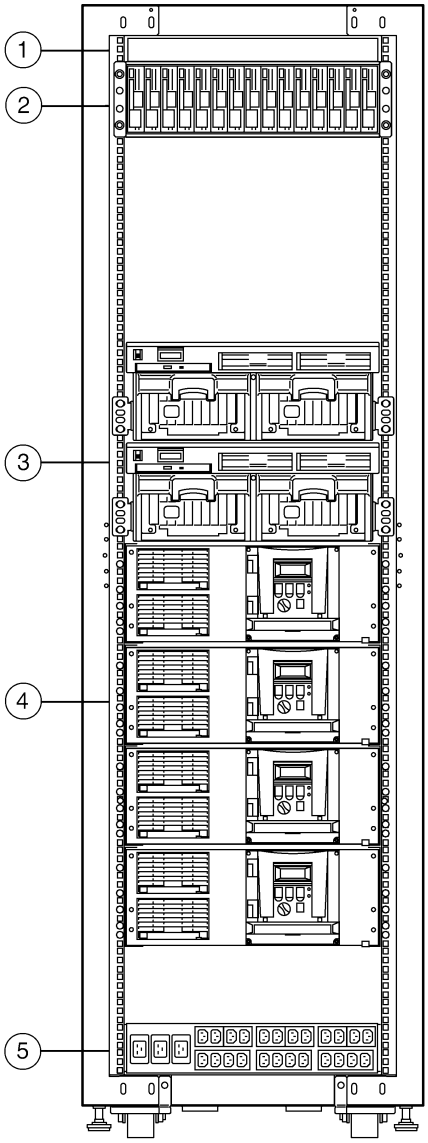
Overview

At A Glance

AlphaServer™ ES80 systems

- Two, four, six, or eight 1000-MHz Alpha 21364 processors
- Advanced on-chip memory controllers and switch logic capable of providing 10.7-GB/s of peak memory bandwidth per processor
- Choice of memory options; up to 4-GB of RDRAM memory per processor (32-GB total for an 8P system) – Future expansion to 8-GB/processor planned
- Redundant features providing maximum uptime – N+1 Voltage Regulator Modules (VRMs); hot-plug redundant power supplies; cooling provided by four hot-plug redundant system fans
- Optional RAID memory support
- Up to 42 PCI/PCI-X I/O slots (8P system with I/O expansion)
- Up to six AGP slots (8P system with I/O expansion))
- Internal hot-plug drive storage of 1.1TB (8P system)
- Integrated Ultra3 SCSI controller (one per System Building Block Drawer)
- CD-RW drive
- Dual USB port (one per System Building Block Drawer)
- Enhanced reliability with ECC-protected memory, processor cache and system data paths
- *Tru64* UNIX or *OpenVMS* factory installed software (FIS); optional high availability support with Tru64 UNIX and OpenVMS cluster solutions
- Product warranty, 1-year hardware, on-site next business day and 90-day software, telephone support delivered by HP Services
- Consult the HP Customer Support Center at 1-800-345-1518 for details



1. Cable/DSL HUB
2. StorageWorks Drawer (Optional)
3. PCI/PCI-X I/O Expansion Drawer(s)
4. System Building Block Drawer (Model 2 includes 1 drawer; Model 4 includes 2 drawers; Model 6 includes 3 drawers; Model 8 includes 4 drawers)
5. AC input controller(s)

Standard Features

Processor

Two, four, six, or eight Alpha 21364 1000-MHz CPUs

Cache Memory

1.75-MB ECC L2 on-chip cache per CPU

Architecture

Glue-less processor-to-processor multiprocessor architecture constructed from a set of basic components:

- System Building Block Drawers
- CPU Building Block Modules
- I/O Expansion Drawers

CPUs, Memory, and I/O slots	ES80 Model 2	ES80 Model 4	ES80 Model 6	ES80 Model 8
Maximum CPUs supported	2	4	6	8
Maximum memory supported	8 GB	16 GB	24 GB	32 GB
Maximum PCI/PCI-X slots supported	16	32	48	64
Maximum AGP slots supported	2	4	6	8

Storage Controller

Integrated Ultra3 SCSI controller for internal disk drives (One per System Building Block Drawer)

Interfaces

USB	One Dual USB port per System Building Block Drawer
Server Management	One MBM Server Management LAN Connection per System Building Block Drawer
Serial	One MBM serial connection per System Building Block Drawer

Form Factor

Rack (mounting slide rails included)

Boot/Diagnostic Devices

CD-R	Slim-line multi-bay 16X/10X/24X CD-RW
Hard Drives	Choice of 18.2/36.4/72.8/146-GB SCSI disk drives

Internal Disk Expansion

Total Internal Drive Bays

Model 2 - Up to 2 drives may be mounted in the System Building Block Drawer
Model 4 - Up to 4 drives may be mounted in the two System Building Block Drawers
Model 6 - Up to 6 drives may be mounted in the three System Building Block Drawers
Model 8 - Up to 8 drives may be mounted in the four System Building Block Drawers
Up to 14 drives may be mounted in each optional StorageWorks Universal Shelves

Power Supplies

Two @208V (700–Watt @120V) 48V auto-sensing power supplies, hot swappable, N+1
Cabinets require power distribution units, NA or International variant

OS Support

AlphaServer ES80Tru64 UNIX systems include pre-installed software, Base license, Unlimited User license, Server Extension license, Internet Express, and Secure Web Server

AlphaServer ES80 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 V5.1B + IPK or OpenVMS V7.3-1 plus VMS731-EV7_V0100 upgrade kit

NOTE: For the complete list of supported options, refer to the following Web page:
http://h18002.www1.hp.com/alphaserver/es80/es80_tech.html

Service and Support

Protected by HP Services including a 1-year on-site hardware warranty 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.

Step 1 – Assess Application Requirements

- Selection of system components must be made in the context of total application requirements. Although the configuration of system components must be done in steps (for example, base system, CPUs, memories, etc.), these steps should not be done in isolation.
- The order in which requirements are assessed is also important, since one requirement may impact others. Before proceeding, it would be useful to assess the total application requirements in the following order:
- What level of availability is required?
  - If no single points of failure are allowed, then the solution should be configured as a multi-system cluster.
  - If access to specific devices must be assured, consider redundant adapters, RAID, redundant I/O Expansion Drawers, etc.
- What overall capacities are required in terms of performance, memory capacity, and disk storage?
- How should the system be configured to optimize performance?
  - In most cases, optimum performance is achieved if the system resources (CPUs, memory and I/O adapters) are balanced across the System Building Blocks in the system.
  - Memory should be configured according to application guidelines listed in Step 4.
- What are the near-term system expansion needs?

NOTE: Most configuration steps require that the above data be considered in whole or in part. Be sure to execute each step in the context of the total application requirements.

NOTE: Support for hard partioning and soft partioning (Galaxy) planned for a future date.

System Ordering Requirements:

Certain system components or services are either required for normal operation or are recommended for best system performance and/or operation. This document uses the following definitions to specify these options:

- **Mandatory purchase**: The system cannot function without this option or service – the option or service must be ordered with the system.
- **Required to function**: This option or service is needed to support a working system – the option or service must be ordered with the system or be available onsite.
- **Recommended**: System performance or function will be enhanced if this option or service is ordered.

Step 1b – System Requirements

AlphaServer ES80 systems require selection of the following items:

Mandatory Purchases:

- **One Base System (see Step 2)**
- **One CPU Building Block Module (see Step 3)**
- **Memory option(s) (see Step 4)**
- **One system disk drive (see Step 5)**
- **Ethernet adapter (see Step 11)**

Optional Purchases:

- Software media and documentation only required for first system onsite
- Country-specific keyboard and mouse only if required (see Step 14)
- See Step 7 for 11000 Series Cabinet, PDU, and Factory Integration Service if required

Recommended Services:

- CarePaq Priority Service Plan

System Management Hardware/Software Requirements

NOTE: The following Server Management requirements only apply to customers who prefer to use the AMS or AMU Server Management software.

- The AlphaServer Management Station (AMS) provides the highest level of server management for a single or multi platform environment. The AMS provides for a local or remote web accessible central point of management and control for a multiple ES47/ES80/GS1280 environment
- The AlphaServer Management Station (AMS) software requires the following hardware in order to operate:
  - Tru64 UNIX platform with 1-GB memory, 1-GB disk space, and two network interface cards running Tru64 UNIX V5.1B
- The AlphaServer Management Utility provides the next highest level of server management. The AMU is a GUI based application that provides a sophisticated, yet user-friendly graphics interface to monitor and manage a single ES47/ES80/GS1280 system. From this application, the user can monitor the status of the platform, and provide a significant level of control of the platform. The AMU is a Web based utility, which allows a user local and remote access from a browser.
- The AlphaServer Management Utility (AMU) requires one of the following hardware platforms in order to operate:
  - Wintel Platform running Windows 2000, 500-MHz CPU or faster, 1-GB memory, 10-GB disk space
  - Tru64 UNIX platform running V5.1B or later, 1-GB memory, 10-GB disk space
- Both the AMS and AMU Software require Internet Explorer 5 or later or Netscape 6

Step 2 – Select base system

- **Mandatory** selection of at least one Base System required

Base Systems include:

- Model 2 systems include one System Building Block Drawer
- Model 4 systems include two System Building Block Drawers
- Model 6 systems include three System Building Block Drawers
- Model 8 systems include four System Building Block Drawers

NOTE: Base systems do not include CPUs or memory (see Steps 3 and 4)

