

BACKGROUND FOR EDITORS

DIGITAL'S SERVER SYSTEMS: POWER, FLEXIBILITY, AND SIMPLICITY TO SERVE THE ENTIRE COMPUTING COMMUNITY

File servers, application servers, network servers, compute servers... the list of server terminology has grown in size and complexity as networking technology has evolved and personal computers and workstations have proliferated. But the idea behind servers is a simple one: to provide all desktops within a computing community with a consistent set of resources, applications, and services. Digital Equipment Corporation believes that while server technology may be complex, using servers should nevertheless be simple and effective. Furthermore, Digital's approach to servers helps customers protect their investment by allowing existing systems to become networked servers.

Digital realizes that many computing communities are diverse, with different devices used by people with different needs. Digital's server products easily accommodate this diversity, allowing users of workstations, personal computers, video terminals, and even devices like point-of-sale terminals to access and share computing resources -- whether for a community of ten users, or of ten-thousand users.

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"Client-Server" Defined

A server is a computer accessible to other devices on a network, that allows users to access the resources they need from the network -- resources like local and remote information, applications, high-speed processing, and printing services. Often, the software running at the user's device works in conjunction with processing taking place on the server.

In such a computing environment, each device being served is known as a "client." Clients do not necessarily have to be desktop devices like personal computers, workstations, or terminals. A client can in fact be any I/O device; bar-code scanners, laboratory data-collection instruments, and process controllers can all be clients connected to a Digital server. Even a time-sharing system can act as a client. Clients are connected to the server via networking; as such, all servers can be thought of as "network servers."

This environment is referred to as the "client-server model." The client-server model provides a number of benefits, including shared storage for simplified data management and backup; integration of mixed workstations and personal computers; and the optimization of computing resources across the network -- so that a user's or device's request is satisfied transparently with data and processing power located throughout the network.

A server can be either a general-purpose computer (i.e., a system that can deliver time-sharing, batch, or real-time functions) or a special-purpose system. Any of Digital's VAX or RISC general-purpose computers can easily play the role of server, providing services to networked clients throughout the

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enterprise. And Digital also offers specialized servers that are optimized for cost-effective implementation of specific client-server environments. Some of these specialized servers are pre-configured as packaged systems for easy deployment on the network.

What is important to realize is that what makes a computer a server is what it does, not what it is. In other words, how a computer is used defines whether or not that computer is a server -- and if a computer provides a specific, well-defined service to other systems or devices on the network, then it can be appropriately classified as a server. Today, servers are most commonly used as file servers, applications servers, and communications servers.

File Servers. File servers provide desktop devices with high-performance file storage, access, and sharing. To the user at the desktop, this file activity appears to be taking place locally; however, it is actually occurring on the server. Files are rapidly delivered to and from the client, where processing takes place.

In a software development environment, for instance, a VAX computer might act as a file server for networked VAXstation workstations, personal computers, and a high-speed laser printer. These clients would be used by software developers, documentation writers, and support staff -- each performing their share of the work on the device that best suits the task and the individual.

File servers simplify system management, consolidate data for added protection, and provide economies of scale for disk resources.

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Applications Servers. Applications servers split applications between the desktop and the server, utilizing the processing and disk I/O power of the server, yet allowing local data manipulation on the client. As with file servers, this process is invisible to the user. A common implementation of this type of distributed application is using the server for database storage and access (some might refer to this as a database server), while using the client to handle the user interface for issuing requests for, and receiving, information.

For example, Digital and Ashton-Tate Corporation have joined in an agreement to offer Ashton-Tate's popular dBASE database management product for use on Digital's VMS and ULTRIX multi-user systems and workstations. These products will allow PC users and workstation users to operate from within the familiar dBASE environment on their desktop, yet access distributed VAX Rdb/VMS databases on networked VAX systems. The VAX systems in this instance are acting as application servers.

