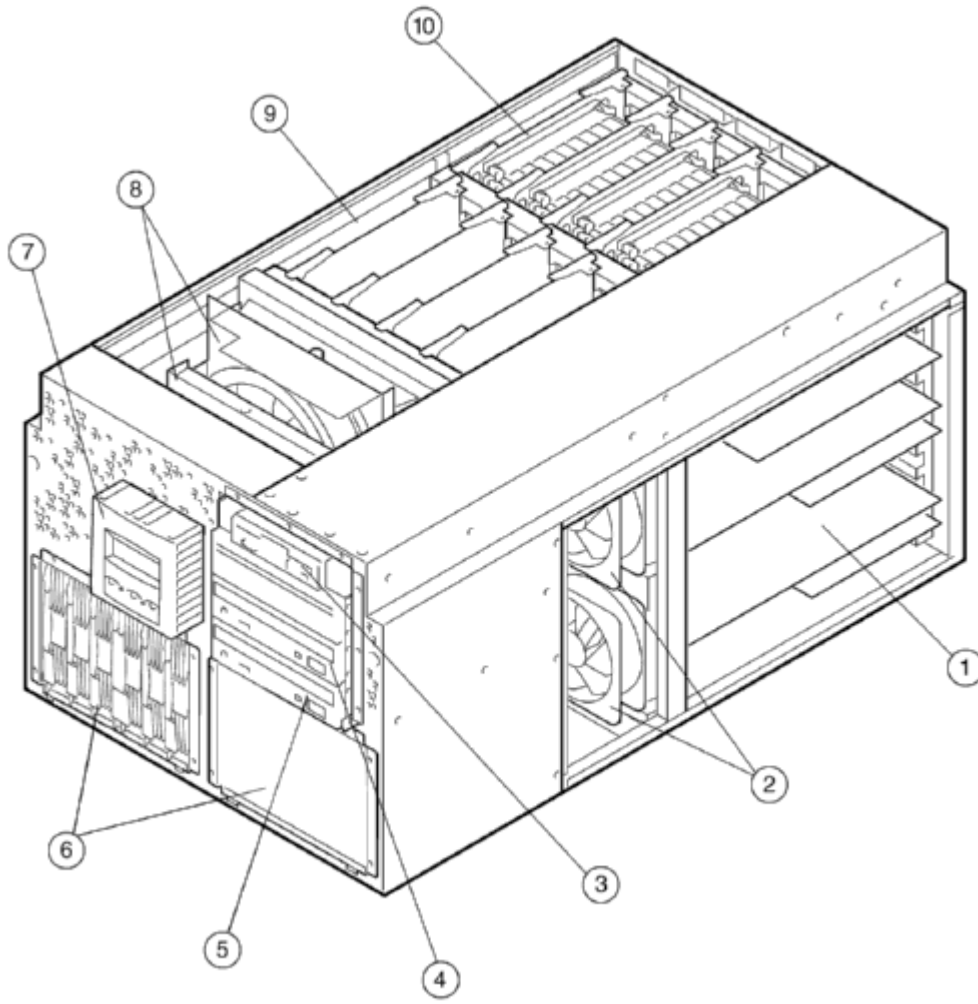


Overview



- | | |
|-------------------------|-----------------------------------|
| 1. PCI Cards | 6. 6-Bay disk drive storage cages |
| 2. Fans | 7. Control Panel |
| 3. Diskette drive | 8. Fans |
| 4. Removable media bays | 9. CPUs |
| 5. DVD-ROM drive | 10. Memory |

Overview

At A Glance

AlphaServer ES45 Systems include:

- Alpha 21264C 68/1250-MHz CPU with 16-MB L2 Dual Data Rate Cache
- Six 64-bit PCI I/O expansion slots for Model 1B plus one AGP 4X graphics slot
- Ten 64-bit PCI I/O expansion slots for Models 2B and 3B
- Up to four PCI buses

Model 1B

- Two 64-bit/66-MHz PCI buses
- One 64-bit/33-MHz PCI bus
- One AGP 4X bus

Model 2B

- Three 64-bit/66-MHz PCI buses
- One 64-bit/33-MHz PCI bus

Model 3B

- One 64-bit/66-MHz PCI bus
- Three 64-bit/33-MHz PCI buses
- Up to 32-GB memory using 512-MB, 1-GB, 2-GB, or 4-GB memory options
- 1.44-MB diskette drive
- 16X DVD-ROM drive
- Two 9-pin serial ports
- One 25-pin parallel port
- Remote Management Console (RMC) – dedicated serial port, 6-pin MMJ connector
- Keyboard and mouse port
- Knockouts for two additional 68-pin external SCSI connections
- One power supply
- Integral remote system management console
- Customer documentation
- Tru64UNIX or OpenVMS Factory Installed Software
- Protected by HP Services, including one-year hardware warranty, on-site with 5 x 9 next business day response.

Standard Features

Processor	Alpha 21264C 68/1250-MHz CPU	
Cache Memory	8-MB (1 GHz) or 16-MB (1.25 GHz) L2 Dual Data Rate Backup Cache	
Upgradability	Supports additional processors and upgrades of memory and hard drives	
Memory	Minimum	1 GB – AlphaServer ES45
	Maximum	16 GB (16 DIMM slots) - Model 1B 32 GB (32 DIMM slots) - Model 2B or Model 3B
Network Controller	Choice of Ethernet controllers	
Expansion	PCI I/O slots	Up to ten PCI slots – See PCI Configuration Guidelines
Storage	Diskette Drive	1.44-MB diskette drive in dedicated slot
	DVD-ROM Drive	16X DVD-ROM drive
	Hard Drives	Choice of 36.4-GB, 72.8-GB, 146-GB or 300-GB drives
Interfaces	Parallel	One 25-pin parallel port
	Serial	Two 9-pin serial ports
	Keyboard	One port
	Mouse	One port
	Remote Management Console port (RMC)	One 6-pin MMJ dedicated port
	SCSI connections	Knockouts for two additional 68-pin external SCSI connections
Graphics	Optional	
Form Factor	Tower	Up to 12 Universal disk drives
	Pedestal	Up to 40 Universal disk drives
	Rackmount	Up to 152 Universal disk drives
Power Supply	One auto-sensing power supply, hot swappable, N+1, power factor corrected	
Manageability	Insight Manager	

Standard Features

OS Support

AlphaServer ES45 Tru64 UNIX systems include pre-installed software, Base license, Unlimited User license, Server Extension license, Internet Express, and Secure Web Server
AlphaServer ES45 OpenVMS systems include pre-installed software, Base license with System Manager license and Enterprise Integration Server License Package for OpenVMS
Minimum OS support - Tru64 UNIX V5.1A or OpenVMS V7.3

Service and Support

Protected by HP Services including a one-year on-site hardware warranty with next business day response. Training, consulting, network integration, software support, comprehensive system maintenance and guaranteed uptime services are also available for customers requiring higher levels of service and support.
AlphaServer ES45 systems are available in the following models or configurations:

- Model 1B (1.25 GHz)
- Model 2B (1.25 GHz)
- Model 3B (1.25 GHz)

When configuring an AlphaServer ES45 system, refer to the following chart that summarizes the features of each model as well as the differences between each model.

AlphaServer ES45 Model Summary	Model 1B (1.25 GHz)	Model 2B (1.25 GHz)	Model 3B (1.25 GHz)
I/O Slots	7	10	10
- 33-MHz PCI Slots	2	4	8
- 66-MHz PCI Slots	4	6	2
- 4X AGP Slots	1	0	0
Power Supplies (Minimum/Maximum)	1-3	1-3	1-3
Power Supply (DC Watts) One included – maximum three power supplies per system	3X-H7514-AA	3X-H7514-AA	3X-H7514-AA
	1080 Watts	1080 Watts	1080 Watts
Memory (Minimum/Maximum)	1 GB – 16 GB	1 GB – 32 GB	1 GB – 32 GB
Memory Option (4-GB Option)	MS620-DB	MS620-DB	MS620-DB
	Higher Power DIMM	Higher Power DIMM	Higher Power DIMM
Memory Channel I/O Space (CCMAB-AA) See Memory Channel – Step 9	128K	128K	512K or 128K

NOTE: Minimum firmware for 1.25-GHz systems is V6.2-8, minimum SROM firmware is V2.22-F. Firmware files are available at: <http://ftp.digital.com/pub/Digital/Alpha/firmware/interim/es45/v6.2C/>

Standard Features

PCI Configuration Guidelines

- Modules designed for 5.0 V signaling and 33-MHz bus speed can only operate in 5.0 V/33-MHz slots
- Modules designed for 3.3 V signaling and 66-MHz bus speed can only operate in 66-MHz slots
- Universal PCI modules can operate in all slots (3.3 V and 5.0 V)
- Universal PCI modules operating at 33 MHz placed in a 66-MHz slot will reduce the entire hose to operate at 33 MHz
- Universal PCI modules capable of operating at 66 MHz when placed in a 33-MHz slot will operate at 33 MHz

PCI Module Descriptions:

- PCI modules listed in this document as 33 MHz or 66 MHz refer to the module's maximum PCI bus speed.
- Modules that can only operate at 5 V are designated as 5 V – 33-MHz modules.
- Universal PCI modules are designated as 3.3/5 V and can be installed into 33-MHz or 66-MHz slots.

AlphaServer ES45 systems provide four I/O hoses, each is configured differently as illustrated in the following charts for Models 1B, 2B, and 3B.

AlphaServer ES45 PCI bus and slot specification for Model 1B follows:

PCI Slot	PCI Bus Speed	Signal Voltage	PCI Hose Number
1	33 MHz	5.0 V	0
2	33 MHz	5.0 V	0
3	AGP 4X	1.5 V	2
4	66 MHz	3.3 V	3
5	66 MHz	3.3 V	3
6	-	-	-
7	66 MHz	3.3 V	1
8	66 MHz	3.3 V	1

AlphaServer ES45 PCI bus and slot specification for Model 2B follows:

PCI Slot	PCI Bus Speed	Signal Voltage	PCI Hose Number
1	66 MHz	3.3 V	2
2	66 MHz	3.3 V	2
3	33 MHz	5.0 V	0
4	66 MHz	3.3 V	3
5	66 MHz	3.3 V	3
6	33 MHz	5.0 V	0
7	66 MHz	3.3 V	1
8	66 MHz	3.3 V	1
9	33 MHz	5.0 V	0
10	33 MHz	5.0 V	0

AlphaServer ES45 PCI bus and slot specification for Model 3B follows:

PCI Slot	PCI Bus Speed	Signal Voltage	PCI Hose Number
1	33 MHz	5.0 V	2
2	33 MHz	5.0 V	2
3	33 MHz	5.0 V	0
4	66 MHz	3.3 V	3
5	66 MHz	3.3 V	3

Standard Features

6	33 MHz	5.0 V	0
7	33 MHz	5.0 V	1
8	33 MHz	5.0 V	1
9	33 MHz	5.0 V	0
10	33 MHz	5.0 V	0

Systems

Step 1 – Select system

AlphaServer ES45 Model 1B, Model 2B, and Model 3B Systems require the mandatory selection of the following items. AlphaServer ES45 Base Systems require the selection of a minimum of 1-GB memory in addition to the following mandatory items.

- Disk drive cage or StorageWorks shelf (Step 5)
- System disk drive (Step 5)
- Tower, Pedestal, or Rack Kit (Step 6)
- Ethernet adapter (Step 8)
- Storage adapter (Step 10)
- Order country-specific keyboard and mouse only if required (Step 14)
- Software media and documentation for first system onsite (Step 16)

NOTE: Only 2-5-2 part numbers are factory integrated.

AlphaServer ES45 Systems (1250 MHz)

ES45	OS	CPU	PCI I/O Slots	Memory/Cache	Order Number
Model 1B	Tru64 UNIX	1250 MHz	6 PCI, 1 AGP 4X	1 GB/16 MB	DA-66EBA-BA
Model 1B	Tru64 UNIX	1250 MHz	6 PCI, 1 AGP 4X	2 GB/16 MB	DA-66EBA-CA
Model 1B	Tru64 UNIX	1250 MHz	6 PCI, 1 AGP 4X	4 GB/16 MB	DA-66EBA-DA
Model 1B	OpenVMS	1250 MHz	6 PCI, 1 AGP 4X	1 GB/16 MB	DY-66EBA-BA
Model 1B	OpenVMS	1250 MHz	6 PCI, 1 AGP 4X	2 GB/16 MB	DY-66EBA-CA
Model 1B	OpenVMS	1250 MHz	6 PCI, 1 AGP 4X	4 GB/16 MB	DY-66EBA-DA
Model 2B	Tru64 UNIX	1250 MHz	10 PCI	1 GB/16 MB	DA-68EBA-BA
Model 2B	Tru64 UNIX	1250 MHz	10 PCI	2 GB/16 MB	DA-68EBA-CA
Model 2B	Tru64 UNIX	1250 MHz	10 PCI	4 GB/16 MB	DA-68EBA-DA
Model 2B	OpenVMS	1250 MHz	10 PCI	1 GB/16 MB	DY-68EBA-BA
Model 2B	OpenVMS	1250 MHz	10 PCI	2 GB/16 MB	DY-68EBA-CA
Model 2B	OpenVMS	1250 MHz	10 PCI	4 GB/16 MB	DY-68EBA-DA
Model 3B	Tru64 UNIX	1250 MHz	10 PCI	1 GB/16 MB	DA-67EBA-BA
Model 3B	Tru64 UNIX	1250 MHz	10 PCI	2 GB/16 MB	DA-67EBA-CA
Model 3B	Tru64 UNIX	1250 MHz	10 PCI	4 GB/16 MB	DA-67EBA-DA
Model 3B	OpenVMS	1250 MHz	10 PCI	1 GB/16 MB	DY-67EBA-BA
Model 3B	OpenVMS	1250 MHz	10 PCI	2 GB/16 MB	DY-67EBA-CA
Model 3B	OpenVMS	1250 MHz	10 PCI	4 GB/16 MB	DY-67EBA-DA

Systems

AlphaServer ES45 Base Systems (1250 MHz)

NOTE: Selection of a minimum of 1-GB memory is mandatory for AlphaServer ES45 Base systems.

