hp e3000 business servers

X.25 iX network link and SNA/X.25 link/iX

provides connectivity for high-performace remote communication and standardization of multi-vendor communications

36939B or 36939C—X.25 iX Network Link and SNA/X.25 Link/iX

X.25 iX network link

The X.25 iX network link is a high-performance networking solution that provides connectivity to public and private X.25 packet switching networks for HP e3000 A/N-Class or Series 900 computers.

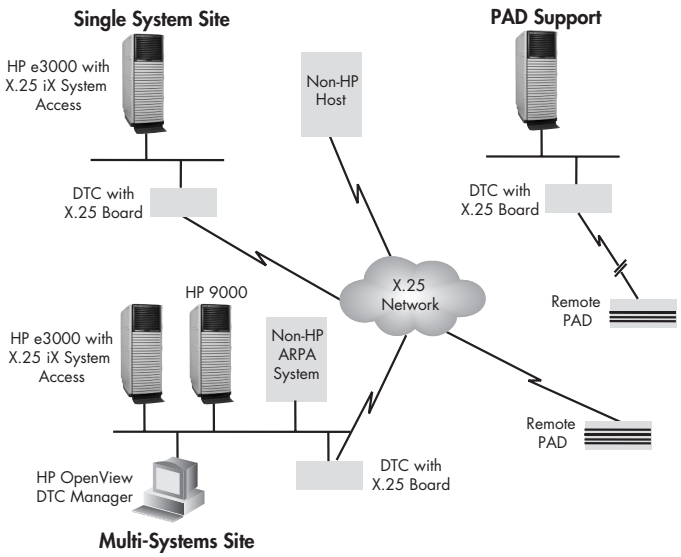
The X.25 iX Network Link functions with the Datacommunications and Terminal Controller (DTC) to provide customers with high-performance remote communications. The X.25/iX Network Link offers a range of line speeds and connections depending on the DTC. The DTC16/X.25 iX Network Link provides a solution for customers with less extensive communications needs.

Note: DTC16 and 48 have been discontinued.

The same DTC being used for X.25 and PAD functionality can also be used for multivendor, multisystem terminal server connectivity, providing customers with an integrated communications solution. (Please refer to the "Datacommunications and Terminal Controller" data sheets for more information.)

The X.25 iX Network Link offloads protocol processing from the HP e3000 A-/N-Class or Series 900 host to an optimized DTC/X.25 Network Access card (in the DTC). This LAN-Based design allows multiple Series 900 host to share the same X.25 line, making cost-effective use of the X.25 network subscription.

A single operator can manage X.25 connections through the use of a PC-based HP OpenView Windows Workstation. HP OpenView Windows provides an easy-to-use advanced graphics user interface that simplifies the management of multiple DTCs.



features

Extensive host-to-host communications:

- Full support of NS Services (36920B) and Internet/ARPA Services for communications to remote computers across public and private X.25 Networks.
- SNA connectivity for HP e3000-to- IBM communications with SNA/X.25 Link/iX, a software product that enables HP SNA Services to be supported over an X.25 network.
- Programmatic access to X.25 level 3 and TCP level 4 for program development of special applications such as HP to non-HP communications.
- Packet routing and gateway capabilities to IEEE 802.3 or point-to-point subnetworks, achieving higher network transparency.

Cost-effective terminal-to-host communications:

- Cost-effective solution for remote PAD terminal and printer access to HP e3000 A-/N-Class or Series 900 computers.
- Support of character mode and VPLUS block mode applications.

In addition to providing PAD terminal access to the HP e3000 A-/N-Class or Series 900 computers, the X.25 Network Access card provides PAD terminal access to HP e3000 MPE V systems (with Telnet), or non-HP systems (with Telnet). The incoming PAD call is processed in the DTC.

