digital

Software Product Description

DESCRIPTION:

DECnet/E allows a suitably configured RSTS/E system to participate as a Phase II DECnet node in point-to-point computer networks. DECnet/E is a Phase II network product and is warranted for use only with Phase II DECnet products supplied by DIGITAL.

DECnet/E offers task-to-task communications and network file transfer capabilities using the DIGITAL Network Architecture protocols. DECnet/E communicates with adjacent nodes over synchronous communication lines interfaced with DMC11 microprogrammed controllers.

DECnet/E functions are available to RSTS/E user programs written in BASIC-PLUS and BASIC-PLUS-2. The network functions available to a DECnet/E user depends, in part, on the configuration of the rest of the network. Each DECnet product offers its own functions and its own set of features to the user. Networks consisting entirely of DECnet/E nodes have all the functions described in this SPD. Networks that mix DECnet/E nodes with other DECnet products may limit the functions available to the DECnet/E user because some DECnet/E features may not be supported by all DECnet products.

The Phase II products and functions available to users on mixed networks can be determined by comparison of the SPD's for the appropriate products. The DECnet Phase II Products SPD (10.78) contains a description of DECnet functions and it identifies the common functions available with mixed networks.

Task-to-Task Communication

Using DECnet/E, a RSTS/E user program written in BASIC-PLUS or BASIC-PLUS-2 can exchange messages with other user programs using DNA protocols. The two user programs can be on the same or adjacent DECnet nodes. (Adjacent nodes control opposite ends of a point-to-point communication line.) If on adjacent nodes, the second node can be any Phase II DECnet System that supports synchronous communication lines.

The DECnet messages sent and received by the two user programs can be in any data format. Each message segment can be up to 512 bytes long (less if limited by capabilities of the communication line or the remote DECnet node).

Network File Transfer Utilities

Using DECnet/E utilities, a user can transfer sequential ASCII files between Phase II DECnet nodes. RSTS/E RMS-11 files can be transferred in both directions between RSTS/E and an adjacent DECnet node.

The DECnet/E file transfer utilities support all RSTS/E RMS-11 supported devices and file formats. They do not, however, support DOS-11 or stream-ASCII magtapes.

Other types of files can be transferred where formats between the Phase II DECnet nodes are compatible. Between two DECnet/E systems, for instance, any RSTS/E RMS-11 file can be copied with file attributes preserved.

Additional facilities allow batch command files to be submitted to a remote node. The list of commands must be in the format expected by the node responsible for the execution. DECnet/E also allows batch files to be received from other systems and executed.

DECnet/E does not support network file spooling. Users can request only one file transfer at a time, and only single files can be transferred with each command. Wild carding is not permitted, nor are directory listing commands implemented.

Three-point file transfers are also possible if the source and destination node are both adjacent to the DECnet/E node from which the command is given.

Media Copy Utility

A NETCPY utility is provided which uses network communications to copy RK05 disks, floppies, DECtapes, and magtapes from one DECnet/E node to another DECnet/E node. The user's node must be either the source or destination node for the copy. The copy must be done without breaks and between like peripherals. NETCPY is similar to the RSTS/E copy utility in operation and capability. The entire media is copied and copy operations are non-file structured. NETCPY does not provide recovery from bad blocks and is not intended for copying RK06 or larger disks.

Terminal Communication Utility

The DECnet/E TLK utility allows a user at a DECnet/E node to send messages to adjacent DECnet nodes that support the same feature. Messages can be directed to a specific terminal or to the operator's console at the destination node. TLK dialog mode allows users on the two systems to type messages to one another.

Network Information Program

Using the DECnet/E NIP utility, a user can display the status of DECnet activity at the local node. A complete NIP report gives information about local programs using the network, the logical links in use, and the status of adjacent network nodes. Output can be directed to the terminal or to a report file.

Network Control Utility

Using the DECnet/E NCP utility, the local console operator can perform many network configuration and maintenance functions. The operator can maintain node data bases and line assignments. Individual DMC11 lines can be put into loopback modes for diagnostic testing. Programs can be defined for automatic job startup whenever network connections are requested to them. Individual logical links can be aborted when necessary.

Communications

DECnet/E uses DMC11 communication controllers to interface with other network nodes. The DMC11 is a DMA UNIBUS peripheral that implements line control and error recovery procedures in microcode. The DMC11 uses DIGITAL Data Communications Message Protocol (DDCMP) to provide full- or half-duplex communication over point-to-point synchronous lines.

DECnet/E Operation

DECnet/E is implemented as an extension to the RSTS/E executive and large message Send/Receive facility. Permanent memory requirements are 1K words for the DMC11 driver and 4K words for the NSP protocol module. At least 3K words of extended buffer pool space should be allocated for message buffers for operation of a single DMC11. Additional lines will require additional buffer space depending on line speed.