Applications servers can also serve time-sharing systems -- as with a back-end VAX system serving front-end MicroVAX clients in a transaction processing environment.

Communications Servers. Communications servers can link desktops in a local-area network to other local-area or wide-area networks. Communications servers are specialized hardware/software packages, providing cost-effective communication links.

Digital's communications servers include the DECserver family of terminal servers -- ideal for users in large banking, manufacturing, and office environments who need to connect large

volumes of terminals, printers, modems, personal computers, and even non-Digital equipment to an Ethernet LAN. The DECserver family of terminal servers enable users to access any of the other computers and resources available on the network at an extremely attractive cost per user.

Another example of a communications server is Digital's DECnet/SNA Gateway -- allowing DECnet users and applications to access data stored on IBM systems.

General-Purpose Computers and Specialized Servers

As noted previously, a server can be either a general-purpose computer or a specialized system. A customer's requirements -- the use for which a server is intended and the client workload anticipated -- will determine if a general-purpose system or a specialized system is more appropriate.

A general-purpose computer, in addition to being used as a time-sharing system, may be used concurrently as a print or file server, or as an application server. Digital offers software for general-purpose systems that easily enables the implementation of server capabilities.

Unlike general-purpose computers, a specialized server is not a multipurpose machine. Digital offers two types of specialized servers: those that provide pre-defined server capabilities, and those that address customers' needs to develop customized client-server solutions. Examples of pre-defined servers include communications servers, and others like Digital's PrintServer 40 Plus PostScript laser printer, which provides high-speed printing services to clients on the network. These pre-defined servers come configured with all the hardware and software needed to perform their particular tasks.

For customers who need flexible, customizable server capability -- but not the multipurpose, time-sharing capabilities of a general-purpose VAX system -- Digital offers the VAXserver family.

Digital's VAXserver Family

Digital's VAXserver systems provide a flexible, cost-effective hardware and software platform on which specific server applications can be implemented. VAXserver systems are VAX computers that have been optimized for specific use as servers, yet that maintain all the scalability and networking capability for which the VAX family is renowned.

VAXserver systems (based on the VAX 6000 and MicroVAX 3XXX series) are configured with all the necessary software for implementing a client-server network, and are priced lower than their general-purpose counterparts.

VAXserver systems are base server systems, for which customers define the computing task to be handled. With the addition of Digital, third-party, or customer-developed software, the best server for a customer's specific needs can be implemented. For example, a VAXserver 3300 system running Digital's VAX ACMS product becomes a transaction processing server. Or, the VAXserver system might run a retail inventory-control application using data collected from cash registers and bar-code scanners in retail stores.

VAXserver 6000 systems are packaged with hardware and software that makes them ready to perform file or compute services for large or data-intensive workgroups. These servers support large, mixed workstation and PC environments of VMS,

ULTRIX, UNIX, and MS-DOS clients. Customers can then choose to build on this functionality; for example, adding a FORTRAN compiler to the VAXserver 6000 Model 410 makes it a file and compile server. Or, enterprise-wide electronic mail can be provided to those personal computer and workstation users.

Because of their VAX family heritage, VAXserver systems provide the flexibility and scalability to ensure that customers can match their information systems to their business needs. And with DECnet/OSI or TCP/IP networking, applications can be easily distributed to put computing resources where they are needed, as they are needed.

And if time-sharing capabilities are required in the future, conversion options are available to change VAXserver systems to general-purpose MicroVAX and VAX systems.

Servers for Personal Computers and Workstations

Digital offers the pre-configured PCLAN/Server 3100 system as an entry-level LAN server optimized for up to forty-eight active personal computers. Digital's general-purpose computers and VAXserver systems can also be ideal personal computer and workstation servers.

All of these Digital systems utilize VAX/VMS Services for MS-DOS software for integrating MS-DOS personal computers into client-server DECnet/OSI networks. These systems can be used as file and print servers, application servers, or both.

