

Subchapter 4.2—Datacommunications and Terminal Controllers (DTCs)

Description

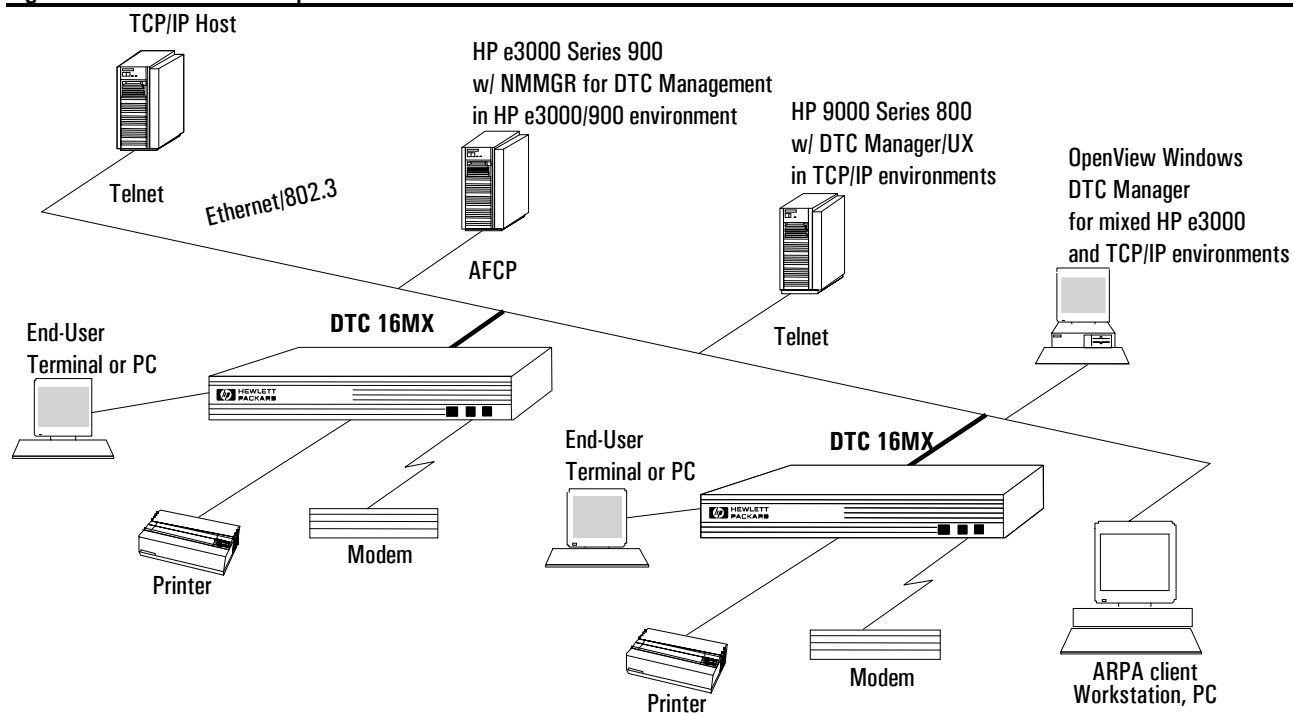
The DTC is a modular and flexible LAN-based terminal server which provides asynchronous connectivity and PAD Support for local and remote terminals, PCs in terminal emulation mode and printers, to HP e3000 A- and N-Class, older HP e3000 Series 900, HP 9000, HP 1000, or any Telnet/TCP/IP systems. The communication protocol between the DTC and the HP e3000 is AFCP.

The DTC 72MX also provides Telnet Access and X.25 networking for the HP e3000 A- and N-Class and older Series 900.

Note: Telnet Access is also provided with MPE Release 5.0 or later, which does not require a DTC.

Figure 4.2.1 shows DTCs and multiple hosts on a LAN.

