DEC Network Integration Server

Introduction and Glossary

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Preface

This manual introduces the DEC™ Network Integration Server. Throughout the manual, the term DECNIS is used to refer to the DEC Network Integration Server. This manual describes the functions and protocols supported by the DECNIS. It also includes a glossary of terms.

Audience

This manual is for all DECNIS users.

This manual assumes that you understand and have some experience of:

- Local Area Networks (LANs)
- Wide Area Networks (WANs)
- X.25 (if using the CCITT X.25 protocols)
- OpenVMS™ (if using an OpenVMS load host)
- ULTRIX™ (if using an ULTRIX load host)
- OSF/1® (if using an OSF/1 load host)
- PCs (if using an PC load host)

Associated Documentation

Product Documentation

The contents of the documentation kit depends on which load host you are using.

- *DEC Network Integration Server Management*
- *DEC Network Integration Server Installation and Configuration for Open VMS, ULTRIX and OSF/1*
- *DEC Network Integration Server Configuration and Loading*
- *Router Configuration and Management from PCs*

- *DEC Network Integration Server Problem Solving*

  This is only available on line through the Bookreader™ or as a text file if you have a PC load host.

- *DEC Network Integration Server Event Messages* (supplied on line)
- *DEC Network Integration Server Release Notes* (supplied on line)

Hardware Documentation

The following documents are supplied with the DECNIS hardware:

- *Installation and Service Manual*
- *Configuration Card*

The following documents are supplied with each Network Interface Card:

- *Cabling Instructions and Specifications* card
- *Problem Solving* card
- *Configuration* card

Related Documentation

- *DECnet/OSI Routing Overview*

  This manual introduces routing on DECnet™/OSI networks, and defines the basic routing terminology and concepts. Read this manual before using the DECNIS.

- Network management documentation for the load-host operating system you are using.
- *Common Trace Facility (CTF) Use* manual

  This manual is part of the VMS™ documentation set, and describes how to use the Common Trace Facility for problem solving.

- *Network Information* (supplied on line)

  This supplies profile information about all the public Packet Switching Data Networks that Digital supports.

- *X.25 Security* manual

  This manual explains the underlying concepts of X.25 security. You can order this manual through your local Digital office.

- *Bridge and Extended LAN Reference* manual

  This manual provides a general description of bridging and extended LANs. You can order this manual through your local Digital office.

- RFCs (for IP routing)

  RFCs are the working notes for the internet research and development community. These notes are available in a three-volume set, the *DDN Protocol Handbook*, which can be ordered from the following address:

  Network Solutions, Inc.
  Attn: InterNIC Registration Service
  505 Huntmar Park Drive
  Herndon, VA 22070
  Tel. 1-800-444-4345 or 619-455-4600 (USA only)

Documentation Comments

If you have comments or suggestions for this manual or any of the DECNIS documents and you have access to the Internet, mail your comments electronically to the DECNIS writing group within Digital at the following address:

doc_quality@lkg.mts.dec.com

Alternatively, you can complete the postpaid Reader's Comments form at the end of this document.

Thank you.

1
What Is the DECNIS?

This chapter describes the functions of the DECNIS. It includes a reading table to guide you to the documentation required to perform tasks on the DECNIS.

1.1 DECNIS Functions

The DECNIS operates in multiprotocol and multivendor environments. It provides a network service over both Local Area Networks (LANs) and Wide Area Networks (WANs).

The DECNIS provides the following communications functions:

- Integrated IS–IS routing, including:
  - OSI routing
  - IP routing
- DECnet Phase IV routing
- Bridging
- X.25

The DECNIS uses Integrated IS–IS to simultaneously control OSI routing and IP routing.

1.1.1 Definition of Integrated IS–IS

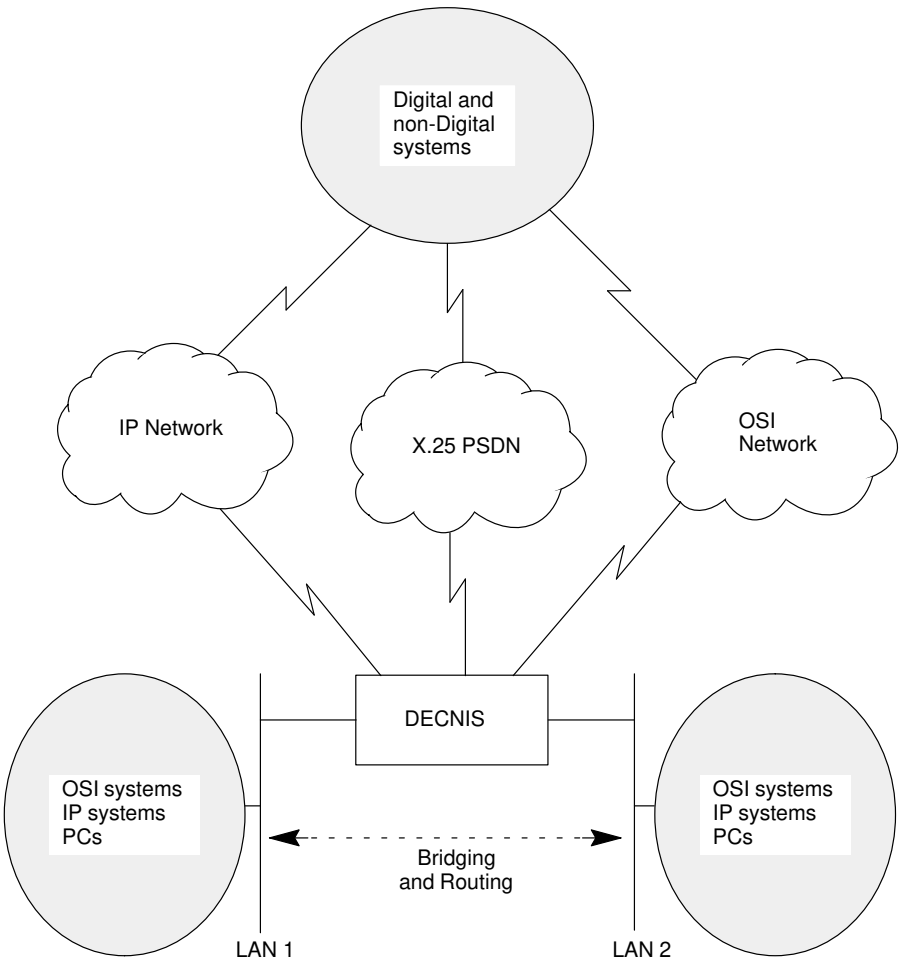
Integrated IS–IS is an extended form of the OSI routing protocol, IS–IS.[1] The extension provides support for IP routing, as defined in RFC 1195.

This means the DECNIS does not have to run two separate routing protocols. As a result, the DECNIS uses less memory, has lower routing costs, and can support larger networks.

[1] OSI Intermediate System to Intermediate System (IS–IS) Intra-Domain Routing Exchange Protocol, as specified in ISO/IEC 10589.

Figure 1–1 represents the DECNIS using all of its functions.

Figure 1–1 Functions of the DECNIS



1.1.2 Communication Abilities

Figure 1–1 shows two features of the DECNIS:

- Multiprotocol ability

  The DECNIS is using several protocols to allow the different types of system to communicate.

- Multivendor ability

  The DECNIS is providing communication between Digital and non-Digital systems.

The functions you can use on the DECNIS depend on the type of licenses you have and how you configure your system. Refer to the *DEC Network Integration Server Software Product Description* (SPD) for details of licensing, and the *DEC Network Integration Server Configuration and Loading* manual for details about configuring your system.

Chapter 2 describes the functions of the DECNIS in more detail.

1.2 Useful Documentation

Table 1–1 contains information on the DECNIS documentation. It indicates which manuals you should read to perform tasks on the DECNIS. It also shows which manuals are shipped with each load host operating system.

If you are responsible for all aspects of a DECNIS system, read the manuals as you undertake the relevant tasks. You will probably carry out the tasks in the order shown.

Table 1–1 DECNIS Documentation

Manual	Use	Load Host System
DECnet/OSI Routing Overview	General routing information	All
DEC Network Integration Server Introduction	General DECNIS information	All
DEC Network Integration Server Installation and Configuration for Open VMS, ULTRIX and OSF /1	Installation and load host configuration	VMS, ULTRIX and OSF/1
Router Configuration and Management from PCs	Installation, configuration and management from PCs	PC only
DEC Network Integration Server Configuration and Loading	DECNIS configuration	All
DEC Network Integration Server Management	Management of DECNIS system	All
DEC Network Integration Server Problem Solving (on-line only)	Problem Solving	All (Bookreader for VMS, ULTRIX and OSF/1, text file for PCs)
DEC Network Integration Server Event Messages (on-line text)	Network management	All
Using MS–DOS Kermit	PC management	PC only

For hardware problem solving, refer to the *Installation and Service* for your hardward system. For further network management information, refer to the on-line NCL help and the NCL documentation for your load host system.

2
DECNIS Functions

2.1 Introduction

This chapter describes in detail the functions provided by the DECNIS.

2.2 OSI Routing

The DECNIS supports Level 1 and Level 2 routing using Link State (Phase V) or Routing Vector (Phase IV) algorithms.

2.2.1 Definitions

Level 2 routers forward data between routing domains and between areas within routing domains. Level 1 routers forward data within their own area. A routing domain is a set of systems which communicate using the same routing procedures or algorithms. To support large routing domains, you can divide a network into subdomains called areas.

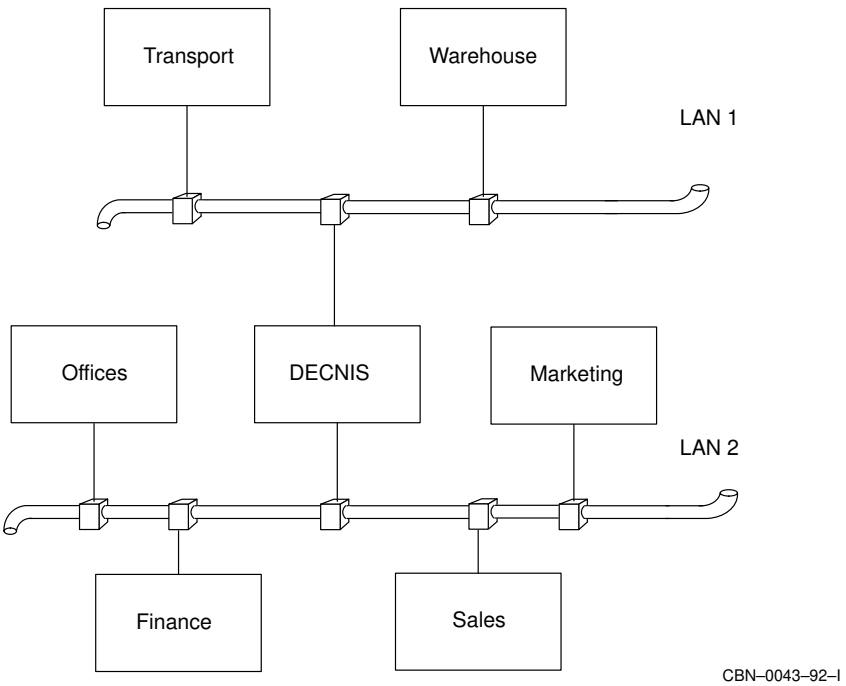
Refer to the *DECnet/OSI Routing Overview* for more details about OSI routing levels and algorithms.

