154-79F

NOTE:

- All hard drives within a RAID array should be of the same capacity.
- Embedded SATA RAID Controller does not support RAID 10 configured with 2TB or more HDDs.

1.1.12 RAID 0/1 Controller without Cache for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller **Required**	**RAID Controller (RAID 0/1)** Avago(LSI) MegaRAID SAS 9341-8i RAID0/1/10, no memory cache, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-188
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage **Required**	**3.5-inch Drive Cage** 4 x 3.5-inch hot plug drive bays	N8154-79F

NOTE:

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

1.1.13 RAID 0/1 Controller with 1 GB Cache for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller **Required**	**RAID Controller (1GB, RAID 0/1)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/10, 1GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-176
Flash Backup **Recommended**	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage **Required**	**3.5-inch Drive Cage** 4 x 3.5-inch hot plug drive bays	N8154-79F

NOTE:

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

1.1.14 RAID 5/6 Controller with 1 GB Cache for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller **Required**	**RAID Controller (1GB, RAID 0/1/5/6)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 1GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-177
Flash Backup **Recommended**	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage **Required**	**3.5-inch Drive Cage** 4 x 3.5-inch hot plug drive bays	N8154-79F

NOTE

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

1.1.15 RAID 5/6 Controller with 2 GB Cache for 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller Required	**RAID Controller (2GB, RAID 0/1/5/6)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 2 GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-178
Flash Backup Recommended	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 1 x Mini SAS HD	(Included in the Drive Cage)
Drive Cage Required	**3.5-inch Drive Cage** 4 x 3.5-inch hot plug drive bays	N8154-79F

NOTE

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

1.1.16 Embedded SATA Non-RAID Controller for Non-hot plug 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 4 x 6Gb/s SATA	(Standard)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 4 x Single SATA	(Included in the Drive Cage)
Drive Cage Required	**3.5-inch Drive Cage** 4 x 3.5-inch non-hot plug drive bays	N8154-81F

1.1.17 Embedded SATA RAID Controller for Non-hot plug 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller	**Embedded SATA Controller** 4 x 6Gb/s SATA, RAID0/1/10 capable	(Standard)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 4 x Single SATA	(Included in the Drive Cage)
Drive Cage Required	**3.5-inch Drive Cage** 4 x 3.5-inch non-hot plug drive bays	N8154-81F

NOTE:

- All hard drives within a RAID array should be of the same capacity.
- Embedded SATA RAID Controller does not support RAID 10 configured with 2TB or more HDDs.

1.1.18 RAID 0/1 Controller without Cache for Non-hot plug 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller Required	**RAID Controller (RAID 0/1)** Avago(LSI) MegaRAID SAS 9341-8i RAID0/1/10, no memory cache, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-188
Cable Required	**RAID LED Cable**	K410-293(00)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 4 x Single SATA	(Included in the Drive Cage)
Drive Cage Required	**3.5-inch Drive Cage** 4 x 3.5-inch non-hot plug drive bays	N8154-81F

NOTE:

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

1.1.19 RAID 0/1 Controller with 1 GB Cache for Non-hot plug 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller Required	**RAID Controller (1GB, RAID 0/1)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/10, 1GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-176
Flash Backup Recommended	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable Required	**RAID LED Cable**	K410-293(00)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 4 x Single SATA	(Included in the Drive Cage)
Drive Cage Required	**3.5-inch Drive Cage** 4 x 3.5-inch non-hot plug drive bays	N8154-81F

NOTE:

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

1.1.20 RAID 5/6 Controller with 1 GB Cache for Non-hot plug 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller Required	**RAID Controller (1GB, RAID 0/1)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/10, 1GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-177
Flash Backup Recommended	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable Required	**RAID LED Cable**	K410-293(00)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 4 x Single SATA	(Included in the Drive Cage)
Drive Cage Required	**3.5-inch Drive Cage** 4 x 3.5-inch non-hot plug drive bays	N8154-81F

NOTE:

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

1.1.21 RAID 5/6 Controller with 2 GB Cache for Non-hot plug 3.5-inch Drives

Category	Product Name / Description	Part Number
Storage Controller Required	**RAID Controller (2GB, RAID 0/1/5/6)** Avago(LSI) MegaRAID SAS 9362-8i RAID0/1/5/6/10/50/60, 2 GB, Int. 8, PCIe 3.0(x8), SAS 12Gb/s, SATA 6Gb/s	N8103-178
Flash Backup Recommended	**Flash Backup Unit** for Avago(LSI) MegaRAID SAS 9362-8i 500mm Cable for Flash Backup Unit included	N8103-180
Cable Required	**RAID LED Cable**	K410-293(00)
Cable	**Internal SAS/SATA Cable** 1 x Mini SAS HD to 4 x Single SATA	(Included in the Drive Cage)
Drive Cage Required	**3.5-inch Drive Cage** 4 x 3.5-inch non-hot plug drive bays	N8154-81F

NOTE:

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

Supported Drives

1.1.22 2.5-inch Drives (1)

Category		Product Name / Description	Part Number
Drive 4 slots available	**SATA HDD (512n)**	**250GB 7.2K Hot Plug 2.5-inch SATA HDD** 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-487
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-488
		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	N8150-489
		2TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-527

1.1.23 2.5-inch Drives (2)

Category		Product Name / Description	Part Number
Drive 4 slots available	**SATA HDD (512n)**	**250GB 7.2K Hot Plug 2.5-inch SATA HDD** 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-487
		500GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-488
		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	N8150-489
		2TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-527
	SATA SSD (ME)	**200GB Hot Plug 2.5-inch SATA SSD** 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-725
		400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-726
		800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-727
	SATA SSD (VE)	**200GB Hot Plug 2.5-inch SATA SSD** 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-732
		400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-733
		800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-734
		1.6TB Hot Plug 2.5-inch SATA SSD 1 x 1.6 TB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-735

1.1.24 2.5-inch Drives (3)

Category		Product Name / Description	Part Number
Drive 8 slots available	**SAS HDD (512n)**	**300GB 10K Hot Plug 2.5-inch SAS HDD** 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-479
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-480
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-481
		900GB 10K Hot Plug 2.5-inch SAS HDD 1 x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-482
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1 x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-483
		300GB 15K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-485
		450GB 15K Hot Plug 2.5-inch SAS HDD	N8150-486

	1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	
	600GB 15K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-518
SATA HDD (512n)	**250GB 7.2K Hot Plug 2.5-inch SATA HDD** 1 x 250 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-487
	500GB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-488
	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	N8150-489
	2TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-527
SAS SSD (eMLC)	**200GB Hot Plug 2.5-inch SAS SSD** 1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-721
	400GB Hot Plug 2.5-inch SAS SSD 1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-722
SATA SSD (ME)	**200GB Hot Plug 2.5-inch SATA SSD** 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-725
	400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-726
	800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-727
SATA SSD (VE)	**200GB Hot Plug 2.5-inch SATA SSD** 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-732
	400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-733
	800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-734
	1.6TB Hot Plug 2.5-inch SATA SSD 1 x 1.6 TB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-735

NOTE:

- All hard drives within a RAID array should be of the same capacity.
- Up to two kinds of drives selected from SAS 10K HDDs, SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME), and SATA SSDs (VE) can be mixed in a 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.
- The 2.5-inch SAS/SATA SSDs have limited lifetime. Refer to **Endurance of SSD** for details.

1.1.25 2.5-inch Drives (4)

Category		Product Name / Description	Part Number
Drive **8 slots available**	**SAS HDD (512n)**	**300GB 10K Hot Plug 2.5-inch SAS HDD** 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-479
		450GB 10K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-480
		600GB 10K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-481
		900GB 10K Hot Plug 2.5-inch SAS HDD 1 x 900 GB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-482
		1.2TB 10K Hot Plug 2.5-inch SAS HDD 1 x 1.2TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512n sector	N8150-483
		300GB 15K Hot Plug 2.5-inch SAS HDD 1 x 300 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-485
		450GB 15K Hot Plug 2.5-inch SAS HDD 1 x 450 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-486
		600GB 15K Hot Plug 2.5-inch SAS HDD 1 x 600 GB SAS HDD, 2.5-inch, 12Gb/s, 15,000 rpm, 512n sector	N8150-518
	SAS HDD (512e)	**1.8TB 10K Hot Plug 2.5-inch SAS HDD** 1x 1.8TB SAS HDD, 2.5-inch, 12Gb/s, 10,000 rpm, 512e sector	N8150-541
	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, 512n sector	N8150-487

