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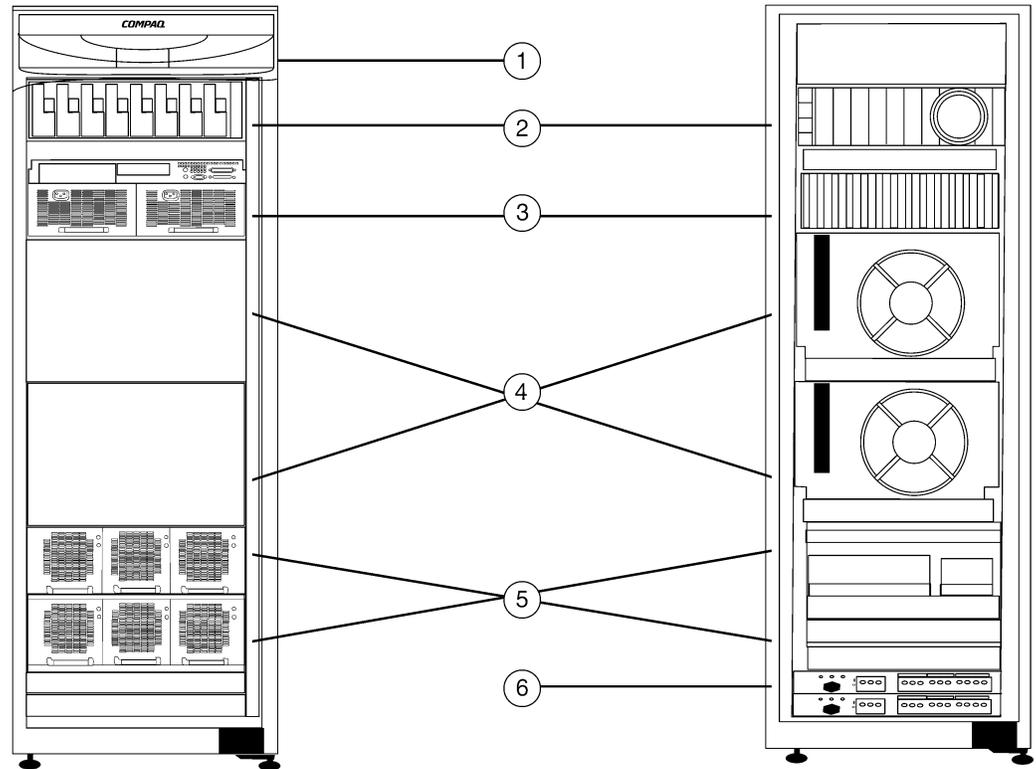
Compaq AlphaServer GS80

Overview

AT A GLANCE

AlphaServer GS80 systems include:

- One 731-MHz CPU module; up to eight 731-MHz Alpha 21264 processors are supported
- Optional Compaq Capacity on Demand (CCoD) SMP processors for non-disruptive performance growth
- 4-MB on-board cache per processor
- Advanced crossbar switch with 6.4-GB/s of memory bandwidth per building block; up to 12.8-GB/s memory bandwidth per system
- Up to 64-GB memory
- Up to 16 64-bit PCI channels with 3.2-GB/s aggregate I/O bandwidth
- PCI I/O master drawer with 12 configurable PCI slots
- PCI dual 10/100 Mbit Dual Ethernet adapter
- 9.1-GB SCSI-3 disk drive
- 600-MB CD-ROM drive
- Enhanced reliability with ECC-protected memory, processor cache, and system data paths
- Security of RAID storage and online repair of I/O buses
- Optional redundant power supplies, with N+1 power option (hot-swappable processors are available on GS160 and GS320 models)
- Up to 56 64-bit PCI slots supported
- 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 Compaq Services



1. Operator control panel
2. One optional PCI or StorageWorks drawer
3. Standard 14-slot PCI I/O Master Drawer
4. System drawers each with 1 QBB (Model 4 includes 1 drawer with space reserved for 2nd drawer; Model 8 includes 2 drawers)
5. 48-volt DC power shelves, 2 power supplies per shelf (Model 4 includes 1 shelf; Model 8 includes 2 shelves)
6. AC input controller(s)

Standard Features

Processor

Up to 8 Alpha 21264 6/731-MHz CPUs (one CPU per module)

Cache Memory

64K I and D caches on-chip; 4-MB ECC on-board cache per CPU

Architecture

AlphaServer GS80 utilizes a modular crossbar switch structure

Quad building blocks (QBBs) support up to four CPUs, four memory modules, and eight PCI buses on a 6.4-GB/s non-blocking backplane switch

Up to two QBBs are connected by a direct internal interconnect with 3.2-GB/s of bandwidth

CPUs, Memory, and I/O Slots

Base systems contain one CPU and one master PCI I/O drawer

	Model 4	Model 8
Maximum CPUs supported	4	8
Maximum memory supported	32 GB (4 modules)	64 GB (8 modules)
Maximum PCI slots supported	28	56

Note: Model 4 and Model 8 base systems include 12 configurable PCI slots.

System capacities shown are available with both Tru64 UNIX and OpenVMS operating systems.

Network and I/O Controllers

Ethernet	PCI Dual 10/100 Mbit Fast Ethernet adapter (3X-DE602-AA) included in master PCI shelf box; additional Ethernet adapters available as options
Console ports	One bi-directional parallel port with 25-pin D-subminiature connector Two EIA-232 full duplex asynchronous modem control serial ports, 9-pin D-subminiature connectors One PS/2 compatible keyboard port; one PS/2 compatible mouse port

Boot/Diagnostic Devices

Boot/diagnostic devices included in master PCI shelf box

CD-ROM One 5.25" half height 600-MB CD-ROM drive

Hard Drives One 9.1-GB 7200 rpm SCSI-3 disk drive

Internal Disk Expansion

Total Internal Drive Bays	Up to seven 36-GB drives (252 GB) can be mounted in one optional storage shelf in the system cabinet
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Power Supplies

Single-phase power subsystem with power cords; optional redundant 48 Vdc hot swap power supplies

OS Support

Tru64 UNIX systems include pre-installed software, Base license, Unlimited User license, Server Extension license, Open Source Internet Solutions, and iPlanet Web Server Enterprise Edition 4.0

OpenVMS systems include pre-installed software, Base license and Enterprise Integration Package V3.0

Support for up to two total instances of Tru64 UNIX or OpenVMS, or a combination of both, in hardware partitions on a single GS80 Model 8 hardware platform

Service and Support

Protected by Compaq Services including a 1-year on-site hardware warranty. Software warranty is 90-day telephone advisory. 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.

Systems/Options

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 packages, CPUs, memories, etc.), these steps cannot 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 cluster.
 - If access to specific devices must be assured, consider redundant adapters, RAID, N+1 power, redundant PCI drawers, and redundant consoles.
 - If software redundancy is required, consider clusters and/or hardware partitioning. The choice of hardware partitioning will generate a need for multiple master PCI drawers, multiple consoles, and I/O adapters.
- Is hardware partitioning required for optimal system management?
- What overall capacities are required in terms of processor performance, memory capacity, and disk storage?
- What are the near-term system expansion needs?
- How will system cabinets be physically arranged? This will determine if expansion cabinets are required and what cable lengths are required.

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

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 2 – Select base system

AlphaServer GS80 systems require selection of the following items:

Mandatory Purchases:

- Base system with operating system license (either OpenVMS or Tru64 UNIX) and one 731-MHz CPU module
- Minimum of one memory module

Required Options and Services:

- Software media and documentation for first system onsite
- Installation and/or startup services
- System management console or device and software with equivalent functionality

Recommended Services:

- Priority Service Plan
- VIS Services

Note: The base system package should be selected in the context of the number of hardware partitions required, the total capacity required, and the anticipated near-term system growth.

AlphaServer GS80 Base Systems

Model	OS	QBBs Included	Total CPUs Supported	Geography	Input Power	Order No.
Model 4	Tru64 UNIX	1	4	US/Canada	120V	DA-A80AA-AC
Model 4	Tru64 UNIX	1	4	Europe	220-240V	DA-A80AA-AD
Model 4	Tru64 UNIX	1	4	Japan	200-240V	DA-A80AA-AE
Model 4	OpenVMS	1	4	US/Canada	120V	DY-A80AA-AC
Model 4	OpenVMS	1	4	Europe	220-240V	DY-A80AA-AD
Model 4	OpenVMS	1	4	Japan	200-240V	DY-A80AA-AE

Systems/Options

Step 2 – Select base system *(continued)*

AlphaServer GS80 Base Systems <i>(continued)</i>						
Model 8	Tru64 UNIX	2	8	US/Canada	120V	DA-A80BA-AC
Model 8	Tru64 UNIX	2	8	Europe	220-240V	DA-A80BA-AD
Model 8	Tru64 UNIX	2	8	Japan	200-240V	DA-A80BA-AE
Model 8	OpenVMS	2	8	US/Canada	120V	DY-A80BA-AC
Model 8	OpenVMS	2	8	Europe	220-240V	DY-A80BA-AD
Model 8	OpenVMS	2	8	Japan	200-240V	DY-A80BA-AE

Step 3 – Additional SMP CPUs

- AlphaServer GS80 base systems contain one CPU module. Additional SMP CPUs may be added, up to the limits shown in above table. SMP CPU options include an operating system SMP license.