2.2.2 OSI Routing on LANs and WANs

The DECNIS routes data over Local Area Networks (LANs) and Wide Area Networks (WANs).

Figure 2–1 shows an example of the DECNIS routing over two LANs.

Figure 2–1 Routing over LANs



2.2.3 LAN Protocols

The DECNIS uses the following LAN protocols:

- CSMA/CD (Carrier Sense, Multiple Access with Collision Detect) type protocols. These protocols include Ethernet and IEEE 802.3.
- FDDI (Fiber Distributed Data Interface) which is 10 times faster than Ethernet. FDDI can be used for metropolitan LANs (with up to 2 kilometers between stations).
- Novell NetWare® IPX on Ethernet and FDDI links using the 802.2 LAN protocol to and from the following:
  - NetWare IPX routers
  - NetWare IPX workstations (clients)

– NetWare IPX servers (file and print servers)

Tunnel circuits can also be used on these links.

- AppleTalk® on Ethernet and FDDI links using CSMA/CD protocols. AARP is supported for mapping between the AppleTalk Node Address and the Ethernet or FDDI hardware address.

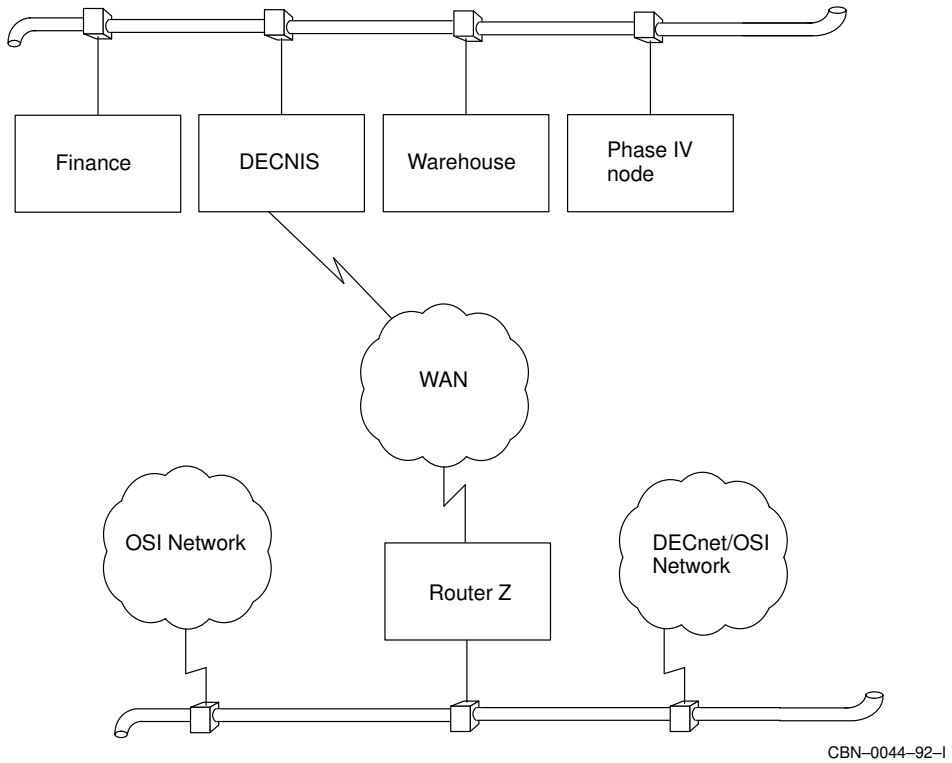
  Tunnel circuits can also be used on these links.

2.2.4 WAN Protocols

Figure 2–2 shows an example of the DECNIS routing over a WAN.

In this example, the WAN can be an OSI network or an X.25 Packet Switched Data Network (PSDN). Router Z can be another DECNIS, a DEC WANrouter, or any other vendor's router that conforms to the OSI or X.25 protocols.

Figure 2–2 Routing over WANs



If the WAN is an OSI network, the DECNIS uses one of the following protocols:

- High-level Data Link Control (HDLC) protocol over synchronous point-to-point connections
- Digital Data Communications Message Protocol (DDCMP™) links over synchronous and asynchronous point-to-point connections
- Point-to-Point Protocol (PPP) over synchronous connections
- CHDLC protocol over synchronous connections for compatibility with the DECbrouter 90™)

Using the DECNIS, you can also create PPP and CHDLC links over a frame relay network. The DECNIS supports the Frame Relay Bearer Service (FRBS) protocol and interface standards, which have been, and continue to be, developed by the American National Standards Institute (ANSI) T1 S1 committee.

FRBS provides:

- High-speed packet transmission
- Minimal network delay
- Efficient use of the wide area network bandwidth
- A packet switched service allowing data transfer over both public and private networks

To provide frame relay bearer connections, the DECNIS requires a DEC WANcontroller 622 Network Interface Card. However, over each single, physical line on the card, the software supports multiple, simultaneous connections. This multiplexed interface allows you to communicate without requiring:

- Dedicated lines to each destination
- Preallocated fixed bandwidth

If the WAN is an X.25 PSDN, the DECNIS uses X.25 protocol connections. PSDNs can be public or private networks.

The term OSI network often refers to a network that uses a combination of OSI routing and X.25 packet switching.

The DECNIS also communicates with Phase IV DECnet nodes, and integrates them into the DECnet/OSI network. This is often referred to as backwards compatibility.

2.3 IP Routing

The DECNIS can be configured as an IP router.

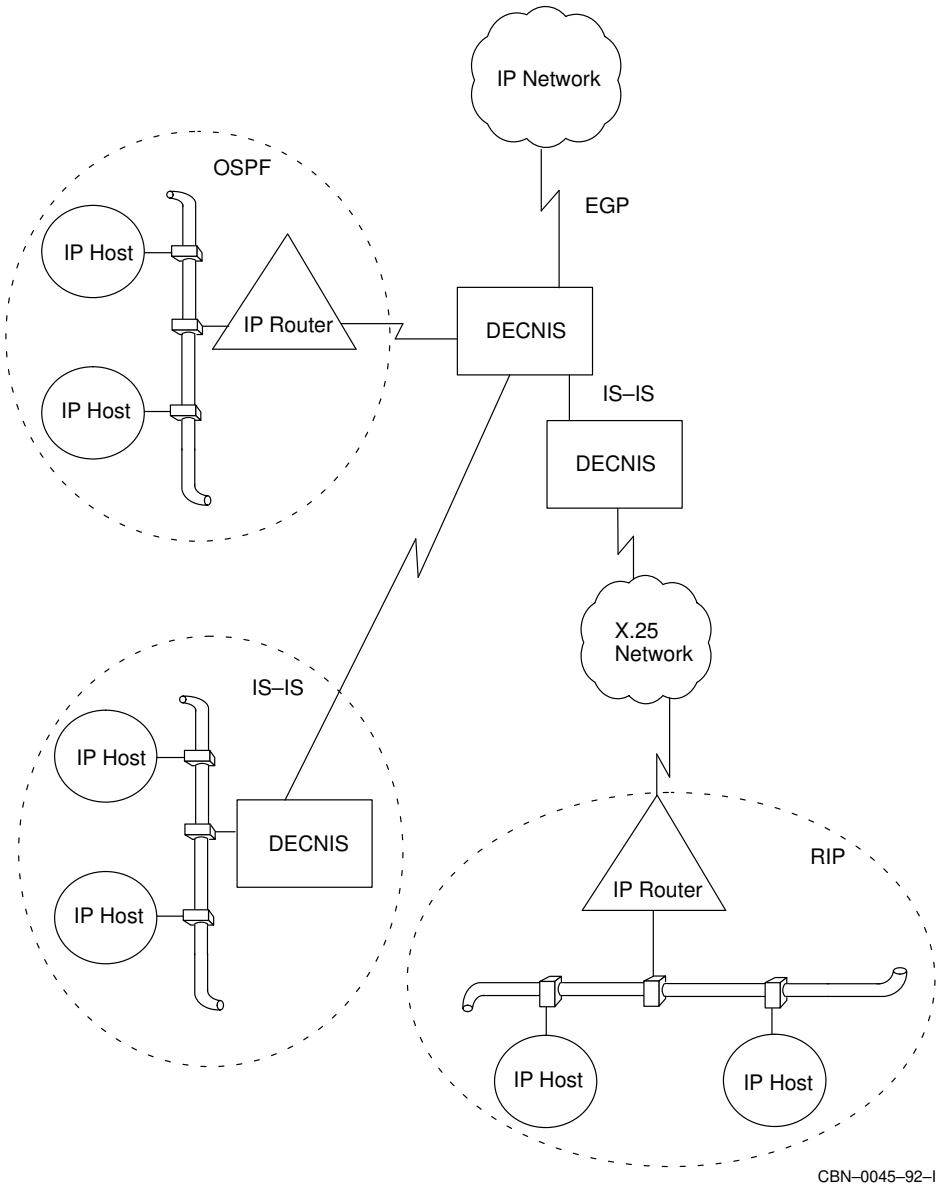
2.3.1 Definition of IP Routing

An IP router is a system that routes IP packets within an IP network (often referred to as an internet). IP routers are sometimes called IP gateways.

2.3.2 Example IP Networks

Figure 2–3 shows an example IP network using DECNIS systems as IP routers. The DECNIS systems communicate with each other and with non-Digital IP routers using various IP routing protocols. All the IP hosts (systems running IP software) in this network can communicate with each other.

Figure 2–3 Example IP Network



Packet forwarding is as follows:

- Over CSMA/CD circuits, PPP, CHDLC and X.25 dynamically assigned (DA) circuits, the DECNIS can forward packets to both Digital and non-Digital IP hosts and IP routers.
- Over HDLC/DDCMP serial circuits and X.25 static circuits, the DECNIS can forward packets to other Digital IP routers only.
- Over IPX and AppleTalk circuits according to RFC 1234.

