Software Product Description

DESCRIPTION

The EtherWORKS Router/DECnet software is a communications product that provides routing service for DECnet nodes on an Ethernet/802.3 Local Area Network (LAN). This software product is used exclusively with the DE206-xx hardware option, which is a PC-AT (EISA/ISA) bus compatible option module. The DE206-AA has an Ethernet connection, a PC bus connection, and an I/O connector that supports "Y" cables which provide two serial connections.

Overview

The EtherWORKS Router/DECnet software provides access to and from Phase IV/IV+ DECnet nodes on a LAN, and Phase III or Phase IV/IV+ DECnet nodes connected over asynchronous/synchronous lines. These nodes can be located either locally by means of dedicated wiring or remotely by means of modem connections or leased lines. Connection to remote DECnet end nodes, such as PCs running PATHWORKS for DOS, are via 9600 baud asynchronous lines.

Note: LAN refers to any local area network that conforms to IEEE 802.3 or ISO 8802/3 standards

The EtherWORKS Router/DECnet software performs adaptive routing utilizing both of the asynchronous /synchronous lines and the Ethernet/802.3 ports of the hardware. In the case where communications to an end node might pass through multiple routers, the EtherWORKS Router/DECnet software has the capability of choosing the least cost path or re-routing in case of a line failure.

The EtherWORKS Router/DECnet software supports intra-area (Level 1) and inter-area (Level 2) routing of messages between DECnet nodes. These nodes can be Phase III/IV/IV+ routing nodes or end nodes. Use of this software offloads routing-related communications from hosts that would otherwise serve as routing nodes on the Local Area Network-based DECnet LAN.

The EtherWORKS Router/DECnet software can be downline loaded from a PC running MS–DOS® and PATHWORKS for DOS onto the EtherWORKS Router /DECnet hardware units over the Ethernet/802.3 port. The user can downline load from any PC system running MS–DOS and PATHWORKS for DOS on the Ethernet, including the same PC system that is housing the EtherWORKS Router/DECnet hardware unit, assuming an additional Ethernet controller is present.

By using the PC port load option, the EtherWORKS Router/DECnet software can be loaded onto an EtherWorks Router/DECnet hardware unit from the hard disk or floppy disk of the PC containing the EtherWORKS Router/DECnet unit.

Routing and DECnet Phase IV Areas

The EtherWORKS Router/DECnet software implements Phase IV/IV+ DECnet routing and network management. Phase IV/IV+ DECnet networks are hierarchical networks that can be segmented into up to 63 areas, each containing up to 1,023 nodes.

Routers can be one of two types: Level 1 or Level 2. Level 1 Routers route directly toward nodes within their own area, and route toward a Level 2 Router when the destination node is in a different area. Level 2 Routers act as Level 1 Routers within their own area, but, in addition, route to other areas.

The EtherWORKS Router/DECnet software performs both intra-area routing (Level 1) and inter-area routing (Level 2) for Phase IV/IV+ nodes on a Local Area Network, or for Phase III/IV/IV+ remote nodes connected to one of the asynchronous/synchronous serial communications ports.

Line Support

The EtherWORKS Router/DECnet software uses the EtherWORKS Router hardware serial communications ports to connect nodes running asynchronous or synchronous DDCMP DECnet, and the Ethernet/802.3

port to connect to the Ethernet/802.3 LAN. The asynchronous/synchronous ports operate in full-duplex, point-to-point mode and support the ability to connect manually dialed, auto-dialed, or auto-answered modems. The asynchronous/synchronous ports have been designed to be compatible with modems conforming to Bell standards and CCITT recommendations.

Note: Multipoint lines or connections to DMC11s are not supported.

Refer to the System Support Addendum (SSA 36.37.03-x) for further information on supported modems.

The EtherWORKS Router/DECnet supports line speeds and configurations up to and including two lines each at 64 Kbps. The two ports conform to EIA 232/V.24 and EIA 449/423/V.10 for low-speed asynchronous/synchronous and EIA 449/422/V.36/Version.11/(V.35 US only) for high-speed synchronous.

Adapter cables provide the necessary interchange circuits for the various combinations of high/low speed ports. Refer to the System Support Addendum (SSA 36.37.03-x) for further information on the required adapter cables.

Installation and Configuration

The EtherWORKS Router/DECnet software is installed and configured on an MS–DOS/PC-DOS system (termed a load host) by means of a simple menu-driven installation and configuration program. This load host can be the same PC system that is housing the EtherWORKS Router/DECnet hardware unit, assuming an additional Ethernet controller is present, or another PC system running MS–DOS and PATHWORKS for DOS on the same Ethernet LAN.

