DATAPRO

Datapro Reports on
Minicomputers

M09-325-**501**

Supermicrocomputer
Systems

Digital Equipment Corp. DECsystems

Note: This report
revises information
presented in a June
1991 Datapro Product
Profile.

The DECsystem server and multiuser sys-
tems utilize the RISC-based R3000 CPU
and R3010 FPU developed by MIPS Com-
puter Systems. The line is oriented toward
general-purpose computing in government
and commercial markets as well as scien-
tific and technical computing in high-end
commercial and manufacuturing markets.

Strengths

- Adherence to current and emerging in-
  dustry standards, including an ULTRIX
  operating system based on Berkeley 4.2
  BSD UNIX with extensions from AT&T
  UNIX. Operating systems complies with
  AT&T's System V interface definition is-
  sued to Volume 1.

- Digital hardware adheres to a CPU stan-
  dard based on the MIPS Computer Sys-
  tems R3000 RISC processor accepted by
  the ACE consortium.

- Compatibility across product line; appli-
  cations written for one system will run on
  any other without modification.

- Support for multivendor environments
  via DEC's support for networking stan-
  dards.

Limitations

- Necessary options can dramatically in-
  crease system cost.

Competition
MIPS Computer RISCsystems, NCR 3000
Series computers, IBM RS/6000 comput-
ers.

Vendor
Digital Equipment Corp.
146 Main St.
Maynard, MA 01754-2571
(508) 493-5111

Price
Basic configuration list prices range from
$10,995 to $190,000. GSA schedule: Yes.

—*By Shane A. Rau*
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Product Analysis

The Digital Equipment DECsystem server and multiuser systems are based on the RISC R3000 CPU and R3010 FPU developed by MIPS Computer Systems. They run Digital's ULTRIX Version 4.2 operating systems, a UNIX implementation based on Berkeley BSD 4.2 UNIX and supporting extensions for AT&T UNIX System V.4.

The DECsystem line comprises the 5000 Model 200, 5100, 5500, and 5800 Series (5810, 5820, 5830, and 5840). Digital Equipment targets its systems toward general purpose applications in the commmercial and government markets as well as the technical and manufacturing markets.

Target Applications

5000 Model 200	Server, general-purpose
5100	Database, publishing, server, general-purpose business
5500	Electronic publishing, server, software development, general-purpose business
5800 Series 5810, 5820, 5830, and 5840	Scientific CASE, ECAD, software development, server

Strengths

- Compliance with major open software standards, including POSIX, OSF, and X/OPEN.

- Near compliance with emerging open hardware standards set by the ACE (Advanced Computing Environment) consortium.

- Base configurations are backed by a wide variety of options, including networking, operating system, and peripheral upgrades.

- Large number and variety of applications available from Digital and third parties.

- Networking transparent interaction with VMS, MS-DOS, and Macintosh applications through NAS.

- Support for Display PostScript.

Limitations

- Hardware and software options necessary for fully functional systems could add substantially to total system cost.

- Workstation or terminal could add substantially to total system cost.

- Graphics options are severely limited.

Vendor Analysis

Product Strategy

The DECsystems and their single-user DECstation workstation counterparts represent a fundamental shift in Digital's direction, away from the proprietary VAX/VMS-based systems and workstations. Digital's key strategy for the '90s is open systems geared toward compatibility and adherence to current and emerging industry hardware, software and communications standards. For the DECsystems, these standards include support for a POSIX-compliant operating environment, an X/Open-compliant windowing system, the Ethernet networking standard, and the R3000 RISC processor from MIPS Computer Systems. Processors developed by MIPS Computer Systems are the standard declared by the newly formed Advanced Computing Environment Consortium, of which DEC is a key member. Digital's embracing of these standards comes only after the company spent significant time and effort in its own, now-defunct RISC architecture development effort.

The effort has met with success. DECsystems and DECstations have made significant inroads into the UNIX workstation and multiuser system markets. These inroads are most significant in the manufacturing and research industries and R&D facilities. However, the recent introduction of the HP 9000 Series 700 UNIX workstation and multiuser systems threatens Digital's future success. Digital also faces stiff competition from the RISCsystem multiuser and server systems from MIPS Computer Systems.

