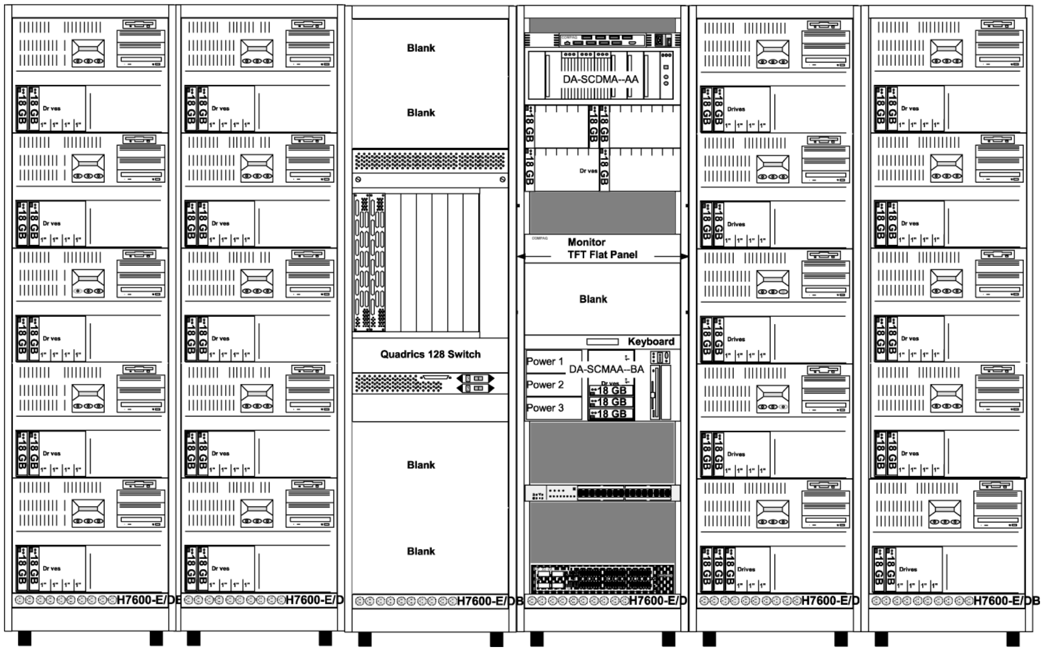
Overview



An example AlphaServer SC system based on AlphaServer SC45 CBBs

At A Glance

The AlphaServer SC system is a distributed memory, parallel supercomputer that scales up to 512 Alpha processors in the non-federated configuration and up to 4096 Alpha processors in a federated configuration to deliver incredible sustained performance for large-scale applications. It is based on AlphaServer nodes and an ultra-low-latency, high-bandwidth interconnect with an integrated software package for management and application development.

AlphaServer SC systems include:

- Compute Building Blocks (CBBs)
- Interconnect Building Blocks (IBBs)
- Management Building Block (MBB)
- Storage Building Blocks (SBBs)

Compute Building Block

CBB is a rack that includes specially configured AlphaServer nodes. Each node includes:

- One or more Alpha 21264 (EV68) 1250-MHz, 1000-MHz CPUs
- One or two AlphaServer SC Elan Adapter Cards
- Tru64 UNIX

Interconnect Building Block

IBB includes a multi-port switch using technology from Quadrics Supercomputers World. Some IBB's also may contain management network and console network components.

Management Building Block

MBB consists of zero, single, or dual Management Servers, based on a DS20E, and may also include management-network and console network management components.

Storage Building Block

SBB includes:

- Dual HSV110 RAID Controller
- Required Storage Software

AlphaServer SC System Software provides the utilities and libraries required to operate and manage the AlphaServer SC.
Optional AlphaServer SC Development Software provides a full suite of tools for technical software development.
Warranty for SC45 is 1-year onsite, 5 day x 9-hour warranty with next business day response.
The AlphaServer SC includes integration and installation.

Preface

Preface: AlphaServer SC Architecture

- AlphaServer SC System Software Version 2.5 supports up to 128 interconnected nodes in a non-federated configuration (as described in these QuickSpecs) and up to 1024 interconnected nodes in a federated configuration. Refer to the HP SC45 Federated QuickSpecs for node configuration information up to 1024 nodes.
- Each AlphaServer SC non-federated system consists of at least one and up to five Cluster File System Domains (CFS Domains) built from system building blocks. These building blocks include the Interconnect, Management, Compute, Base, and Storage Building Blocks. Each CFS Domain consists of up to 32 specially configured AlphaServer ES45 nodes. There are two types of CFS Domains - a File-Serving Domain and a Compute-Serving Domain. Together, these form the global AlphaServer SC File System (SCFS) whose system storage is served by Storage Building Blocks (SBB) attached to the File-Serving Domains.
- The system building blocks are designed to incorporate the components required for the operation of a basic AlphaServer SC System. The building blocks also incorporate the integration services required to stage, integrate and test the entire system at the factory, as well as to install the system at the customer site. AlphaServer SC System Software and AlphaServer SC Development Software enable administration and usage of the AlphaServer SC systems. The AlphaServer SC System Software is factory installed.
- One File-Serving Domain is required for each AlphaServer SC System. File-Serving Domains consist of a total of at least two and up to 32 File-Serving nodes in the first Domain of the AlphaServer SC system. All nodes must be of the same type. The File-Serving nodes may also be used for computations other than file services. Nodes are configured in the Compute Building Blocks (CBBs - Step 1), each of which house up to five nodes. Additional nodes, if required, are selected as Base Building Blocks (BBBs - Step 1). It is recommended that the File-Serving Domains be configured with the maximum anticipated number of File-Serving nodes, since later expansions would require rewiring, as well as rebuilding of the file systems for the Domains. The balance of the first Domain should be filled out with Compute Building Blocks. In addition, highly available CFS storage is included for both the local CFS operating system files, and for the high-speed system-wide user files. The storage is provided by one or more Storage Building Blocks (SBBs - Step 4) each of which includes a RAID subsystem. The amount and type of storage depends on considerations of total capacity, bandwidth and availability. A storage specialist should be consulted before configuring extra storage.
- Each Compute-Serving Domain consists of one or more CBBs or BBBs with a total of at least two and up to 32 compute nodes. Within each Domain, all nodes must be of the same type. It is recommended that the Compute-Serving Domains be configured with the maximum possible number of nodes, since later expansions would require rewiring, as well as rebuilding of the file systems for the Domains. AlphaServer SC System Software supports up to five Compute-Serving Domains. For each compute server Domain, CFS storage is included for the local CFS operating system. The storage is provided by extra disk drives that are accommodated in the primary SBBs for the File-Serving Domains. Extra storage can optionally be configured and integrated. A storage specialist should be consulted before configuring extra storage.
- The Interconnect Building Blocks (IBBs - Step 2) provide high-speed connectivity between nodes. IBBs are selected according to the anticipated maximum scale of the system. For systems limited to 16 or 128 nodes, a single 16-way or 128-way IBB should be selected for a standard bandwidth configuration (delivering close to 300 MB/s when used between pairs of AlphaServer ES45 nodes). The 16-way and 128-way IBBs also incorporate management components (see the description below of the MBB). The 128-way IBB can be extended to provide ultra-high bandwidth (delivering close to 550 MB/s when used between pairs of ES45 nodes), by selecting an Expansion IBB.
- The Management Building Blocks (MBBs - Step 3), and console and management expansion options (Step 3) provide extra infrastructure for managing the AlphaServer SC System. For systems with a 16-way or 128-way IBB, the MBB is not sold as a separate part, but rather is a combination of management components incorporated in the IBB, and zero, one or two Management Server consisting of a specially configured AlphaServer DS20E. For systems using the 16-way IBB, a management server is optional. For systems using the 128-way IBB, a management server is mandatory. An optional second AlphaServer DS20E can be added to the MBB for redundancy and availability in a Clustered Management Server configuration. The AlphaServer SC 16-way and 128-way IBBs have full console and management support for up to 16 nodes. For additional nodes, extra components are selected according to the rules of Step 3. Each AlphaServer SC System also requires one or more monitors and keyboards. Step 3 lists the possible options, including a choice of either rackmount or tabletop console.
- Every node of an AlphaServer SC system must have special software configured and licensed to manage the system and to execute parallel jobs. This software, AlphaServer SC System Software (Step 7), is licensed using combinations of part numbers explained in Step 7. The licenses also permit the software to be used on management servers. Optional development software, AlphaServer SC Development Software (Step 7), can be licensed for compilation and analysis of user applications on the AlphaServer SC systems.
- Options are available for Ethernet connectivity (Step 5) of the AlphaServer SC system to external networks. Options are also available for adding cabinets (Step 6) to the AlphaServer SC system to house storage and other devices. When adding cabinets, it is mandatory to purchase integration services to ensure correct installation.
- Hardware and software support services (Step 8) are highly recommended, and are available in various combinations as described in Step 9. Professional Services (Step 9) may be selected for extra installation and administrative support, as well as for training.