The EtherWORKS Router/DECnet system image is loaded into the memory of the DE206-xx hardware unit either from a load host on the LAN or from disk on the PC in which the DE206-xx hardware unit is housed. Loading the image by means of the host PC using the PC port loading option eliminates the need for a load host on the LAN.

If there are several EtherWORKS Router/DECnet hardware units on the LAN and they use a common load host, then each EtherWORKS Router/DECnet hardware unit will have a separate system image on the load host.

The EtherWORKS Router/DECnet system image contains the configuration information that tailors the router system for proper operation in its intended environment.

The configuration information contained in the system image on the load host can be modified by the System/Network Manager using a utility provided on the installation kit. The changes made to the configuration information in the system image are retained until the System/Network Manager changes them using the configuration utility. The changes take effect the next time the system image is downline loaded to the EtherWORKS Router/DECnet hardware unit.

Network and Configuration Management

The Network Management utility (DECnet Network Control Program (NCP)) on Phase IV DECnet nodes can execute commands remotely with the EtherWORKS Router/DECnet software to perform three primary functions:

- Display statistical and error information for the router (for example, statistics on line usage or errors)

- Control the operation of the router (for example, starting and stopping lines, setting parameters, and loading software)

- Test the components of the network (for example, loop messages through all or part of a communications path to isolate a defective component)

The EtherWORKS Router/DECnet software also has a monitor that is available remotely. The remote monitor runs on any MS–DOS/PC-DOS host system to monitor the current state of the router. These displays are updated at pre-set intervals and present current router data and status information, such as CPU and line utilizations, current adjacencies, and buffer use.

Path Splitting

If the costs are set appropriately, the EtherWORKS Router/DECnet software performs path splitting.

Note: Routing cost is an arbitrary network management parameter set by the network manager to control network traffic flow. If the cost between the router and the destination node is the same on multiple asynchronous/synchronous ports, up to a maximum of four circuits, then the EtherWORKS Router/DECnet software splits traffic across the ports. As a result, higher data transfer rates and higher reliability due to redundant paths are provided.

Note: For this path splitting feature to work, the destination nodes must support out-of-order packet caching.

Performance

The EtherWORKS Router/DECnet software will support and saturate serial line speeds and configurations of 2 lines each at 64 Kbps.

Dynamic Buffering Feature

As part of the initialization sequence, a check is made as to the number of SIMMs installed on the EtherWORKS Router/DECnet hardware unit. This determines the number of buffers available to be used by the router software. Increasing the number of buffers should lower delays experienced due to high routing traffic. The EtherWORKS Router/DECnet hardware unit as shipped has two empty SIMM sockets. Users may elect to install two SIMMs (either two one meg by nine, eighty nanosecond SIMMs, or two 256K by nine, eighty nanosecond SIMMs) to improve performance (see SSA 36.37.03-x).

Dial-out Feature

The dial-out feature in the EtherWORKS Router/DECnet Version 1.1 allows the router to automatically connect to a remote site, dynamically connect per user request, and reconnect to a remote site on a line disconnect. Dial-out is based on the client server architecture, with the user interface residing on the PC being the client, and the software image loaded into the router being the server. A maximum of six active requests will be allowed at one time. The dial-out command user interface includes:

- Cancel–cancel one request or all requests to one or all ports.

- Help–provide command syntax and information on all commands listed here.

- Dial–used to start the dial-out process from a router node. User specifies router node, port, number, and adjacency in the simplest form of the command.

- Set–allows user to set characteristics for an adjacency node.

- Status–shows the status of one request for one port, all requests for all ports, or all requests for one port.

- Register–marks a specific port on the remote system as being in use by this node.

- De-register–removes the lock on a specific port on the remote system.

- Other features include time delay before attempting connection to remote node, and number of connect attempts from one (default) to persistent.

HARDWARE REQUIREMENTS

Processor and/or hardware configurations as specified in the System Support Addendum (SSA 36.37.03-x).

Version 1.1 of the EtherWORKS Router/DECnet software requires different firmware (PROM) than did the version 1.0 software. The correct PROM is part of the hardware module included in DE206-AA units shipping with version 1.1 software. An updated kit is available that includes version 1.1 software as well as the required PROM. Module and PROM part numbers and revision numbers for Version 1.1 versus Version 1.0 are specified in the System Support Addendum (SSA 36.37.03-x).

SOFTWARE REQUIREMENTS

Each DOS PC acting as a load host or dump receiver must be running one of the following network software packages:

- DECnet PCSA Client for DOS
  or
  PATHWORKS for DOS

- And one of the following operating systems:

  — COMPAQ® DOS

  — DECstation DOS

  — IBM® DOS

  — Olivetti® DOS

  — Tandy® DOS

  — Toshiba® DOS

  — Zenith® DOS

Refer to the System Support Addendum (SSA 36.37.03-x) for availability and required versions of prerequisite /optional software.