(512n)	**500GB 7.2K Hot Plug 2.5-inch SATA HDD** 1 x 500 GB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-488
	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	N8150-489
	2TB 7.2K Hot Plug 2.5-inch SATA HDD 1 x 2 TB SATA HDD, 2.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-527
SAS SSD (eMLC)	**200GB Hot Plug 2.5-inch SAS SSD** 1 x 200 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-721
	400GB Hot Plug 2.5-inch SAS SSD 1 x 400 GB SAS SSD, eMLC, 2.5-inch, 12Gb/s, 512n sector	N8150-722
SATA SSD (ME)	**200GB Hot Plug 2.5-inch SATA SSD** 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-725
	400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-726
	800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, ME	N8150-727
SATA SSD (VE)	**200GB Hot Plug 2.5-inch SATA SSD** 1 x 200 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-732
	400GB Hot Plug 2.5-inch SATA SSD 1 x 400 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-733
	800GB Hot Plug 2.5-inch SATA SSD 1 x 800 GB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-734
	1.6TB Hot Plug 2.5-inch SATA SSD 1 x 1.6 TB SATA SSD, MLC, 2.5-inch, 6b/s, 512n sector, VE	N8150-735

NOTE:

- All hard drives within a RAID array should be of the same capacity.
- Up to two kinds of drives selected from SAS 10K HDDs (512n), SAS 10K HDDs (512e), SAS 15K HDDs, SATA HDDs, SAS SSDs, SATA SSDs (ME), and SATA SSDs (VE) can be mixed in a system.
- For 512e sector HDD, the supported operating systems of virtual machines on Hyper-V are:
  - Windows Server 2008 R2 SP1 or later
  - Windows 7 SP1 or later
- 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.
- The 2.5-inch SAS/SATA SSDs have limited lifetime. Refer to **Endurance of SSD** for details.

1.1.26 Hot Plug 3.5-inch Drives (1)

Category		Product Name / Description	Part Number
Drive **4slots available**	**SATA HDD (512n)**	**500GB 7.2K Hot Plug 3.5-inch SATA HDD** 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-524
		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	N8150-504
		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	N8150-505
		3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-506
		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	N8150-507

NOTE:

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

1.1.27 Hot Plug 3.5-inch Drives (2)

Category		Product Name / Description	Part Number
Drive **4 slots available**	**SATA HDD (512n)**	**500GB 7.2K Hot Plug 3.5-inch SATA HDD** 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-524
		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	N8150-504
		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	N8150-505

		3TB 7.2K Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-506
		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	N8150-507
	SATA HDD (512e)	**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	N8150-540
		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	N8150-528
		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	N8150-543

NOTE:

- All drives within a RAID array should be of the same capacity.
- Embedded SATA RAID Controller does not support RAID 10 configured with 2TB or more HDDs.
- For 512e sector HDD, the supported operating systems of virtual machines on Hyper-V are:
  - Windows Server 2008 R2 SP1 or later
  - Windows 7 SP1 or later

1.1.28 Non-hot plug 3.5-inch Drives (1)

Category		Product Name / Description	Part Number
Drive **4slots available**	**SATA HDD (512n)**	**500GB 7.2K non-Hot Plug 3.5-inch SATA HDD** 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-526
		1TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-514
		2TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-515
		3TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-516
		4TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-517

NOTE:

- All drives within a RAID array should be of the same capacity.
- Embedded SATA RAID Controller does not support RAID 10 configured with 2TB or more HDDs.

1.1.29 Non-hot plug 3.5-inch Drives (2)

Category		Product Name / Description	Part Number
Drive **4slots available**	**SATA HDD (512n)**	**500GB 7.2K non-Hot Plug 3.5-inch SATA HDD** 1 x 500 GB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-526
		1TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 1 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-514
		2TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 2 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-515
		3TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 3 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-516
		4TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x 4 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512n sector	N8150-517
	SATA HDD (512e)	**6TB 7.2K non-Hot Plug 3.5-inch SATA HDD** 1 x 6 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e sector	N8150-538
		8TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x8 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e Sector	N8150-539
		10TB 7.2K non-Hot Plug 3.5-inch SATA HDD 1 x10 TB SATA HDD, 3.5-inch, 6Gb/s, 7,200 rpm, 512e Sector	N8150-542

NOTE:

- Embedded SATA RAID Controller does not support RAID 10 configured with 2TB or more HDDs.
- For 512e sector HDD, the supported operating systems of virtual machines on Hyper-V are:
  - Windows Server 2008 R2 SP1 or later
  - Windows 7 SP1 or later

2 Optical Drive

Category	Product Name / Description	Part Number
Internal	**Internal Slim DVD-ROM drive** Slim DVD-ROM drive DVD read speed: 8x (DVD-ROM / DVD-R / DVD-RW) CD read speed: 24x (CD-ROM / CD-R/RW)	N8151-134
	Internal DVD Super Multi Drive Slim DVD Super Multi drive, not including writing software DVD Read speed: 8x (DVD-R / DVD-RW / DVD-R DL / DVD+R / DVD+RW / DVD+R DL / DVD-ROM) DVD-RAM read speed: 5x CD read speed: 24x (CD-ROM / CD-R/RW) **NOTE:** - Not supported for Linux or VMware.	N8151-135F
External	**External DVD Super MULTI Drive** Slim DVD Super Multi drive, Bus powered, 1.5A required, not including writing software DVD Read speed: 8x (DVD-R / DVD-RW / DVD-R DL / DVD+R / DVD+RW / DVD+R DL / DVD-ROM) DVD-RAM read speed: 5x CD read speed: 24x (CD-ROM / CD-R/RW) **NOTE:** - Windows Server 2008 R2 installation is not supported with this drive.	N8160-98F

NOTE:

- An optical drive is required for maintenance and OS installation.
- Up to 1 optical drive can be connected.

Internal RDX / LTO Drives

RDX/LTO Drive Selection

Refer to the section in accordance with your type of tape drives:

- RDX: Refer to 2.1.1
- LTO: Refer to 2.1.2

NOTE:

- Tape devices cannot be directly connected to VMware ESXi servers. For an ESXi environment, it is recommended to connect and configure an additional backup server via network.

2.1 RDX/LTO Configuration

2.1.1 RDX Drive

Category	Product Name / Description	Part Number
Controller	**Internal USB Controller** 1 x USB port	(Standard)
Cable **Required**	**Internal USB cable** 1x Internal USB3.0 to 1x USB 3.0 device	K410-276(00)
Drive **1 drive available**	**Internal RDX (USB)** **NOTE:** - Not supported for VMware.	N8151-125

2.1.2 LTO Drive

Category	Product Name / Description	Part Number
Controller **Required**	**SAS Controller** LSI SAS9212-4i4e Host Bus Adapter 6Gbps SAS, Int. 4, Ext. 4, 7-pin SATA / SFF-8088, PCIe 2.0 x8	N8103-142
Cable **Required**	**Internal SAS Cable** 1x 7-pin Single SATA to 1x SFF-8482 SAS	K410-217(00)
Drive **1 drive available**	**Internal LTO (SAS)** LTO3, Half height, Native capacity 400 GB	N8151-126
	Internal LTO (SAS) LTO4, Half height, Native capacity 800 GB	N8151-127
	Internal LTO (SAS) LTO5, Half height, Native capacity 1.5 TB	N8151-128
	Internal LTO (SAS) LTO6, Half height, Native capacity 2.5 TB	N8151-129
	Internal LTO (SAS) LTO7, Half height, Native capacity 6 TB	N8151-136

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.

Network Interface Controller

Category		Product Name / Description	Part Number
Adapter	**GbE**	**1000BASE-T Adapter** Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-150
		Dual Port 1000BASE-T Adapter Broadcom ® BCM5718 Gigabit Ethernet Controller PCIe 2.0 x1	N8104-151
		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.	N8104-152
	10GbE	**10GBASE SFP+ Adapter (SFP+/2ch)** Qlogic® NetXtreme II BCM57810 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 two SFP+ Modules can be installed. - Up to two adapters can be installed.	N8104-149
		Dual Port 10GBASE-T Adapter Intel® Ethernet Controller X540 PCIe 2.0(x8)	N8104-153
		Dual Port 10GBASE-T Adapter Intel X550-BT2 PCIe 3.0 x4	N8104-157
SFP+ Module		**SFP+ Module (10G-SR)** 1 x SFP+ Module for N8104-149	N8104-129

NIC Teaming feature – NIC Teaming and bonding features

See the table below for supported network interfaces and OS combinations.
Windows Server 2008 R2 supports BASP (Broadcom Advanced Server Program) teaming while Windows Server 2012 or later and Linux support teaming with bonding function supported by OS.