Step 1 – Select AlphaServer SC45 Compute Building Blocks (CBBs), Base Building Blocks (BBBs), Memory, Additional CPUs, Disk Drives and Cabinet Sides

AlphaServer SC45 CBBs are hardware cabinets with SC45 BBBs, which are specially configured AlphaServer ES45 nodes. Select CBBs and BBBs to populate at least one File-Serving/Compute Domain and up to four additional Compute-Serving Domains, for a maximum of 128 nodes. Also select memory, disk drives, and cabinet sides as described in the rules below. Optionally select extra CPUs. Within each Domain, all nodes must be of the same type.

Step 1a – Mandatory – Select the Number and Type of CBBs and BBBs

ES45 EV68 1250-MHz CBBs and BBB	AlphaServer SC45 68/1250 CBB-5, North America (select carbon options)	DA-SCAAE-BA
	AlphaServer SC45 68/1250 CBB-5, International	DA-SCAAE-BB
	AlphaServer SC45 68/1250 CBB-1, North America	DA-SCAAE-TA
	AlphaServer SC45 68/1250 CBB-1, International	DA-SCAAE-TB
	AlphaServer SC45 68/1250 Base Building Block (BBB)	DA-68EBA-AL
ES45 EV68 1000-MHz CBBs and BBB	AlphaServer SC45 68/1000 CBB-5, North America (select carbon options)	DA-SCAAD-BA
	AlphaServer SC45 68/1000 CBB-5, International	DA-SCAAD-BB
	AlphaServer SC45 68/1000 CBB-1, North America	DA-SCAAD-TA
	AlphaServer SC45 68/1000 CBB-1, International	DA-SCAAD-TB
	AlphaServer SC45 68/1000 Base Building Block (BBB)	DA-68DBA-AL

For Each Base Building Block configured, you must choose one integration part

	VIS – Staging/Integration AlphaServer SC BBB	YT-SCVIS-AE

Each AlphaServer SC45 68/1250 CBB-5 includes the following:

- One H9B15-ST/SU 2-meter tall rack assembly with AlphaServer SC door kit (includes front and rear doors) but without sides
- One AlphaServer ES45 System Information Kit (print and CD-ROM), Owner's Guide, User Interface Guide, and Release Notes
- Five AlphaServer SC45 68/1250 Base Building Blocks (BBB) (DA-68EBA-AL)

Each AlphaServer SC45 68/1250 CBB-1 includes the following:

- One H9B15-ST/SU 2-meter tall rack assembly with AlphaServer SC door kit (includes front and rear doors) but without sides
- One AlphaServer ES45 System Information Kit (print and CD-ROM), Owner's Guide, User Interface Guide, and Release Notes
- One AlphaServer SC45 68/1250 Base Building Block (BBB) (DA-68EBA-AL)

Each AlphaServer SC45 68/1000 CBB-5 includes the following:

- One H9B15-ST/SU 2-meter tall rack assembly with AlphaServer SC door kit (includes front and rear doors) but without sides
- One AlphaServer ES45 System Information Kit (print and CD-ROM), Owner's Guide, User Interface Guide, and Release Notes
- Five AlphaServer SC45 68/1000 Base Building Blocks (BBB) (DA-68DBA-AL)

Each AlphaServer SC45 68/1000 CBB-1 includes the following:

- One H9B15-ST/SU 2-meter tall rack assembly with AlphaServer SC door kit (includes front and rear doors) but without sides
- One AlphaServer ES45 System Information Kit (print and CD-ROM), Owner's Guide, User Interface Guide, and Release Notes
- One AlphaServer SC45 68/1000 Base Building Block (BBB) (DA-68DBA-AL)

Each AlphaServer SC45 68/1250 Base Building Block (DA-68EBA-AL) includes the following items (choose carbon options):

- One Alpha 21264 68/1250-MHz CPU module with 16-MB cache
- No system memory (see Step 1c)
- Disk drive cage and 2-port UltraSCSI storage adapter
  Ten PCI I/O slots, six to eight are used for required SC45 options

- One 600-MB 48X IDE CD-ROM drive
- One AlphaServer SC Elan adapter card
- One bi-directional parallel port, 25-pin
- Two EIA-232 full duplex asynchronous modem control serial ports, 9-pin D-subminiature connectors
- One dedicated remote-systems management port, which includes adapter for connection to the DECserver
- Two 68-pin SCSI connections knockouts
- One 2-port PCI 32/64-bit 10/100-Mb UTP Ethernet adapter (3X-DE602-BB) – one port reserved for connection to the Management Network
- Three auto-sensing, hot-swappable power supplies providing all configurations with N+1 power redundancy
- Insight Manager
- Tru64 UNIX Operating System V5.1A including base license, unlimited user license, and server extension license.

Each AlphaServer SC45 68/1000 Base Building Block (DA-68DBA-AL) includes the following items (choose carbon options):

- One Alpha 21264 68/1000-MHz CPU module with 8-MB cache
- No system memory (see Step 1c)
- Disk drive cage and 2-port UltraSCSI storage adapter
- Ten PCI I/O slots, six to eight are used for required SC45 options
- One 600-MB 48X IDE CD-ROM drive
- One AlphaServer SC Elan adapter card
- One bi-directional parallel port, 25-pin
- Two EIA-232 full duplex asynchronous modem control serial ports, 9-pin D-subminiature connectors
- One dedicated remote-systems management port, which includes adapter for connection to the DECserver
- Two 68-pin SCSI connections knockouts
- One 2-port PCI 32/64-bit 10/100-Mb UTP Ethernet adapter (3X-DE602-BB) – one port reserved for connection to the Management Network
- Three auto-sensing, hot-swappable power supplies providing all configurations with N+1 power redundancy
- Insight Manager
- Tru64 UNIX Operating System V5.1A including base license, unlimited user license, and server extension license.

Step 1b – Optional - Select the Number of Additional CPU Modules by CPU type

NOTES:

- Each node includes one CPU module.
- Each node supports up to three additional CPU modules.
- All nodes within a Domain (see the Preface) must have the same number of CPU modules.

SC45 68/1250 CPU Modules	Alpha 21264 (EV68) 1250-MHz CPU module (ES45) with 16-MB cache and a Tru64 UNIX SMP license	KN610-EB
SC45 68/1000 CPU Modules	Alpha 21264 (EV68) 1000-MHz CPU module (ES45) with 8-MB cache and a Tru64 UNIX SMP license	KN610-DB

Step 1c – Mandatory – Select Memory

When selecting memory, note the following:

- Each node includes no memory options.
- Each node supports up to eight memory options (total of 32 DIMMs).
- All nodes within a Domain must have the same size and number of memory options.
- Interleaved operations reduce the average latency and increase the memory throughput compared to non-interleaved operations.
- Up to 32 GB of memory per node is supported on the ES45.

For ES45 nodes, to achieve 4-way memory interleaving, with room for memory expansion in each node, select a memory option from the following list and order at least four memory options for each ES45 node in the system.

4 - 512-MB memory option (4 x 128-MB DIMMs) – provides 2 GB per node	MS620-AA
4 - 1-GB memory option (4 x 256-MB DIMMs) – provides 4 GB per node	MS620-BA
4 - 2-GB memory option (4 x 512-MB DIMMs) – provides 8 GB per node	MS620-CA
4 - 4-GB memory option (4 x 1024-MB DIMMs) – provides 16 GB per node	MS620-DB
8 - 4-GB memory option (4 x 1024-MB DIMMs) – provides 32 GB per node	MS620-DB

Step 1d – Mandatory – Select Cabinet Sides

One pair of cabinet sides must be selected for the end-cabinets in each contiguous group of cabinets. The number of pairs of cabinet sides is determined during site preparation planning.

H9B15 Cabinet Sides for SC45 CBBs, carbon black (pair)	H9C15-ZS

Step 1e – Mandatory – Select Disk Drives

As explained in the preface, AlphaServer SC systems are organized into File-serving Domains and Compute-Serving Domains. There are at most five Domains, and each Domain is configured with a Cluster File System whose system storage is served by Storage Building Blocks specified in Step 4. Within each Domain, it is mandatory to select three identical disk drives for the first ES45 node. For each additional node in the Domain, it is mandatory to select either two identical 18.2-GB, 36.4, 72.8, or 146.8-GB disk drives. All nodes must have the same disk drives.