GS80 SMP upgrade CPU, 6/731-MHz with 4-MB on-board cache, Tru64 UNIX	3X-KN8AA-AB
GS80 SMP upgrade CPU, 6/731-MHz with 4-MB on-board cache, OpenVMS	3X-KN8AA-AC

Compaq Capacity on Demand (CCoD) CPUs

- AlphaServer GS80 base systems can be configured with optional Compaq Capacity on Demand (CCoD) CPUs for non-disruptive future capacity expansion. The CPUs will be field installed as part of the system installation. The total number of CPUs – base CPU, SMP CPUs, and CCoD CPUs – must adhere to the limits shown in the above table. Refer to the Compaq Capacity on Demand Program described in the "Upgrades" section.

GS80 CCoD SMP CPU, includes one 6/731-MHz CPU module with 4-MB on-board cache, Tru64 UNIX SMP license, and CCoD program license	3X-KN8CA-AB
GS80 CCoD SMP CPU, includes one 6/731-MHz CPU module with 4-MB on-board cache, OpenVMS SMP license, and CCoD program license	3X-KN8CA-AC

Step 4 – Select Memory Options

- Memory options are engineered specifically for use with this series and include additional components, which are integral to the system architecture.
- Memory options consist of a series of base modules that contain one memory array. A second array (called "upgrades" in the table) may be added to a base module in the factory or in the field.

1-GB GS80/160/320 base memory module	3X-MS8AA-BB
1-GB GS80/160/320 memory DIMM upgrade	3X-MS8AA-BU
2-GB GS80/160/320 base memory module	3X-MS8AA-CB
2-GB GS80/160/320 memory DIMM upgrade	3X-MS8AA-CU
4-GB GS80/160/320 base memory module	3X-MS8AA-DB
4-GB GS80/160/320 memory DIMM upgrade	3X-MS8AA-DU

Options

Step 4 – Select Memory Options *(continued)*

Memory Configuration Guidelines

Memory options should be selected in the context of the application's sensitivity to memory bandwidth and memory capacity, and the number of hardware partitions. This will determine the number of memory base modules and upgrades needed. The total capacity required will determine the size of the arrays to be chosen.

The configuration of memory may influence the performance of applications, and there are numerous ways to configure the choices of memory base modules and upgrade DIMMs. The following general guidelines can lead to several configuration choices. Application-specific guidelines will help narrow down the choices.

- Configuring for capacity: The highest capacity is achieved when the 3X-MS8AA-DB/DU combination is used.
- Configuring for performance: Interleaved operations reduce the average latency and increase the memory throughput over non-interleaved operations. Each memory base module is capable of 4-way interleaving with one array (no upgrades added) or 8-way interleaving with two arrays (base module plus one upgrade). A QBB configured with eight arrays (four base modules plus four array upgrades) provides 32-way interleaving and has the maximum potential memory bandwidth. Refer to "Memory Applications Examples" below to determine which applications gain the most benefit from this bandwidth.
- Memory modules should be configured in powers of 2: That is, 0, 1, 2, or 4 base modules in a QBB. Upgrades should also be installed in powers of 2: 0, 1, 2, or 4 base modules in a QBB.
- Although mixed-capacity memory modules may be configured, the highest bandwidth is achieved when a QBB is populated with eight identical arrays: four base modules and four upgrades. The next-highest bandwidth would be four base modules (four arrays).
- If it is not possible to match the capacities of all the arrays, the next best choice is to configure pairs of identical base modules, or base module/upgrade combinations. For example, a configuration of two 2-GB base modules (3X-MS8AA-CB), each with a 1-GB upgrade (3X-MS8AA-BU) is a better choice than a configuration of three 2-GB modules (3X-MS8AA-CB).

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, some are sensitive to memory bandwidth, some are sensitive to neither. 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 base module, with upgrade, for every two CPUs. This would result in one memory array per CPU.
- 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 arrays to the number of CPUs.
- Data mining can benefit from additional memory bandwidth. It is best to match the number of memory base modules to the number of CPUs.
- The most demanding high-performance technical applications (HPTC) achieve a performance level that is directly proportional to memory bandwidth. In these cases, configure one memory base module, with upgrade, per CPU. This results in two memory arrays per CPU.

The following table represents how 8 GB could be configured in a 4-CPU QBB in each of the four referenced applications. The numbers under each application represent how many of each memory option should be ordered.

Memory Configuration Examples – Configuring a QBB with a total of 8 GB for specific applications

		Application			
		VLM	OLTP, Timesharing	Data Mining	HPTC
1-GB base module	(3X-MS8AA-BB)	-	-	-	4
1-GB upgrade	(3X-MS8AA-BU)	-	-	-	4
2-GB base module	(3X-MS8AA-CB)	2	2	4	-
2-GB upgrade	(3X-MS8AA-CU)	2	2	-	-
The following additional configuration options utilizing the 4-GB base module are available:					
4-GB base module	(3X-MS8AA-DB)	2	2	N/R	N/R
4-GB upgrade	(3X-MS8AA-DU)	-	-		
N/R = Not recommended – For these applications, configure either four or eight like-sized memory options rather than one or two.					

Options

Step 5 – Evaluate Configuration Requirements to Support Optional Partitioning

Configuration Requirements for Partitions

- Configuring partitions requires some attention to detail with respect to minimum requirements for option selection, population, and option placement.
- A single GS80 Model 8 can be divided into two logical hardware partitions, each running an instance of Tru64 UNIX V4.0G, Tru64 UNIX V5.1, or an instance of OpenVMS V7.2-1H1. Each partition is allocated its own dedicated “shared-nothing” set of hardware resources: QBB(s), CPU module(s), memory module(s), and I/O.
- Each hardware partition is viewed as a unique node, from a system point-of-view, with its own instance of Tru64 UNIX or OpenVMS operating system and application software, independent system console, and error log.
- In the AlphaServer GS80 each of the two hardware partitions is defined by a single QBB.
- One system management console (3X-DS8BA-xx) and one console hub (3X-DS8AA-AA) required per system.
- Supported option rules apply for maximum configurations of each GS80 system partition. Care must be exercised to ensure that any planned reconfiguration of hardware partitions will not violate option support rules.

Minimum Hardware Required per GS80 Hardware Partition

Each hardware partition requires one QBB and that QBB must be configured with the minimum hardware listed below. Each QBB can be configured with additional hardware once this minimum requirement is met.

- One Alpha 21264 6/731-MHz CPU module
- One 3X-MS8AA-BB/CB/DB memory module (1 GB, 2 GB, 4 GB)
- One 3X-KFWHA-BA system I/O module and one 3X-DWWPA-AA master PCI drawer. Depending upon the configuration, this may require the use of an H9A20-AA/AB/AC expansion cabinet.
- AlphaServer GS80 systems are normally configured according to standard module placement rules, and are shipped with one copy of the operating system installed at the factory (Tru64 UNIX V4.0G, Tru64 UNIX V5.1, or OpenVMS V7.2-1H1). However, systems with hardware partitions offer hardware and software configuration flexibility. Factory Integration Services (VIS) are recommended to enable custom module configuration and factory installation of multiple copies of the operating system on hardware partitioned systems.

Optimizing System Resources

The following configuration guidelines can be used to improve performance in systems or in each partition of a hardware-partitioned system.

- Balance the resources in the system (or hardware partition) based upon the available backplane space and the proposed option populations:
 - Sparsely configured systems, those that are using half or less than half of their available capacity for CPUs, memory, and PCI drawers, should be configured with the options concentrated in as few QBBs as possible. For example, a GS80 Model 8 with four CPUs, four memory modules, and two PCI drawers would usually be configured in the first QBB. The first QBB would be “active” and the second QBB would be available for expansion.
 - Densely populated systems, those that are using more than half of their available capacity for CPUs, memory, and PCI drawers, should be configured with the options spread out across both QBBs.
- Configure active QBBs symmetrically, each with CPUs, memory, and PCI drawers.
- Configure the I/O adapters so that each active QBB has direct access to the most frequently accessed data.

