digital
Software Product Description

DESCRIPTION:

DECnet Phase II is the collective name for the set of software products that extend various DIGITAL operating systems by enabling the user to interconnect these systems with each other to form computer networks. The DECnet Phase II products include DECnet-11M Version 2, DECnet-11S Version 2, DECnet-11D Version 2, DECnet-IAS Version 2, DECnet/E Version 1, DECnet-RT Version 1, DECnet-VAX, Version 1 and DECnet-20, Version 1.0. The DECnet user can configure a variety of networks, to satisfy a variety of applications, by choosing the appropriate CPUs, line interface (and speeds), and operating system software.

In order to satisfy these widely varying applications, DECnet allows the user to build networks from a range of systems and communications components. DECnet allows users to interconnect systems using serial asynchronous, serial synchronous, and parallel facilities. When configuring DECnet systems, both ends of any given link must use the same type of communications discipline (e.g., synchronous, asynchronous or parallel) running at the same line speed.

DIGITAL Network Architecture:

DECnet includes a set of network protocols, each of which is designed to fulfill specific functions within the network. Collectively, these protocols are known as the DIGITAL Network Architecture, or DNA. The major protocols, and their functions, are:

DIGITAL Data Communications Message Protocol (DDCMP) — DDMCP handles the physical link traffic control and physical link error recovery within DECnet. DDCMP operates over both full and half duplex facilities, using serial synchronous or serial asynchronous facilities in a point-to-point mode. DDCMP has the following important characteristics:

- operates over a wide variety of hardware types
- makes efficient use of full-duplex channel capacity
- allows transmission of all data types (including binary) with low overhead
- allows standard (character-oriented) communications hardware to be used
- uses CRC-16 for error detection, with recovery by retransmission
- effective on earth/satellite links (or other links) with long signal propagation delays

A full specification for DDCMP Version 4.0 is available on request. DIGITAL does not regard DDCMP as a proprietary protocol, and allows others to implement and use the protocol, providing an acknowledgment of the source is made in any public documentation.

Network Services Protocol (NSP) — NSP handles network management functions within DECnet. This includes sending messages between two nodes and routing messages within any given node. NSP makes it possible for two programs on different machines to establish a logical communications channel (or logical link) between the programs, and to exchange data using this logical link. These programs need not be aware of either the nature of the physical link (full/half duplex, parallel or serial) or the nature of the protocols supporting the physical link. NSP has the following important characteristics:

- dynamic creation of logical links between tasks
- exchange of data between tasks on a solicited basis
- exchange of data between tasks on a non-solicited (e.g., interrupt) basis
- nodes can be dynamically connected within the network once NSP initialization occurs over a previously established physical link

A full specification for the Network Services Protocol Version 3.0 is available on request. NSP is not a proprietary protocol.

Data Access Protocol (DAP) — The Data Access Protocol enables programs on one node of the network to use the I/O services available on other network nodes. Each operating system in DECnet provides facilities for translating its own unique I/O calls into the DAP standard, and vice versa. Thus, DAP enables data requests to be processed in a meaningful way by many (possibly heterogenous) operating systems. DAP's facilities include:

- remote file access, including OPEN, READ, WRITE, CLOSE and DELETE for sequential and random access files, and command files

It should be noted that each DAP function requires support at both ends of the link. At the local node, where the user program initiates a data request, the DAP support must package the request for transmission through the network. At the remote node (where the device or file resides), the DAP support must cause the appropriate actions to be performed. Not all systems support both local and remote portions of each DAP operation.

A full specification for the Data Access Protocol Ver-

sion 4.1 is available on request. DAP is not a proprietary protocol.

DECnet Functions:

Digital Network Architecture, implemented across a wide range of operating systems and hardware configurations, enables users to build a variety of networks. While such networks have a common attribute, individual systems in the network may have certain system-specific attributes. The common attribute is:

- Task-to-task communication: Programs or tasks on one system can create logical links and exchange data with programs or tasks on other systems in a real-time fashion.

Additionally, many DECnet systems support other features which are useful in network environment. These include:

- Inter-system File Transfer: This facility allows an entire data file to be moved between systems, at either program or operator request. The common file type supported across systems that provide this functionality is sequential ASCII.
- Batch/Command File Submission: Local users can submit batch or command files to remote systems for execution.
- Batch/Command File Execution: Remote users can cause a batch or command file which resides at a remote node to be submitted for execution at the local node.
- Remote File Access: Tasks or programs can access sequential files on a record-by-record basis from files located on remote nodes.
- Down-line System Loading: Initial memory images for DECnet-11S systems in the network can be stored on the local system, and loaded on request into other systems in the network. Remote systems usually require the presence of a network bootstrap loader, implemented in read-only memory.
- Down-line Task Loading: Programs to be executed cn DECnet-11S systems in the network can be stored on the local system, and loaded on request into other systems, under the joint control of the operating systems at both ends of the physical link. This and the preceding feature simplify the operation of network systems which do not have mass storage devices.