Figure 4.2.1 DTCs with Multiple Hosts on a LAN



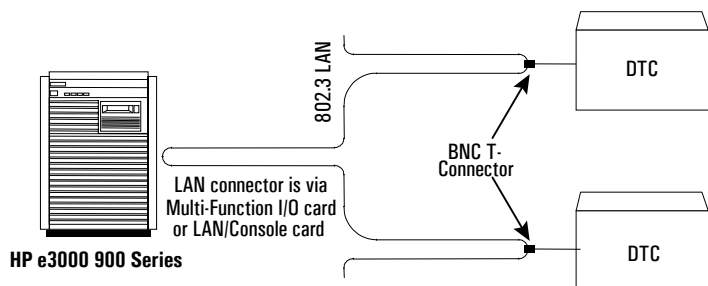
Models

- The DTC 16MX (J2063A) allows up to 16 asynchronous connections (RS-232 direct connect, RS-232 modem connect and RS-423 direct connect). It offers multi-system connectivity and up to 38.4 kbps line speed.
- The DTC 16RX (J2064A) has the same features as the DTC 16MX except that it is managed remotely over a routed network.
- The DTC 72MX (J2070A) provides up to 72 asynchronous connections (RS-232 direct, RS-232 modem connect, or RS-423 direct connect); up to three X.25 links supporting up to 256 virtual circuits at speeds up to 64 kbps; and/or one HP e3000 Telnet Access Board protocol converter. The DTC 72MX is a high-port-count terminal server that offers industry-leading performance for large system configurations, as well as multi-system/multi-session connectivity.

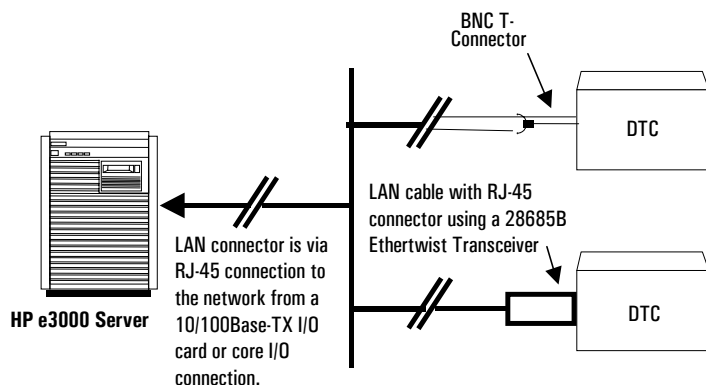
Connecting DTCs to HP e3000

The minimum required terminal communications subsystem for HP e3000 A- and N-Class or Series 900 systems consists of the 802.3 LAN IC card installed in the SPU, the ASC software (Asynchronous Serial Communications software residing on the SPU), one DTC, and 802.3 cabling (ThinLAN, ThickLAN or Ethertwist). See **Figure 4.2.2**.

Figure 4.2.2 DTC-to-SPU Thin (10Base-2) LAN Connection (via MFIO or LAN/Console with an Integrated LANIC and ThinLAN Transceiver



HP e3000 9x7, 9x8, 9x9KS or 99x Server



HP e3000 A- or N-Class Server

Each A- and N-Class Server, and older Series 9x8LX/RX, 9x9KS, and 9x7LX/RX/SX system is delivered with a Multi-Function I/O (MFIO) card (also known as a core I/O card) and ASC software.

Each HP e3000 A-Class and N-Class Server comes with a 4.2-meter twisted pair LAN cable (CAT 5 cable with RJ-45 connectors) for connecting the server's MFIO (core I/O card) or a 10/100 Mbit LAN card to a network. (The LAN connection on the MFIO [core I/O] card will be supported with MPE/iX Release 7.0 Express 1.) HP e3000 A and N-Class Servers do not have a BNC coaxial connector on their MFIO (core I/O) cards. If twisted pair LAN cabling is used to connect DTCs to the network, an Ethertwist Transceiver (28685B) per DTC must be ordered separately. HP e3000 A- and N-Class Servers do not include any coaxial cables.