Each System Building Block Drawer includes:

- Space for one CPU Building Block Module (CPU Building Block Module contains two processors (Step 3) and space for four memory options (Step 4)
- Five PCI-X slots, one AGP 2X slot
- Two redundant power supplies
- Two disk drive bays (see Step 5)

AlphaServer ES80 Base Systems

Model	OS	CPUs Supported (See Step 3)	I/O Slots	Order No.
Model 2	Tru64 UNIX	2	5 PCI-X, 1 AGP	DA-20AAA-AA
Model 2	OpenVMS	2	5 PCI-X, 1 AGP	DY-20AAA-AA
Model 4	Tru64 UNIX	4	10 PCI-X, 2 AGP	DA-40AAA-AA
Model 4	OpenVMS	4	10 PCI-X, 2 AGP	DY-40AAA-AA
Model 6	Tru64 UNIX	6	15 PCI-X, 3 AGP	DA-60AAA-AA
Model 6	OpenVMS	6	15 PCI-X, 3 AGP	DY-60AAA-AA
Model 8	Tru64 UNIX	8	20 PCI-X, 4 AGP	DA-80AAA-AA
Model 8	OpenVMS	8	20 PCI-X, 4 AGP	DY-80AAA-AA

Step 3 – CPU Building Block Module - Mandatory

- **Mandatory** selection of one CPU Building Block Module required per ES80 Model 2 system
- **Mandatory** selection of two CPU Building Blocks Modules required per ES80 Model 4 system
- **Mandatory** selection of three CPU Building Block Modules required per ES80 Model 6 system
- **Mandatory** selection of four CPU Building Blocks Modules required per ES80 Model 8 system
- CPU Building Block Module includes two Alpha 21364 CPUs
- Selection of CPU Building Block Module type (Tru64 UNIX or OpenVMS) must match base system operating system selected in Step 2

AlphaServer ES80, Dual CPU Building Block, 2xEV7 CPUs, 1000-MHz, **Tru64 UNIX** SMP License	3X-KN73A-AB
AlphaServer ES80, Dual CPU Building Block, 2xEV7 CPUs, 1000-MHz, **OpenVMS** SMP License	3X-KN73A-AC

Step 4– Memory - Mandatory

Memory Configuration Guidelines

Memory options should be selected in the context of the application's sensitivity to memory bandwidth and future memory capacity expansion. This will determine the number of memory options to order. The total capacity required will determine the size of the options to be ordered.

- **Mandatory** selection of memory option required
  - ES80 Model 2 systems require a minimum of **one** memory option
  - ES80 Model 2 systems ordered with one I/O Expansion Drawer require a minimum of **two** memory options
  - ES80 Model 4 systems require a minimum of **two** memory options
  - ES80 Model 4 systems ordered with one I/O Expansion Drawer require a minimum of **three** memory options
  - ES80 Model 4 systems ordered with two I/O Expansion Drawers require a minimum of **four** memory options
  - ES80 Model 6 systems require a minimum of **three** memory options
  - ES80 Model 6 systems ordered with one I/O Expansion Drawer require a minimum of **four** memory options
  - ES80 Model 6 systems ordered with two I/O Expansion Drawers require a minimum of **five** memory options
  - ES80 Model 8 systems require a minimum of **four** memory options
  - ES80 Model 8 systems ordered with one I/O Expansion Drawer require a minimum of **five** memory options
  - ES80 Model 8 systems ordered with two I/O Expansion Drawers require a minimum of **six** memory options
- Each ES80 Model 2 system supports up to four memory options (four RIMMs each) and up to four memory RAID options (one RIMM each) for a total of 20 RIMMs.
- ES80 Model 4 system supports up to eight memory options and up to eight memory RAID options for a total of 40 RIMMs.
- ES80 Model 6 system supports up to 12 memory options and up to 12 memory RAID options for a total of 60 RIMMs.
- ES80 Model 8 system supports up to 16 memory options and up to 16 memory RAID options for a total of 80 RIMMs.
- If an I/O Expansion Drawer is ordered (see Step 6), both CPUs in the CPU Building Block Module connected to the I/O Drawer **must** contain memory in at least one memory controller.
- Each CPU has two memory controllers – Each memory controller can support four RIMMs (one memory option) and a fifth RIMM slot for redundancy (RAID option).
- If populated, the two memory controllers per CPU **must** contain the same size RIMMs.
- Order one RAID option (one RIMM) per memory option if desired.
  - If RAID memory option is selected, the number of RAID options selected **must** equal the number of memory options selected.

The following examples illustrate different ways of configuring an ES80 Model 4 system with a total of 4 GB (1 GB per CPU)

Memory Option	CPU Building Block Module 1				CPU Building Block Module 2			
	CPU 1		CPU 2		CPU 3		CPU 4	
	Controller 1	Controller 2	Controller 1	Controller 2	Controller 1	Controller 2	Controller 1	Controller 2
3X-MS7AB-AA (4x128MB)	1	1	1	1	1	1	1	1
3X-MS7AB-BA (4x256MB)	1	-	1	-	1	-	1	-
3X-MS7AB-CA (4x512MB)	1	-	-	-	1	-	-	-

Memory Application Examples

Configuring memory is a compromise between cost, total memory capacity, and memory bandwidth requirements. The behavior of the application must be used to define the most-desired configuration. Some applications are sensitive to memory capacity while some are sensitive to memory bandwidth. If actual application measurements are not available, the following may be used as guidelines:

- Large memory (VLM) applications, in which large amounts of memory can substantially reduce I/O, may be optimized for total memory capacity and future capacity growth. In VLM applications, the right balance might be one memory option per CPU. (Case B)
- Typical commercial applications, such as transaction processing (OLTP) and multi-user timesharing, usually operate efficiently from cache and may not be materially affected by memory bandwidth. Memory configuration is a balance between memory bandwidth and future capacity growth. It is advisable to match the number of memory options to the number of CPUs. (Case B)
- Data mining can benefit from additional memory bandwidth. In these cases, configure four memory options, two per CPU. (Case A)

The most demanding high-performance technical applications (HPTC) achieve a performance level that is directly proportional to memory bandwidth. In these cases, configure four memory options, two per CPU. (Case A)

512-MB RDRAM Memory (4x128) Option	3X-MS7AB-AA
512-MB RDRAM Memory (1x128) RAID Option	3X-MS7AB-AC
1-GB RDRAM Memory (4x256) Option	3X-MS7AB-BA
1-GB RDRAM Memory (1x256) RAID Option	3X-MS7AB-BC
2-GB RDRAM Memory (4x512) Option	3X-MS7AB-CA
2-GB RDRAM Memory (1x512) RAID Option	3X-MS7AB-CC

Options

Step 5 – Select System Disk

- **Mandatory** selection of at least one system disk drive is required for each ES80 system ordered
  - AlphaServer ES80 Model 2 systems support up to two internal hard disk drives
  - AlphaServer ES80 Model 4 systems support up to four internal hard disk drives
  - AlphaServer ES80 Model 6 systems support up to six internal hard disk drives
  - AlphaServer ES80 Model 8 systems support up to eight internal hard disk drives

36.4-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3838-AA
72.8-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3839-AA
146-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3841-AA
18.2-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3848-AA
36.4-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3849-AA
72.8-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3851-AA

I/O Configuration Guidelines:

- Each System Building Block Drawer in an AlphaServer ES80 system supports six total slots spread over three buses (ports). The following details the internal I/O slots:

Port #	Slot #	Maximum Bus Speed	Signal Voltage	Number of Devices Supported
0	1	133 MHz	3.3V	1 – 133 MHz or 66 MHz PCI-X or 1 – 66 or 33 MHz PCI
1	1	66 MHz	3.3V	2 – 66 MHz PCI-X or 2 – 66 MHz PCI or 4 – 33 MHz PCI
	2	66 MHz	3.3V	
	3	66 MHz	3.3V	
	4	66 MHz	3.3V	
3	1	2X AGP	1.5V	1 – 1X or 2X AGP

NOTE: ES80 Model 2 Base Systems contain one System Building Block Drawer; ES80 Model 4 Base Systems contain two System Building Block Drawers; ES80 Model 6 Base Systems contain three System Building Block Drawers; ES80 Model 8 Base Systems contain four System Building Block Drawers

- AlphaServer ES80 Model 2 system supports one optional I/O Expansion Drawer
- AlphaServer ES80 Model 4 systems support up to two optional I/O Expansion Drawers
- AlphaServer ES80 Model 6 supports up to three optional I/O Expansion Drawers; Model 8 systems support up to four I/O Expansion Drawers
- Each I/O Expansion Drawer supports 12 total slots spread over four buses (ports)

The following details the External I/O Expansion Drawer slots:

Port #	Slot #	Maximum Bus Speed	Signal Voltage	Number of Devices Supported
0	1	33 MHz	3.3V	1 – 33 MHz PCI
	2	33 MHz	5.0V	1 – CCMAB-AA (Memory Channel) or 1 – CIPCA-BA or 2 – 3X- KZPBA-CC (**NOTE:** No mixing of options within 5v slots)
	3	33 MHz	5.0V	
1	1	133 MHz	3.3V	2 – 66 or 33 MHz PCI or 2 – 66 MHz PCI-X or 1(1) – 133 MHz PCI-X
	2	133 MHz	3.3V	
2	1	66 MHz	3.3V	6 – 33 MHz PCI or 3(2) – 66 MHz PCI or 2 – 66 MHz PCI- X
	2	66 MHz	3.3V	
	3	66 MHz	3.3V	
	4	66 MHz	3.3V	
	5	66 MHz	3.3V	
	6	66 MHz	3.3V	
3	1	2X AGP	1.5V	1 – 1X or 2X AGP

NOTE: (1) Two 133 MHz PCI-X devices are supported in Port 1, slots 1 and 2; they will however operate at 100 MHz.
(2) Five 66 MHz PCI devices are supported in Port 2, slots 1-5; they will however operate at 50 MHz.