Digital has further shown its commitment to open standards through agreements with major industry players. For example, Digital has inked an agreement with Sony

Overview

Model/Version	5000	5100	5500	5810/5820	5830/5840
Actively marketed?	Yes	Yes	Yes	No	No
Base price ($)	19,795	10,995		75,000	140,000
Design	Desktop	Desktop	Pedestal	Cabinet	Cabinet
Date announced	Apr 90	Oct 90	Oct 90	Jul 89	Apr 90
Suggested terminals	36	36	60	NA	NA

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Decision Points

Requirements	Performance	DataPro Opinion
Compatibility with existing computing environment	Supports 802/Ethernet, TCP/IP, HFS and other connectivity products	Sufficient for smooth integration in multi-vendor environment
	More than 1,500 applications available	Numer and diversity sufficient to support most general purpose, business, scientific and engineering needs.
	ULTRIX-32 supports Berkeley BSD 4.2 and AT&T UNIX extensions	No concurrent support for VMS hinders migration of VAX users
High-performance computing	R3010 FPU built in	RISC-based FPU excellent for scientific and technical applications
	Cache memory varies from 128K bytes to 128K/256K bytes 1st and 2nd level combination	Utility of cache beyond 64K bytes questionable
High-performance graphics	No support for high-level graphics	Digital offers high-level graphics on its DECstation workstations
Human factors	No ruggedized versions for harsh environments available from Digital	Digital relies on third parties for ruggedized enhancements
Special purposes	No support for live video; no output to video	Support for video relegated to DECstation workstations
	No support for sound	
Online transaction processing	No fault tolerance	Users with mission-critical applications should determine if fault tolerance is a must

and others to form the Open Document Architecture consortium and formed other development-related agreements with companies such as Lotus, Advanced Micro Devices, Motorola, ASK Computer, and Verity.

Target Markets
The DECsystems target low-end, midrange, and high-end markets.

DECsystem 5000 Model 200 is the low-end general-purpose member of the DECsystem family. It is a desktop system meant to serve small workgroups as a file server and to off-load compute-intensive tasks from local workstations. It features Digital's TURBOchannel open I/O interconnect and supports internally up to three TURBOchannel cards supporting peripherals.

DECsystem 5100 is a newer entry-level member of the DECsystem family built for the commercial customer. It is a desktop system meant to be used as a terminal server or as a server for workstations and PCs, diskless or otherwise, performing system management tasks. It includes four asynchronous lines, one with full modem control. The 5100 supports the Prestoserve hardware and software-based NFS accelerator as an option.

DECsystem 5500 is a midrange deskside RISC system with up to twice the performance of the discontinued midrange DECsystem 5400. It occupies a pedestal enclosure and is designed for an office environment to serve client/server and multiuser environments. It includes the Prestoserve hardware- and software-based file system accelerator for improved NFS server performance.

DECsystem 5800 Series is the cabinet-based high-end of the DECsystem line for the most compute-intensive applications. It can provide high-performance compute and file server functions for a large number of workstations performing CPU intensive applications such as molecular modeling, high-energy physics, manufacturing engineering, and software development. DECsystem 5800 series

computer support up to five VAXBI channels, can support multiprocessing. Its 5810, 5820, and 5830 are upgradable to the 5840. In addition, any lower-numbered model is upgradeable to the next higher model.

Mergers & Acquisitions
4/17/91 — Digital purchased a minority interest in MasPar Computer Corporation as part of it move into the massively-parallel computer market.

Market Position

Digital Equipment Corp. designs, sells, and services computers, peripheral equipment, related software and supplies. Its products are used worldwide in scientific research, computation, communications, timesharing, word processing, and simultation.

Digital is the second largest computer company in the world, with typical annual revenues between $12 billion and $13 billion. This position has been largely based on the successes of its proprietary line of VAX workstations and multiuser systems using Digital's VMS multitasking operating system.