Alternatively, on HP e3000 A- and N-Class Servers, a twisted pair LAN cross over cable (CAT 5 cross over cable with RJ-45 connectors) may be used for directly connecting one DTC to either the server's MFIO (core I/O) card or a 10/100 Mbit LAN card. (The LAN connection on the MFIO [core I/O] card is supported with MPE/iX Release 7.0 Express 1, which began shipping as of September 1, 2001.) The 4.2-meter twisted pair LAN cable

shipped with the HP e3000 A- and N-Class Servers is not a cross over cable and cannot be used to directly connect a DTC. Instead, one must separately purchase from Hewlett-Packard product number C7539A, a 7-foot (2.1-meter) CAT 5 cross over cable with RJ-45 connectors, or C7538A, a 25-foot (7.6-meter) CAT 5 cross over cable with RJ-45 connectors. If a twisted-pair crossover LAN cable is used to connect a DTC to the server, an Ethertwist Transceiver (28685B) per DTC must also be ordered.

Each older Series 9x8LX/RX, 9x9KS, and 9x7LX/RX/SX MFIO and LAN/Console card has a built-in 802.3 LANIC, ThinLAN Transceiver, and an integrated AUI port for optional connection to either an Ethertwist (28685B) Transceiver. The transceiver products must be ordered separately if required. Each of these servers also comes with one 2-meter coaxial cable.

Each older 99x Corporate Business Server comes standard with a LAN/Console card and ASC software.

Each HP e3000 A- and N-Class or Series 900 system can support multiple DTCs on the LAN. The number of active connections supported will be determined by the application load on the system. For details on numbers of DTCs supported and numbers of logged-on workstations supported for each SPU, see the server specifications in **Chapter 2**.

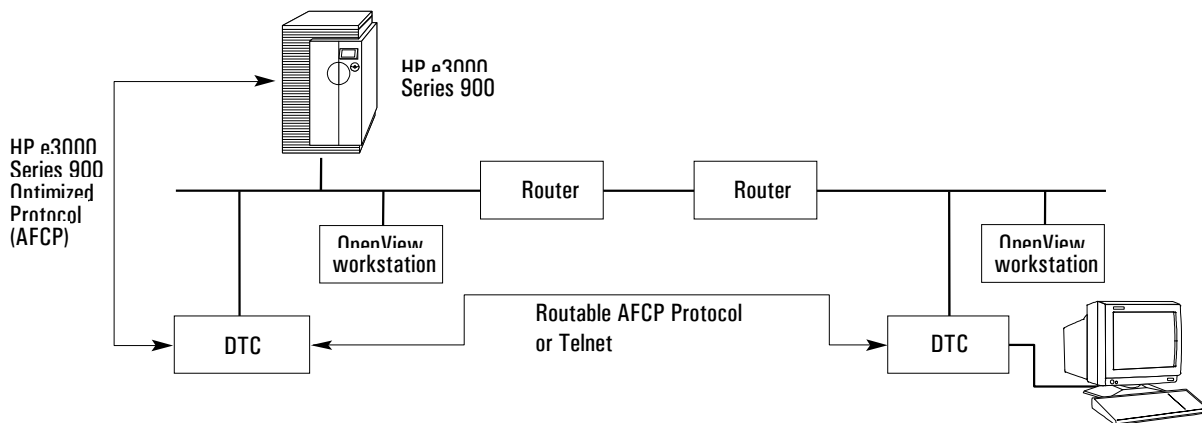
DTC in Extended LAN Configurations

The DTC supports extended LAN configurations with bridges (using the HP e3000 A- and N-Class or older Series 900 optimized AFCP protocol) and level 3 IP routers (using TCP/IP protocol). This means that a DTC user can access a system located on a remote segment of a LAN. Users can access the HP e3000 or HP 9000 server through level 3 IP routers using the Telnet TCP/IP protocol on the remote system. Telnet access to the HP e3000 can be provided by the DTC-based Telnet product. The HP 3000 also supports Telnet communication without a DTC, with MPE Release 5.0 or later.