2.3.3 Internet Protocols

The DECNIS supports the following Internet protocols:

- Internet Protocol (IP)
- Internet Control Message Protocol (ICMP)
- Address Resolution Protocol (ARP)
- User Datagram Protocol (UDP)

The DECNIS supports the following IP routing protocols:

- U.S. Department of Defense Routing Information Protocol (RIP) as defined in RFC 1058, but not over X.25 DA circuits.
- Integrated IS–IS either over a LAN or over a WAN, as defined in RFC 1195. IS–IS is supported over either synchronous lines or X.25 static circuits, but not over X.25 DA circuits.
- Open Shortest Path First (OSPF®) as defined in RFC 1247.
- Exterior Gateway Protocol (EGP) as defined in RFCs 827, 888, and 904, but not over X.25 DA circuits.

The DECNIS supports IP Reachable Addresses ("static routes") as defined by DECnet/OSI management:

- Over a LAN to a Digital or non-Digital IP router
- Over an HDLC link to a Digital IP router
- Over a DDCMP link to a Digital IP router
- Over X.25 DA circuits to an IP host, or a Digital or non-Digital IP router (RFC 877)
- Over PPP and CHDLC links to a Digital or non-Digital IP system (RFC 1332)

2.3.4 AppleTalk and IPX Protocols

The DECNIS supports routing over IPX and AppleTalk links (RFC 1234) as encapsulated packets within IP.

The following Novell NetWare protocols are supported:

- Novell NetWare Routing Information Protocol (NetWare RIP), which provides the reachability of Novell NetWare routers and end systems.
- Novell NetWare Service Access Protocol (NetWare SAP), which provides information about the services available in the Novell NetWare network.

The following AppleTalk protocols are supported:

- AppleTalk Routing Table Maintenance Protocol (RTMP), which provides reachability information to other AppleTalk nodes (routers and end systems).
- AppleTalk Zone Information Protocol (ZIP), which provides mapping between AppleTalk networks and zones.
- AppleTalk Name Binding Protocol (NBP), which provides numeric address mapping.
- AppleTalk Echo Protocol (AEP). The DECNIS can reply to an AppleTalk echo request as specified by the AppleTalk echo protocol.

If you have a PC LAN license, you can set up the DECNIS as an AppleTalk router.

Refer to the *DEC Network Integration Server Management* manual for full details on using these protocols with the DECNIS.

For more information about IP, refer to the *DECnet/OSI Routing Overview*.

2.4 Bridging

The DECNIS supports local and remote bridging in accordance with the IEEE 802.1d standard and Digital's LAN Bridge 100 standard. It acts as a bridge for any data that is not forwarded by OSI, IP, or X.25 functions.

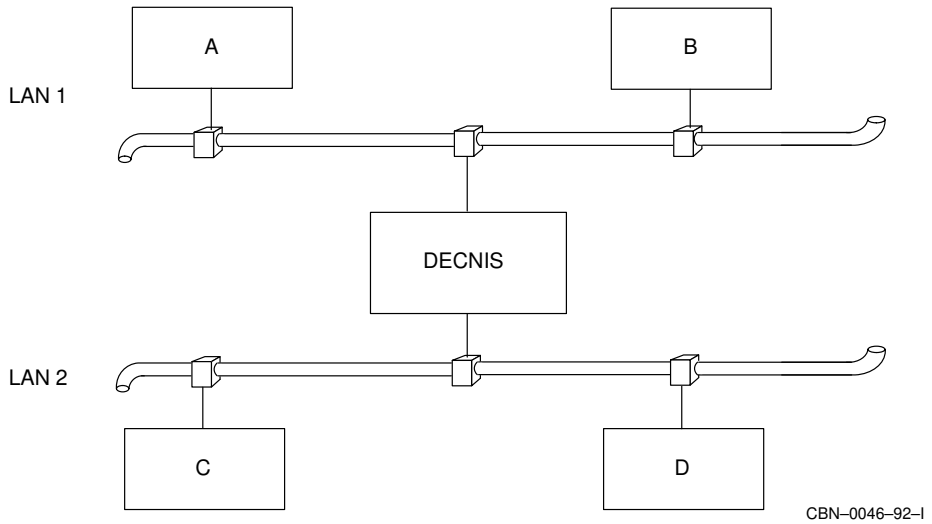
2.4.1 Bridge Filtering

Bridges filter traffic between two LANs. This has the following benefits:

1. It reduces the amount of traffic on each LAN.
2. It lets you limit traffic to defined areas.

Figure 2–4 shows an example of the DECNIS acting as a local bridge between two LANs.

Figure 2–4 Local Bridging Between LANs



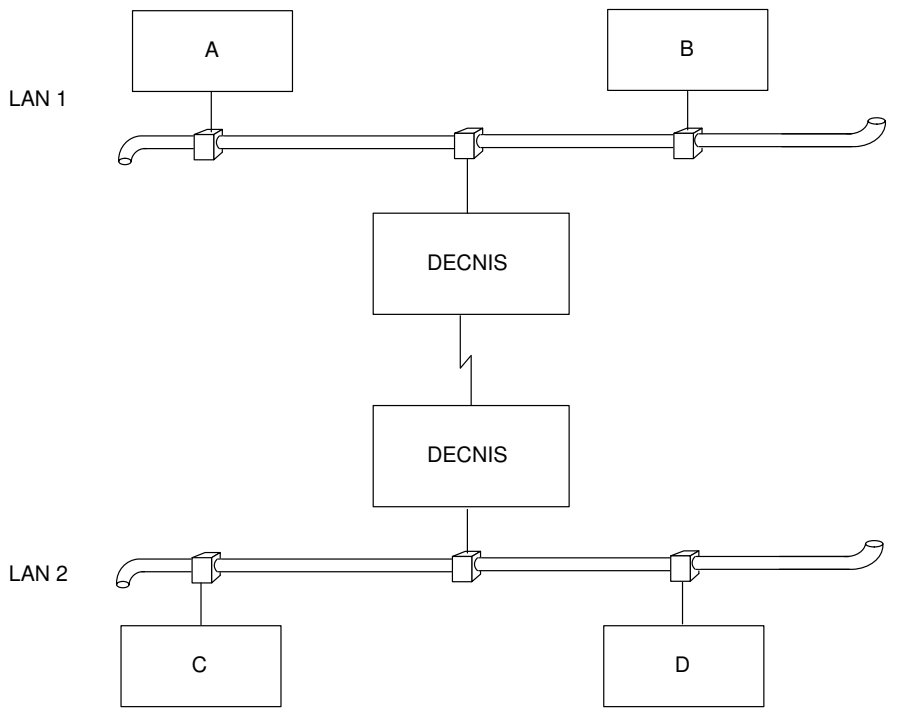
The bridge reduces the amount of traffic by only retransmitting data addressed to destinations on the attached LAN. For example, in Figure 2–4, the bridge recognizes whether data is addressed to LAN 1 or LAN 2. If system A sends a packet to system D, the bridge retransmits the packet to LAN 2. If system A sends a packet to system B, the bridge confines the packet to LAN 1.

In the example in Figure 2–4, you could set up the bridge to only allow communication between systems B, C, and D. This is an example of limiting the traffic between two LANs. You might do this for security reasons or simply to reduce the amount of traffic on the LAN.

2.4.2 Remote Bridging

Figure 2–5 shows the DECNIS acting as a remote bridge. The remote bridge filters traffic in the same way as a local bridge, but does not have a direct connection to both LANs. It forwards data over one synchronous line, through another DECNIS to the remote LAN. The DECNIS connects over the synchronous line using the HDLC, VCP, PPP or CHDLC protocol.

Figure 2–5 Remote Bridging Between LANs



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The DECNIS supports VCP (Vitalink® Communications Protocol) links which allow you to form connections to Vitalink systems.

The VCP link uses a variant of the CSMA-CD station running over modem connect to transfer data. This station runs the VCP keepalive protocol on the synchronous line and is also responsible for adding and removing the Vitalink headers from the frames on the line. The keepalive protocol ensures that both ends of the connection are up before any data is transferred.

The VCP link is configured and managed in a similar manner to Ethernet connections. You can only set up VCP links on the DEC WANcontroller 622.

VCP links can also be used to set up IP circuits. Refer to the *DEC Network Integration Server Management* manual for full details on using VCP.

2.5 X.25

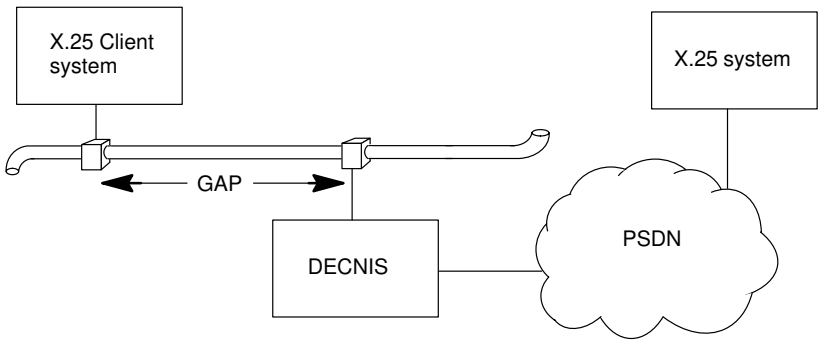
The following sections describe the X.25 functions of the DECNIS.

2.5.1 X.25 Gateway

The DECNIS can act as an X.25 gateway allowing Digital Client systems to connect to PSDNs. Digital Client systems are VAX™ P.S.I. Access systems and DEC X.25 for ULTRIX Gateway Client systems.

The gateway function allows the Client systems to communicate with other X.25 systems (Digital or non-Digital) over PSDNs. The Client systems communicate with the DECNIS using Gateway Access Protocol (GAP). Figure 2–6 shows an example of the DECNIS acting as a gateway.

