

DEC 7000 AXP and DEC 10000 AXP Systems

Data Center, Enterprise-wide Solutions for the 21st Century

digital



**Putting
Imagination
to Work...**

*Implementing
Open Client/Server
Solutions*

DEC 7000 AXP™ and DEC 10000 AXP systems are the highest-performance members of Digital's 64-bit family of Alpha AXP™ servers. They offer single- or multiprocessing capability for mission-critical technical and commercial applications that previously required larger, more costly systems. If you need a high-performance system, you'll find that you can downsize your application on the DEC 7000 AXP system and get powerful performance at low cost. If your IS resources are limited, choose the DEC 10000 AXP system for a comprehensive, integrated, packaged solution that provides exceptional service and support.

These systems can grow as your needs grow because they are the industry's most expandable servers. The modular platform lets you improve performance in a number of different dimensions—symmetric multiprocessing (SMP), larger memory, more I/O bandwidth, greater disk capacity, Prestoserve™, and clustered systems—all while building upon your current investments.

Digital's Alpha AXP solutions offer a choice of open operating system environments: OpenVMS AXP or the UNIX®-based DEC OSF/1® AXP. You can count on getting seamless integration with servers, workstations, and PCs from other computer vendors, as well as Digital. Outstanding hardware and software investment protection is ensured through Network Application Support (NAS) and client/server computing.

With exceptional performance, the highest levels of reliability and dependability, the utmost flexibility and expandability, and the world's fastest RISC processor, these Alpha AXP servers are 21st century systems. They deliver the complete environment for compute-intensive, data center, and commercial applications—today and tomorrow!

Unparalleled Performance and Scalability

The DEC 7000 AXP and DEC 10000 AXP servers offer identical technical specifications and performance — the highest level of performance of any data center system on the market today. These systems also offer outstanding configuration flexibility. A standard internal 128-bit-wide synchronous system bus provides 800 MB/s peak (640 MB/s sustained) bandwidth, virtually eliminating the potential for bottlenecks. Support for up to six CPUs, seven memory arrays (ranging from 64 MB to 512 MB capacity), and four XMI I/O channels or one Futurebus+ I/O channel allows users to configure large systems to suit a wide variety of needs. The CPU, memory, and I/O are all upgradable to future generations of components, protecting the investments you make today.

SCSI-2 and SDI-based storage are supported. The SCSI-2 disks reside in BA350 modular storage arrays within the system cabinet and expander cabinets. Each storage shelf holds as many as seven SCSI devices. A total of 20 modular storage shelves can be accommodated internally on an expanded system — bringing the total to 280 GB of local SCSI-2 storage. External SDI storage provides more than 10,000 gigabytes of disk storage in an OpenVMS clustered configuration — easily enough capacity for the largest data center applications. Additionally, DSSI-based storage will be supported in a future release of OpenVMS AXP, providing flexibility and investment protection for customers with DSSI-based systems.

A balanced I/O subsystem provides substantial throughput (one 100 MB/s XMI I/O channel is standard). That capacity can be greatly expanded by the addition of up to three more 12-slot XMI I/O channels or one 9-slot 180 MB/s Futurebus+ I/O channel, for a total I/O bandwidth of 400 MB/s. The ability to access third-party I/O adapters and devices is provided via Futurebus+ adapters.

Prestoserve is offered to increase the NFS® responsiveness of servers operating with DEC OSF/1 AXP. Prestoserve significantly improves NFS throughput in heavy workloads, so file servers can support more clients and provide better response times.

High Availability Features

For these Alpha AXP systems, high availability means the ability to continue functioning in the event of a power outage, not just maintain memory contents. Ongoing operation is ensured by the high-reliability features incorporated in the basic design. The CPU technology is based on Digital's proven high-reliability CMOS technology. ECC protection is provided on the system bus, on all memory modules, and on the 4 MB CPU write-back cache. The power system uses several power conditioning functions to protect against high-voltage transients.

An optional N+1 power system (standard on the DEC 10000 AXP system) allows for higher system availability in the event of a power regulator failure. Systems can be configured with up to three power regulators per cabinet (standard on the DEC 10000 AXP system), ensuring that even the most heavily configured systems can keep operating if a power regulator fails. Optional system-level UPS (Uninterruptible Power System) capability (standard on the DEC 10000 AXP system) is available to support *all*

elements within the CPU and I/O expansion cabinets: CPU, memory, I/O channels and devices, and in-cabinet disk storage. Plus, warm swap of disks is supported, thereby ensuring exceptional levels of availability.