Modules designed for 5.0v signaling and 33-MHz bus speed can only operate in Port 0 – slots 2 and 3 (reserved for Memory Channel or CIPCA)
Modules designed for 3.3v signaling and 66-MHz bus speed can not operate in Port 0 – slots 2 and 3
Universal PCI modules capable of operating at 66 MHz will operate at 33 MHz when placed in a 33-MHz slot

Step 6 – I/O System Expansion (Optional)

I/O Expansion Drawer

- Model 2 systems support one I/O Expansion Drawer; Model 4 supports two, Model 6 supports three, and Model 8 supports four
- I/O Expansion Drawers contain 11 PCI/PCI-X slots and one AGP 2X slot and an N+1 redundant power system
- I/O Expansion Drawer required for Memory Channel network adapter or CIPCA (PCI-CI) adapter

I/O Expansion Drawer – Factory Installed	3X-BA70A-BA
I/O Expansion Drawer – Field Installable	3X-BA70A-ZB
I/O cable for connection between System Building Block Drawer and I/O Expansion Drawer shelves mounted in system power cabinet; one **mandatory** per each I/O Expansion Drawer ordered	3X-BNPCB-02

Step 7 – 11000 Series Cabinets

- 11000 Series Cabinet enclosures support ES80 System Building Block Drawers, I/O Expansion Drawers, and StorageWorks Shelves (see configuration chart below)
- All ES80 Base Systems include all necessary hardware to mount the systems in an 11000 Series Cabinet
- All ES80 Base Systems include all required internal IEC/IEC power cords
- 11000 Series Cabinets require the **mandatory** selection of the following items:
  1. 11000 Series Cabinets: 3X-H9A45-ZD (41U) or 3X-H9A40-ZA (34U)
  2. Three-phase Power Distribution Unit(s): Choice of 3X-H7606-AA (North America 120/208V) or 3X-H7606-AB (International 380/415V)
  3. Factory integration: YS-ASCAA-AA
- 3X-H9A45-ZD/3X-H9A40-ZA includes one Cable/DSL Hub

NOTE: For configurations beyond those listed in the following charts, or for mounting ES80 systems in non-11000 series cabinet, contact CustomSystems.

Number of Systems for mounting in 3X-H9A45-ZD (41U) Cabinet – Using one 30A three-phase PDU (3X-H7606-AA/AB)							**Number of I/O Drawers and/or DS43XX StorageWorks Shelves for mounting in 3X-H9A45-ZD (41U) Cabinet**				
	ES80 Model 2		ES80 Model 4	ES80 Model 6		ES80 Model 8	I/O Expansion Drawers	Max. DS43xx SW Shelves	Total U's Consumed	3X-H9A45-ZD Cab	Extra U's
Size in U's	4U		8U	12U		16U	4U	3U		41U	
Configuration #1	1		-	-		-	0	10	40	41	1
Configuration #2	1		-	-		-	1	9	41	41	0
Configuration #3	2	or	1	-		-	0	9	41	41	0
Configuration #4	2	or	1	-		-	1	7	39	41	2
Configuration #5	2	or	1	-		-	2	6	40	41	1
Configuration #6	3	or	-	1		-	0	7	39	41	2
Configuration #7	3	or	-	1		-	1	6	40	41	1
Configuration #8	3	or	-	1		-	2	5	41	41	0
Configuration #9	3	or	-	1		-	3	3	39	41	2
Configuration #10	4	or	2	-	or	1	0	6	40	41	1
Configuration #11	4	or	2	-	or	1	1	5	41	41	0
Configuration #12	4	or	2	-	or	1	2	3	39	41	2
Configuration #13	4	or	-	-		1	3	2	40	41	1
Configuration #14	4	or	-	-		1	4	1	41	41	0

NOTE: For redundancy on any configuration listed above, order second PDU (3X-H7606-AA/AB).
Each 3X-H9A45-ZD/3X-H9A40-ZA cabinet includes one Cable/DSL Hub. In order to fully utilize the Server Management capabilities (i.e. running AMS or AMU software), each Model 2 or Model 4 system ordered must have a Cable/DSL Hub.
The Hub included with the cabinet supports the 1st system (Model 2 or Model 4) mounted in the cabinet.
An additional Hub is required for each additional system (Model 2 or Model 4) mounted in the cabinet.
For serial console or VGA operation of the system, the Cable/DSL Hub is not required.

Step 7 – 11000 Series Cabinets *(continued)*

Number of systems for mounting in 3X-H9A40-ZA (34U) Cabinet – Using one 30A three-phase PDU (3X-H7606-AA/AB)				Number of I/O Drawers and/or DS43XX StorageWorks Shelves for mounting in 3X-H9A40-ZA (34U) Cabinet				
	ES47 Model 2		ES47 Model 4	I/O Expansion Drawers	Max. DS43xx SW Shelves	Total U's Consumed	3X-H9A40-ZA Cabinet	Extra U's
Size in U's	4U		8U	4U	3U		34U	
Configuration #1	1		-	0	8	34	34	0
Configuration #2	1		-	1	6	32	34	2
Configuration #3	2	or	1	0	6	32	34	2
Configuration #4	2	or	1	1	5	33	34	1
Configuration #5	2	or	1	2	4	34	34	0
Configuration #6	3		-	0	5	33	34	1
Configuration #7	3		-	1	4	34	34	0
Configuration #8	3		-	2	2	32	34	2
Configuration #9	3		-	3	1	33	34	1
Configuration #10	4	or	2	0	4	34	34	0
Configuration #11	4	or	2	1	2	32	34	2
Configuration #12	4	or	2	2	1	33	34	1
Configuration #13	4		-	3	0	34	34	0
Configuration #14	4		-	3	0	34	34	0

NOTE: For redundancy on any configuration listed above, order second PDU (3X-H7606-AA/AB).
Each 3X-H9A45-ZD/3X-H9A40-ZA cabinet includes one Cable/DSL Hub. In order to fully utilize the Server Management capabilities (i.e., running AMS or AMU software, each Model 2 or Model 4 system ordered **must** have a Cable/DSL Hub.
The Hub included with the cabinet supports the 1st system (Model 2 or Model 4) mounted in the cabinet.
An additional Hub is required for each additional system (Model 2 or Model 4) mounted in the cabinet.
For serial console or VGA operation of the system, the Cable/DSL Hub is not required.

11000 Series Cabinets		
11000 Series Cabinets	41U 11000 Series Cabinet	3X-H9A45-ZD
	34U 11000-Series Cabinet	3X-H9A40-ZA
Power Distribution Unit – **Mandatory** (if cabinet is ordered)	120/208V Y or 200V, 30A NEMA L21-30P plug 3 x C19 outlets plus 24 x C13 outlets	3X-H7606-AA
	380/415V Y, IEC 309 32A 6h/230/400~ plug 3 x C19 outlets plus 24 x C13 outlets	3X-H7606-AB
Factory Integration – **Mandatory** (if cabinet is ordered)	Factory Integration of systems and storage devices assembled and configured in cabinet enclosure in predefined locations	YS-ASCAA-AA
Cable/DSL Hub - **Optional**	Cable/DSL 8-port Hub - only required when more than one Model 2 or Model 4 is mounted in the same cabinet and the Server Management capabilities need to be fully utilized.	3X-DGHUB-AA

Options

Step 8– Storage Adapters/Controllers

	Maximum # Supported						Speed	PCI/PCI-X Slot	
	Tru64 UNIX			OpenVMS					
	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Per System	Per External I/O Drawer	Per 2P Building Block Drawer			
SCSI									
NOTE: Maximum storage controllers per systems, all types - Tru64 UNIX: 32, OpenVMS: 26									
PCI 2-port Ultra3 (LVD) 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; HSZxx RAID controllers not supported. No shared SCSI or tape support, no SDLT tape support. No support for Model 4314R single-bus shelves with 3X-KZPEA-DB adapter. Tru64 UNIX requires graphics adapter to run console utilities (RUN BIOS).	16	8	4	12	8	4	66 MHz	3.3V PCI	3X-KZPEA-DB
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.	8	8	4	8	8	4	33 MHz	3.3V PCI	3X-KZPCA-AA
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 25 meters) to connect adapter to differential UltraSCSI shelf or RAID controller	4	2	0	4	2	0	33 MHz	3.3V PCI	3X-KZPBA-CC
68-pin HD male-to-VHDCI male UltraSCSI cable; xx = 02, 03, 05, 10, 20, meters									BN38C-xx
RAID									
Ultra160 2-channel internal RAID controller with 128-MB cache. **NOTE**: One controller supported per bus segment; supported only as a data device.	-	-	-	1	1	1	66 MHz	3.3V PCI	3X-KZPDC-BE
Ultra160 4-channel internal RAID controller with 256-MB cache. **NOTE**: One controller supported per bus segment; supported only as a data device.	-	-	-	1	1	1	66 MHz	3.3V PCI	3X-KZPDC-DF
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
Fibre Channel									
PCI to 2-Gbit Fibre Channel adapter, 64-bit/66-MHz, single-channel	16	8	4	16	8	4	66 MHz	3.3V PCI	DS-KGPSA-DA
PCI to Fibre Channel Host Bus Adapter, 64-bit/66-MHz							66 MHz	3.3V PCI	DS-SWLA4-PD
Fibre Channel cable (BNGBX-xx) xx=02, 03, 05, 10, 15, 30, 50 meters									BNGBX-xx
CI									
PCI CI adapter, requires two PCI slots – Each PCI CI adapter ordered requires the **mandatory** selection of an I/O Expansion Drawer (see Step 6)	NA	NA	NA	2	1	0	33 MHz	5V	CIPCA-BA
Computer interconnect cable set, connects CIPCA to star coupler; select length xx=10, 20, 45 meters									BNCIA-xx

