Software Product Description

PRODUCT NAME: DECnet for OS/2, Version 1.0 Operating System/2 Network Software for Personal Computers **SPD 55.23.00**

DESCRIPTION

DECnet for OS/2 allows selected IBM® personal computer systems and selected IBM compatible personal computer systems to participate as non-routing (end) nodes in DECnet computer networks. Refer to the System Support Addendum (SSA 55.23.00-x) for detailed configuration information. For information on Digital's network product for systems running MS-DOS™, refer to DECnet PCSA Client for DOS (SPD 55.07.xx) and VMS Services for PCs (SPD 30.50.xx).

Note: For purposes of this Software Product Description, IBM's Operating System/2 and specific variants of Operating System/2 are referred to simply as "OS/2."

DECnet for OS/2 is a DECnet Phase IV network product and is warranted for use only with supported Phase IV products supplied by Digital.

DECnet for OS/2 offers task-to-task communications, remote file access, utilities for network file operations, network virtual terminal support, and network resource-sharing capabilities using the Digital Network Architecture (DNA) protocols. Access to full DECnet functions is supported for OS/2 user programs written in MACRO Assembler and the C language.

DECnet for OS/2 nodes can be connected to a baseband network via an Ethernet connection. See the *OPTIONAL HARDWARE* section of the System Support Addendum (SSA 55.23.00-x) for details on supported Ethernet configurations.

Given proper network planning, DECnet Phase IV networks can contain a maximum of 1023 nodes per network area, and up to 63 areas per network. Phase III nodes participating in Phase III/IV networks are limited to the Phase III routing capability of 255 nodes. Phase II nodes are not supported. Phase IV end nodes not directly connected to an Ethernet Local Area Network can connect to only one node. In order to communicate with other nodes in the network, including Phase III nodes, the connected node must be a Phase IV full-function (routing) node.

The functions available to the DECnet for OS/2 system user depend largely upon the configuration of the rest of the network. Each DECnet product offers its own level of capability and its own set of features to the user. The OS/2 operating system is limited to a single user, and access to a DECnet for OS/2 node from a remote network terminal is not supported.

The DECnet products and functions available to users on mixed networks can be determined by comparison of the SPDs for the component products.

DECnet for OS/2 User Interface

DECnet for OS/2 provides a command line interface. Utilities supplied with DECnet for OS/2 can run within the context of a Presentation Manager screen group. Applications which use DECnet for OS/2 can be written by the user to take advantage of presentation manager features. Applications which use DECnet for OS/2 and utilities supplied with DECnet for OS/2 cannot be run in the OS/2 compatibility box.

Task-to-Task Communication

Using DECnet for OS/2, an OS/2 user program written in Microsoft's MACRO Assembler, or the C language, can exchange messages with other network user programs. The remote end user program can be on a Phase III node in the same area, or on any other Phase IV node in the network. The messages sent and received by the two user programs can be in any data format.

Full (non-transparent) user program to user program capabilities are possible in C or MACRO through a library of special network subroutine calls. The C language network interface library is almost exactly the same as those provided with DECnet PCSA/Client software (SPD 55.07-xx) and DECnet-DOS software (SPD 50.15.xx) and is a compatible subset of that provided with the DECnet-ULTRIX product (SPD 26.83.xx). This gives the network programmer access to the complete set of DECnet functions. Microsoft compatible compilers (compilers which produce Microsoft object file format) are supported.

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Small, compact, medium and large size memory models are supported, where small refers to single data and code segments (under 64K bytes each), compact refers to multiple data segments and one code segment, medium refers to a single data segment and multiple code segments, and large refers to multiple data segments and multiple code segments.

NETBIOS Interface Support

A network driver in DECnet for OS/2 provides the session level NETBIOS interface used by LAN Manager. The driver conforms to the *IBM Local Area Network Technical Reference,* order number SC30-3383-2.

Network Resource Access

File Transfer

Using the Network File Transfer (NFT) utility, the user can transfer sequential ASCII and binary files between the personal computer and another DECnet node. Files can be transferred in both directions between the locally supported OS/2 file system and the file systems of other DECnet nodes. Wild cards can be used in source file specifications for both local and remote nodes, subject to support on the remote system.

ASCII text files transferred to the DECnet for OS/2 system are converted into OS/2 stream files; such files are converted into the remote system's normal format when transferred from the DECnet for OS/2 node. On transfer of binary files to a DECnet for OS/2 system, file data is preserved, but any record attributes will be lost; record attributes can be restored on such transfers from the personal computer to a record file system through use of utility switch settings.

