digital™

Software Product Description

PRODUCT NAME: DIGITAL TCP/IP Services for OpenVMS Version 4.2 SPD 46.46.06

DESCRIPTION

The DIGITAL TCP/IP Services for OpenVMS software product (also known as UCX) is the OpenVMS implementation of the industry-standard TCP/IP suite of communications protocols defined in the TCP/IP layered model.

Based on the UNIX Berkeley Software Distribution (BSD) Version 4.3 software, the DIGITAL TCP/IP Services for OpenVMS product is layered software that provides interoperability and resource sharing between OpenVMS systems, UNIX systems, and other systems that support the TCP/IP protocol suite and the Network File System (NFS) product from Sun Microsystems.

The DIGITAL TCP/IP Services for OpenVMS product makes it possible for OpenVMS users to connect to heterogeneous networks and accomplish a variety of tasks:

- Network file access — users can access files on remote hosts.
- Electronic mail — users can exchange messages between hosts.
- Application development — application programmers can develop TCP/IP applications for communication between local and remote hosts.
- Download and file transfer — users can exchange files between hosts.
- User information — users can access information about other users logged onto the local or remote host.
- Remote management — system managers can monitor the UCX network and applications from remote management stations.
- Remote terminal access — users can access a remote system as if their terminal is connected directly to that system.
- Remote command execution — users can issue commands to remote hosts.
- Remote printing — users can send or receive print jobs to or from remote printers.
- Remote file copy — users can copy files that reside on remote hosts.
- Remote booting — system managers can boot remote nodes.

Internetworking with TCP/IP hides the hardware details of each individual network and allows computers to communicate independently of their physical network connections. Internetworking uses a uniform set of protocols to define behavior on an internet for all nodes using supported network media. TCP/IP provides both a standard transport mechanism and full-duplex, reliable, stream communication services for software applications.

Features

The features of the DIGITAL TCP/IP Services for OpenVMS product include:

- A number of components based on Network Interface, Internet, and Transport layer protocols and services, which move and manage the flow of data around the internet.
- A number of components based on Application layer protocols and services, such as electronic mail and remote file computing, that OpenVMS users require in open client/server environments

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- Support for a number of network hardware configurations: Ethernet, Fiber Distributed Data Interface (FDDI), Token Ring, and asynchronous transfer mode (ATM; Alpha systems only)
- A Berkeley Internet Name Domain (BIND) resolver and name server that maintains and distributes information about internet hosts
- Cluster load balancing and round-robin scheduling
- Easy, fast installation on an OpenVMS Alpha system (using the POLYCENTER Software Installation utility) or an OpenVMS VAX system (using the VMSINSTAL facility)
- A flexible configuration process that includes an interactive configuration procedure
- The UCX Management Control Program (UCP) command interface for configuring and managing the network connections and the UCX software
- Command procedures for automatic startup and shutdown of UCX components
- Logical names to help manage applications for local and remote users
- Application Programming Interfaces (APIs) for developing customized applications: $QIO, SRI $QIO, standard C sockets and C sockets library, SUN RPC, and eSNMP
- An auxiliary server, similar to the UNIX Internet daemon (*inetd*), that reduces the load on the system and provides security features, access control, and event logging
- Troubleshooting tools including error messages that display on the screen or print to log files; the Trace utility (TCPIPTRACE); BIND server load balancing and NSLOOKUP debugging; and management commands to isolate problems and tune performance

Licenses

Several DIGITAL TCP/IP Services for OpenVMS licenses are available:

License	Description
Server	For customers who require the full product functionality (server and client) of DIGITAL TCP/IP Services for OpenVMS.
Client	For customers who require the full functionality of the DIGITAL TCP/IP Services for OpenVMS product without the server components (NFS server, BIND server, PC-NFS server, remote BOOT server, and RMT/RCD server).
Client upgrade	For customers who purchased a client license and now require full DIGITAL TCP/IP Services for OpenVMS server functionality.

Network Interface Layer Support

With support for multiple network interfaces for each physical network controller, the DIGITAL TCP/IP Services for OpenVMS software allows OpenVMS systems to connect to individual host computers on different types of networks:

- Ethernet
- Fiber Distributed Data Interface (FDDI)
- Token Ring
- Asynchronous transfer mode (ATM) (Alpha systems only)

Individual host computers can also connect with other hosts or networks over serial communications lines using either the Serial Line Internet Protocol (SLIP or CSLIP) or the Point-to-Point Protocol (PPP) (OpenVMS Alpha Version 7.1 only).