Figure 2–6 DECNIS as an X.25 Gateway



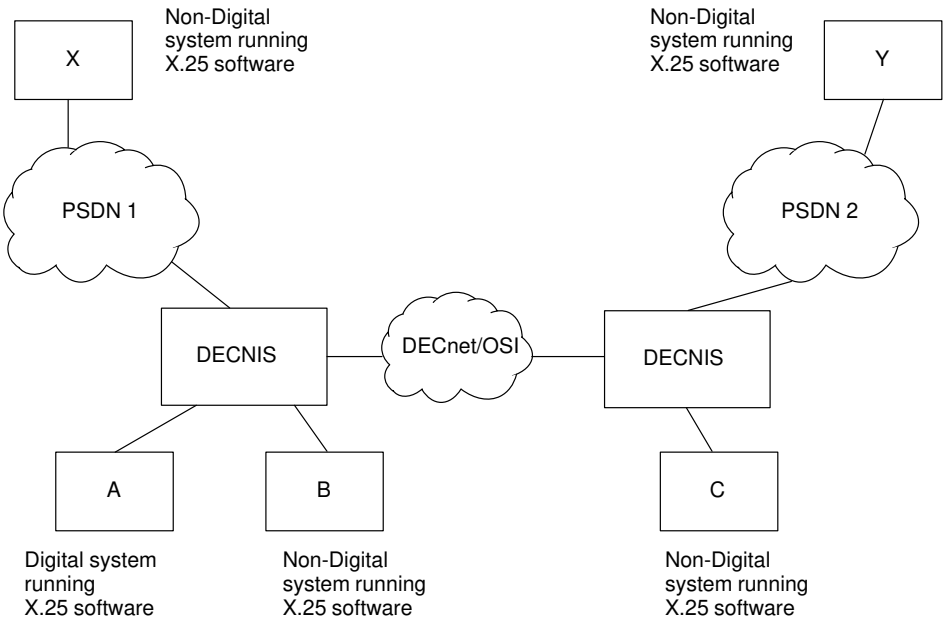
2.5.2 X.25 Relay

The DECNIS can act as a relay over PSDNs and DECnet/OSI networks. This means that Digital X.25 systems can communicate with non-Digital X.25 systems. For example, in Figure 2–7, system A can communicate with all the other systems (B, C, X, Y).

The relay function also lets non-Digital systems communicate with each other using X.25 software. For example, in Figure 2–7, system B can communicate with systems C, X, and Y.

Note, however, that systems X and Y cannot communicate through the DECNIS systems. The PSDN authorities allow X and Y to communicate only through an X.75 link.

Figure 2–7 DECNIS as an X.25 Relay



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2.5.3 CONS LAN/WAN Relay

The DECNIS uses CONS (Connection-mode Network Service) to allow LLC2 systems on a LAN to communicate over a PSDN with any X.25 system.

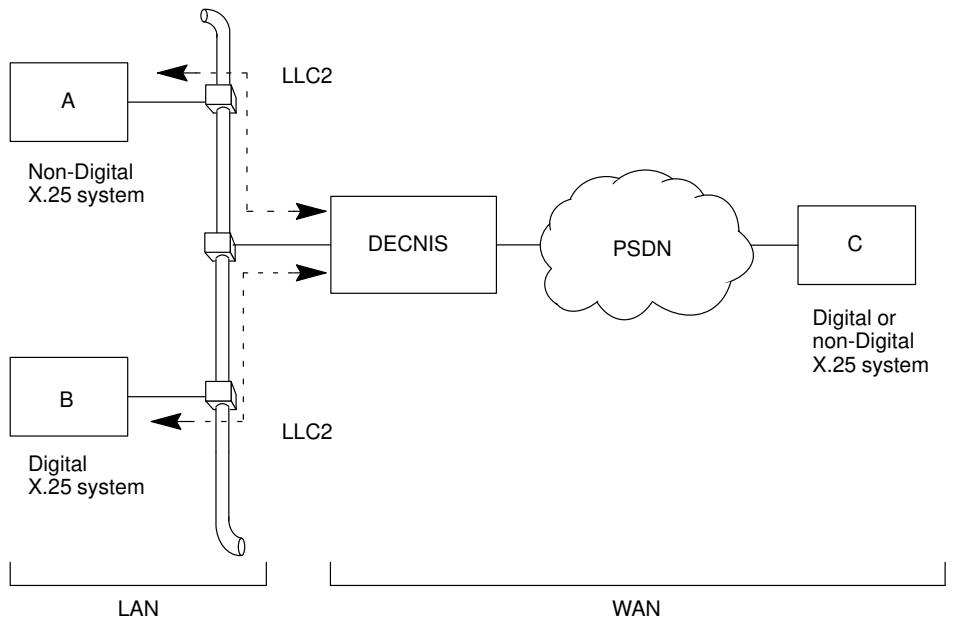
This is often known as a CONS LAN/WAN relay.

The connecting systems can be Digital or non-Digital systems.

The DECNIS supports the LLC type II protocols ISO 8881 and ISO 8802, and implements the recommendations in the ISO Technical Report 10029 for CONS LAN/WAN relays.

An example of a CONS LAN/WAN relay is shown in Figure 2–8.

Figure 2–8 A CONS LAN/WAN Relay



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In Figure 2–8, systems A and B can communicate with system C using a CONS LAN/WAN relay. Systems A and B can also communicate with each other directly over the LAN using LLC2.

2.6 Multiprotocol and Multivendor Environments

This section describes how an international company might use the DECNIS to operate in a multiprotocol and a multivendor environment.

The example company has offices in the U.S. and in Europe. Figure 2–9 shows the connections between the offices using combinations of OSI routing, X.25, IP and bridging.

In Figure 2–9, the systems in the U.S. Programming department communicate with the European Programming department by:

1. Using the DECNIS as an OSI router with:
    - HDLC on synchronous connections over the OSI network
    - DDCMP connections over the OSI network
    - PPP on synchronous connections over the OSI network
    - Dynamically Assigned circuits over the X.25 PSDN
2. Using the DECNIS as an X.25 gateway to the X.25 PSDN

The U.S. Sales department uses the DECNIS as an OSI router to communicate with the European Sales and Administration departments.

Non-Digital UNIX systems in the Programming departments use the DECNIS as an X.25 relay, or as a CONS LAN/WAN relay, to communicate with each other.

The European Research and Development department use the IP function of the DECNIS to communicate with the universities in the Internet.

The bridge function of the DECNIS carries LAN traffic between the European Research and Development department and the European Programming department.

In Figure 2–10, the U.S. Sales department use the DECNIS to communicate with their customers in Japan and Germany. They use message routing services including X.400 and Electronic Data Interchange (EDI) applications.

The WANs are a combination of OSI routing networks and X.25 PSDNs.

To set up the DECNIS in a multiprotocol/multivendor environment, refer to the *DEC Network Integration Server Management* manual.

Figure 2–9 A Multiprotocol Environment

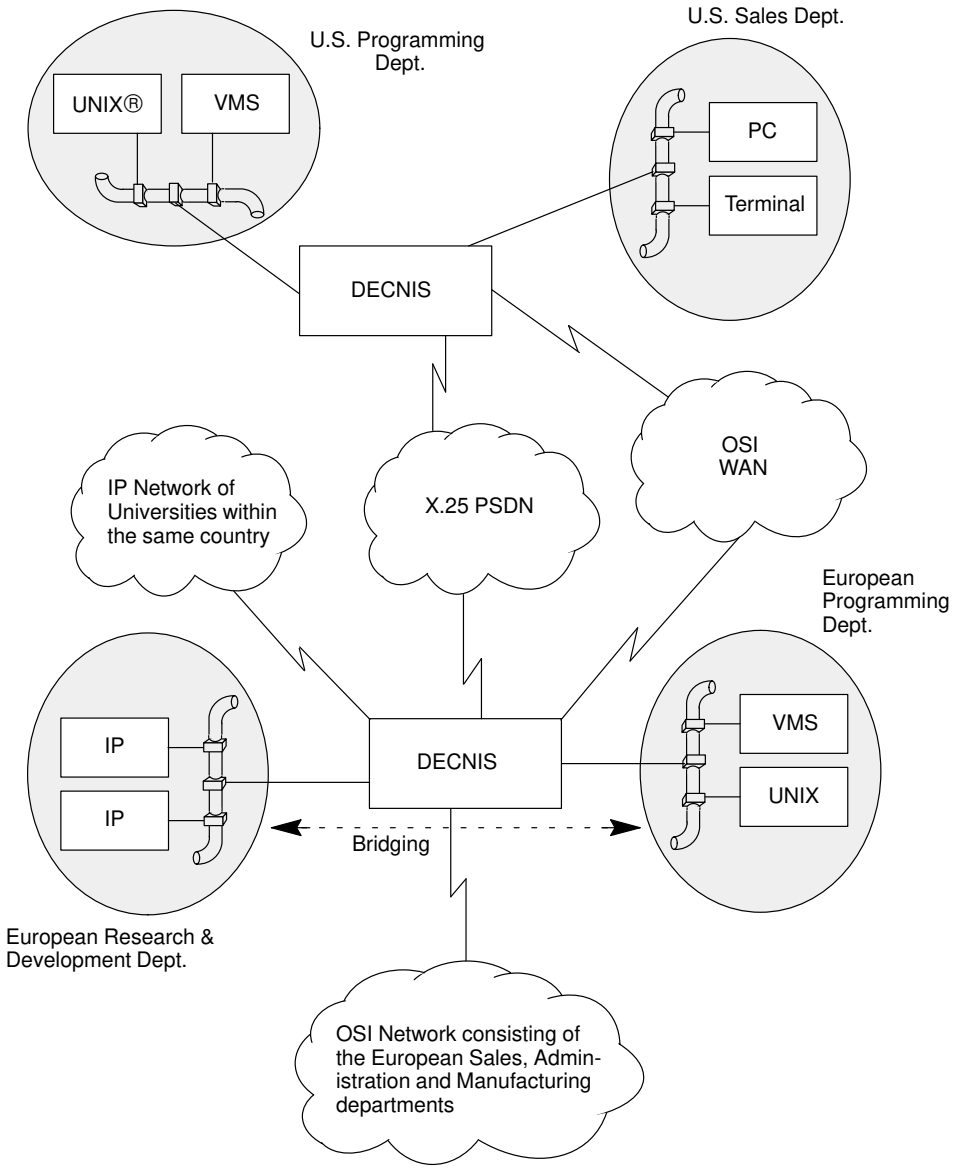
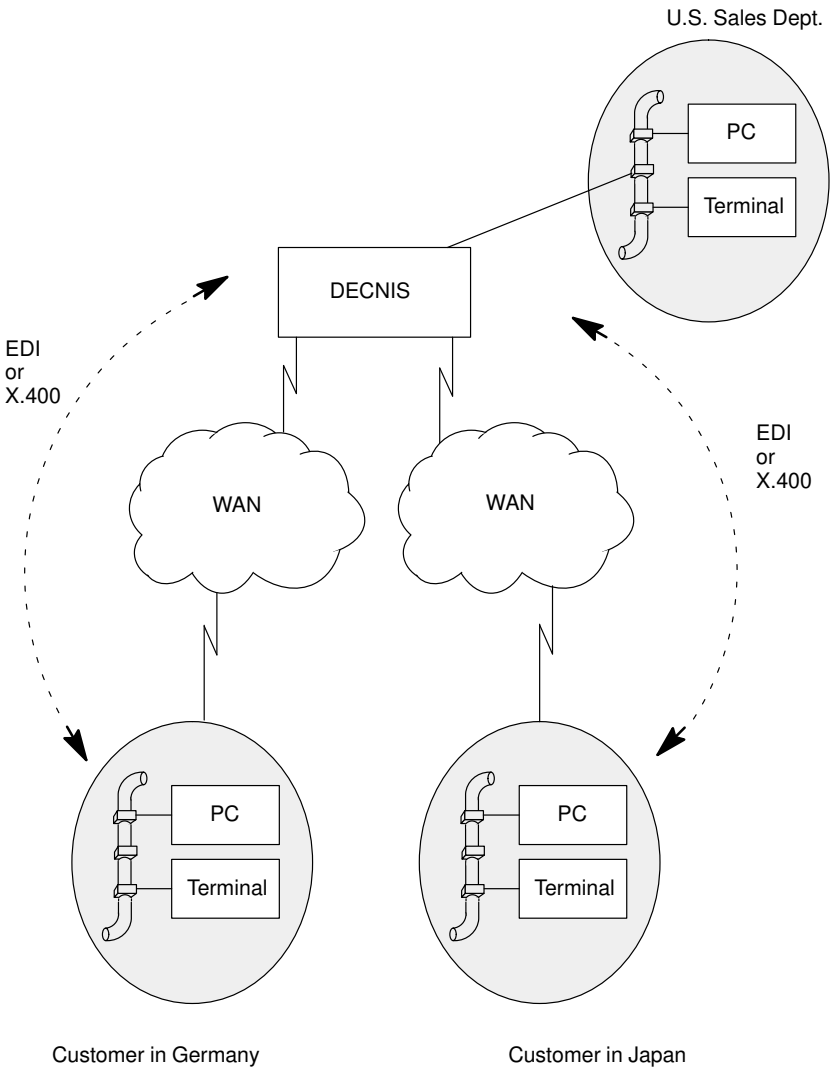