Since the late 1980s, however, Digital has embraced industry standards, namely those in the personal computer, workstation, and server/multiuser systems markets. Digital has agreed with such notable PC manufacturers as Tandy and Olivetti to provide it with a full line of PCs, from notebooks to workstation-class Intel-based systems.

Digital has moved aggressively within the workstation and multiuser systems markets by implementing the Reduced Instruction Set Computing processor standard and the UNIX operating system standard in its DECstation and DECsystem computer lines. In 1988, Digital agreed with MIPS Computer to implement MIPS' RISC-based R2000 and R3000 processors in its systems.

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Digital's multiuser systems have traditionally done well. In fact, according to IDC, Digital led the multiuser systems market with $5.7 billion in revenue in 1989. No information particular to the DECsystems' market share was available as this report was being prepared.

Digital has moved this year to bolster its share of the multiuser systems market. In January, the company formed the DECsystem Servers and Multiusers Systems Group to focus on UNIX-based RISC technology for RISC customers. In August 1990, a dedicated channels organization was created to increase the number of VARs selling Digitals's DECstations and DECsystems products. Over the past year, Digital has increased the number of VARs by 400 worldwide.

Major Competitors

Major competitors to the DECsystems include MIPS Computer's RISComputers, NCR's Series 3000s, and Hewlett-Packard HP 9000 Series 700 systems.

Sales & Distribution Strategy

Sales

Digital sells the DECsystems through its own worldwide sales force and through resellers and systems integrators into territories it defines as American, European and General International.

Distribution

The Digital direct sales force concentrates on *Fortune* 1000 customers, small establishments to whom Digital is one of many vendors, and independent intermediary channels represented by business centers, dealers, systems houses, and retailers who sell to end users.

Digital uses the independent intermediary channels as its indirect means into vertical markets. Digital concentrates on signing individual resellers with vertical market expertise. Typically, accounts which would net Digital less than $500,000 annually are handled through the indirect sales force represented by the franchises.

Support

Digital supports all of its products with a minimum one-year return-to-Digital warranty. Extra coverage is optional.

Digital handles most of its technical support and on-site converage through its own technicians.

Policies & Programs

Warranty

All DECsystems and peripherals come with a one full-year return-to-Digital product warranty referred to by Digital as the Product Foundation Warranty or List Warranty J. Most DECsystems and peripherals, however, are purchased under the Standard Warranty, or Warranty E, program. This program offers hardware installation, one year of on-site service, telephone assistance, critical on-site

software support, and the right to use new versions of operating system and kernel software.

Products purchased under List Warranty J are slightly lower.

Support Services

Basic Service

The one-year hardware Basic Service includes on-site hardware support that will be performed during the standard hours of coverage. Digital will automatically activate an accelerated backup plan to involve the necessary technical resources should some extraordinary problem require longer than predicted time.

Telephone Assistance

Digital Telephone Assistance includes telephone support for authorized purchaser employees via a toll-free telephone number and Customer Service Center access number. Three purchaser employees will be authorized to call the Customer Support Center.

Critical On-Site Software Support

On-site support will be provided to solve software problems that cannot be solved remotely when Digital determines that the problem is critical.

Advanced Electronic Support

Digital will provide special software for two-way electronic mail and file transfer between the customer site and a Customer Service Center. The customer will be able to access technical databases, predictive maintenance tools, and time-critical information. **Note:** *This service is not yet available to DECsystems running ULTRIX at this writing.*

Kernel Software

Support for kernel software includes the operating system, DECnet, VAXcluster software, Workstation software, and any other software products included with the hardware system purchased.

New Software Versions

This support service grants the customer proper license to all new versions of Digital-license software products covered under this Warranty and that become available during the Warranty term.

Service Providers

Digital provides its own support through its Customer Support Centers with more than 40,000 service employees worldwide.

Service Locations

Digital has more than 450 service locations in 84 countries worldwide, including 250 in the United States.

Service Hours

Service hours under the Standard Warranty program are 8 a.m. to 5 p.m., Monday through Friday except locally observed Digital holidays.