Additional facilities of the utility allow concatenation (APPEND), deletion (DELETE), remote spooling (PRINT), and display (TYPE) of files, as well as submission (SUBMIT) and/or execution of command files, provided the remote node supports these functions. Directory (DIRECTORY) listings are also supported.

Job Spawner

Since OS/2 is a multi-tasking operating system, background network servers are supported. The job spawner is a utility that allows a personal computer running DECnet for OS/2 to act as a server for performing multiple service functions. When the job spawner is activated, it listens for connect requests from other nodes. The job spawner also allows remote users to execute command files on PCs running DECnet for OS/2.

File Access Listener

The File Access Listener (FAL) server task provides full access to the personal computer node's file resources from remote systems. User ID and password protection can be used to control access to local files. FAL receives remote file access requests from the network and translates them into calls to the OS/2 file system. FAL then sends or receives the resulting file data back to the accessing program. FAL also supports the execution of remotely submitted command files.

Network Virtual Terminal

The SETHOST utility provides the user with VT220-like terminal emulation via LAT, CTERM or the asynchronous serial communications port. SETHOST allows the personal computer to appear as if it were a terminal physically connected to the target system. This is particularly useful for remote program development because it allows the user of the small, application-oriented personal computer to utilize the resources of larger systems.

CTERM, Digital's Terminal Services Architecture Command protocol, is used by SETHOST to give the personal computer the ability to establish a virtual connection to remote multi-user Phase IV DECnet systems which provide this support. The maximum number of CTERM sessions is limited by the maximum number of network links defined during the configuration of the DECnet for OS/2 node.

LAT, Digital's Local Area Transport protocol, is used for virtual terminal connections to Digital systems in an Ethernet Local Area Network. This is the same protocol used between Digital terminal servers and LAT hosts. The interface to the LAT driver is documented in order to allow users to write their own applications which take advantage of these protocols.

A copy of SETHOST can be run in each available screen group. Each copy of SETHOST can support one virtual terminal session. Multiple CTERM and LAT terminal sessions (to the same or different hosts) can be established, suspended and resumed.

SETHOST uses the COM port driver, provided by Microsoft in the operating system, to access the serial port for network virtual terminal support. The modem control provided by the operating system is available to SETHOST.

Only one SETHOST session can be enabled on the communications port when SETHOST uses the asynchronous communication port for an asynchronous terminal connection.

Terminal characteristics can be selected and saved by use of the utility's setup feature. The following list of character sets are supported with SETHOST: ISO Latin-1 (ISO), DEC multi-national (MCS) and National Replacement (NRCS). Refer to the System Support Addendum for information on supported keyboards. Full local printer support is provided under SETHOST (i.e. printing within ALL-IN-1) with Digital printers. SETHOST sessions can also be logged to a file for future examination.

SETHOST provides a script processing language that allows for the automation of frequently executed functions. For example, a script can be written to automatically log a user in to a computer. Scripts can be written which perform a task and then exit SETHOST, without user intervention.

Remote Network

DECnet for OS/2 provides the capability to use disk space on a remote DECnet node as though it were an additional disk local to the DECnet for OS/2 system. This can be useful for providing extra storage capacity to the personal computer user, or for backing up local files using the OS/2 COPY utility.

The Network Device Utility (NDU) creates a file on the remote system (using the standard DECnet file access interface) representing a local device. This file is then opened and assigned a local OS/2 device name (such as G:). User programs or OS/2 utilities which then perform I/O to this pseudo-device will actually be affecting the remote file. Up to eight network disks can be opened simultaneously. Sizes can be 1M, 1.2M, 1.44M, 10M, 20M, or 32M bytes in any combination.

Multiple DECnet for OS/2 nodes may access the same network disk simultaneously, for read only operations. OS/2 applications on the same personal computer can both read and write to a network disk.

The Network Device Utility also permits assignment of a local printer device identifier to the default system printer of a remote DECnet system. The user can direct output to the network printer device identifier, LPT1:, causing the data to be sent to a file located at the remote node. That file will be queued to the remote system's printer when the connection is closed by NDU. This is a limited facility, and does not allow the use of print job switches or the setting of printer characteristics.

OS/2 MAIL Utility

DECnet for OS/2 MAIL allows transmission of text messages and documents to users of MAIL software (e.g., VMS MAIL, MAIL-11) on systems that operate within the same DECnet network. A MAIL server task for a VAX system running a minimum of VMS V5.0 is required. The user can specify a text editor such as the OS/2 system editor, to be invoked when creating a message. The user can also specify a remote nodename::username to be used by respondents and for ''carbon copies'' of all MAIL sent. The user can specify whether mail accessed by the MAIL utility is stored directly on the server or is delivered to the local OS/2 system from the server.