Figure 2–10 A Multivendor Environment



3
General Operation

This chapter describes the general operation of the DECNIS.

- Section 3.1 describes the hardware on which the DECNIS software runs.
- Section 3.2 describes the load hosts used with the DECNIS.
- Section 3.3 describes how the DECNIS is managed.

3.1 Hardware Information

The DECNIS software runs on any DECNIS hardware unit.

For full information about the DECNIS hardware, refer to the *Installation and Service* manual for your hardware system.

3.1.1 Network Interface Cards

The DECNIS hardware units connect to LANs and WANs using Network Interface Cards (NICs). Each DECNIS has several Network Interface Card slots. The Network Interface Cards you slot into the DECNIS determine the type and number of connections to LANs and WANs.

There are six types of Network Interface Card:

- DEC LANcontroller 601

  This has one Ethernet port.

- DEC LANcontroller 602

  This has two Ethernet ports.

- DEC WANcontroller 614

  This has four synchronous ports, each running at up to 64 kbits/s.

- DEC WANcontroller 618

  This has eight synchronous ports, each running at up to 64 kbits/s.

- DEC FDDIcontroller 621

  This has one FDDI port running at up to 100 Mbits/s. Unlike the other Network Interface Cards, this one occupies two slots in the DECNIS.

- DEC WANcontroller 622

  This has two synchronous ports, each running at between 56 kbits/s and 2.048 Mbits/s (T1/E1 ports).

You can have any combination of the six Network Interface Cards on one DECNIS.

You can add new Network Interface Cards to the DECNIS without interrupting its other operations. This is called Live Insertion.

3.2 Loading the DECNIS Software

The DECNIS can load its software either from a load host in the same network, or from the contents of its nonvolatile memory (Flash). When using a load host, the DECNIS can use either MOP (Maintenance Operations Protocol) or BOOTP/TFTP to load and dump its software.

3.2.1 Loading from the DECNIS Nonvolatile Memory (Flash)

The DECNIS can store its software in its nonvolatile memory, once it is initially loaded. This means that for subsequent reloads, a load host is not required.

A load host is required for the first load, and for changes to the configuration of the DECNIS.

3.2.2 MOP Load Hosts

You can load, configure, and manage the DECNIS software from any of the following MOP load hosts:

- An OpenVMS node with a DECnet end node license
- A RISC/ULTRIX node with DECnet/OSI for ULTRIX
- A DECnet–VAX Phase IV node
- An MS–DOS® personal computer running PATHWORKS™ for DOS, Version 4.1

For more details about operating system version requirements, refer to the *DEC Network Integration Server Software Product Description (SPD)*.

The DECNIS software loads, configures, and dumps over the following:

- Any Ethernet
- Any synchronous line connected to a node implementing the MOP load/dump function over HDLC

3.2.3 BOOTP Load Hosts

You can load the DECNIS from any system whose operating system supports the BOOTP and TFTP protocols. A BOOTP load host does not have to run DECnet.

A BOOTP load host must be on the same Local Area Network as the DECNIS.

3.2.4 Remote Loading and Dumping

The DECNIS can act as a load host for other DECNIS systems and other routers that load over synchronous lines.

3.3 Management

The following tools are used to manage the DECNIS:

- DECNIS configurator

  The modify option of the DECNIS configurator lets you change the configuration of the DECNIS. The *DEC Network Integration Server Management* manual outlines how to use the configurator to alter the DECNIS configuration. The *DEC Network Integration Server Configuration and Loading* manual describes how to run the configurator.

- NCL

  You issue Network Control Language (NCL) commands to display information about the DECNIS and to change its configuration. Refer to the NCL documentation and the NCL online help for more detail about NCL.

- DECmcc™

  The Digital Management Control Center (DECmcc) now integrated into the POLYCENTER™ family of products lets you control the DECNIS in the same way as NCL, but it uses a DECwindows interface and provides graphical representations of the status of the system. DECmcc also provides alarm notification and performance monitoring. Refer to the *DECmcc Introduction* for more detail about DECmcc.

- SNMP

  A management station that complies with the SNMP standard (as specified in RFC 1157) can be used to manage the DECNIS, using both Set and Get SNMP requests.

  The DECNIS supports the following MIBs:

  MIB-II (RFC 1213)
  Bridge MIB (RFC 1493)
  FDDI MIB (RFC 1285—draft)
  DEC Vendor MIB elanext V2.7

For more detail about managing the DECNIS, refer to the *DEC Network Integration Server Management* manual.

Glossary

This glossary describes terms that are used throughout the DECNIS documentation. If you cannot find the term you are looking for, it may be described in the *DECnet/OSI Routing Overview*.

AARP

See AppleTalk Address Resolution Protocol.

Access Control List (ACL)

An ACL consists of ACL entries (ACEs) that grant or deny access to a particular system object.

Adaptive Routing

Method of routing that uses the most cost-effective path available.

Address Filtering

In bridging, the process of preventing frames from being forwarded across a bridge, based on the source or destination address of that frame, or both.

Address Resolution Protocol

See ARP.

Addressing Authority

Authority responsible for assigning unique Network layer addresses.

Addressing Domain

Part of Network layer address. Every NSAP address is part of an addressing domain administered directly by one addressing authority.

Adjacency

A single connection to an adjacent node.

Adjacent Node

A node connected to the local node directly. All nodes on an Ethernet are considered adjacent.

Administrative Domain

Collection of end nodes, routers, and subnetworks operated by a single organization or administrative group. This domain can be divided into a number of routing domains.

AFI (Authority and Format Identifier)

An AFI is part of the Initial Domain Part (IDP), which is part of an NSAP address. The AFI specifies different addressing authorities.

Aging Process

The process a bridge uses to purge inactive learned address entries from its forwarding database. If the bridge does not see the address of an entry in the source address of a frame during the aging time, the bridge marks the entry inactive. The bridge removes inactive entries when it next purges the database.

AppleTalk

Apple's PC LAN protocol.

Area

Group of nodes or systems forming a Level 1 routing subdomain. The systems run as an independent subnetwork.

AppleTalk Address Resolution Protocol (AARP)

The protocol that maps AppleTalk node addresses with the address of the underlying datalink.

AppleTalk Echo Protocol (AEP)

The protocol that allows a node to send a packet to any other node within the Internet and to receive an echoed copy in return.

Area Address

The IDP and LOC-AREA fields of the NSAP address combined. A system can have more than one area address, but it must have at least one area address in common with its neighbors.

Area Router

A system that can send and receive packets from one system to another both within its own area and to other areas. Also known as a Level 2 router.

Area Routing

The forwarding of packets from one area to another using Level 2 routers.

ARP (Address Resolution Protocol)

A protocol used on LANs to determine the physical address of a system from its IP address.

AS

See Autonomous System.

Attenuation

The amount of power (or light) that is lost as the light travels from the transmitter through the medium to the receiver. The difference between transmitted and received power. Expressed in decibels (dB).

Attribute

Software variable which is part of an entity. This is the controllable part of the entity, for example, sizes of packets and lengths of timers.

Authority and Format Identifier

See AFI.

Autonomous System (AS)

A collection of hosts and routers that fall within the same administrative domain, for example, one company. An Interior Gateway Protocol (IGP) is used to route within an autonomous system; an Exterior Gateway Protocol (EGP) is used between autonomous systems.

Backbone

The name sometimes given to the Level 2 routers that link together all the areas of a network.

Bandwidth

The range between the highest and lowest frequencies at which signals can pass over the transmission medium.

BCUG (Bilateral Closed User Group)

A Closed User Group (CUG) consisting of two DTEs.

Beacon

A specialized frame used by media access control to announce to other stations that the ring is broken.

Bilateral Closed User Group

See BCUG.

BOOTP

The Bootstrap Protocol as defined by RFC 951. This protocol allows diskless systems to discover their own IP address, the server's address and the load file name.

Bridge

Device that links two LANs together and filters traffic between them.

Broadcast

The ability to send a single message simultaneously to several systems.

Broadcast Addressing

Type of multicast addressing in which all systems receive the same message simultaneously.

Broadcast Circuit

Circuit connecting multiple systems on which a message can be transmitted to multiple receivers.

Buffer

Area of memory used for temporary storage. This compensates for the difference in the rate of data flow, when transmitting from one device to another.

Bypass

The ability of a station to be optically or electronically isolated from the network while maintaining the integrity of the ring.

Call

To make (or attempt to make) a connection with a remote system.

Carrier Sense, Multiple Access with Collision Detect

See CSMA/CD.

CCITT (Comite Consultatif International Téléphonique et Télégraphique)

The CCITT is a United Nations committee that makes recommendations on data communications services.

Channel

The logical path between a DTE and a DCE over which data is transmitted. Each channel is identified by a unique reference number, called a Logical Channel Number (LCN).

Characteristics

Information about a component. This can include attributes defined for the component with NCL commands.

CHDLC

Compatibility HDLC mode for using the DECNIS with the DECbrouter 90. These links are similar to PPP connections.