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

Step 1f – Optional – Select Floppy Disk Drives

The floppy drive in an SC45 is optional. Each node in an AlphaServer SC45 can have a floppy drive configured in a bay designed for it. The Interconnect Building Block for each system already includes a service kit with two (16-way) or four (128-way) floppies supplied for use by the Field Service technicians for diagnostic and software update. Additional floppy drives may now be selected if needed.

AlphaServer SC floppy drive, carbon	3X-SCRXA-AA

Step 1g – Optional – Select Additional Disk Drive Cage

Extra disk drives can be configured into each node, primarily for the purpose of providing system redundancy, and higher availability, but also to provide local storage or additional swap space. Within each node, identical disk drives (see step 1e) must be selected. For all nodes, up to a total of six disk drives can be added with the included hardware. For ES45 nodes a second Drive Cage (BA610-6D) that contains up to six additional drives may be added for use with included adapter. Only two SCSI Drive Cages are supported per each node. Contact your account manager if you require additional 3X-KZPEA-DB adapter support on an AlphaServer SC45.

SCSI Drive Cage 6-slot @1-inch pitch for ES45	BA610-6D

Step 2 - Select Interconnect Building Blocks (IBBs), Expansion IBBs and other AlphaServer SC Interconnect components

- AlphaServer SC IBBs and Expansion IBBs consist of AlphaServer SC Interconnect switches and other hardware and software at the core of AlphaServer SC systems. Each AlphaServer SC System includes one or more IBB's and optionally (depending on system size) may include extra 16-port switch cards and Elan adapter cards. If the maximum nodes in the AlphaServer SC system will not exceed 16 nodes, choose an AlphaServer SC 16-way IBB. Otherwise, if the system is planned to expand up to128 nodes, select an AlphaServer SC 128-way IBB. If extra interconnect bandwidth is desired, an Expansion IBB may optionally be added to the 128-way IBB (but not to the 16-way IBB).

Step 2a – Mandatory – Select the IBBs and 16-port switch cards

- Select either a 16-way* or a 128-way** IBB with 128-way chassis and the additional 16-port switch cards, as needed, as specified below in this step (includes *1 or **2 - H9B15 cabinet(s)).

AlphaServer SC 16-way IBB, North America, carbon	DA-SCBAA-DA
AlphaServer SC 16-way IBB, International, carbon	DA-SCBAA-DB
AlphaServer SC 128-way IBB, North America, carbon	DA-SCCAA-DA
AlphaServer SC 128-way IBB, International, carbon	DA-SCCAA-DB

The AlphaServer SC 128-way IBB has one switch card to support the first 16 nodes configured as described in Step 1a. For each additional full or partial set of 16 nodes, order an additional AlphaServer SC 16-port switch card.

AlphaServer SC 16-port switch card	3X-CCNXF-BA

The AlphaServer SC 16-way IBB includes the following hardware and services:

- AlphaServer SC Interconnect 16-port Switch
- Four 5-meter and twelve 10-meter AlphaServer SC Interconnect Cables
- One DECserver 732 (3X-SCNTA-KC) to connect the console ports of up to 16 nodes to the Management Ethernet (rackmount kit and Ethernet cable included)
- One 24-port 10/100 Ethernet Switch (rackmount kit included)
- Rackmounted 4-way console graphics switch for selecting keyboard, mouse, and video signals from Nodes 0 and 1 and optional Management Server
- Two ATI Radeon 7500 graphics cards for installation in Nodes 0 and 1 or Management Server for graphics console switch connection
- One H9B15-ST/SU (carbon) 2-meter tall rack assembly without sides
- H9B15-ST/SU cabinet door (H9C15-SE)
- Tru64 UNIX Operating System V5.1A and layered products media and documentation
- AlphaServer SC System Software media and documentation
- Documentation for Advanced File System Utilities, a component used by the AlphaServer SC System Software
- Factory staging, integration, and full test of the IBB, the CBBs, the SBB(s), and the MBB
- Installation and basic configuration of system software and storage
- Customer Services installation on site
- Three days of AlphaServer SC Quickstart Professional Services for System Software support
- Service kit with two 3X-SCRXA-AA floppy drives for microcode and diagnostic software loads

The AlphaServer SC 128-way IBB includes the following hardware and services:

- AlphaServer SC Interconnect 128-port Switch with one 16-port Switch Card
- Four 5-meter and twelve 10-meter AlphaServer SC Interconnect Cables
- Two DECserver 732 (3X-SCNTA-KC) (rackmount kits included) to connect the console ports of up to 32 nodes to the Management Ethernet, with space to support up to three additional 32-port upgrades (3X-SCNTA-KC)
- One 48-port 10/100 Ethernet Switch (rackmount kit included) with space to support up to two additional 48-port upgrades (3X-SCNBA-AA)
- Rackmounted 4-way console graphics switch for selecting keyboard, mouse, and video signals from Nodes 0 and 1 and Management Server
- Two ATI Radeon 7500 graphics cards for installation in Nodes 0 and 1 or Management Server for graphics console switch connection
- Two H9B15-ST/SU (carbon) 2-meter tall rack assemblies with AlphaServer SC door (H9C15-SE), with no sides
- Tru64 UNIX Operating System V5.1A and layered products media and documentation
- AlphaServer SC System Software media and documentation
- Documentation for Advanced File System Utilities, a component used by the AlphaServer SC System Software
- Factory staging, integration, and full test of the IBB, the CBBs, the SBB(s), and the MBB
- Installation and basic configuration of system software and storage
- Customer Services installation on site
- Five days of AlphaServer SC Quickstart Professional Services for System Software support
- Service kit with four 3X-SCRXA-AA floppy drives for microcode and diagnostic software loads

Step 2b – Optional for 128-way IBBs– Select IBB's and parts for extra bandwidth (also known as dual rail)

- For extra interconnect bandwidth (also known as dual rail) between nodes connected by a 128-way IBB, select an Expansion IBB, as well as the 16-port switch cards and Elan adapter cards specified below in this step. All nodes in the system must be ES45 nodes. No more than one Expansion IBB can be configured. The Expansion IBB (includes H9B15 cabinet) can only be added to a 128-way IBB and not to a 16-way IBB.

AlphaServer SC 128-way Expansion Interconnect Building Block, North America, carbon	DA-SCCBA-AA
AlphaServer SC 128-way Expansion Interconnect Building Block, International, carbon	DA-SCCBA-AB

The AlphaServer SC 128-way Expansion IBB has one switch card to support the first 16 nodes configured as described in Step 1a. For each additional full or partial set of 16 nodes, order an additional AlphaServer SC 16-port switch card.

AlphaServer SC 16-port switch card	3X-CCNXF-BA

Each AlphaServer SC45 68/1000 Base Building Block includes one Elan adapter card that must be connected by cables to the 128-way IBB. If an Expansion IBB is included in the system, an additional Elan adapter card is required for each of the nodes.

AlphaServer SC Elan Adapter Card	3X-CCNNA-AA

The AlphaServer SC 128-way Expansion IBB includes the following hardware and services:

- AlphaServer SC Interconnect 128-port Switch with one 16-port Switch Card
- Four 5-meter and twelve 10-meter AlphaServer SC Interconnect Cables
- One H9B15-ST/SU (carbon) 2-meter tall rack assembly with AlphaServer SC doors
- All services required to integrate and test the Expansion IBB at the factory and to install it on site

Step 2c – Mandatory – Select cables to interconnect the IBBs to the nodes

- Cable layouts depend sensitively on site constraints. Furthermore, cable lengths can influence the interconnect performance. Since cables – of the correct length – must be ordered long in advance of the system delivery, it is recommended that a cable specialist be engaged to do a site and cable analysis prior to completion of the order. For systems interconnected by a 16-way or 128-way IBB, the guidelines below may be used in lieu of a complete cabling analysis
- The AlphaServer SC 128-way IBB and the 128-way Expansion IBB each have sufficient cables to connect the IBB to the first 16 of the nodes configured as described in Step 1a. For more than 16 nodes, order extra cables as follows:

For each of the first 48 additional nodes, order one cable, 10-meters long – or if an Expansion IBB is ordered, order two cables, 10-meters long

AlphaServer SC 10-meter Interface Cable	3X-BN62A-10

For each additional node after the first 48, order one cable, 15-meters long - or if an Expansion IBB is ordered, order two cables, 15-meters long

AlphaServer SC 15-meter Interface Cable	3X-BN62A-15

Step 3 – Select Management Building Block (MBB) and Options for Console and Management Expansion

Step 3a – Mandatory for Systems connected by a 128-way IBB, optional for those connected by a 16-way IBB – Select a Management Server

- For systems with a 16-way or 128-way IBB, the MBB is not sold as a separate part, but rather is a combination of management components incorporated in the IBB, and a Management Server consisting of a specially configured AlphaServer DS20E. For systems connected by a 16-way IBB, it is optional to select a Management Server. However, it is mandatory to select a Management Server for systems connected by a 128-way IBB.
- For a 128-way IBB, an optional second AlphaServer SC Management Server (DA-SCMAA-BA) can be clustered with the first to provide added redundancy.