Step 9– *StorageWorks* Universal Shelves

***StorageWorks* Model 4314R and Model 4354R Universal Drive Shelves**

StorageWorks Model 4314R 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-Bx split-bus shelf, two SCSI channels are required. No support for Model 4314R or 4314T single-bus shelves with embedded Ultra3 SCSI adapter or 3X-KZPEA-DB adapter. BN38C-xx cable is required when connecting to embedded Ultra3 SCSI adapter. Note that the depth of a DS-SL13R-xx shelf does not allow front and rear mounting. Note: DS-SL13R single-bus shelves include one 12-foot VHDCI to VHDCI SCSI cable; dual-bus shelves include two 12-foot VHDCI to VHDCI SCSI cables.

	StorageWorks Model 4314R Ultra3 SCSI (LVD) single-bus Universal drive rackmount shelf, includes one power supply. No support for Model 4314R single-bus shelves with embedded Ultra3 SCSI adapter or 3X-KZPEA-DB adapter	DS-SL13R-AA
	StorageWorks Model 4314R Ultra3 SCSI (LVD) single-bus Universal drive rackmount shelf, includes one power supply. No support for Model 4314R single-bus shelves with embedded Ultra3 SCSI adapter or 3X-KZPEA-DB adapter	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

Disk Drives (Supported in Model 4314R and 4354R Universal Drive Enclosures)

	36.4-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3838-AA
	72.8-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3839-AA
	146-GB Ultra320 SCSI 10,000 rpm 1-inch Universal disk drive	3R-A3841-AA
	18.2-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3848-AA
	36.4-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3849-AA
	72.8-GB Ultra320 SCSI 15,000 rpm 1-inch Universal disk drive	3R-A3851-AA

Step 10 – Storage Options

Step 10a – Tape Devices

AIT Hot-plug Tape Drives (for use in StorageWorks Model 4314R and 4354R Universal Drive Shelves)	• AIT hot-plug tape drives require two Universal slots	
	AIT 35/70-GB hot-plug LVD Universal tape drive, uses two slots in 43xxx shelves	3R-A2396-AA
	AIT 50/100-GB hot-plug LVD Universal tape drive, uses two slots in 43xxx shelves	3R-A2779-AA
Autoloaders	AIT 35-GB rackmount autoloader, 8 cartridge, U.S.	280349-001
	Same as above, International	280349-B31
	AIT rail kit for rackmount autoloader	284930-001
AIT Tape Libraries	SSL2020 AIT rackmount library with one AIT 50-GB drive and 20 slots, LVD	175196-B21
	SSL2020 AIT rackmount library with two AIT 50-GB drives and 20 slots, LVD	175196-B22
DAT Hot-plug Tape Drive	DAT 20/40-GB DDS4 hot-plug LVD Universal tape drive, uses two slots in 43xxx shelves	3R-A2780-AA
DLT/SDLT Tape Libraries	MSL5026DLX, DLT rackmount library with 1 40/80-GB DLT tape drive, LVD	231891-B21
	MSL5026DLX, DLT rackmount library with 2 40/80-GB DLT tape drives, LVD	231891-B22
	MSL5026SL, SDLT rackmount library with 1 110/220-GB SDLT tape drive, LVD; graphite	302512-B21
	MSL5026SL, SDLT rackmount library with 2 110/220-GB SDLT tape drives, LVD; graphite	302512-B22
	MSL5026S2, SDLT rackmount library with 0 drives, LVD; graphite	293472-B21
	MSL5026S2, SDLT rackmount library with 1 160/220-GB SDLT tape drive, LVD; graphite	293472-B22
	MSL5026S2, SDLT rackmount library with 1 160/220-GB SDLT tape drive, LVD; graphite	293472-B23
	MSL5026S2, SDLT rackmount library with 1 160/220-GB SDLT tape drive, Fibre Channel Interface; graphite	293472-B24
	MSL5026S2, SDLT rackmount library with 2 160/220-GB SDLT tape drives, Fibre Channel Interface; graphite	293472-B25

Step 10 – Storage Options (*continued*)

Step 10a – Tape Devices (*continued*)

DLT/SDLT Tape Libraries (*continued*)	MSL5000 SDLT2 upgrade drive, all	293475-B21
	MSL5052SL SDLT rackmount library, 0 drives, LVD	255102-B21
	MSL5052SL SDLT rackmount library with 2 110/220-GB drives, LVD	249491-B21
	MSL5052SL SDLT 110/220-GB drive field upgrade, LVD	231823-B22
	MSL5052S2, SDLT rackmount library with 2 160/220-GB SDLT tape drives, LVD; graphite	293474-B21
	MSL5052S2, SDLT rackmount library with 2 160/220-GB SDLT tape drives, Fibre Channel Interface; graphite	293474-B24
	ESL9322S2 SDLT tape library, with 2 160/320-GB SDLT tape drives, 222 slots – requires 3X-KZPCA-AA adapter	293409-B22
	ESL9322S2 SDLT tape library, with 8 160/320-GB SDLT tape drives, 222 slots – requires 3X-KZPCA-AA adapter	293409-B28
	ESL9322S2 SDLT tape library, with 2 160/320-GB SDLT tape drives, 322 slots – requires 3X-KZPCA-AA adapter	293410-B22
	ESL9322S2 SDLT tape library, with 8 160/320-GB SDLT tape drives, 322 slots – requires 3X-KZPCA-AA adapter	293410-B28
	ESL9000 SDLT2 LVD Upgrade Drive	293414-B21
	ESL9595SL SDLT tape library, 0 drives, 400 slots – requires 3X-KZPCA-AA adapter	274672-B21
	ESL9595SL SDLT tape library, 2 drives, 400 slots – requires 3X-KZPCA-AA adapter	274672-B22
	ESL9595SL SDLT tape library, 16 drives, 400 slots – requires 3X-KZPCA-AA adapter	274672-B28
	ESL9595SL SDLT tape library, 0 drives, 500 slots – requires 3X-KZPCA-AA adapter	281627-B21
	ESL9595SL SDLT tape library, 2 drives, 500 slots – requires 3X-KZPCA-AA adapter	281627-B22
	ESL9595SL SDLT tape library, 16 drives, 500 slots – requires 3X-KZPCA-AA adapter	281627-B28
	ESL9595SL SDLT tape library, 0 drives, 595 slots – requires 3X-KZPCA-AA adapter	281628-B21
	ESL9595SL SDLT tape library, 2 drives, 595 slots – requires 3X-KZPCA-AA adapter	281628-B22
	ESL9595SL SDLT tape library, 16 drives, 595 slots – requires 3X-KZPCA-AA adapter	281628-B28
	ESL9595S2 SDLT2 tape library, 2 drives, 400 slots – requires 3X-KZPCA-AA adapter	293411-B22
	ESL9595S2 SDLT2 tape library, 16 drives, 400 slots – requires 3X-KZPCA-AA adapter	293411-B28
	ESL9595S2 SDLT2 tape library, 2 drives, 500 slots – requires 3X-KZPCA-AA adapter	293412-B22
	ESL9595S2 SDLT2 tape library, 16 drives, 500 slots – requires 3X-KZPCA-AA adapter	293412-B28
	ESL9595S2 SDLT2 tape library, 2 drives, 595 slots – requires 3X-KZPCA-AA adapter	293413-B22
	ESL9595S2 SDLT2 tape library, 16 drives, 595 slots – requires 3X-KZPCA-AA adapter	293413-B28
	ESL9000 SDLT2 LVD upgrade drive	293414-B21

3U Rackmount Tape Drive Enclosure	**NOTE**: The 3U Tape Drive Enclosure supports up to four internal half-height removable devices, or up to two full height devices. Select up to four AIT or DAT devices, or two DLT/SDLT devices with 3U Rackmount Tape Drive Enclosure (274338-B21), or select preconfigured configurations listed below	
	AIT 35/70-GB tape drive, requires 3X-KZPCA-AA LVD adapter, carbon black	216884-B21
	AIT 50/100-GB tape drive, requires 3X-KZPCA-AA LVD adapter, carbon black	3R-A3753-AA
	DAT 20/40-GB tape drive, requires 3X-KZPCA-AA LVD adapter, carbon black	3R-A3752-AA
	DLT8000 40/80-GB tape drive, requires 3X-KZPCA-AA LVD adapter	146196-B22
	SDLT 110/220-GB tape drive, requires 3X-KZPCA-AA LVD adapter	192106-B25
	SDLT 160/320-GB tape drive, requires 3X-KZPCA-AA LVD adapter, carbon black	257319-B21
	Preconfigured configurations	
	AIT 50-GB 3U rackmount kit, carbon black	274333-B21
	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

Options

Step 10 – Storage Options (*continued*)