ES45	OS	CPU	PCI I/O Slots	Order Number
Model 1B	Tru64 UNIX	1250 MHz/16 MB	6 PCI, 1 AGP 4X	DA-66EBA-AA
Model 1B	OpenVMS	1250 MHz/16 MB	6 PCI, 1 AGP 4X	DY-66EBA-AA
Model 2B	Tru64 UNIX	1250 MHz/16 MB	10 PCI	DA-68EBA-AA
Model 2B	OpenVMS	1250 MHz/16 MB	10 PCI	DY-68EBA-AA
Model 3B	Tru64 UNIX	1250 MHz/16 MB	10 PCI	DA-67EBA-AA
Model 3B	OpenVMS	1250 MHz/16 MB	10 PCI	DY-67EBA-AA

Step 2 - Additional CPU Modules - Optional

- One CPU included, three additional CPUs are supported

SMP upgrade, includes one 68/1000-MHz CPU with 8-MB cache and Tru64 UNIX SMP license KN610-DB

SMP upgrade, includes one 68/1000-MHz CPU with 8-MB cache and OpenVMS SMP license KN610-DC

SMP upgrade, includes one 68/1250-MHz CPU with 16-MB cache and Tru64 UNIX SMP license KN610-EB

SMP upgrade, includes one 68/1250-MHz CPU with 16-MB cache and OpenVMS SMP license KN610-EC

NOTE: Minimum firmware for 1.25-GHz systems is V6.2-8, minimum SROM firmware is V2.22-F. Firmware files are available at:

<http://ftp.digital.com/pub/Digital/Alpha/firmware/interim/es45/v6.2C/>

NOTE: Existing AlphaServer ES45 1-GHz Model 2 (xx-68DAA-xx) customers who upgrade to 1.25-GHz CPUs should continue to follow Model 2 configuration guidelines. The following options are required: H7906-A9 power supply and MS620-AA, MS620-BA, and MS620-CA memory options. Do not order 3X-H7514-AA power supplies or MS5620-DB memory options.

Systems

Step 3 - Memory - Optional

- Base systems do not include memory; select a minimum of 1-GB memory; this is a mandatory selection. All other systems include one memory option.
 - Maximum four memory options (total of 16 DIMMs) for Model 1B (one per array)
 - Maximum eight memory options (total of 32 DIMMs) for Model 2B and Model 3B (two per array)
 - AlphaServer ES45 system includes two memory buses
 - AlphaServer ES45 system includes two arrays per bus
 - For Model 2B and Model 3B, memory options within an array must be identical
 - 512-MB memory option (4 x 128-MB DIMMs)MS620-AA
 - 1-GB memory option (4 x 256-MB DIMMs)MS620-BA
 - 2-GB memory option (4 x 512-MB DIMMs)MS620-CA
 - 4-GB memory option (4 x 1024-MB DIMMs)MS620-DB
- NOTE:** Do not order MS620-DB memory option for installation in ES45 1-GHz Model 2 (xx-68DAA-xx) system. MS620-DB memory option can only be installed in (xx-6xDBA-xx) and (xx-6xEBA-xx) systems.

Memory performance considerations:

- The AlphaServer ES45 system has two memory buses. When two or more memory options are installed, both buses are utilized, enhancing system performance.
- The AlphaServer ES45 system has two arrays per bus. Interleaved operations reduce the average latency and increase the memory throughput. When all four arrays are populated with the same amount of memory, read-write operations are four-way interleaved, enhancing system performance.

The following examples illustrate different ways of configuring a 4-GB system. Case C yields the best performance and is the recommended method for configuring memory on an AlphaServer ES45 system.

ES45 System (one memory option included)	Add-on Memory Options	Total Memory	Total DIMMs	Performance
Case A - DA-68EBA-DA (MS620-DB)	None	4-GB	4	Good
Case B - DA-68EBA-CA (MS620-CA)	MS620-CA	4-GB	8	Better
Case C - DA-68EBA-BA (MS620-BA)	MS620-BA + MS620-BA + MS620-BA	4-GB	16	Best*

* **NOTE:** Operating system and application dependent. Up to an 18% performance enhancement has been measured in Case C over Case A.

Options

Step 4 - Additional Power Supply - Optional

One Power Supply	Standard with Model 1B, 2B, and 3B systems; provides system support for: • Two CPUs • One disk drive cage (up to six disk drives) • Four memory options (up to 16 DIMMs)
Two Power Supplies	Optional – Provides system support for: • Four CPUs • Two disk drive cages (up to 12 disk drives) • Eight memory Options (up to 32 DIMMs)
Third Power Supply	Optional - Provides (N+ 1) power redundancy system support for two power supply configuration
• Additional power supply ordered with a tower system requires an additional country-specific power cord • Pedestal system and Rack kit include three internal IEC/IEC power cords (for internal connection to power distribution unit or power strip) regardless of the number of power supplies ordered	
ES45 1080 W power supply; order for Models 1B, 2B, and 3B (1-GHz) and Models 1B, 2B, and 3B (1.25-GHz) systems only; do not order for Model 2 (xx-68DAA-xx) systems.	
3X-H7514-AA	
ES45 720 W power supply; order for Model 2 (1-GHz xx-68DAA-xx) systems only.	
H7906-A9	

Step 5 - Disk Drive Cage, Universal Drive Shelf, or Universal Disk Drive - Mandatory

- Each system supports up to two disk drive cages
- Each disk drive cage supports six 1-inch Universal disk drives
- StorageWorks 43xx shelves support up to 14 Universal disk drives
- Pedestal enclosure supports one system and two disk drive cages, two Universal 43xx StorageWorks shelves
- M-Series and Series 10000 cabinets support up to five systems or one system with up to ten StorageWorks shelves

Step 5a - Disk Drive Cage - Requires selection of system disk drive

	Disk drive cage with storage cable accommodates up to six internal 1-inch Universal disk drives – Requires mandatory selection of a Storage Adapter in the system. Requires an internal Ultra2 SCSI or Ultra3 SCSI channel per disk drive cage. Maximum of two storage cages in system. NOTE: See ES45 Configuration Chart for Storage Adapters in Step 10.	BA610-6D
Universal Disk Drives (Supported in Disk Drive Cage and Universal StorageWorks Shelves)	36.4-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3849-AA
	72.8-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3839-AA
	72.8-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3851-AA
	146-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3841-AA
	146-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A4945-AA
	300-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A4952-AA

Options

Step 5b - StorageWorks Model 4314R and Model 4354R Universal Drive Shelves

- Up to two shelves in Pedestal form factor
- See Step 7 for rack configurations with M-Series and Series 10000 cabinets
- StorageWorks Model 4314R, 4314T and 4354R Ultra3 SCSI (LVD) single-bus and split-bus Universal drive shelves; refer to StorageWorks Enclosure 4300 Family QuickSpecs when configuring shelves. When selecting a DS-SL13R-xx split-bus shelf, two SCSI channels are required from selected storage adapters. BN38C-05 cable is required per channel if the connection is not VHDCI/VHDCI. DS-SL13R shelves include one 12-foot VHDCI/VHDCI SCSI cable.

StorageWorks Model 4314R Ultra3 SCSI (LVD) single-bus Universal drive rackmount shelf, includes one power supply, U.S.	DS-SL13R-AA
StorageWorks Model 4314R Ultra3 SCSI (LVD) single-bus Universal drive rackmount shelf, includes one power supply, Japan	DS-SL13R-AJ
StorageWorks Model 4354R Ultra3 SCSI (LVD) split-bus Universal drive rackmount shelf, includes two redundant power supplies, U.S.	DS-SL13R-BA
StorageWorks Model 4354R Ultra3 SCSI (LVD) split-bus Universal drive rackmount shelf, includes two redundant power supplies, Japan	DS-SL13R-BJ
To add additional power supply for single-bus Universal shelf, U.S.	DS-SE2UP-BA
To add additional power supply for single-bus Universal shelf, International	DS-SE2UP-BI

StorageWorks Model 4314T Standalone Enclosures	Model 4314T Ultra3 SCSI, Single-bus Tower Enclosure, U.S.	DS-SL13T-AA
	Model 4314T Ultra3 SCSI, Single-bus Tower Enclosure, International	DS-SL13T-AB
	Model 4314T Ultra3 SCSI, Single-bus Tower Enclosure, Japan	DS-SL13T-AJ

Step 5c - StorageWorks Modular Storage Array 30 (MSA30) Universal Drive Shelves

- Up to two shelves in Pedestal form factor
- See Step 7 for rack configurations with M-Series and Series 10000 cabinets
- StorageWorks Model 4414R and 4454R Ultra320 single-bus and split-bus Universal drive shelves; refer to StorageWorks Modular Storage Array 30 Family QuickSpecs when configuring shelves. When selecting a 3R-A4076-AA split-bus shelf, two SCSI channels are required from selected storage adapters. BN38C-05 cable is required per channel if the connection is not VHDCI/VHDCI.
- MSA30 shelves are not currently supported in SCSI cluster configurations
- For OpenVMS 7.3-2, DEC-AXPVMS-VMS732_FIBRE_SCSI-V0100-4.PCSI is required to support dual-port I/O module (287483-B21) and/or the MSA30DB dual bus enclosure (3R-A4076-AA) in an OpenVMS cluster environment
- Hardware to mount into a Series 10000 Cabinet is included. When mounting into an M-Series Cabinet or ES45 Pedestal Enclosure, a rail kit (3R-A5281-AA/313877-B21) must be ordered separately.

StorageWorks Modular Smart Array SW4414R Single Bus Ultra320 rackmountable SCSI disk drive, 4-node Storage Enclosure (302969-B21). Includes one 12-foot VHDCI/VHDCI SCSI cable and two IEC-C13 power cords. See Supported Options List for configuration details -- http://h18002.www1.hp.com/alphaserver/options/ases45/ases45_options.html	3R-A4075-AA
StorageWorks Modular Smart Array SW4454R Dual Bus Ultra320 rackmountable SCSI disk drive, 4-node Storage Enclosure (302970-B21). Includes two 12-foot VHDCI/VHDCI SCSI cables and two IEC-C13 power cords. See Supported Options List for configuration details -- http://h18002.www1.hp.com/alphaserver/options/ases45/ases45_options.html	3R-A4076-AA
M-series Rack Rail Kit Option	3R-A5281AA/ 313877-B21

Options

NOTE: The 3R-A4075-AA and 3R-A4076-AA enclosures are not supported in a shared-SCSI cluster using the 3X-KZPEA-DB adapter.

Step 6 - System Enclosures - Mandatory selection of Tower, Pedestal, Rack Kit, Power Cords

- All AlphaServer ES45 enclosures are carbon black
- Power cords are mandatory for tower and pedestal enclosures
- Power cords are included in Rack Kits

Step 6a - Tower Enclosure

- Tower enclosure supports one system
 - Selection of one country-specific power cord is mandatory
 - Additional power cord is mandatory if additional power supply is ordered.
- 200–240V Tower Enclosure

BA61M-CT

Step 6b - Pedestal Enclosure

- Pedestal enclosure supports one system, and up to two Universal 43xx StorageWorks shelves.
 - Selection of two country-specific power cords (for external connection from power strip to wall outlet) is mandatory for all systems.
- 200-240V Pedestal Enclosure

BA61P-CB

Step 6c - Rack Kit for M-Series Cabinet or Series 10000 Rack

- Rack Kit required for each AlphaServer ES45 system installed in an M-Series Cabinet or Series 10000 Rack
- Rack Kit supports one system

M-Series	Rack kit for AlphaServer ES45, includes dress bezel, slides, three internal IEC/IEC power cords, all brackets and hardware for mounting in M-Series cabinets, 200-240V	BA61R-CR
Series 10000	Rack kit for AlphaServer ES45, includes slides, three internal IEC/IEC power cords, all brackets and hardware for mounting in Series 10000 racks	3X-BA61R-RD

Options

Step 6d - Power Cords - (for Tower/Pedestal Models)

North America, 200 to 240V, 75-inch - Tower	BN18J-1K
North America, 200 to 240V, 108-inch - Pedestal	3X-BN64A-1C
Australia, New Zealand, 2.5-meter (8121-0838)	3R-A6023-AA
Central Europe, 2.5-meter	BN19C-2E
Denmark, 2.5-meter (103541-481)	BN19K-2E
Egypt, India, South Africa, 2.5-meter (103541-AR1)	BN19S-2E
Israel, 2.5-meter	BN18L-2E
Italy, 2.5-meter (103541-461)	BN19M-2E
Japan, 2.5-meter, Dentori approved	3X-BN46F-02
Switzerland, 2.5-meter (103541-511)	BN19E-2E
UK, Ireland, 2.5-meter	BN19A-2E
Republic of China (103541-001)	BN19H-2E

Step 7 - Cabinets

Step 7a - M-Series Cabinets - Optional

- M-Series Cabinet enclosures support up to five systems, or one system with up to 10 StorageWorks shelves.
- M-Series Cabinets require mandatory selection of the following items:
 - Rear cabinet extender based on cabinet height
 - Cabinet front door or trim kit based on cabinet height
 - Second power distribution unit (PDU)
 - Factory integration
 - Ballast kit, if only one system is ordered for the H9A15 cabinet

NOTE: For more information on M-Series Cabinet Enclosures, see <http://www.compaq.com/alphaserver/products/m-series/specs.html>

Cabinet Configuration Chart for AlphaServer ES45 (8U) with 43xx Series StorageWorks Shelves (3U) – Supports high-density configurations						
Cabinet (b)	Front Door or Trim Kit	Cabinet Depth Extender	Power Distribution Unit	ES45 Systems	43xx/MSA30 Storage Shelves	Unused U Spaces
H9A10-ME/-MF	H9C10-ZF or H9C10-ZT	H9C10-ZE	With second H7600	1	8	1
(34U)				2	5	2
				3	3	0
				4	0	1
H9A15-ME/-MF	H9C15-ZF or H9C15-ZT	H9C15-ZE	With second H7600	1(a)	10	2
(41U)				2	8	0
				3	3	7
				4	0	8
			(b)	3	3 or 5	1

Options

			With second H7602	4	0 or 2	2
				5	0	0

NOTES:

- a. Installation of only one AlphaServer ES45 system in an H9A15 cabinet requires the mandatory selection of a ballast kit.
b. H9A1x-ME includes one H7609-EB PDU; H9A1x-MF includes one H7609-DB PDU - Order second PDU.