Depending on the designated system, the DTC will either send out an optimized LAN packet to the HP e3000 A-/N-Class or Series 900, or will send out a Telnet package to the HP e3000 MPE V, HP 9000, or non-HP system.

additional features and benefits

- Open systems Interconnect (OSI) layered architecture.
- Standard CCITT 1980 and 1984 version of X.25 and 1980 and 1984 versions of X.3/X.28/X.29, and Defense Advanced Research Projects Agency (DARPA) TCP/IP protocols.
- Compliance with Defense Data Network (DDN) specifications.
- High system connectivity with up to 11 X.25 Network Interfaces (NI) and 2048 virtual circuits per HP 3000 Series 900 host.
- 32 A-/N-Class or Series 900 hosts can share one DTC/X.25 and PAD protocol processing on the DTC. In addition, multiple cards (either in the same DTC multiple DTC) are supported for a single IP address for higher throughput and redundancy.
- Up to 60 X.25 iX Network Links can be managed by a single HP OpenView Windows Workstation.

Note: The DTC cannot support both a X.25 Network Access card and an HP ARPA Telnet Access Card. Please refer to the "HP ARPA Services/iX" data sheets for more information.

- Easy-to-use graphical user interface, based on HP OpenView Windows (32048A) for DTC management, providing better efficiency for network operators.
- PAD terminal and X.25 host access security.

components

The X.25 iX Link for HP e3000 A-/N-Class or Series 900 computers is a networking solution based on the multivendor Datacommunications and Terminal Controller hardware and software.

It includes:

- DTC/X.25 Network Access
- X.25 iX System Access
- HP OpenView DTC Manager

DTC/X.25 Network Access card resides in the DTC (DTC16 or DTC72MX), and is used to process the X.25 protocols. The necessary software is downloaded to the DTC across the IEEE 802.3 Local Area Network from the HP OpenView DTC Manager, which controls the entire DTC from an HP OpenView Windows Workstation.

DTC/X.25 Networking Access card allows connections to be established with HP e3000 A-/N-Class or Series 900 hosts across the IEEE 802.3 LAN, using HP optimized protocols for maximum efficiency. In this way, it provides cost-effective HP e3000 host access to remote X.3/X.28/X.29 PAD users. When used in conjunction with X.25 iX System Access and NS Services or FTP, it features extensive host-to-host communications across X.25 public and private packet-switching networks.

functional description of DTC/X.25 network access card

DTC/X.25 Network Access card is a high-performance VLSI card that implements 1980 and 1984 CCITT X.25 protocols at levels 1,2,and 3, as well as 1980 CCITT X.3/X.28/X.29 PAD protocols.

The DTC is a modular device that can accommodate both asynchronous and X.25 connections. The DTC16 accommodates one DTC16/X.25 Network Access card. This same DTC16 can also accommodate up to two asynchronous connector cards, which allow local and remote asynchronous connections for terminals and printers.

The DTC72MX can accommodate up to three DTC/X.25 Network Access cards. This same DTC can also accommodate several asynchronous connector cards, which allow local and remote asynchronous connections for terminals and printers.

In a configuration without X.25 iX System Access, the DTC/X.25 Network Access allows remote X.3/X.28/X.29 PAD terminals and printers to exchange data with any HP e3000 computer on the LAN, as configured by the HP OpenView DTC Manager. Consequently, remote PAD users can have direct logon access to any HP e3000 A-/N-Class or

Series 900 host. Access can be either direct, to a single host, or user-selectable to any host on the LAN, through the DTC user interface.

Connectivity of remote X.3/X.28/X.29 PAD terminals to DTC/X.25 Network Access can be restricted using PAD access lists. These lists are configured by the HP OpenView DTC Manager, and restrict user access to a predefined list of HP e3000 hosts, based on the calling X.25 address. Security on remote X.25 host access is implemented with the Local User Group utility, which filters incoming and outgoing calls based on the calling and called X.25 address, respectively.