Internet Layer Support

The DIGITAL TCP/IP Services for OpenVMS product supports the following Internet layer protocols that work together to move data around the internet:

- Internet Protocol (IP) — a connectionless packet delivery service
- Routing Information Protocol (RIP) — enables gateways to exchange current routing information about hosts and directly connected networks
- Internet Control Message Protocol (ICMP) — provides diagnostic functions and handles error and control messages
- Address Resolution Protocol (ARP) — dynamically maps an IP address to a physical hardware address

Transport Layer Support

To provide either connection-oriented or connectionless data transmission between two hosts (either local or remote), the DIGITAL TCP/IP Services for OpenVMS product supports both TCP and UDP protocols. These protocols form the bridge between the Application layer and the Internet layer:

- Transmission Control Protocol (TCP) — provides connection-oriented, reliable, sequenced data transfers for applications that must guarantee delivery of the data
- User Datagram Protocol (UCP) — provides fast, connectionless data transfers for applications that do not require delivery confirmation

Application Layer Support

The DIGITAL TCP/IP Services for OpenVMS product supports numerous Application layer protocols that allow OpenVMS users to:

- Run software on remote systems
- Transfer data files between local and remote systems
- Share remote system resources such as disk storage space and printers as if they were directly connected to the user's local system
- Send and receive electronic mail messages locally or across the worldwide Internet
- Provide consistent, reliable, and efficient network services to all users on the internet

Remote Computing

With TELNET, an OpenVMS user can log into remote hosts in the network. The TELNET features include:

- Simultaneous multiple sessions
- IBM 3270 model terminal emulation (TN3270)
- Support for both OpenVMS-style and UNIX-style interfaces

The popular UNIX Remote commands, called R commands, let OpenVMS users work in accounts on remote internet hosts that are either UNIX or other OpenVMS systems. The DIGITAL TCP/IP Services for OpenVMS software supports the RLOGIN, RSH, REXEC, and RMT/RCD commands.

The Finger utility enables users to obtain information about each user on local or remote systems. This information includes user name, account name, and the program the user is running.

File Transfer

OpenVMS users transfer data files between local and remote systems through the use of the following components:

- File Transfer Protocol (FTP) — transfers files between hosts
- Trivial File Transfer Protocol (TFTP) — downloads and transfers files
- The remote copy (*rcp*) command — copies files to or from remote hosts

Resource Sharing

The DIGITAL TCP/IP Services for OpenVMS software provides network printing through the line printer/line printer daemon (LPR/LPD) protocols. LPD provides remote printing services for UNIX and OpenVMS client hosts through local and remote print queues. Once the print queues are set up by the system manager, OpenVMS client users issue the DCL command PRINT and UNIX client users typically issue the *lpr* command.

The TELNET print symbiont (TELNETSYM) lets users print remotely during a TELNET session. With TELNETSYM, the local OpenVMS system drives a remote printer as if it were directly connected.

With the robust Network File System (NFS) server software, NFS client users gain transparent access to remote file services. With NFS, when a user accesses files and directories from a remote system, they appear to reside on the local system regardless of operating system, hardware type, or architectural differences between the local and remote systems. The PC-NFS daemon allows the NFS client software to run on a personal computer. The NFS server promotes data sharing among clients through a central data storage facility for OpenVMS and UNIX files. The NFS services are available where specific implementations of NFS exist on both the client and server systems.

Electronic Mail

With the Simple Mail Transfer Protocol (SMTP), OpenVMS users can send and receive electronic mail to and from local and remote hosts. The DIGITAL TCP /IP Services for OpenVMS implementation of SMTP uses the OpenVMS Mail facility, which automatically recognizes an SMTP host address in the format smith@widgets.com.

The SMTP server works with the Post Office Protocol (POP) server to provide a reliable mail service. With POP as the mail repository, PC clients are assured that mail is accepted even when the PC is turned off.