In lieu of Telnet, users can access an HP e3000 remotely over a routed network, using Routable AFCP. This requires the MPE Release 5.0 or later, and two DTCs, both running DTC code 14.2 or later.

Figure 4.2.3 diagrams a DTC connected user accessing an HP e3000 Series 900 on a remote LAN segment via level 3 IP routers.

Figure 4.2.3 HP 3000 Series 900 in Extended LAN

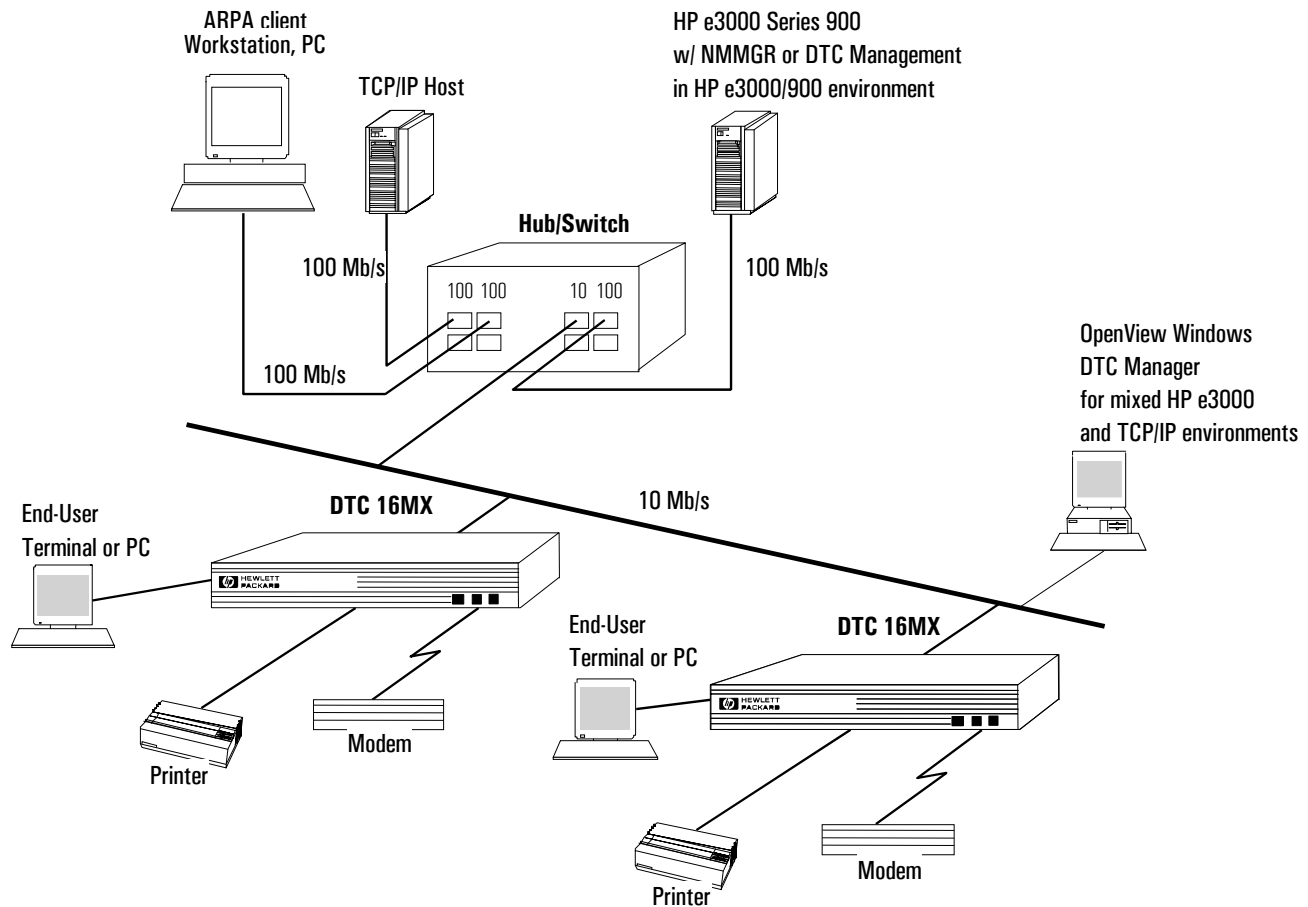


DTC in 100 Mb/s LAN Configurations

The DTC can be used in a 100 Mb/s (Mbit/sec) LAN environment through the use of a switch or hub with speed-matching capability (see **Figure 4.2.4**). The HP e3000 A- and N-Class Servers support DTC and DTC/X.25 traffic and management over 10/100Base-TX PCI I/O cards (A5230A), beginning with MPE release 7.0. The older HP e3000 900 Series systems support DTC and DTC/X.25 traffic and management over 100 VG (B5426AA) and 100Base-T (B5427AA) HP-PB I/O card LAN connections (beginning with MPE Release 5.5 Express 3 and later).

In 100 Mb/s LAN environments, DTCs attach to 10 MB/s hub/switch ports, while other network devices can attach to 100 Mb/s ports. For twisted-pair LAN wiring, each built-in DTC 802.3 LANIC port uses an Ethertwist (28685B) Transceiver, separately connected to a dedicated 10 Mb/s hub/switch port. In a ThinLAN environment, one or more DTCs are connected to a 10 Mb/s ThinLAN, which then connects to one 10 Mb/s hub/switch port via an appropriate ThinLAN transceiver. Hub, switch, and transceiver products must be ordered separately if required.

Figure 4.2.4 DTC with Multiple Hosts in a 100 Mb/s LAN Environment



DTC Telnet Access

Telnet is available on the HP e3000 A- and N-Class and older Series 900 and can be implemented using the DTC. There are two key features provided by DTC-based Telnet:

- Access to HP e3000 A- and N-Class or older Series 900 applications from a Telnet host user