Using Digital's range of systems as servers for personal computers or workstations provides a powerful capability: a consistent, flexible, and nearly unlimited server growth path that enables exceptional system performance to be maintained as

the computing environment grows. With the realization that most networks never get smaller and instead grow larger, this capability becomes critical.

Performance Considerations. When purchasing a PC LAN server, the important performance consideration is not raw MIPS; chip performance does not necessarily translate into system performance. Rather, a LAN server should be thought of as a "throughput engine", where network I/O and disk I/O capabilities are of primary importance. Digital's servers are designed to provide consistent performance at the desktop, while offering the scalability to easily adapt to growth. Alternatively, a LAN server with a PC-based engine may run out of gas with more than eight users.

Of course, more PC-based LAN servers can always be added as prior PC-based servers run out of gas -- but the new servers may be isolated from the others. With Digital's servers and DECnet/OSI networking, however, additional servers are still part of the same seamless information network. Digital's "throughput engines" therefore offer maximum scalability and networking capability.

Compute Servers for Workstations. A server can be dedicated to an application that requires intensive computing power, and can thus be called a compute server. For example, engineers might use the power of a compute server to quickly process data for display on a diskless workstation running a mechanical or electrical CAD application.

General-purpose systems, such as Digital's RISC-based DECsystem family, can easily act as compute servers. For

instance, because of its high processing speed, the DECsystem 5800 computer is well-suited to storing ECAD data and running circuit simulations.

Workstation users also benefit from the data management and control afforded by the server -- an important advantage in large design projects or technical publishing projects that involve many workstation users. And client-server computing means engineers and professionals won't have to act as their own system managers. Data management, software updates, and data backups are all performed on the server, without users' knowledge or concern.

And Digital servers can simultaneously support UNIX, ULTRIX, and VMS workstations as well as the NFS set of protocols.

Appendix A outlines the capabilities of each of Digital's server systems.

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Note to Editors:

DEC, DECnet/OSI, DECserver, DECsystem, MicroVAX, PCLAN/Server 3100, PrintServer 40 Plus, ULTRIX, VAX, VAXserver, VAX Rdb/VMS, and VMS are trademarks of Digital Equipment Corporation.

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MS-DOS is a registered trademark of Microsoft Corporation.

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UNIX is a registered trademark of American Telephone and Telegraph Company.

APPENDIX A
DIGITAL'S SERVER CAPABILITIES

<u>CAPABILITY</u>	<u>SERVER</u>	
	PC LAN/Server 3100	VAXstation 3100 Model 40 Workstation/Server
. PC Connectivity	1-48	NO
. WS Connectivity	- diskless NO	1-7
	- with disk NO	1-15
. Mixed Workstation and PC Connectivity	NO	NO
. Print Service	YES	YES
. Central File Storage (MAX. Storage)	1.3GB	1.3GB
. Terminal, Printer, Modem Connectivity	YES	NO
. System Management and Backup	YES	YES
. Application Source	YES	YES
. Compute Server	2.4 VUPS	2.7 VUPS
. Database Server	NO	YES
. Batch Processing	NO	NO
. Network Management	NO	NO
. Transfer Data	YES	YES
. Connect to X.25 Networks	YES	YES
. Connect to SNA Networks	YES	YES
. Local Area Network (LAN)	YES	YES
. Wide Area Network (WAN)	YES	NO
. Local Area VAXcluster (LAVc)	YES	YES