Step 10a – Tape Devices (*continued*)

5U Rackmount Tape Drive Enclosure	**NOTE**: The 5U Rackmount Tape Drive Enclosure supports four full-height devices; select up to four DLT or SDLT devices with 274339-B21, or select preconfigured configurations listed below	
	DLT8000 40/80-GB tape drive, requires 3X-KZPCA-AA LVD adapter, carbon black	146196-B22
	SDLT 110/220-GB tape drive, requires 3X-KZPCA-AA LVD adapter, carbon black	192106-B25
	SDLT 160/320-GB tape drive, requires 3X-KZPCA-AA LVD adapter, 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

Step 10b – hp StorageWorks Network Storage Router M2402

	2 Fibre Channel x 4 LVD SCSI Ports	3R-A3740-AA
	2 Fibre Channel x 4 HVD SCSI Ports	3R-A3741-AA
	Two Fibre Channel x 4 HVD FC to SCSI Data Router	3R-A3741-AA
	Two Fibre Channel x 4 LVD FC to SCSI Data Router	3R-A3740-AA

Step 10c – External Storage Solutions/Controllers

	41U graphite storage cabinet, M3220 Controller assembly with dual HSV110 controllers, 6 M5214 dual FC loop 14-bay drive enclosures, 4 FC loop switches; Model 2C6D-B, 60 Hz	DS-SV110-JA
	41U graphite storage cabinet, M3220 Controller assembly with dual HSV110 controllers, 6 M5214 dual FC loop 14-bay drive enclosures, 4 FC loop switches; Model 2C6D-B, 50 Hz	DS-SV110-JB
	41U graphite storage cabinet, M3220 Controller assembly with dual HSV110 controllers, 12 M5214 dual FC loop 14-bay drive enclosures, 4 FC loop switches; Model 2C12D-B, 60 Hz	DS-SV110-KA
	41U graphite storage cabinet, M3220 Controller assembly with dual HSV110 controllers, 12 M5214 dual FC loop 14-bay drive enclosures, 4 FC loop switches; Model 2C12D-B, 50 Hz	DS-SV110-KB
	Fibre Channel Controller (HSG80), includes 256-MB cache, requires following firmware: 8.6-4F ACS FW (222318-B22, QB-6BUAA-SD), one per controller 8.6-4S ACS FW (222364-B22, QB-6ENAA-SC), one per controller 8.6-4P ACS FW (222316-B22, QB-6CAAA-SD), one per controller Requires Tru64 UNIX software: 222320-B23, QB-65RAB-SE, one per controller Requires OpenVMS software: 222321-B22, QB-65RAC-SD, one per controller	DS-HSG80-BK
	Additional 256-MB cache for HSG80	DS-HSDIM-AC
	Single cache battery, one per HSG80 controller	DS-SE2CS-CB
	Model 2200 controller shelf for HSG80 controller – only supported in 9000 Series and M-Series Cabinets	DS-SE2ZS-C8

Step 10d – Fibre Channel Options

	The following disk drives, 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	3R-A3239-AA
	36-GB 15K rpm dual-port 2-Gb/sec FC-AL 1-inch (25.4 mm) drive	3R-A3210-AA
	72-GB 10K rpm dual-port 2-Gb/sec FC-AL 1-inch (25.4 mm) drive	3R-A3260-AA
Fibre Channel Hubs	Fibre Channel 7-port Storage Hub, International (Tru64 UNIX only)	DS-SWXHB-I7
	Fibre Channel 7-port Storage Hub, North America (Tru64 UNIX only)	DS-SWXHB-07
	Fibre Channel 7-port Storage Hub, Japan (Tru64 UNIX only)	DS-SWXHB-J7
Fibre Channel Data Routers	1 Fibre Channel x 2 HVD data router	3R-A2673-AA
	1 Fibre Channel x 2 LVD data router	3R-A2774-AA
	2 x 4 LVD Fiber Channel to SCSI Network Storage Router	3R-A3740-AA
	2 x 4 HVD Fiber Channel to SCSI Network Storage Router	3R-A3741-AA

Options

Step 10 – Storage Options *(continued)*

Step 10d – Fibre Channel Options – Optional *(continued)*

Fibre Channel Switches	Fibre Channel 2-Gb 8-port SAN switch	DS-DSGGD-AC
	Fibre Channel 2-Gb 16-port SAN switch	DS-DSGGD-AD
	Fibre Channel 2-Gb SAN switch – 16-port;	DS-DSGGD-BA
	Fibre Channel 2-Gb 64-port Core Switch	DS-DSGGE-AB
McData 64-port Fibre Channel Director/Edge Class Switches	SAN Director 64 (1 Gb) 32 ports, base model	DS-DMGGD-BA
	SAN Director 64 Long-wave 4-port module kit	DS-DMGGD-AC
	SAN Director 64 Short-wave 4-port module kit	DS-DMGGD-AD
	SAN Director 64 Combo, Long – 1 port/Short – 3 ports - Wave Module Kit	DS-DMGGD-AE
	HP StorageWorks Edge Switch 2/16	DS-DMGGE-BB
	HP StorageWorks Edge Switch 2/32	DS-DMGGE-BC
	NOTE: Connection for, or between, 1-Gb and/or 2-Gb SAN switches require 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	3R-A2976-AA
	5-meter LC-SC multi-mode Fibre Channel cable	3R-A2977-AA
	15-meter LC-SC multi-mode Fibre Channel cable	3R-A2978-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	3R-A2979-AA
	5-meter LC-LC multi-mode Fibre Channel cable	3R-A2980-AA
	15-meter LC-LC multi-mode Fibre Channel cable	3R-A2981-AA

Options

Step 11 – Networks and Communications

Step 11a – Networks and Communications - Mandatory

- **Mandatory** selection of at least one of the following Ethernet adapters is required for each ES80 system ordered
- Maximum network adapters supported per system, all types - Tru64 UNIX: 16, OpenVMS: 16

	Maximum # Supported						Speed	PCI/PCI-X Slot	
	Tru64 UNIX			OpenVMS					
	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Per System	Per External I/O Drawer	Per 2P Building Block Drawer			
Ethernet Adapters									
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, or BN28Q twisted pair RJ45 cables.	8	8	4	8	8	4	66 MHz	3.3/5V	3X-DE602-BB
PCI-X/PCI Single-port 10/100/1000 Mbps (Twisted-pair Copper with RJ45) Gigabit Ethernet NIC. Cables - BN25G, BN26M, BN24Q, BN28Q, or equivalent with RJ45 connectors **NOTE**: Only supported in PCI mode. Supported as a cluster interconnect under OpenVMS only. OpenVMS remedial kit required: EV7 Tima: DEC-AXPVMS–VMS731_EV7-V0100--4.PCSI LAN Tima: DEC-AXPVMS-VMS731_LAN-V0100--4.PCSI	8	8	4	8	8	4	66 MHz	3.3V	3X-DEGXA-TA

Step 11 – Networks and Communications *(continued)*

Step 11b – Networks and Communications - Optional

	Maximum # Supported						Speed	PCI/PCI-X Slot	
	Tru64 UNIX			OpenVMS					
	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Per System	Per External I/O Drawer	Per 2P Building Block Drawer			
Ethernet Adapters									
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 provide four 10/100 (UTP/RJ45s) ports in a single PCI slot option **NOTE**: 3X-DE602-TA **cannot** be used standalone. Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	8	8	4	8	8	4	33 MHz	3.3/5V	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 provides 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.	8	8	4	8	8	4	33 MHz	3.3/5V	3X-DE602-FA
PCI-X/PCI Single-port 1000 Mbps (Fiber with duplex-SC) Gigabit Ethernet NIC. Cables - BN34A, BN34B, or equivalent with SC connectors. **NOTE**: Only supported in PCI mode. Supported as a cluster interconnect under OpenVMS only. OpenVMS remedial kit required: EV7 Tima: DEC-AXPVMS–VMS731_EV7-V0100- -4.PCSI LAN Tima: DEC-AXPVMS-VMS731_LAN-V0100- -4.PCSI	8	8	4	8	8	4	66 MHz	3.3V	3X-DEGXA-SA
FDDI Controllers									
PCI (32-bit, 33-MHz) to FDDI SAS (MMF/duplex-SC) NIC Use BN34A, BN34B, or BN34D cables.	8	8	4	8	8	4	33 MHz	3.3/5V	3X-DEFPA-AC
PCI (32-bit, 33-MHz) to FDDI DAS (MMF/duplex-SC) NIC Use BN34A, BN34B, or BN34D cables.	8	8	4	8	8	4	33 MHz	3.3/5V	3X-DEFPA-DC
PCI (32-bit, 33-MHz) to FDDI DAS (UTP/RJ45) NIC Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	8	8	4	8	8	4	33 MHz	3.3/5V	3X-DEFPA-MC
PCI (32-bit, 33-MHz) to FDDI SAS (UTP/RJ45) NIC Use BN25G, BN26M, BN24Q, or BN28Q twisted pair RJ45 cables.	8	8	4	8	8	4	33 MHz	3.3/5V	3X-DEFPA-UC
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