- Access to applications on a Telnet host from a DTC-connected user

Using a DTC to access HP e3000 A- and N-Class or older Series 900 applications from a Telnet host requires Telnet hardware as well as HP OpenView DTC Manager.

HP ARPA Telnet Access for DTC 72MX (J2070A, option 004) is a card that is installed in an open slot of a DTC 72MX and can provide up to a maximum of 80 concurrent Telnet sessions. All 80 sessions can be active if VPLUS applications are being accessed; fewer if character mode applications are being accessed. The disparity between the number of active sessions is due to the increased number of packets and DTC CPU overhead needed to process character mode applications. Only one Telnet Access card can reside in a given DTC 72MX.

Access to applications on a Telnet host, such as an HP 9000 system, from a DTC 16MX, DTC 16RX, or DTC 72MX connected user does not require any additional hardware. Users connected to any of these DTCs can access remote hosts via the Telnet protocol provided the DTCs are managed by HP OpenView DTC Manager. The DTC 72MX requires HP OpenView DTC Manager Release 14.0 or later, and the DTC 16MX and the DTC 16RX requires HP OpenView DTC Manager release 14.1 or later.

DTC Management

For the DTC 16MX and DTC 72MX, a PC with HP OpenView running the HP OpenView DTC Manager Software (D2355B) is required for Telnet access to a non-HP e3000 Series 900 single system. Customers can use the same PC to manage other equipment (like HP's 2335A Asynchronous X.25 PAD, the HP Model 45 X.25 Multi-protocol Concentrator, HP's Ethertwist hubs, routers, and bridges).

A UNIX workstation and DTC 16RX manager software (J2496A) are needed to manage the DTC 16RX. One UNIX workstation can be used to manage multiple DTCs over a routed network.

Please refer to the DTC 16RX datasheet for more information on remote management from a UNIX platform.