- Single Input - H7600-DB/EB, 240V
- Dual Input - H7602-DB/EB, 240V

M-Series Cabinets - Specify cabinet selection	67-inch carbon black cabinet with 59.5-inch or 34U of usable vertical space, 200-240V dual-16A PDU, 16 IEC C13 outlets, two input power plug NEMA L620P, Americas, Asia Pacific; includes rear door.	H9A10-ME
	67-inch carbon black cabinet with 59.5-inch or 34U of usable vertical space, 240V dual-16A PDU, 16 IEC C13 outlets, two input power plug IEC 309, 20A, Europe; includes rear door.	H9A10-MF
	79-inch carbon black cabinet with 71.7-inch or 41U of usable vertical space, 200-240V dual-16A PDU, 16 IEC C13 outlets, two input power plug NEMA L620P, Americas, Asia Pacific; includes rear door.	H9A15-ME
	79-inch carbon black cabinet with 71.7-inch or 41U of usable vertical space, 240V dual-16A PDU, 16 IEC C13 outlets, two input power plug IEC 309, 20A, Europe; includes rear door.	H9A15-MF
Rear Cabinet Extender - Mandatory based on cabinet height	Rear cabinet extender for carbon black H9A10 cabinets	H9C10-ZE
	Rear cabinet extender for carbon black H9A15 cabinets	H9C15-ZE
Front Cabinet Treatment - Mandatory based on cabinet height	Front door for carbon black H9A10 cabinet enclosure	H9C10-ZF
	Front trim kit for carbon black H9A10 cabinet enclosure	H9C10-ZT
	Front door for carbon black H9A15 cabinet enclosure	H9C15-ZF
	Front trim kit for carbon black H9A15 cabinet enclosure	H9C15-ZT
Factory Integration - Mandatory	Factory Integration of systems and storage devices assembled and configured in cabinet enclosure in predefined locations	YS-ASCAA-AA
Ballast Kit - Mandatory if only one ES45 system drawer is ordered for the H9A15 cabinet	Ballast is added to a cabinet at particular locations for specific configurations to meet safety regulations for installation, operation, and service; see Cabinet Configuration Charts.	
	Two 35–40 lb (16–18 kg) steel plates	H9C10-MC

Options

Power Distribution Unit - Mandatory	240V single 16A input power plug IEC 309, 12 IEC C13 outlets	H7600-DB
	200-240V single 16A input power plug NEMA L620P, with 12 IEC C13 outlets, North America/Canada/Japan	H7600-EB
	240V dual 16A input power plugs IEC 309, with 16 IEC C13 outlets	H7602-DB
	200-240V dual 16A input power plugs NEMA L620P, with 16 IEC C13 outlets, NA/Canada/Japan	H7602-EB

Storage Shelves For supported StorageWorks shelves, see Step 5b.
Supported in M-Series Cabinets - Optional

Step 7b - Rack 10000 Series - Optional

- The Series 10000 rack enclosure supports up to five systems, or with one system up to 10 Storage Works shelves
- The 10000 Series rack enclosure (10642) requires mandatory selection of the following items:
 - Rack kit for each system
 - Rack sidewall kit or baying kit
 - Deployable stabilizer
 - Two Power Distribution Units (both PDUs must be H7609)
 - Ballast kit if only one system is ordered for the 10642 rack
 - Factory integration

NOTE: For more information on Series 10000 42U rack enclosure, see http://h18004.www1.hp.com/products/quickspecs/10995_na/10995_na.html

Rack Configuration Chart for AlphaServer ES45 (8U) with 43xx Series StorageWorks Shelves (3U) - Supports high density configurations

Rack	Rack Kit	Rack Height/Space	ES45 Systems	43xx/MSA30 Storage Shelves	Unused U Spaces	Ballast Kit
3R-A3894-AA (10642 42U)	3X-BA61R-RD	79-inches/41U	1 (a)	10	3	1
-	-	-	2	8	1	-
-	-	-	3	5	2	-
-	-	-	4	3	0	-
-	-	-	5	0	1	-

NOTE: Rack 10000 comes with front and rear doors -- Order sidewalls or baying kit and two H7609 PDUs.
 a. Installation of only one AlphaServer ES45 system in an H9A15 cabinet requires the mandatory selection of a ballast kit.

Rack 10000 Series	79-inch graphite rack with 71.75-inch or 41U of usable vertical space, includes front and rear doors. No PDU or side panels, on a shock pallet.	3R-A3894-AA
Power Distribution Unit (PDU) Mandatory - order two	Single Phase, Double Power Controller, 16 outlet North America/Japan 240V	3X-H7609-EB
	Single Phase, Double Power Controller, 16 outlet, Europe 240V	3X-H7609-DB

Options

Side Panel Kit or Baying Kit - Mandatory	42U graphite metallic (Carbon) - Used to join two or more 10000 Series racks	3R-A3895-AA 3R-A4125-AA
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Deployable Stabilizer Kit	Mandatory selection	2T-H9C30-MK
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Factory Integration - Required	Factory Integration of systems and storage devices assembled and configured in cabinet enclosure in predefined locations	YS-ASCAA-AA
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Ballast Kit	- Required only if one system is ordered for the Rack 10000 Series. - Ballast is added to a cabinet at particular locations for specific configurations to meet safety regulations for installation, operation, and service; see Rack Configuration Chart.	
	Two 35-40 lb steel plates	2T-H9C30-MA

Shelves Supported in Series 10000 Racks - Optional	For supported StorageWorks shelves, see Step 5b.	
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Step 7c - KVM (Keyboard, Video, Mouse) Switch - Optional

KVM (Keyboard, Video, Mouse) Switch - Optional	The HP Server Console Switch 1 x 8 (8-port) is supported on Alpha Systems using PS/2 mouse and keyboard with VGA video - this includes support for the PS/2 interface adapter, part number 262588-B21, required for operation. The switch is supported on systems running Tru64 UNIX operating system - minimum version V5.1A and the OpenVMS operating system - minimum version 7.3-2. The KVM is 1U high and can be installed in the M-Series cabinet or Series 10000 rack. Supports up to eight servers. HP Server 1 x 8-port KVM Console Switch	336044-B21
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CAT5e Cables	3 foot (1m) - 4 pack	263474-B21
	6 foot (2m) - 8 pack	263474-B22
	12 foot (4m) - 8 pack	263474-B23
	20 foot (6m) - 4 pack	263474-B24
	40 foot (12m) - 1 pack	263474-B25

Interface Adapters	PS/2 Interface Adapter - 1 pack	262588-B21
	PS/2 Interface Adapter - 8 pack	262587-B21

NOTE: Supported graphics cards - ELSA GLoria Synergy (SN-PBXGK-BB), 3DLabs Oxygen VX1 (SN-PBXGF-AB), and ATI RADEON 7500 (3X-PBXGG-AA)
For more information, refer to the Release Notes at:
http://h18002.www1.hp.com/alphaserver/download/console_switch_rn.pdf
http://h18002.www1.hp.com/alphaserver/download/html/console_switch_rn.html

Step 8 - Networking Adapters/Controllers – Mandatory Ethernet Adapter

Options

Step 8a – Networking Adapters/Controllers – Mandatory

- Select mandatory Ethernet adapter
- Adapters require a minimum of Tru64 UNIX V5.1A or OpenVMS V7.3
- Each adapter uses one PCI slot

		Maximum # Supported				
		Tru64 UNIX	Open VMS	PCI Slot		
Ethernet 10/100	PCI (32/64-bit, 33-MHz to 66-MHz) dual-port 10/100 Ethernet (UTP/RJ45s) NIC and Base Module. (One 3X-DE602-TA or 3X-DE602-FA optional add-on daughter card can be combined with this module.) NOTE: Use BN25G, BN26M, BN24Q, BN28Q twisted pair RJ45 cables.	4	4	3.3/5 V	66 MHz	3X-DE602-BB
Ethernet 10/100/1000	PCI single-port 10/100/1000 Mbps (Twisted-Pair Copper with RJ45) Gigabit Ethernet; Tru64 UNIX V5.1B/TruCluster V5.1B supports up to eight nodes and requires: - T64V51BB22AS0002-20030415.tar Requires Early Release Patch to update driver to V1.0.21: T64V51BB22-C0019200-19212-E-20030710.tar http://ftp1.support.compaq.com/public/unix/v5.1b/t64v51bb1-0003000-16672-e-20030130.README Tru64 UNIX V5.1A/TruCluster V5.1A supports up to eight nodes and requires Early Release Patch: - T64V51AB21-C0127901-19213-E-20030710.tar OpenVMS V7.301 support as a standalone network interface and as a cluster interconnect requires that users download and install the following two ECO Kits: DEC-AXPVMS-VMS731_PCSI_V0100-4.PCSI DEC-AXPVMS-VMS731_LAN_V0600-4.PCSI NOTE: Use BN25G, BN26M, BN24Q, BN28Q twisted pair RJ45 cables.	8	8	3.3/5 V	66 MHz	3X-DEGXA-TB

Step 8b – Networking Adapters/Controllers – Optional

Options

		Maximum # Supported				
		Tru64 UNIX	Open VMS	PCI Slot		
Ethernet 10/100/1000	PCI single-port 1000 Mbps (MMF with duplex-SC) Gigabit Ethernet; Tru64 UNIX V5.1B/TruCluster V5.1B supports up to eight nodes and requires: - T64V51BB22AS0002-20030415.tar Requires Early Release Patch to update driver to V1.0.21: T64V51BB22-C0019200-19212-E-20030710.tar http://ftp1.support.compaq.com/public/unix/v5.1b/t64v51bb1-0003000-16672-e-20030130.README Tru64 UNIX V5.1A/TruCluster V5.1A supports up to eight nodes and requires Early Release Patch: - T64V51AB21-C0127901-19213-E-20030710.tar OpenVMS V7.301 support as a standalone network interface and as a cluster interconnect requires that users download and install the following two ECO Kits: DEC-AXPVMS-VMS731_PCSI_V0100-4.PCSI DEC-AXPVMS-VMS731_LAN_V0600-4.PCSI NOTE: Use BN34A, BN34B, or equivalent cables with SC connectors.	8	8	3.3/ 5 V	66 MHz	3X-DEGXA-SB

Ethernet 10/100	Dual-port 10/100 Ethernet (UTP/RJ45) add-on daughter card for use with the 3X-DE602-BB only. The combined 3X-DE602-BB and 3X-DE602-TA modules, running at 66MHz, provide four 10/100 (UTP/RJ45s) ports in a single PCI slot option; allows for a maximum of 16 ports per system. OpenVMS V7.3 requires Tima Kit: - DEC-AXPVMS-VMS73_LAN-V0100—4.PCSI NOTE: 3X-DE602-TA cannot be used standalone. Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	4	4	3.3/ 5 V	66 MHz	3X-DE602-TA
	Single-port 100 Mbps (MMF/duplex-SC) add-on daughter card for use with the 3X-DE602-BB. The combined 3X-DE602-BB and 3X-DE602-FA modules, running at 66 MHz, provide two 10/100 (UTP/RJ45s) and one 100Mbps (MMF/SC) ports in a single PCI slot option. NOTE: 3X-DE602-FA cannot be used standalone. Use BN34A or BN34B cables.	4	1 per 3X- DE602- BB	3.3/ 5 V	66 MHz	3X-DE602-FA

Options

Multi-function Module	PCI 32-bit, 33-MHz multi-function (single-port 10/100 Ethernet UTP/RJ45, Ultra2 LVD SCSI, and 2D graphics) adapter. Model 1B requires installation on PCI Bus 0 in slots 1 or 2; Models 2B and 3B require installation on PCI Bus 0 in slots 3, 6, 9, or 10 NOTE: Tru64 UNIX V5.1A requires Patch Kit 3: T64V51AS0003-20010413.tar. Only one 3X-KZPEA-DB allowed on same PCI bus; no multi-head graphics support; TruCluster support restricted to non-shared SCSI buses only. Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	1	1	5V	33 MHz	3X-DEPVZ-AA
	3X-DEPVZ-AA specific-use 3-meter LVD2 SCSI cable					BN37A-03
FDDI	PCI (32-bit, 33-MHz) to FDDI SAS (MMF/duplex-SC) NIC Use BN34A, BN34B, or BN34D cables.	4	4	3.3/5 V	33 MHz	3X-DEFPA-AC
	PCI (32-bit, 33-MHz) to FDDI DAS (MMF/duplex-SC) NIC Use BN34A, BN34B, or BN34D cables.	4	4	3.3/5 V	33 MHz	3X-DEFPA-DC
	PCI (32-bit, 33-MHz) to FDDI DAS (UTP/RJ45) NIC Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	4	4	3.3/5 V	33 MHz	3X-DEFPA-MC
	PCI (32-bit, 33-MHz) to FDDI SAS (UTP/RJ45) NIC Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	4	4	3.3/5 V	33 MHz	3X-DEFPA-UC
FDDI-specific Cable	Multimode fiber optic (MMF) 62.5/125um duplex cable with SC-to-MIC connectors xx = available lengths: (01, 03, and 10) for 1, 3, and 10 meters					BN34D-xx
ATM	PCI (32-bit, 33-MHz) to 155 Mbps ATM Fiber NIC with SC connector Use BN34B-xx cable.	6	6	3.3/5 V	33 MHz	3X-DAPBA-FA
Synchronous Communications	PCI (32-bit, 33-MHz) to Dual-port Intelligent Synchronous Communications NIC – Requires at least one (maximum two) 3X-BC34x sync cable listed below.	4	4	3.3/5 V	33 MHz	3X-PBXDD-AA
	PCI (32-bit, 33-MHz) to Quad-port Intelligent Synchronous Communications NIC – Requires at least one (maximum four) 3X-BC34x sync cable listed below.	4	4	3.3/5 V	33 MHz	3X-PBXDD-AB
Synchronous-specific Cables	V.24/EIA-232 Single-port cable					3X-BC34L-06
	V.11/x.21 Single-port cable					3X-BC34S-06
	V.35 Single-port cable					3X-BC34T-06