Child Entity

Subordinate class of entity.

Circuit

Logical path providing connection between adjacent nodes.

Circuit Switching

The dynamic establishment of a physical connection prior to information exchange.

Claim Process

A technique used to determine which station will initialize the FDDI ring.

Clear

To stop a connection across a virtual circuit to a remote DTE by sending clear request packets.

Client System

In general terms, a Client system is a system which uses the services of another system. The other system is referred to as a Server system.

An X.25 Client system is a DECnet system running VAX P.S.I. Access or DEC X.25 for ULTRIX Gateway Client. X.25 Client systems use the services of a Connector system to connect to PSDNs.

CLNS (Connectionless-mode Network Service)

A network service that operates on the datagram model. Each message is routed and delivered to the destination system independent of any other message.

Closed User Group

See CUG.

CMIP (Common Management Information Protocol)

ISO protocol used to exchange network management information.

Comite Consultatif International Téléphonique et Télégraphique

See CCITT.

Common Carrier

An organization in the United States that offers standard and consistent communications services within a country. *See also* Post, Telegraph and Telephone Authority.

Common Management Information Protocol

See CMIP.

Common Trace Facility (CTF)

A diagnostic tool used for examining data generated by the network.

Communications Link

Physical medium connecting two nodes.

Concentrator

An FDDI node that provides attachment points through M-ports for stations that are not connected directly to the dual ring. The concentrator is the focal point of the dual ring of trees topology.

Congestion

When a network or part of a network is overloaded and has insufficient resources for the traffic volume.

Connectionless-mode Network Service

See CLNS.

Connection-mode Network Service

See CONS.

Connector System

A DECnet system with a direct connection to a PSDN which provides an indirect connection to PSDNs for Client systems. These are also referred to as gateway systems.

CONS (Connection-mode Network Service)

Network service that operates according to a connection-oriented model. Before data can be exchanged, a connection must first be established. The OSI term is Connection-Oriented Network Service.

Cost

Value assigned to a circuit between two nodes. Packets are routed on paths of the lowest cost.

Counter Rotating Ring

An arrangement where two FDDI signal paths, whose directions are opposite to each other, exist in a ring topology.

Counters

Performance and error statistics kept for a component by network management. For example, line counters.

CPU

Functional term for the system management processor.

CSMA/CD (Carrier Sense, Multiple Access with Collision Detect)

The Data Link protocol used by Ethernet and ISO 8802-3 LANs. It allows multiple stations to access the broadcast channels at will. Each station awaits an idle channel before transmitting and can detect overlapping transmissions by other stations.

CUG (Closed User Group)

A group of DTEs that can communicate with each other only.

DA

See Dynamic Assignment.

DAC

See Dual Attachment Concentrator.

DAS

See Dual Attachment Station.

Database Sizing

Adjusting the sizes of the various databases used by routing and other DECNIS functions. It allows you to make the best use of the DECNIS memory for a given network configuration.

Data Circuit-terminating Equipment

See DCE.

Data Link

Logical connection between two stations on the same circuit.

Data Link Connection Identifier (DLCI)

The 10-bit address of a frame relay Permanent Virtual Circuit (PVC). Used by the frame relay network to identify PVCs. Each PVC associated with a channel has a unique DLCI within that channel, but DLCIs are not necessarily unique within the frame relay network.

Data Link Layer

Layer of OSI that provides a path between two directly connected systems.

Data Link Mapping (DLM)

The software interface (defined by DNA™) that creates a path between DECnet and X.25 implementations residing in the same node. DLM allows DECnet nodes with an X.25 implementation to route over a PSDN to another DECnet node.

Data Network Identification Code (DNIC)

Usually the first four digits of the DTE Address. The DNIC identifies the country, and distinguishes the PSDN from other PSDNs within the same country.

Data Segments

This is a charging unit for PSDNs. For most PSDNs, a data segment is 64 octets.

Data Terminal Equipment

See DTE.

DCE (Data Circuit-terminating Equipment)

The CCITT X.25 term for the network switching exchange to which DTEs are connected. It provides the following functions:

- Establishing, maintaining and terminating connections between the DTE and the network.
- Signal conversion and coding between the DTE and the network.

Default Route

In IP, a route to be used when no other matching route is found. This is a route with an address of 0.0.0.0.

Designated Bridge

The bridge with the shortest cost path to the root bridge. It connects that LAN with the next LAN closer to the root bridge. Each LAN in an extended network elects one designated bridge.

Designated Router

Router providing routing for end nodes.

DECdns (Digital Distributed Name Service)

Service that provides network applications with a means of assigning unique names to network resources so that a network application can find resources within the network.

DECdts (Digital Distributed Time Service)

Service that provides clock synchronization for local and wide area systems.

DEC LANcontroller 601

A Network Interface Card (NIC) with one Ethernet port.

DEC LANcontroller 602

A Network Interface Card (NIC) with two Ethernet ports.

DECnet

Collective name for the software products that allow various Digital operating systems to be connected to form computer networks. A network is a configuration of two or more independent computer systems linked together to share resources and/or exchange information.

DECnet/OSI

Digital's Phase V implementation of the OSI open networking protocol.

DECnet/OSI Area

Area using DECnet/OSI protocols.

DECnet/OSI End Node

End node capable of transmitting and receiving DECnet/OSI packets.

DECnet/OSI Level 1 Router

Level 1 router capable of routing DECnet/OSI packets.

DECnet/OSI Level 2 Router

Level 2 router capable of routing DECnet/OSI packets.

DECnet Phase IV Area

Area in which all systems and routers are using Phase IV protocols.

DECnet Phase IV End Node

End node capable of transmitting and receiving Phase IV packets only.

DECnet Phase IV Level 1 Router

Level 1 router capable of routing Phase IV packets only.

DECnet Phase IV Level 2 Router

Level 2 router capable of routing Phase IV packets only.

DECNIS FDDIcontroller 621

A Network Interface Card (NIC) with a single-port FDDI interface.

DEC WANcontroller 614

A Network Interface Card (NIC) with four synchronous ports each running at up to 128 kbits/s.

DEC WANcontroller 618

A Network Interface Card (NIC) with eight synchronous ports each running at up to 128 kbits/s.

DEC WANcontroller 622

A Network Interface Card (NIC) with two synchronous ports each running at between 56 kbits/s and 2.048 Mbits/s.

Dial-up Line

Telephone communications circuit set up by dialing. Also called a switched circuit connection.

DDCMP (Digital Data Communications Message Protocol)

A Digital Data Link layer protocol that operates over synchronous or asynchronous communications links.

Digital Distributed Name Service

See DECdns.

Digital Distributed Time Service

See DECdts.

Digital Network Architecture (DNA)

DNA controls all data that travels throughout a Digital network. DNA is a set of protocols governing the format, control, and sequencing of message exchange for all Digital network implementations. DECnet/OSI is based on the fifth version (Phase V) of DNA.

Distance Vector Routing

One of the two widely used types of routing algorithm. Routers exchange reachability information with adjacent routers. DECnet Phase IV and RIP are examples of distance vector routing.

DLCI

See Data Link Connection Identifier.

DLM

See Data Link Mapping.

DNA

See Digital Network Architecture.

DNIC

See Data Network Identification Code.

DNS

See DECdns.

Domain

A collection of end nodes, routers, and subnetworks that all use the same routing procedures and are operated by a single organization, or administrative authority.

Domain Specific Part (DSP)

Part of the Network Service Access Point (NSAP) address defined by the networking authority.

Downline Load

Transferring a copy of a software product image from a load host to a target node.

Downstream

A term that refers to the relative position of two FDDI stations in a ring. A station is downstream of its neighbor if it receives the token after its neighbor receives the token.

DSP

See Domain Specific Part.

DTE (Data Terminal Equipment)

A CCITT term referring to the user's equipment (computer or terminal) connected to a DCE on a PSDN for the purpose of sending and/or receiving data.

DTE Class

A named class of DTEs. DTE Classes are used to determine which DTE to use when making outgoing calls.

DTE Address

A unique destination address given to a DTE.

Dual Attachment Concentrator

A concentrator that offers two connections to the FDDI network capable of accommodating the FDDI dual "counter rotating" ring, and additional ports for connection of other concentrators or FDDI stations.

Dual Attachment Station

An FDDI concentrator that offers two connections to the FDDI dual counter rotating ring.

Dual Homing

A method of cabling FDDI concentrators and stations that permits an alternative or backup path to the dual ring in case the primary connection fails Can be used in a tree or dual ring of trees topology.

Dual Ring of Trees

A topology of FDDI concentrators and nodes that cascade from concentrators on a dual ring.

Dynamic Assignment (DA)

Term for providing routing over X.25 switched circuits. The circuits are created and timed out through usage.

EGP (Exterior Gateway Protocol)

A routing protocol that operates between autonomous systems.

Encapsulated Packet

IP packet used over IPX and AppleTalk WAN links.

Encapsulating Bridge

A proprietary hardware device that encapsulates packets in specialized frames.

End System

System that transmits data packets to and receives data packets from other systems but does not forward data packets from other systems.

Entity

Element in the network that can be managed.

Event

A network or system occurrence that is recorded. Network events inform you of what is happening on the network and where there are any problems.

Event Log

This contains a record of each event generated by the network.

Event Sink

A node designated to receive events.

Event Stream

Entity that collects events.

Executor Node

Node at which an NCL command is executed.

Extended LAN

Two or more LANs connected by bridges. The stations connected to these LANs can communicate with one another as if they were all on the same LAN.

Exterior Gateway Protocol

See EGP.

FCS (Frame Checking Sequence)

A 16-bit error check polynomial that checks that the bit content of a frame is the same before and after transmission.

FDDI

See Fiber Distributed Data Interface.

FDDI Port Type

One of four port types defined for FDDI. They are:

- A — connects to primary in, secondary out
- B — connects to secondary in, primary out
- M — connects a concentrator to a DAS or SAS, or to another concentrator
- S — connects an SAS or an SAC to a concentrator

Fiber Distributed Data Interface

A set of ANSI/ISO standards that define a high-bandwidth (100 Mb/s) general-purpose LAN connection between computers and peripheral equipment in a timed-token passing, dual ring of trees topology.

Fiber-Optic Cable

A transmission medium designed to transmit digital signals in the form of pulses of light.

Filter

A filter is used to control the information that a system can receive. In X.25, a filter can determine which X.25 applications or Client systems receive incoming calls. In IP, a filter can determine which routes an IP router receives; *see also* Route Filtering.

Flag Sequence

A series of ones and zeros that indicate the start and end of a frame.

Flash

Region of DECNIS nonvolatile memory that contains the DECNIS image and (optionally) configuration. This allows the DECNIS to load without the use of a load host.