System Software Required for GS80 Hardware Partition Support

Software Licensing for Hardware Partitions

- Base systems include operating system license (Tru64 UNIX or OpenVMS) that licenses up to two hardware partitions

User and capacity-based licensing is unaffected by hardware partitions. Examples:

- If a product is licensed for 200 concurrent users, these users can be split among the partitions, but cannot exceed 200 total users.
- If users have a departmental (license code “G”) capacity license for a product, that license can be loaded into the license databases on each of the hardware partitions.

Options

Step 5 – Evaluate Configuration Requirements to Support Optional Partitioning *(continued)*

Licensing Partitioned GS80 Systems for Both OpenVMS and Tru64 UNIX

- If the system requires both OpenVMS and Tru64 UNIX operating systems be licensed, one operating system license is included in the base system and the second is added as a line item. The second operating system license upgrade, which includes the license for only one CPU, would be added to the order using the following part numbers. Order appropriate media and documentation kits from Step 13.

OpenVMS software upgrade for GS80 QB-63PAG-AG

Tru64 UNIX software upgrade for GS80 QB-595AM-AA

- Only those SMP processors intended for use with the second operating system must be similarly licensed. Use the following license-only part numbers to add an SMP license for any CPUs intended for use with the second operating system:

OpenVMS Alpha SMP license for GS80 QL-MT1A9-6Q

Tru64 UNIX Alpha SMP license for GS80 QL-MT4A9-6Q

- The order of licensing is not important, but the following examples are similarly constructed for clarity: The configuration starts with a Tru64 UNIX base system part number and the addition of OpenVMS licenses.

Example 1: 8-CPU GS80 system in which all processors are licensed for both OpenVMS and Tru64 UNIX:

- Base system order would include a DA-A80BA-Ax and seven 3X-KN8AA-AB SMP upgrade CPUs
- Add one QB-63PAG-AG OpenVMS software upgrade and seven QL-MT1A9-6Q OpenVMS Alpha SMP licenses

Example 2: 8-CPU GS80 system in which all the processors are licensed for Tru64 UNIX and four processors are also licensed for OpenVMS:

- Base system order would include a DA-A80AA-Ax and seven 3X-KN8AA-AB SMP upgrade CPUs
- Add one QB-63PAG-AG OpenVMS software upgrade and three QL-MT1A9-6Q OpenVMS Alpha SMP licenses
- User and capacity-based licenses would be added for the second operating system environment as though it were a standalone system.

Step 6 – Configure Packaging Options

Step 6a – Redundant (N+1) Power Supplies

- Power supplies included with Model 4 and Model 8 systems can support all combinations of CPUs, memory, and I/O that can be configured within the system boxes.
- Additional 48V power regulators can be ordered to provide N+1 power redundancy.
- For Model 4 systems, order one power supply to achieve N+1 capability; for Model 8 systems, order two power supplies to achieve N+1 capability.

1000W 48V power supply H7510-AA

Step 6b – Internal System Expansion

- GS80 Model 4 and Model 8 systems can support one additional PCI drawer (master or expansion) or one StorageWorks BA36R shelf in the system cabinet.

Internal StorageWorks Expansion

- System cabinet provides space for one forward facing BA36R-RC/RD StorageWorks shelf, which can hold a maximum of two 5.25" devices and one 3.5" device or seven 3.5" devices
- Each UltraSCSI StorageWorks shelf requires a SCSI controller and a SCSI cable to connect controller to shelf
- StorageWorks drives are listed in a subsequent section

UltraSCSI single-channel SE StorageWorks shelf includes 16-bit I/O personality module BA36R-RC
(DS-BA35X-FA), 180W ac power supply, dc fans, and RETMA rackmounting hardware; supports 16-bit UltraSCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum revision levels

UltraSCSI dual-channel SE StorageWorks shelf, includes 16-bit I/O personality module BA36R-RD
(DSBA35X-FB), 180W ac power supply, dc fans, and RETMA rackmounting hardware; supports 16-bit UltraSCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum revision levels

UltraSCSI StorageWorks Differential personality card; installs in BA36R-RC and is cabled to the DS-BA35X-DA
KZPBA-CB; field installed only

Options

Step 6 – Configure Packaging Options *(continued)*

Power Option for BA36R Shelves

- Additional power supply provides N+1 power for StorageWorks shelves; power supply uses 3.5" slot in StorageWorks shelf reducing total number of devices supported by one
- StorageWorks drives are listed in a subsequent section

180W redundant power supply for StorageWorks shelf; includes power cord

CK-BA35X-HH

System I/O Expansion

- Model 4 systems support up to two PCI drawers; Model 8 systems support up to four PCI drawers. One PCI drawer included in Model 4 and Model 8 base systems.
- Model 4 and Model 8 system cabinets provide space for one additional PCI drawer or one internal storage shelf.
- Additional PCI drawers and storage shelves can be configured in H9A20-AA/AB/AC I/O expansion cabinet, described in a subsequent section.
- All PCI drawers contain 14 PCI slots configured into four PCI buses; two of the buses have four slots each, the other two buses have three slots each.
- There are two types of PCI drawers: expansion drawers and master drawers. Base system configurations include one PCI master drawer with 12 configurable PCI slots.
- Expansion drawers contain 14 PCI slots and N+1 redundant power system; expansion drawers are used for most PCI expansion applications.
- Master drawers contain 13 configurable PCI slots, N+1 redundant power system, plus the console ports and storage devices required for use as a system console. (These devices are listed on page 2. Note that the Fast Ethernet adapter is not included in optional master PCI drawers.) Master drawers have two applications:
 - As redundant console sub-systems
 - As consoles for individual partitions in hardware partitioned systems
- PCI drawers are connected to a QBB utilizing a 3X-KFWHA-BA system I/O module that connects to the PCI drawer using two BN39B cables.

PCI Drawer Expansion

- PCI drawers are connected to a QBB utilizing a 3X-KFWHA-BA system I/O module that connects to the PCI drawer using two BN39B cables. One 3X-KFWHA-BA and cable pair are mandatory per PCI drawer.
- Maximum one additional drawer in the system power cabinet

Master PCI shelf mount box for system and I/O expansion cabinets with standard I/O PCI module and 13 PCI expansion slots. (The 1st master comes standard with all systems and includes a standard dual Ethernet network card and the system module and cable pair for connection to the QBB).

Expansion PCI shelf mount box for system and I/O expansion cabinets with 14 PCI expansion slots 3X-DWWPA-BA

System I/O module for connecting to master or expansion PCI shelves 3X-KFWHA-BA

I/O module cable for connection between I/O module and master or expansion PCI shelves is BN39B-04

mounted in system cabinet; two are mandatory per system I/O module

Step 6c – External Expansion Cabinets

- Additional PCI drawers and storage shelves can be installed in an optional H9A20-AA/AB/AC expansion cabinet. One H9A20-AA/AB/AC expansion cabinet is supported
- The H9A20-AA/AB/AC I/O expansion cabinet can be configured to hold all disk BA36R StorageWorks shelves or combination of StorageWorks shelves and PCI drawers.
 - If no PCI drawers are configured, cabinet supports up to eight BA36R StorageWorks shelves.
 - If one PCI drawer is configured, cabinet supports up to five BA36R StorageWorks shelves.
 - If two PCI drawers are configured, cabinet supports up to four BA36R StorageWorks shelves.
 - If three PCI drawers are configured, cabinet supports up to two BA36R StorageWorks shelves.

I/O expansion cabinet for use with GS80 systems, includes two 120V single-phase power controllers and cords for use in US and Canada —does not support dual AC input configurations H9A20-AA

I/O expansion cabinet for use with GS80 systems, includes two 220-240V single-phase power controllers and cords for use in Europe – supports dual AC input configurations H9A20-AB

I/O expansion cabinet for use with GS80 systems, includes two 200-240V single-phase power controllers and cords for use in US, Canada, and Japan – supports dual AC input configurations H9A20-AC

- If large quantities of disks are required, the use of StorageWorks Storage Array cabinets and components is highly recommended.

Options

Step 6 – Configure Packaging Options *(continued)*

Step 6c – External Expansion Cabinets *(continued)*

- Systems installed in the US and Canada may use the H9A20-AA cabinet when 120V input power is required. In all other cases, the H9A20-AC cabinet is preferred because of the ability to support dual AC input.
- H9A20-AA/AB/AC cabinets may be joined to GS80 system. PCI drawers placed in these cabinets require 7-m I/O cables.
- H9A20-AA/AB/AC cabinets may be placed up to 6 meters from the system cabinet. Multiple expander cabinets may be connected to one another or placed separately. Each group of free-standing H9A20 cabinets requires an end-panel trim kit (CK-H9A20-AA).
- PCI drawers placed in remote cabinets require 10-m I/O cables.