Each AlphaServer SC DS20E Management Server includes

- DS20E system drawer
- Two 67/667 CPUs
- 1-GB memory
- Dual-port Ethernet adapter (3X-DE602-AA); one port reserved for connection to the Management Network
- Disk drive cage and 1-channel Ultra2 storage adapter
- Rackmount kit for fitting in standard S-Series cabinet (select cabinet as described in Step 8)
- Tru64 UNIX Operating System including base license, unlimited user license, server extension license, and Open Source Internet Solutions
- Three hot-swappable power supplies providing N+1 power redundancy

Select number of management servers required.

AlphaServer SC DS20E Management Server	DA-SCMAA-BA

Step 3b – Mandatory – Select Disk Drives

- For each standalone Management Server, it is mandatory to select either three 18.2, 36.4, 72.8, or 146.8-GB disk drives. - Select disk drives from disks listed in Step 1e
- Where a clustered management server is being specified, no local disk drives are required. Instead shared Fibre Channel storage is used. - see Step 4b for additional disk drives for clustered management servers.

Step 3c – Optional – Clustered Management Server - Dual Management Server for Redundancy

If specifying a Clustered Management Server, then the following additional parts are mandatory. The quantities below reflect the minimum required to achieve adequate redundancy and availability. Additional KGPSA cards and fiber optic cables can be purchased to increase redundancy and availability.

Description	Quantity	Part Number
PCI Gigabit Ethernet adapter, SC connectors, MMF	One each MS Cluster member	DEGPA-SA
Crossover Gigabit fiber cable for TruCluster interconnect (5 meters)	One only	BNGBX-05
64-Bit PCI-to-Fibre Channel HBA for Tru64 UNIX	One each MS Cluster member	DS-KGPSA-DA
Fiber optic short wave LC-LC cable	One each MS Cluster member	
2-meter LC-LC Fibre Cable		3R-A2979-AA
5-meter LC-LC Fibre Cable		3R-A2980-AA
15-meter LC-LC Fibre Cable		3R-A2981-AA
30-meter LC-LC Fibre Cable		3R-A3454-AA
50-meter LC-LC Fibre Cable		3R-A3455-AA

Step 3d - Mandatory for systems interconnected with a 128-way IBB and with more than 32 nodes – Console and Management Network Expansion

- The AlphaServer SC 128-way IBB has console management support for the first 32 of the nodes configured as described in Step 1a. For each additional full or partial set of 32 nodes, order one of each of the following:

AlphaServer SC 32-port console network upgrade	3X-SCNTA-KC
Power cord for rackmounting of DECserver 732	BN35S-02

- The AlphaServer SC 128-way IBB has Management Ethernet support for the first 44 of the nodes configured as described in Step 1a. For one additional full or partial set of 48 nodes, order the following:

One AlphaServer SC 48-port Management Network Upgrade	3X-SCNBA-AA
One power cord for rack mounting of the Extreme network switch	BN35S-02
Four AlphaServer SC Network Fibre Port Upgrades for Ethernet Switch to enable Gigabit ports to connect to Ethernet Switch in AlphaServer SC 128-way IBB	3X-SCNXA-AA
Two SC-SC dual-fiber optic cables, mm, pp	BN34B-01

Step 3e – Mandatory – Monitor(s) and Keyboard(s)

- Choose either a rackmount console or tabletop console(s) for the AlphaServer SC.

One Rackmount Console	Select the following items to install a monitor in the IBB rack:	
	One TFT 5110R 15-inch (15-inch viewable image size) flat panel monitor, TFT active matrix, 1024 x 768 @75Hz resolution, 1U, detachable base	3R-A4220-AA
	Rackmount keyboard/trackball drawer, 1U, North America	3R-A4404-AA
	Rackmount keyboard/trackball drawer, 1U, International	3R-A4405-AA
	One 1U 30-inch deep extension rail for each monitor and keyboard drawer	3X-BA57B-AA

If one of the monitor kits is selected, choose two of the following for installation in the Management Server(s) and/or File Server Domain nodes:

Virtual keyboard adapters for Tru64 UNIX	2T-H7085-GU

One Tabletop Console

- Each IBB supports one monitor and one keyboard switched between nodes 0 and 1.
- This monitor requires a video cable for connection to the console switch.
- Select one monitor, one monitor power cord, one 12-foot video cable, one extension cable if desired and one keyboard from the following lists.

Two Tabletop Consoles

- Two consoles are supported by direct connection to node 0 and to node 1.
- One monitor and one keyboard will be connected to node 0.
- The other monitor and keyboard will be connected to node 1.
- Select two monitors, two monitor power cords, two 12-foot video cables and two keyboards from the following lists.

Systems/Options

Monitors - Carbon/ Silver	V7550 17-inch (16-inch viewable image size) flat-faced shadow mask, 2-tone (carbon/silver), 0.25-mm dot pitch, VGA to 1024 x 768 @85 Hz, MPRII/TCO 99/Energy Star Compliant, Northern Hemisphere with NA power cord, VGA cable	3R-A4002-AA
	Same as above, with Euro power cord	3R-A4201-AA
	Same as above, APD, no power cord	3R-A4202-AA
	Same as above, with PRC power cord, CCIB	3R-A4446-AA
	Same as above, Southern Hemisphere, with Australia/New Zealand power cord	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, with PRC power cord, CCIB	3R-A4394-AA
	Same as above, Southern Hemisphere, 0.25 to 0.27 mm aperture grille pitch, with Australia/New Zealand power cord	3R-A4393-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
Monitor Power Cords	North America, 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
	Israel, 2.5-meter	BN18L-2E
	Italy, 2.5-meter	BN35M-02
	Japan, 2.5-meter, Dentori approved	3X-BN46F-02
	Switzerland, 2.5-meter	BN19E-2E
	UK, Ireland, 2.5-meter	BN19A-2E
Video Cables	110936-B21 12-foot Plenum Cable for connection to Console Switch in AlphaServer SC 16- or 128-way IBB	3R-A0719-AA

Carbon Keyboards	• AlphaServer SC Software is qualified for the English language. • A selection of a country-specific keyboard is required for keyboard support.	
	U.S./English keyboard	3R-A4362-AA
	Arabic keyboard	3R-LKQ48-BR
	Belgian keyboard	3R-LKQ48-AB
	BHCSY keyboard	3R-LKQ48-AX
	Canadian/French keyboard	3R-LKQ48-AC
	Cyrillic keyboard (Russian)	3R-LKQ48-BT
	Czech keyboard	3R-LKQ48-BV
	Danish keyboard	3R-LKQ48-AD
	Dutch keyboard	3R-LKQ48-AH
	Finnish keyboard	3R-LKQ48-AF
	French keyboard	3R-LKQ48-AP
	German keyboard	3R-LKQ48-AG
	Greek keyboard	3R-LKQ48-BH
	Hebrew keyboard	3R-LKQ48-AT
	Hungarian keyboard	3R-LKQ48-BQ
	International keyboard	3R-A4362-AA
	Italian keyboard	3R-A4363-AA
	Japanese keyboard	3R-LKQ48-AJ
	Korean keyboard	3R-LKQ48-BK
	Latin-American keyboard	3R-LKQ48-AR
	Norwegian keyboard	3R-LKQ48-AN
	Polish keyboard	3R-LKQ48-BP
	Portuguese keyboard	3R-LKQ48-AV
	Simplified Chinese keyboard	3R-LKQ48-CV
	Slovak keyboard	3R-LKQ48-CZ
	Spanish keyboard	3R-LKQ48-AS
	Swedish keyboard	3R-LKQ48-AM
	Swiss/French keyboard	3R-A4374-AA
	Traditional Chinese keyboard	3R-LKQ48-BI
	Thai keyboard	3R-LKQ48-CB
	Turkish keyboard	3R-LKQ48-BU
	UK keyboard	3R-A4378-AA
Mouse	3-button mouse - carbon	3R-A3480-AA

Step 3f – Optional – Graphics cards

- Additional consoles are available by custom configuration. Each additional console requires additional ATI Radeon graphics cards and other equipment. Contact your account manager for configuration assistance.