DTC72MX X.25 network access specifications

- Up to 32 local HP e3000 A-/N-Class or Series 900 hosts supported per DTC/X.25 Network Access card.
- Up to three DTC/X.25 Network Access cards supported per DTC.
- Each DTC/X.25 Network Access card is able to support up to 256 Switched or Permanent Virtual Circuits (VC). Each card can support the following:
  - 256 VCs for packet sizes up to 512
  - 150 VCs for packet sizes up to 1024
  - 100 VCs for packet sizes up to 2048
  - 54 VCs for packet sizes up to 4096
- The DTC16/X.25 Network Access card supports signaling rates up to 19.2 Kbps.
- The DTC72MX Network Access cards support signaling rates up to 64 Kbps.
- Two type of boards are available for the DTC72MX: one with RS-232C interface supporting 19.2 kbps, the other with V.35 interface supporting 64 Kbps.
- CCITT 1980 and 1984 X.25 and compliant with CCITT 1980 and 1984 X.3/X.28/X.29 PAD Protocols.
- Compliance with standard Defense Data Network (DDN) specifications.
- Acceptance of all 1984 X.25 user and DTE facilities for host-to-host connections for processing at the same the NS X.25/iX level.
- Closed User Groups (CCITT 1980) supported with PAD access.
  - X.25 level 3 parameters:
  - Modulo 8 sequence numbering
  - Window sizes: 1-7
  - Throughput classes: 7-12 (speeds up to 64 Kbps)
  - D-Bit and Q-bit
  - Switched Virtual Circuits for X.25 packet level 3 applications only
  - Packet sizes 32-4096.
- LAP-B 2 parameters:
  - Modulo 8 or 128 frame sequence numbering
  - Window sizes: 1-7
  - Frame sizes as required by level 3.
- PAD Parameters-supported packet sizes of 128, 256, and 512.
- PAD support for HP e3000 A-/N-Class or Series 900 systems connected to the same LAN as the DTC (no back to back).
- PAD support for HP e3000 MPE V, HP 9000, and non-HP systems (through DTC Extended switching and Telnet protocol).
- Physical interfaces: RS-232-C, RS-422, RS-423, V.35, V.36

DTC16/X.25 network access specifications

- Up to 32 local HP e3000 A-/N-Class or Series 900 hosts supported per DTC/X.25 Network Access card.
- One DTC/X.25 Network Access card supported per DTC16.
- Each DTC/X.25 Network Access card is able to support up to 32 Switched or Permanent Virtual Circuits (VC).
- CCITT 1980 and 1984 X.25 and compliant with CCITT 1980 and 1984 X.l3/X.28/X.29 PAD Protocols.
- Compliance with standard Defense Data Network (DDN) specifications.
- Acceptance of 1984 x.25 User and DTC facilities for processing at the NS X.25/iX level.
- Closed User Groups (CCITT 1980) supported with PAD access.
  - X.25 level 3 Partners:
  - Modulo 8 sequence numbering
  - Window sizes: 1-7
  - Throughput classes: 7-12 (speeds up to 19.2 Kbps)
  - D-Bit and Q-bit
  - Packet sizes 32-4096.
- LAP-B level 2 parameters:
  - Modulo 8 or 128 frame sequence numbering
  - Window sizes: 1-7
  - Frame sizes as required by level 3.
- PAD support for HP e3000 A-/N-Class or Series 900 systems connected to the DTC. (PAD functions are not supported for other systems connected to the DTC in back-to-back configurations).
- Physical interfaces: RS-232-C

functional description of X.25 iX system access

X.25 iX System Access is a software product that resides on the HP e3000 A-/N-Class or Series 900 computer. It implements Defense Advanced Research Projects Agency (DARPA) TCP/IP at layers 3 and 4 of the OSI reference model, and interconnects with X.25 Network Access software across the IEEE 802.3 Local Area Network (LAN). Note that X.25 iX System Access is not an X.25 protocol implementation, but simply provides an X.25 addressing and facility interface between the HP e3000 A-/N-Class or Series 900 computer and the DTC.

An HP e3000 A-/N-Class or Series 900 host defines a Network Interface (NI) for each DTC/X.25 Network Access card it uses. Each NI can support up to 11 DTC/X.25 Network Access cards, and up to 11 such NIs can be configured on the same host.

certified X.25 packet switched networks

The following public Packet Switched Networks (PSNs) have certified the X.25 iX Network Link. This list is current as of February 1993. Please consult your HP sales representative for an updated list of certified PSNs.