Network Management

The Network Control Program (NCP) performs four primary functions:

- Displaying statistical and error information
- Configuring the OS/2 network node
- Controlling the node's network components
- Testing local network components

The output resulting from a command can be directed to a local file or to the personal computer console.

The user can display the status of the local node's DECnet activity. Statistics related to both the node and the communication line can be displayed, including data on traffic and errors. Network parameters such as timer values, and buffer sizes can be modified.

Control functions include starting and stopping the line and links, deactivating the local node, controlling access to files from remote nodes (for file security) and defining parameters for down-line load and up-line dump support. In order to test hardware components, loop test messages can be sent and received over the network between the personal computer and another node, or through controller loopback arrangements.

DECnet for OS/2 provides for limited local network event logging.

The Network Management Listener task is an optional background task which allows remote DECnet nodes to monitor network activity and parameters on DECnet for OS/2 nodes. This allows network managers to know whether or not remote DECnet for OS/2 nodes are functioning correctly on the network. Remote alteration of any network parameters is not supported. Refer to the *DECnet for OS/2* technical documentation for details on which parameters can be remotely displayed.

The network management mirror task is an optional background task which responds to LOOP NODE tests from remote nodes and LOOP EXECUTOR tests from the local node.

Down-line Loading

A DECnet for OS/2 node can act as a host in performing down-line load functions for systems (such as routers) on a local area network. Refer to the specific SPD for the product to be down-line loaded for information on DECnet for OS/2 load host support.

The down-line load function transfers a copy of the file image of a remote node operating system from the DECnet for OS/2 node to the unattended target node. The down-line load can be initiated by an OS/2 operator or by the target node. Simultaneous down-line loading of multiple systems is not supported, though a single DECnet for OS/2 system can be the load host for multiple unattended systems.

Up-line Dumping

An unattended system may detect an impending system failure and request an up-line dump of the contents of memory. An appropriately configured DECnet for OS/2 node may accept an up-line dump request and store the unattended system's memory image in a file on the OS/2 node. This image is helpful for the diagnosis of the problem on the unattended system.

LAN Communications

DECnet for OS/2 supports direct connection to baseband Ethernet local area networks via Ethernet adapters (See *OPTIONAL HARDWARE*). These interfaces, when used in conjunction with Digital's baseband Ethernet components, allow DECnet for OS/2 to utilize Ethernet as its datalink transmission medium.

Broadband connections are not supported.

DECnet for OS/2 Configuration and Performance

The process of configuring a DECnet for OS/2 node is based primarily on trade-off of cost, performance, and capability, within the realm of satisfying the user's application requirements. The performance of any given DECnet node is a function of not only the expected network traffic and resultant processing (''global'' conditions), but also of the amount of processing specific to the IBM personal computer node (''local'' conditions).

Thus, node performance depends on many factors, including:

- Memory size
- Number of device interrupts per unit time
- Number and size of buffers
- Message size and frequency of transmission
- Local applications

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

DECnet for OS/2 Installation and Operation

DECnet for OS/2 is provided as a set of device drivers, background tasks, and utilities. Not all components provided on the DECnet for OS/2 media kits are necessary for a viable DECnet node. Users can customize DECnet for OS/2 configurations to best suit their needs. The network database files must be accessible by the DECnet utility programs at run time.

Note that there may be OS/2 layered software applications and PC hardware products which are not compatible with DECnet operation.

The software installation procedure, included with the product, guides the user through installation with a series of screen form selections. The answers establish the DECnet for OS/2 node's network configuration. The installer is prompted for network node name, address, and type of network connection; default values for all other options are supplied.

The procedure ensures that the system configuration files, CONFIG.SYS, STARTUP.CMD and OS2INIT.CMD cause the network processes (and optional network device drivers) to be loaded at system startup (boot) time. When each screen group is invoked, the installation information establishes the correct environment in which to run the DECnet application.

A procedure is also provided to help the installer verify successful software installation and to demonstrate connectivity to the adjacent network node.

The DECnet installation procedure is only supported on systems with hard disks.

INSTALLATION

This software product can be installed by the customer using the step-by-step documentation available for this product. Optionally, you can purchase Digital Installation Services which provide for the installation of the software product by an experienced Digital Software Specialist.

