digital™

Software Product Description

PRODUCT NAME: DECnet–11M–PLUS, Version 4.6
RSX–11M–PLUS Network Software

SPD 10.66.12

DESCRIPTION

DECnet–11M–PLUS is a product of Mentec Inc. and is licensed under Compaq Computer Corporation's Standard Terms and Conditions.

DECnet–11M–PLUS allows a suitably configured RSX-11M–PLUS system to participate as a routing or non-routing (end) node in DECnet computer networks. DECnet–11M–PLUS is a Phase IV network product and is warranted for use only with supported Phase III and Phase IV products supplied by Compaq Computer Corporation.

DECnet Phase IV networks can contain up to 1,023 nodes per network area given proper network planning. 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.

DECnet–11M–PLUS offers task-to-task communications, utilities for network file operations, network command terminal support, and network resource-sharing capabilities using the Digital Network Architecture (DNA) protocols. DECnet–11M–PLUS communicates with adjacent nodes over synchronous and asynchronous communication lines, Ethernet Local Area Networks (LANs), and parallel interfaces. Communications using X.25 circuits over selected Packet Switched Data Networks (PSDNs) is also possible. This requires DECnet–11M–PLUS to be configured with the RSX–11 Packetnet System Interface (P.S.I.) /M–PLUS product[1]. Access to DECnet–11M–PLUS is supported for RSX–11M–PLUS user programs written in MACRO–11, FORTRAN–77, BASIC-PLUS-2, and PDP–11 C.

[1] This product is no longer sold or supported by Compaq.

The functions available to an RSX–11M–PLUS user depend, in part, on the configuration of the rest of the network. Each DECnet product offers its own level of functionality and its own set of features to the user. Networks consisting entirely of DECnet–11M–PLUS nodes can have the full functionality described in this Software Product Description (SPD). Networks that mix DECnet–11M–PLUS nodes with other DECnet products can limit the functions available to the DECnet–11M–PLUS user because some DECnet–11M–PLUS features are not supported by all DECnet products. DECnet–11M–PLUS provides the same primary services on all systems; however, some supplied optional features require hardware configurations larger than the minimum supported systems.

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

Adaptive Routing

Adaptive routing is the mechanism by which one or more nodes in a network can route or forward messages between another pair of nodes in the same network. This routing capability will forward such messages even if no direct physical link exists between the pair of nodes apart from the sequence of physical links that includes the routing node(s).

A DECnet–11M–PLUS node must function as a routing node whenever multiple lines are used simultaneously by that node. DECnet–11M–PLUS end nodes provide all the capabilities of DECnet–11M–PLUS routing nodes except that end nodes cannot route messages on behalf of other nodes in the network. Since end nodes do not route messages, they do not need to store or update routing databases. Consequently, end nodes use less

system resource and generate less traffic than routing nodes.

For this same reason, end node operation consumes less processing power than routing node operation. The Full Function DECnet–11M–PLUS software must be installed on a node in order for that node to operate as a routing node. For a node to operate as an end node, either the Full Function or the End Node DECnet–11M–PLUS software must be installed on that node. Full Function DECnet–11M–PLUS software allows a node to be set up as either a routing node or as an end node.

When path splitting is enabled, packets can be forwarded over multiple paths between a source and destination node.

Note: All nodes in a network must support out of order packet handling in order for this feature to work successfully.

When path splitting is disabled, even when two adjacent routing nodes are connected by more than a single physical link, messages will be sent over only one of the links. All other lines will serve as "hot standbys," such that the least cost path available between two nodes is the one that will be used for message traffic. A line cost parameter set by the system manager determines the line over which all messages will be sent from node to adjacent node.