Country	Network
Austria	Datex-P
Belgium	DCS
Brazil	Renpac*
Finland	Datapak
France	Transpec
Germany	Datex-P
Hong Kong	Intelpak
Italy	Itapac
Luxembourg	Luxpac
Netherlands	Datanet1
Norway	Datapak
Spain	Iberpac*
Sweden	Datapak
Switzerland	Telepac
United Kingdom	PSS*
U.S.A.	Telenet
U.S.A.	Tymnet
U.S.A.	DDN

** In process.*

When used with the NS3000/iX Network Services (36920B) and HP ARPA FTP Service (36957A), X.25 iX System Access features host-to-host communications with remote computers. Furthermore, connections originating from other HP e3000 computers on the same IEEE 802.3 LAN or from an NS point-to-point network can be transparently routed to the X.25 network via the IP layer 3 internet protocol.

The X.25 iX System Access product provides programmatic access to packet level 3 to allow sophisticated users to develop their own protocols and services for communications with remote HP or non-HP computers.

recommended networking devices

The following devices are fully certified and tested for operation with the X.25/iX Network Link. Both devices can also be managed from the DTC Management OpenView workstation with the HP OpenView SwitchPad Manager application.

- HP Model 45 Plus: X.25 Multiprotocol switch. This product features traffic concentration in multilinks and multiprotocol environments (SNA, X.25, and Async).
- HP 2355A: X.25 PAD/Statistical multiplexer. This product allows connection of remote asynchronous terminals and printers to a control computer via an X.25 Link.

For detailed information on these products, refer to the individual product data sheets.

documentation

Included with the X.25 iX System Access product (36939C for A-/N-Class or 36939B for Series 900):

- 36920-61005—NetIPC 3000/iX Programmer's Guide Reference Manual

Additional orderable manuals:

- 36922-61005—NS3000/iX Operations and Maintenance Reference Manuals
- 32022-61005—Using the Node Management Services Utilities
- 36922-90040—NS3000/iX NMMGR Screens Reference Manual
- 36923-61000—NS3000/iX Error Message Reference Manual

installation and configuration support policy

The customer is responsible for loading the X.25 iX Network Link onto the system. Hewlett-Packard will provide installation of the Datacommunications and Terminal Controller (DTC), the DTC/X.25 Network Access cards, and the HP OpenView DTC Manager (if PC-based Network Management) and will perform minimum configuration of X.25 iX Network Link in order to verify minimum functionality. These activities are included in the product purchase price. For product configuration tailored to the customer's specific needs, or for a complete HP implementation, HP offers a comprehensive range of integrated and flexible support services. Please refer to the Network Support data sheets for more information on these services.

pre-installation customer responsibility

The customer is responsible for the following:

- Providing HP with the information necessary to complete the Network Implementation and Support Plan (NISP), including:
  - system configurations
  - logical network map identifying relevant traffic flow
  - physical network map identifying relevant network hardware components
- Installing and verifying the communications line between the DTC and the X.25 network
- Completing all tasks related to the DTC TIO installation
- When necessary, subscribing to the appropriate administration for access to the public PSN

- Updating the HP e3000 system to the proper release level and installing the X.25 iX Network Link system software using AUTOINST, if HP 36939B (for Series 900) and HP 36939C (for A-/N-Class) X.25 iX System Access is purchased. Refer to the "HP e3000 MPE/iX Installation and Update Manual".
- Verifying that all of the necessary software modules have been successfully installed
- Performing a full system backup

hp responsibility

Following the installation of the X.25 iX System Access (36939C or 36939B) software, if purchased, HP is responsible for performing the following tasks for the various components of the X.25 iX Network Link. To install the DTC, HP is responsible for the following:

- Attaching the communication line from the X.25 network to the DTC/X.25 Network Access card
- Configuring the DTC/X.25 Network Access card via the OpenView DTC Manager or NMMGR
- Verifying that the DTC/Network Access card properly operates

To install add-on DTC/X.25 Network Access cards, HP is responsible for the following:

- Inserting the add-on card in the DTC and performing the self-test
- Attaching the communication line from the X.25 network to the add-on card
- Configuring the DTC/X.25 Network Access card via the OpenView DTC Manager of NMMGR.
- Verifying that the DTC/Network Access card properly operates

To install the HP 36939C or 36939B X.25 iX System Access for system-to-system communication, HP is responsible for the following:

- Confirming that all the necessary software modules for the X.25 iX System Access software have been installed and are at the correct version level
- Configuring the S.25 Link on the HP e3000 using the customer-supplied values and cross-validating the DTC-related configuration with the system configuration
- Verifying the X.25 Link between the HP e3000 and the X.25 network properly operates

post-installation customer responsibility

After HP has completed its installation responsibilities, the customer is responsible for fully integrating the new installation to the existing customer network.

DTC X.25 management specifications

X.25 Management Product	**NMMGR Utility**	**HP OpenView DTC Manager**
Platform	HP e3000 A-/N-Class or 900 systems	PCs
User Interface	ASCII (VPLUS)	Graphical (OpenView and MS-Windows)
Configuration Management		
Configuration X.25 levels 2-3	Yes	Yes
Configuration X.25 system switching	No	Yes*
Configuration X.25 PAD access and security	Yes	Yes*
Start/Stop X.25 card (and upload databases)	Yes	Yes
X.25/Padsup autorestart	Yes	Yes
X.25/Padsup profiles	Yes	Yes
Fault Management		
Reset X.25 card and X.25 LCI	Yes	Yes
Upload X.25	Yes	Yes
Self Test X.25 card and loopback	Yes	Yes
X.25 tracing and logging	Yes	Yes
X.25 site management	No	Yes

** Indicates parameters can be modified online.*

product requirements

Refer to HPSL database for the supported DTC and Operating System releases.

SNA/X.25 Link/iX

SNA/X.25 Link/iX allows standardization on a single X.25 backbone network for multivendor communications, specifically, HP e3000-to-HP e3000 and HP e3000-to-IBM communications.

SNA/X.25 Link/iX is a software product that enables HP SNA Services to be supported over an X.25 network. The HP e3000 A-/N-Class or Series 900 system running SNA/X.25 Link/iX communicates with IBM system via an HP Model 45 Plus Multiprotocol X.25 Switch as a host PAD or via IBM X.25 NCP Packet Switching Interface (NPSI). SNA/X.25 Link/iX allows communications between an HP e3000 and an IBM system to occur simultaneously with NS traffic to another HP e3000 over a single X.25 link.

SNA/X.25 Link/iX requires the installation and use of the X.25/iX Network Link hardware and software components. X.25/iX Network Link provides access to public or private X.25 packet-switching networks.

functional description

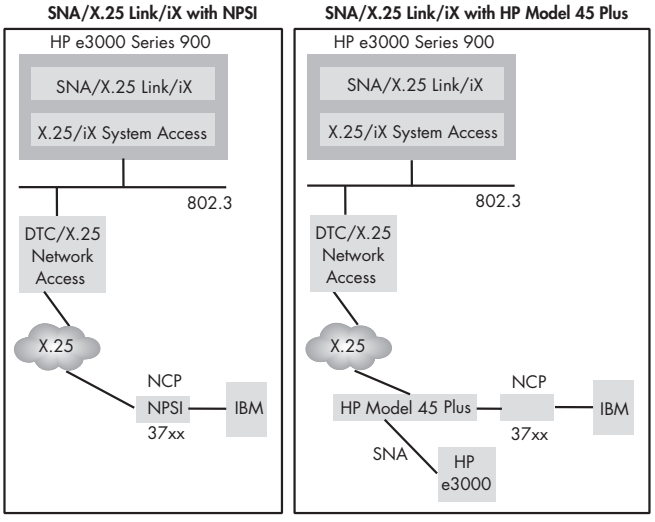
SNA/X.25 Link/iX allows an HP e3000 A-/N-Class or Series 900 computer to communicate to an IBM system over a public or private X.25 network. SNA/X.25 Link/iX is a pseudo-link product that supports a link-level protocol (QLLC) but does not actually control the hardware. The true link level product that operates in conjunction with SNA/X.25 Link/iX is the X.25/iX Network Link.