Options

Asynchronous Communications	PCI (32-bit, 33-MHz) to 4-port Async Communications NIC with DB-25 octopus cable NOTE: The Tru64 UNIX driver (UNIX Tar File 4001180K.tar) is located at: http://support.digi.com/support/indexes/tru64-xr.html The OpenVMS driver kit (Filename 4001778L.bin) is located at http://support.digi.com/support/drivers/vms/index-async.html	2	2	3.3/5 V	33 MHz	PBXDA-BA
	PCI (32-bit, 33-MHz) to 8-port Async Communications NIC with DB-25 octopus cables NOTE: The Tru64 UNIX driver (UNIX Tar File 4001180K.tar) is located at: http://support.digi.com/support/indexes/tru64-xr.html The OpenVMS driver kit (Filename 4001778L.bin) is located at http://support.digi.com/support/drivers/vms/index-async.html	2	2	3.3/5 V	33 MHz	PBXDA-BB
	PCI (32-bit, 33-MHz) to 16-port Async Communications Controller and tabletop 16-port distribution box with RJ45 connectors.	2	2	3.3/5 V	33 MHz	PBXDA-AC

Asynchronous Connector Adapters	RJ45-to-DB-25 Converter Cable					CXI01-AC
	RJ45-to-DEC MJ11 Converter Cable (8 pack)					CXI01-AF

Step 8c – Multi-use Cables

Ethernet, FDDI, ATM	Multimode fiber optic (MMF) 62.5/125um duplex cable, with SC-to-ST connectors xx = available lengths: (2E, 4E, 01, 03, 10, 20, 30) for 2.4, 4.5, 1, 3, 10, 20, and 30 meters					BN34A-xx
	Multimode fiber optic (MMF) 62.5/125um duplex cable, with SC-to-SC connectors xx = available lengths: (2E, 4E, 01, 03, 10, 20, 30) for 2.4, 4.5, 1, 3, 10, 20, and 30 meters					BN34B-xx
	Category 5e (4-Unshielded Twisted Pairs / UTP) straight-through cable with RJ45-to-RJ45 connectors for system to switch, repeater, or hub connectivity xx = available lengths: (0B, 0E, 01, 03, 04, 07) for 0.2, 0.5, 1, 3, 4, and 7 meters					BN25G-xx
	Category 5e (4-Twisted Pairs, Screened/ ScTP) straight-through cable with RJ45-to-RJ45 connectors for system to switch, repeater, or hub connectivity xx = available lengths: (0E, 01, 03, 04, 07) for 0.5, 1, 3, 4, and 7 meters					BN26M-xx
	Category 5e (4-Unshielded Twisted Pairs / UTP) Xover cable with RJ45-to-RJ45 connectors for system to switch, repeater, or hub connectivity xx = available lengths: (0E, 01, 03, 04, 07) for 0.5, 1, 3, 4, and 7 meters					BN24Q-xx

Options

Category 5e (4-Twisted Pairs, Screened / ScTP) Xover cable with RJ45-to-RJ45 connectors for system to switch, repeater, or hub connectivity xx = available lengths: (0E, 01, 03, 04, 07) for 0.5, 1, 3, 4, and 7 meters				BN28Q-xx
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Step 9 - Memory Channel - Optional

Tru64 UNIX Systems (V5.1A)	Each system node in the cluster requires a TruCluster software license (QL-6BRAE-AA) or TruCluster Plus Software Package (QP-6R9AE-AA)
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OpenVMS Systems	OpenVMS V7.3 and OpenVMS Cluster license (QL-MUZAE-AA) are required
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Configuring Information	• Memory Channel adapters (CCMAB-BA) must be configured in 5-volt PCI slots. • Up to two PCI-to-System Area Network adapters (CCMAB-BA) are supported in a single system. • Two-node clusters can be configured by ordering a CCMAB-BA for each node and one BN39B-04 or BN39B-10 cable; cable connects directly to CCMAB-BA in each node. • Two-node clusters can also be configured by ordering two CCMAB-BA adapters for each node and two BN39B-04 or BN39B-10 cables; cables connect directly to CCMAB-BA in each node. • For a two-node cluster that will not need to be rebooted when adding additional members, order one CCMAB-BA adapter and one BN39B-04 or BN39B-10 cable for each node, and one CCMHB-AA hub for the cluster. • For three- or four- node clusters, order one CCMAB-BA adapter and one BN39B-04 or BN39B-10 cable for each node, and one CCMHB-AA hub for the cluster. If two CCMAB-BAs are configured in each system, a second CCMHB-AA is required. • CCMHB-AA includes four CCMLB-AA line cards and supports up to four nodes; expansion up to eight system nodes can be achieved by adding up to four CCMLB-AA line cards. • If nodes must be separated by a distance longer than standard copper cables allow the CCMFB option converts the output of the standard CCMAB controller or CCMLB line card to single-mode fiber optic cable. The fiber optic connection may be up to 2,000 meters long between two CCMAB controllers connected in virtual hub mode, or 3,000 meters between a CCMAB controller and a CCMHB hub. (The connection from the CCMHB hub to a second system may also be 3,000 meters.) The CCMFB option requires a second PCI slot in the system from which it draws power only. It is normally connected to the corresponding CCMAB controller with the short BN39B-01 cable. The CCMFB is also used in the CCMHB hub where it occupies a slot normally used by the CCMLB line card, limiting expansion to four radial fiber optic connections. • CCMHB-BA hub expansion box provides additional slots for up to eight fiber optic connections. Two standard length single-mode fiber optic cables are available (BN34R-10 and BN34R-31); however, users normally provide this fiber optic connection. Fiber optic connectivity is completely transparent to the systems using it and has no performance impact.
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NOTE: When configuring Model 1B or Model 2B with two Memory Channel Controllers (CCMAB-BA) installed in hose 0 only, all nodes in a Memory Channel cluster must have the window size jumper set to the same size, specifically 128. When configuring Model 3B with two Memory Channel Controllers (CCMAB-BA), all nodes in a Memory Channel cluster must have the window size jumper set to the same size, specifically 128; Memory Channel Hub must be installed on a different hose (hose 0, 1, or 2). Refer to the TruCluster QuickSpecs for Memory Channel details.

Options

Model 1B	Model 2B	Model 3B
128K I/O	128K I/O	128K I/O
Use for new or existing clusters; if existing cluster at 512K, shut down and configure all nodes to 128K	Use for new or existing clusters; if existing cluster at 512K, shut down and configure all nodes to 128K	Use for new or existing clusters; if existing cluster at 512K, shut down and configure all nodes to 128K
Supports dual-rail, (two) Memory Channel controllers on single PCI Bus 0	Supports dual-rail, (two) Memory Channel controllers on single PCI Bus 0	Supports dual-rail, (two) Memory Channel controllers on separate PCI Bus (0, 1, or 2)

MEMORY CHANNEL Controller/System Area Network Hub

PCI-to-System Area Network Controller, maximum two - 5V/3.3V	CCMAB-BA
System Area Network Hub with four line cards; includes BN19P-2E power cord for Canada, Japan, and U.S. - for other regions, order appropriate power cord from the following list:	CCMHB-AA
Hub expansion box with no line cards	CCMHB-BA
Expansion line card for CCMHB hub	CCMLB-AA
1-meter cable for CCMAB and CCMHB	BN39B-01
4-meter cable for CCMAB and CCMHB	BN39B-04
10-meter cable for CCMAB and CCMHB	BN39B-10
Copper-to-single mode fiber optic converter – 5V (clock not affected)	CCMFB-BA
Rackmount kit (3U) for CCMHB (Memory Channel Hub II); required for mounting in H9A1x cabinets.	3X-BA61R-MC
Power cord for rackmount CCMHB hub	BN35S-02

MEMORY CHANNEL Power Cords

Australia, New Zealand (8121-0838)	3R-A6023-AA
Central Europe	BN19C-2E
Denmark (103541-481)	BN19K-2E
Egypt, India (103541-AR1)	BN19S-2E
Ireland, United Kingdom	BN19A-2E
Israel	BN18L-2E
Italy (103541-461)	BN19M-2E
Japan, 2.5-meter, Dentori approved	3X-BN46F-02
Switzerland (103541-511)	BN19E-2E

NOTE: When using MEMORY CHANNEL, refer to the TruCluster QuickSpecs for configuration guidelines and restrictions:

<http://www.compaq.com/products/quickspecs/Division/10657.html>

The MEMORY CHANNEL controller, CCMAB-AA, must be revision D01 or later.

NOTE: This Web Site is available in English only.

Step 10 - Storage Adapters/Controllers - Mandatory

NOTE: Refer to the following chart when configuring adapters, shelves, and disks.

Options

AlphaServer ES45 Configuration Chart for Storage Adapters					
Storage Adapters		Shelf	Disk Drives	Tru64 UNIX	OpenVMS
3X-KZPCA-AA		BA610-6D	3R-A0xxx-AA 1-inch Universal	V5.1A	V7.3
3.3/5 V	33 MHz	DS-SL13R-xx	3R-A1xxx-AA 1-inch Universal		
		3R-A4075-AA/3R-A4076-AA	3R-A3xxx-AA 1-inch Universal		
3X-KZPEA-DB		BA610-6D	3R-A0xxx-AA 1-inch Universal	V5.1A	V7.3
3.3/5 V	33 MHz	DS-SL13R-Bx	3R-A1xxx-AA 1-inch Universal		
		3R-A4075-AA/3R-A4076-AA	3R-A3xxx-AA 1-inch Universal		
3X-KZPBA-CC*		See external storage options	DS-RZ1xx-VW	V5.1A	V7.3
3.3/5 V	33 MHz				
DS-KGPSA-EA		See external storage options	3R-A0xxx-AA 1-inch Universal	V5.1A	V7.3-1
3.3/5 V	66 MHz		3R-A1xxx-AA 1-inch Universal		
			3R-A3xxx-AA 1-inch Universal		
DS-KGPSA-DA		See external storage options	3R-A0xxx-AA 1-inch Universal	V5.1A	V7.3
3.3/5 V	33 MHz		3R-A1xxx-AA 1-inch Universal		
			3R-A3xxx-AA 1-inch Universal		
* Requires 3X-DWZCV-BA/CA, HVD-to-LVD converter					

RAID Controller				
DS-KZPCC-AC/CE	BA610-6D	3R-A0xxx-AA 1-inch Universal	V5.1A	-
	DS-SL13R-xx	3R-A1xxx-AA 1-inch Universal		
	3R-A4075-AA/3R-A4076-AA	3R-A3xxx-AA 1-inch Universal		
3X-KZPDC-BE/DF	BA610-6D	3R-A0xxx-AA 1-inch Universal	V5.1B/V5.1A	V7.3-1
	DS-SL13R-xx	3R-A1xxx-AA 1-inch Universal		
	3R-A4075-AA/3R-A4076-AA	3R-A3xxx-AA 1-inch Universal		

		Maximum # Supported				
		Tru64 UNIX	Open VMS	PCI Slot		
SCSI	PCI 2-port Ultra3 (LVD2) SCSI adapter, 64-bit/66-MHz dual-channel (uses one PCI slot); includes internal 68-pin and external 68-pin VHDCI connectors; requires 3X-BC56J-xx cable to connect adapter to DS-SL13R-Bx shelf; supports internal SDLT tape drives and external SDLT tape libraries. HSZxx RAID controllers not supported. Supports dual-bus (Models 4354R and 4454R) and single-bus (Models 4314R and 4414R) shelves with 3X-KZPEA-DB adapter. Tru64 UNIX requires graphics adapter to run console utilities (RUN BIOS). MSA30 enclosures (Models 4414R and 4454R) are not supported in shared SCSI configurations. 3X-KZPEA-DB adapter supports shared SCSI under Tru64 UNIX V5.1B and TruCluster V5.1B with Initial Patch Kit installed; supports maximum of two nodes per shared bus; requires 3X-BN55A-01 Y-cable and connector plug assembly, and 3X-H32CT-AA external LVD terminator per shared bus. NOTE: Tru64 UNIX Initial Patch Kit for V5.1B is located at: http://ftp1.support.compaq.com/public/unix/v5.1b	6	6	3.3/5 V	66 MHz	3X-KZPEA-DB

Options

	Ultra160 cable, VHDCI to VHDCI (341174-B21 - 6-feet, 341175-B21 - 12-feet, 164604-B21 - 24-feet) xx = 02 (6-feet), 03 (12-feet), 04 (24-feet)					3X-BC56J-xx
	PCI 1-port Ultra2 (LVD) SCSI adapter, 32-bit/33-MHz, single-channel (uses one PCI slot); includes internal 68-pin and external 68-pin HD connectors; order BN38C-xx cable to connect adapter to Ultra3 shelf, or order VHDCI converter (BN38E-0B) for use with included cable; HSZxx RAID controllers not supported. No support for shared SCSI.	6	6	3.3/ 5 V	33 MHz	3X-KZPCA-AA
	68-pin HD male-to-VHDCI male UltraSCSI cable; xx = 02, 03, 05, 10, 20 meters					BN38C-xx
	PCI 1-port UltraSCSI wide differential 32-bit/33-MHz PCI adapter (uses one PCI slot); includes external 68-pin HD connector, requires BN38C-xx cable (2 to 20 meters) to connect adapter to differential UltraSCSI shelf or RAID controller	4	4	3.3/ 5 V	33 MHz	3X-KZPBA-CC
	68-pin HD male-to-VHDCI male UltraSCSI cable; xx = 02, 03, 05, 10, 20 meters					BN38C-xx

Fibre Channel	PCI-X 64-bit 144-MHz 2-GB StorageWorks Fibre Channel Host Bus Adapter - FCA2684 - single channel NOTE: For configuration details refer to the Supported Options List at http://h18002.www1.hp.com/alphaserver/options/ases45/ases45_options.html The following pointer also provides additional information regarding this FCA: http://h18006.www1.hp.com/products/storageworks/fca2684/index.html	6	6	3.3/ 5 V	66 MHz	DS-A5132-AA
	PCI-X 64-bit 144-MHz 2-GB StorageWorks Fibre Channel Host Bus Adapter - FCA2684 - dual channel NOTE: For configuration details refer to the Supported Options List at http://h18002.www1.hp.com/alphaserver/options/ases45/ases45_options.html The following pointer also provides additional information regarding this FCA: http://h18006.www1.hp.com/products/storageworks/fca2684/index.html	4	4	3.3/ 5 V	66 MHz	DS-A5134-AA
	See Fibre Channel cables and switches, Step 11					