End-panel trim kit for remote H9A20-AA/AB/AC cabinets CK-H9A20-AA

I/O module cables for connection between I/O module and master or expansion PCI drawers mounted in H9A20-AA/AB/AC expansion cabinet adjacent to system; two cables (BN39B-07 or BN39B-10) are mandatory per PCI drawer. BN39B-07

I/O module cables for connection between I/O module and master or expansion PCI drawers mounted in second expansion cabinet or in remote H9A20-AA/AB/AC expansion cabinets; two cables (BN39B-07 or BN39B-10) are mandatory per PCI drawer. BN39B-10

Step 7 – Internal Storage

PCI UltraSCSI Controllers

- Tru64 UNIX V4.0G or Tru64 UNIX V5.1 can support more SCSI controllers per hardware partition. Support for these controller quantities will be phased-in. Refer to the "Supported Options List" for specific rules.
- OpenVMS V7.2-1H1 or later supports 24 KZPBA-Cx SCSI controllers per system.
- Each master PCI drawer contains an embedded SCSI controller that must be included in the total count.
- For cluster configurations, use Y cable (BN39A-0G).
- Manufacturing may substitute correct cable lengths depending on configuration.

Note: "Per System" quantities apply to systems or to each hardware partition. The SCSI adapters included in the base system or in 3x-DWWPA-AA master PCI drawers must be included in this calculation.

	Maximum # Supported						
	Tru64 UNIX V4.0G/V5.1			OpenVMS V7.2-1H1			
	Per System	Per QBB	Per PCI Drawer	Per System	Per QBB	Per PCI Drawer	
PCI Fibre Channel adapter (uses one PCI slot); requires Fibre Channel cable	26	26	13	26	26	13	DS-KGPSA-CA
Fibre Channel cable (BNGBX-xx) xx=02, 05, 15, 30, 50 meters, y=1, 2, 3, 4, 5							234457-B2
PCI 1-port UltraSCSI single-ended host adapter (uses one PCI slot)	8	8	8	8	8	8	KZPBA-CA
PCI 1-port UltraSCSI differential host adapter (uses one PCI slot); requires BN38C-xx cable.	24	24	12	26	24	12	KZPBA-CB
VHDCI male-to-68-pin HD male UltraSCSI cable xx=03, 05, 10, 20 meters (-03 recommended for internal cabinet connections, -05, -10, -20 recommended for connections between cabinets)							BN38C-xx

CI Adapters (OpenVMS only)

PCI CI adapter, maximum 26 per system or hardware partition (12 per QBB, 6 per PCI drawer); requires two PCI slots CIPCA-BA

Computer interconnect cable set, connects CIPCA to star coupler; select length xx=10, 20, 45 meters BNCIA-xx

Options

Step 7 – Internal Storage (continued)

External Storage Arrays

- ESA 12000 Storage Arrays and RAID Array 8000 (HSG80/HSZ80 product set) are supported on Tru64 UNIX and OpenVMS systems.
- ESA 10000 Storage Arrays and RAID Array 7000 (HSZ70 product set) are supported on Tru64 UNIX and OpenVMS systems.
- Modular Array 6000 Storage Arrays (HSG60 product set) are supported on Tru64 UNIX and OpenVMS systems.
- SW800 CI Storage Arrays (HSJ5x product set) are supported on OpenVMS systems.
- Complete ordering and configuring information is available at www.compaq.com/products/StorageWorks/ (Only Tru64 UNIX and OpenVMS operating systems options are supported.)

Storage Array Controllers

The following controllers are used in StorageWorks array packaging:

HSZ70 RAID Array Controllers

- HSZ70 UltraSCSI RAID Array controllers for RA7000 and ESA10000 are supported under Tru64 UNIX V4.0G or Tru64 UNIX V5.1 and OpenVMS V7.2-1H1.
- HSZ70 UltraSCSI RAID Controllers require QB-5SBAB-SA/SB for Tru64 UNIX or QB-5SBAC-SA/SB for OpenVMS. Also required is 380566-B21/DS-HS35X-BC external cache.
- HSZ70 UltraSCSI Controllers require KZPBA-CB adapters and BN38C cables (and UltraSCSI hubs if used).

Note: For system integration of the following option, contact Compaq *CustomSystems*.

DS-HSZ70-AH UltraSCSI controller includes 64-MB cache expandable to 128 MB 116271-B21

HSZ80 RAID Controllers

- HSZ80 UltraSCSI RAID controllers for RA8000 and ESA12000 are supported under Tru64 UNIX V4.0G or Tru64 UNIX V5.1 and OpenVMS V7.2-1H1.
- HSZ80 UltraSCSI RAID controllers require platform kit 400569-001 for Tru64 UNIX or 400571-001 for OpenVMS. PCMCIA software kit, 400566-001/QB-678AA-SA, also required for each controller.
- HSZ80 UltraSCSI controllers require KZPBA-CB adapters and BN38C cables (and UltraSCSI hubs if used).

Note: For system integration of the following options, contact Compaq *CustomSystems*.

DS-HSZ80-AH UltraSCSI controller, includes 64-MB cache expandable to 128 MB 400564-B21

DS-HSZ80-AJ UltraSCSI controller, includes 256-MB cache expandable to 512 MB 400565-B21

HSG60 Fibre Channel Controllers

HSG60 Fibre Channel controllers for MA6000 and ESA12000 are supported under Tru64 UNIX V4.0G, Tru64 UNIX V5.1, and OpenVMS V7.2-1H1.

HSG60 Fibre Channel controllers require ACS software kit, QB-6J4AB-SA for Tru64 UNIX or QB-6J4AC-SA for OpenVMS.

HSG60 Fibre Channel controllers require KGPSA-CB or DS-KGPSA-CA Fibre Channel adapters, BNGBX cables, and fiber hubs or switches (see Fiber Hubs, Switches and Components)

Note: For system integration of the following options, contact Compaq *CustomSystems*.

HSG60 Fibre Channel controller, includes 256-MB cache 174134-B21

256-MB cache upgrade for HSG60 380674-B21

Options

Step 7 – Internal Storage *(continued)*

HSG80 Fibre Channel Controllers

- HSG80 Fibre Channel controllers for RA8000 and ESA12000 are supported under Tru64 UNIX V4.0G or Tru64 UNIX V5.1 and OpenVMS V7.2-1H1.
- HSG80 Fibre Channel controllers require platform kit 380553-001/QB-65RAB-SA for Tru64 UNIX or 380555-001/QB-65RAC-SA for OpenVMS. Software kit, 128697-B21 HSG80 ACS V8.4F or 128698-B21 V8.4P, also required for each HSG80 ordered.
- HSG80 Fibre Channel controllers require KGPSA-CB or DS-KGPSA-CA Fibre Channel adapters, BNGBX cables, and fiber hubs or switches (see Fiber Hubs, Switches and Components)

Note: For system integration of the following options, contact Compaq [CustomSystems](#).

DS-HSG80-BH Fibre Channel controller, includes 64-MB cache expandable to 128 MB	380671-B21
DS-HSG80-BJ Fibre Channel controller, includes 256-MB cache expandable to 512 MB	380672-B21
64-MB cache upgrade for HSx80 (DS-HSDIM-AB)	380673-B21
256-MB cache upgrade for HSx80 (DS-HSDIM-AC)	380674-B21

HSJ5x CI Storage Array Controllers

- HSJ5x CI Storage Array controllers are supported under OpenVMS V7.2-1H1 with CIPCA-BA CI controllers; QB-5C4AA-SA software kits required for each external cache (one for HSJ50, two for HSJ52, four for HSJ54).
- HSJ5x CI Storage Array controllers require star couplers (SC008-AB, -AC or -AD) with CIPCA-BA adapters and BNCIA cables.
- Controllers require KZPBA or CIPCA SCSI adapters or controllers, as appropriate.

Note: For system integration of the following options, contact Compaq [CustomSystems](#).

32-MB cache 6-channel CI array controller with cache battery	HSJ50-AF
64-MB cache 6-channel CI array controller with cache battery	HSJ50-AH
128-MB cache 6-channel CI array controller with cache battery	HSJ50-AJ
Dual 64-MB cache CI array controller with cache batteries	HSJ52-AF
Dual 128-MB cache CI array controller with cache batteries	HSJ52-AH
Dual 256-MB cache CI array controller with cache batteries	HSJ52-AJ
Quad 512-MB cache CI array controller with cache batteries	HSJ54-AJ

UltraSCSI Hubs

- UltraSCSI hubs are supported with KZPBA-CB PCI differential SCSI adapters.

