
Digital Equipment Corp. VAXft Series: Product Profile

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System Overview

The VAXft Series is a family of fault-tolerant computer systems designed for applications that demand continuous processing together with a high level of data and computational integrity. The systems are implementations of a hardware-intensive fault-tolerant architecture and are fully compatible with all other VAX and VAXcluster systems. The VAXft systems support a wide range of applications running under the VMS operating system, and are available in server and multiuser configurations.

The VAXft line comprises the VAXft Models 110, 310 (initially introduced in February 1990 as the VAXft 3000 Model 310), 410, 610, and 612.

Competition

The VAXft systems compete with the fault-tolerant products from a number of vendors, including the Tandem NonStop, Stratus XA2000, and IBM System/88.

Vendor

Digital Equipment Corp.
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Price

All VAXft systems are offered as base systems. System Building Block (SBB) platforms are available in office pedestal, rackmount, or 60-inch enclosures. VMS Timeshare Base System SBB prices range from \$149,000 to \$365,200. VMS Server Base System SBB prices range from \$92,700 to \$260,400.

GSA Schedule

Yes.

—By *Alyn J. Gorman*
Managing Editor

Characteristics

See Table 1 for a comparison of system characteristics for the VAXft models.

Processing Components

Each VAXft includes two fully duplicated sets of components, called zones. Each zone is housed in a separate cabinet. The two cabinets are linked by high-speed cables, providing parallel data paths. Each zone contains a backplane linking its CPU, system I/O, and memory modules. This redundancy ensures that even the backplane is not a single point of failure. The two CPU/memory subsystems run synchronously, executing the same instruction at the same time. All subsystems can be

serviced from the front of the machine without interrupting running applications. All VAXft systems except the Model 110 include battery backup; power conditioning functions and battery backup can be purchased as options.

The VAXft Model 612 incorporates two Model 610 units into a Digital Storage Systems Interconnect (DSSI) VAXcluster system.

Peripherals

Each VAXft system I/O module contains an Ethernet port and a Digital Storage Systems Interconnect (DSSI) port. The system I/O module design has sufficient bandwidth and control to allow peripheral devices to work together simultaneously. Fault-tolerant mass storage is achieved using a combination of VMS Volume Shadowing, redundant DSSI ports, and redundant DSSI buses. VMS Volume Shadowing is a software facility that duplicates all data written to disk onto two separate volumes.

Table 1. System Comparison

Model	VAXft Model 110	VAXft Model 310	VAXft Model 410	VAXft Model 610	VAXft Model 612
System Characteristics					
Min./Max. Memory (bytes) (1)	16-96M	32-128M	32-128M	32-128M	32-128M
Expansion Increments (bytes)	16M, 32M	32M	32M	32M	32M
Min./Max. Storage (bytes)	381M-4G	381M-12G	381M-12G	381M-24G	381M-24G
Number of Processors	2	2	2	2	4
Upgradeable to	Bounded system, expansion cabinets are not available				
Recommended No. of Users	(2)	(2)	(2)	(2)	(2)
Date First Installed	7/91	7/91	7/91	7/91	7/91
Central Processing Unit & Memory					
Computer Type	32-bit	32-bit	32-bit	32-bit	32-bit
Processor Model	Proprietary	Proprietary	Proprietary	Proprietary	Proprietary
Memory Type	ECC	ECC	ECC	ECC	ECC
Floating-Point Co-Processor	Integrated in CPU	Integrated in CPU	Integrated in CPU	Integrated in CPU	Integrated in CPU
Cache Memory (bytes)	None	None	None	None	None
Performance Characteristics					
Multiprocessing Capability (Yes/No)	No	No	No	No	No
Relative Performance (VUPS) (based on VAX 11/780 1.0)	2.4	3.8	6.0	6.0	12.0
I/O Transfer Rate (bytes/second)	8M	8M	8M	16M	16M
Basic Configuration					
Memory/Storage Included (bytes)	16M/381M	32M/381M	32M/381M	32M/381M	32M/381M
Purchase Price (\$)	Custom	149,144	185,023	149,675	260,367

(1) Bytes per zone.

(2) Configuration dependent.

