Software Product Description

PRODUCT NAME: HP DECnet for OpenVMS Integrity servers Version 8.4 and OpenVMS Alpha Version 8.4   **SPD 48.48.13**

Note: This Software Product Description (SPD) covers DECnet for OpenVMS on Alpha and Integrity servers. Unless explicitly noted, the features described apply to both platforms. Licenses and part numbers are platform specific and are noted in the Ordering Information section of this SPD.

DESCRIPTION

DECnet for OpenVMS on Alpha and Integrity servers allows a suitably configured OpenVMS system to participate as an end node. With proper network planning, DECnet networks can contain up to 1,023 nodes per network area and up to 63 areas per network.

DECnet for OpenVMS end node or Extended function products are licensed separately for OpenVMS systems. The DECnet for OpenVMS License Product Authorization Key (PAK), when registered on an OpenVMS system, enables communication between systems using the DECnet protocols.

DECnet for OpenVMS has been implemented in accordance with Phase IV of the Digital Network Architecture (DNA) product. DECnet for OpenVMS is a layered product that ships with the Alpha and Integrity server operating system. On OpenVMS Alpha systems, the DECnet for OpenVMS License provides the right to use the software product on a single CPU and includes the delivery of a License Product Authorization Key (PAK) to enable DECnet for OpenVMS software. On OpenVMS Integrity server systems, the DECnet for OpenVMS license is part of the Base Operating Environment (BOE), which is licensed on a per core license basis. DECnet for OpenVMS is warranted only for use with Phase IV and DECnet-Plus (formerly DECnet/OSI) products supported by HP.

DECnet for OpenVMS offers task-to-task communications, file management, downline system and task loading, network command terminals, and network resource sharing capabilities using the Digital Network Architecture (DNA) protocols. DECnet for OpenVMS communicates with adjacent and nonadjacent Phase IV and DECnet-Plus nodes.

OpenVMS programs written in MACRO and native mode high-level languages can use DECnet for OpenVMS VAX capabilities.

The network functions available to a DECnet for OpenVMS user depend, in part, on the configuration of the rest of the network. Each DECnet product offers its own subset of Digital Network Architecture (DNA) functions and its own set of features to the user. Networks consisting entirely of DECnet for OpenVMS Phase IV nodes have all the functions described in this SPD. The functions available to users on mixed networks can be determined by a comparison of the SPDs for the appropriate DECnet products.

Standard DECnet for OpenVMS Capabilities

Task-to-Task Communication

For most applications, task-to-task communication can be programmed in a transparent manner where the remote task is treated as a full duplex, record-oriented device. Transparent operation is provided via the following interfaces: System Service calls, Record Management System (RMS) calls (OPEN, GET, PUT, and CLOSE) and high-level language I/O statements (which are mapped to RMS calls). A nontransparent mode of task-to-task communication is offered by means of the System Service interface that extends the capabilities

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provided by the transparent mode. These capabilities include support for interrupt messages and multiple inbound connect requests.

Using DECnet for OpenVMS, an OpenVMS program can exchange messages with other user programs. The two user programs can be on the same node, on adjacent Phase IV or DECnet-Plus nodes, or on any two nonadjacent Phase IV or DECnet-Plus nodes in the same network connected by Phase IV or DECnet-Plus routing nodes. DECnet for OpenVMS imposes no special data formatting requirements on the user.

Network Resource Access

File Access — File access is supported to and from remote DECnet systems using RMS. User programs can sequentially read, create, and delete files on a remote node.

Record Access — User programs can perform record level operations such as GET, PUT, UPDATE, DELETE, FIND, and REWIND to access and modify files residing on a remote OpenVMS node. In addition to sequential access to a file, several other access methods are supported through RMS using DECnet for OpenVMS. These methods include random access by relative record number, random access by key value, random access by Record File Address (RFA), and block I/O access by virtual block number.

Proxy Access

Remote users can have access to up to 15 proxy accounts on a specific remote system. One proxy account should be designated as the default proxy account on the remote system.

Command Language File Management

Most OpenVMS Digital Command Language (DCL) commands can be used to perform network file operations. These commands include: ANALYZE, APPEND, BACKUP, CLOSE, CONVERT, COPY, CREATE, DELETE, DIFFERENCES, DIRECTORY, DUMP, OPEN, PRINT, PURGE, READ, SEARCH, SUBMIT, TYPE, and WRITE. The operation of these commands is transparent except for commands that invoke processing on a specific system (that is, SUBMIT/REMOTE and PRINT/REMOTE). Only a node name added to a file specification is required to invoke the network capabilities via one of these commands.