Training/Education

Digital Education and Consulting Services offers self-paced or customized training programs in more than 16 languages either at the customer site or at any of 145 training centers worldwide. The services of more than 2,000 consultants are available as well.

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Documentation

English-language user documentation is standard with all DECsystems. Foreign language documentation, particularly German and French, is also available.

Documentation is available in hardcopy and on CD-ROM.

Technical manuals are also available.

Upgrade Policies

DECsystem hardware upgrades are only available through purchase. Customers who purchase the Standard Warranty are eligible for software upgrades through the Right-To-Use-New-Versions of Software component of this warranty. This support service grants the customer proper license to all new versions of Digital-licensed software products covered under the warranty and that become available during the warranty period.

Competitors' Programs

MIPS Computer System's RISCsystem multiuser systems and servers most closely resemble the Digital DECsystems. Furthermore, the ultimate end-user market toward which each company targets it product line is also similar.

MIPS, however, has a different distribution channel in mind and this distinction explains the different composition of this manufacturer's support policies.

MIPS' distribution channels are heavily composed of original equipment manufacturers and resellers. As a result, the company offers highly graduated support programs to cater to the needs of OEMs and resellers selling in highly vertical and stratified markets.

Warranty

All MIPS RISCsystems include a 90-day warranty including on-site hardware maintenance and toll-free technical support from 6:00 am to 6:00 pm P.S.T. An optional one-year hardware service contract is available for a cost of roughly 7.5% of basic system and peripherals cost and 3% for memory products. Also available is an optional software support contract.

A program providing software upgrades as they occur during the warranty period is also available.

Support Services

MIPS' premium service is equally a la carte. Twenty-four hour, seven days per week hardware support contract is available for approximately 60% of the basic system and peripherals cost. Similar support for software is available and priced on a case-by-case basis as is software upgrade support.

User Group

Name: DECUS (Digital Equipment Computer Users Group)
Purpose: The exchange of information processing-related information among users of Digital products.
Address: DECUS, SHR1-4/32, 333 South Street, Shrewsbury, MA 01545
Telephone: (508) 841-3537
Affiliation: An official body of Digital Equipment Corp.

User Ratings

Site Profiles

DECsystem 5000 Model 200

Industry: Wine Production
Size: $1 Billion, 6000 Employees

System Configuration

DECsystem 5000 Model with 64M bytes of memory, VT320 console, two 665M-byte disk drives (RZ56), one 332M-byte hard drive (RZ55), one 4mm tape drive (TLZ04), and one 600M-byte CD-ROM drive (RRD40). Runs standard ULTRIX/DECwindows environment with TCP/IP and NFS. Runs optional DECnet. No additional graphics capabilities.

Applications

System supports approximately 40 terminals and runs an internally developed time and attendance application. System runs 24 hours a day, seven days a week.

Opinion

Overall Performance: Upgraded from a VAX 8550 and estimates DECsystem 5000 Model 200 to be four times faster, leaving significant room for growth. "The [Ultrix] environment is far more mature than we expected."
Reliability: Quite pleased with system reliability. "With this system there really haven't been any problems."
Technical Support: Digital hardware and software technical support rated excellent.
Maintenance: Rates maintenance by local DEC field-support to be excellent. "We have an absolutely superb relationship with our DEC technician."

DECsystem 5500

Industry: Education
Size: 80 users

System Configuration

DECsystem 5500 with 120M bytes of memory, one VT320 console, three 1G-byte disk drives (RZ57), two 1.5G-byte disk drives (RA92), and two 8mm DAT drives. Runs standard ULTRIX/DECwindows environment with TCP/IP and NFS in a distributed computing environment. No additional graphics capabilities.

Applications

System supports approximately 50 users at a time and seven to ten million packets per day for computer-aided design of integrated circuits, code development and debugging.

Opinion

System Overall Performance: "It has met all of our expectations."
Reliability: System experienced disk-drive problem soon after installation. Otherwise, user feels reliability of system is acceptable. [*see below*]

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Application Software: Applications generally meet laboratory needs. Is currently testing C++ debugging environment and will use third party's environment.