SNA/X.25 Link/iX supports the Qualified Logical Link Control (QLLC) protocol. QLLC is a special protocol developed by IBM to resolve the differences between SDLC and X.25. It uses qualified X.25 packets to send link control messages in a format similar to SDLC link control messages.

SNA/X.25 Link/iX enables the HP SNA Services (LU 6.2 API, SNADS/iX, NRJE, IMF, DHCF) running on an HP e3000 to communicate with an IBM system through an IBM 37xx communications controller running NPSI. Alternatively, an HP Model 45 Plus Multiprotocol X.25 Switching Node can be used as an SNA/SDLC PAD, eliminating the need for NPSI.

SNA/X.25 Link/iX supports the simultaneous operation of two or more SNA services. With an SNA service, SNA/X.25 Link/iX allows the HP e3000 to appear as a Node Type 2.0 device. SNA/X.25 Link/iX does not support Node Type 2.1. Depending upon the SNA service, SNA/X.25 Link/iX can support several logical unit types that include LU 1, LU 2, LU 3, and LU 6.2.

SNA/X.25 Link/iX encapsulates SNA data inside X.25 packets on the HP e3000. These packets are sent to the X.25/iX Network Link to access the X.25 network. The destination IBM communications controller or the HP Model 45 Plus removes the X.25 packet information, and the original SNA data is sent to the IBM host.



features and benefits

With SNA/X.25 Link/iX, network costs are reduced and management and control of the network is simplified with the following features:

- A single link is shared by both NS and SNA services.
- An HP e3000 A-/N-Class or Series 900 system accesses multiple hosts with one card, one access line, and one X.25 connection.
- All HP SNA Services (LU 6.2 API/iX, NRJE/iX, IMF/iX, SNADS/iX, DHCF/iX) are supported.
- Connections may be established via permanent virtual circuits (PVC) or switched (incoming and outgoing) virtual circuits (SVC).
- Error codes, tracing records, and logging records are provided to facilitate troubleshooting and diagnosis of problems.
- Packet sizes of 4096 bytes are supported at a maximum line speed of 64 Kbps.
- Configuration is consistent with HP network products—via NMMGR.

product requirements

hp hardware and software requirements

- An HP e3000 A-/N-Class running MPE/iX 7.0 or Series 900 computer system running MPE/iX Release 5.5 Express 7 or later, or MPE/iX Release 6.0 Express 1 or later.
- The X.25/iX Network Link hardware and software components.
- An HP Model 45 Plus Multiprotocol X.25 Switch or IBM NPSI.
- A block mode terminal supported by VPLUS for Node Management configuration.
- One or more HP SNA services (LU 6.2 API, NRJE, IMF, SNADS/iX, DHCF)

host hardware and software requirements

- An IBM System/370 compatible host (i.e., Model 370, 308x, 43xx) with an IBM 37xx communications controller. The following software must be running on the host and communications controller:
  - MVS/SP, MVS/XA, MVS/ESA, VSE or VM
  - ACF/NCP Network Control Program
  - ACF/VTAM Telecommunications Access Method
- NPSI NCP Packet Switching Interface (Version 2 Release 1 or later for the IBM 3725, and Version 3 or later for the IBM 3745) or an HP Model 45 Plus Multiprotocol X.25 Switch

installation and configuration policy

The customer is responsible for loading the SNA/X.25 Link/iX software onto the system.

Hewlett-Packard will perform minimum configuration of SNA/X.25 Link/iX in order to verify minimum product functionality. This activity is included in the product purchase price.

customer responsibility

Prior to having HP personnel Onsite to perform minimum configuration of SNA/X.25 Link/iX, the customer is responsible for the following:

- Providing HP with the information necessary to complete the Network Implementation and Support Plan (NISP) including:
  - system configurations
  - logical network map identifying relevant traffic flow
  - physical network map identifying relevant network hardware components.
- Verifying that the necessary host mainframe software is installed and configured to support SNA/X.25 Link/iX.