Options

Step 11 – Networks and Communications *(continued)*

Step 11b – Networks and Communications – Optional *(continued)*

	Maximum # Supported						Speed	PCI/ PCI-X Slot	
	Tru64 UNIX			OpenVMS					
	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Per System	Per External I/O Drawer	Per 2P Building Block Drawer			
Synchronous/Asynchronous Controllers									
PCI (32-bit, 33-MHz) to Dual-port Intelligent Synchronous Communications NIC -- Requires at least one (maximum two) BN34x sync cable listed below.	-	-	-	4	4	2	33 MHz	3.3V PCI	3X-PBXDD-AA
PCI (32-bit, 33-MHz) to Quad-port Intelligent Synchronous Communications NIC -- Requires at least one (maximum four) BN34x sync cable listed below.	-	-	-	4	4	2	33 MHz	3.3V PCI	3X-PBXDD-AB
Synchronous-specific Cables									
EIA-530 Single-port cable									3X-BC34G-06
V.24/EIA-232 Single-port cable									3X-BC34L-06
V.11/x.21 Single-port cable									3X-BC33S-06
V.35 Single-port cable									3X-BC34T-06
Asynchronous Communications									
PCI (32-bit, 33-MHz) to 4-port Async Communications NIC with DB-25 octopus cable	2	2	2	2	2	2	33 MHz	3.3/5V	PBXDA-BA
PCI (32-bit, 33-MHz) to 16-port Async Communications Controller and rackmount 16-port distribution box with RJ45 connectors	2	2	2	2	2	2	33 MHz	3.3/5V	PBXDA-AC
Asynchronous Connector Cables									
RJ45-to-DB-25 Converter Cable									CXI01-AC
RJ45-to-DEC MJ11 Converter Cable (8 pack)									CXI01-AF
ATM Adapters									
PCI (32-bit, 33-MHz) to 155 Mbps ATM, Copper NIC with RJ45 connector. Use BN25G-xx, or BN26M-xx cables.	8	8	4	8	8	4	33 MHz	3.3/5V	3X-DAPBA-UA
PCI (32-bit, 33-MHz) to 155 Mbps ATM Fiber NIC with SC connector. Use BN34B-xx cable.	8	8	4	8	8	4	33 MHz	3.3/5V	3X-DAPBA-FA

Step 11 – Networks and Communications *(continued)*

Step 11b – Networks and Communications – Optional *(continued)*

	Maximum # Supported								
	Tru64 UNIX			OpenVMS					
	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Speed	PCI/ PCI-X Slot	
Ethernet, FDDI, ATM Cables									
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
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

Step 12 – Graphics Support

	Maximum # Supported								
	Tru64 UNIX			OpenVMS					
	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Per System	Per External I/O Drawer	Per 2P Building Block Drawer	Speed	PCI/AGP Slot	
3Dlabs Oxygen VX1 32-MB PCI 2D graphics accelerator	2	2	1	1	1	1	66 MHz	3.3V PCI	SN-PBXGF-AB
3Dlabs Oxygen VX1 32-MB AGP 2D graphics accelerator	1	1	1	1	1	1	4X(1)	AGP	SN-PBXGF-BC
ATI Radeon 7500 2D AGP graphics accelerator	1	1	1	-	-	-	4X(1)	AGP	3X-PBXGG-AB

1) Only supported in 2X mode.

Maximum graphics adapters per systems, all types - Tru64 UNIX: 2 (1 AGP and 1 PCI or 2 PCI), OpenVMS: 2 (1 AGP and 1 PCI or 2 PCI)

Step 13– MEMORY CHANNEL

Configuring Information

- Up to two PCI-to-System Area Network adapters (CCMAB-AA) are supported in a single system.
- Each PCI-to-System Area Network adapter ordered requires the **mandatory** selection of an I/O Expansion Drawer (see Step 6)
- Only supported with Tru64 UNIX
- Two-node clusters can be configured by ordering a CCMAB-AA for each node and one BN39B-04 or BN39B-10 cable, cable connects directly to CCMAB-AA in each node
- For a two-node cluster that will not need to be rebooted when adding additional members, order one CCMAB-AA 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-AA adapter and one BN39B-04 or BN39B-10 cable for each node and one CCMHB-AA hub for the cluster
- 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 two CCMAB-AAs are configured in each system, a second CCMHB-AA is required.
- 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.

Tru64 UNIX (V5.1B)

- Each system node in the cluster requires a TruCluster software license (QL-6BRAE-AA) or TruCluster Plus Software Package (QP-6R9AE-AA)

MEMORY CHANNEL Controller/ System Area Network Hub

PCI-to-System Area Network Controller, maximum two – 5V/33 MHz	CCMAB-AA
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-AA
Rackmount kit (3U) for CCMHB (Memory Channel Hub II); required for mounting in 11000 Series Cabinets	3X-BA61R-MD
Power cord for rackmount CCMHB hub	BN35S-02

Options

Step 13 – MEMORY CHANNEL *(continued)*

Country-specific Power Cords for Standalone MEMORY CHANNEL Hubs	Australia, New Zealand	BN19H-2E
	Central Europe	BN19C-2E
	Denmark	BN19K-2E
	Egypt, India	BN19S-2E
	Ireland, United Kingdom	BN19A-2E
	Israel	BN18L-2E
	Italy	BN35M-02
	Japan, 2.5-meter, Dentori approved	3X-BN46F-02
	Switzerland	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 D02 or later.	

Step 14 – Mouse, Monitors, Power Cords, Keyboards

Keyboard, Mouse, and Video Extension Cable Kit	Two 6-foot/1.8-meter USB keyboard/mouse extension cables and one 6-foot/1.8-meter video extension cable (One per system)	CK-GSKVM-AA
Video Extension Cable	6-foot/1.8-meter video extension cable	BN39C-02
Mouse	3-button mouse - USB	3X-PBQWS-WB
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.	
Carbon/Silver Monitors	V7550 17-inch (16-inch viewable image size) flat-faced shadow mask color monitor, two-tone (carbon/silver), 0.25mm dot pitch, VGA to 1024 x 768 @85 Hz, MPRII/TCO99/Energy Star compliant, Northern Hemisphere with NA power cord, VGA cable	3R-A4002-AA
	P720 17-inch (16-inch viewable image size) auto-scanning color monitor, Diamondtron NF, 0.25-mm aperture grille pitch, VGA to 1280 x 1024 @85 Hz, MPRII/TCO 99/Energy Star Compliant, Northern Hemisphere with Euro power cord, VGA cable – **NOTE**: This variant can also be used for North America and Asia Pacific	3R-A3389-AA
	Same as above, APD, no power cord	3R-A3390-AA
	Same as above, with PRC power cord, CCIB	3R-A3391-AA
	Same as above, Southern Hemisphere, with Australia/New Zealand power cord	3R-A3392-AA
	P920 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-A3393-AA
	Same as above, with Euro power cord	3R-A3394-AA
	Same as above, with PRC power cord, CCIB	3R-A3396-AA
	Same as above, Southern Hemisphere, 0.25 to 0.27 mm aperture grille pitch, with Australia/New Zealand power cord	3R-A3397-AA
	P1220 22-inch (20-inch viewable image size) auto-scanning color monitor, Diamondtron NF, 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-A3398-AA
	Same as above, with Euro power cord	3R-A3399-AA
	Same as above, APD, no power cord	3R-A3400-AA
	Same as above, with PRC power cord, CCIB	3R-A3401-AA
	Same as above, Southern Hemisphere, with Australia/New Zealand power cord	3R-A3402-AA

Options

Step 14 – Mouse, Monitors, Power Cords, Keyboards *(continued)*

Carbon/Silver Flat Panel Monitors	TFT1825, 18-inch (18-inch viewable image size) TFT flat panel monitor, 0.28mm pixel pitch, 1600 x 1200 @60Hz, multi-mode support, MPRII/TCO99/Energy Star compliant, one VGA, one DVI-I input connector. NA power cord, VGA and DVI-I cables	3R-A4292-AA
	TFT1520, 15.1-inch (15-inch viewable image size) TFT flat panel monitor, 0.297 mm pixel pitch, 1024 x 768 @75 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-A4249-AA
Monitor Power Cords	North American, 120V, 75-inch	BN26J-1K
	Australia, New Zealand, 2.5-meter	BN19H-2E
	Central Europe, 2.5-meter	BN19C-2E
	Denmark, 2.5-meter	BN19K-2E
	Egypt, India, South Africa, 2.5-meter	BN19S-2E
	UK, Ireland, 2.5-meter	BN19A-2E
	Italy, 2.5-meter	BN35M-02
	Japan, 2.5-meter, Dentori approved	3X-BN46F-02
	Switzerland, 2.5-meter	BN19E-2E
	Israel, 2.5-meter	BN18L-2E
	North American, 120V, 75-inch	BN26J-1K