Using the COPY command, a user can transfer sequential, relative, and indexed-sequential (ISAM) files between DECnet nodes that support compatible file structures and record formats. Sequential or relative files with fixed length, variable length, or variable length with fixed control field records can be transferred between two OpenVMS systems. Similarly, multikeyed indexed files with variable or fixed length records are supported.

The SUBMIT/REMOTE command allows command files residing on a remote node to be submitted for execution at the remote node. The command file must be in the format expected by the node responsible for execution. DECnet for OpenVMS also allows OpenVMS command files to be received from other systems and executed.

The DCL command EXCHANGE/NETWORK, allowing for the transfer of files to or from heterogeneous systems, is available. This command gives users the option to transfer file types between MS-DOS®, ULTRIX or Digital UNIX, and OpenVMS systems regardless of record semantics. Unlike the COPY command, which preserves file and record organization during a file transfer, this command enables the user to modify file and record attributes during file transfer.

Downline System Loading

DECnet for OpenVMS allows for the loading of an unattended system using the services provided by the Maintenance Operations Module (MOM). MOM provides a set of maintenance operations over various types of circuits by using the Maintenance Operations Protocol (MOP). A loadable system is a system that has a load device enabled for MOP service functions and for which a properly formatted load file is supplied. Downline loading involves transferring a copy of the properly formatted load file image of a remote node's operating system from an OpenVMS node to the unattended target node. For example, DECnet for OpenVMS permits the user to load routing software from the OpenVMS node downline to the target node. Load requests can come from the local DECnet for OpenVMS operator or from the target node. Downline loading is supported for HP server products. However, this facility is not supported over asynchronous lines.

Downline Task Loading

Initial task images for loadable systems can be stored on OpenVMS file system devices and loaded into remote nodes. Programs already executing on loadable remote systems can be checkpointed to the host OpenVMS file system and later restored to main memory in the remote node. These features simplify the operation of network systems that do not have mass storage devices.

This facility is not supported over asynchronous lines.

Upline Dumping

Memory images of adjacent nodes connected by DECnet can be written or dumped into a file on an OpenVMS system. This facility helps the system manager in fault isolation on a remote system. This facility is also supported for HP server products.

This facility is not supported over asynchronous lines.

Network Command Terminal

The DCL command SET HOST allows a terminal user on one DECnet node to establish a logical connection to another DECnet node that uses the Command Terminal Protocol (CTERM). This connection makes the terminal appear physically connected to the remote system and the operator can use all the standard system and network utilities supported by that remote node. This capability is particularly useful for doing remote program development and allows the terminal users on smaller application-oriented systems to use the resources of larger development-oriented systems.

OpenVMS MAIL Utility

The OpenVMS MAIL utility allows transmission of text messages between users of a standalone system. The DECnet for OpenVMS software allows users to send and receive OpenVMS MAIL to or from users of other systems that operate within the same DECnet network.

OpenVMS PHONE Utility

The OpenVMS PHONE utility allows users to send and receive data interactively from one user's terminal to another user's terminal. DECnet increases the scope of OpenVMS PHONE to allow active users on different systems in the same network to exchange information.

Cluster Alias

DECnet supports the ability to access some or all nodes in a VMScluster using a separate alias node address, while retaining the ability to address each node in the cluster individually. Not all network objects may be accessed using this mechanism. More than 64 nodes can operate within a cluster, but the maximum number of nodes that are allowed to participate in the cluster alias is 64. Refer to the VMScluster Software Product Description (SPD 29.78.xx) for relevant restrictions.

DECnet and DECnet-Plus nodes can coexist in the same cluster. However, DECnet and DECnet-Plus must have separate system disks, and they cannot share the same cluster alias.

The DECnet for OpenVMS Alpha cluster alias requires that at least one node in the VMScluster be licensed as an Extended Function node.

Refer to the DECnet-Plus documentation for details on configuring a DECnet-Plus cluster alias.

Network Management

The Network Control Program (NCP) performs three primary functions: displaying statistical and error information, controlling network components, and testing network operation. These functions can be performed locally or executed at remote Phase IV nodes that support these functions. NCP allows for planning, building, tuning, and controlling DECnet networks. NCP can be used to create and manage networks including local node operation, remote node operation, circuits, lines, and objects.

An operator can display the status of DECnet activity at any Phase IV node in the network. The user can choose to display statistics related to the node itself or the communication lines attached to that node, including traffic and error data. The local operator can also perform many network control functions such as starting and stopping lines, activating the local node, and downline loading systems.

DECnet provides network event logging to a terminal device or disk file. Any logged event can be used to monitor, diagnose, and tune a network. The NCP utility can be used to enable and disable the event logging facility.