Network Services

With the following DIGITAL TCP/IP Services for OpenVMS management components, network and system managers can provide consistent, reliable, and efficient services to their users, with minimal interruption:

- Simple Network Management Protocol (SNMP) — a master agent and subagents that allow the UCX system to be managed by a management station on the network.
- Network Time Protocol (NTP) — an environment to synchronize time between hosts on a TCP/IP network.
- Berkeley Internet Name Domain (BIND) — a distributed database system that distributes and manages host information so hosts do not need to know the address of every other host on the internet. The BIND server translates the Domain Name System (DNS) host names into IP addresses. This feature complements the BIND resolver, which is the client component of BIND that requests node-name-to-address translations from a BIND server.
- Portmapper — a database system that allocates ports so system managers do not need to preconfigure client applications with port numbers for each service.
- Auxiliary server — a process that greatly simplifies application writing and manages overhead by reducing simultaneous server processes; eliminates high overhead surrounding services processes; provides system security through authentication of service requests; and supports event and error logging.
- The Bootstrap Protocol (BOOTP) — a process that answers bootstrap requests from remote devices.

Management Control Program

The DIGITAL TCP/IP Services for OpenVMS product provides the UCX Management Control Program (UCP), which is a comprehensive, easy-to-use network management tool that includes over 100 OpenVMS-style commands. These commands let system managers locally configure and monitor the UCX components.

Logical Names and Command Procedures

Startup and shutdown command procedures are available for all the components. In addition, logical names shorten the time it takes to complete management tasks for various applications such as FTP, NFS, SMTP, and POP.

Application Programming Interfaces (APIs)

The DIGITAL TCP/IP Services for OpenVMS product provides the following APIs for programmers to develop customized applications:

- Standard C Sockets and C Sockets Library — provides UNIX-like access to TCP, UDP, and raw IP using the C programming language.
- $QIO — provides access to TCP, UDP, and IP by extending OpenVMS system services for socket communications. Supports any programming language.
- SRI $QIO — translates older, non-UCX $QIO interfaces into $QIO interfaces.
- Sun RPC — provides an industry-standard, portable API for programmers who do not have an in-depth knowledge of networking protocols. An efficient alternative to application development using sockets.
- Extensible Simple Network Management Protocol (eSNMP) — provides eSNMP routines for building eSNMP subagents.

PATHWORKS Integration

The DIGITAL TCP/IP Services for OpenVMS product supports the PATHWORKS IP driver for improved PATHWORKS and TCP/IP integration.

INSTALLATION AND CONFIGURATION

System managers install the DIGITAL TCP/IP Services for OpenVMS product using the VMSINSTAL utility (VAX systems) or the POLYCENTER Software Installation utility (Alpha systems).

A menu-driven configuration procedure makes it easy to enable the full range of components and services or only those needed. In addition, management commands and logical names let you modify the default characteristics of the components and services to fit the needs of the network.

HARDWARE REQUIREMENTS

Supported Processors

The DIGITAL TCP/IP Services for OpenVMS product supports central processing units (CPUs) running OpenVMS Versions 6.2, 7.0, and 7.1. For a complete list of hardware products, see the SPD for the specific OpenVMS operating system release.

Required Network Controllers

The DIGITAL TCP/IP Services for OpenVMS software requires one of the following network controllers:

Controller	Description
Integral Ethernet	Resident Ethernet communications system
DEFTA	High-performance network adapter that connects TURBOchannel systems to ANSI FDDI local area networks
DEMFA	High-performance network adapter that connects XMI systems to ANSI FDDI local area networks; requires microcode revision of 1.4 or higher
DEMNA	High-performance network adapter that connects XMI systems to both Ethernet and IEEE 802.3 local area networks
PMAD	Network adapter that connects TURBOchannel systems to both Ethernet and IEEE 802.3 local area networks
DETRA	Token ring adapter for the TURBOchannel bus
DW110	Token ring adapter for the ISA bus
DW300	Token ring adapter for the EISA bus

The DIGITAL TCP/IP Services for OpenVMS software can share an Ethernet interface with other DIGITAL networking products such as DECnet-Plus for OpenVMS.

Memory Requirements

The minimum amount of memory required for the DIGITAL TCP/IP Services for OpenVMS product under the client or server license is:

System	Minimum Memory
OpenVMS VAX	24 MB
OpenVMS Alpha	32 MB

Disk Space Requirements (Block Cluster Size = 1)

The approximate amount of space required on the system disk to support the DIGITAL TCP/IP for OpenVMS software under the client or server license is as follows. Actual sizes may vary depending on the system environment, configuration, and software options.