In addition to adaptive routing, which all DECnet Phase IV implementations use, DECnet–11M–PLUS supports Area Routing. Area Routing is a method by which DECnet can send and route messages between the nodes in the same or different areas of the network. If the network manager chooses to separate the network into areas, up to 63 (Area 1 through Area 63), with up to 1,023 nodes per area, may be defined. For single area networks, Area 1 is the default. Area-based DECnet networks are hierarchical networks and some restrictions apply to communications from nodes in one area to nodes in another. For example, Phase III nodes in area-based networks can communicate only with nodes within their own areas. Proper network planning is essential when using Area Routing or configuring large networks.

Pregenerated System

A subset of DECnet–11M–PLUS is available on TK50 tape cartridge and 1600 BPI magtape distribution media. This kit is a single disk distribution that neither requires nor allows network generation. It must be installed with the pregenerated RSX–11M–PLUS system (with or without Data space) available on TK50 or 1600 BPI magtape (Refer to the RSX–11M–PLUS SPD 14.70.xx). This DECnet–11M–PLUS subset supports end node operation, and is functionally equivalent to the end node that may be built using the standard full function or end node kit.

Task-to-Task Communication

Using DECnet–11M–PLUS, an RSX–11M–PLUS user program written in MACRO–11 or one of the supported high level languages can exchange messages with other network user programs. These two user programs can be on the same node, on any other Phase IV node in the network, or Phase III node in the same area. The messages sent and received by the two user programs can be in any data format.

The DECnet–11M–PLUS software will optionally verify the access control privileges of a task requesting communication with a DECnet–11M–PLUS task. The RSX–11M–PLUS System Account File is used to determine access privileges. The results can either be passed on to the receiving task or used to reject the request by the network software.

Network Resource Access:

File Transfer Utilities

Using DECnet–11M–PLUS utilities, a user can transfer sequential ASCII files between DECnet nodes. Files can be transferred in both directions between the locally supported RSX–11M–PLUS File Control System (FCS) devices and the file system of other DECnet nodes. Wild cards can be used for the user identification code, file name, file type, and version number for local to remote file transfers. Transfer of other file types is supported, provided the source and destination DECnet systems support the same file type. Directory listings are also a supported DECnet–11M–PLUS feature. File transfer integrity is now supported by verifying the transfer via a cyclic redundancy check (DAPCRC).

The DECnet–11M–PLUS file transfer utilities support file transfers for both FCS and RMS files where formats are compatible between the DECnet nodes.

Additional facilities allow system command files to be submitted to a remote node where the list of commands is in a format acceptable to the node responsible for the execution. DECnet–11M–PLUS also allows RSX–11M–PLUS command files to be received from other systems and executed as a batch job.

A utility is also provided with DECnet–11M–PLUS that allows the user to queue file operation requests for execution at a specified time. The user has the ability to monitor, list, and delete entries from this queue.

Network users must specify the appropriate user identification and password in order to access the files on

a DECnet–11M–PLUS node. Access to local files using the DECnet software can be controlled through the RSX–11M–PLUS System Account File.

File Access

File access is supported to and from remote DECnet systems by explicit subroutine calls in the supported high level languages. READ, WRITE, OPEN, CLOSE, and DELETE operations can be initiated by local tasks for sequential and random access files residing on the local system or at remote DECnet systems. Other nodes supporting File Access can exercise this capability for files located on the RSX–11M–PLUS node. Fixed and variable length record formats are supported. Files accessed remotely can contain either ASCII or binary information.

Access to RMS file organizations from other DECnet products is supported by DECnet–11M–PLUS.

Network Command Terminal

DECnet–11M–PLUS supports two protocols (CTERM and LAT) that make the user's terminal appear as if it were physically connected to the target system, whether local or remote, and the operator can use the standard system and network utilities supported by that system.

DECnet–11M–PLUS supports Digital's Terminal Services Architecture Command Terminal protocol (CTERM), giving the terminal user the ability to establish a virtual connection to remote Phase IV DECnet systems that provide similar support. This is particularly useful for doing remote program development, and allows terminal users on small application-oriented systems to utilize the resources of larger development-oriented systems.

Note: Some functions using CTERM between OpenVMS and non-OpenVMS systems are not supported. Specifically, OpenVMS-style command line editing, VAX TDMS applications, and VAX FMS applications are not supported under DECnet-RSX products.