Customer Responsibilities

Before installation of the software, the customer must:

- Previously have installed all requisite software and hardware.
- Obtain, install and demonstrate as operational any modems and other equipment and facilities necessary to interface to Digital's communication equipment.
- Make available for a reasonable period of time, as mutually agreed by Digital and the customer, all hardware and communication facilities that are to be used during installation.

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

HARDWARE REQUIREMENTS

A base system from the Configuration Chart (refer to the System Support Addendum, SSA 55.23.00-x) with the following:

- A minimum of 1.5MB system memory for OS/2 V1.0 variants
- A minimum of 3.0MB system memory for OS/2 V1.1 variants
- One network connection chosen from the Ethernet section associated with a base system in the Support Configuration Chart

  Only one DECnet line can be configured under DECnet for OS/2
- A hard disk with a minimum of 3MB of free disk space
- At least one diskette drive capable of reading 5 1/4" 1.2MB diskettes or 3 1/2" 1.44MB diskettes

OPTIONAL HARDWARE

Refer to the System Support Addendum (SSA 55.23.00-x) for additional hardware options which may be added to supported configurations.

SOFTWARE REQUIREMENTS

Refer to the System Support Addendum (SSA 55.23.00-x) for supported operating systems.

ORDERING INFORMATION

Software Licenses: QL-YESA*-**
Software Media: QA-YESA*-**
Software Documentation: QA-YESAA-GZ
Software Product Services: QT-YESA*-**

* Denotes variant fields. For additional information on available licenses, services and media, refer to the appropriate price book.

Note: Both 3 1/2" (RX23s) and 5 1/4" (RX33s) are included with the software media kits.

SOFTWARE LICENSING

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

SOFTWARE PRODUCT SERVICES

A variety of service options are available. For more information on these or other services, please contact your local Digital office.

SOFTWARE WARRANTY

Warranty for this software product is provided by Digital with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

System Support Addendum

PRODUCT NAME: **DECnet for OS/2, Version 1.0 Operating System/2 Network Software for Personal Computers**

SSA 55.23.00-A

HARDWARE REQUIREMENTS

- A base system from the Configuration Chart
- A minimum of 1.5MB system memory for OS/2 V1.0 variants
- A minimum of 3.0MB system memory for OS/2 V1.1 variants
- One network connection chosen from the Ethernet column associated with a base system in the Supported Configuration Chart.

  Only one DECnet line can be configured under DECnet for OS/2.
- A hard disk with a minimum of 3MB of free disk space
- At least one diskette drive capable of reading 5.25 inch 1.2 MB diskettes or 3.5 inch 1.44MB diskettes

OPTIONAL HARDWARE

The following hardware options from Digital may be added to the configurations (subject to the limitations of the system chosen) described under HARDWARE REQUIREMENTS.

Standard keyboards and enhanced keyboards which come with the base systems listed below are supported. The LK250 is supported on the Personal Computer AT™ . The LK250 is supported in both Digital and IBM mode. IBM mode can be invoked by the user by hitting the Alt-F17 key sequence.

The following hardware options from IBM, and COMPAQ® may be added to the configurations (subject to the limitations of the system chosen) described under HARDWARE REQUIREMENTS:

- IBM Enhanced Keyboard
- COMPAQ Enhanced Keyboard
- Diskette Drives and Adapters
- Fixed Disks and Adapters
- Memory Expansion Options
- Memory Module Kits
- Color Display, Color/Graphics Monitor Adapter
- Printer Adapter
- Digital DEPCA-xx Ethernet controller boards with the DEPCA-AU Attachment Unit Interface in the personal computer

DECnet for OS/2 supports any video adapter supported by the OS/2 Operating System listed in the SSA.

SOFTWARE REQUIREMENTS

A minimum of:

- 1.5BM system memory for IBM Operating System/2 Standard Edition V1.0
- 3.0MB system memory for IBM Operating System/2 Standard Edition V1.1
- 1.5MB system memory for COMPAQ MS-Operating System/2 Standard Edition V1.0
- 3.0MB system memory for COMPAQ MS-Operating System/2 Standard Edition V1.1
- 1.5MB system memory for Zenith Microsoft MS OS/2 V1.0

OPTIONAL SOFTWARE

None

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® COMPAQ is a registered trademark of COMPAQ Computer Corporation

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ORDERING INFORMATION

Software Licenses: QL-YESA*-**
Software Media: QA-YESA*-**
Software Documentation: QA-YESAA-GZ
Software Product Services: QT-YESA*-**

* Denotes variant fields. For additional information on licenses, services and media, refer to the appropriate price book.