Ethernet, CI, FDDI, and DSSI OpenVMS Clustered Systems

OpenVMS clustered systems are years ahead of the competition, making Digital the world's largest supplier of high availability solutions. Clustering allows multiple computer systems to share disks and spread the computing load across multiple CPUs. Through clustering, a collection of processors and storage elements can operate as one system. OpenVMS clustered systems represent yet another way to grow Alpha AXP servers.

Ethernet-based local area clusters provide a low-cost avenue to resource sharing, centralized system management, and increased data storage for workgroup users.

CI clustered systems support multiple paths to provide higher availability and performance for business-critical computing. Over 10,000 gigabytes (10 terabytes) of storage can be supported by these servers in a CI clustered configuration. This is a phenomenal amount of storage, offering both growth and high availability.

FDDI clustered configurations connect geographically dispersed sites into an FDDI network, which can provide either redundant data center operations or consolidate the management of the data center sites at one location. In all clustered systems — whether the interconnect is FDDI, CI, DSSI, or Ethernet — all data is available to all systems on the cluster.

When DSSI-based storage is supported, DSSI clustered systems will offer a cost-effective, entry-level option for the user whose business and computing needs require clustering capability. Should availability, online storage, and performance needs grow in the future, the DSSI clustered system can be integrated with a high-end, CI-based clustered system.

Innovative Packaging

DEC 7000 AXP and DEC 10000 AXP ADVANTAGE-SERVER systems offer outstanding, value-priced, balanced configurations — complete with CPU, memory, I/O channels, disks, tape, CD-ROM, base operating system, and Network Application Support (NAS) software. They also give you the flexibility to add components as needed, including user licenses, additional memory, and additional disks.

When workspace is at a premium, you can stack DEC 7000 AXP components in a 19-inch rackmount cabinet. Up to three CPUs, as much as 1.5 GB of memory, two Ethernet ports, two disk controllers, and one optional Futurebus+ or XMI I/O channel can all be mounted in the same rack — with no increase in the amount of floor space required.

Exceptional Service and Support

Whether your IS mission is technical computing, client/server computing, enterprise integration, or rightsizing, Digital has the consulting, technical, and support services to help you. With more than 40,000 professionals in 450 locations around the world, Digital is singularly positioned to deliver precisely the range of services that you require.

The service and support solution choices for the DEC 10000 AXP system make it especially attractive to the shop with limited IS resources. These solutions are the most comprehensive in the industry. Highlights include:

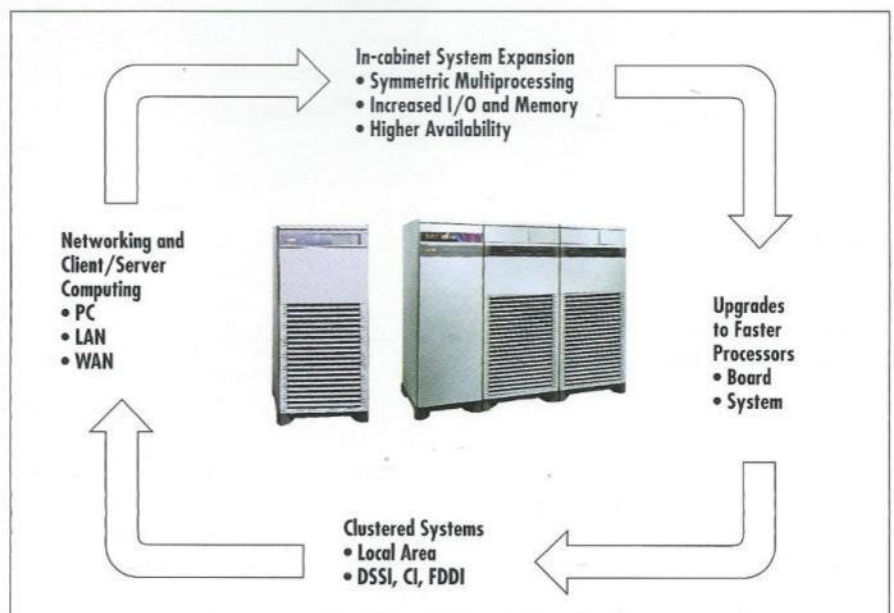
- A formal needs assessment and operations review, which forms the basis for planning and documenting other services via the System Support Plan
- Customer configuration design service, to design and document the DEC 10000 AXP configuration that best meets your application needs

- Full hardware and software installation service, including an environment/logistics assessment and pre-installation planning
- A consulting and training plan, which assesses start-up, migration, and training needs, and recommends the appropriate consulting and training services
- Digital's premier hardware and software remedial support, which includes the dedicated customer support embodied in the Mission-Critical Support Service

In addition to all of these services, the DEC 10000 AXP system offers capacity and performance management services, as well as Digital System Service (24 × 7). Details of the support component may differ outside the U.S.A.