Network Interface	Team	OS
1GbE NIC Embedded 1GbE NIC and N8104-150/-151/-152	Up to four teams per one system Up to four ports per one team	Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux
10GbE NIC N8104-149	Up to two teams per one system Up to two ports per one team	Windows Server 2008 R2 Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux
10GbE NIC N8104-153/-157	Up to one teams per one system Up to two ports per one team	Windows Server 2012 Windows Server 2012 R2 Red Hat Enterprise Linux

NOTE:

- The network interfaces for a teaming must be the same.
- When 10GbE and 1GbE LAN teams 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.

Category	Network Interface	Operating Systems
1GbE	Embedded 1GbE NIC/ N8104-150/-151/-152	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 7, VMware
10GbE	N8104-149	Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 7, VMware
	N8104-153/-157	Windows Server 2012, Windows Server 2012 R2, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 7, VMware

NOTE:

- NIC Teaming feature is not supported on iSCSI interfaces.

SAS Controller

Product Name / Description	Part Number
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
SAS Controller LSI SAS9300-8e Host Bus Adapter 12Gb/s SAS, Int. 4 / Ext. 4, 7-pin SATA / SFF-8088, PCIe 3.0 x8	N8103-184

Graphics Accelerator

Product Name / Description	Part Number
Graphics Accelerator NVIDIA NVS 315, PCI Express 2.0 (x16) 1x DVI-VGA connector, DMS-59-DVI-I branch cable included	N8105-48

NOTE:

- The standard VGA connector cannot be used when this option is installed.
- The remote KVM feature is not supported when this option is installed.

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.

Other Add-in Components

2.2 Fan Kit

Product Name / Description	Part Number
Non-redundant Fan Kit Non-hot plug cooling fan for T110h	(Standard)
Non-redundant Power Supply Fan Non-hot plug cooling fan for T110h **NOTE:** - This optional fan kit is required to install a RAID controller in a non-redundant power supply model and/or to operate the non-redundant power supply model at temperatures over 40°C.	N8181-132F

Trusted Platform Module Kit

Product Name / Description	Part Number
Trusted Platform Module Kit TPM 2.0 module **NOTE:** - Supported for Windows Server 2012 and Windows Server 2012 R2 only.	N8115-23A

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.

Internal Flash Memory

Product Name / Description	Part Number
VMware ESXi support kit Internal USB flash memory to install VMware ESXi system	N8106-011

NOTE:

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

High Temperature Support Option

Product Name / Description	Part Number
High temperature resistant Kit Required for high temperature operation over 40°C (up to 48°C) Supported for Non-hot plug power supply model only	N8181-146F

NOTE:

- To apply this option, there are some configuration limitations below.

Required System Configuration:

- For non-redundant power supply model, N8181-132F Non-redundant Power Supply Fan is required.
- Internal RDX or LTO must not be installed.

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 derive can be connected
- Not supported when VMware is running on the server.

Input Devices

Product Name / Description	Part Number
Keyboard 1 x 104-keys USB keyboard	N8170-25
USB Optical Mouse 1 x USB Mouse, 2-button, Optical with wheel	N8170-22

NOTE:

- Keyboard and mouse are not included in the base models. Please order separately if necessary.

Add-on Components

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 KVM 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.

2.3 Dust Proof Kit

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

Category	Product Name / Description	Part Number
Front Bezel	**Dust Proof Bezel** Including 1 set of dust proof filter	N8146-71
	Dust Proof Bezel with Sensor Including 1 set of filter replacement sensors, 1 set of dust proof filter	N8146-72
Filter	**Dust proof filter (5 pcs.)** For N8146-71 Dust Proof filter Removal capacity of particles : Up to 1 µm-sized	N8147-27
Sensor	**Filter replacement Sensor** For N8146-71 Dust Proof Bezel	N8146-73

Rack Conversion Kit

The following rack conversion kit is required to install the server into a 19-inch rack system:

Product Name / Description	Part Number
Rack Conversion Kit Convert to 4U form factor	N8143-93