Table I provides the information for determining if the preceding functions are available on a particular DECnet system. Note that the above descriptions define the minimum capabilities provided by a given function. Additional capabilities, above those described as the minimum for a function, may be available between two of the same or different DECnet systems.

Configuring DECnet Networks:

DECnet provides a basic level of interconnection between specific products. However, each DECnet system has its own level of functions. The user can recognize specific constraints when configuring a network of heterogeneous DECnet systems. Table II lists the communication interfaces supported by each DECnet Phase II product for particular class of line

characteristics (e.g., 9.6 kilobits/second, synchronous). Each column lists the connections that are permissible for those line characteristics in cross-product network configurations. Individual product SPD's must be consulted to determine whether any particular configuration violates the maximum number of communications interfaces and line speeds for an individual product.

TRAINING CREDITS:

No training credits are included with a DECnet software license. Training courses on DECnet software are scheduled at regular intervals in DIGITAL's Training Centers. Arrangements should be made directly with DIGITAL's Educational Services Department.

SUPPORT CATEGORY:

Category A Software Support, as described in the Software Support Categories Addendum to this SPD, will be provided with DECnet Phase II product options that include support services.

The installation of DECnet software under Category A Support Services in any host system will convert that system to a node with the potential of being connected to a DECnet network. Category A installation does not include demonstration of network connection.

The Customer may purchase DECnet Phase II product license options that do not include support services. The category of support applicable to such software is Category C. While a DECnet product option that does not include support services is connected to a DECnet network, the category of support applicable to all DECnet products in that network is Category C.

INSTALLATION SERVICE:

The installation of the Software under Category A Software Support shall consist of:

1. Verifying that the software kit contains all software modules and manuals offered.
2. Generating the DECnet software.
3. Demonstrating the use of the majority of operator commands and system utilities.
4. Running a sample DIGITAL-supplied program.
5. Introducing the Customer to the sources of software information and services.

Before installation of the Software, the Customer must:

1. Install or have installed all hardware, including terminals, to be used on the system.
2. Make available to DIGITAL personnel all hardware, including terminals, to be used during installation for a reasonable period of time each day, as mutually agreed upon by DIGITAL and the Customer, until installation is complete.

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

PREREQUISITE SUPPORT:

A Network Profile and DECnet Support Plan covering all intended network nodes and their support must be

prepared jointly by the Customer and DIGITAL.

ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources Agreement between Purchaser and DIGITAL.

When multiple systems are connected in a single network, each individual system must be licensed separately with regard to both operating system and DECnet software.

ADDITIONAL SERVICES:

Software Consulting Services are offered on a time and materials basis to meet specific customer needs. Two levels of consulting services are available:

Level I Services
QJ680 -S— DECnet Level I Services (media: Z)

Level I services provide for the integration of DECnet nodes that carry Category A support into an interconnected network, with verification of network integrity and demonstration of DECnet functions. Level I services use DIGITAL sample procedures only.

Before installation of the Network, the Customer must:

1. Obtain, install, and demonstrate operational to DIGITAL's satisfaction any modems and other equipment and facilities necessary to interface DIGITAL's communications line interfaces and terminals.

2. Make available to DIGITAL's personnel all hardware, including communications facilities and terminals, to be used during installation for a reasonable period of time each day, as mutually agreed upon by DIGITAL and the Customer.

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

Level II Services
QS912 -S— Daily Software Consulting Services (media: Z)

QS926 -S— Weekly Software Consulting Services (media: Z)

QS922 -S— 6-Month Resident Software Consulting Services (media: Z)

QS924 -S— 12-Month Resident Software Consulting Services (media: Z)

Level II services provide for additional support as mutually agreed upon by DIGITAL and the Customer in the DECnet Customer Support Plan.

Table I

	DECnet-11M Version 2.0	DECnet-11S Version 2.0	DECnet-11D Version 2.0	DECnet-IAS Version 2.0	DECnet/E Version 1.0	DECnet-RT Version 1.0	DECnet-VAX Version 1.0	DECnet-20 Version 1.0
Task-to-Task	YES	YES	YES	YES	YES	YES	YES	YES
Intersystem File Transfer	YES	NO	YES	YES	YES	YES	YES	NO
Command/Batch File Submission	YES[1]	NO	YES[1]	YES[1]	YES	YES	YES[1]	NO
Command/Batch File Execution	YES	NO	YES	YES	YES	NO	YES	NO
Remote File Access	YES	YES[2]	YES	YES	NO	YES	YES	NO
Down-Line System Loading	YES	NO	YES	YES	NO	NO	YES	NO
Down-Line Task Loading	YES	NO	YES	YES	NO	NO	NO	NO

[1]Cannot submit files to DECnet/E systems. Can tell DECnet/E to execute batch files already at the DECnet node.
[2]Offers local users network access to remote file systems. Does not allow users on remote systems to access local files.