UltraSCSI hub with three differential ports, no single-ended ports, consists of two host ports and one storage port in 3.5" SBB, UltraSCSI cables not included	DS-DWZZH-03
UltraSCSI hub with five differential ports, no single ended ports, consists of four host ports and one storage port in 5.25" SBB, UltraSCSI cables not included	DS-DWZZH-05
UltraSCSI hub with nine differential ports, no single ended ports, consists of eight host ports and one storage port in 5.25" SBB, UltraSCSI cables not included	DS-DWZZH-09

Options

Step 7 – Internal Storage *(continued)*

Fibre Hubs, Switches, and Components

Note: For system integration of the following options, contact Compaq *CustomSystems*.

12-port fibre hub, S.W.	295573-B22
8-port fibre switch	380591-B21
16-port fibre switch, S.W. OP	380578-B21
8-port fibre switch	158222-B21
16-port fibre switch, S.W. OP	158223-B21
Long wave GBIC	127508-B21
Unmanaged FC 7-port hub	234453-001
FC 7-port hub, International	234453-B31
FC 7-port hub, Japan	234453-291
FC 7-port hub mount kit	136127-B21
Short wave optical GBIC	380561-B21
FC 3 GBIC connection kit	380579-B21
FC 2 GBIC connection kit	380596-B21

Storage Devices

36.4-GB 7,200 rpm 16-bit UltraSCSI disk drive SBB	DS-RZ1FB-VW
36.4-GB 10,000 rpm 16-bit UltraSCSI disk drive SBB	DS-RZ1FC-VW
18.2-GB 10,000 rpm 16-bit UltraSCSI disk drive SBB	DS-RZ1ED-VW
18.2-GB 7,200 rpm 16-bit UltraSCSI disk drive SBB	DS-RZ1EA-VW
9.1-GB 10,000 rpm 16-bit UltraSCSI disk drive SBB	DS-RZ1DD-VW
9.1-GB 7,200 rpm 16-bit UltraSCSI disk drive SBB	DS-RZ1DA-VW

Tape Devices

32/64-GB DAT tape loader in StorageWorks carrier	TLZ9L-VA
12/24-GB 4mm DAT SCSI tape drive in 3.5" StorageWorks carrier	DS-TLZ10-VA
20/40-GB DLT SCSI tape drive in 5.25" StorageWorks carrier	TZ88N-VA
35/70-GB DLT SCSI tape drive in 5.25" StorageWorks carrier	DS-TZ89N-VW

Compatible Storage Devices

The following tape drives are compatible with the AlphaServer GS80:

- TZ88, TSZ07, TLZ09, TKZ62, TKZ63, TKZ90, TLZ9L, TL800, TL891, TL892, TL890, TL893, TL894, TL895, TL896, DS-TLZ10-VA, TSZ20, TSZ08, DLT7000, AIT35, TZ89N

Options

Step 8 – Networks and Communications

- One Fast Ethernet adapter included in base systems. Connection of system to Ethernet requires twisted-pair cable.

PCI LAN Communications Controllers

- Requires 3X-DWWPA-AA /BA PCI shelf mount box
- Each adapter/controller uses one PCI slot
- A maximum of eight network adapters – 3X-DE602-AA, DEGPA-SA, 3X-DEFPA-xx – are supported per system or hardware partition.

Note: "Per System" quantities apply to systems or to each hardware partition. The 3X-DE602-AA included in base system must be included in these calculations.

	Maximum # Supported						
	Tru64 UNIX			OpenVMS			
	Per System	Per QBB	Per PCI Drawer	Per System	Per QBB	Per PCI Drawer	
10/100-Mbit Fast Ethernet Adapter							
PCI Dual Base 10/100 Fast Ethernet adapter (338456-B21)	8	8	8	8	8	8	3X-DE602-AA
Single-port multi-mode fiber add-on daughter card	8	8	8	8	8	8	3X-DE602-FA
Category 5 cross-over cable for point-to-point, unshielded xx=01, 03, 04, 07, 0E for 1,3,4, 7, 0.5 meters							BN24Q-xx
Category 5 cross-over cable for point-to-point, shielded xx=01, 03, 04, 07, 0E for 1,3,4, 7, 0.5 meters							BN28Q-xx
Category 5 straight through for system to repeater or hub, unshielded, xx=01, 03, 04, 07, 0E, 0B for 1,3,4, 7, 0.5, 0.2 meters							BN25G-xx
FDDI Controllers							
PCI FDDIcontroller, fiber, single-attachment station multimode fiber, requires BN34x SC type connecting cable; maximum six DEFPA-AC/DC/UC/MC per system	8	8	8	8	8	8	3X-DEFPA-AC
PCI FDDIcontroller, fiber, dual-attachment station multimode fiber, requires BN34x SC type connecting cable; maximum six DEFPA-AC/DC/UC/MC per system	8	8	8	8	8	8	3X-DEFPA-DC
Multimode fiber optic duplex cable, SC connector-to-ST connector, xx=01, 03, 10, 20, 30, 2E, 4E for 01, 03, 10, 20, 30, 2.5, 4.5 meters							BN34A-xx
Multimode fiber optic duplex cable, SC connector-to-SC connector, xx=01, 03, 10, 20, 30, 2E, 4E for 01, 03, 10, 20, 30, 2.5, 4.5 meters							BN34B-xx
Multimode fiber optic duplex cable, SC connector-to-MIC connector, xx=01, 03, 10 for 01, 03, 10 meters							BN34D-xx
PCI FDDIcontroller, copper, dual-attachment station UTP, requires BN26x or BN25H connecting cables; maximum six DEFPA-AC/DC/UC/MC per system	8	8	8	8	8	8	3X-DEFPA-MC
PCI FDDIcontroller, copper, single-attachment station UTP, requires BN26x or BN25H connecting cables; maximum six DEFPA-AC/DC/UC/MC per system	8	8	8	8	8	8	3X-DEFPA-UC
8-pin MP-to-8-pin MP, screened, EIA/TIA category 5 cable							BN26M-xx
8-pin MP-to-8-pin MP, screened, crossover, EIA/TIA category 5 cable, 3 meters							BN26S-03
3-m unshielded twisted pair RJ45 connectors							BN25H-03
Gigabit Ethernet Adapter							
For maximum performance, Compaq recommends configuring two DEGPA-SA adapters (or less) per PCI drawer, however, eight adapters per PCI drawer may be configured to achieve maximum connectivity.							
PCI Gigabit Ethernet adapter, does not support network boot	8	8	8	8	8	8	DEGPA-SA

Options

Step 8 – Networks and Communications *(continued)*

ATM Adapters

For maximum performance, Compaq recommends configuring four 3X-DAPCA-FA adapters (or less) per PCI drawer, however, eight adapters per PCI drawer may be configured to achieve maximum connectivity.

PCI-to-ATMworks 155-Mbit adapter, fiber	8	8	8	-	-	-	3X-DAPBA-FA
PCI-to-ATMworks 155-Mbit adapter, UTP	8	8	8	-	-	-	3X-DAPBA-UA
PCI-to-ATMworks 622-Mbit adapter, fiber	8	8	8	-	-	-	3X-DAPCA-FA

Step 9 – MEMORY CHANNEL

- Up to two PCI System Area Network controllers supported on AlphaServer GS80 systems
- Two-node clusters can be configured by ordering a CCMAB-AA for each system and one BN39B-04 or BN39B-10 cable, cable connects directly to CCMAB-AA in each system
- For three or four system clusters, order one CCMAB-AA adapter and one BN39B-04 or BN39B-10 cable for each system 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 additional CCMLB-AA line cards
- If two or more CCMAB-AA controllers are configured in each system, a second CCMHB-AA hub is required for clusters with more than two nodes; in two-node clusters the CCMAB-AA may be directly connected
- One or two MEMORY CHANNEL adapters may be placed on a PCI bus segment; however, no other devices may be placed on the same segment, and the remaining slots must be left empty.

Tru64 UNIX Systems (V5.1 and later)

- Each system in the cluster requires a TruCluster Server software license (QL-6BRAG-AA)

Tru64 UNIX Systems (V4.0G)

- Requires Tru64 UNIX V4.0G with TruCluster V1.6
- Each system node in a MEMORY CHANNEL cluster requires a TruCluster Production Server (QB-3RLAG-AA) or TruCluster MEMORY CHANNEL (QB-4ZCAG-AA) software license
- TruCluster MEMORY CHANNEL license (QB-4ZCAG-AA), normally used for high performance technical computing applications, not required if systems include a TruCluster Production Server license (QB-3RLAG-AA)

OpenVMS Systems

- Requires OpenVMS V7.2-1H1 or later and OpenVMS Cluster license (QL-MUZAG-AA)

MEMORY CHANNEL Fiber Optic Cable Option

- In cases where nodes must be separated by a longer distance 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.
- The 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 connection. Customers should reference the TIA/EIA 568-A Commercial Building Telecommunications Cabling Standard, Section 12.3.4. Fiber optic connectivity is completely transparent to the systems using it and has no performance impact.
- Up to two CCMHB-AA hubs may be mounted in an H9A20-AA expansion cabinet by utilizing a 2T-MAVRK-AA rack-mounting kit for each hub. Each CCMHB-AA hub mounted in an expansion cabinet replaces the space available for one PCI drawer.