Appendix A -- Digital's Server Capabilities

<u>CAPABILITY</u>	<u>SERVER</u>			
	VAXserver 3100	VAXserver 3300/3400	VAXserver 3800/3900	VAXserver 6000 Models 210/310/ 410/420
. PC Connectivity	1-48	1-90	1-120	1-300
. WS Connectivity	- diskless	1-12	1-16	1-40
	- with disk	1-19	1-26	1-50
. Mixed Workstation and PC Connectivity	YES	YES	YES	YES
. Print Service	YES	YES	YES	YES
. Central File Storage	1.5GB	1.5/2.4GB	2.4/9.7GB	58.2GB (local); over 800GB (VAXcluster)
. Terminal, Printer, Modem Connectivity	YES	YES	YES	YES
. System Management and Backup	YES	YES	YES	YES
. Application Source	YES	YES	YES	YES
. Compute Server	2.4 VUPS	2.4 VUPS	3.8 VUPS	2.8-13 VUPS
. Database Server	YES	YES	YES	YES
. Batch Processing	YES	YES	YES	YES
. Network Management	YES	YES	YES	YES
. Transfer Data	YES	YES	YES	YES
. Connect to X.25 Networks	YES	YES	YES	YES
. Connect to SNA Networks	YES	YES	YES	YES
. Local Area Network (LAN)	YES	YES	YES	YES
. Wide Area Network (WAN)	YES	YES	YES	YES
. Local Area VAXcluster (LAVc)	YES	YES	YES	YES

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<u>CAPABILITY</u>		<u>SERVER</u>				
		MUXserver 100/ DECmux II	MUXserver 300/ DECmux 300	DECserver 200	DECserver 300	DECserver 550
. PC Connectivity		YES w/ TE	YES w/ TE	YES w/ TE	YES w/ TE	YES w/ TE
. WS Connectivity	- diskless	YES w/ TE	YES w/ TE	YES w/ TE	YES w/ TE	YES w/ TE
	- with disk	YES w/ TE	YES w/ TE	YES w/ TE	YES w/ TE	YES w/ TE
. Mixed Workstation and PC Connectivity		NO	NO	NO	NO	NO
. Print Service		NO	NO	NO	NO	NO
. Central File Storage		NO	NO	NO	NO	NO
. Terminal, Printer, Modem Connectivity		1-16 (REMOTE)	1-48 (REMOTE)	1-8	1-16	16-128
. System Management and Backup		NO	NO	NO	NO	NO
. Application Source		NO	NO	NO	NO	NO
. Compute Server		NO	NO	NO	NO	NO
. Database Server		NO	NO	NO	NO	NO
. Batch Processing		NO	NO	NO	NO	NO
. Network Management		YES w/ TSM	YES w/ TSM	YES w/ TSM	YES w/ TSM	YES w/ TSM
. Transfer Data		NO	NO	NO	NO	NO
. Connect to X.25 Networks		NO	NO	NO	NO	NO
. Connect to SNA Network		NO	NO	NO	NO	NO
. Local Area Network (LAN)		YES	YES	YES	YES	YES
. Wide Area Network (WAN)		NO	NO	NO	NO	NO
. Local Area VAXcluster (LAVc)		NO	NO	NO	NO	NO

Appendix A -- Digital's Server Capabilities

<u>CAPABILITY</u>	<u>SERVER</u>		
	X25router 2000	DECnet/SNA Gateway	PrintServer 20/ PrintServer 40/ PrintServer 40 Plus
. PC Connectivity	NO	NO	NO
. WS Connectivity	NO	NO	NO
- diskless	NO	NO	NO
- with disk	NO	NO	NO
. Mixed Workstation and PC Connectivity	NO	NO	NO
. Print Service	NO	NO	YES
. Central File Storage	NO	NO	NO
. Terminal, Printer, Modem Connectivity	NO	NO	NO
. System Management and Backup	NO	NO	NO
. Application Source	NO	NO	NO
. Compute Server	NO	NO	NO
. Database Server	NO	NO	NO
. Batch Processing	NO	NO	NO
. Network Management	NO	NO	NO
. Transfer Data	NO	NO	NO
. Connect to X.25 Networks	YES	NO	NO
. Connect to SNA Networks	NO	YES	NO
. Local Area Network (LAN)	NO	YES	YES
. Wide Area Network (WAN)	YES	YES	NO
. Local Area VAXcluster (LAVc)	NO	NO	YES