The DTC 16MX and 72MX may also be managed from the MPE/iX host rather than from the HP OpenView PC Manager. The system will download software to manage all the DTCs. Host-Based X.25 Management provides the capability to manage an X.25 link from the MPE/iX host. Users connected to DTCs can switch access to multiple systems. The management software is included in the Fundamental Operating System (FOS).

A PC-based HP OpenView DTC Manager or MPE/iX host-based manager is required on each segment of the LAN to download and manage the local DTCs, except for the DTC 16RX. With software release 14.1 or later, the DTCs support an SNMP agent.

Wide-Area Multi-protocol Access Products

DTC X.25/iX Network Link

The DTC/X.25 iX Network Link is provided as an X.25 card in the DTC. It provides access to public and private X.25 packet-switching networks for communication with remote systems and PAD devices.

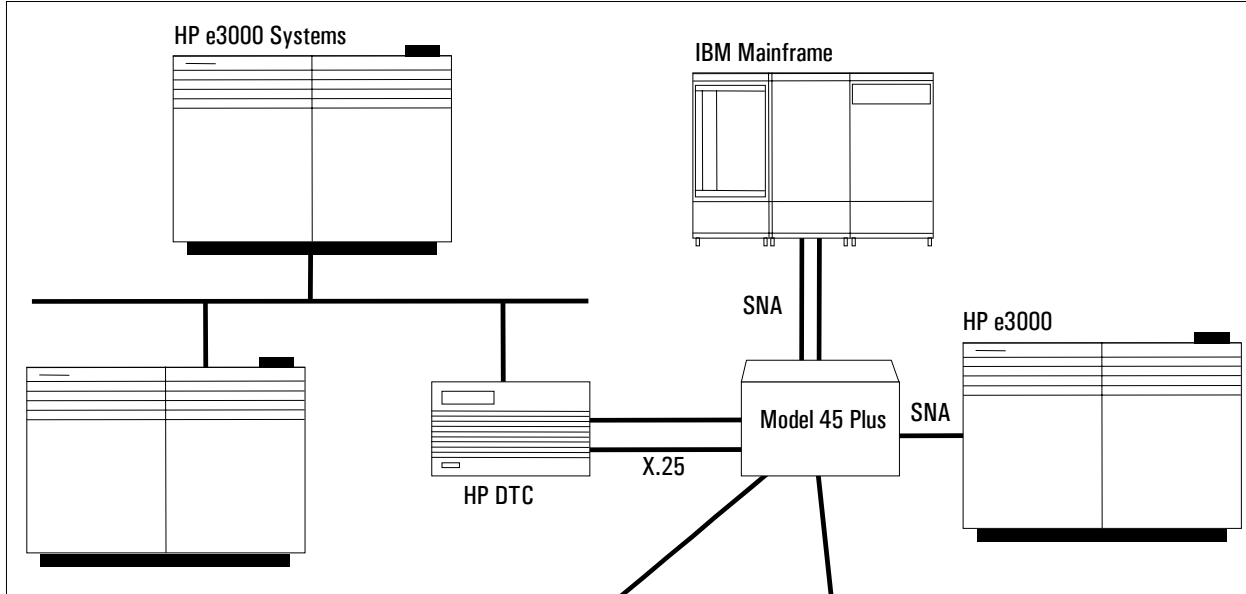
The DTC 72MX supports up to three DTC/X.25 Network Access cards. The available DTC 72MX/X.25 Network Access cards include:

- DTC 72MX/X.25 Network Access card with RS-232 interface (J2070A option 1CW or J2079A option 1CW)
- DTC 72MX/X.25 Network Access card with V.35 interface (J2070A option 1CX or J2079A option 1CX)

X.25 System Access software (36939C for A- and N-Class or 36939B for older Series 900) resides on the HP e3000 SPU and makes system-to-system communication possible. System Access is NOT required for users who only need PAD support.