Step 14 – Mouse, Monitors, Power Cords, Keyboards *(continued)*

Keyboards - USB Keyboard/Language	Tru64 UNIX	OpenVMS
U.S./English keyboard	3R-LKQ50-AA	3X-LK463-A2
Arabic keyboard	3R-LKQ50-BR	-
Belgian keyboard	3R-LKQ50-AB	3X-LK463-AB
BHCSY keyboard	3R-LKQ50-AX	-
Canadian/English keyboard	-	3X-LK463-AQ
Canadian/French keyboard	3R-LKQ50-AC	3X-LK463-AC
Cyrillic keyboard (Russian)	3R-LKQ50-BT	3X-LK463-BT
Czech keyboard	3R-LKQ50-BV	3X-LK463-BV
Danish keyboard	3R-LKQ50-AD	3X-LK463-AD
Dutch keyboard	3R-LKQ50-AH	3X-LK463-AH
Finnish keyboard	-	3X-LK463-AF
French keyboard	3R-LKQ50-AP	3X-LK463-AP
German keyboard	3R-LKQ50-AG	3X-LK463-AG
Greek keyboard	3R-LKQ50-BH	3X-LK463-BH
Hebrew keyboard	3R-LKQ50-AT	3X-LK463-AT
Hungarian keyboard	3R-LKQ50-BQ	3X-LK463-BQ
International keyboard	3R-LKQ50-BA	-
Italian keyboard	3R-LKQ50-AI	3X-LK463-AI
Japanese keyboard	3R-LKQ50-AJ	-
Korean keyboard	3R-LKQ50-BK	-
Latin-American keyboard	3R-LKQ50-AR	-
Norwegian keyboard	3R-LKQ50-AN	3X-LK463-AN
Polish keyboard	3R-LKQ50-BP	3X-LK463-BP
Portuguese keyboard	3R-LKQ50-AV	3X-LK463-AV
Romanian keyboard	-	3X-LK463-BL
Simplified Chinese keyboard	3R-LKQ50-CV	-
Spanish keyboard	3R-LKQ50-AS	3X-LK463-AS
Swedish keyboard	3R-LKQ50-AM	3X-LK463-AM
Swiss/French keyboard	3R-LKQ50-AK	3X-LK463-AK
Swiss/German keyboard	-	3X-LK463-AL
Traditional Chinese keyboard	3R-LKQ50-BI	-
Thai keyboard	3R-LKQ50-CB	-
Turkish keyboard	3R-LKQ50-BU	3X-LK463-BU
Turkish/F keyboard	-	3X-LK463-BW
UK keyboard	3R-LKQ50-AE	-
Yugoslavian keyboard	-	3X-LK463-BY

Rackmount Keyboard/Drawer and Keyboard/Monitor Options	PS2 to USB Converter - allows for connection of a PS2 keyboard and/or mouse to an AlphaServer ES80 System	3R-A4495-AA
	HP Rackmount Flat Panel Monitor	3R-A4220-AA
	Integrated Keyboard and Drawers	
	Integrated Keyboard and Drawer (1U), North America	3R-A4404-AA
	Integrated Keyboard and Drawer (1U), International	3R-A4405-AA
	Integrated Keyboard and Monitor (TFT5600RKM	
	Integrated Keyboard and Monitor, North America	3R-A3496-AA
	Integrated Keyboard and Monitor, France	3R-A3709-AA
	Integrated Keyboard and Monitor, Germany	3R-A3708-AA
	Integrated Keyboard and Monitor, International	3R-A3498-AA
	Integrated Keyboard and Monitor, Spain	3R-A3710-AA
	Integrated Keyboard and Monitor, United Kingdom	3R-A3706-AA
	NOTE: Integrated Keyboard and Drawer and Integrated Keyboard and Monitor require one Keyboard and Mouse Adapter for USB (3R-A4495-AA)	

Options

Step 15 – System Software

Tru64 UNIX

- Media and documentation required for first system on site
- Software Processor Code = G
- Tru64 UNIX base systems include pre-installed software, Base license, Unlimited User license, Server Extension license, Internet Express, and Secure Web Server

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 with licenses for TruCluster Server, Logical Storage Manager and AdvFS Utilities	QP-6R9AG-AA
TruCluster Server license	QL-6BRAG-AA
Logical Storage Manager license	QL-2GVAG-AA
AdvFS Utilities license	QL-0EGAG-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 end-system function license for Tru64 UNIX	QL-MTJAG-AA
DECnet/OSI extended license for Tru64 UNIX	QL-MTKAG-AA

OpenVMS

- Media and documentation required for first system on site
- Software Processor Code = G
- AlphaServer ES80 OpenVMS systems include Base license with System Manager license and Enterprise Integration Server Package for OpenVMS -- OpenVMS OS media on CD-ROM
- Enterprise Integration Package includes licenses for TCP/IP Services for OpenVMS, DECwindows Motif for OpenVMS Alpha, DECnet-Plus for OpenVMS Alpha End System, Archive/Backup System for OpenVMS Management Tools, Archive/Backup Agent for Windows NT®, Office Server for OpenVMS, Office Server Client Access, PATHWORKS 32, PATHWORKS for OpenVMS and Advanced Server.
- 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 single 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
Concurrent Use 128-user license	QL-MT3AA-3J
Concurrent Use 256-user license	QL-MT3AA-3K
Traditional unlimited-user license	QL-MT2AG-AA
OpenVMS media and online documentation on CD-ROM	QA-MT1AA-H8
OpenVMS hard copy documentation	QA-001AA-GZ
OpenVMS base hard copy documentation	QA-09SAA-GZ
OpenVMS Alpha Software Products Library Package: Layered products media and documentation for OpenVMS on CD0ROM, includes media and documentation for all products licensed in the Enterprise Integration Package.	QA-03XAA-H8
DECnet-Plus/DECnet extended function license for OpenVMS	QL-MTGAG-AA
DECnet-Plus/DECnet end-system to extended function upgrade license for OpenVMS	QL-MTHAG-AA
Cluster License for OpenVMS Alpha	QL-MUZAG-AA
OpenVMS Volume Shadowing license	QL-2A1AG-AA

A more complete software list can be found at: http://www.openvms.compaq.com/swcat/index.html

Options

Step 16 – Hardware and Software Support Services

- Select one of the optional CarePaq Priority Service Packages described below that best supports the customer's operational requirements for system availability.

CarePaq Priority Services	• CarePaq Priority Services are available for AlphaServer systems running Tru64 UNIX or OpenVMS operating systems. Priority Services are designed for the growing number of customers who need support beyond the basic warranty. Five packages are offered - Priority, Priority 24, Priority Silver, Priority Gold, and Priority Executive with coverage for both Principal servers systems and SSPs (Subsequent System Packages) – that meet a full range of customer support requirements.
Program Features – Principal Server	
Priority	• 9x5 HW/SW support • 4-hour response on-site hardware support • 2-hour response for Bronze software support • License Subscription for HP O/S software and embedded L/P (i.e., EIS for OpenVMS, unlimited users, and server extensions for Tru64 UNIX)
Priority 24	• 24x7 HW/SW support • Named HW engineer • 4-hour response on-site hardware support • 2-hour response for Bronze software support • License Subscription for HP O/S software and embedded L/P (i.e., EIS for OpenVMS, unlimited users, and server extensions for Tru64 UNIX) • Consolidated Software Media Update Distribution for OpenVMS or Tru64 UNIX and their layered products. (Some layered products on Consolidated Media Update Distribution can be ordered separately.)
Priority Silver	• 24x7 HW Support. Named Engineer, 4-hour response • 24x7 Silver SW Support - Named Account Rep, 1-hour response Monday – Friday, 8AM-5PM local time; 2-hour response remaining hours • License Subscription for HP O/S software and embedded L/P (i.e., EIS for OpenVMS, unlimited users, and server extensions for Tru64 UNIX) • Consolidated Software Media Update Distribution for OpenVMS or Tru64 UNIX and their layered products. (Some layered products on Consolidated Media Update Distribution can be ordered separately.) • Technical newsletter and SW activity review • Proactive Patch Notification • One (1) System Healthcheck per year
Priority Gold	• 24x7 HW support with Named Engineer, 4-hour response for on-site support • 24x7 Gold SW support - Named Account Rep • 30-minute callback (critical); 1-hour callback (non-critical) • License Subscription for HP O/S software and embedded L/P (i.e., EIS for OpenVMS, unlimited users, and server extensions for Tru64 UNIX) • Consolidated Software Media Update Distribution for OpenVMS or Tru64 UNIX and their layered products. (Some layered products on Consolidated Media Update Distribution can be ordered separately.) • Technical newsletter, SW activity review and 10 hours Upgrade impact planning • Proactive Revision Management • Two (2) System Healthchecks per year • Mandatory pre-qualification required

Options

Step 16 – Hardware and Software Support Services *(continued)*

Priority Gold Executive	• 24x7 HW support with Named Engineer, two-hour response for on-site support • 24x7 Gold SW support - Named Account Rep • 30-minute callback (critical); one-hour callback (non-critical) • License Subscription for HP O/S software and embedded L/P (i.e., EIS for OpenVMS, unlimited users, and server extensions for Tru64 UNIX) • Consolidated Software Media Update Distribution for OpenVMS or Tru64 UNIX and their layered products. (Some layered products on Consolidated Media Update Distribution can be ordered separately.) • Technical newsletter, SW activity review and 10 hours Upgrade impact planning • Proactive Revision Management • Two (2) System Healthchecks per year • Customer site must be within 25 miles of an HP service location • Mandatory pre-qualification required

Program Features – Additional Services

SSPs (Subsequent System Packages)	• For Priority, Priority 24, Priority Silver, Priority Gold, and Priority Gold Executive • 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 and Startup HP O/S	• Pre-installation review • Unpacking of equipment • Assemble and test • Basic product usage info • Install operating systems • Product configuration • Print and network access • Orientation