DISTRIBUTION MEDIA

Disk: RX23 3 1/2" Floppy Diskette, RX33 5 1/4" Floppy Diskette

Software Configuration Chart

For purposes of the Supported Configuration Chart, the terms 3COM1™, 3COM2, and Digital refer to the following definitions:

Digital	Digital DEPCA-xx Ethernet multi-buffered controller for personal computers. The use of the -AU transceiver adapter is also supported. (See configuration notes 1 and 2.)
3COM1	3COM 3C503 EtherLink™ II multi-buffered Ethernet controller
3COM2	3COM 3C523 EtherLink/MC Ethernet multi-buffered controller

For the purposes of the following Supported Configuration Chart, the terms IBM OS/2, COMPAQ OS/2, Zenith OS/2 and Olivetti OS/2 refer to the following definitions:

IBM OS/2	IBM Operating System/2 Standard Edition V1.0 or V1.1
COMPAQ OS/2	COMPAQ MS-Operating System/2 V1.0 or V1.1
Olivetti OS/2	Olivetti MS OS/2 V1.1
Zenith OS/2	Zenith Microsoft MS OS/2 V1.0

Note: Only systems, components, and peripherals which are identified and follow were available from IBM, Zenith, Compaq or Olivetti as of August 31,1989 are supported.

Base System	**Ethernet**	**Operating System**
IBM 5162 Personal Computer XT Model 286	Digital 3COM1	IBM OS/2
IBM 5170 Personal Computer AT	Digital 3COM1	IBM OS/2
IBM 8530 Personal System/2 Model 30/286	3COM1	IBM OS/2
IBM 8550 Personal System/2 Model 50	3COM2	IBM OS/2
IBM 8555 Personal System/2 Model 55SX	3COM2	IBM OS/2
IBM 8560 Personal System/2 Model 60	3COM2	IBM OS/2
IBM 8570 Personal System/2 Model 70	3COM2	IBM OS/2
IBM 8580 Personal System/2 Model 80	3COM2	IBM OS/2
COMPAQ DESKPRO 286	Digital 3COM1	COMPAQ OS/2
COMPAQ DESKPRO 386s	Digital 3COM1	COMPAQ OS/2

Base System	Ethernet	Operating System
COMPAQ DESKPRO 386/20e	Digital 3COM1	COMPAQ OS/2
COMPAQ DESKPRO 386/16	Digital 3COM1	COMPAQ OS/2
COMPAQ DESKPRO 386/20	Digital 3COM1	COMPAQ OS/2
COMPAQ DESKPRO 386/25	Digital 3COM1	COMPAQ OS/2
COMPAQ PORTABLE III	Digital 3COM1	COMPAQ OS/2
COMPAQ PORTABLE 386/20	Digital 3COM1	COMPAQ OS/2
COMPAQ SLT/286	Digital 3COM1	COMPAQ OS/2
Olivetti M250	Digital 3COM1	Olivetti OS/2
Olivetti M380/XP1	Digital 3COM1	Olivetti OS/2
Zenith Z-248	Digital 3COM1	Zenith OS/2

Disk Requirements Table

Component	Disk Space
Ethernet Connection:	
DLLMAC, Ethernet MAC driver datalink, one of:	12K
3COM 3C503, ELNKII	19K
3COM 3C523, ELNKMC	18K
DLLDEPCA, Ethernet datalink	13K
DECnet network process	44KB
NETDRV, DECnet network driver	12K
Network Components:	
LAT, local area terminal driver	29K
LAT, local area terminal dynamic link library	26K
MOP, maintenance operation protocol	29K
NETBIOS, NETBIOS session driver	27K
NDDRV, network virtual disk driver	26K
NPDRV, network virtual printer driver	22K
Applications:	
NFT, network file transfer	91K
FAL, file access listener	58K
NCP, network control program	298K
NML, network management listener	21K
MIRROR, loopback server	14K

Component	Disk Space
SETHOST, terminal emulation	180K
One keyboard file, or	13K
All keyboard files	47K
One character set file, or	3K
All character set files	41K
MAIL program	199K
MAIL server program	23K
MAIL support utilities	340K
NDU network device utility	56K
Job spawner	24K
DTS, data test sender	72K
DTR, data test receiver	23
Programming Interface:	
Include files	69K
C language programming library, small model	45K
C language programming library, compact model	47K
C language programming library, medium model	45K
C language programming library, large model	47K
DECnet programming library, dynamic link library	13K

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