ATI Radeon 7500 64-MB PCI graphics adapter	3X-PBXGG-AA

Step 4 – Mandatory - Select Storage Building Blocks (SBBs) and Options

- AlphaServer SC systems are organized into File-Serving Domains and Compute-Serving Domains. Altogether there are five or fewer Domains. Each Domain has from two to 32 AlphaServer ES45 nodes configured with a cluster file system that is served by two of the nodes. This system storage is supported by a single Storage Building Block (SBB) that is capable of supporting all the system storage requirements of the entire AlphaServer SC System.
- The File-Serving Domain is used to serve user data to the rest of the system and may optionally have several extra SBBs configured.
- An AlphaServer SC SBB includes a RAID disk subsystem and software and hardware required for providing system or user data storage for the AlphaServer SC. The SBB consists of HSV110 2C2D storage controllers with dual redundant controllers and two storage shelves integrated into an SC cabinet. Optionally, EVA storage systems listed below can also be used in place of the SBB. Note the additional components required to be added to the EVA system if EVA systems are utilized.
- Optional storage configurations can be added to provide extra user RAID storage. Various amounts of redundancy can also be configured. The storage and cabinetry components for these can be found in this section or later sections of the QuickSpecs. Contact your account manager to plan the configuration.
- Use the following table to determine the parts and quantities required to build the minimum required system storage for the AlphaServer SC. Locate the column corresponding to the number of Domains. Select the parts required for system storage as specified in that column.

Step 4a – Mandatory - Configure minimum SBBs required for Booting the AlphaServer SC System

- Select storage building block - HSV110 based storage systems

HSV110 Storage Building Block	DA-SCDMA-CA

HSV110 Storage Building Block (SBB) includes:

- HSV110 dual controller 2C2D enclosure, rackmount kit
- Space for up to 28 -36-GB, 72-GB, and 146-GB 1-inch FC-AL disk drives
- Software
  - Two Advanced File System Licenses
  - Controller VCS Code (ET-SV110-01)
  - VCS (250203-B24

The following EVA5000 Storage systems below can be selected in place of the SBB listed above (these systems include their own cabinet)- Refer to HP StorageWorks Enterprise Virtual Array EVA5000 QuickSpecs for selections -

Enterprise Virtual Array Model EVA5000 2C2D-B - North America	DS-SV110-RA
Enterprise Virtual Array Model EVA5000 2C2D-B - International	DS-SV110-RB
Enterprise Virtual Array Model EVA5000 2C6D-B - North America	DS-SV110-JA
Enterprise Virtual Array Model EVA5000 2C6D-B - International	DS-SV110-JB

Step 4b – Mandatory - Configure minimum disk drives required for booting the AlphaServer SC System

Number of required disk drives (must all be the same). Select the type from the list below.	Number of Domains	1	2	3	4	5
	Number of disk drives					
Refer to HP AlphaServer SC Installation Guide "Calculate the Minimal Storage Requirement"	36.4-GB sparing Level-1	8	10	12	14	16
	36.4-GB sparing Level-2	10	12	14	16	16
	72.8-GB sparing L1 & L2	8	8	8	8	8
	146-GB sparing L1 & L2	8	8	8	8	8

36 GB 10K rpm dual-port 2-Gb FC-AL drive	3R-A3239-AA
36 GB 15K rpm dual-port 2-Gb FC-AL drive	3R-A3210-AA
72 GB 10K rpm dual-port 2-Gb FC-AL drive	3R-A3260-AA
72 GB 15K rpm dual-port 2-Gb FC-AL drive	3R-A3971-AA
146 GB 10K rpm dual-port 2-Gb FC-AL drive	3R-A3975-AA

Step 4c – Mandatory - Select single switched Fibre Channel fabric

- Select the components for single non-redundant switched Fibre Channel connectivity. Choose either type of F/C switch and the number required.

	Number of Domains	1	2	3	4	5
Description	Part Number	Qty.	Qty.	Qty.	Qty.	Qty.
AlphaServer SC RAID Fiber Channel 2/8 EL Switch, includes rack kit	3X-SCFEA-AA	1	1	0	0	0
AlphaServer SC RAID Fiber Channel 2/16 EL Switch, includes rack kit, no SFPs	3X-SCFFA-AA	0	0	1	1	1
64-Bit PCI-to-Fibre Channel 2Gb/s HBA for Tru64 UNIX	DS-KGPSA-DA	2	4	6	8	10
AlphaServer SC RAID FC 2Gb/s Transceiver (SPF)	3R-A2973-AA	4	6	8	10	12
Fiber optic short wave LC-LC cable 2-meter 5-meter 15-meter 30-meter 50-meter	 3R-A2979-AA 3R-A2980-AA 3R-A2981-AA 3R-A3454-AA 3R-A3455-AA	4	6	8	10	12
Ethernet Cable - connects Fibre Channel Switch(es) to management network	BN25G-03	1	1	1	1	1
AlphaServer SC HSV SAN Appliance BB	DA-SCDSB-AA	1	1	1	1	1
Tru64 Kit V2.0 Enterprise Virtual Array	QB-6RPAB-SB	1	1	1	1	1

Step 4d– Mandatory – Select extra AdvFS Utilities licenses

- Select extra licenses for installation on the system-storage nodes of the Compute-Serving Domains

Systems/Options

	Number of Domains	1	2	3	4	5
Description	Part Number	Qty.	Qty.	Qty.	Qty.	Qty.
Tru64 UNIX Advance File System Utilities License	QL-0EGAE-AA	0	2	4	6	8

Step 4e – Optional – Select extra components for dual (redundant) switched Fibre Channel fabric

- Select extra components (in addition to Step 4c) for dual (redundant) switched Fibre Channel connectivity.

	Number of Domains	1	2	3	4	5
Description	Part Number	Qty.	Qty.	Qty.	Qty.	Qty.
● Select extra components if configuring dual switched Fibre Channel connectivity. Choose either type of F/C switch and the number required						
AlphaServer SC RAID Fiber Channel 2/8 EL Switch, includes rack kit, no SFPs	3X-SCFEA-AA	1	1	0	0	0
AlphaServer SC RAID Fiber Channel 2/16 EL Switch, includes rack kit, no GBICs	3X-SCFFA-AA	0	0	1	1	1
64-Bit PCI-to-Fibre Channel 2Gb/s HBA for Tru64 UNIX	DS-KGPSA-DA	2	4	6	8	10
AlphaServer SC RAID FC 2Gb/s Transceiver (SFP)	3R-A2973-AA	4	6	8	10	12
Fiber optic short wave LC-LC cable	2m - 3R-A2979-AA 5m - 3R-A2980-AA 15m - 3R-A2981-AA 30m - 3R-A3454-AA 50m - 3R-A3455-AA	4	6	8	10	12
Ethernet Cable - connects Fibre Channel Switch(es) to management network	BN25G-03	1	1	1	1	1

Step 4f– Optional – Select extra RAID components for user data

- The File-Serving Domain can be configured with RAID storage to serve user data. Increased redundancy and RAID user data storage can be added using parts described above as well as cabinetry parts and integration services listed in Step 6. A storage specialist should be consulted.

Step 5 – Optional – Communications

Ethernet

- Each adapter uses one PCI slot
- Each node includes one 3X-DE602-BB 2-port Ethernet Adapter
- One port reserved for Management Network
- One port available for other use

		Maximum # supported per node	
	PCI 2-port 32/64-bit 10/100-Mb UTP FE Ethernet adapter (Twisted Pair)	2	3X-DE602-BB
	Cable for 10BaseT Twisted Pair connection, xx=length in meters (0.5, 1, 3, 4, 7)		BN25G-xx
	PCI Gigabit Ethernet adapter, SC connectors, MMF - no boot support	2	DEGPA-SA
	PCI Gigabit Ethernet adapter, UTP FE Ethernet adapter (Twisted Pair)	2	DEGPA-TA

Step 6 – Optional – S-Series Cabinets for AlphaServer SC Configurations

Cabinets are available for housing additional storage and other peripherals. Cabinet enclosures H9B15-ST/SU are carbon black and preconfigured with trim, rear extender, one dual circuit H7602 16A Power Distribution Unit, and joiner kit.