In addition, communication with Digital's Local Area Transport (LAT) terminal server products is supported. LAT must be used in a Local Area Network. Application programs written using DECnet-RSX can identify a terminal server resource by specifying the terminal server name and also either a service name and/or port name. The RSX–11M–PLUS queue manager can be set up to access printers that are connected to a terminal server.

DECnet–11M–PLUS also provides an unsupported utility (RMT) that allows a terminal user to establish a virtual connection to other Phase III or Phase IV DECnet-RSX nodes. This utility may not be included in future releases of DECnet–11M–PLUS.

Down-Line System Loading

Initial memory images for RSX–11S nodes in the network can be stored on RSX–11M–PLUS file system devices and loaded into nodes across point-to-point, multipoint (DMP/DMV only), and Ethernet links. Load requests can come from the local RSX–11M–PLUS operator or from the remote node. Generation of initial memory images of DECnet–11S systems for down-line loading is supported by RSX–11M–PLUS.

Upline Dumping

Memory images of adjacent RSX–11S nodes connected by DECnet can be written onto a file on a DECnet–11M–PLUS system. This facility helps a programmer understand what may have caused the RSX–11S system to crash.

Down-Line Task Loading

Programs to be executed on DECnet–11S nodes in the network can be stored on the DECnet–11M–PLUS system and loaded on request into DECnet–11S nodes. In addition, programs already executing on DECnet–11S nodes can be checkpointed to the host file system and later restored to main memory of the DECnet–11S node. These features simplify the operation of network systems that do not have mass storage devices.

Communications Servers

Digital offers several communications server products for the DECnet Phase IV network environment. Some of these are standalone processor and/or software packages based upon the PDP–11/RSX architecture. Such DECSA-based servers include the DECnet Router Server and DECnet/SNA Gateway. Consult the SPD of the server product in question for details regarding availability of support on RSX–11M–PLUS.

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 III or Phase IV nodes that support this feature. In either case, the output resulting from a command can be directed to a local file or to the user's terminal.

An operator can display the status of DECnet activity at the local node and other Phase III or Phase IV nodes. The user can choose to display statistics related to both node and communication lines, including data on traffic and errors. The local console operator can also perform many network control functions such as loading and unloading DECnet components, starting and stopping lines, activating the local node, and down-line loading RSX–11S systems.

DECnet–11M–PLUS also provides local network event logging to the console device, a file, or a user-written program. Logging of events to a remote node is also supported. The NCP utility can be used to enable and disable the logging of specific events as well as to enable and disable the event logging facility.

Communications

DECnet–11M–PLUS supports the Digital Data Communications Message Protocol (DDCMP) for full- or half-duplex transmission in point-to-point and multipoint operation using serial synchronous or asynchronous facilities. DDCMP provides error detection/correction and physical link management facilities. In addition, an auto-answer capability is provided if supported by the modem in use.

Multipoint and auto-answer function with EIA-type devices only. Parallel communication devices use special link protocols (not DDCMP) optimized for their characteristics.

The Ethernet bus interfaces, when used in conjunction with Digital's Ethernet transceivers, or DELNI, allows DECnet–11M–PLUS to utilize Ethernet as a data link transmission medium.

RSX–11 Packetnet System Interface/M–PLUS [1] is the software product that provides an interface to X.25 Packet Switched Data Networks (PSDNs). When RSX–11 P.S.I./M–PLUS is used in conjunction with DECnet–11M–PLUS, a PSDN can be used to transmit messages between DECnet nodes.

The maximum number of physical links that can be supported by a DECnet–11M–PLUS node is sixteen, depending on CPU, type of communications interface, and speed of interfaces.