NCP can also be used to test components of the network. NCP enables transmission and reception of test messages over individual lines either between nodes or through other controller loopback arrangements. The messages can then be compared for possible errors. NCP allows the performance of a logical series of tests that will aid in isolating network problems.

Integrated Interfaces

DECnet interfaces are standard parts of the OpenVMS operating system for use on local, standalone systems. Users can develop programs and procedures based upon these interfaces for such functions as file access and task-to-task communication on individual systems. Since the DECnet interfaces stay the same, the programs and procedures developed on an individual system can be used in a network environment without being modified.

Communications Options

DECnet for OpenVMS uses Ethernet and FDDI communications controllers to interface with other network nodes. LAN failover sets are also supported on Alpha.

LAN Failover

DECnet for OpenVMS provides support for OpenVMS LAN failover sets. LAN failover provides a mechanism to protect LAN applications against network interface card (NIC) failures. A LAN failover set is defined by the system manager and consists of a set of like adapters (all the same class) that support LAN failover. One adapter in the failover set is used for LAN traffic; one or

more other adapters in the set remain idle. If the active adapter fails, one of the idle adapters in the set automatically takes over LAN traffic using the same address as the failed adapter.

DECnet for OpenVMS Operation

DECnet for OpenVMS is implemented under the OpenVMS operating system as an Ancillary Control Process (ACP) and a network device driver with executive-level components and user-level programs supplied by HP.

The normal OpenVMS protection has been incorporated in the operation of DECnet for OpenVMS. For example, incoming connects including file access and file transfer requests are protected by the normal OpenVMS login and file protection mechanisms. Outgoing connects including file access and file transfer requests can include user password information that is implicitly specified via NCP, or explicitly specified by the user for verification on the remote node.

DECnet for OpenVMS Configuration and Performance

The process of configuring a DECnet node is based primarily on trade-offs of cost, performance, and functionality while satisfying the user's application requirements. It can be expected that network applications will range from low-speed, low-cost situations to those of relatively high performance and functionality. The performance of a given DECnet for OpenVMS node is a function not only of the expected network traffic and resultant processing, but also of the amount of concurrent processing specific to that node. Thus, node performance depends on many factors including:

- CPU types
- Number and type of devices
- In an SMP environment, the overall load on the primary CPU is especially relevant because the Phase IV NETACP can only be scheduled on that CPU.
- Number of device interrupts per unit time
- Communication line(s) characteristics
- Number and size of buffers
- Message size and frequency of transmission
- Applications in use
- Size and frequency of route-through traffic

It is important to note that the rate at which user data can be transmitted (throughput) over a communications line can sometimes approach, but will never exceed, the actual line speed. The reason is that the actual throughput is a function of many factors, including the line quality, protocol overhead, topology, and network application(s), as well as the factors cited in this section.

INSTALLATION

For the first installation of this product, HP recommends the purchase of HP's Installation Services. These services provide for installation of the software product by an experienced HP Software Specialist.

Customer Responsibilities

Before HP can install the software, the customer must:

- Ensure that the system meets the minimum hardware and software requirements (as specified in the relevant SPDs).
- Prior to installing HP hardware or software, obtain, install, and demonstrate as operational any modems and other necessary customer equipment or facilities to which HP's communication hardware or software will connect.
- Designate one adjacent node to verify installation/connectivity.
- Make available for a reasonable period of time, as mutually agreed upon by HP and the customer, all hardware communication facilities and terminals that are to be used during installation.

Delays caused by any failure to meet these responsibilities will be charged at the then prevailing rate for time and materials.

Installation for DECnet for OpenVMS will consist of the following:

- Verification that all components of DECnet for OpenVMS have been received.
- Verification that the necessary versions of the OpenVMS software and documentation are available.
- Verification of the appropriate SYSGEN parameters.

  Note: Should a HP Software Specialist be required to modify the previously installed operating system parameters, a time and materials charge will apply.

- Create any necessary DECnet accounts and directories.
- Enable software via License Product Authorization Key (PAK) registration.
- Define and create a local node DECnet database.
- Modify the system's startup command procedure to include startup of the DECnet for OpenVMS network.
- Verify the proper installation of DECnet for OpenVMS by running a series of tests to show connectivity to a designated node.

Connectivity to all other nodes within the network is the responsibility of the customer.

HARDWARE REQUIREMENTS

Refer to the HP OpenVMS for Integrity Servers and HP OpenVMS Alpha Operating Systems Software Product Description (SPD 82.35.xx) for hardware requirements and processor support. Reference can be made to the configuration charts listed in the OpenVMS Operating System SPD. For general device or controller descriptions, please refer to the *Networks and Communications Buyers Guide.*

CLUSTER ENVIRONMENT

DECnet for OpenVMS is fully supported when installed on any valid and licensed VMScluster configuration without restrictions. The *SYSTEMS SUPPORTED* section of the HP OpenVMS for Integrity Servers and HP OpenVMS Alpha Operating Sy stems Software Product Description (SPD 82.35.xx) details any special hardware required or not supported by this product.