- 40U is the maximum space available for the enclosures listed below.
- Select H9C15-SE door kit for each H9B15-ST/SU cabinet enclosure.
- Select H9C15-ZS cabinet sides for H9B15-ST/U end-cabinets.

AlphaServer SC 2-meter, 19-inch cabinet enclosure, no sides, joiner kit, carbon black, North America	H9B15-ST
AlphaServer SC 2-meter, 19–inch cabinet enclosure, no sides, joiner kit, carbon black, International	H9B15-SU
AlphaServer SC custom door kit, carbon black (HP logo) – one kit is required with each cabinet ordered	H9C15-SE
AlphaServer SC cabinet sides (pair), carbon black – one kit is required for each contiguous set of cabinets	H9C15-ZS
Joiner Kit (carbon) for H9B15-ST/SU cabinets (included in H9B15-ST/SU)	H9C15-JD
VIS for AlphaServer SC System Building Block – required for each cabinet ordered	YT-SCVIS-AB

- Either Manufacturing or CustomSystems must assemble cabinets containing AlphaServer SC systems, components, and storage. Your account manager will quote for any additional integration services required for the assembly of additional equipment (included desired third party options) or racks.

HP staff may consult documents B-IB-H9A15-S-DBM for cabinet enclosure rules for M-Series enclosures.

Step 7 – Mandatory – System Software and Documentation

The following software and documentation is provided as part of the AlphaServer SC System and does not need to be ordered separately:

- Each of the ES45 systems included in the CBBs includes the Tru64 UNIX Operating System V5.1A, including base license, unlimited user license, and server extension license.
- Each IBB includes one set of Tru64 UNIX Operating System, V5.1A media and documentation, and one set of AlphaServer SC System Software media and documentation - and each SC45 CBB includes an AlphaServer ES45
- System Information Kit (print and CD-ROM), Owner's Guide, User Interface Guide, and Release Notes.

  Each Storage Building Block (SBB) includes two licenses each for the following:
  - HSV110 Array Controller Software
  - HSV110 Solution Software for Tru64 UNIX
  - StorageWorks command console UNIX agents
  - Advanced File System Utilities

Additional media and documentation can be ordered using the part numbers provided below.

All symmetric multiprocessors (nodes) in the AlphaServer SC System must be licensed for AlphaServer SC System Software, as described below. In addition, it is recommended that all nodes be licensed for AlphaServer SC Development Software, as described below.

NOTE: Do not order UNIX TruCluster Software.

Step 7a – Mandatory – Select AlphaServer SC System Software

- Choose a combination of licenses that adds up to as many, or more, nodes as there are symmetric multiprocessors configured in Step 2 above. Do not order any additional licenses for the Management Server, since the AlphaServer SC System Software licenses allow the software to be used for management, on up to two Management Servers. As an example, a system with one Management Server and 48 nodes can be licensed by combining one 16-node license (QM-6EQAA-AB) with one 32-node license (QM-6EQAA-AC).

AlphaServer SC System Software License, 1 node	QM-6EQAA-AA
AlphaServer SC System Software License, 16 nodes	QM-6EQAA-AB
AlphaServer SC System Software License, 32 nodes	QM-6EQAA-AC
AlphaServer SC System Software License, 64 nodes	QM-6EQAA-AD
AlphaServer SC System Software License, 128 nodes	QM-6EQAA-AE

Step 7b – Optional – Select AlphaServer SC Development Software, Media and Documentation

- Choose a combination of licenses that matches, or exceeds, the number of nodes in the AlphaServer SC. As an example, a system with 48 nodes can be licensed for AlphaServer SC System Software by combining one 16-node license (QM-6ERAA-AB) with one 32-node license (QM-6ERAA-AC).

AlphaServer SC Development Software License, 1 node	QM-6ERAA-AA
AlphaServer SC Development Software License, 16 nodes	QM-6ERAA-AB
AlphaServer SC Development Software License, 32 nodes	QM-6ERAA-AC
AlphaServer SC Development Software License, 64 nodes	QM-6ERAA-AD
AlphaServer SC Development Software License, 128 nodes	QM-6ERAA-AE
AlphaServer SC System Documentation Kit	QA-6EQAA-GZ
AlphaServer SC User Documentation Kit	QA-6EQAB-GZ
AlphaServer SC System Software CD-ROM Kit	QA-6EQAA-H8

Step 7c – Optional – Additional Media and Documentation

- Media and documentation are included with the system. Additional copies can be ordered as needed.
  - One set of the following is included with each IBB:

Tru64 UNIX V5.1A media and online documentation on CD-ROM	QA-6ADAA-H8
Tru64 UNIX V5.1A full hard copy documentation	QA-6ADAA-GZ
Layered products media and documentation for Tru64 UNIX on CD-ROM	QA-054AA-H8

  - One set of the following is included with each CBB:

AlphaServer ES45 System Information Kit (print and CD-ROM), Owner's Guide, User Interface Guide, and Release Notes	QA-6NUAB-G8

Step 8 – Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific Only

- Installation is included in all AlphaServer SC45 system building blocks
- Hardware and software support can be purchased separately or as a packaged CarePaq Priority Service.
- Selection of a minimum level of hardware and software support is mandatory. The minimum separate software and hardware service levels available are: Bronze Software Support and On-site 9x5 4 Hour Response Hardware Support. See the AlphaServer One Step Quoting Guide for separate software and hardware Supplemental Service part numbers and pricing. The minimum CarePaq Priority Service available is Priority Service, which is described.
- Choose the CarePaq Priority Service Package which best supports the Customer's operational requirements for system availability.
- The SC45 CBB CarePaq Priority Service Packages are described below:

CarePaq Priority Services

- CarePaq Priority Services are available for AlphaServer systems running Tru64 UNIX operating system. Priority Services are designed for the growing number of customers who need support beyond the basic warranty. Five service packages are available for the SC45 AlphaServer systems – Priority, Priority 24, Priority Silver, Priority Gold, and Priority Executive Gold 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

- 9 x 5 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 (unlimited users and server extensions for Tru64 UNIX)
- Condist update distribution for Tru64 UNIX and layered products. (Layered products not on Condist can be ordered separately.)

Priority 24

- 24 x 7 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 (unlimited users and server extensions for Tru64 UNIX)
- Condist update distribution for Tru64 UNIX and layered products. (Layered products not on Condist can be ordered separately.)

Priority Silver	• 24 x 7 HW Support. Named Engineer, 4-hour response • 24 x 7 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 (unlimited users and server extensions for Tru64 UNIX) • Condist update distribution for Tru64 UNIX and layered products. (Layered products not on Condist can be ordered separately.) • Technical newsletter and SW activity review • Proactive Patch Notification • One (1) System Healthcheck per year
Priority Gold	• 24 x 7 HW support with Named Engineer, 4-hour response for on-site support • 24 x 7 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 • Condist update distribution for OpenVMS or Tru64 UNIX and their layered products. (Layered products not on Condist 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
Priority Gold Executive	• 24 x 7 HW support with Named Engineer, 2-hour response for on-site support • 24 x 7 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) • Software update distribution on CD-ROM: OpenVMS or Tru64 UNIX and their layered products (L/P not on CDDS are ordered separately.) • Technical newsletter, SW activity review and 10 hrs 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 – Subsequent Servers	
SSP's (Subsequent System Packages for SC45 AlphaServer systems)	• For Priority, Priority 24, Priority Silver, Priority Gold, Priority Gold Executive • HW Support at same level as corresponding package for Principal server • License Subscription: HP O/S • Telephone support through Principal server covered by full support package

Program Features – Installation

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

Model / CarePaq Priority Service	Principal Server 1 Year	Principal Server 3 Years	Subsequent Systems 1 Year	Subsequent Systems 3 Years
SC45 CBB	Package #	Package #	Package #	Package
Priority	FP-SC01B-12	FP-SC01B-36	FP-SC21B-12	FP-SC21B-36
Priority 24	FP-SC02B-12	FP-SC02B-36	FP-SC22B-12	FP-SC22B-36
Priority Silver	FP-SC04B-12	FP-SC04B-36	FP-SC24B-12	FP-SC24B-36
Priority Gold	FP-SC08B-12	FP-SC08B-36	FP-SC28B-12	FP-SC28B-36
Priority Gold Exec.	FP-SC09B-12	FP-SC09B-36	FP-SC29B-12	FP-SC29B-36
SC45 Base Building Block				
Priority	NA	NA	FP-F21BA-12	FP-F21BA-36
Priority 24	NA	NA	FP-F22BA-12	FP-F22BA-36
Priority Silver	NA	NA	FP-F24BA-12	FP-F24BA-36
Priority Gold	NA	NA	FP-F28BA-12	FP-F28BA-36
Priority Gold Exec.	NA	NA	FP-F29BA-12	FP-F29BA-36