Options

Multi-function Module	PCI 32-bit, 33-MHz multi-function (single-port 10/100 Ethernet UTP/RJ45, Ultra2 LVD SCSI, and 2D graphics) adapter. Model 1B requires installation on PCI Bus 0 in slots 1 or 2; Models 2B and 3B require installation on PCI Bus 0 in slots 3, 6, 9, or 10 NOTE: Tru64 UNIX V5.1A requires Patch Kit 3: T64V51AS0003-20010413.tar. Only one 3X-KZPEA-DB allowed on same PCI bus; no multi-head graphics support Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	1	1	5 V	33 MHz	3X-DEPVZ-AA
	3X-DEPVZ-AA specific-use 3-meter LVD2 SCSI cable					BN37A-03
RAID	PCI 3-port PCI to Ultra2, 64-bit, LVD backplane RAID controller with 64-MB cache (uses one PCI slot); requires connection to BA610-6D disk card cage or DS-SL13R-xx Universal StorageWorks shelf; requires graphics adapter to run console utilities (SMOR) or alternatively, this can run via a serial line using a PC and terminal emulation software. NOTE: DS-KZPCC-xx RAID controllers require Tru64 UNIX V5.1A; TruCluster support with V5.1A requires Initial Patch Kit: T64V51AB01AS0001-20020116.TAR	8	-	3.3/5 V	33 MHz	DS-KZPCC-CE
	PCI 1-port PCI to Ultra2, 64-bit, LVD backplane RAID controller with 16-MB cache (uses one PCI slot); requires connection to BA610-6D disk card cage or DS-SL13R-xx Universal StorageWorks shelf; requires graphics adapter to run console utilities (SMOR) or alternatively, this can run via a serial line using a PC and terminal emulation software. NOTE: DS-KZPCC-xx RAID controllers require Tru64 UNIX V5.1A; TruCluster support with V5.1A requires Initial Patch Kit: T64V51AB01AS0001-20020116.TAR	8	-	3.3/5 V	33 MHz	DS-KZPCC-AC
	PCI 2-port PCI to Ultra3, 64-bit, 66 MHz, LVD backplane RAID controller with 128-MB cache (uses one PCI slot); requires connection to DS-SL13R-xx shelves or BA610-6D card cage. NOTE: Tru64 UNIX requires V5.1B and TruCluster V5.1B (non- shared buses only) with Initial Patch Kit: T64V51BV1AS0001-20021229.tar Tru64 UNIX requires V5.1A with Initial Patch Kit: T64V51AV21AS0004-20030206.tar NOTE: No host-based volume shadowing or shared bus support under OpenVMS.	6 per system, 3 per PCI bus	6 per system, 3 per PCI bus	3.3/5 V	66 MHz	3X-KZPDC-BE
	PCI 4-port PCI to Ultra3, 64-bit, 66 MHz, LVD backplane RAID controller with 256-MB cache (uses one PCI slot); requires connection to DS-SL13R-xx shelves or BA610-6D card cage. NOTE: Tru64 UNIX requires V5.1B and TruCluster V5.1B (non-shared buses only) with Initial Patch Kit: T64V51BV1AS0001-20021229.tar Tru64 UNIX requires V5.1A with Initial Patch Kit: T64V51AV21AS0004-20030206.tar	6 per system, 3 per PCI bus	6 per system, 3 per PCI bus	3.3/5 V	66 MHz	3X-KZPDC-DF

Options

	PCI to Fibre Channel adapter, 64-bit single-channel (uses one PCI slot); supported only on Linux, maximum of 4 adapters; requires 3X-KZPCA-AA SCSI adapter and must be installed in 66-MHz PCI bus slots only; supports HSG80 controller in transparent failover mode only. No support for multi-path and multi-bus modes.	-	-		66 MHz only	DS-SWLA4-PD
CI	PCI CI adapter for OpenVMS systems only; requires two 5.0V PCI slots and CI cable for each adapter NOTE: DS-HSJ80-LX and DS-SWXM2-AA.BA controllers are supported with CIPCA on ES45 systems.	-	2	5 V	33 MHz	CIPCA-BA
	CI cable					BNCIA-xx
HVD to LVD Converters	HVD (High Voltage Differential) adapters and LVD (Low Voltage Differential) devices are normally incompatible due to their different signaling voltage levels. This incompatibility does not allow direct communication between the different technologies. The HVD to LVD converter allows connectivity between legacy HVD Host Bus Adapters and today's LVD devices. The converter provides: - Connectivity in direct attach or shared configurations of all currently available LVD devices, including disks, tapes, libraries, and shelves (4314 or 4354) when used with the KZPBA-CB and 3X-KZPBA-CC HVD adapters. With the retirement of StorageWorks 1 disks and HVD shelves (BA36R), converters are desirable where upgrades to LVD HBAs, or upgrades to current operating system versions are not possible. - Shared and direct attach configurations are interconnected much the same as those previously configured with homogeneous HVD solutions, except that the HVD output is now passed through the converter before proceeding to the LVD device. Where required, Y cables (BN21W-0B), terminators (H879-AA), cables (BN38C-10, BN37A-20), one or two HVD/LVD converters (one-port, two-port), Memory Channel adapters (CCMAB), one Memory Channel cable (BN39B-10), are used in conjunction with the LVD device of choice.					
	HVD to LVD one-port converter					3X-DWZCV-BA
	HVD to LVD two-port converter					3X-DWZCV-CA

Step 11 - Storage Devices - Optional

Step 11a - Tape Devices

For detailed tape drive information see
<http://www.compaq.com/products/storageworks/sitemap.html#tapedrives>

- System includes embedded 1.44-MB diskette drive
- System includes embedded 5.25-inch half-height 600-MB 16X ATPI DVD-ROM drive
- Removable media slots provide support for up to two 5.25-inch half-height devices, or one 5.25-inch full-height (remove slot separator) removable media device; select up to two DAT devices or one DLT/SDLT tape device
- For maximum performance, tape libraries must be configured with Fast Wide Differential (FWD) controllers for tape backup

Options

DAT Tape Drives (Internal)	- Select up to two DAT devices - The following DAT tape drives are supported with 3X-KZPCA-AA adapter; TLZ10 tape drives are supported with 3X-KZPEA-DB adapters on Tru64 UNIX and OpenVMS systems (4 per bus).	
	DAT 12/24-GB 4-mm 5.25-inch half-height SCSI tape drive, top gun blue; requires SCSI cable (3X-BN46M-01)	TLZ10-LB
	DAT 20/40-GB 4-mm 5.25-inch half-height Ultra2 (LVD) SCSI tape drive, top gun blue; requires SCSI cable (3X-BN46M-01)	3X-SD20X-LB
	DAT 20/40-GB 4-mm 5.25-inch half-height Ultra2 (LVD) SCSI tape drive, carbon black; requires SCSI cable (3X-BN46M-01) (157769-B22)	3R-A3752-AA
	DAT 40-GB LVD internal tape drive (C5686B)	3R-A4752-AA
	DAT 72-GB LVD internal tape drive (Q1522A)	3R-A4544-AA
	1-meter Ultra2 68-pin LVD cable with two connectors, multimode terminator and two wide-to-narrow adapters	3X-BN46M-01
	DAT 12/24-GB 4-mm narrow SCSI tape drive in StorageWorks carrier	DS-TLZ10-VA
DAT Tabletop Tape Drives	DAT 20/40-GB 4-mm Wide Ultra2 (LVD) tabletop SCSI tape drive with 120V North American power cord, carbon black	157770-002
	Same as above, International	157770-B32
	Same as above, Japan	157770-292
	DAT 40-GB LVD tabletop tape drive with North America power cord (Q1554A)	3R-A4753-AA
	Same as above, International (Q1555A)	3R-A4754-AA
	DAT 72-GB LVD tabletop tape drive with North America power cord (Q1525A)	3R-A4545-AA
	Same as above, International	3R-A4546-AA
	DAT 36/72-GB LVD tabletop SCSI tape drive with 120V North America power cord, carbon black (Q1527A)	3R-A4545-AA
	Same as above, International (Q1528A)	3R-A4546-AA
	Same as above, International	157770-B32
	Same as above, Japan	157770-292
DAT Hot-plug Tape Drive	DAT 40-GB hot-plug LVD tape drive (Q1546A), uses two slots in BA610-6D or 43xxx shelves	3R-A4745-AA
	DAT 72-GB hot-plug LVD tape drive (Q1529A), uses two slots in BA610-6D or 43xxx shelves	3R-A4547-AA
DAT Autoloaders	DAT 20/40-GB auto loader external; requires VHDCI BN38A-0B adapter and BN23G-xx SCSI cable, North America	166505-001
	Same as above, International	166505-B31
	Same as above, Japan	166505-291
DLT/SDLT Tape Drives (Internal)	- Select one DLT/SDLT tape device - The following DLT/SDLT tape drives are supported with 3X-KZPCA-AA or 3X-KZPEA-DB LVD adapters	
	DLT8000 40/80-GB tape drive	146196-B22
	SDLT 110/220-GB 3U/5U tape drive	192106-B25
	SDLT 160/320-GB 3U/5U tape drive, carbon black	257319-B21

Options

DLT/SDLT Tabletop Tape Drives	SDLT tabletop 110/220-GB external tape drive, carbon black - TruCluster support restricted to non-shared buses only - U.S.	192103-002
	Same as above – International	192103-B32
	Same as above – Japan	192103-292
	SDLT tabletop 160/320-GB external tape drive, carbon black, U.S.	257319-001
	Same as above, International	257319-B31
	Same as above, Japan	257319-291
	Rackmount kit for H9Axx M-Series cabinets – required for mounting MSL5000 series in M-Series cabinets	254795-001
	MSL5026DLX, DLT tabletop library with one 40/80-GB DLT tape drive, LVD	231821-B21
	MSL5026DLX, DLT tabletop library with two 40/80-GB DLT tape drives, LVD	231821-B22
	MSL5026DLX or MSL5026SL, DLT/SDLT rackmount library, 0 drives; requires rackmount kit (254795-001)	231979-B21
	MSL5026DLX, DLT rackmount library with one 40/80-GB DLT tape drive, LVD; requires rackmount kit (254795-001)	231891-B21
	MSL5026DLX, DLT rackmount library with two 40/80-GB DLT tape drives, LVD; requires rackmount kit (254795-001)	231891-B22
	MSL5026SL, SDLT tabletop library with one 110/220-GB SDLT tape drive, LVD	302511-B21
	MSL5026SL, SDLT tabletop library with two 110/220-GB SDLT tape drives, LVD	302511-B22
	MSL5026SL, SDLT rackmount library with one 110/220-GB SDLT tape drive, LVD; requires rackmount kit (254795-001)	302512-B21
	MSL5026SL, SDLT rackmount library with two 110/220-GB SDLT tape drives, LVD; requires rackmount kit (254795-001)	302512-B22
	MSL5026S2, SDLT2 tabletop library with one 160/320-GB SDLT tape drive, LVD	293473-B21
	MSL5026S2, SDLT2 tabletop library with two 160/320-GB SDLT tape drives, LVD	293473-B22
	MSL5026S2, SDLT2 rackmount library, 0 drives, LVD – requires rackmount kit (254795-001)	293472-B21
	MSL5026S2, SDLT2 rackmount library with one 160/320-GB SDLT tape drive, LVD	293472-B22
	MSL5026S2, SDLT2 rackmount library with two 160/320-GB SDLT tape drive, LVD	293472-B23
	MSL5026S2, SDLT2 rackmount library with one 160/320-GB SDLT tape drive with Fibre Channel, LVD	293472-B24
	MSL5026S2, SDLT2 rackmount library with two 160/320-GB SDLT tape drive with Fibre Channel, LVD	293472-B25
	MSL5052SL, SDLT tabletop library with two 110/220-GB drives, LVD	249490-B21
	MSL5052SL, SDLT rackmount library, 0 drives, LVD – requires rackmount kit (254795-001)	255102-B21
	MSL5052SL, SDLT rackmount library with two 110/220-GB drives, LVD – requires rackmount kit (254795-001)	249491-B21
	MSL5052SL, SDLT 110/220-GB drive field upgrade, LVD	231823-B22
	MSL5052S2, SDLT2 tabletop library with two 160/320-GB SDLT tape drives, LVD, graphite	293476-B21
	MSL5052S2, SDLT2 rackmount library with two 160/320-GB SDLT tape drive, LVD	293474-B21

Options

MSL5052S2, SDLT2 rackmount library with two 160/320-GB SDLT tape drive with Fibre Channel, LVD 293474-B24

MSL6000 with LTO Gen2 Tape Libraries

MSL6000 LTO Gen2 add-on drive	330729-B21
MSL6030 with 0 drives, LTO, LVDS, rackmount	330731-B21
MSL6030 with one drive, LTO2, LVDS, rackmount	330731-B22
MSL6030 with two drives, LTO2, LVDS, rackmount	330731-B23
MSL6030 with one drive, LTO2, Fibre, rackmount	330731-B24
MSL6030 with two drives, LTO2, Fibre, rackmount	330731-B25
MSL6030 with one drive, LTO2, LVDS, tabletop	330788-B21
MSL6030 with two drives, LTO2, LVDS, tabletop	330788-B22
MSL6060 with 0 drives, LTO, LVDS, rackmount	331196-B23
MSL6060 with two drives, LTO2, LVDS, rackmount	331196-B21
MSL6060 with two drives, LTO2, Fibre, rackmount	331196-B22
MSL6060 with two drives, LTO2, LVDS, tabletop	331195-B21

DLT/SDLT Tape Libraries	ESL9198SL SDLT tape library with four 110/220-GB SDLT tape drives, 198 slots	234618-B21
	ESL9198SL SDLT tape library with eight 110/220-GB SDLT tape drives, 198 slots	234618-B22

ESL9322S2 SDLT2 tape library, two 160/320-GB SDLT tape drives, 222 slots	293409-B22
ESL9322S2 SDLT2 tape library, eight 160/320-GB SDLT tape drives, 222 slots	293409-B28
ESL9322S2 SDLT2 tape library, two 160/320-GB SDLT tape drives, 322 slots	293410-B22
ESL9322S2 SDLT2 tape library, eight 160/320-GB SDLT tape drives, 322 slots	293410-B28

ESL9326SL SDLT tape library with six 110/220-GB SDLT tape drives, LVD	234615-B21
ESL9326SL SDLT tape library with eight 110/220-GB SDLT tape drives, LVD	234615-B22
ESL9326SL SDLT tape library with 16 110/220-GB SDLT tape drives, LVD	234615-B26

ESL9595S2 SDLT2 tape library, two 160/320-GB SDLT tape drives, 400 slots	293411-B22
ESL9595S2 SDLT2 tape library, 16 160/320-GB SDLT tape drives, 400 slots	293411-B28
ESL9595S2 SDLT2 tape library, two 160/320-GB SDLT tape drives, 500 slots	293412-B22
ESL9595S2 SDLT2 tape library, 16 160/320-GB SDLT tape drives, 500 slots	293412-B28
ESL9595S2 SDLT2 tape library, two 160/320-GB SDLT tape drives, 595 slots	293413-B22
ESL9595S2 SDLT2 tape library, 16 160/320-GB SDLT tape drives, 595 slots	293413-B28

ESL9595SL SDLT tape library, 0 drives, 400 slots	274672-B21
ESL9595SL SDLT tape library, 2 drives, 400 slots	274672-B22
ESL9595SL SDLT tape library, 16 drives, 400 slots	274672-B28
ESL9595SL SDLT tape library, 0 drives, 500 slots	281627-B21
ESL9595SL SDLT tape library, 2 drives, 500 slots	281627-B22
ESL9595SL SDLT tape library, 16 drives, 500 slots	281627-B28
ESL9595SL SDLT tape library, 0 drives, 595 slots	281628-B21
ESL9595SL SDLT tape library, 2 drives, 595 slots	281628-B22
ESL9595SL SDLT tape library, 16 drives, 595 slots	281628-B28

NOTE: The following options are supported with 3X-KZPCA-AA or 3X-KZPEA-DB LVD adapters.