Technical Support: Digital is usually quick to respond. However, getting an accurate response is difficult. User is currently arranging for a dedicated Digital support person. "We've found that just calling up with a problem is often frustrating."

Maintenance: System experienced disk drive problem soon after installation that Digital required two months to identify and repair. "The main problem was that the local people didn't escalate the problem early enough."

Specifications

Features/Functions

Model	5000	5100	5500
System Characteristics			
Min./Max. Memory (M bytes)	8-480	8-128	32-256
Expansion Increments (M bytes)	8, 32	8, 32	32, 64
Max./Min Int. Mass Storage (bytes)	0M	109M-2.1G	381M-4G
Max. Ext. Mass Storage (G bytes)	28	6	28
Processors	1	1	1
Recommended number of users	131	153	241
Central Processing Unit and Memory			
Processor Model	MIPS R3000	MIPS R3000	MIPS R3000
Processor Type	RISC	RISC	RISC
Memory Type	ECC	Parity	ECC
Fl. Pt. Processor	MIPS R3010	MIPS R3010	MIPS R3010
Cache Memory (K bytes)	64/64	64/64	64/64
General performance			
MIPS	27.3	21.7	32.5
SPECmarks	19.9	16.2	23
MFLOPS	6.8	5.3	8.2
Processor Speed	25	20	30
Fl. Pt. Processor Speed	25	20	30
Graphics Processor Speed	N/A	N/A	N/A
Input/Output Subsystem			
Bus Architecture	TURBOchannel	SCSI	Q-Bus
Expansion Slots	3	NA	9
Parallel Ports	N/A	N/A	1
Serial Lines	N/A	12	144
Other I/O Ports	1 SCS1; 1 Ethernet; 1 FDDI	1 SCS1; 1 Ethernet	1 Ethernet

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Features/Functions

Model	5810/5820	5830/5840
System Characteristics		
Min./Max. Memory (M bytes)	32-256	64-256
Expansion Increments (M bytes)	8, 32	8, 32
Max./Min Int. Mass Storage (bytes)	560M-8.8G	560M-8.8G
Max. Ext. Mass Storage (G bytes)	115	115
Processors	½	¾
Recommended number of users	200+	200+
Central Processing Unit and Memory		
Processor Model	MIPS R3000	MIPS R3000
Processor Type	RISC	RISC
Memory Type	ECC	ECC
Fl. Pt. Processor	MIPS R3010	MIPS R3010
Cache Memory (K bytes)	64/64 1st level; 128/128 2nd level	64/64 1st level; 128/128 2nd level
General performance		
MIPS	18.7/35	48/62
SPECmarks (single/dual processor)	10.7/20.2	29.8/39.0
MFLOPS (single/dual processor)	4.3/1.8	4.3/1.8
Processor Speed	25	25
Fl. Pt. Processor Speed	25	25
Graphics Processor Speed	N/A	N/A
Input/Output Subsystem		
Bus Architecture	VAX BI	VAX BI
Expansion Slots	11	11
Parallel Ports	N/A	N/A
Serial Ports	N/A	N/A
Other I/O Ports	1 Ethernet	

Peripherals

Hard Disk Storage Devices

Model	RZ23L	RZ24	RF31	RF72
Type	Winchester	Winchester	Winchester	Winchester
Size (in.)	3.5	3.5	3.5	5.25
Formatted Capacity (bytes)	121M	209M	381M	1G
Interface/Controller Type	SCSI	SCSI	DSSI	DSSI
Average Access Time (ms)	19.0	16	23.6	21.7
Data Transfer Rate (M bytes/sec.)	1.5	1.5	4	4
Supported By System Model	All	All	5500	5500

Hard Disk Storage Devices (Continued)

Model	RZ55/6/7	RA70	RZ25	RA90/RA92
Type	Winchester	Winchester	Winchester	Winchester
Size (in.)	5.25	5.25	3.5	9