Options

Step 9 – MEMORY CHANNEL *(continued)*

MEMORY CHANNEL Controller

PCI System Area Network controller, maximum two per system, two per QBB, two per PCI drawer, two per PCI segment.	CCMAB-AA
System Area Network hub with four line cards; includes BN19P-2E power cord for Canada, Japan, and US operations; country-specific power cord for other regions is required	CCMHB-AA
MEMORY CHANNEL hub expansion box with no line cards	CCMHB-BA
MEMORY CHANNEL hub rack-mounting kit	2T-MAVRK-AA
Expansion line card for CCMHB hub	CCMLB-AA
1-m cable for CCMAB and CCMHB	BN39B-01
4-m cable for CCMAB and CCMHB	BN39B-04
10-m cable for CCMAB and CCMHB	BN39B-10
Copper-to-single mode fiber optic converter	CCMFB-AA

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	BN19M-2E
Japan	3X-BN46F-02
Switzerland	BN19E-2E

Power Cord for MEMORY CHANNEL Hubs Rackmounted in H9A20-AA/AB/AC Cabinets

IEC 320 power cord (one mandatory per hub)	BN35S-02
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(Note: MEMORY CHANNEL hubs mounted in H9A20-AA cabinets do not require additional power cords.)

Step 10 – System Console Support

System Management Console

- GS80 systems require the ability to log console messages, provide remote access for service and support, and, in some cases, manage multiple hardware partitions. The system management console is mandatory if the customer has no other means to provide these capabilities.
 - PC-based system management console is required for system power-up, diagnostics, console partitioning, and console display and logging for use with AlphaServer GS80 systems.
 - Includes network interface cards, universal modem, Compaq console software, 101-key keyboard, mouse, and console documentation kit
 - A monitor is required for use with the system management console. Choose monitor listed in Step 12.
 - Systems configured with redundant consoles or employing hardware partitioning require the ability to connect multiple consoles. A console hub is mandatory if the customer has no other means to provide these capabilities.
 - Console printer recommended, but not required.
- | | |
|--|-------------|
| PC-based system management console in tower package, includes network interface cards and Compaq console software | 3X-DS8BA-AA |
| PC-based system management console in mini-tower package, includes network interface cards and Compaq console software, Europe | 3X-DS8BA-AB |
| PC-based system management console in desktop package, includes network interface cards and Compaq console software, US/Canada/Japan | 3X-DS8BA-BA |
| PC-based system management console in desktop package, includes network interface cards and Compaq console software, Europe | 3X-DS8BA-BB |
| Console hub for use with system management console, includes console concentrator, cables, and universal power supply; mounts in system cabinet and communicates with the system management console over Ethernet using the Telnet protocol. | 3X-DS8AA-AA |

Options

Step 10 – System Console Support *(continued)*

System Management Console – Modem Localization Kits

System management consoles include one adapter kit

- 3X-DS8BA-AA/BA includes a localization kit for use in US, Canada, Japan, Mexico, Brazil, Argentina, Peru and Taiwan
- 3X-DS8BA-AB/BB includes a localization kit for use in Great Britain, Ireland, Hong Kong, Singapore, and Malaysia

In all other cases, the appropriate localization kit is required:

Australia	3R-A1608-AA
Austria	3R-A1607-AA
Belgium	3R-A1609-AA
China	3R-A1594-AA
Denmark	3R-A1596-AA
Finland, Norway	3R-A1597-AA
France	3R-A1598-AA
Germany	3R-A1595-AA
Greece	3R-A1606-AA
India	3R-A1600-AA
Italy	3R-A1601-AA
Netherlands	3R-A1602-AA
New Zealand	3R-A1603-AA
Sweden, Iceland	3R-A1604-AA
Switzerland	3R-A1610-AA

System Management Console – Country-specific Power Cords

- System management console includes a line cord for use in North America. Order a country-specific line cord if required.

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	3X-BN46F-02
North America	BN26J-1K
Switzerland	BN19E-2E

Step 11 – Graphics Support

- Graphics support for GS80 can be provided through use of a graphics adapter
ELSA Gloria synergy graphics with 8-MB SGRAM 1600 x 1200, 2D/3D graphic accelerator, maximum one per system SN-PBXGK-BB

Options

Step 12 – Monitors

- Graphics monitors other than those listed below can be used if compatible with SVGA graphics ordered with system.
- Selection of video extension cable and country-specific power cord is mandatory for all monitors.

15" Corporate Series auto-scan color monitor, VGA to 1024 x 768 @ 85 Hz; Northern Hemisphere without power cord	3R-VRQV5-24
Same as above except Southern Hemisphere without power cord	3R-VRQV5-11
17" (16" viewable image size) professional series auto-scanning color monitor, flat definition Trinitron CRT, 0.25 mm aperture grill pitch, VGA to 1280 x 1024 at 75 Hz, TCO 99, MPR-II, Energy Star, includes 1.8-m video cable; Northern Hemisphere without power cord	3R-VRQP7-24
Same as above except Southern Hemisphere without power cord	3R-VRQP7-23
19" (18" viewable image size) professional series auto-scanning color monitor, flat definition Trinitron CRT, 0.25 mm aperture grill pitch, VGA to 1280 x 1024 at 75 Hz, TCO 99, MPR-II, Energy Star, includes 1.8-m video cable; Northern Hemisphere without power cord	3R-VRQP9-24
Same as above except Southern Hemisphere without power cord	3R-VRQP9-23
21" (19.6" viewable image size) auto-scanning color monitor, Trinitron CRT, 0.28 mm aperture grill pitch, VGA to 1600 x 1200 at 85 Hz NI, TCO 99, Energy Star, includes 1.8-m video cable; Northern Hemisphere without power cord	3R-VRQP1-24
Same as above except Southern Hemisphere without power cord	3R-VRQP1-23

Video Extension Cable

1.8-m video extension cable; order one for each monitor	BN39C-02
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Monitor Power Cords

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	BN19M-2E
Japan	3X-BN46F-02
North America	BN26J-1K
Switzerland	BN19E-2E

Options

Step 13 – System Software

- Media and documentation required for first system on site
- Software Processor Code = G

Tru64 UNIX

- Tru64 UNIX base systems include pre-installed software, Base license, Unlimited User license, Server Extension license, Open Source Internet Solutions, and iPlanet Web Server Enterprise Edition 4.0

When using Tru64 UNIX V5.1 or later

Tru64 UNIX media and online documentation on CD-ROM	QA-6ADAA-H8
Tru64 UNIX full hard copy documentation	QA-6ADAA-GZ
StorageWorks software package with licenses for Logical Storage Manager and AdvFS Utilities	QB-5RXAG-AA
TruCluster Server license	QL-6BRAG-AA
Advanced Server for Tru64 UNIX, 25 client concurrent use license	QL-5U29M-3D
Advanced Server for Tru64 UNIX, 50 client concurrent use license	QL-5U29M-3E
Advanced Server for Tru64 UNIX, 100 client concurrent use license	QL-5U29M-3F
Advanced Server for Tru64 UNIX, 250 client concurrent use license	QL-5U29M-3G
Advanced Server for Tru64 UNIX, 500 client concurrent use license	QL-5U29M-3H
Layered products media and documentation for Tru64 UNIX on CD-ROM	QA-054AA-H8
DECnet/OSI extended function license for Tru64 UNIX	QL-MTJAG-AA
DECnet/OSI end-system license for Tru64 UNIX	QL-MTKAG-AA

When using Tru64 UNIX V4.0G

Tru64 UNIX media and online documentation on CD-ROM	QA-MT4AA-H8
Tru64 UNIX full hard copy documentation	QA-MT4AA-GZ
StorageWorks software package with licenses for Logical Storage Manager and AdvFS Utilities	QB-5RXAG-AA
TruCluster Available Server license	QL-05SAG-AA
TruCluster Production Server license	QB-3RLAG-AA
Tru64 UNIX Driver for MEMORY CHANNEL license	QB-4ZCAG-AA
Advanced Server for Tru64 UNIX, 25 Client Concurrent License	QL-5U29M-3D
Advanced Server for Tru64 UNIX, 50 Client Concurrent License	QL-5U29M-3E
Advanced Server for Tru64 UNIX, 100 Client Concurrent License	QL-5U29M-3F
Advanced Server for Tru64 UNIX, 250 Client Concurrent License	QL-5U29M-3G
Advanced Server for Tru64 UNIX, 500 Client Concurrent License	QL-5U29M-3H
Layered products media and documentation for Tru64 UNIX on CD-ROM	QA-054AA-H8
DECnet/OSI end-system license	QL-MTJAG-AA
DECnet/OSI extended function license	QL-MTKAG-AA

Options

Step 13 – System Software (continued)

OpenVMS

- OpenVMS system base packages include Base license and Compaq Enterprise Integration Server for OpenVMS License Package Revision V3.0A
- 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.