Options

ESL9000 with LTO Gen2 Tape Libraries

ESL9322 library with 0 drives	330832-B21
ESL9595 library with 0 drives	330833-B21
ESL9000 Ultrium 460 drive upgrade kit	330834-B21
ESL9000 SDLT 110 drive upgrade kit	330837-B21
ESL9322 222 to 322 slot upgrade kit	330840-B21
ESL9000 5-MB memory module	330841-B21
ESL9595 400 to 500 slot upgrade kit	330842-B21
ESL9595 500 to 595 slot upgrade kit	330842-B22
ESL9595 400 to 595 slot upgrade kit	330842-B23

3U Rackmount Tape Drive Enclosure

3U LVD Rackmount Tape Drive Enclosure for use in M-Series Cabinets and Series 10000 Cabinets, 0 drives, carbon black	274338-B21
Rackmount Kit for H9Axx M-Series Cabinets, carbon black – required for mounting 3U Rackmount Tape Drive Enclosure in M-Series cabinet	3R-A3804-AA
NOTE: The 3U Rackmount Tape Enclosure supports up to four internal half-height removable devices, or up to two full-height devices; select up to four DAT devices or two DLT/SDLT devices with 3U Rackmount Tape Enclosure (274338-B21) or select one of the preconfigured configurations listed below.	
DAT 20/40-GB 3U tape drive, carbon black, 157769-B22)	3R-A3752-AA
DLT8000 40/80-GB tape drive	146196-B22
SDLT 110/220-GB tape drive	192106-B25
SDLT 160/320-GB tape drive, carbon black	257319-B21
Preconfigured configurations	
DLT 40/80-GB, 3U rackmount kit, carbon black	274332-B21
DLT 40/80-GB, dual-drive, 3U rackmount kit, carbon black	274335-B21
SDLT 110/220-GB, 3U rackmount kit, carbon black	274331-B21
SDLT 110/220-GB, dual-drive, 3U rackmount kit, carbon black	274334-B21

5U Rackmount Tape Drive Enclosure

5U LVD Rackmount Tape Drive Enclosure for use in H9Axx M-Series Cabinets, 0 drives, carbon black	274339-B21
Rackmount Kit for H9Axx M-Series Cabinets, carbon black - required for mounting 5U Rackmount Tape Drive Enclosure in M-Series Cabinet	254795-001
NOTE: The 5U Rackmount Tape Enclosure supports four full-height removable devices; select up to four DLT or SDLT devices with 5U Rackmount Tape Enclosure (274339-B21) or select one of the preconfigured configurations listed below.	
DLT8000 40/80-GB tape drive	146196-B22
SDLT 110/220-GB tape drive	192106-B25
SDLT 160/320-GB tape drive, carbon black	257319-B21
Preconfigured configurations	
SDLT 110/220-GB Tape Array III, 5U rackmount kit, carbon black	274336-B21
DLT 40/80-GB Tape Array III, 5U rackmount kit, carbon black	274337-B21
DLT Tape Array III, Model 0 enclosure, U.S.	168047-001
Same as above, International	168047-B31
Same as above, Japan	168047-291

Options

Step 11b –Modular Data Routers

Network Storage Routers **NOTE:**

- e2400 and e1200 support LVD tape drives and tape libraries
- e2400 supports ESL family tape drives and tape libraries
- e1200 supports MSL family tape drives and tape libraries

NSR M2402 Two Fibre Channel x 4 HVD FC to SCSI Data Router, Tru64 UNIX and OpenVMS (262654-B21)	3R-A3741-AA
NSR M2402 Two Fibre Channel x 4 LVD FC to SCSI Data Router, Tru64 UNIX and OpenVMS (262653-B21)	3R-A3740-AA
NSR e1200-160 One Fibre Channel x 2 LVD FC to SCSI Data Router, Tru64 UNIX and OpenVMS, graphite	330728-B21
NSR e2400 Two Fibre Channel x 4 LVD FC to SCSI Data Router with card cage, Tru64 UNIX and OpenVMS, carbon black (262665-B21)	3R-A3935-AA
NSR e2400 Two Fibre Channel x 4 LVD FC to SCSI Data Router with no card cage, Tru64 UNIX and OpenVMS, carbon black (262664-B21)	3R-A3745-AA
NSR N1200 One Fibre Channel x 2 LVD FC to SCSI Data Router, Tru64 UNIX and OpenVMS, supports tape drives and tape libraries (280823-B21)	3R-A3747-AA

Step 11c – External Storage Solutions/Controllers

Enterprise Virtual Array 5000

ES45 servers support HP Enterprise Virtual Array 5000 (EVA5000) StorageWorks products running Tru64 UNIX and OpenVMS.

The EVA5000 is available in pre-defined configurations with controllers and/or expansion configurations without controllers. The EVA5000 also offers a pre-defined configuration that is optimized for High Performance Technical Computing (HPTC) environments. For ordering information and configuration rules, refer to the EVA5000 QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/11006_div/11006_div.HTML

Enterprise Virtual Array 3000

ES45 servers support HP Enterprise Virtual Array 3000 (EVA3000) StorageWorks products running Tru64 UNIX and OpenVMS. Available in one of four integrated "independent bundle" configurations, the EVA3000 includes one pair of HSV100 controllers, two Fibre Channel drive enclosures and 8 to 16 Fibre Channel disk drives (bundle dependent). The EVA3000 is a full 2-Gb end-to-end Fibre Channel Array solution, which operates in 1-Gb, 2-Gb, or mixed 1-Gb/2-Gb SAN fabrics. For ordering information and configuration rules, refer to the EVA3000 QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/11619_div/11619_div.HTML

Options

Modular SAN Array 1000 (msa 1000)	Modular SAN Array 1000, supported on Tru64 UNIX and two-node clusters (maximum); supported with DS-A5132-AA, DS-A5134-AA, DS-KGPSA-CA, DS-KGPSA-DA, and DS-KGPSA-EA adapters; requires connection via a switch - no direct connect; no support for FC arbitrated loop Tru64 UNIX V5.1A requires Patch Kit 4: T64V51AB21AS0004-20030206.tar Tru64 UNIX V5.1B requires Patch Kit 1: T64V51BB03AS0001-20021229.tar OpenVMS V7.3-1 requires TIMA Kit: VMS731_MSA1000-V0100 OpenVMS V7.3 requires TIMA Kit: VMS73_FIBRE_SCSI-V0500 OpenVMS V7.2-2 requires TIMA Kit: VMS722_FIBRE_SCSI-V0400 HP recommends OpenVMS customers run the default msa1000 cache settings at 50% read cache and 50% write cache; if a change to the default cache is required, msa1000 cache must be set to 50% write cache or higher (lower than 50% write cache is not supported) NOTE: Requires M-Series Rack Kit.	201723-B22
	M-series Rack Kit	313877-B21 3R-A5281-AA

StorageWorks Disk Array Family	NOTE: The HP StorageWorks Disk Array Family, specifically the XP128 and XP1024, are supported on AlphaServer ES45 systems. For product and ordering information, refer to the following Web pages: http://www.hp.com/products1/storage/products/disk_arrays/highend/xp1024/index.html http://www.hp.com/products1/storage/products/disk_arrays/highend/xp128/index.html http://h18006.www1.hp.com/products/storageworks/xp12000/index.htm The following part numbers have been assigned for reference purposes only:	
	3R-A4417-AA	A7876A XP128 Disk Array Control Frame
	3R-A4418-AA	A7906A XP1024 Disk Array Control Frame
		AE001A XP12000 Disk Array Control Frame

Step 11d – Fibre Channel Options

The following hubs, data routers, switches, and cables are used in Fibre Channel configurations using the DS-KGPSA-xx adapter.

Fibre Channel Disk Drives	36-GB 10K rpm dual-port 2-Gb/sec FC-AL 1-inch (25.4 mm) drive (238590-B21)	3R-A3239-AA
	36-GB 15K rpm dual-port 2-Gb/sec FC-AL 1-inch (2.54 cm) drive (236205-B21)	3R-A3210-AA
	72-GB 10K rpm dual-port 2-Gb/sec FC-AL 1-inch (2.54 cm) drive (238921-B21)	3R-A3260-AA
	72-GB 15K rpm dual-port 2-Gb/sec FC-AL 1-inch (2.54 cm) drive (293568-B21)	3R-A3971-AA
	146-GB 10K rpm dual-port 2-Gb/sec FC-AL 1-inch (25.4 mm) drive (293556-B21)	3R-A3975-AA
Fibre Channel Hubs	Fibre Channel 7-port Storage Hub, International (Tru64 UNIX only) (234453-B31)	DS-SWXHB-17
	Fibre Channel 7-port Storage Hub, Japan (Tru64 UNIX only) (234453-291)	DS-SWXHB-J7
Fibre Channel Data Routers	1 Fibre Channel x 2 HVD data router (163082-B21)	3R-A2673-AA
	1 Fibre Channel x 2 LVD data router (163083-B21)	3R-A2774-AA
	2 x 4 LVD Fiber Channel to SCSI Network Storage Router (262653-B21)	3R-A3740-AA
	2 x 4 HVD Fiber Channel to SCSI Network Storage Router (262654-B21)	3R-A3741-AA

Options

Fibre Channel Switches	Fibre Channel 2-Gb 8-port SAN switch (Base) (322120-B21)	DS-DSGGD-BC
	Fibre Channel 2-Gb 8-port SAN switch (Power pack) (322121-B21)	DS-DSGGD-CC
	Fibre Channel 2-Gb 16-port SAN switch (Base); requires Tru64 UNIX V5.1A Patch Kit: T64V51AB01AS0001-20020116.tar (322118-B21)	DS-DSGGD-CA
	Fibre Channel 2-Gb 16-port SAN switch (Power pack) (322119-B21)	DS-DSGGD-CB
	Fibre Channel 2-Gb 32-port SAN switch (Base) (240603-B21)	DS-DSGGD-AB
	Fibre Channel 2-Gb 32-port SAN switch (Power pack) (333764-B21)	DS-DSGGD-DB
	Fibre Channel 2-Gb 64-port core switch (Base) (332177-B21)	DS-DSGGE-BA
	Fibre Channel 2-Gb 64-port core switch (Power pack) (332178-B21)	DS-DSGGE-CA

McData 64-port Fibre Channel SAN Director Class Switches	SAN Director 64 (1 Gb) 32 ports, base model	DS-DMGGD-AA
	SAN Director 64 (2 Gb) 140 ports	DS-DMGGD-CA
	SAN Edge Switch 2 Gb, 16-ports	DS-DMGGE-BB
	SAN Edge Switch 2 Gb, 24 ports	DS-DMGGE-BD
	SAN Edge Switch 2 Gb, 32 ports	DS-DMGGE-BC

NOTE: Connection for, or between, 1-Gb and/or 2-Gb SAN switches requires different cables. Refer to the Switches, Hubs, and Interconnects QuickSpecs at: http://www.compaq.com/products/quickspecs/North_America/10490.html

Fibre Channel Cables	NOTE: The following LC-SC connector cables support connectivity between 1-Gb and 2-Gb devices.	
	2-meter LC-SC multi-mode Fibre Channel cable (221691-B21)	3R-A2976-AA
	5-meter LC-SC multi-mode Fibre Channel cable (221691-B22)	3R-A2977-AA
	15-meter LC-SC multi-mode Fibre Channel cable (221691-B23)	3R-A2978-AA
	30-meter LC-SC multi-mode Fibre Channel cable (221691-B26)	3R-A3458-AA
	50-meter LC-SC multi-mode Fibre Channel cable (221691-B27)	3R-A3459-AA
	NOTE: The following LC-LC connector cables support connectivity between 2-Gb and 2-Gb devices.	
	2-meter LC-LC multi-mode Fibre Channel cable (221692-B21)	3R-A2979-AA
	5-meter LC-LC multi-mode Fibre Channel cable (221692-B22)	3R-A2980-AA
	15-meter LC-LC multi-mode Fibre Channel cable (221692-B23)	3R-A2981-AA
	30-meter LC-LC multi-mode Fibre Channel cable (221692-B26)	3R-A3454-AA
	50-meter LC-LC multi-mode Fibre Channel cable (221692-B27)	3R-A3455-AA

Step 12 - Graphics Adapters - Optional

- Select graphics adapter, monitor, and country-specific keyboard for Tru64 UNIX and OpenVMS systems if required.