NOTES:

- SC45 AlphaServer systems include one-year hardware warranty with 5x9, on-site Next Business Day response.
- Priority Service includes new HP hardware options internal to the AlphaServer enclosure receive the same warranty or service level as purchased with the server 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.
- A 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 service options available for AlphaServers, please consult your sales account manager or visit http://www.hp.com/hps/.
  NOTE: This Web site is available in English only

Step 8a - Building Blocks

Select support services for the AlphaServer SC45 at the building block level. The building blocks include:

AlphaServer SC45 Compute Building Block (CBB)
AlphaServer SC45 Base Building Block (BBB)
AlphaServer SC45 Interconnect Building Block (IBB)
AlphaServer SC45 Storage Building Block (SBB)
AlphaServer SC45 Management Building Block (MBB)

AlphaServer SC45 CBB Services

- Priority Services are required for each Compute Building Block, and Base Building Blocks. Select one Principal Server Priority Service for the first AlphaServer SC45 CBB and a Subsequent Server Priority Service for each additional SC45 CBB.
- In addition Subsequent Server Priority Services are required for each Base Building Block. Select one Subsequent Server Priority Service for each additional SC45 BBB
- Priority service for the Principal and Subsequent servers will provide hardware support for options internal to CBB(s), remedial software support and advisory and rights to new versions on the CBB(s) including Tru64 UNIX Base, unlimited users, and Server Extensions and Open Source Internet Software.

For example: SC45:

Number of Nodes	5	16	32	64	128
Number of CBBs	1	3	6	12	25
Number of BBBs	0	1	2	4	3
Principal Server FP-SC01B-36	1	1	1	1	1
Subsequent Servers FP-SC21B-36	0	2	5	11	24
Base Building Block FP-F21BA-36	0	1	2	4	3

Step 8b - AlphaServer SC IBB Services

- Select one consolidated distribution update subscription service for the IBB in order to receive software updates on CD-ROM.

AlphaServer SC ConDist — FM-CDDSU-36

- To support an AlphaServer SC45 system with a 16-way IBB, select an IBB service part based on the hours of service coverage desired.

3-year IBB-16 5X9/4 HR — FM-SCQ64-36
3-year IBB-16 7X24 HR — FM-SCQ67-36

- To support an AlphaServer SC45 system with a 128-way IBB, or Expansion IBB select an IBB service part number based on the hours of service coverage desired.

3-year IBB-128 5X9/4 HR — FM-SCQ84-36
3-year IBB-128 7X24 HR — FM-SCQ87-36
3-year Expansion IBB 5X9/4 HR — FM-SCQR4-36
3-year Expansion IBB 7x24 HR — FM-SCQR7-36

- To support an AlphaServer SC45 system with a 128-way IBB, select one 16-port Switch Card service part number for each additional front switch card ordered in Step 3 with the SC45 128-way IBB based on the number of hours of service coverage desired.

3-year Switch Card 5X9/4 HR — FM-SCQC4-36
3-year Switch Card 7X24 HR — FM-SCQC7-36

- For one additional full or partial set of 48 nodes selected in Step 1, select an AlphaServer SC 48-port Management Network Upgrade service part number based on the hours of service coverage desired.

3-year 48-port Network Switch 5x9/4 HR — FM-SCE84-36
3-year 48-port Network Switch 7X24 HR — FM-SCE87-36

Step 8c - AlphaServer SC SBB Services

- For each AlphaServer SBB selected in Step 4, select an AlphaServer SC SBB service part number based on the hours of service coverage desired.

	3-year SBB 5X9/4 HR	FP-CS114-36
	3-year SBB 7X24 HR	FP-CS214-36

AlphaServer SC MBB Services	● For each AlphaServer Management Server selected in Step 3, select appropriate DS20E Priority Service part numbers.	
	3-year Priority Service	FP-A01MA-36
	3-year Priority SSP	FP-A21MA-36
	3-year Priority 24	FP-A02MA-36
	3-year Priority 24 SSP	FP-A22MA-36
	3-year Priority Silver	FP-A04MA-36
	3-year Priority Silver SSP	FP-A24MA-36
	3-year Priority Gold	FP-A08MA-36
	3-year Priority Gold SSP	FP-A28MA-36
	3-year Gold Executive	FP-A09MA-36
	3-year Gold Executive SSP	FP-A29MA-36

AlphaServer SC Software Services

AlphaServer SC System Software License Subscription	AlphaServer SC System 1-Node License Subscription Service	QT-6EQAA-TA
	AlphaServer SC System 16-Node License Subscription Service	QT-6EQAA-TB
	AlphaServer SC System 32-Node License Subscription Service	QT-6EQAA-TC
	AlphaServer SC System 64-Node License Subscription Service	QT-6EQAA-TD
	AlphaServer SC System 128-Node License Subscription Service	QT-6EQAA-TE
	AlphaServer SC Software Update Media & Doc Distribution	QT-6EQAA-E8
	AlphaServer SC Software Update Documentation Distribution	QT-6EQAA-KZ

Priority Service Plan for Layered Products*	AlphaServer SC Layered Product Support for up to 1Node	FP-S1207-36
	AlphaServer SC Layered Product Support for up to 4 Nodes	FP-S1215-36
	AlphaServer SC Layered Product Support for up to 16 Nodes	FP-21221-36
	AlphaServer SC Layered Product Support for up to 32 Nodes	FP-21228-36
	AlphaServer SC Layered Product Support for up to 64 Nodes	FP-21233-36
	AlphaServer SC Layered Product Support for up to 128 Nodes	FP-21233-36
	NOTE: * = These part numbers reflect the most commonly purchased AlphaServer SC configurations, and are not inclusive of any other software layered products. Please refer to the Priority Service Plan for Layered Products, One-Step Quoting Table, for additional ordering information.	
	Software Support Menu 5/List 3	QR-SMSW3-A

Hardware and Software Supplemental Support Services — Europe Only	In EMEA the corporate Service Menu (release 3b) is used and any service from Installation, Hardware Maintenance Service, Software Support, 9x5 up to 24x7 can be offered to the customer. To administrate and quote the customer service offer, the Building Block part numbers and any optional products as mentioned in the above steps needs to be entered. The NCAS system will automatically recognize the Building Block containing the SC45 CBB systems and reflects the bundled price. When the customer requires both hardware maintenance and software support, a DSS service level should be selected, which still leaves the flexibility to have a hardware coverage level of C or D and a higher software level of A or B as example.

Step 9 – Optional – Supplemental Professional Services

HP Services offers the following options in the United States and in other geographies:

- Systems Installation and Administration Support
- Applications Development, Migration, and Optimization Services
- Customer Education

All Services are offered under the same part number. Contact the HP Services representatives in your country for more details.

Remote Systems Software and Applications Consulting, 160 hours remote consulting	QS-A1767-HL
Standard Systems Installation and Administrative Service, 60 days on-site consulting	QS-A1758-HL
Basic Systems Installation and Administrative Service, 30 days on-site consulting	QS-A1759-HL
Initial Systems Installation and Administrative Service, 10 days on site consulting	QS-A1760-HL
AlphaServer SC Systems Administration Course, 4 days on-site consulting	QS-A1765-HL
Introduction to HPTC Applications Programming Course, 4 days on-site consulting	QS-A1765-HL
Applications Programming with the AlphaServer SC Course, 2 days on-site consulting	QS-A1763-HL
Optimizing Applications for the AlphaServer SC Course, 2 days on-site consulting	QS-A1763-HL
3 days on-site AlphaServer SC systems software support	QS-A1948-CP
5 days (1 week) on-site AlphaServer SC systems software support – recommended for each 32 nodes configured in an AlphaServer SC system	QS-A1949-CP
20 days (4 weeks) on-site AlphaServer SC systems software support	QS-A1950-CP