ORDERING INFORMATION

Full EtherWORKS Router kit including hardware, media, documentation, cables, and DECnet software license: DE206-AA

EtherWORKS Router/DECnet Upgrade kit: DE206-UA

Additional Documents Available Stand-alone:
    Router Management Guide: AA-PJJ1A-TE (included with DE206-AA version 1.1 software)
    Routing and Network Overview: AA-HS15A-TK

Software Product Services: QT-XV8*-**

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

SOFTWARE LICENSING

A separate license is shipped with each EtherWORKS Router/DECnet (DE206-xx) hardware unit. A license is required for each EtherWORKS Router/DECnet (DE206-xx) hardware unit on which this software product will be used (except as otherwise specified by Digital).

The licensing provisions of Digital Equipment Corporation's Standard Terms and Conditions provide in part that the software and any part thereof (but excluding those parts specific to the load hosts) may be used only on the single EtherWORKS Router/DECnet (DE206-xx) hardware unit on which the software is operated, but may be copied, in whole or in part (with the proper inclusion of Digital's copyright notice and any proprietary notices on the software) between multiple load hosts on the same LAN.

This product does not provide support for the VMS* or ULTRIX License Management Facility. A Product Authorization Key (PAK) is not required for installation or use of this version of the product.

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, please contact your local Digital office.

SOFTWARE WARRANTY

The EtherWORKS Router/DECnet software is warranted for use only with supported Phase III/IV/IV+ DECnet products supplied by Digital.

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.

---

* The terms VMS and OpenVMS refer to the OpenVMS Operating System.

System Support Addendum

PRODUCT NAME: EtherWORKS Router/DECnet, Version 1.1   **SSA 36.37.03-A**

HARDWARE/LOAD HOST REQUIREMENTS

Processors Supported

Note: An asterisk (*) indicates a system is supported only as a load host and is not supported for housing the DE206.

COMPAQ®	Deskpro 286 Model 20 and 40, Model 2551 on UL label,
	Deskpro 286e, Deskpro 386/16,
	Deskpro 386/20, Deskpro 386/25,
	Deskpro 386/33, Deskpro 386s,
	Deskpro 386/20e, PORTABLE III,
	PORTABLE 386, Deskpro 286N,
	Deskpro 386N, Deskpro 386s/20,
	Deskpro 386/25e, SYSTEMPRO,
	Deskpro 486/25, SLT 386s/20
	*Deskpro Model 2, Deskpro 286N
	*Deskpro 486/33L

Digital	DECstation 200, DECstation 212LP,
	*DECstation 210, DECstation 220,
	DECstation 300, DECstation 316,
	DECstation 316+, DECstation 316sx,
	DECstation 320, DECstation 320sx,
	DECstation 325, DECstation 325c,
	DECstation 333c, DECstation 350,
	DECstation 425, DECstation 425c

IBM®	
	5170 Personal Computer AT® Model 80
	PS/2® Model 30, PS/2 Model 30-286,
	*5150 Personal Computer,
	*5160 Personal Computer,
	*5162 Personal Computer,

	*PS/2 Model 50, PS/2 Model 50Z,
	*PS/2 Model 55sx, PS/2 Model 60,
	*PS/2 Model 70, PS/2 Model 80

Olivetti®	M28, M250, M250E, M280,
	M290, M300, M380/XP1, M386/25, M486
	*M24, M240, M290s

Tandy®	4025LX, 3000NL

Toshiba®	T3200, T3200SX

Zenith®	Z-248/12, Z-386/20, Z-386/25, Z-386/33,
	Z-386SX, Z-386/33E, SupersPort SX
	Z-248, SupersPort 286

For DOS load host support, refer to the supported base systems chart in the PATHWORKS for DOS Software Product Description (SPD 55.07.xx) for a list of supported system configurations and specific model numbers.

Load Host System Restrictions

Every load host on which the EtherWORKS Router /DECnet software is installed must contain:

- A valid system configuration for the relevant operating system and for the appropriate PATHWORKS product (refer to the DECnet and appropriate operating system Software Product Descriptions)

- A supported connection to EtherWORKS Router (DE206) hardware unit

- An appropriate device available to read the software during installation:

    — For MS–DOS® Operating Systems: an RX24 or RX31 drive (a minimum of two drives, at least one of which must be capable of reading 5.25-inch 360 Kbyte diskettes or 3.5-inch 720 Kbyte diskettes)

Other Hardware Required

The EtherWORKS Router/DECnet software runs only on the EtherWORKS Router (DE206) hardware unit. Version 1.1 software, which adds dynamic buffering, dial-out, and PC port loading features (see SPD 36.37.03), requires updated firmware (PROM). The proper unit revision, module revision, and PROM were /are shipped with the appropriate revision software. A kit is available to update from version 1.0 to 1.1. The PROM hardware/software compatibility requirements are as follows:

- Version 1.0:

    Module 54-20950-01, Rev D01/D02

    PROM 164E8

- Version 1.1:

    Module 54-20950-01, Rev E01

    PROM 253E8

If the PC system that houses the EtherWORKS Router card is also used as the load host, and the PC port loading option is not being used, then it must provide a separate connection to Ethernet besides the connection in the EtherWORKS router.