Medium and Cartridge

Category		Product Name	Drive supported	Part Number
RDX	**HDD**	RDX Cartridge (500GB)	N8151-125	N8153-02
		RDX Cartridge (1TB)	N8151-125	N8153-03
		RDX Cartridge (2TB)	N8151-125	N8153-09
		RDX Cartridge (3TB)	N8151-125	N8153-10
		RDX Cartridge (4TB)	N8151-125	N8153-11

References

Boot Mode Setting

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

Operating System	Supported Boot Mode	Supported X2APIC Setting
Windows Server 2008 R2 (x64)	Legacy	Disabled
Windows Server 2012	UEFI	Enabled
Windows Server 2012 R2	UEFI	Enabled
Red Hat Enterprise Linux 6(x86_64)	UEFI	Enabled
Red Hat Enterprise Linux 7	UEFI	Enabled
VMware ESXi 5.5 Update3	Legacy	Disabled
VMware ESXi 6 Update1	Legacy	Disabled

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/hard drive[1]/fan/voltage/power consumption/ System LAN/degeneration/ (memory/hard drive[1])	✓	✓
	Hardware configuration information collection	✓	✓
	Hardware event log collection	✓	✓
Boot monitoring	BIOS/POST stall, Booting, OS stall, shutdown	✓[3]	✓[3]
Alerting	HW error, Boot error and OS panic (by SNMP, E-Mail)	✓	✓
Remote KVM (via LAN)	POST/BIOS setup, ROM utility	✓[2]	✓
	Panic screen, Boot screen	✓[2,4,5]	✓
	CUI-based screen (OS console)	✓[2,5]	✓
	GUI-based screen (OS console)	-	✓
	Remote Screen Video Capture	-	✓
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	✓[3]	✓[3]
	Remote media (CD/DVD/FD/USB)	-	✓
	CLP (Command Line Protocol) (DMTF compliant)	✓	✓
	Remote control via Web browser (multi user login at the same time)	✓	✓
	Scheduling (without UPS, require NEC ESMPRO Manager)	✓[3]	✓[3]
	BIOS setting by using XML file	✓	✓
Maintenance	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 feature is not supported on non-hot plug 3.5-inch drive.
2 The optional serial port is not available for the feature.
3 The feature is not supported on VMware systems.
4 Monitoring boot screens is not supported on VMware systems.
5 In VMware systems, only the direct console user interface is supported.

Endurance of SSD

The 2.5-inch SAS/SATA SSDs have limited lifetime, which can only be written a limited number of times before it fails.
The warranty period of SSD is the stated period of warranty or until the total bytes of written value (PBW) exceeds the limit value, whichever occurs first. It is recommended to check the total bytes of written value periodically.

Refer to the table below for the write endurance (PBW and DWPD), warranty period and monitoring tool.

SSD Lifetime

Part Number	Product Name	PBW	DWPD	Period	Monitoring Tool
SAS SSD					
N8150-721	200GB Hot Plug 2.5-inch SAS SSD	3.6PBW	10 Times	3 Years	Universal RAID Utility, EXPRESSBUILDER (System Test and Diagnostics)
N8150-722	400GB Hot Plug 2.5-inch SAS SSD	7.3PBW	10 Times	3 Years	
SATA SSD (Middle Endurance)					
N8150-725	200GB Hot Plug 2.5-inch SATA SSD	3.6PBW	10 Times	3 Years	
N8150-726	400GB Hot Plug 2.5-inch SATA SSD	7.3PBW	10 Times	3 Years	
N8150-727	800GB Hot Plug 2.5-inch SATA SSD	14.6PBW	10 Times	3 Years	
SATA SSD (Low Endurance)					
N8150-732	200GB Hot Plug 2.5-inch SATA SSD	1.1PBW	3 Times	3 Years	
N8150-733	400GB Hot Plug 2.5-inch SATA SSD	3.0PBW	3 Times	3 Years	
N8150-734	800GB Hot Plug 2.5-inch SATA SSD	5.3PBW	3 Times	3 Years	
N8150-735	1.6TB Hot Plug 2.5-inch SATA SSD	10.7PBW	3 Times	3 Years	

- PBW(Peta-Bytes Write): Total amount of data that can be written into the SSD. 1PB=1,000TB.
- DWPD(Drive Writes per Day): Rewrite capacity of the SSD per day.
- Check the lifetime of SSD by monitoring tool regularly.
- It is recommended to replace the SSD before it reaches its end of life. For repurchase, please contact your sales representative.
- For detailed operating methods of monitoring tool, refer to the User's Guide.