The system I/O Ethernet interface supports both Thick and ThinWire connections. For redundant Ethernet support, a single port in each of the two zones is connected to a single Ethernet rail. For dual-rail Ethernet, two system I/O modules can be installed in each zone, providing a port in each zone for each rail. Up to four synchronous communications modules can be configured in each zone. Expanded synchronous communications are supported via Ethernet-based communications servers and gateways. Asynchronous communications, using terminal servers, are also supported via Ethernet.

Mass Storage

DSSI devices are the only local storage devices supported with the VAXft systems. The VAXft Model 110 supports up to 4G bytes of nonshadowed disk storage and 1G byte of shadowed storage. Models 310 and 410 support up to 12G bytes nonshadowed and 5G bytes shadowed. VAXft Models 610 and 612 support up to 24G bytes of nonshadowed and 10G bytes of shadowed storage.

See Table 2 for specifications on available mass storage devices.

Tape Drives

See Table 3 for specifications on available mass storage devices.

Terminals/Printers

Console: Two local console terminals are required, one per zone, for fault-tolerant console access. The console port supports the DEC423 cable connection. A combination of video terminal and LA75 printer is recommended by Digital. The VAXft Series supports the VT320/330/340, VT420 Video Terminal, and VT1000 and VT1200 X Terminals.

Two remote console ports are provided, one per zone. The remote console ports are used for automatic notification, upon failure, by system to notify remote customer or Digital site. These ports can also be used for dial-in from a remote site for system diagnosis. Remote console ports can be connected via modems to a remote customer location or to a Digital Customer Services site.

Workstations/Printers: All asynchronous communications for the VAXft systems are provided via

Ethernet. Terminals and printers are connected over Ethernet to a DECserver communications server.

Communications

Protocols Supported: TCP/IP.

Network Applications Supported: DECnet, NFS.

LANs Supported: Ethernet.

Operating Environment

The DECsystems can operate between 50 and 104 degrees Fahrenheit and within a humidity range of 10 to 90 percent (noncondensing). The physical and electrical specifications of the DECsystems are highlighted in the following tables.

Electrical Specifications

Model	Voltage	Power Consumption (kVA)
110	120/240	1000
310	120/240	1800
410	120/240	1800
610	120/240	1900
612	120/240	5700

Physical Specifications

Model	Height (in.)	Width (in.) (1)	Depth (in.) (1)	Weight (lb.)
110	24	Not specified	Not specified	180
310	24	Not specified	Not specified	480
410	24	Not specified	Not specified	480
610	24	Not specified	Not specified	720
612	24	Not specified	Not specified	720

(1) Footprint is provided (sq. ft.): 110—3.5; 310—5.25; 410—5.25; 610—7.5; 612—20.0.

Software

Operating System

The VAXft software environment is based on the Digital's VMS operating system architecture. VMS (also known as VAX/VMS) is a general-purpose operating system that provides the environment for the concurrent execution of multiuser timesharing, batch, and time-critical applications. It also contains special features for VAXcluster support

Table 2. Mass Storage Devices

Model	RF31	RF72
Type	Winchester	Winchester
Size (inches)	5¼	5¼
Formatted Capacity (bytes)	381M	1G
Interface/Controller	DSSI	DSSI
Average Access Time (ms.)	23.6	21.7
Peak Data Transfer Rate (bytes/second)	4M	4M
Purchase Price (\$)	7,600	13,000

Table 3. Tape Drives

Model	TF70	TF857
Type	Cartridge	Magazine
Tape Width	8 mm.	8 mm.
Capacity (bytes)	290M	18.2G
Interface/Controller	DSSI	DSSI
Peak Data Transfer Rate (bytes/second)	Not specified	800K
Supported by	All models	610/612
Purchase Price (\$)	7,100	29,000
Comments	Integrated storage option	Magazine systems provides up to 18.2GB of unattended backup at a data rate of 2.9G bytes/hour (max.)

and provides programming tools, scheduling services, and protection mechanisms for multiuser program development. All VMS system-based software products are available, and all run without modification on the VAXft series.

Communications

The VAXft systems come with TCP/IP and NFS networking software, and Digital provides a range of DECnet products that provides application access, business communications, and information/resource sharing services across VMS.