Table II

	EIA Sync <9.6K bits/sec	EIA Sync <19.2K bits/sec	EIA Async <9.6K bits/sec	20mA Async <9.6 bits/sec	Local Sync 56K bits/sec	Local Sync 1M bits/sec	Local Parallel
DECnet-11M Version 2.0	DP11 DU11-DA DUP11-DA DV11	DQ11-DA DMC11-AR DMC11-DA	DL11-E DZ11-A DZ11-B	DL11-C DL11-WA DZ11-C DZ11-D	DMC11-AL DMC11-MD	DMC11-AL DMC11-MA	DA11
DECnet-11S Version 2.0	DP11 DU11-DA DUP11-DA DV11 DUV11-DA	DQ11-DA DMC11-AR DMC11-DA	DL11-E DZ11-A DZ11-B	DL11-C DL11-WA DZ11-C DZ11-D	DMC11-AL DMC11-MD	DMC11-AL DMC11-MA	DA11
DECnet-11D Version 2.0	DP11 DU11-DA DUP11-DA DV11	DQ11-DA DMC11-AR DMC11-DA	DL11-E DZ11-A DZ11-B	DL11-C DL11-WA DZ11-C DZ11-D	DMC11-AL DMC11-MD	DMC11-AL DMC11-MA	DA11
DECnet-IAS Version 2.0	DP11 DU11-DA DUP11-DA DV11	DQ11-DA DMC11-AR DMC11-DA	DL11-E DZ11-A DZ11-B	DL11-C DL11-WA DZ11-C DZ11-D	DMC11-AL DMC11-MD	DMC11-AL DMC11-MA	DA11
DECnet-RT Version 1.0	DU11-DA DUP11-DA DUV11-DA	DMC11-AR DMC11-DA	DL11-E	DL11-C DL11-WA	DMC11-AL DMC11-MD	DMC11-AL DMC11-MA	
DECnet/E Version 1.0		DMC11-DA DMC11-AR			DMC11-AL DMC11-MD	DMC11-AL DMC11-MA	
DECnet-VAX Version 1.0		DMC11-AR DMC11-DA			DMC11-AL DMC11-MD	DMC11-AL DMC11-MA	
DECnet-20 Version 1.0 2040/50/60	DN20-BA (DUP11-DA)				DN21-BA (DMC11-AL DMC11-MD)		
2020		DN20 BA/BB (DUP11-DA)					

SOFTWARE SUPPORT CATEGORIES

Each software product (hereinafter 'SOFTWARE') with a designated Support Category A or B in the applicable Software Product Description (SPD) existing at the time of order will be the current release at the time of delivery and will conform to the SPD. DIGITAL's sole obligation shall be to correct defects (nonconformance of the SOFTWARE to the SPD) as described below. Any SOFTWARE with a designated Support Category C will be furnished on an 'as is' basis.

For SOFTWARE with a designated Support Category A or B, DIGITAL will provide the services set forth below without additional charge.

CATEGORY A

1. Upon notification by customer to the nearest DIGITAL office that the computer system, including all required prerequisite hardware and software, is ready for the installation of the SOFTWARE, DIGITAL will install such SOFTWARE in any location within the contiguous forty-eight (48) United States, the District of Columbia, or a country in which DIGITAL or a subsidiary of DIGITAL has a software service facility. The notification must be received by DIGITAL and the system must be ready for installation within thirty (30) days after the delivery of the SOFTWARE to customer or DIGITAL will have no obligation to install. Installation will consist of: (1) verification that all components of the SOFTWARE have been received by customer, (2) loading the SOFTWARE, and (3) executing a DIGITAL sample procedure.

2. During the ninety (90) day period after installation, if the customer encounters a problem with the current unaltered release of the SOFTWARE which DIGITAL determines to be a defect in the SOFTWARE, DIGITAL will provide the following remedial service (on site where necessary): (1) if the SOFTWARE is inoperable, apply a temporary correction (TC) or make a reasonable attempt to develop an emergency by-pass, and (2) assist the customer to prepare a Software Performance Report (SPR) and submit it to DIGITAL.

3. During the one (1) year period following installation, if the customer encounters a problem with the SOFTWARE which his diagnosis indicates is caused by a SOFTWARE defect, the customer may submit an SPR to DIGITAL. DIGITAL will respond to problems reported in SPRs which are caused by defects in the current unaltered release of the SOFTWARE via the Maintenance Periodical for the SOFTWARE, which reports SPRs received, code corrections, temporary corrections, generally useful emergency by-passes and/or notice of the availability of corrected code. Software Updates, if any, released by DIGITAL during the one (1) year period, will be provided to the customer on DIGITAL's standard distribution media as specified in the applicable SPD. The customer will be charged only for the media on which such updates are provided, unless otherwise stated in the applicable SPD, at DIGITAL's then current media prices.

CATEGORY B

During the one (1) year period following delivery, the services provided to the customer will be the same as set forth in 3 above.

CATEGORY C

SOFTWARE is provided on an 'as is' basis. Any software services, if available, will be provided at the then current charges.

DIGITAL shall have the right to make additional charges for any additional effort required to provide services resulting from customer use of other than current unaltered release of the SOFTWARE operated in accordance with the SPD.