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 systems to form computer networks. The DECnet Phase II products include DECnet-IAS Version 2.1, DECnet/E Version 1.1, DECnet-RT Version 1.1, DECnet-VAX Version 1.3, and DECnet-20 Version 2.0. DECnet allows the user to build networks from a range of systems and communications components (CPUs, operating system software, line interfaces and speeds) in order to satisfy widely varying application needs.

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 layered network protocols, each of which is designed to fulfill specific functions within the network architecture. 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) — DDCMP 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. DDCMP is not a proprietary protocol; DIGITAL allows others to implement and use the protocol, provided that an acknowledgement 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. By establishing a logical communications channel (or logical link), NSP makes it possible for two programs on different machines to exchange data. 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
- Ability to connect nodes dynamically within the network once NSP initialization occurs over a previously established physical link

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

Data Access Protocol (DAP) — DAP enables programs on one node of the network to use the I/O services available on other network nodes. Some DECnet products provide facilities for translating the operating system's 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 heterogeneous) 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 DAP, Version 4.1 is available on request. DAP is not a proprietary protocol.

DECnet Functions

DIGITAL Network Architecture (DNA), 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 can 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 that are useful in a 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 function is sequential ASCII.

- Command/Batch File Submission: Local users can submit batch or command files to remote systems for execution.

- Command/Batch File Execution: Remote users can cause a batch or command file that 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 on DECnet-11S systems in the network can be stored on the local system, and loaded upon 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 that 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 a 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 SPDs 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.

PRODUCT SUPPORT:

DECnet Phase II products are DIGITAL Supported software products. A Network Profile and DECnet Customer Support Plan covering all intended network nodes and their support must be prepared jointly by the customer and DIGITAL.

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 Customer Supported. When 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 Customer Supported.

INSTALLATION SERVICE:

The installation of DECnet Phase II software under DIGITAL Supported/DIGITAL Installed 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. 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 personnel all hardware, including terminals, to be used during installation for a reasonable period of time, 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.

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 License 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 DIGITAL Installed/DIGITAL Supported support into an interconnected network, with verification of network integrity and demonstration of DECnet functions. Level I services use DIGITAL sample procedures only.

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.

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TABLE I

		DECnet-IAS Version 2.1	DECnet/E Version 1.1	DECnet-RT Version 1.1	DECnet-VAX Version 1.3	DECnet-20 Version 2.0
Task-to-Task		YES	YES	YES	YES	YES
Intersystem File Transfer		YES	YES	YES	YES	YES
Command/Batch File Submission	Requestor Server	YES YES	YES YES	YES NO	NO YES	NO YES
Command/Batch File Execution	Requestor Server	YES YES	YES YES	YES NO	YES YES	YES YES
Remote File Access	Requestor Server	YES YES	NO YES	YES YES	YES YES	NO NO
Down-Line System Loading		YES	NO	NO	YES	NO
Down-Line Task Loading		YES	NO	NO	NO	NO

Requestor — Requests Service
Server — Provides Service

TABLE II

	EIA Async ≲9.6K bits/sec	20mA Async ≲9.6K bits/sec	EIA Sync ≲9.6K bits/sec	EIA Sync ≤19.2K bits/sec	Remote Sync ≲56K bits/sec	Local Sync 56K bits/sec	Local Sync 1M bits/sec	Local Parallel
DECnet-IAS Version 2.1	DL11-E DZ11-A/B	DL11-C/WA DZ11-C/D	DP11 DU11-DA DUP11-DA DV11 DQ11-DA	DMC11-AR-DA		DMC11-AL-MD	DMC11-AL-MA	DA11-B/AL
DECnet-RT Version 1.1	DL11-E	DL11-C/WA	DU11-DA DUP11-DA DUV11-DA	DMC11-AR-DA	DMC11-AR-FA	DMC11-AL-MD	DMC11-AL-MA	
DECnet/E Version 1.1				DMC11-AR-DA	DMC11-AR-FA	DMC11-AL-MD	DMC11-AL-MA	
DECnet-VAX Version 1.3				DMC11-AR-DA		DMC11-AL-MD	DMC11-AL-MA	
DECnet-20 Version 2.0				DN20-BA (KMC/ DUP11-DA)	DN21-BA (DMC11-AR-FA)	DN21-BB (DMC11-AL-MD)	DN21-HA (DMC11-AL-MA)	