OpenVMScluster software provides a distributed computing environment across a highly integrated set of Integrity server and Alpha systems that operate as a single environment. OpenVMScluster members can share many resources such as disk and tape storage, CPU resources, and system management operations. Within this highly integrated environment, systems retain their independence because they use local, memory-resident copies of the OpenVMS operating system. Thus, members can boot and fail independently while benefiting from common resources.

OpenVMScluster configurations are fully described in the OpenVMScluster Software Product Description (29.78.xx).

SOFTWARE REQUIREMENTS

DECnet for OpenVMS requires the following:

- OpenVMS Operating System Version 8.4 for Alpha
- OpenVMS Operating System Version 8.4 for Integrity servers

Only the Base OpenVMS Kit component is required.

GROWTH CONSIDERATIONS

The minimum hardware/software requirements for any future version of this product may be different from the requirements for the current version.

DISTRIBUTION MEDIA

DECnet for OpenVMS Alpha is distributed on CD–ROM.

DECnet for OpenVMS Integrity server system is distributed on DVD with the Base Operating Environment (BOE).

SOFTWARE LICENSING

On OpenVMS Alpha systems, the DECnet for OpenVMS License provides the right to use the software and includes the delivery of a License Product Authorization Key (PAK) to enable DECnet for OpenVMS software. On OpenVMS Integrity servers, the DECnet for OpenVMS license is part of the Base Operating Environment, which is licensed on a per core license basis.

To use this software product on additional CPUs, users must purchase a Single-Use License Option for each CPU on OpenVMS Alpha systems. On OpenVMS Integrity server systems, users must purchase additional PCL license units for each active CPU.

The DECnet for OpenVMS End System License grants the right to use all the DECnet features with the exception of cluster alias support. The DECnet for OpenVMS Extended Function license is required for cluster alias support.

This software is furnished under the licensing provisions of HP Computer Corporation's Standard Terms and Conditions. For more information about HP's licensing terms and policies, contact your local HP office.

LICENSE MANAGEMENT FACILITY SUPPORT

This product supports the OpenVMS License Management Facility.

License units for this product are allocated on a CPU capacity basis on OpenVMS Alpha. On OpenVMS Integrity servers, DECnet is licensed on a Per Core License (PCL) basis, as part of the Base Operating Environment.

For more information on the License Management Facility, refer to the OpenVMS Operating System Software Product Description (SPD 25.01.xx) or the *License Management Facility* manual of the OpenVMS operating system documentation set.

ORDERING INFORMATION

DECnet for OpenVMS is a layered product that ships with the Alpha operating system and with the BOE on Integrity server systems.

DECnet for OpenVMS licenses also include the right to use DECnet-Plus for OpenVMS.

Base License Option Numbers for DECnet for OpenVMS Alpha and Integrity servers are as follows:

HP OpenVMS Alpha Licenses	
End System	QL-MTFA*-AA
Extended Function	QL-MTGA*-AA
End System to Extended Function Upgrade	QL-MTHA*-AA

* Denotes processor variant.

HP OpenVMS Integrity Licenses[1]	
End System	Included in OE license
Extended Function	BA406AC

[1]Update licenses not available; updates available through SW Updates Service.

Media and Documentation

Product binary kits and online documentation are delivered on consolidated media libraries. Delivery model varies by platform.

HP OpenVMS Alpha Media and Online Documentation	
Software Layered Products Library Package[1]	QA-03XAA-H8
Software Layered Products and Operating System Library Package[1]	QA-5G98A-H8

[1]Quarterly Software Updates Service is available.

HP OpenVMS Integrity Media and Online Documentation[1]	
Base Operating Environment	BA322AA#AJR

[1]Product ships on Layered Products Library media included in all Operating Environment media kits, available with initial OpenVMS OE order.

NOTE: If you are *adding* a layered product to an existing OpenVMS Integrity system and do not have the latest software revision on site, please contact your local Sales Rep to request a Special Media kit.

SOFTWARE PRODUCT SERVICES

Support for this product is provided only under a prior version support contract. For more information, contact your local HP office.

SOFTWARE WARRANTY

This software is provided by HP with a 90 day comformance warranty in accordance with the HP warranty terms applicable to the license purchase.

The above information is valid at time of release. Please contact your local HP office for the most up-to-date information.