OS Support Matrix for PCI Cards and Embedded Controllers

Part Number	Product Name	WS 2012 R2	WS 2012	WS 2008 R2	RHEL 7	RHEL 6 x64	ESXi 6.0	ESXi 5.5
-	Embedded SATA non-RAID Controller	✓	✓	✓	✓	✓	✓	✓
-	Embedded SATA RAID Controller	✓	✓	-	-	-	-	-
-	Embedded 1GbE NIC	✓	✓	✓	✓	✓	✓	✓
N8103-188	RAID Controller (RAID 0/1)	✓	✓	✓	✓	✓	✓	✓
N8103-176	RAID Controller (1GB, RAID 0/1)	✓	✓	✓	✓	✓	✓	✓
N8103-177	RAID Controller (1GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓
N8103-178	RAID Controller (2GB, RAID 0/1/5/6)	✓	✓	✓	✓	✓	✓	✓
N8105-48	Graphics Accelerator	✓	-	-	-	-	-	-
N8104-157	Dual Port 10GBASE-T Adapter	✓	✓	-	✓	✓	✓	✓
N8104-153	Dual Port 10GBASE-T Adapter	✓	✓	-	✓	✓	✓	✓
N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	✓	✓	✓	✓	✓	✓	✓
N8103-184	SAS Controller	✓	✓	-	✓	✓	✓	✓
N8103-142	SAS Controller	✓	✓	✓	✓	✓	✓	✓
N8104-152	Quad Port 1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓
N8104-151	Dual Port 1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓
N8104-150	1000BASE-T Adapter	✓	✓	✓	✓	✓	✓	✓

Supported PCI cards and Installable Slots

		Slots			
Part Number	**Product Name**	**#1**	**#2**	**#3**	**#4**
N8103-188	RAID Controller (RAID 0/1)	-	-	-	**(1)**
N8103-176	RAID Controller (1GB, RAID 0/1)	-	-	-	**(1)**
N8103-177	RAID Controller (1GB, RAID 0/1/5/6)	-	-	-	**(1)**
N8103-178	RAID Controller (2GB, RAID 0/1/5/6)	-	-	-	**(1)**
N8105-48	Graphics Accelerator	-	-	**(1)**	**-**
N8104-157	Dual Port 10GBASE-T Adapter	-	-	**(1)**	**(2)**
N8104-153	Dual Port 10GBASE-T Adapter	-	-	**(1)**	**(2)**
N8104-149	10GBASE SFP+ Adapter (SFP+/2ch)	-	-	**(1)**	**(2)**
N8103-184	SAS Controller	-	-	**(1)**	**(2)**
N8103-142	SAS Controller	-	**(3)**	**(1)**	**(2)**
N8104-152	Quad Port 1000BASE-T Adapter	**(1)**	**(3)**	**-**	**(2)**
N8104-151	Dual Port 1000BASE-T Adapter	**(2)**	**(4)**	**(1)**	**(3)**
N8104-150	1000BASE-T Adapter	**(2)**	**(4)**	**(1)**	**(3)**
N8117-01A	Serial Port Adapter	**(2)**	**(4)**	**(1)**	**(3)**

NOTE:

- The number between parentheses shows the population priority (recommendation). For example, install N8103-176 in the slot #4 and N8104-153 in the slot #3 when you have those cards.
- There are PCI slot limitations depending on the processor and operating system. Please refer to the following and be careful to choose a processor and PCI cards.

PCI slot limitations

See the table below for the limitations on installing PCI cards (due to the number of interrupts that can be processed in

the system) depending on the installed processor.

Processor	RAID controller required	PCI slot limitations
Celeron G3900 **Pentium G4400**	Yes	● Do not install the following PCI cards. N8103-184 SAS Controller N8104-152 Quad Port 1000BASE-T Adapter ● Up to one card from the following can be installed. N8104-153 Dual Port 10GBASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter ● No limitations for other cards.
	No	● Up to one of either N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter can be installed and up to one card from the following can be installed. Then, no limitations for other cards. N8104-153 Dual Port 10GBASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter ● No limitations when N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter is not installed.
Core i3-6300 **Xeon E3-1220v5**	Yes	● Up to two cards from the following can be installed. N8103-184 SAS Controller N8104-152 Quad Port 1000BASE-T Adapter ● No limitations for other cards.
	No	● Up to one card of N8103-184 SAS Controller can be installed. ● No limitations for other cards.
Other processors	-	No limitations

PCI slot limitations for VMware

- Do not install N8104-152 Quad Port 1000BASE-T Adapter when any of the following cards is installed.
  N8104-153 Dual Port 10GBASE-T Adapter
  N8104-157 Dual Port 10GBASE-T Adapter
  N8104-149 10GBASE SFP+ Adapter (SFP+/2ch)
- The number of installable N8104-150/-151 is limited up to one.
- For the configuration limitation for VMware ESXi, refer to the following documents.