Flow Control

The mechanism that keeps traffic within limits acceptable by the end receiver or any intermediate receiver. At the terminal level, the flow control mechanism must guarantee that the flow of characters will stop if the buffer fills up.

Frame

A data unit that is used by the link level. It is used to exchange packets, control information, and error information, between the DTE and the DCE. A frame consists of data and a header, and it is delimited by flags.

Frame Checking Sequence

See FCS.

FRMR

A frame used by the DTE or DCE to report an error that cannot be recovered by the retransmission of the identical frame. Only used by LAPB/LAPBE.

Frame Relay

The forwarding of packets using the Frame Relay Bearer Service (FRBS) protocol and interface standards.

Frame Relay Bearer Service (FRBS)

A data service that provides packet-switched data transfer over public and private networks. FRBS protocol and interface standards are developed by the American National Standards Institute (ANSI) T1 S1 committee.

FRBS

See Frame Relay Bearer Service.

Full-Duplex Circuit

A circuit allowing simultaneous two-way independent transmission in both directions.

GAP (Gateway Access Protocol)

Protocol used between a host DNA system and a DNA system that is a DTE on a PSDN. It provides the X.25 gateway access facility to a user on the host.

Gateway

A system or device that allows different vendors' networks to be linked together. In IP, this is a widely used term for router. *See also* Connector system.

Gateway Access Protocol

See GAP.

Graded Index

A characteristic of fiber-optic cable in which the core refractive index is varied so that it is high at the center and matches the refractive index of the cladding at the boundary between the core and the cladding.

Half-Duplex Circuit

A circuit allowing transmission in either direction but only one direction at one time.

Hardware Address

Unique physical address for a node's Ethernet communications controller.

HDLC (High-level Data Link Control)

An ISO Data Link layer protocol that operates over synchronous, switched, or nonswitched communications links.

Header

The control information placed before the data in a frame or a packet. For example, source or destination code, priority, or packet or frame identification.

High-level Data Link Control

See HDLC.

Host Node

Node that provides a service for another node.

ICMP (Internet Control Message Protocol)

The protocol used for various IP error and control messages.

IDI (Initial Domain Identifier)

This is a value allocated under the addressing authority identified by the Authority and Format Identifier (AFI). The IDI is part of the Initial Domain Part (IDP), which is part of an NSAP address.

IDP

See Initial Domain Part.

IGP

See Interior Gateway Protocol.

Index Profile

The refractive index of a fiber-optic cable as a function of its distance from the center of the core.

Initial Domain Identifier

See IDI.

Initial Domain Part (IDP)

Part of an NSAP address. It identifies the administrative domain and consists of an AFI and an IDI.

Integrated IS–IS

An extended version of the OSI routing protocol, IS–IS. This is a link state protocol used for both IP and OSI routing.

Interior Gateway Protocol (IGP)

A routing protocol that operates within an autonomous system.

International Organization for Standardization

See ISO.

Internet

Networks linked by gateways (or routers) that use the TCP/IP protocols. They are sometimes referred to as IP networks. The name "Internet" refers to the Defense Advanced Projects Research Agency (DARPA) internet and the TCP/IP protocols it uses.

Internet Address

Address assigned to nodes within the Internet network.

Internet Control Message Protocol

See ICMP.

Internet Protocol (IP)

See IP.

Internetwork Packet Exchange

See IPX.

IP (Internet Protocol)

The Network layer protocol of the TCP/IP protocol suite, used within Internet networks.

IP Gateway

Same as IP router.

IP Network

Same as Internet.

IP Router

A system that routes IP packets within an internet.

IPX

A connectionless datagram protocol as used by Novell NetWare.

IS–IS

An OSI routing protocol. *See also* Integrated IS–IS.

ISO (International Organization for Standards)

The International Standards Organization has produced recommendations for data communications. The ISO has produced a model called the Open Systems Interconnect (OSI) reference model.

LAN (Local Area Network)

A high-speed data communications network that covers a limited geographical area, such as one building.

LAN/WAN Relay

Communications that allow systems on LANs to communicate over PSDNs without having a direct connection to the PSDN. This usually involves Connection-mode Network Service (CONS).

LAPB (Link Access Protocol Balanced)

An X.25 module that defines the X.25 Level 2 protocol used to exchange frames between a DTE and a DCE. It is a set of procedures used for link control, where the DTE/DCE interface is defined as operating in two-way simultaneous asynchronous response mode (ARM), with the DTE and DCE containing a primary and secondary function.

LAPBE

Extended Level 2 access protocol for X.25. Provides a packet-level window size of 127.

Layer

A software protocol level.

LCI

Logical Channel Indicator. Same as Logical Channel Number.

LCN

See Logical Channel Number.

Learning Process

The process by which a bridge builds and maintains its address database. By "listening" to network traffic the bridge notes the source address of each incoming packet and which port received the packet.

Leased Line

A line for the exclusive use of a leasing customer without interchange switching arrangements. Also called a private line or a dedicated line.

Level 1 Router

A system that can forward packets within its own area.

Level 2 Router

A system that can forward packets both within its own area and to other areas. Also known as an area router.

Line

A physical data path between two systems.

Line Speed

Rate at which data can be transmitted over a line.

Link

A path between two nodes.

Link Access Protocol Balanced

See LAPB.

Link-loss Budget

The total amount of optical loss that can be introduced into an FDDI system (by splicing, for example) without preventing it from working.

Link Service Access Point (LSAP)

A protocol identifier that identifies an OSI Network layer entity. An example of such an entity is an implementation of the Internet protocol.

Link-State Routing Algorithm

One of the two widely used types of routing algorithms. It is based on the shared knowledge of all end systems and intermediate systems. Routers receive reports from each system, detailing the state of the system's links with its immediate neighbors. DECnet/OSI Phase V uses link-state routing.

Live Insertion

When a Network Interface Card is inserted into a running system without interrupting the system's operation.

LLC2

An X.25 module that defines the data link protocol used on Local Area Networks (LANs), conforming to the LLC Type 2 standard. This allows machines on a LAN to communicate with remote nodes over a PSDN.

Load Host

A system which provides MOP services for other systems such as downline loading and upline dumping.

Local Area Network

See LAN.

Local DTE

A DTE on the local node.

Local Node

Node where you are located.

Logical Channel

A logical link between a DTE and its DCE. The physical communications line between a DTE and DCE is divided into a set of logical channels.

Logical Channel Number (LCN)

A unique reference number that identifies a logical channel. A DTE recognizes a virtual circuit by its associated LCN.

LSAP

See Link Service Access Point.

MAC

See Media Access Control.

Maintenance Operation Protocol

See MOP.

Management Protocol

The protocol defined for the circuit between the DECNIS and the frame relay device. For example, LMI/Joint, ANSI T1.617 Annex D. The management protocol carries information between the DECNIS and frame relay device about the state of PVCs in the network.

Manual Routing

Same as static routing.

Martian Address

This is an IP term for an invalid IP destination address.

Media Access Control

The Data Link layer sublayer responsible for scheduling, transmitting, and receiving data on a shared-medium local area network such as FDDI.

Migration Bridges

Bridges manufactured by Digital that can dynamically adapt to either the LAN Bridge 100 Spanning Tree Mode or the IEEE 802.1 Spanning Tree Mode, depending on what the network requires. The LAN Bridge 150 and the DECNIS are migration bridges.

Modem (Modulator–Demodulator)

A device that translates digital signals (electrical impulses) generated by a computer into analog signals (tones) that can be transmitted over telephone lines, and vice versa.

Modem Connect

Name used in DNA for the class of communications links governed by industry standards for modem connection.

MOP (Maintenance Operation Protocol)

The protocol used for low-level communication with a system that is not fully operational, or a system being tested. It is used to perform maintenance functions such as circuit testing, triggering, upline dumping, and downline loading.

MOP Client

A MOP Client on a load host identifies a DECNIS that requires the MOP services of the load host. The MOP services include downline loading to the DECNIS and upline dumping from the DECNIS.

Multiple Area Network

Network divided into areas, each area having a group of nodes.

Multiprotocol Environment

A network in which several protocols are operating.

Name Binding Protocol (NBP)

The AppleTalk transport layer protocol that allows user-defined zones and names to be understood by using a translation table.

Name Service

General term for DECdns which manages system names and objects within the network.

Native System

A system running VAX P.S.I. Native that has direct access to one or more PSDNs.

NBP

See Name Binding Protocol.

NCL (Network Control Language)

NCL is a command line interface that allows you to obtain information about, and manage, a network. NCL replaces the Network Control Program (NCP) used for DECnet Phase IV networks.

NCL Script

An ASCII file of NCL commands.

NetWare RIP

Novell NetWare Routing Information Protocol, which provides the reachability of Novell NetWare routers and end systems.

NetWare SAP

Novell NetWare Service Access Protocol, which provides information about the services available in the Novell NetWare network.

Network

A collection of systems interconnected by lines.

Network Control Language

See NCL.

Network Delay

Time taken for a unit of data to travel from the transmission system to the destination system.

Network Diameter

This is the length of the most direct path between the two furthest systems in a network.

Network Information Frame

Frame sent periodically to a station's downstream neighbor, for use by Station Management.

Network Interface Card (NIC)

Network Interface Cards are the hardware through which the DECNIS connects to LANs and WANs. The type of card used determines the connection type. An example of a Network Interface Card is the DEC LANcontroller 601.

Network Layer

OSI layer that permits communications between network entities in open systems. CONS and CLNS services are provided at this level.

Network Service Access Point

See NSAP.

Network Service Access Point (NSAP) Address

Address of a Network Service Access Point. This is a Phase V address type used in DECnet/OSI networks.

Network Services Protocol

A DECnet proprietary transport protocol.

NIC

See Network Interface Card.

NIF

See Network Information Frame.

Node

In DECnet/OSI, a top-level entity in the management hierarchy of a system. A Phase IV node supports DECnet Phase IV software. A DECnet/OSI node (usually called a system) supports DECnet/OSI.

Node Name

Name associated with a specific node. This could be a name registered in DECdns, or any other alphanumeric name.

NSAP (Network Service Access Point)

The addressable point at which a network service is made available.

NSP

See Network Services Protocol.

Open Shortest Path First

See OSPF.

Open Systems Interconnection

See OSI.

OSI (Open Systems Interconnection)

The OSI reference model is a 7-layer model which incorporates many standards from various organizations. The three CCITT X.25 levels correspond to the lower three layers of OSI.

OSI TP

See OSI Transport.

OSI Transport

OSI layer that transfers data between end systems, and has error recovery and flow control.

OSPF (Open Shortest Path First)

An IP routing protocol. This is a link state interior gateway protocol (IGP).