DECnet/E utilities require up to 16K words of user memory when resident. The file transfer utilities additionally require the RMS-11 run-time system. The other utility programs require a BASIC-PLUS run-time system.

DECnet/E Configuration and Performance

Cost, performance, and function selection must be considered when deciding where nodes should be located and how they should be interconnected with communication lines. Dial-up telephone circuits are often best for networks with low messages traffic. Other applications require higher-speed communication lines. DECnet/E supports both types of network traffic over point-to-point communication lines, but each application must be analyzed separately by the user and/or a DIGITAL Software Specialist.

Each DECnet/E node must be analyzed individually to determine its performance in a given network application. Network throughput and responsiveness depend on many factors, including:

● network topology
● CPU power and system loading
● communication line characteristics
● allocation of system buffers
● swapping overhead and scheduling priorities

● size and distribution of network messages

The maximum number of DMC11 lines that can be connected to a single DECnet/E node can be determined from the following table. The aggregate line speeds shown are burst rates that can be achieved during buffered data transfers. Sustained rates to transfer user data will be less than the rates shown because of network protocol overhead and other factors listed above. At higher speeds, message processing time will limit total throughput.

Maximum Line Configurations
on PDP-11/34, 11/70 CPUs

Device Group	Max. No. of Lines	Max. Line Speed (K bits/sec)	Max. Device Bandwidth (K bits/sec)	Mode
DMC11-AR,-DA	16	19.2	307.2	FDX,HDX
DMC11-AL,-MD	4	56.0	224.0	FDX,HDX
DMC11-AL,-MA	1	1000.0	1000.0	FDX,HDX

Device Group

DECnet/E supports only DMC11's for DECnet communication. The DMC11-AL, -MD and DMC11-AL, -MA options use coaxial cables for local interconnection. Line speed for the DMC11-AR and -DA is determined by the modem used, up to the maximum line speed shown.

Maximum Number of Lines

DECnet/E supports 16 communication lines only if all of them use DMC11-AR, -DA interfaces. Higher speed lines can be substituted using ratios of one DMC11-AL, -MD line for four DMC11-AR, -DA lines.

Maximum Line Speeds

Line speed of the DMC11-AR, -DA is dependent on choice of modem.

Maximum Device Bandwidth

As explained above, these numbers are burst rates obtained during half-duplex operation. Burst rates using full-duplex lines are twice the rates shown.

Mode

Message traffic on half-duplex (HDX) lines takes place in one direction at a time. Simultaneous bi-directional communication is possible using full-duplex (FDX) lines.

MINIMUM HARDWARE REQUIRED:

Any valid RSTS/E system configuration with:

● additional main memory as specified under "DECnet/E Operation" above
● a DD11-B, -C, or -D system interface unit with one or more of the following communications devices:
   1. DMC11-AR or -DA remote synchronous EIA interface (to 19.2 kilobits/second)
   2. DMC11-AL or -MD local synchronous interface (56 kilobits/second)
   3. DMC11-AL or -MA local asynchronous interface (1 megabits/second)

OPTIONAL HARDWARE:
Additional DMC11 interfaces as described under "DECnet/E Configuration and Performance" above.

PREREQUISITE SOFTWARE:
RSTS/E, Version 6C

OPTIONAL SOFTWARE:
None

TRAINING CREDITS:
None

SUPPORT CATEGORY:

A — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

Installation under Category A support will convert the RSTS/E system into a node with connection potential to a DECnet Phase II network. This installation does not include a demonstration of network connection.

The Customer may purchase DECnet/E licenses with options that do not include support services. The category of support applicable to such software is Category C. While a DECnet/E 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.

CUSTOMER RESPONSIBILITIES:
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 Customer Support Plan covering all intended network nodes and their support must be prepared jointly by DIGITAL and the Customer.

UPDATE POLICY:
Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer for a media charge (includes no installation). After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

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.

Standard options with no support services are only available after the purchase of one supported license. When a software license is ordered without support services, the category of support applicable to such software is Category C.

A single-use license only option is a license to copy the software previously obtained under license, and use such software in accordance with DIGITAL's Standard Terms and Conditions of Sale. The category of support applicable to such copied software is Category C.

The following key (D, E, F, Q, T, V, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QP690-AD = binaries on 9-track magnetic tape.

D = 9-track Magnetic Tape
E = RK05 Disk Cartridge
F = 7-track Magnetic Tape
Q = RL01 Disk Cartridge
T = RK06 Disk Cartridge
V = RK07 Disk Cartridge
Z = No hardware dependency

Standard Options
QP690 -A— Single-use license, binaries, documentation, support services (media: D, E, F, Q, T, V)
QP690 -C— Single-use license, binaries, documentation, no support services (media: D, E, F, Q, T, V)
QP690 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

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

Level II services are also available. Consult the DECnet Phase II Products SPD (10.78) for a description of Level I and Level II services.

ADDENDUM
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.