The customer should contact their HP Sales Representative for typical host parameter values or consult the "HP SNA Products Remote System Configuration Guide" (J2220-61025) for details.

- Verifying that the DTC/X.25 Network Access option (2340A #310, 2345A #3XX, 2343D, 2346D, 2346E, J2070A #1CX, J2070A #ICW, or J2079A) is installed, configured, and verified to include accommodation for the installation of SNA/X.25 Link/iX.
- Verifying that the X.25/iX System Access product (36939B) is installed, configured, and validated for proper operation prior to the installation of SNA/X.25 Link/iX.
- Updating the HP e3000 system to the proper release level and installing the SNA/X.25 Link/iX software using AUTOINST. Refer to the HP e3000 Installation and Update Manual (36123-90001).
- Verifying that all of the necessary software modules have been successfully installed by AUTOINST and are at the correct version levels using the NMMAINT.PUB.SYS utility.
- Performing full system backups as necessary, and ensuring that the HP e3000 system and personnel with HP e3000 system management knowledge are available when HP is Onsite to complete the installation/minimum configuration of SNA/X.25 Link/iX.

The customer is also responsible for completing the configuration in order to fully integrate SNA/X.25 Link/iX into the existing customer network after HP has completed the minimum configuration of SNA/X.25 Link/iX.

hp responsibility

Following the installation of SNA/X.25 Link/iX, HP is responsible for the following:

- Confirming that all of the necessary software modules have been installed and are at the correct version level.
- Configuring the SNA/X.25 Link/iX product to a minimum configuration (1 PU and 1 LU) necessary to verify software and hardware functionality.
- Verifying the SNA/X.25 Link/iX configuration by issuing the SNACONTROL STATUS command and ensuring that the PU activates when the SNA/X.25 Link/iX subsystem is started.

These steps complete HP's portion of the installation and minimum configuration of SNA/X.25 Link/iX.

additional implementation assistance

For implementation needs that go beyond installation, the customer can either provide self-support or can purchase additional services from HP. These services include Network Startup and HP ConsultLine. In addition, the customer can also purchase service from HP on a time-and-materials basis.

Network Startup includes implementation scheduling and coordination assistance, network configuration and verification testing, and network documentation.

documentation

- 30291-61000—SNA Link/iX Node Manager's Guide
- J2220-61025—HP SNA Products Remote System Configuration Guide

ordering information

Ordering the DTC X.25 Network Access Card for DTC72MX:

- J2070A opt. 1CW—X.25 Network Access with RS-232-C interface when ordered with DTC72MX
- J2079A opt. 1CW—X.25 Network Access with RS-232-C interface when ordered as add-on card
- J2070A opt. 1CX—X.25 Network Access with V.35 interface when ordered with a DTC72MX
- D2355A—DTC Manager application software for an HP OpenView Windows (PC) workstation
- D1824F opt. 201—Update of an existing HP OpenView Windows Workstation with the latest revision of software and DTC manager application.

Ordering the X.25/iX System Access:

- 36939C (for A-/N-Class) or 36939B (for Series 900) X.25/iX System Access (includes SNA Services)
- 310—Tier 1 License (also applies to 315, 320 Tier 2, 3 systems)
- 330—Tier 4 License (also applies to 335 Tier 5 systems)
- 340—Tier 6 License (also applies to 350 Tier 7 systems)
- 0CD—Upgrade credit Tier 1
- 0CF—Upgrade credit Tier 4

In order to receive the upgrade credit, customers must select the upgrade credit option that pertains to their current processor/tier-based option in addition to the new tier-based option on the same order.

Customers must also order the MPE media product (51453B) on MPE/iX 5.5 Express 7 or later, or MPE/iX 6.0 Express 1 or later. This is required to receive software for this product.

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for more information on hp e3000 business servers, contact any of our worldwide sales offices or hp channel partners (in the u.s. 1-800-637-7740) or visit our hp e3000 business servers website at www.hp.com/go/e3000

invent