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Peripherals

Hard Disk Storage Devices (Continued)

Model	RZ55/6/7	RA70	RZ25	RA90/RA92
Formatted Capacity (bytes)	332M/665M/ 1G	280M	426M	1.2G/1.5G
Interface/Controller Type	SCSI	KDA50	SCSI	KDB50
Average Access Time (ms)	24.3/24.3/ 22.8	27	14	18.5
Data Transfer Rate (M bytes/sec.)	1.0/1.85/2	1.4	3.125	2.8
Supported By System Model	All	5800	All	5800

Tape Devices

Model	TLZ04	TU81
Type	Digital Audio	Tape Subsystem
Size	4 mm.	0.5 in.
Format		
Recording Density (BPI)	Helical scan	6250 (GCR), 1600 (PE)
Recording Mode		Group code recording to ANSI x3.54-76 Phase encoded to ANSI X3.39-1973
Characteristics		
Interface Controller	SCSI	SCSI
Unformatted Storage Capacity (bytes)	1.2G (max.)	145M
Tape Speed	N/A	75 ips
Data Transfer Rate (K bps)	183 (max.)	468
Supported By System Model	All	All

Tape Devices (Continued)

Model	TZ30	TK50	TK70
Type	Streaming	Streaming	Streaming
Size	QIC	QIC	0.5 in.
Format			
Recording Density (BPI)	N/A	6,667	10,000
Recording Mode		Serial serpentine	Serial serpentine
Characteristics			
Interface Controller	SCSI	SCSI	SCSI
Unformatted Storage Capacity (bytes)	95M	95M	296M
Tape Speed	75 ips	75 ips	100 ips
Data Transfer Rate (K bps)	62.5	62.5	90
Supported By Workstation Model	5100	5100	All

Printers

Model	LP37	LP29	LG01/LG02
Type	Band	Band	Line dot-matrix
Speed	1200 lpm	2000 lpm	600 lpm
Graphics Resolution	Fully formed character	Fully formed character	200 x 2000
Interface/Controller	Parallel	Parallel	Parallel EIA232

Printers (Continued)

Model	Turbo Print Server 20	Print Server 40 Plus
Type	Laser	Laser
Speed	20 ppm	40 ppm
Graphics Resolution	300 x 300 dpi	300 x 300 dpi
Interface/Controller	DECnet, TCP/IP, Ethernet	DECnet, TCP/IP, Ethernet

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Peripherals (Continued)

Networking Features

Network Interfaces	Ethernet, (FDDI for DECsystem 5000 model 200 only)
LAN Protocols Supported	NFS
WAN Protocols Supported	TCP/IP
Network Applications	DECnet

Software

Operating System	ULTRIX V4.2
UNIX Implementation	Berkeley 4.3 BSD, AT&T UNIX V.4 Extension
Standards Complied With	ISO/OSI, OSF, POSIX, IEEE 802.3 Ethernet, LU6.2, X.400, X.25, TCP/IP, XPG3
Window Systems Supported	X Window Systems, DEC Windows
Graphical User Interfaces Supported	MOTIF, DEC Windows
Compilers	C

Security Features

Operating System/Physical Security	Removable disks
NCSC Security: Date/Level	C2 fuctionality
File Encryption Capabilities	Yes
Tempest Version Available	Yes

Configuration

Components

DECsystem 5000 Model 200 systems include a SCSI controller, one TURBOchannel I/O interconnect, Ethernet port and English-language user documentation. For software, an ULTRIX base license, ULTRIX 4-user license, ULTRIX server license, and a DECnet-ULTRIX license are included.

DECsystem 5100 systems include one RZ24 209M-byte fixed disk, embedded 802.3 Ethernet, three DEC423 asynchronous serial lines, one EIA-232 asynchronous serial modem line, one SCSI port, one console terminal cable, and English-language hardware documentation kit. For software, an ULTRIX 2-user base license and a 2- to 4-user upgrade license is included.