A maximum of 32 X.25 virtual circuits (64 on a PDP–11 /44 or 11/70 with I/D space executive) is supported when DECnet–11M–PLUS is used in conjunction with RSX–11 P.S.I./M–PLUS for DECnet communication through an X.25 PSDN. However, when the total number of DECnet circuits (Data Link Mapping and other) is greater than 24, the maximum node address supported is less than 1,023 (# circuits * maximum address <25,000).

DECnet–11M–PLUS multipoint will support up to a maximum of twelve tributaries on a single multipoint line. Aggregate bandwidth of tributaries is limited to that of the control station device. The communication path to each tributary counts as a link with respect to the limits on number of links specified above. Multipoint line configurations will be supported for the following devices:

[1] This product is no longer available from Compaq and may not be supported in future releases

Table 1
Multipoint Line Configurations

	Multipoint Devices	
Devices	**Multipoint Control Station (Master)**	**Multipoint Tributary (Slave)**
DL11/DLVE1	Yes	Yes
DUP11	Yes	Yes
DUV11	Yes	Yes
DPV11	Yes	Yes
DZ11/DZV11/DZQ11	Yes	No
DHU11/DHV11	Yes	No
DHQ11	Yes	No
DV11	Yes	Yes
DMP11/DMV11[1]	Yes	Yes
KMC11 (DZ11)	Yes	No
KMC11 (DUP11)	Yes	Yes

[1] Multipoint communication hardware device

Direct Line Access

User-written MACRO–11 tasks will be provided with Direct Line Access (DLX) support to all supported devices (including Ethernet Controllers). DLX allows direct control of the communications lines, bypassing the logical link control and transport mechanism provided by the DECnet software. User programs are required on both ends of the link in order to use this interface. Direct Line Access supports both Ethernet and IEEE 802.3 frame formats in a LAN environment.

DECnet–11M–PLUS Configuration

The process of configuring a DECnet–11M–PLUS node is based primarily on trade-offs of cost, performance, and functionality, within the realm of satisfying the user's application requirements. It can be expected that network applications will run the gamut from low-speed, low-cost situations to those of relatively high performance and functionality. The performance of a given DECnet node is a function not only of the expected network traffic and resultant processing ("global" conditions), but also of the amount of concurrent processing specific to that node (local conditions). Thus, node performance depends on many factors including:

- CPU type and memory size
- Number of device interrupts per unit time
- Communication line characteristics

- Number and size of buffers
- Message size and frequency of transmission
- Local applications
- Size and frequency of route-through traffic

Note: 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, such as the network application(s), topology, protocol overhead, and line quality, as well as the factors previously cited.

Six basic groups of communications interfaces are presented in the following tables. They differ in many respects, particularly in their effect upon CPU utilization.

- With character interrupt devices such as the DUP11, CPU cycles are required for not only the line protocol processing such as DDCMP or the optional X.25 protocol, but also for each character sent and received.
- Devices such as the DHV11 are direct memory access (DMA) on transmit, and character interrupt on receive. While CPU cycles are consumed for line protocol processing, and for each character received, the load is reduced for messages transmitted.
- Devices such as the DV11 are direct memory access (DMA) for both transmission and reception. Since the line protocol (DDCMP) is in the PDP–11 software, CPU cycles are required for its processing.
- The DMR11, DMP11, DMV11, and KMS11 are DMA devices with the line protocol (DDCMP or X.25) executed in microcode, thus off-loading the PDP–11 CPU. The only DECnet load the processor sees is completed incoming and outgoing messages.
- The PCL11-B is a high speed DMA device that uses local parallel communications lines. It has its own line protocol and does not use DDCMP. CPU cycles are only required for processing of incoming and outgoing data messages and to perform control functions.
- The DEUNA and DELUA, UNIBUS-to-Ethernet, and DEQNA[1], DELQA, and DESQA Q–bus-to-Ethernet controllers are high speed DMA devices supporting the CSMA/CD protocol. CPU cycles are only required for processing of incoming and outgoing messages.

[1] This product is no longer available from Compaq and may not be supported in future releases.