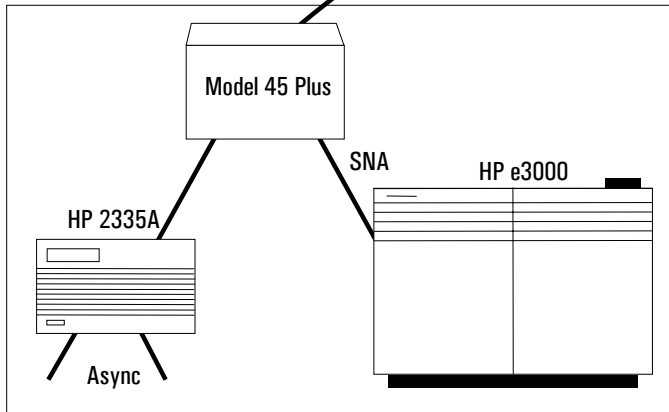
Figure 4.2.5 Model 45 (X.25 Switch)

Central Site

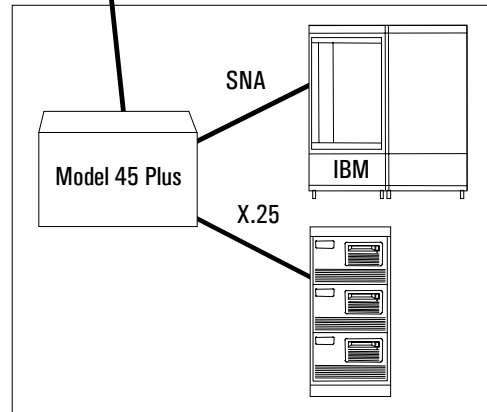


T1 Speed
 (1.5 Mbps)

Branch Office



Regional Office



These products provide HP e3000 users the following:

- Remote terminal access to HP e3000 systems
- Concentration of multiple X.25 access links in one location
- Turn-key solution to interconnect dispersed sites at very high speed, up to T1 (1.5 Mbps)

Both HP 2335A and HP Model 45 Plus can typically use the full physical line bandwidth at speeds up to 64 Kilobits-per-second. The HP Model 45 Plus is an X.25 Multi-protocol concentrator, which is able to switch up to 2500 data packets per second.

Many HP customers are also IBM customers. When they install HP e3000 systems, they often realize that they have to connect their HP e3000 systems to their IBM Mainframe through their X.25 backbone network. In this case, the HP Model 45 Plus performs very well where both X.25 and IBM SNA Wide-Area-Networking communication are needed.

The HP 2335A PAD and the HP Model 45 Plus are fully managed by HP OpenView Switch/PAD Manager, allowing customers to manage these devices from the same HP OpenView network management platform that manages HP's DTCs, hubs, bridges, and HP 3000 systems.

Configuring DTCs

Configuring the DTC 16MX and 16RX

The DTC 16MX and 16RX provide 16 RS-232 direct, RS-232 modem, or RS-423 direct ports. They do not support X.25 or Telnet Access.

The DTC 16MX and 16RX include integrated ThinLAN (with BNC-T) and AUI interfaces. To connect to ThickLAN, order a ThickLAN MAU (30241A). To Connect to Ethertwist, order an Ethertwist MAU (28685B). See **Figure 4.2.6**.

Configuring the DTC 72MX

The DTC 72MX may be configured with up to three of the following cards in any combination:

- 24-port RS-232 Asynchronous Interface Card
- 24-port RS-423 Asynchronous Interface Card
- X.25 Network Access Card (up to three per DTC 72MX)
- Telnet Access Card (only one Telnet Access Card per DTC 72MX)

All of these cards may be ordered as options to the DTC 72MX.

The DTC 72MX includes integrated ThinLAN (with BNC-T) and AUI interfaces. To connect to Ethertwist, order an Ethertwist MAU (28685B). See **Figure 4.2.7**.

Racking the DTC

The DTC 16RX, 16MX, or 72MX can be racked in HP cabinets, using option 1AC, or product number J2085A, option 105 or 106 (see the *HP e3000 Business Servers Ordering Guide*).