Options

		Maximum # Supported				
		Tru64 UNIX	Open VMS	PCI/ AGP Slot		
2D/3D Graphics	RADEON 7500 PCI 3D graphics accelerator; Tru64 UNIX: Requires V5.1B with latest patch kit. Dual head on first card only (unique video DVI port for 2D or 3D. OpenVMS: Requires V7.3-1 with TIMA Kit: DEC-AXPVMS-VMS731_GRAPHICS-V0300-4.PCSI or latest version. Dual head on first card only (cloned video using DVI port for 2D or 3D. NOTE: For multi-head support, refer to Read Me First document/Release Notes. Do not mix with other graphics cards.	4 - (2D only) 1 - 3D	4 - 2D/3D	3.3/ 5 V	66 MHz	3X-PBXGG-AA
	RADEON 7500 AGP 2D/3D graphics accelerator; Tru64 UNIX V5.1B with latest patch kit: Tru64 UNIX supports a maximum of 4 graphics heads when configured with additional RADEON PCI cards (3X-PBXGG-AA) OpenVMS requires: DEC-AXPVMS-VMS731_GRAPHICS-V0200-4.PCSI or latest version NOTE: Can only operate in Model 1B in slot 3; supports 2X mode only; do not mix with other graphic card types.	1	1	1.5 V	4X	3X-PBXGG-AB
	Tru64 UNIX Open3D license for RADEON 7500 (required for 3D functionality)					QL-6ZRA9-AA
	OpenVMS Open3D license for RADEON 7500 (required for 3D functionality)					QL-0ADA9-AA
	Additional Tru64 UNIX media kit for RADEON 7500 (initial kit ships with RADEON card)					QA-6ZRAA-H8
	Additional OpenVMS media kit for RADEON 7500 (initial kit ships with RADEON card)					QA-6ZPAA-H8
2D	PCI 32-bit, 33-MHz multi-function (single-port 10/100 Ethernet UTP/RJ45, Ultra2 LVD SCSI, and 2D graphics) adapter. Model 1B requires installation on PCI Bus 0 in slots 1 or 2; Models 2B and 3B require installation on PCI Bus 0 in slots 3, 6, 9, or 10. NOTE: Tru64 UNIX V5.1A requires Patch Kit 3: T64V51AS0003-20010413.tar Only one 3X-KZPEA-DB allowed on same PCI bus; no multi-head graphics support; TruCluster support restricted to non-shared SCSI buses only. Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	1	1	5 V	33 MHz	3X-DEPVZ-AA

Options

Step 13 - Monitors

- Graphics monitors other than those listed can be used if compatible with SVGA graphics ordered with system
- A video cable, 6-foot/1.8-meter length, is included with all variants of monitors
- Video extension cable required if monitor is located more than 1 meter from server
- Monitors will ship with, but not be integrated with systems.

CRT Monitors

S7500 17-inch (16-inch viewable image size) 0.24mm FST multi-frequency color monitor, 2-tone (carbon/silver), VGA to 1024 x 768 @85 Hz, MPRII/TCO 99/Energy Star Compliant, Northern Hemisphere with NA power cord, VGA cable	3R-A5227-AA
Same as above, with Euro power cord	3R-A5228-AA
Same as above, Taiwan, NA power cord	3R-A5229-AA
Same as above, with PRC power cord, CCIB	3R-A4800-AA
V7550 17-inch (16-inch viewable image size) flat-faced shadow mask color monitor, 2-tone (carbon/silver), 0.25-mm dot pitch, VGA to 1024 x 768 @85 Hz, MPRII/TCO 99/Energy Star Compliant, Southern Hemisphere with Australia/New Zealand power cord, VGA cable	3R-A4203-AA
P930 19-inch (18-inch viewable image size) auto-scanning color monitor, Diamondtron NF, 0.24-mm aperture grille pitch, VGA to 1600 x 1200 @85 Hz, MPRII/TCO 99/Energy Star Compliant, Northern Hemisphere with NA power cord, VGA cable	3R-A4215-AA
Same as above, with Euro power cord	3R-A4391-AA
Same as above, Taiwan, with NA power cord	3R-A4392-AA
Same as above, Southern Hemisphere, 0.25 to 0.27 mm aperture grille pitch, with Australia/New Zealand power cord	3R-A4393-AA
S9500 19-inch (18-inch viewable image size) FST multi-frequency color monitor, 2-tone (carbon/silver), 0.22-mm dot pitch, VGA to 1280 x 1024 @85 Hz, MPRII/TCO 99/Energy Star Compliant, Northern Hemisphere with PRC power cord CCIB, VGA cable	3R-A4801-AA
P1130 21-inch (19.8-inch viewable image size) FD Trinitron auto-scanning color monitor, 0.24-mm aperture grille pitch, VGA to 1792 x 1344 @85Hz, dual video input, USB Hub, MPRII/TCO 99/Energy Star Compliant, Northern Hemisphere with NA power cord, VGA cable	3R-A4216-AA
Same as above, with Euro power cord	3R-A4396-AA
Same as above, Taiwan, NA power cord	3R-A4397-AA
Same as above, with PRC power cord, CCIB	3R-A4400-AA
Same as above, Southern Hemisphere, with Australia/New Zealand power cord	3R-A4398-AA

Options

Flat Panel Monitors	L2035 20" (20.1" viewable image area) flat panel monitor 0.255mm pixel pitch, 1600 x 1200 @60 Hz, A + D, TCO 03, Energy Star compliant, 4 video input connectors, (VGA, DVI-I, composite video and s-video), NA power cord, VGA and DVI-I cables	3R-A5056-AA
	L2035 20" (20.1" viewable image area) flat panel monitor 0.255mm pixel pitch, 1600 x 1200 @60 Hz, A + D, TCO 03, Energy Star compliant, 4 video input connectors, (VGA, DVI-I, composite video and s-video), Euro power cord, VGA and DVI-I cables	3R-A5057-AA
	L1955, 19" (19" viewable image size) TFT flat panel monitor, 0.294mm pixel pitch, 1280 x 1024 @60Hz, multi-mode support, MPRII/TCO 03/Energy Star compliant, one VGA, one DVI-I input connector. NA power cord, VGA and DVI-D cables	3R-A5713-AA
	L1955, 19" (19" viewable image size) TFT flat panel monitor, 0.294mm pixel pitch, 1280 x 1024 @60Hz, multi-mode support, MPRII/TCO 03/Energy Star compliant, one VGA, one DVI-I input connector. Euro power cord, VGA and DVI-D cables	3R-A5714-AA
	L1530, 15." (15" viewable image size) TFT flat panel monitor, 0.297 mm pixel pitch, 1024 x 768 @60 Hz, multi-mode support, MPRII/TCO99/Energy Star compliant, two video input connectors (one VGA and one DVI-I), NA power cord, VGA and DVI-I cables	3R-A4857-AA
	L1530, 15." (15" viewable image size) TFT flat panel monitor, 0.297 mm pixel pitch, 1024 x 768 @60 Hz, multi-mode support, MPRII/TCO99/Energy Star compliant, two video input connectors (one VGA and one DVI-I), Euro power cord, VGA and DVI-I cables	3R-A4858-AA
Flat Panel Monitor – Rack Mountable	TFT7210R 17" (17" viewable image area) 1U rack-mount flat panel display, 0.264mm pixel pitch, 1280 x 1024 @60/75 Hz, high and low voltage power cords, worldwide	3R-A5187-AA
Video Extension Cable	6-foot/1.8-meter video extension cable optional	BN39C-02
Monitor Power Cords	North American, 120 V, 75-inch	BN26J-1K
	Australia, New Zealand, 2.5-meter	3R-A6023-AA
	Central Europe, 2.5-meter	BN19C-2E
	Denmark, 2.5-meter	BN19K-2E
	Egypt, India, South Africa, 2.5-meter	BN19S-2E
	Israel, 2.5-meter	BN18L-2E
	Italy, 2.5-meter	BN19M-2E
	Japan, 2.5-meter, Dentori approved	3X-BN46F-02
	Switzerland, 2.5-meter	BN19E-2E
	UK, Ireland, 2.5-meter	BN19A-2E

Step 14 - Keyboards, Mouse, Documentation

Options

Keyboards - Optional

- Select a keyboard and mouse
- All keyboards listed may not be available in all geographies
- Select an opal OpenVMS keyboard for use with VT5xx text terminals.

	Opal	Carbon	
Keyboard/Language	OpenVMS	Tru64 UNIX	OpenVMS*
U.S. keyboard	LK461-A2	3R-A4362-AA	3X-LK463-A2
Arabic keyboard	-	3R-A4348-AA	-
Belgian keyboard	LK461-AB	3R-A4349-AA	3X-LK463-AB
BHCSY keyboard	-	3R-A4350-AA	-
Canadian/English keyboard	LK461-AQ	-	3X-LK463-AQ
Canadian/French keyboard	LK461-AC	3R-A4351-AA	3X-LK463-AC
Cyrillic keyboard (Russian)	LK461-BT	3R-A4352-AA	3X-LK463-BT
Czech keyboard	LK461-BV	3R-A4353-AA	3X-LK463-BV
Danish keyboard	LK461-AD	3R-A4354-AA	3X-LK463-AD
Dutch keyboard	LK461-AH	3R-A4355-AA	3X-LK463-AH
Finnish keyboard	LK461-AF	3R-A4356-AA	3X-LK463-AF
French keyboard	LK461-AP	3R-A4357-AA	3X-LK463-AP
German keyboard	LK461-AG	3R-A4358-AA	3X-LK463-AG
Greek keyboard	LK461-BH	3R-A4359-AA	3X-LK463-BH
Hebrew keyboard	LK461-AT	3R-A4360-AA	3X-LK463-AT
Hungarian keyboard	LK461-BQ	3R-A4361-AA	3X-LK463-BQ
International keyboard	-	3R-A4362-AA	-
Italian keyboard	LK461-AI	3R-A4363-AA	3X-LK463-AI
Japanese keyboard	-	3R-A4364-AA	-
Korean keyboard	-	3R-A4365-AA	-

Latin-American keyboard	-	3R-A4366-AA	-
Norwegian keyboard	LK461-AN	3R-A4367-AA	3X-LK463-AN
Polish keyboard	LK461-BP	3R-A4368-AA	3X-LK463-BP
Portuguese keyboard	LK461-AV	3R-A4369-AA	3X-LK463-AV
Romanian keyboard	LK461-BL	-	3X-LK463-BL
Simplified Chinese keyboard	-	3R-A5358-AA	-
Slovak keyboard	LK461-CZ	3R-A4371-AA	3X-LK463-CZ
Spanish keyboard	LK461-AS	3R-A4372-AA	3X-LK463-AS
Swedish keyboard	LK461-AM	3R-A4373-AA	3X-LK463-AM
Swiss/French keyboard	LK461-AK	3R-A4374-AA	3X-LK463-AK
Swiss/German keyboard	LK461-AL	-	3X-LK463-AL
Traditional Chinese keyboard	-	3R-A4375-AA	-
Thai keyboard	-	3R-A4376-AA	-
Turkish Q keyboard	LK461-BU	3R-A4377-AA	3X-LK463-BU
Turkish/F keyboard	LK461-BW	-	3X-LK463-BW

Options

UK keyboard	-	3R-A4378-AA	3X-LK463-A2
Yugoslavian keyboard	LK461-BY	-	3X-LK463-BY

*OpenVMS keyboard (3X-LK463-xx) comes with PS/2 and USB connectors

Keyboard or Mouse Extension Cable	6-foot/1.8-meter keyboard or mouse extension cable; to extend both keyboard and mouse order two cables	3X-BC34A-06
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Mouse	3-button mouse - carbon	3R-A5676-AA
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Console Terminal

- Any terminal can be used as a console device
- Third-party console devices require an EIA-232 25-pin DSUB connector

VT510 video terminal; requires keyboard, H8575-x adapter, and BC16E-x cable	VT510-xx
Console cable, female connector (25-pin passive adapter)	H8575-A
Console cable, male connector (adapter with EOS, ESD, 25 POS D-SUB)	H8575-D

Documentation	Additional AlphaServer ES45 System Information Kit (print and CD), Owners Guide, User Interface Guide, and Release Notes	QA-6E88A-G8
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Step 15 - Software - Media and documentation required for first system on site

- Software Processor Code = E

Tru64 UNIX	AlphaServer ES45 Tru64 UNIX systems include Unlimited User license, Server Extension license, Internet Express, and Secure Web Server
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Options

When using Tru64 UNIX V5.1A	Tru64 UNIX media and online documentation on CD-ROM	QA-6ADAA-H8
	Tru64 UNIX full hard copy documentation	QA-6ADAA-GZ
	TruCluster Plus Software Package, licenses for TruCluster Server, Logical Storage Manager and AdvFS Utilities	QP-6R9AE-AA
	TruCluster Server License	QL-6BRAE-AA
	Logical Storage Manager License	QL-2GVAE-AA
	AdvFS Utilities License	QL-0EGAE-AA
	Advanced Server for Tru64 UNIX, 25 client concurrent use license	QL-5U29M-3D
	Advanced Server for Tru64 UNIX, 50 client concurrent use license	QL-5U29M-3E
	Advanced Server for Tru64 UNIX, 100 client concurrent use license	QL-5U29M-3F
	Advanced Server for Tru64 UNIX, 250 client concurrent use license	QL-5U29M-3G
	Advanced Server for Tru64 UNIX, 500 client concurrent use license	QL-5U29M-3H
	Layered products media and documentation for Tru64 UNIX on CD-ROM	QA-054AA-H8
	DECnet/OSI extended function license for Tru64 UNIX	QL-MTKAE-AA
	DECnet/OSI end-system license for Tru64 UNIX	QL-MTJAE-AA
	Open3D for Tru64 UNIX on CD-ROM, includes graphics drivers	QA-OAFAA-H8

OpenVMS

- AlphaServer ES45 OpenVMS systems include Base license with System Manager license and Enterprise Integration Server License Package for OpenVMS Revision V3.1
- Enterprise Integration Package includes licenses for TCP/IP Services for OpenVMS, DECwindows Motif for OpenVMS Alpha, DECprint Supervisor for OpenVMS Alpha Plus, DECprint Supervisor for OpenVMS Open, DECnet-Plus for OpenVMS Alpha End System, Archive/Backup System for OpenVMS Management Tools, Archive/Backup Agent for Windows NT, OpenVMS Disk Services for Windows NT, Office Server for OpenVMS, PATHWORKS 32, PATHWORKS V6 for OpenVMS – Advanced Server, and DIGITAL Office Server Client Access License
- OpenVMS Concurrent Use licenses provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.
- OpenVMS Traditional Unlimited Use license is system specific and can only be used on one system at a time. It cannot be shared between systems or in an OpenVMS VAX or OpenVMS Alpha Cluster.