The DE206 requires an adapter cable to provide the necessary interchange circuits at the appropriate electrical interface types for its high-speed ports. The following table shows the cable numbers for each of the electrical interface types.

Table 1

Adapter Cables

Adapter Cable	Electrical Interface Type
BC09S-03	Two EIA232 Serial Ports at up to 19.2 Kbps
BC09T-03	Two EIA449/EIA422 Serial Ports at up to 64 Kbps
BC09R-03	One EIA232 port at up to 19.2 Kbps and one EIA449/EIA422 port at up to 64 Kbps
BC11G-04	One EIA232 serial port at up to 19.2 Kbps and one V.35 serial port at up to 64 Kbps (US /Canada only)
BC11Q-04	Two V.35 serial ports at up to 64 Kbps (US/Canada only)
BC21G-02	BT Kilostream to EIA449/EIA442 Sync Line Adapter cable (UK only)
BC55D-50	V.36/EIA449/EIA422/EIA423 Sync line extension cable
BC19L-25	V.35 Sync line extension cable
BC22F-XX	Asynch line extension cable, XX is length shown below
	length 10 feet: XX=10 length 25 feet: XX=25 length 50 feet: XX=50 length 100 feet: XX=A0 length 200 feet: XX=B0
BC22Z-25	BT Kilostream to BT Kilostream line extension cable, UK only

.

The low-speed adapter cable, BC09S-03, is shipped with the module. Other cables are available as separate options.

The EtherWORKS Router/DECnet product has been tested against and is supported in configurations with appropriate Digital DE***-series Ethernet Controllers. While third-party Ethernet controllers may work, they are not supported, and Digital is not responsible for any damages that result from their use.

Disk Space Requirements:

For DOS Systems:

Disk space required for installation:	1,000 Kbytes
Disk space required for use (permanent):	270 Kbytes (per router image)

These counts refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options.

OPTIONAL HARDWARE

Modems Supported (excluding auto-dial feature):

• DEC DF03, DF112, and DF224

Modems Supported (including auto-dial feature):

• DEC DF242 and DF296

• Hayes® SmartModem 2400™

• CODEX 2233/2260

SIMMS:

The Etherworks router supports buffer memory expansion of the following:

• Two 80ns (or faster) 1MB X 9 SIMMs

• Two 80ns (or faster) 256KB X 9 SIMMs.

Both are available through Digital's Desktop Direct:

FR-PC4XM-CA 512 Memory Kit (2/80ns 256K SIMMs)
FR-PC4XM-CB 2MB Memory Kit (2/80ns 1MB SIMMs)

SOFTWARE REQUIREMENTS

Each DOS PC acting as a load host or dump receiver must be running one or more of the following network software packages:

• DECnet PCSA Client for DOS Version 3.0 at a minimum

• PATHWORKS for DOS Version 4.0 at a minimum

And one of the following operating systems:

— COMPAQ DOS Version 3.31, Version 4.0, Version 4.01 at a minimum

— DECstation DOS Version 3.3, Version 4.0 at a minimum

— IBM DOS Version 3.3, Version 4.0 at a minimum

— Olivetti DOS Version 3.3, Version 4.0, Version 4.01 at a minimum

— Tandy DOS Version 3.30, Version 4.01 at a minimum

— Toshiba DOS Version 3.3 (R3C90US), Version 4.01 (R4A15US) at a minimum

— Zenith DOS Version 3.3+, Version 4.0, Version 4.01 at a minimum

GROWTH CONSIDERATIONS

The minimum hardware/software requirements for future versions of this product may differ from the requirements for the current version.

DISTRIBUTION MEDIA

For DOS systems running MS–DOS and acting as a load host, the following distribution media is available:
   RX24 Floppy Diskette, RX31 Floppy Diskette

ORDERING INFORMATION

The part number for the full EtherWORKS Router kit, including hardware media, documentation, cables, and DECnet software license is DE206-AA

An upgrade kit from Version 1.0 to Version 1.1 is available: part number DE206-UA.

Additional Documents Available Stand-alone:
   Router Management Guide: AA-PJJ1A-TE (included in DE206-AA with version 1.1 software)
   Routing and Network Overview: AA-HS15A-TK

Software Product Services: QT-XV8*-**

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

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