The following tables describe the physical hardware configurations supported by DECnet–11M–PLUS in terms of CPU type and communication interface. The numbers given in the tables are "load costs." Maximum line speeds (the fastest clock rate at which the device can be driven under DECnet–11M–PLUS relative to the load cost), expressed in kilobits per second, are shown in parentheses.

Device loading provides a method by which one can compute a maximum system configuration for a variety of communications devices. The load cost indicates the maximum load that a device can put on a particular type of CPU. The load cost limit for each CPU type is 16.

For communications devices that support half/full duplex, the load costs in the tables are for full duplex configurations. The load cost for a half duplex configuration can be calculated as one half of the load cost in the table except at very low speeds, in which case the load cost is the same as in the full duplex case.

Table 2
DECnet–11M–PLUS UNIBUS Device Load Table

	Processor Type				
Device Type	11/24	11/44	11/70	11/84	11/94
DEUNA (10meg)	16	16	16	16	16
DELUA (10meg)	16	16	16	16	16
PCL (4meg)	16	16	16	16	16
DMP (to 19.2K)	2	1	1	1	1
DMP (56K)	3	3	3	3	3
DMP (1meg)	16	16	16	16	16
DMR (to 19.2K)	2	1	1	1	1
DMR (56K)	3	3	3	3	3
DMR (1meg)	16	16	16	16	16
DV (to 9.6K)	4	3	3	3	3
DHU (to 9.6K)	2	2	2	2	2
DL (to 9.6K)	2	2	2	2	2
DU (to 9.6K)	2	2	2	2	2
DUP (to 9.6K)[1]	2	2	2	2	2
DZ (to 9.6K)	2	2	2	2	2

[1] Maximum 4.8Kbps for 11/24 processor

Note: For processor types not shown, use the load costs associated with the PDP–11/24 to compute device loading.

Table 3
DECnet–11M–PLUS Q–bus Device Load Table

	Processor Type					
Device Type	11/23	11/23-PLUS	11/53	11/73	11/83	11/93
DEQNA[1] (10meg)	16	16	16	16	16	16
DELQA (10meg)	16	16	16	16	16	16
DESQA (10meg)	16	16	16	16	16	16
DMV (to 19.2K)	2	2	1	1	1	1
DMV (56K)	3	3	3	3	3	3
DHQ (to 9.6K)	2	2	2	2	2	2
DHV (to 9.6K)	2	2	2	2	2	2
DLV (to 4.8K)	2	2	2	2	2	2
DPV (to 4.8K)	2	2	2	2	2	2
DUV (to 4.8K)	2	2	2	2	2	2
DZV (to 9.6K)	2	2	2	2	2	2

[1]This product is no longer available from Digital and may not be supported in future releases.

Table 4
Maximum Line Configurations Guidelines (Multipoint)

	Maximum Line Speed (Kilobits per Second, half- or full-duplex)				
Device Group	19.2	56	250	500	1000
DMV11 (All Options)	2/8	2/8			
DMP11 (RS232-C, V.35)	4[1]/8	2/8			
(Local)		2/8	1/12	1/12	1/12[2]
(RS422)	4[1]/8	2/8	1/12	1/12	1/12[2]

[1]half-duplex

[2]11/24 is limited to 2 controllers

Note: Left side of slash (/) indicates number of controllers per node and right side indicates total number of tributaries per control node.

Total number of circuits not to exceed 16 per node.

Number of tributaries on lines should be carefully configured for performance considerations.

In order to achieve a viable configuration, the user and /or a Digital software specialist must perform a level of application analysis that addresses the factors above.

INSTALLATION

Only experienced customers should attempt installation of this product. Digital recommends that all other customers purchase Digital's Installation Services. These services provide for installation of the software product by an experienced Digital Software Specialist.

Digital's Installation Services can be purchased as a separate service.

Installation for DECnet–11M–PLUS will consist of the following:

- Verification that all components of DECnet–11M–PLUS have been received.
- Verification that the necessary versions of the RSX–11M–PLUS software and documentation are available.
- Verification of the appropriate sysgen parameters.