VMware ESXi5.5

https://www.vmware.com/pdf/vsphere5/r55/vsphere-55-configuration-maximums.pdf

VMware ESXi6.0

https://www.vmware.com/pdf/vsphere6/r60/vsphere-60-configuration-maximums.pdf

Secure Boot Mode

This server supports Secure Boot. It is supported with UEFI Boot mode and protects the security by only allowing software programs with digital signature to run. The supported operating systems, software, and boot devices are below. The default setting of Secure Boot is disabled. Keep the setting disabled to use other operating systems and/or software.

Supported OS and Software for Secure Boot Mode

Operating System	Supported Boot Mode	Secure Boot Mode
Windows Server 2012	UEFI	✓
Windows Server 2012 R2	UEFI	✓
Software Related to Boot	**Supported Boot Mode**	**Secure Boot Mode**
System Diagnostics Utility	UEFI	✓
EXPRESSBUILDER	UEFI	✓

Supported Boot Device for Secure Boot Mode

Supported Boot Device	Part Number
RAID controller (RAID0/1)	N8103-188
RAID controller (1GB, RAID0/1)	N8103-176
RAID controller (1GB, RAID0/1/5/6)	N8103-177
RAID controller (2GB, RAID0/1/5/6)	N8103-178
RAID controller (2GB, RAID0/1/5/6)	N8103-179

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Revision History

Revision	Date	Description
5.0	January 26, 2017	**New products added:** 10TB 7.2K non-Hot Plug 3.5-inch SATA HDD / N8150-542 10TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-543 RDX Cartridge (4TB) / N8153-11 Trusted Platform Module Kit / N8115-23A **Discontinued product deleted:** Trusted Platform Module Kit / N8115-23
4.0	October 12, 2016	**New products added:** 6TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-540 6TB 7.2K non-Hot Plug 3.5-inch SATA HDD / N8150-538 1.8TB 10K Hot Plug 2.5-inch SAS HDD / N8150-541 Dual Port 10GBASE-T Adapter / N8104-157 **Discontinued product deleted:** 6TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-503 6TB 7.2K non-Hot Plug 3.5-inch SATA HDD / N8150-513 1.8TB 10K Hot Plug 2.5-inch SAS HDD / N8150-490 **Others:** Removed 4Kn sector HDD descriptions
3.1	August 19, 2016	**Others:** Added PCI slot limitations.
3.0	July 20, 2016	**New products added:** 8TB 7.2K Hot Plug 3.5-inch SATA HDD / N8150-528 8TB 7.2K non-Hot Plug 3.5-inch SATA HDD / N8150-539 External DVD Super Multi Drive / N8160-98F Internal LTO (SAS) / N8151-136 **Discontinued product deleted:** External DVD Super MULTI Drive / N8160-97F USB Extension Cable / K410-351(00) **Others:** VMware ESXi is not supported on Core processor systems. Corrected the references of Supported HDD/SSD for 3.5-inch drive configuration.
2.2	June 30, 2016	**Others:** Added N8105-48 in the “Supported PCI cards and Installable Slots” matrix.
2.1	May 17, 2016	**Others:** Added DVD read speed information
2.0	April 26, 2016	**New products added:** Dust Proof Bezel with Sensor N8146-72 Filter replacement Sensor N8146-73 RDX Cartridge (3TB) N8153-10 **Discontinued product deleted:** RDX Cartridge (320GB) N8153-01 **Others:** Added a note for Windows Server 2008 R2 installation Changed the Installable slot information for N8103-184 Added SATA SSDs for the RAID configuration for RAID 0/1 (Embedded SATA RAID) (4.3.2)
1.1	February 2, 2016	Corrected typos and errors.
1.0	January 22, 2016	Initial release