Requirement	Size
Disk space required for installation	40,000 blocks (Alpha) 19,000 blocks (VAX)
Disk space required for permanent use	32,000 blocks (Alpha) 18,000 blocks (VAX)

System Parameter Requirements

The DIGITAL TCP/IP Services for OpenVMS software requires the following additional system parameters (minimum amounts):

- 65 global sections
- 8100 global pagelets
- 350,000 bytes of nonpaged dynamic pool

CLUSTER SUPPORT

The DIGITAL TCP/IP Services for OpenVMS product is fully supported when installed on any valid and licensed OpenVMS Cluster configuration.

SOFTWARE REQUIREMENTS

To qualify for a software support contract, the DIGITAL TCP/IP Services for OpenVMS product requires the OpenVMS operating system Version 6.2, 7.0, or 7.1.

Client access requires a system that supports the protocols specified by NFS Version 2.0 and all TCP/IP application protocols defined by the TCP/IP Request for Comments (RFCs).

The NFS component of the DIGITAL TCP/IP Services for OpenVMS software has been tested for interoperability and connectivity with clients of the following systems:

Sun Microsystems SunOS
Hewlett-Packard HP-UX
IBM AIX
Apple A/UX
Santa Cruz Operation SCO UNIX

For Systems Using Terminals: OpenVMS Version 6.2, 7.0, or 7.1

For Workstations Running DECwindows: OpenVMS Version 6.2. 7.0, or 7.1

For Workstations Running DECwindows Motif:

OpenVMS Version 6.2, 7.0, or 7.1
DECwindows Motif for OpenVMS Version 1.1 (or later)

GROWTH CONSIDERATIONS

The minimum hardware and software requirements for any future version of the DIGITAL TCP/IP Services for OpenVMS product may be different from the minimum requirements for the current version.

DISTRIBUTION MEDIA

Media and documentation for the DIGITAL TCP/IP Services for OpenVMS product are available on the DIGITAL CD-ROM Software Library for OpenVMS (QA–03XAA–H8). You can order printed documentation separately.

ORDERING INFORMATION

DIGITAL TCP/IP Services for OpenVMS Alpha

Software Licenses: QL–0LXA*–**
Software Documentation: QA–0LXAA–GZ
Software Product Services: QT–0LXA*–**

DIGITAL TCP/IP Services for OpenVMS Alpha Client

Software Licenses: QL–0M2A*–**
Software Documentation: QA–0LXAA–GZ
Software Product Services: QT–0M2A*–**

DIGITAL TCP/IP Services for OpenVMS Alpha Client Upgrade

Software License: QL–0PHA*–**
Software Documentation: QA–0LXAA–GZ
Software Product Services: QT–0PHA*–**

DIGITAL TCP/IP Services for OpenVMS VAX

Software Licenses: QL–VHRA*–**
Software Media: QA–VHRAA–H*
Software Documentation: QA–VHRAA–GZ
Software Product Services: QL–VHRA*–**

DIGITAL TCP/IP Services for OpenVMS VAX Client

Software Licenses: QL–GL7A*–**
Software Documentation: QA–VHRAA–GZ
Software Product Services: QT–GL7A*–**

DIGITAL TCP/IP Services for OpenVMS VAX Client Upgrade

Software License: QL–OPJA*–**
Software Documentation: QA–VHRAA–GZ
Software Product Services: QT–OPJA*–**

* Denotes variant fields. For additional information about available licenses, services, and media, refer to the appropriate price book. This ordering information was valid at the time of release. Contact your local DIGITAL office for current ordering information.

SOFTWARE LICENSING

This software is furnished under license only. For more information about DIGITAL licensing terms and policies, contact your local DIGITAL office.

The client license provide complete product functionality except for the following server components: NFS server, BIND server, PC-NFS server, the remote BOOT server, and the RMT/RCD server.

License Management Facility Support

The DIGITAL TCP/IP Services for OpenVMS product supports the OpenVMS License Management Facility (LMF).

License units are allocated on an unlimited use basis.

For information about the License Management Facility, see the OpenVMS Operating System Software Product Description (SPD 41.87.xx) or the OpenVMS documentation.

SOFTWARE WARRANTY

Warranty information about the DIGITAL TCP/IP Services for OpenVMS product is outlined in the Software Warranty Addendum, included with the product documentation.

SOFTWARE PRODUCT SERVICES

A variety of service options are available from DIGITAL. For detailed information about the service options, contact your local DIGITAL office.

The product information in this SPD was valid at time of release. For current product information, contact your local DIGITAL office.

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