  Note: Should a software specialist be required to modify the previously installed operating system parameters, a time and materials charge will apply.
- Install DECnet–11M–PLUS software
- Define and create a local node DECnet database
- Modify the system's start-up command procedure including starting up the DECnet–11M–PLUS network
- Verify the proper installation of DECnet–11M–PLUS by running a series of tests to show connectivity, demonstrated by the use of the post-installation checkout procedure, to a designated node

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

Pre-Installation Procedures Required

Before Digital can install the software, the customer must:

- Ensure that system meets the minimum hardware and software requirements (as specified in the SPD)
- Obtain, install, and demonstrate as operational any modems and other equipment and facilities necessary to interface Digital's communication equipment
- For multi-node networks, designate one adjacent node to verify installation/connectivity

- Make available for a reasonable period of time, as mutually agreed upon by Digital 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 prevailing rate for time and materials.

HARDWARE REQUIREMENTS

Any valid RSX–11M–PLUS system configuration with:

- The following additional memory must be available:

  DECnet–11M–PLUS end node — 22 KW
  DECnet–11M–PLUS routing node — 26 KW
  DECnet–11M–PLUS end node with RSX–11 P.S.I./M–PLUS — 28 KW
  DECnet–11M–PLUS routing node with RSX–11 P.S.I./M–PLUS — 36 KW

  Ethernet support will add 6 KW to the above memory requirements.

- The following additional disk space must be available for DECnet–11M–PLUS network software:

DECnet–11M–PLUS end node capability	4,500 blocks (2,304 Kbytes)
DECnet–11M–PLUS full routing capability	5,000 blocks (2,560 Kbytes)
DECnet–11M–PLUS end node with RSX–11 P.S.I. /M–PLUS	5,000 blocks (2,560 Kbytes)
DECnet–11M–PLUS routing node with RSX–11 P.S.I. /M–PLUS	5,500 blocks (2,816 Kbytes)
DECnet–11M–PLUS Pre-generated end node RL02 distribution	2,600 bytes (1,331 Kbytes)

- PDP–11/24, PDP–11/44, PDP–11/70, PDP–11/84, or PDP–11/94 central processor with one of the following communications devices:

DUP11	low-speed synchronous interface[4]
DMP11	synchronous UNIBUS interface (RS232-C/RS423A, CCITT V.35/DDS or RS449 /RS422)[4,5]
DMP11	local synchronous UNIBUS interface[4,5]
DMR11	synchronous UNIBUS interface (RS232-C/RS423A, CCITT V.35/DDS or RS449 /RS422)[4]
DMR11	local synchronous UNIBUS interface[4]
DL11	asynchronous EIA interface with modem control[4,5]
DL11	asynchronous 20mA current loop interface [1,4,5]
DZ11	multiline asynchronous EIA interface[2,4]
DZ11	multiline asynchronous 20mA current loop interface [1,2,4]
DHU11	multiline asynchronous interface[2,4]
DV11	multiline NPR synchronous interface[2,4]
DELUA	UNIBUS-to-Ethernet controller
DEUNA	UNIBUS-to-Ethernet controller
PCL11-B	multiple CPU link[5]
KMS11-BD/E	synchronous UNIBUS multiplexer[3]

[1] Requires either the H319 option for optical isolation or one side of the 20mA line to be in passive mode.

[2] All lines on this interface must be dedicated as DECnet links.

[3] Requires RSX–11 P.S.I./M product.

[4] With appropriate FCC-compliant cabinet option.

[5] This product is no longer marketed by Compaq and may not be supported in future releases.

- PDP–11/23 PLUS or Micro/PDP–11 central processor (11/23, 11/53, 11/73, 11/83, or 11/93) with one of the following communications devices.

  Note: The KDJ11-A 11/73 option is only supported per the RSX–11M–PLUS Operating System SPD (14.70.xx).