DECsystem 5500 pedestal systems include 32M bytes of memory, embedded 802.3 Ethernet, pedestal enclosure, Prestoserve license, console terminal cable, SCSI cable, English-hardware documentation kit, and nine Q-bus slots. For software, an ULTRIX 2-user license and a 16-user license is included. Disk and tape are not included with base system.

DECsystem 5800 Series systems include a TK70 load device, a KDB50 disk controller, VT320 terminal, a DEBNI 802.3 Ethernet communications interface, and an LA75 printer. One VAXBI channel supports 11 slots. For software, an ULTRIX two-user base license and 16-user license is included. A system disk is required for a fully supported system.

Configuration Rules

DECsystem 5000 Model 200

No internal storage devices supported.
System supports up to 128M bytes of memory.
A maximum of six external SCSI devices are support by base SCSI controller.
A maximum of three SZ12 expansion boxes.
A maximum of two drive in one SZ12 expansion box.
A maximum of one removable media (tape or diskette) drive per SZ12 expansion box.
A SCSI TURBOchannel option card must be added for more than six SCSI devices.
SCSI TURBOchannel option card supports six external devices.
DEC FDDI controller requires one TURBOchannel slot.
Ethernet TURBOchannel option card requires one TURBOchannel slot.

DECsystem 5100

A maximum of 128M bytes of memory supported by system.
A maximum of 92M bytes of memory with Prestoserve option.
Prestoserve option uses two memory slots for pair of cache RAM modules.
One RZ24 209M-byte disk drive is included with all systems, but an RX23 or RZ24 disk drive is necessary to receive factory-installed software.
A load device is required unless the system will be loaded via network.
A maximum of five internal SCSI devices.
A maximum of seven total system SCSI devices, internal and external.
A maximum of two TX30 streaming tape drives.
A maximum of two RX23 floppy drives.
A maximum of two TZK10 QIC 320M-byte tape drives.
A maximum of two external enclosures.
A maximum of two disk drives per external enclosure.

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Configuration (Continued)

DECsystem 5500	A maximum of 256M bytes of memory in 32M-byte or 64M-byte increments. Each system must be configured with a least one DSSI or SCSI mass storage device and one software load device. One DSSI adapter supports seven devices. One SCSI adapter supports seven devices. Each KDA50 controller supports up to four RA-series disk drives and uses three Q-bus slots. Maximum of two Q-bus storage adapters/controllers per system. Total of four expansion pedestals per system. B400X-B9 Q-bus storage expansion pedestal provides 10 additional Q-bus slots and space for four DSSI ISEs or SCSI disks or three DSSI ISEs or SCSI disks and one TK70 tape drive. R400X-B9 storage expansion pedestal includes space for seven DSSI ISEs or SCSI disks or six DSSI ISEs or SCSI disks and one tape. Maximum of one B400X Q-bus storage expansion pedestal per system. Maximum of four DSSI storage devices or three DSSI storage devices plus one tape device can be housed in system pedestal enclosure.
DECsystem 5800 Series	A maximum of 256M bytes of memory per DECsystem 5810. A maximum of 256M bytes of memory per DECsystem 5820. A maximum of 192M bytes of memory per DECsystem 5830. A maximum of 128M bytes of memory per DECsystem 5840. A maximum of four KDB50 disk controllers are supported per VAXBI channel in CPU cabinet, two per VAXBI channel in expansion cabinet. A maximum of twelve KDB50 disk controller per system. A maximum of two SA70 1.1G-byte storage arrays per CPU cabinet. A maximum of two RA92 1.5G-byte disk drives per CPU cabinet. A maximum of four disk drives per KDB50 controller. A maximum of two TU81-Plus tape drives per VAXBI channel. A maximum of four DEBNI 802.3 Etherent controllers per VAXBI channel, four per system. User must order a minimum of two RA70 280M-byte disk drives if ordering at all. The CPU cabinet can support two SA70 building blocks (eight RA70) or two RA92 disk drives, or one of each. The DECsystem 5810 can upgrade to a DECsystem 5820. Upgrade includes a 2-user base license upgrade and a 16-user license upgrade. Total of 64M bytes of memory required. The DECsystem 5820 can upgrade to a DECsystem 5830. Upgrade includes a 2-user base license upgrade and a 16-user license upgrade. Total of 64M bytes of memory required, 128M bytes recommended. The DECsystem 5830 can upgrade to a DECsystem 5840. Upgrade includes a 2-user base licence upgrade and a 16-user license upgrade. Total of 64M bytes of memory required, 128M bytes recommended.
Sample Configuration	**DECsystem 5000 Model 200** Low-end system with 1 MIPS R3000 CPU, 1 R3010 Floating Point Coprocessor, 16 Mbyte main memory, 64K-byte data cache memory, 64K-byte instruction cache memory, 1 SCSI controller, 1 332M-byte disk drive, 1 ThinWire Ethernet port, ULTRIX base license, ULTRIX four-user license, ULTRIX server license, and DECnet-ULTRIX license.