Compute Building Blocks

		DA-SCAAD-BA/BB	DA-SCAAE-BA/BB
Dimensions (H x W x D)		79 x 23.6 x 35.4 in/200 x 60 x 90 cm	
Shipping Dimensions		85 x 36 x 48 in/216 x 91.5 x 122 cm	
Weight (When lifting)	Nominal	986 lb/448 kg	986 lb/448 kg
	Maximum	986 lb/448 kg	986 lb/448 kg
Total added to cabinet (brackets, slides, cables)	Nominal	686 lb/313 kg	686 lb/313 kg
	Maximum	686 lb/313 kg	686 lb/313 kg
Shipping Weight	Nominal	1016 lb/463 kg	1016 lb/463 kg
	Maximum	1016 lb/463 kg	1016 lb/463 kg
Clearances	Operating	See specific cabinet requirements	
	Service	36F/36B/0Side	36/36/0
Environmental			
Temperature	Operating (Rackmount)*	50° F to 95° F/10° C to 35° C	
	Non-operating	–40° F to 151° F/–40° C to 66° C	
	Storage (60 days)	–40° F to 151° F/–40° C 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.		
Relative 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	
Heat Dissipation – BTU/Hr	Nominal	19,628	19,628
	Maximum	19,628	19,628
Air Flow and Quality	Intake location	Front	
	Exhaust location	Rear	
	Particle size	N/A	
	Concentration	N/A	
Altitude	Operating*	10,000 ft/3,048 m	
	Non-operating	40,000 ft/12,192 m	
	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.		
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, 240 VAC for ES45)

Nominal Voltage (VAC)	200 to 240
Voltage Range (VAC) Temporary Condition	180 to 250
Power Source Phase	Single
Nominal Frequency (Hz)	50/60

	Frequency Range (Hz)	49 to 51/59 to 61		
	RMS Current (maximum steady state):	Each power cord	16 A	
	Power Cords	DA-SCAAE-BA/TA DA-SCAAD-BA/TA	DA-SCAAE-BB/TB DA-SCAAD-BB/TB	
	PDUs	2 - H7602-EB (1 Front, 1 Back)	2 - H7602-DB (1 Front, 1 Back)	
	Inlet AC Power Cords	4 - NEMA L6-20P (2 per PDU)	4 – IEC309 (2 per PDU)	
	PDU AC Outlets	16 IEC320 (8 per circuit/ 16 per PDU)	16 IEC320 (8 per circuit/ 16 per PDU)	

AlphaServer SC45 Base Building Block (Rackmount Node System Drawer) *DA-68EBA-AL* *DA-68DBA-AL*	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	Nominal	110 lb/50 kg
			Maximum	167.2 lb/76 kg
	Total added to cabinet (brackets, slides, cables):		Nominal	130 lb/59 kg
			Maximum	202.4 lb/92 kg
	Shipping Weight		Nominal	158 lb/72 kg
			Maximum	233 lb/106 kg
	Clearances	Operating	See specific cabinet requirements	
	Service	Minimum 4 ft/121.9 cm, 30 in/76.3 cm withdrawal on rails		

Management Server Rackmount DS20E (each) *DA-SCMAA-B*	*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:	Nominal	80 lb/36 kg
			Maximum	86 lb/39 kg
		Total added to cabinet (brackets, slides, cables):	Nominal	84 lb/38 kg
			Maximum	88 lb/40 kg
		Shipping Weight	Nominal	100 lb/45 kg
			Maximum	110 lb/50 kg
		Clearances	Operating	See specific cabinet requirements
		Service	Minimum 4 ft/121.9 cm, 30 in/76.3 cm withdrawal on rails	

TechSpecs

RAID Storage Building Block Two Drawer Rackmount *DA-SCDMA-CA*	*Dimensions* (H x W x D)	15.75 x 19.875 x 17.625in/ 40 x 50.48 x44.77 cm (fits 15.75 in [9U] standard RETMA cabinet)		
	Shipping Dimensions	Mounted in cabinet		
	Weight	Total added to cabinet (SBB, brackets, slides, cables):	Nominal	120 lb/54 kg
			Maximum	188 lb/85 kg
	Shipping Weight (includes cabinet weight)	Nominal	475 lb/215 kg	
		Maximum	543 lb/245 kg	

RAID Base Building Block Three Drawer Rackmount *DA-SCDMA-CA*	*ENVIRONMENTAL*		
	Temperature	Operating (Rackmount)*	50° F to 95° F/10° C to 35° C Reduce rating by 1°F for each 1,000 ft altitude 1.8°C/1,000 m
		Non-Operating	-40° F to 151° F/-40° C to 66° C
		Storage (60 days)	-40° F to 151° F/-40° C to 66° C
			NOTE: * = Maximum operating temperature at sea level; reduce by 1.8°F (1°C) for each 2,000 ft (600 m) above sea level.
	Relative Humidity	Operating	40% to 60% non-condensing
		Non-Operating	10% to 80% non-condensing
	Maximum Wet Bulb Temperature	Operating	82° F/28° C
		Storage (60 days)	115° F/46° C
	Minimum Dew Point Temperature	Operating	36° F/2° C
	Heat Dissipation - BTU/Hr	Maximum	11,604
	Air Flow and Quality	Intake location	Front
		Exhaust location	Rear
		Particle size	N/A
		Concentration	N/A
	Altitude	Operating*	8000 ft/2400 m
		Non-operating	40,000 ft/12,192 m
		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.	

			DA-SCBAA-DA/DB	DA-SCCBA-AA/AB	DA-SCCAA-DA/DB
Interconnect Building Blocks					
	Dimensions (HxWxD)		79x23.6x35.4 in 200x60x90 cm	79x23.6x35.4 in 200x60x90 cm	2 x joined cabinets
	Shipping Dimensions (HxWxD)		85x36x48 in 216x91.5x122 cm	85x36x48 in 216x91.5x122 cm	2 x single ship dimensions
	Weight				
	When lifting:	Nominal	621 lb/280 kg	494 lb/224 kg	992 lb/450 kg
		Maximum	751 lb/340 kg	494 lb/224 kg	1348 lb/611 kg
	Total added to cabinet (brackets, slides, cables):	Nominal	321 lb/145 kg	494 lb/224 kg	690 lb/315 kg
		Maximum	451 lb/205 kg	494 lb/224 kg	1048 lb/476 kg
	Shipping Weight	Nominal	651 lb/295 kg	524 lb/239 kg	1022 lb/465 kg
		Maximum	781 lb/355 kg	524 lb/239 kg	1378 lb/626 kg
	Clearances	Operating	See specific cabinet requirements		
		Service	36F/36B/0Side	36/36/0	36/36/0
	Vibration	Operating	10 to 500 Hz 0.1 G peak		
		Non-Operationg	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) temporary condition	180 to 250			
	Power Source Phase	Single			
	Nominal Frequency (Hz)	50/60			
	Frequency Range (Hz)	49 to 51/59 to 61			
	RMS Current (maximum steady state):	Each power cord	16 A		
	Power Cords	Agency Approvals (Series EA2008)	UL: Listed to UL1950 (third edition)		
			UL/CNL: Certified to CAN/CSA-C22.2 No. 950-M93		
			FCC: Part 15.B Class A		
			CE: EN55022, EN55024, EN61000-3-2, EN61000-3-3		
			VCCI V-3/97.04 Class A		
			BSMI: CNS13438		
			C-Tick: AS/NZS 3548: 1995 Class A		
		Reviewed to	AS/NZ 3260:1993 Australian/New Zealand Standard		
			EN60950/A11:1997 European Norm		
			IEC 950 (second edition, second amend)		
			PDU	Inlet AC Power Cord	PDU AC Outlets
		DA-SCBAA-DA	2	4 - NEMA L6-20P	32xIEC320

	(2-H7602-EB)	(2x2-H7602-EB)	(2x16-H7602-EB)
DA-SCBAA-DB	2 (2-H7602-DB)	4 - IEC309 (2x2-H7602-DB)	32xIEC320 (2x16-H7602-DB)
DA-SCCBA-AA	1 (1-H7602-EB)	2 - NEMA L6-20P (2-H7602-EB)	16xIEC320 (16-H7602-EB)
DA-SCCBA-AB	1 (1-H7602-DB)	2 - IEC309 (2-H7602-DB)	16xIEC320 (16-H7602-DB)
DA-SCCAA-DA	3 (3-H7602-EB)	6 - NEMA L6-20P (2x3-H7602-EB)	48xIEC320 (3x16-H7602-EB)
DA-SCCAA-DB	3 (3-H7602-DB)	6 - IEC309 (2x3-H7602-DB	48xIEC320 (3x16-H7602-DB)

Rack Expansion Cabinet		H9B15 S-Series with AlphaServer SC components as above	
	Dimensions (H x W x D)	79 x 23.6 x 35.4 in/200 x 60 x 90 cm	
	Shipping Dimensions	85 x 36 x 48 in/216 x 91.5 x 122 cm	
	Weight	Configuration dependent	
	Shipping Weight	Nominal	300 lb/136 kg
		Maximum	1,408 lb/640 kg