Step 16 – Hardware and Software Support Services *(continued)*

Model/CarePaq Priority Service	Principal Server 1 year	Principal Server 3 years	Subsequent Systems 1 year	Subsequent Systems 3 years
AlphaServer ES80 Model 2 and Model 4				
Priority	FP-F01HA-12	FP-F01HA-36	FP-F21HA-12	FP-F21HA-36
Priority 24	FP-F02HA-12	FP-F02HA-36	FP-F22HA-12	FP-F22HA-36
Priority Silver	FP-F04HA-12	FP-F04HA-36	FP-F24HA-12	FP-F24HA-36
Priority Gold	FP-F08HA-12	FP-F08HA-36	FP-F28HA-12	FP-F28HA-36
Priority Gold Exec.	FP-F09HA-12	FP-F09HA-36	FP-F29HA-12	FP-F29HA-36
Installation	FP-FINST-HA	FP-FINST-HA	FP-FINST-HA	FP-FINST-HA
Installation & Startup	FP-FSTAR-HA	FP-FSTAR-HA	FP-FSTAR-HA	FP-FSTAR-HA
AlphaServer ES80 Model 6 and Model 8				
Priority	FP-F01HB-12	FP-F01HB-36	FP-F21HB-12	FP-F21HB-36
Priority 24	FP-F02HB-12	FP-F02HB-36	FP-F22HB-12	FP-F22HB-36
Priority Silver	FP-F04HB-12	FP-F04HB-36	FP-F24HB-12	FP-F24HB-36
Priority Gold	FP-F08HB-12	FP-F08HB-36	FP-F28HB-12	FP-F28HB-36
Priority Gold Exec.	FP-F09HB-12	FP-F09HB-36	FP-F29HB-12	FP-F29HB-36
Installation	FP-FINST-HB	FP-FINST-HB	FP-FINST-HB	FP-FINST-HB
Installation & Startup	FP-FSTAR-HB	FP-FSTAR-HB	FP-FSTAR-HB	FP-FSTAR-HB
AlphaServer ES80 Expansion from Model 2 or 4 to Model 6 or 8				
Priority	FP-F01HU-12	FP-F01HU-36	FP-F21HU-12	FP-F21HU-36
Priority 24	FP-F02HU-12	FP-F02HU-36	FP-F22HU-12	FP-F22HU-36
Priority Silver	FP-F04HU-12	FP-F04HU-36	FP-F24HU-12	FP-F24HU-36
Priority Gold	FP-F08HU-12	FP-F08HU-36	FP-F28HU-12	FP-F28HU-36
Priority Gold Exec.	FP-F09HU-12	FP-F09HU-36	FP-F29HU-12	FP-F29HU-36
Installation	FP-FINST-HU	FP-FINST-HU	FP-FINST-HU	FP-FINST-HU
Installation & Startup	FP-FSTAR-HU	FP-FSTAR-HU	FP-FSTAR-HU	FP-FSTAR-HU

NOTES:

- AlphaServer ES80 systems include one-year parts and labor warranty with 5x9, on-site Next Business Day response.
- Priority 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.
- Five-year CarePaq Priority Service is available upon request. To quote five-year service, change the last two part number digits from 12 or 36 to 60.
- In addition to the CarePaq Priority Services, uplifted warranty. Supplemental Services are available for separate hardware and software support. For more information on Hardware and Software Supplemental Services and other HP service options available for AlphaServers, please consult your Sales Account Manager or visit: http://www.hp.com/services/

NOTES: This website is available in English only.

Step 17 – AlphaServer ES80 System Hardware Upgrades

AlphaServer ES80 systems can be field upgradeable with the following options

- AlphaServer ES80 Model 2 to AlphaServer ES80 Model 4 Upgrade
- AlphaServer ES80 Model 4 to AlphaServer ES80 Model 6 Upgrade
- AlphaServer ES80 Model 6 to AlphaServer ES80 Model 8 Upgrade

System Upgrades

- AlphaServer ES80 upgraded by ordering the appropriate 3X-BA60B-xx upgrade kit

System expansion hardware to upgrade an AlphaServer ES80 Model 2 to an AlphaServer ES80 Model 4. Includes one System Building Block Drawer with two power supplies; one rackmount slide kit; associated inter-processor cabling. (CPU Building Block Module and memory options required. See Steps 3 and 4.)	3X-BA60B-AB
System expansion hardware to upgrade an AlphaServer ES80 Model 4 to an AlphaServer ES80 Model 6. Includes one System Building Block Drawer with two power supplies; one rackmount slide kit; associated inter-processor cabling. (CPU Building Block Module and memory options required. See Steps 3 and 4.)	3X-BA60B-AC
System expansion hardware to upgrade an AlphaServer ES80 Model 6 to an AlphaServer ES80 Model 8. Includes one System Building Block Drawer with two power supplies; one rackmount slide kit; associated inter-processor cabling. (CPU Building Block Module and memory options required. See Steps 3 and 4.)	3X-BA60B-AD

Technical Specifications

Power Requirements			
ES80 System	**US/Canada**	**Japan**	**Europe**
PDU Part Number	**3X-H7606-AA**	**3X-H7606-AA**	**3X-H7606-AB**
Nominal voltage(s)	208	200	380/415
Rated Current	24A	24A	24A
Kva Model 6, 2 I/O Expansion Drawers, 5 StorageWorks Shelves	6.349	6.349	6.349
Kva Model 8, 2 I/O Expansion Drawers, 3 StorageWorks Shelves	5.932	5.932	5.932
Frequency range	50-60 Hz	50- 60 Hz	50-60 Hz
Phases	3W+N+G	3W+N+G	3W+N+G
Number of Auxiliary PDUs required	0	0	0
Rating	10/7A per cord	10/7A per cord	10/7A per cord
Receptacle (site)	L21-30P, Hubbell 2811	L21-30P, Hubbell 2811	Hubbell 532P6W

Physical Characteristics - ES80 System				
Dimensions (H x W x D)	79 x 24 x 47 in (200 x 60 120 cm) (41U Rack) 6 x 17.5 x 34 in (15 x 44.5 x 86 cm) (Drawer)			
Shipping Dimensions	86 x 32 x 48 in (217 x 92.5 142 cm) (41U Rack)			
	ES80 Model 2 – 1 I/O Expansion Drawer, 1 StorageWorks Shelf, 41U Rack	**ES80 Model 4** – 2 I/O Expansion Drawers, 1 StorageWorks Shelf, 41U Rack	**ES80 Model 6** – 3 I/O Expansion Drawers, 1 StorageWorks Shelf, 41U Rack	**ES80 Model 8** – 4 I/O Expansion Drawers, 1 StorageWorks Shelf, 41U Rack
Weight Maximum Configuration	706 lb (320 kg)	910 lb (412 kg)	1104 lb (500 kg)	1304 lb (591 kg)
Shipping Weight - Maximum Configuration - cardboard outside wrap not included	883 lb (400 kg)	1088 lb (493 kg)	1282 lb (581 kg)	1483 lb (672 kg)
Heat dissipation	**ES80 Model 2** – 1 I/O Expansion Drawer, 1 StorageWorks Shelf, 41U Rack	**ES80 Model 4** – 2 I/O Expansion Drawers, 1 StorageWorks Shelf, 41U Rack	**ES80 Model 6** – 3 I/O Expansion Drawers, 1 StorageWorks Shelf, 41U Rack	**ES80 Model 8** – 4 I/O Expansion Drawers, 1 StorageWorks Shelf, 41U Rack
nimally configured system (1 PCI option, disk, 8 memory RDRAMs) I/O Expansion awer, no storage shelf	894 W	1788 W	2682 W	3576 W
Btu/hr	3051	6102	9153	12204
Airflow@20C DT, cfm	336	617	1063	1399
lly configured system (3 PCI, 1 AGP, disks, 20 RDRAMs) ES80, I/O Expansion awer, one StorageWorks Shelf	1930 W	3860 W	4596 W	5928 W
Btu/hr	6587	13174	15686	20230
Airflow@20C DT, cfm	201	348	1063	1399

Clearances – All Models	**Operating**	**Service**
Front	32 in (81 cm)	32 in (81 cm)
Rear	44 in (111 cm)	44 in (111 cm)
Left Side	None	None
Right Side	None	None

Technical Specifications

Environmental	Operating	Non-Operating	
Temperature	50° to 104°F (10° to 40°C)	–40° to 151°F (–40° to 66°C)	
Humidity	10% to 90%	10% to 95%, Storage (60 days) 115°F/16°C	
Altitude	10,000 ft (3,050 m) **NOTE**: Maximum operating temperature at sea level; reduce by 1.8°F (1°C) for each 2,000 ft (600 m) above sea level	40,000 ft (12,200 m)	
Vibration	10 to 500 Hz 0.1G peak	1.03 Grms 5-300 Hz	
Shock	5G 30ms, half sine		
Acoustics (Declared values per ISO 9296 and ISO 7779)		**Idle/Operating**	**(Bystander pos.)**
Part	Description	L_{wAd}, B	L_{pAm}, dBA
ES80 Model 2	1 x 2P SBB Drawer	6.6	48
ES80 Model 4	2 x 2P SBB Drawer	6.9	51
ES80 Model 6	3 x 2P SBB Drawer	7.1	53
ES80 Model 8	4 x 2P SBB Drawer	7.2	54
	ES80 System Building Block Drawer	6.6	48
3X-BA70A-BA	I/O Expansion Drawer	7.1	51
DS-SL13R-xx	StorageWorks Shelf	6.9	53
NOTE: Current values for specific configurations are available. 1 B = 10 dBA			
Regulatory - Agency approvals	UL: Listed to UL 60950; cUL: Listed to CAN/CSA-C22.2 No.6950-00 CB Report to IEC 950:1991+A1: 1992 + A2:1993 + A3: 1995 + A4:1996 CB Report to EN60950 (1992) with Amdts. 1, 2, 3, 4 and 11 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-3/02.04 Class A BSMI: CNS 13438 Class A C-Tick:AS/NZS 3548:1995 Class A		