Packet

Unit of data sent from a source system to a destination system.

Packet Assembler/Disassembler

See PAD.

Packet Size

The amount of user data in a packet.

Packet Switched Data Network

See PSDN.

PAD (Packet Assembler/Disassembler)

A device that allows an asynchronous terminal, such as a VT220™, to access a PSDN. The terminal connects to the PAD and the PAD formats the data sent from the terminal into packets (assembles). Data which is sent to the terminal in packet format is 'disassembled' by the PAD before transmission to the terminal.

Path

The route a packet takes from the source node to the destination node.

Path Cost

The total of the circuit costs for a path.

Path Length

The number of circuits a packet uses to reach the destination.

Path Splitting

Ability to split data over several paths to a single destination node.

Permanent Virtual Circuit

See PVC.

Physical Layer Medium Dependent

FDDI standard that defines the medium and protocols to transfer symbols between PHYs.

Physical Layer Protocol

FDDI standard that defines symbols, line states, clocking requirements, and the encoding of data for transmission.

Physical Level

A protocol level that defines the characteristics of the physical link between the user's equipment and the network. Also known as Level 1.

PING

In IP terms, PING is used as a verb. "To ping" means to send an ICMP Echo Request and wait for an ICMP Echo Reply, to see if a host is working. It is derived from the name of a program called "Packet Internet Groper".

PMD

See Physical Layer Medium Dependent.

Point-to-Point Protocol

A routing protocol that allows systems from different vendors to interoperate.

Post, Telegraph and Telephone Authority (PTT)

A country's national communications provider. The term is used mainly in Europe.

Power Budget

The difference between transmission power and receiver sensitivity, including any safety margins.

Power Penalty

The total loss introduced by planned-for splices in the fiber-optic link.

PPP

See Point-to-Point Protocol.

Protocol

An agreed set of rules governing the operation of a communications link.

Protocol Filtering

In bridging, the process of preventing a frame from being forwarded across a bridge, based on the protocol type used by that frame.

Proxy ARP

ARP is normally used for LAN communications. Proxy ARP is a process in which a "proxy router" answers ARP requests for a system that is not on the LAN. The proxy router supplies its own physical address to the source system, and forwards any packets to the destination system. By using proxy ARP, a site can use a single Internet network address (without subnets) over more than one physical network.

PSDN (Packet Switched Data Network)

These are both public and private networks that use the CCITT X.25 protocol to route X.25 packets. For public networks, it also means the set of equipment and interconnecting links that provide a public packet switching service to subscribers within a particular country.

PVC (Permanent Virtual Circuit)

A permanent logical association between two DTEs which is analogous to a leased line. Transmission of packets on a PVC needs no call set up or call clearing by the DTE. Packets are routed directly by the network from one DTE to the other.

Reachable Address

This defines the address of a system or set of systems that can be reached over a circuit. A reachable address is manually assigned as opposed to dynamically assigned. It is used by DECnet/OSI routers to reach third-party and DECnet Phase IV addresses.

Remote DTE

Any DTE in a network other than the one at which the user is located.

Remote Node

Any node in the network, other than the local node.

RIP (Routing Information Protocol)

An Interior Gateway Protocol (IGP) which assumes that the same subnet mask is used throughout the network. RIP is used by small IP networks.

Root Bridge

The root bridge initiates Hello messages that propagate to other bridges in the extended LAN. Each spanning tree has a unique root bridge. The root bridge for the spanning tree is the bridge with the lowest bridge ID.

Route Filtering

In IP routing, this process allows you to control which routes the DECNIS inserts into its routing database. For example, the DECNIS might be set up to accept only RIP routes with the address 24.45.21.0.

Route Propagation

In IP routing, this process allows the DECNIS to advertise a route learnt from one IP protocol in another IP protocol. This allows systems running different IP protocols to communicate. For example, a DECNIS might propagate a RIP route into IS–IS. This would allow the IS–IS system to reach the RIP system.

Router

A system that can send and receive data, and forward data to other systems. In OSI terminology, routers are called intermediate systems.

Routing

Network function that determines the path used by data to reach the destination system.

Routing Information Protocol

See RIP.

Routing Table

A table on each AppleTalk router that holds information about the topology of the network.

Routing Table Maintenance Protocol (RTMP)

The AppleTalk protocol used to establish and maintain routing information for the routing tables. RTMP allows dynamic updates to the routing tables as network changes occur.

Routing Vector Algorithm

This is the Phase IV routing algorithm. It is based on the shared knowledge of the network. Each router reports a vector of costs and hops involved in reaching all nodes in the area, to other routers.

RPF (Route Propagation and Filtering)

See the separate descriptions of Route Propagation and Route Filtering.

RTMP

See Routing Table Maintenance Protocol.

SAC

See Single Attachment Concentrator.

SAS

See Single Attachment Station.

Security Filter

An entity which defines an Access Control List (ACL). This controls which remote DTEs can access a filter.

Seed Router

An AppleTalk router that transmits information about the network to other routers.

Server

In general terms, a server is a system which provides services for other systems. It usually refers to a system which provides a service to a Client system. A typical Client–Server relationship is a VAX P.S.I. Access system using a DECNIS to connect to a PSDN.

Server Client

Server clients on a DECNIS identify Client systems that use the DECNIS as a Connector system. Each server client has one or more incoming call filters which ensure that incoming calls are passed to the correct Client systems.

Session Control

DNA module used for process-to-process communications, name-to-address mapping, and protocol selection.

SIF

See Station Information Frame.

Simple Network Management Protocol

See SNMP.

Single Attachment Concentrator

A concentrator that offers one S-port for attachment to the FDDI network, and M-ports for the attachment of stations or other concentrators.

Single Attachment Station

A concentrator that offers one S-port for attachment to the FDDI ring.

Sink Node

The system at which events are logged.

Slot

A single module space on the hardware unit, into which a Network Interface Card is inserted.

SMT

See Station Management.

SNMP (Simple Network Management Protocol)

Network management protocol for IP networks and bridging.

Spanning Tree

The logical arrangement created by bridges in an extended LAN in which all LANs are connected and there are no loops (that is, there is only one path between any two bridges).

Spanning Tree Algorithm

An algorithm used by bridges to ensure that the extended LAN is configured as a spanning tree.

Static Routing

Routing that uses information that has been manually configured, for example Reachable Addresses.

Station

An addressable node on an FDDI ring capable of transmitting, receiving, and repeating data. A station has one instance of SMT, at least one instance of PHY and PMD, and an optional MAC entity.

Station Information Frame

Frame used by FDDI stations to exchange more detailed information for use by Station Management.

Station Management

The entity within a station on the FDDI ring that monitors station activity and exercises overall control of station activity.

Step Index

A characteristic of fiber-optic cable in which the refractive index of the core material is uniform. A sudden change (or step) of the refractive index exists at the boundary between the core and the cladding.

Stuck Beacon

The condition where a station is locked into sending continuous beacon frames.

Subnetwork

Collection of nodes forming a self-contained unit within the network.

SVC (Switched Virtual Circuit)

Temporary logical association between two DTEs connected to a PSDN and analogous to a dial-up line. An SVC is set up only when there is data to transmit and is cleared when the data transfer is complete.

Switched Virtual Circuit

See SVC.

Symbol

The smallest signaling element used by the MAC sublayer. The symbol set consists of sixteen data symbols and sixteen nondata symbols. Each symbol corresponds to a specific sequence of code bits (code group) to be transmitted by the Physical layer.

System

The DECnet/OSI Phase V term for a basic information-processing unit that is directly connected to a network: a single, addressable unit, such as a computer, workstation, or peripheral device. The Phase IV term is node.

Target Token Rotation Time (TTRT)

The value used by the MAC receiver to time the operations of the MAC layer. The TTRT value varies, depending on whether or not the ring is operational.

TCP (Transmission Control Protocol)

The Internet Transport-level protocol.

TCP/IP

This is the name often used to refer to the full Internet protocol suite, as defined by the U.S. Department of Defense. TCP and IP are the basic Internet protocols.

Template

This defines the default values for the call parameters of outgoing X.25 calls.

TFTP

The Trivial File Transfer Protocol used to transfer files as described by RFC 783. This is linked to BOOTP.

Timed–Token Protocol

The rules defining how the target token rotation time is set, the length of time a station can hold the token, and how the ring is initialized.

Trace

A diagnostic process that an FDDI network uses to recover from a stuck-beacon condition. The fault is localized to the MAC entity and its upstream neighbor MAC.

Traffic

Measure of data flow through a network.

Translating Bridge

A nonproprietary MAC layer device used to connect similar and dissimilar LANs according to 802.1d rules.

Transmission Control Protocol

See TCP.

Transport Layer

The layer used for end-to-end data transfer.

Trivial File Transfer Protocol

See TFTP.

TTRT

See Target Token Rotation Time.

Tunnel Circuit

Tunnel circuits are virtual circuits, they are not associated with a physical line, but only with a destination IP address, or addresses.

UI Frames

Unsequenced Information frames sent over HDLC circuits; the service acts in a transparent mode. For example, MOP messages.

Upline Dump

Transferring a copy of a memory image from a target system to a sink node.

Upstream

A term that refers to the relative position of two stations in an FDDI ring. A station is upstream of its neighbor if it receives the token before its neighbor receives the token.

VCP (Vitalink Communications Protocol)

The protocol that allows you to connect the DECNIS to Vitalink systems.

WAN (Wide Area Network)

A data communications network that covers a wide geographical area, such as a country.

Wide Area Network

See WAN.

Window Size

The maximum number of packets that are allowed to be transmitted without an acknowledgment.

X.121

CCITT recommendation that defines the format of a DTE address.

X.25

CCITT recommendation that defines the interface between Data Terminal Equipment and Data Circuit-terminating Equipment for equipment operating in packet mode on public data networks.

X.25 Network

Same as Packet Switched Data Network (PSDN).

X.25 Relay

This is an X.25 function that allows Digital and non-Digital systems to communicate over LANs and WANs.

X.75

CCITT recommendation that specifies procedures for communication between two PSDNs.

X25 Access

An X.25 module that defines the interface between X25 Protocol and applications.

X25 Client

An X.25 module that defines how a Client system operates.

X25 Client System

See Client system.

X25 Protocol

An X.25 module that defines the X.25 Level 3 protocol that is used to exchange packets between a DTE and a DCE. It defines the DTEs, PVCs, and Closed User Groups recognized by an X.25 system.

X25 Server

An X.25 module that defines how a Connector system communicates with a Client system.

X25 Server Client

Same as Server Client.

ZIP

AppleTalk Zone Information Protocol (ZIP), which provides mapping between AppleTalk networks and zones.

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