Physical Environment

Model	5000 Model 200	5100	5500
Physical Specifications			
Physical Orientation	Desktop	Desktop	Deskside
Height x Width x Depth (in.)	3.6 x 20.1 x 17.1	6 x 18 x 6	27 x 21 x 17.8
Weight (lbs)	30	45	145
Electrical Specifications			
Power Supply (watts)	359	230	860
Input Power (VAC)	90-128 or 180-256	88-132 or 176-264	90-128 or 190-256
Power Consumption (amps)	3.3/1.7	4.2/2.1	11.2/5.85
Operating Environment			
Temperature (F°)	50-104	50-90	50-104
Humidity (%)	20-80	10-80	20-80
Heat Output (BTU/hr)	N/A	N/A	N/A

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DECsystems

M09-325-**511**
Supermicrocomputer
Systems

Physical Environment (Continued)

Model	5810/5820	5830/5840
Physical Specifications		
Physical Orientation	Freestanding	Freestanding
Height x Width x Depth (in.)	60.5 x 30.5 x 30	60.5 x 30.5 x 30
Weight (lbs)	700	700
Electrical Specifications		
Power Supply (watts)	1600	1600
Input Power (VAC)	208	208
Power Consumption (amps)	8/4	8/4
Operating Environment		
Temperature (F°)	N/A	N/A
Humidity (%)	N/A	N/A
Heat Output (BTU/hr)	5440	5712

Pricing

Model	Description	Price ($)
Systems		
DECsystem 5000 Model 200	Low-end system with 1 MIPS R3000 CPU, 1 R3010 Floating Point Co-processor, 16 M-byte main memory, 64K-byte data cache memory, 64K-byte instruction cache memory, 1 SCSI controller, 1 332M-byte disk drive, 1 ThinWire Ethernet port, ULTRIX base license, ULTRIX four-userlicense, ULTRIX server license, and DECnet-ULTRIX license	19,795
DECsystem 5100	Entry-level system with 1 MIPS R3000 CPU, 1 R3010 Floating Point Co-processor, 8 M-byte main memory, 64K-byte data cache memory, 64K-byte instruction cache memory, 1 209M-byte disk drive, 1 ThinWire Ethernet port, ULTRIX two-user base license, ULTRIX two- to four-user upgrade license	10,995
DECsystem 5500	Midrange system with 1 MIPS R3000 CPU, 1 R3010 Floating Point Co-processor, 32 M-byte main memory, 64K-byte data cache memory, 64K-byte instruction cache memory, one DSSI adapter, one SCSI adapter, pedestal enclosure, Prestoserver license, ULTRIX two-user base license, ULTRIX two- to four-user upgrade license, UWS server license, English-language hardware documentation kit, nine available q-Bus slots	41,900
DECsystem 5800 Series	High-level system with 1 MIPS R3000 CPU, 1 R3010 Floating Point Co-processor, one VAXBI channel (11 slots), TK70 tape drive and interface, KDB50 disk controller, VT320 terminal, LA75 printer, printer/terminal stand, two RA90-PA disk, ULTRIX two-user base license, ULTRIX 16-user license, UTLRIX WS server license	75,000-190,000

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