Other Software

All VAXft base SBBs include the following licenses for the required software for full fault-tolerant operation:

- VMS Timeshare Systems include VMS Operating system license including Rdb/runtime license, VAXft system services license, VMS volume shadowing license, and DECnet end node license.
- The VAXft Model 612 also includes a VAX-cluster license.

VMS Server Systems include VMS file and application server including Rdb/VMS runtime licenses, VAXft system services license, VMS volume shadowing license, DECnet full function license, and VAXcluster license.

Sample Configuration Pricing

All VAXft systems are offered as base systems. System Building Block (SBB) platforms are available in office pedestal, rackmount, or 60-inch enclosures. The systems can be configured using these basic platforms. All base systems are available in VMS timeshare and server configurations. Digital offers only base systems, with storage expansion enclosures and DSSI adapter modules being added to the base systems as needed. All base system SBB hardware consists of two system zones. Each zone includes a CPU, 32M bytes of memory, a KFE52 DSSI adapter, an Ethernet adapter, and an uninterruptible power supply (UPS). No storage devices (disk or tape) are included in the base system. A minimum of two disks, one for each zone, must be ordered. Sample VAXft configurations are given below.

VAXft Model 310

Description	Product ID	Price (\$)
Packaged System	52AAA-AE SBB	149,144
CPU	Proprietary	Bundled
Enclosure	Pedestal	Bundled
Main Memory	32MB memory	Bundled
Console	Two VT420 mono-chrome	1,258
I/O Ports	ThinWire/Thick Wire Ethernet	Bundled
Disk Controller	DSSI controller	Bundled
Disk Drive	Two 381MB RF31 disks	13,000
Tape Controller	DSSI controller	Bundled
Tape Drive	Two 290MB TF70 cartridges	14,200
Workstation Controller		Bundled
Printer	Choice of Digital printer	Varies
Workstation Display	Choice of terminals	Varies
Total Hardware	52AAA-AE SBB	177,602
Monthly Maintenance	Basic System Support	670
Operating System	VMS	Bundled
Languages	VAX C	Bundled
DBMS	SQL	Bundled
Total		177,602

VAXft Model 410 System

Description	Product ID	Price (\$)
Packaged System	55BAA-AA SBB	186,297
CPU	Proprietary	Bundled
Enclosure	Rackmount	Bundled
Main Memory	32MB memory	Bundled
Add-on Memory	Two 32MB modules	50,400
Console	Two VT420 mono-chrome	1,258
I/O Ports	ThinWire/Thick Wire Ethernet	Bundled
Disk Controller	DSSI	Bundled
Disk Drive	Two 381MB RF31 disks	13,000
Tape Controller	DSSI	Bundled
Tape Drive	Two 290MBTF70C cartridges	14,200

VAXft Model 410 System (Continued)

Description	Product ID	Price (\$)
Workstation Controller		Bundled
Printer	Choice of Digital printer	Varies
Workstation Display	Choice of terminals	Varies
Total Hardware	55BAA-AA SBB	265,155
Monthly Maintenance	Basic System Support	670
Operating System	VMS	Bundled
Languages	VAX C	Bundled
DBMS	SQL	Bundled
Total		265,155

VAXft Model 612

Description	Product ID	Price (\$)
Packaged System	55CDA-AE SBB	365,210
CPU	Proprietary	Bundled
Main Memory	32M-byte memory	Bundled
Add-on Memory	Four 32M-byte modules	100,800
Console	Two VT420 mono-chrome	1,258
I/O Ports	Ethernet	Bundled
Disk Controller	DSSI	Bundled
Disk Drive	Two 1G-byte RF72 cartridge drives	26,000
Tape Controller	DSSI	Bundled
Tape Drive	Two 18.2G TF857 magazines	58,000
Workstation Controller		Bundled
Printer	Choice of Digital printer	Varies
Workstation Display	Choice of terminals	Varies
Total Hardware	55CDA-AE SBB	551,268
Monthly Maintenance	Basic System Support	1,220
Operating System	VMS	Bundled
Languages	VAX C	Bundled
DBMS	SQL	Bundled
Total		551,268