For More Information

To learn more about the DEC 7000 AXP and DEC 10000 AXP systems, or other Digital systems, contact your local Digital sales representative.





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DEC 7000/10000 AXP Specifications

Model	610	620	630	640	650	660
Number of Processors	1	2	3	4	5	6
OpenVMS Performance						
TPS (est.)	325	530	—	—	—	—
SPECint92	106.5	—	—	—	—	—
SPECfp92	200.5	—	—	—	—	—
SPECrate_int92	2,392	4,741	7,014	9,076	11,268	13,351
SPECrate_fp92	4,336	8,488	12,608	17,157	21,604	25,565
LINPACK 1000×1000 (DP MFLOPS)	154.8	—	—	—	—	—
DEC OSF/1 Performance						
TPS (est.)	—	—	—	—	—	—
SPECint92	116.5	—	—	—	—	—
SPECfp92	193.6	—	—	—	—	—
SPECrate_int92	2,765	—	—	—	—	—
SPECrate_fp92	4,368	—	—	—	—	—
LINPACK 1000×1000 (DP MFLOPS)	151	—	—	—	—	—
Operating Systems	OpenVMS AXP, DEC OSF/1 AXP					
CPU/Clock Speed	DECchip 21064/200 MHz					
Cache Size per Processor	8 KB I-cache on chip, 8 KB D-cache on chip					
	4 MB write-back on board					
In-cabinet CPU Upgrade	Each system upgrades to any higher system within the series.					
High-Speed System Interconnect	800 MB/s peak, 640 MB/s sustained					
I/O Features						
Maximum Memory Capacity	3.5 GB					
Maximum Disk Capacity	210 GB in-cabinet/280 GB local, Over 10 TB total					
Maximum I/O Bandwidth	400 MB/s					
I/O Support	4 12-slot XMI, 1 9-slot Futurebus+, 10 CI,† 18 DSSI* 18 Fast SCSI-2,‡ 16 Ethernet†, 8 FDDI, 12 SDI, Prestoserve*, OSF/1, HiPPI,* IPI,* VME*					
Cluster Support	Ethernet, CI, FDDI, DSSI*					
High Availability Features Supported	Disk Shadowing, N+1 Redundant Power System,‡ Integrated Uninterruptible Power System (UPS),‡ Integrated Power Conditioning, POLYCENTER Advanced File System (DEC OSF/1)					
Operating Environment						
Temperature	15°C – 28°C (59°F – 82°F)					
Humidity	10% – 90%					
Altitude	2,400 m (8,000 ft)					
Maximum Heat Dissipation§	5,191 watts					
Power Requirements	U.S./Canada		Europe/GIA		Japan	
Input Voltage (nominal)¶	120/208 Y		380/415 Y		202 Delta	
Frequency Tolerance	50–60 Hz		50–60 Hz		50–60 Hz	
Phases	3 Phase Star 4 Wire N-GND		3 Phase Star 4 Wire N-GND		3 Phase Delta 4 Wire Mid-GND or 3 Wire Junction-GND	
Surge Current	50 A Peak		50 A Peak		50 A Peak	
Physical Characteristics						
DEC 7000 AXP Dimensions	Height: 170 cm (67 in); Width: 80 cm (31.5 in) Depth: 86.5 cm (34.1 in); Weight: 408 kg (900 lb)					
DEC 10000 AXP	3-Cabinet System¶			5-Cabinet System◇		
Maximum Heat Dissipation	6.6 kw			10.9 kw		
Height:	170 cm (67 in)			170 cm (67 in)		
Width:	220 cm (86.7 in)			360 cm (141.8 in)		
Depth:	86.5 cm (34.1 in)			86.5 cm (34.1 in)		
Weight:	1,640 kg (3,600 lb)			2,600 kg (5,700 lb)		

* Available with upcoming software or hardware release.

† 2 CI controllers, 8 Fast SCSI-2, and 8 Ethernet ports supported initially.

‡ Standard on DEC 10000. Optional on DEC 7000.

§ System cabinet only.

¶ These values are per line cord.

¶ The 3-cabinet system has two cabinets with line cords.

◇ The 5-cabinet system has three cabinets with line cords.

Features may differ between OpenVMS AXP and DEC OSF/1 AXP systems.