DMV11	synchronous Q–bus interface (RS232-C /RS423A or CCITT V.35/DDS)[4]
DMV11	local synchronous Q–bus interface[4]
DLVE1	asynchronous EIA interface with full modem control for a single line[4]
DZV11	multiline asynchronous EIA interface[2,4]
DZQ11	multiline asynchronous Q–bus EIA interface[2,4]
DHV11	multiline asynchronous interface[2]
DHQ11	multiline asynchronous interface
DPV11	synchronous Q–bus interface[4]
DEQNA[5]	Q–bus-to-Ethernet controller
DELQA	Q–bus-to-Ethernet controller
DESQA	Q–bus-to-Ethernet controller

[2] All lines on this interface must be dedicated as DECnet links.

[4] With appropriate FCC-compliant cabinet option.

[5] This product is no longer available from Digital and may not be supported in future releases.

OPTIONAL HARDWARE

- Additional lines and/or communication interfaces (from above) up to maximum as defined in Device Load tables for mapped systems.
- KG11-A Communications Arithmetic Element[1] (may be used in conjunction with DV11, DZ11, and DL11)
- KMC11-A (without the RSX–11 P.S.I./M–PLUS product, can be used in conjunction with up to eight DUP11s or one sixteen-line DZ11)

SOFTWARE REQUIREMENTS

- RSX–11M–PLUS Operating System

Refer to the RSX–11M–PLUS Software Product Description (SPD 14.70.xx) for the required version.

OPTIONAL SOFTWARE

- PDP–11 BASIC-PLUS-2 for RSX–11M and RSX–11M–PLUS
- PDP–11 FORTRAN–77/RSX

Refer to the RSX–11M–PLUS Software Product Description (SPD 14.70.xx) for the required versions.

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

9-track 1600 BPI Magtape (PE), TK50 Streaming Tape

ORDERING INFORMATION

For DECnet–11M–PLUS Full Function:

Software License: QJ766-UZ
Software Media and Documentation: QJ766-H*
Software Documentation: QJ766-GZ
Software Product Services: QJ766-**

For DECnet–11M–PLUS End Node:

Software License: QJ767-UZ
Migration License (from DECnet–11M): QR581-UZ
Software Media and Documentation: QJ767-H*
Software Documentation: QJ766-GZ
Software Product Services: QJ767-**

Note: The pregenerated DECnet–11M–PLUS kit is located on the QJ767-H5 and QJ767-HM Media and Documentation kits. Instructions on how to locate the software on the kit are included in the "Supplemental Information" in the documentation.

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

SOFTWARE LICENSING

This software is only furnished under a license. For more information about Compaq's licensing terms contact your local Compaq office.

[1] This product is no longer available from Compaq and may not be supported in future releases.

SOFTWARE PRODUCT SERVICES

A variety of service options are available from Compaq. For more information, contact your local Compaq office.

SOFTWARE WARRANTY

This software is provided by Compaq with a 90-day conformance warranty in accordance with the Compaq warranty terms applicable to the license purchase.

The warranty period is 90 days. It begins when the software is installed or thirty days after delivery to the end user, whichever occurs first and expires 90 days later.

Warranty is provided in the country of purchase. Compaq will provide a service location that will accept reporting(in a format prescribed by Compaq)of a nonconformance problem caused when using the licensed software under normal conditions as defined by this SPD. Compaq will remedy a nonconformance problem in the current unaltered release of the licensed software by issuing correction information such as: correction documentation, corrected code; or a notice of availability of corrected code; or a restriction or a bypass. The customer will be responsible for the preparation and submission of the problem report to the service location.

WARRANTY EXCLUSION

Compaq does not warrant that the software licensed to customer shall be error free, that the software shall satisfy the customer's own specific requirements, or that copies of the software other than those provided or authorized by Compaq shall conform to this SPD.

Compaq makes no warranties with respect to the fitness and operability of modifications not made by Compaq.

If the software fails to function for reasons stated above, the customer's warranty will be invalidated and all service calls will be billable at the prevailing per call rates.

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