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 Galaxy

OpenVMS Galaxy Licensing Requirements

For more details about OpenVMS Galaxy licensing requirements, refer to the Software Product Description for the Compaq Galaxy Software Architecture on OpenVMS Alpha: SPD 70.44.xx – OpenVMS Update 05 is required.

- One OpenVMS Base Operating System License (included in base system) is mandatory for AlphaServer GS80 configured as an OpenVMS Galaxy system.
- One SMP Extension License (included in SMP CPU upgrade) is mandatory for each CPU after the first CPU.
- For each AlphaServer GS80 CPU in an OpenVMS Galaxy, one OpenVMS Galaxy License is mandatory.
- Compaq layered products are licensed as follows:
 - One capacity license per system
 - One user license per use
- Up to two instances of OpenVMS are supported in OpenVMS Galaxy configurations on AlphaServer GS80 systems.

For more information about OpenVMS Galaxy requirements, configurations, and procedures, refer to the OpenVMS Alpha Galaxy Guide. The latest version is always available at <http://www.openvms.compaq.com/gsseries/index.html>

Compaq Galaxy 1-CPU License	QL-66XAA-3B
Compaq Galaxy 2-CPU License	QL-66XAA-3C
Compaq Galaxy 4-CPU License	QL-66XAA-3D
Compaq Galaxy 8-CPU License	QL-66XAA-3E
OpenVMS V7.2-1H1 media and online documentation on CD-ROM	QA-MT1AU-H8
OpenVMS media and documentation on CD-ROM	QA-MT1AA-H8
OpenVMS base hard copy documentation	QA-09SAA-GZ
Layered products media and documentation for OpenVMS on CD-ROM; includes Compaq Enterprise Integration Server for OpenVMS media and documentation	QA-03XAA-H8
DECnet/OSI end-system license	QL-MTFAG-AA
DECnet/OSI extended-function license	QL-MTHAG-AA
Cluster License for OpenVMS Alpha	QL-MUZAG-AA

Example: 8-CPU GS80 system in which all processors are licensed for OpenVMS with two hard partitions (each with four CPUs) and all CPUs licensed for Galaxy:

- Base system order would include a DY-A80BA-Ax and seven 3X-KN8AA-AC SMP upgrade CPUs
- Add one QL-66XAA-3E Compaq Galaxy 8-CPU License
- No other licenses are required for OpenVMS on the SMP instance in the second hard partition with four CPUs.

Options

Step 14 – Hardware and Software Support Services

- Installation or Installation and Startup is required for all AlphaServer GS80 systems.
- Priority Plus Service Plans Packages are shown below.
- Other service levels are available. Consult a Compaq Customer Service Account Representative for assistance in selecting the support plan that is most appropriate. For more information on Compaq Services see: <http://www.compaq.com/services/>

Installation Services

GS80 Installation Service Package	FP-WINST-80
GS80 Installation Service and Start-up Package	FP-WSTAR-80

GS80 Model 4 Priority Service Plan Packages

- Systems include 1-year hardware warranty, on-site, next day response. Select optional Priority Service Plan Package, as required:

	1-year Service	3-year Service
1-year Priority 24 Service	FP-W0201-12	FP-W0201-36
1-year Priority Plus Service	FP-W0301-12	FP-W0301-36
1-year Priority Premier Service	FP-W0501-12	FP-W0501-36
1-year Priority Executive Premier Service	FP-W0601-12	FP-W0601-36

GS80 Model 8 Priority Service Plan Packages

- Systems include 1-year hardware warranty, on-site, next day response. Select optional Priority Service Plan Package, as required:

	1-year Service	3-year Service
1-year Priority 24 Service	FP-W0202-12	FP-W0202-36
1-year Priority Plus Service	FP-W0302-12	FP-W0302-36
1-year Priority Premier Service	FP-W0502-12	FP-W0502-36
1-year Priority Executive Premier Service	FP-W0602-12	FP-W0602-36

Software – Americas and Asia Pacific Only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services if required.
- Software service upgrades for Tru64 UNIX include advisory and remedial software support with new version license rights for Tru64 UNIX Base, unlimited users, and Server Extensions
- Software service upgrades for OpenVMS include advisory and remedial software support with new version license rights for OpenVMS Base and Enterprise Integration Package

Recommended Quickstart Services

AlphaServer GS80 Quickstart Service – This service allows customers to quickly configure and setup their systems for optimal performance and best use of system management and system maintenance features. This 40-hour service will:

- Evaluate their requirements and current systems/applications environment
- Plan the server partitioning, storage layout, installation, and migration of the new system
- Perform installation and setup
- Provide initial system performance tuning
- Provide training in the use of the System Control Manager

GS80/160 Quickstart Evaluate and Plan	QS-GS1A9-CP
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Options

Step 14 – Hardware and Software Support Services *(continued)*

Recommended Factory Integration Services

Value-added Implementation Services (VIS) provide systems integration and delivery services. VIS services, including system integration, extended burn-in, custom documentation, and on-site services can be custom-quoted for the full range of AlphaServer configurations.

Two pre-packaged VIS services are recommended for popular AlphaServer GS80 system configurations that include one ESA12000 storage array:

- VIS Level 1: System integration, testing, extended burn-in, and custom documentation of non-partitioned systems
- VIS Level 2: System integration, testing, extended burn-in, and custom documentation of hardware-partitioned systems

VIS Level 1 and Level 2 Package Contents

	VIS Level 1 North America and Europe	VIS Level 2 North America only
Custom module placement and verification	Yes	Yes
Configuration, exercise, and test of one ESA 12000 external storage unit including up to 72 disk drives that are included in system order.	Yes	Yes
Configure HSGxx or HSZxx controllers that are included in the system order	Yes	Yes
Configure RAID, mirror, or stripe sets to customer requirements	Yes	Yes
Configure hardware partitions	No	Yes; up to 4
Software load and installation of Tru64UNIX or OpenVMS	Single Instance	Multiple Instances
100-hour full system burn-in	Yes	Yes
Custom Configuration Documentation	Yes	Yes

Level 1 Value-added Implementation Services for non-partitioned AlphaServer GS80/160/320 systems for North America and Europe YT-CSSIT-V1

Level 2 Value-added Implementation Services for partitioned AlphaServer GS80/160/320 systems for North America only YT-CSSIT-V2

For Level 2 services in Europe, e-mail specific requirements to: customsystems.europe@compaq.com

Full Custom Configurations

VIS Level 1 and Level 2 packages address the most-common customer requirements. For a wider range of configurations, customers can also choose additional customized services based upon a Statement of Work agreement. This includes: cluster add-on nodes, larger storage configurations, custom option support, custom system packaging, mixed operating system partitions, and configured multi-system clusters.

Upgrades

AlphaServer GS80 System Hardware Upgrades

AlphaServer GS80 systems are field upgradeable to support up to eight CPUs.

- AlphaServer GS80 Model 4 can be internally upgraded to an AlphaServer GS80 Model 8 by adding an additional quad building block.
- Additional upgrades to the AlphaServer GS160 are available. Contact Compaq for details.

System expansion hardware to upgrade an AlphaServer GS80 Model 4 to an AlphaServer GS80 Model 8. Includes one quad building block and associated power supplies and cabling. For use in North America with DA/DY-A80xA-AC DH-A80BB-AC

System expansion hardware to upgrade an AlphaServer GS80 Model 4 to an AlphaServer GS80 Model 8. Includes one quad building block and associated power supplies and cabling. For use in Japan and Europe with DA/DY-A80xA-AD/AE DH-A80BB-AD

Compaq Capacity on Demand (CCoD) Program

AlphaServer GS80 customers can add additional CPU capacity on demand without waiting to purchase the resource when it is required and without re-booting their system. The Compaq Capacity on Demand Program, outlined below, is a two-part process.