Concurrent Use 1-user license	QL-MT3AA-3B
Concurrent Use 2-user license	QL-MT3AA-3C
Concurrent Use 4-user license	QL-MT3AA-3D
Concurrent Use 8-user license	QL-MT3AA-3E
Concurrent Use 16-user license	QL-MT3AA-3F
Concurrent Use 32-user license	QL-MT3AA-3G
Concurrent Use 64-user license	QL-MT3AA-3H

Options

Concurrent Use 128-user license	QL-MT3AA-3J
Concurrent Use 256-user license	QL-MT3AA-3K
Traditional unlimited user license	QL-MT2AE-AA
OpenVMS media and documentation on CD-ROM	QA-MT1AA-H8
OpenVMS full hard copy documentation	QA-001AA-GZ
Layered products media and documentation for OpenVMS on CD-ROM, includes Enterprise Integration Server for OpenVMS media and documentation.	QA-03XAA-H8
DECnet extended function license for OpenVMS	QL-MTGAE-AA
DECnet end-system to extended function upgrade license for OpenVMS	QL-MTHAE-AA
OpenVMS Cluster license for Alpha systems	QL-MUZAE-AA
OpenVMS Volume Shadowing license	QL-2A1AE-AA

Step 16 - Hardware and Software Support Services for Tru64 UNIX and OpenVMS

- Select one of the optional HP Care Pack Service Packages described below that best support the customer's operational requirements for system availability.

HP Care Pack Services

- HP Care Pack Services are available for AlphaServer systems running Tru64 UNIX or OpenVMS operating systems. HP Care Pack Services are designed for customers who require support beyond that provided by the hardware product warranty with coverage for both Principal server systems and SSPs (Subsequent System Packages) - that meet a full range of customer support requirements.

Program Features – Principal Server

HP Support Plus

- HP Support Plus offers combined hardware and software services in one package, providing support during standard HP office hours.

HP Support Plus 24

- HP Support Plus 24 offers combined hardware and software services in one package to help enhance the availability and performance of your IT infrastructure 24x7.

HP Proactive 24

- HP Proactive 24 (P24) is a combined hardware and software support solution designed to help you get more from your IT investment. P24 improves the effectiveness, performance, and availability of the technologies in your IT infrastructure.

HP Critical Service

- HP Critical Service (CS) is a comprehensive hardware and software support solution, designed for organizations running business critical applications. CS provides a combination of proactive and reactive services for mission critical environments with little or no tolerance for downtime.

Options

Program Features – Additional Services

SSPs (Subsequent System Packages)

- For HP Care Pack Support Plus and Support Plus 24
- HW Support at same level as corresponding package for Principal server
- License Subscription: HP O/S (where applicable)
- Telephone support through Principal server covered by full support package

Installation

- Pre-installation review
- Unpacking of equipment
- Assemble and test
- Basic product usage info
- No software installation added

Installation & Startup HP O/S

- Pre-installation review
- Unpacking of equipment
- Assemble and test
- Basic product usage info
- Install operating systems
- Product configuration
- Print & network access
- Orientation

HP Care Pack Services for AlphaServer ES45 Systems (sold via legacy Order Management System)

Model/HP Care Pack Services	Principal Server 1 year	Principal Server 3 years	Subsequent Systems 1 year	Subsequent Systems 3 years
AlphaServer ES45 Model 1B				
HP Support Plus	FP-F01EA-12	FP-F01EA-36	FP-F21EA-12	FP-F21EA-36
HP Support Plus 24	FP-F02EA-12	FP-F02EA-36	FP-F22EA-12	FP-F22EA-36
Installation	FP-FINST-EA	FP-FINST-EA	FP-FINST-EA	FP-FINST-EA
Installation & Startup	FP-FSTAR-EA	FP-FSTAR-EA	FP-FSTAR-EA	FP-FSTAR-EA

AlphaServer ES45 Model 2B, Model 3B

HP Support Plus	FP-F01EB-12	FP-F01EB-36	FP-F21EB-12	FP-F21EB-36
HP Support Plus 24	FP-F02EB-12	FP-F02EB-36	FP-F22EB-12	FP-F22EB-36
Installation	FP-FINST-EB	FP-FINST-EB	FP-FINST-EB	FP-FINST-EB
Installation & Startup	FP-FSTAR-EB	FP-FSTAR-EB	FP-FSTAR-EB	FP-FSTAR-EB

HP Care Pack Services for AlphaServer ES45 Systems (sold via Fusion Order Management System)

	1-year Package ID#	Option ID#	3-year Package ID#	Option ID#
AlphaServer ES45 Model 1B				
HP Support Plus	HA109A1	6JL	HA109A3	6JL
HP Support Plus 24	HA110A1	6JL	HA110A3	6JL
HP Proactive 24	HA111A1	6JL	HA111A3	6JL
HP Critical Service	HA112A1	6JL	HA112A3	6JL

AlphaServer ES45 Model 2B, 3B

HP Support Plus	HA109A1	6JH	HA109A3	6JH
HP Support Plus 24	HA110A1	6JH	HA110A3	6JH
HP Proactive 24	HA111A1	6JH	HA111A3	6JH
HP Critical Service	HA112A1	6JH	HA112A3	6JH

Options

NOTES:

- AlphaServer ES45 systems include one-year parts and labor warranty with 5x9, on-site Next Business Day response.
 - HP Care Pack Services include support for new HP branded hardware options internal to the AlphaServer enclosure plus a monitor (17-inch or less excluding flat panel models).
 - External storage devices/cabinets carry their own level of warranty and should be quoted separately for uplifted warranty services.
 - In addition to the HP Care Pack Services shown above, other service packages are available for separate hardware and software support. For more information on Hardware and Software Upfront Services and other HP service options available for AlphaServers, please consult your Sales Account Manager, HP Services Principal, or visit: <http://www.hp.com/hps/>
- NOTE:** This Web site is available in English only.

Technical Specifications

Tower Configuration	Dimensions (H x W x D)	20 x 15.25 x 31 in (50.8 x 38.7 x 78.7 cm)		
	Shipping Dimensions	32.2 x 24 x 40 in (82.48 x 60.2 x 101.6 cm)		
	Weight	Typical Configuration	144.3 lb (65.6 kg)	
		Maximum Configuration	212.8 lb (96.7 kg)	
	Shipping Weight	Typical Configuration	172 lb (78 kg)	
		Maximum Configuration	242 lb (110 kg)	
	Clearances	Operating		Service
		Front	29.5 in (75 cm)	29.5 in (75 cm)
		Rear	6 in (15 cm)	29.5 in (75 cm)
		Left Side	None	29.5 in (75 cm)
		Right Side	None	None
Pedestal Configuration	Dimensions (H x W x D)	30.8 x 20 x 31.75 in (78.2 x 50.8 x 80.6 cm)		
	Shipping Dimensions	42.4 x 39.5 x 23.9 in (107.7 x 100.3 x 60.7 cm)		
	Weight	Typical Configuration	280 lb (127 kg)	
		Maximum Configuration	350 lb (159 kg)	
	Shipping Weight	Typical Configuration	328 lb (149 kg)	
		Maximum Configuration	407 lb (185 kg)	
	Clearances	Operating		Service
		Front	29.5 in (75 cm)	29.5 in (75 cm)
		Rear	6 in (15 cm)	29.5 in (75 cm)
		Left Side	None	None
		Right Side	None	29.5 in (75 cm)
Rackmount System	Dimensions (H x W x D)	13.87 x 17.6 x 30.1 in (35.2 x 44.7 x 76.5 cm) (fits 14 in [8U] standard RETMA cabinet)		
	Shipping Dimensions	28.8 x 24 x 40 in (73.2 x 60.7 x 101.6 cm)		
	Weight	When lifting:	Typical Configuration	110 lb (50 kg)
			Maximum	167.2 lb (76 kg)
		Total added to cabinet (brackets, slides, cables):	Total added to cabinet (brackets, slides, cables)	130 lb (59 kg)
			Maximum	202.4 lb (92 kg)
	Shipping Weight	Nominal	158 lb (72 kg)	
		Maximum	233 lb (106 kg)	
	Clearances	Operating	Service	
		See specific cabinet requirements	Minimum 4 ft (121.9 cm), 32.4 in (82.2) cm withdrawal on rails	

Technical Specifications

Cabinet Configuration	H9A10 M-Series	H9A15 M-Series	Series 10000 Rack (10642)
Dimensions (H x W x D)	67 x 23.6 x 41.5 in (170 x 60 x 105.4 cm)	79 x 23.6 x 41.5 in (200 x 60 x 105.4 cm)	78.7 x 24 x 39.69 in (199.9 x 60.96 x 100.82 cm)
Shipping Dimensions	73 x 36 x 48 in (185.5 x 91.5 x 122 cm)	85 x 36 x 48 in (216 x 91.5 x 122 cm)	78.7 x 24 x 39.69 in (199.9 x 60.96 x 100.82 cm)
Weight	Configuration dependent	Configuration dependent	Configuration dependent
Shipping Weight	Nominal: 946 lb (430 kg) Maximum: 1,375 lb (625 kg)	Nominal: 1,056 lb (550 kg) Maximum: 1,408 lb (640 kg)	284 lb/129 kg (empty) Maximum: 2,000 lb (909.1 kg)

System Unit

Environmental

Temperature

Operating (Tower, Pedestal, Rackmount)	50° to 95° F (10° to 35° C)
Non-operating	–40° to 151° F (–40° to 66° C)
Storage (60 days)	–40° to 151° F (–40° to 66° C)
Rate of change	20° F/hr (11° C/hr)

NOTE: Maximum operating temperature at sea level; reduce by 1.8° F (1° C) for each 2,000 ft (600 m) above sea level.

Humidity

Operating	20% to 80%
Non-operating	20% to 80%
Storage (60 days)	10% to 95%
Rate of change	20% hr

Maximum Wet Bulb Temperature

Operating	82° F (28° C)
Storage (60 days)	115° F (46° C)

Maximum Dew Point Temperature

Operating	36° F (2° C)
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Heat Dissipation

	Nominal	Maximum
Tower and Rack	980W, 3347 BTU/hr	1300 W, 4,440 BTU/hr
Pedestal	1560W, 5328 BTU/hr	2400 W, 8,196 BTU/hr
H9A10/H9A15 Cabinets	Configuration dependent	4800 W, 16,392 BTU/hr

Air Flow and Quality

Intake location	Front
Exhaust location	Rear Tower, Pedestal, Rack; Rear/top H9A10/H9A15
Particle size	N/A
Concentration	N/A

Altitude (unpressurized)

Operating	10,000 ft (3,048 m)
Non-operating	40,000 ft (12,192 m)

Technical Specifications

NOTE: Higher altitudes are possible if maximum operating temperature is reduced (see Temperature); other restrictions may apply such as maximum permissible altitude for hard drives.

Acoustics (Declared values per ISO 9296 and ISO 7779)

Acoustics		LWAd3B	LnAm5dBA (bystander position)
Tower or Rackmount	Idle	6.4	47
	Operating	6.4	47
Pedestal	Idle	6.6	48
	Operating	6.6	48

NOTE:Current values for specific configurations are available, 1 B = 10 dBA.

Vibration	Operating	10 to 500 Hz 0.1 G peak
	Non-operating	1.03 Grms 5-300 Hz

Electrical (Power supplies are universal, PFC, auto ranging, 100/240 VAC)

Nominal Voltage (VAC) 200 to 240

Voltage Range (VAC) 180 to 250
(temporary condition)

Power Source Phase Single

Nominal Frequency (Hz) 50/60

Frequency Range (Hz) 47 to 53/57 to 63

Maximum Inrush Current	Tower and Rackmount	Single power cord	5.6A
		Multiple power cords	3.6A
		Maximum VA	1440
	Pedestal	Each power cord	8.6A
		Maximum VA	2070
	M-Series Cabinet (configuration dependent)	Nominal voltage (VAC)	200 to 240
		Each power cord	16A
		Up to 3 (Country specific)	IEC 320 to country-specific
	Pedestal (mandatory)	2 (Country specific)	IEC 320 C13 to country-specific
		3 (14 ft 10 in/52 cm)	IEC 320 C13 to IEC 320 C14
Power Cords	Tower (mandatory)	Up to 3 (Country specific)	IEC 320 C13 to IEC 320 C14
		2 (Country specific)	200-240 V non-removable NEMA L6-20P for North America or 200-240 V non-removable IEC 309
	Pedestal (mandatory)	3 (14 ft 10 in/52 cm)	200-240 V non-removable NEMA L6-20P for North America or 200-240 V non-removable IEC 309
		Up to 4 (10 ft /305 cm)	200-240 V non-removable NEMA L6-20P for North America or 200-240 V non-removable IEC 309

Regulatory	Agency Approvals	UL: Listed to UL1950 3rd edition
		UL CNL: Certified to CAN/CSA-C22.2 No. 950-1995
		TUV: EN 60950/A11:1997, GS marked

Technical Specifications

	FCC: Part 15.B Class A
	IC ICES-003 Class A
	CE: EN55022:1998, EN55024:1998, EN61000-3-2:1995, EN61000-3-3:1995
	VCCI:V-3/97.04 Class A
	BSMI: CNS13438 Class A
	C-Tick: AS/NZS 3548:1995 Class A
Reviewed to	AS/NZ 3260:1993 Australian/New Zealand Standard
	EN 60950:2000
	IEC 60950:1999, 3rd edition
	UL 60950, 3rd edition, 2000

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