Part 1

- Customer purchases a system with Tru64 UNIX or OpenVMS CCoD SMP CPU(s) (3X-KN8CA-AD or 3X-KN8CA-AE), or customer purchases Tru64 UNIX or OpenVMS CCoD SMP CPU(s) for field installation within an installed AlphaServer GS80 system.
- When purchasing the CCoD CPU(s), the customer signs a CCoD program agreement to purchase the CPU module(s) within 12 months or upon "first use" of the module(s).
- A blank copy of the agreement is available at <http://www.compaq.com/alphaserver/cod>
Full program terms are outlined in this agreement.

Part 2

- The customer will be invoiced for the CPU module(s) upon notification by the customer of "first use" or expiration of the 12-month period.

Notes:

- CCoD CPUs are field installed. Field installation is not included in the CPU option price.
- Minimum operating system requirements: Tru64 UNIX V4.0G (V5.1 support planned for early 2001), OpenVMS V7.2-1H1

GS80 CCoD SMP CPU, includes one 6/731-MHz CPU module with 4-MB on-board cache and Tru64 UNIX SMP license for use under the CCoD program terms 3X-KN8CA-AB

GS80 CCoD SMP CPU, includes: one 6/731-MHz CPU module with 4-MB on-board cache and OpenVMS SMP license for use under the CCoD program terms 3X-KN8CA-AC

QUICKSPECS

Compaq AlphaServer GS80

Technical Specifications

Physical Characteristics	GS80 Model 4	GS80 Model 8	
Dimensions (HxWxD)	67 x 24 x 39.4 in / 170 x 60 x 100 cm	67 x 24 x 39.4 in / 170 x 60 x 100 cm	
Shipping Dimensions	76.5 x 36 x 48 in / 195 x 79.2 x 122 cm	76.5 x 36 x 48 in / 195 x 79.2 x 122 cm	
Weight Max Config kg (lb)	260 (575)	260 (575)	
Max Shipping Weight kg (lb)	320 (705)	320 (705)	
Heat dissipation	GS80 Model 4	GS80 Model 8	
Minimally configured system ⁽¹⁾	1150 W / 3800 Btu/hr	1900 W / 6400 Btu/hr	
Fully configured system ⁽²⁾	2100 W / 7150 Btu/hr	3450 W / 11650 Btu/hr	
Fully configured system ⁽³⁾ (system cabinet with one I/O expansion cabinet)	4450 W / 15100 Btu/hr	5750 W / 19600 Btu/hr	
Clearances	Operating	Service	
Front	29.5 in, 75 cm	29.5 in, 75 cm	
Rear	29.5 in, 75 cm	29.5 in, 75 cm	
Left Side	None	None	
Right Side	None	None	
Environmental	Operating	Non-Operating	
Temperature	41°F to 95°F / 5°C to 35°C	-40°F to 151°F / -40°C to 66°C	
Humidity	10% to 90%	10% to 95%	
Altitude	0-10,000 ft / 0-3 km	40,000 ft / 12.2 km	
Vibration	5-500 Hz @ .1G maximum		
Regulatory			
Agency approvals	UL Listed to UL1950 cUL Listed to CAN/C22.2 No. 950-M89FCC Part 15 (Class A) CE Declaration		
Reviewed to	EN 60950 1922/A4:1997, European Norm AS/NZS 3260:1993, Australian/New Zealand Standard 73/23/EEC, Low Voltage Directive IEC950, 2nd Ed., 4th Amend.		
Power Requirements ^(4, 5)	GS80 Model 4		
	US/Canada	Japan	Europe
Nominal voltage(s)	120V	200-240V	220-240V
Frequency range	50 Hz–60 Hz	50 Hz–60 Hz	50 Hz–60 Hz
Phases	2 circuits 1-phase star 2-wire+GND	1 circuit 1-phase 2-wire +GND	1 circuit 1-phase 2-wire+GND
Maximum input current/circuit	16A	13A	12A
Rating	30A	30A	32A
Surge current	60A peak	160A peak	190A peak
Total Volt-Amps	2600VA	2600VA	2600VA
Power cord length	15 ft / 4.5 m	15 ft / 4.5 m	15 ft / 4.5 m
Power cap (system)	2 DEC 12-11193-00	1 DEC 12-16886-00	1 DEC 12-14379-07
Receptacle (site)	2 DEC 12-11194-00	1 DEC 12-19658-01	1 Hubbell 332R6W
(industry equivalent)	2 NEMA L5-30R	1 NEMA L6-30R	1 IEC 309 (32A)

Technical Specifications

	Power Requirements ^(4,5)		
	US/Canada	Japan	Europe
Nominal voltage(s)	120V	200-240V	220-240V
Frequency range	50 Hz–60 Hz	50 Hz–60 Hz	50 Hz–60 Hz
Phases	2 circuits 1-phase star 2-wire+GND	1 circuit 1-phase 2-wire +GND	1 circuit 1-phase 2-wire+GND
Maximum input current/circuit	17A	20A	18A
Rating	30A	30A	32A
Surge current	60A peak	200A peak	240A peak
Total Volt-Amps	3900VA	3900VA	3900VA
Power cord length	15 ft / 4.5 m	15 ft / 4.5 m	15 ft / 4.5 m
Power cap (system)	2 DEC 12-11193-00	1 DEC 12-16886-00	1 DEC 12-14379-07
Receptacle (site)	2 DEC 12-11194-00	1 DEC 12-19658-01	1 Hubbell 332R6W
(industry equivalent)	2 NEMA L5-30R	1 NEMA L6-30R	1 IEC 309 (32A)

- (1) Depending on Model 4 or 8, a minimally configured system contains two or four power supplies, single CPU module, single memory module, single system I/O module, minimally configured PCI shelf, and one disk drive.
- (2) Depending on Model 4 or 8, a fully configured system contains three or six power supplies, four or eight CPU modules, four or eight memory modules, two or four system I/O modules, one PCI shelf, and a single storage shelf with six disk drives.
- (3) Fully configured system and one expansion cabinet consist of the above "fully configured system" and one expansion cabinet that includes three PCI shelves, four storage shelves with a total of 24 disk drives.
- (4) Power system provides near unity power factor that allows full utilization of the input line current (Watts = VA).
- (5) The US/Canada model supports nominal input voltages of 115-117V. The Japan and Europe models support nominal input voltages of 200-240V.

Technical Specifications

H9A20 I/O Expander Cabinet

Physical Characteristics

Dimensions (HxWxD)	67 x 24 x 39.4 in / 170 x 60 x 100 cm
Shipping Dimensions	76.5 x 44 x 48 in / 195 x 92 x 122 cm
Weight - kg (lb)	
Maximum configuration	613 (1349)
Shipping Weight - kg (lb)	
Maximum configuration	743 (1635)

Clearances	Operating	Service
Front	29.5 in, 75 cm	29.5 in, 75 cm
Rear	6.0 in, 15 cm	29.5 in, 75 cm
Left Side	None	None
Right Side	None	None

Environmental	Operating	Non-Operating
Temperature	41°F to 95°F / 5°C to 35°C	-40°F to 151°F / -40°C to 66°C
Humidity	10% to 90%	10% to 95%
Altitude	0-10,000 ft / 0-3 km	40,000 ft / 12.2 km
Vibration	5-500 Hz @ .1G maximum	
Heat dissipation ¹	Minimally configured cabinet⁽¹⁾ 250 W / 850 Btu/hr Fully configured cabinet⁽²⁾ 2,400 W / 8,200 Btu/hr	

Power Requirements ⁽³⁾	US/Canada	Japan	Europe
Nominal voltage(s)	120V	200-240V	220-240V
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Phases	2 circuits 1-phase 2-wire+GND	2 circuits 1-phase 2-wire+GND	2 circuits 1-phase 2-wire+GND
Maximum input current/circuit	22A	12A	11A
Rating	30A	30A	32A
Surge current	150A peak	150A peak	170A peak
Total Volt-Amps	2600VA	2600VA	2600VA
Power cord length	15 ft / 4.5m	15 ft / 4.5m	15 ft / 4.5m
Power cap (system)	2 DEC 12-11193-00	2 DEC 12-16886-00	2 DEC 12-14379-07
Receptacle (site)	2 DEC 12-11194-00	2 DEC 12-19658-01	2 Hubbell 332R6W
(industry equivalent)	2 NEMA L5-30R	2 NEMA L6-30R	2 IEC 309 (32A)

(1) Minimally configured expander cab contains a minimally configured PCI shelf and one disk drive

(2) Fully configured expander cab contains three PCI shelves and 24 disk drives

(3) The US/Canada model supports nominal input voltages of 115-117V. The Japan and Europe models support nominal input voltages of 200-240V.