Current Consumption of the DTC 72MX

The current consumption of J2070A is 1.8 amps for the 120 V configuration and 0.9 amps for the 208-240 V configuration.

Figure 4.2.6 DTC 16MX, 16RX Configuration Example (Shown with 16 RJ-45 Ports)

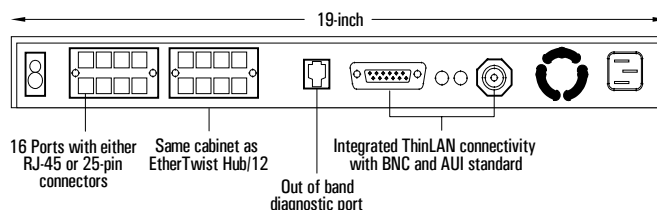


Figure 4.2.7 DTC 72MX Configuration Example (Shown with 24-port RJ-45 Direct Distribution Panel)

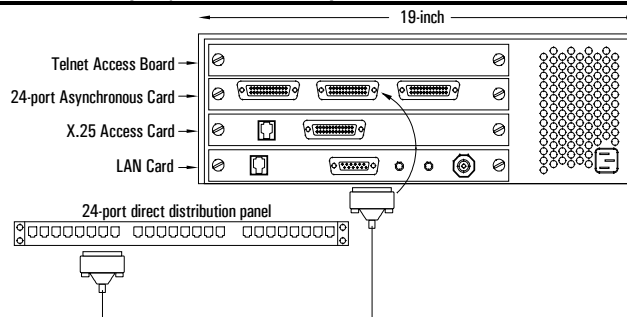


Table 4.2.1 Configuring the DTC in Your HP e3000 A- and N-Class or Series 900 System Environment

Service	DTC 16MX	DTC 16RX	DTC 72MX	Network Management ¹
Local End-User Access				
Single HP e3000 A- and N-Class or Series 900	J2063A	J2064A	J2070A	Included in MPE/iX FOS tape (NMMGR, TermDSM), HP OpenView PC with D2355A, or HP-UX with J2496A
Multiple Systems				
HP e3000 A- and N-Class or Series 900 + access to non-4.0 TCP/IP hosts (back-to-back)	J2063A	J2064A	J2070A	HP OpenView PC with D2355A or HP-UX with J2496A
HP 3000 Series 900 + access to non-12.0 TCP/IP hosts (back-to-back) + HP 9000 access + multivendor connect	J2063A	J2064A	J2070A	HP OpenView PC with D2355A or HP-UX with J2496A
Remote End-User Access				
Single HP e3000 A- and N-Class or Series 900 via X.25	Not supported	Not supported	J2070A + X.25 card	Included in MPE/iX FOS tape (HBX.25)
HP e3000 A- and N-Class or Series 900 + HP 9000 + multivendor + access to non-TCP/IP hosts (back-to-back) via X.25	Not supported	Not supported	J2070A + X.25 card	HP OpenView PC with D2355A release 10.5 or later
HP e3000 A- and N-Class or Series 900 via Routable AFCP ²	J2063A	J2064A	J2070A	HP OpenView PC with D2355A version 14.2 or later, or HP-UX with J2496A
System-to-HP 3000 Series 900				
X.25 communications Single HP e3000 A- and N-Class or Series 900	Not supported	Not supported	J2070A + X.25 card	Included in MPE/iX FOS tape (HBX.25)
X.25 communications Multiple HP e3000 A- and N-Class or Series 900	Not supported	Not supported	J2070A + X.25 card	HP OpenView PC with D2355A release 3.0 or later
Telnet services for HP e3000 A- and N-Class or Series 900	Not supported	Not supported	J2070A + telnet card	HP OpenView PC with D2355A release 10.5 or later

¹ DTC 16RX can only be managed from HP-UX platform with DTC 16RX Manager Software (J2496A). DTC 16RX, DTC 16MX, and DTC 72MX require MPE/iX 4.0 or later. DTC 72MX requires HP OpenView DTC Manager version 14.0 or later for those configurations requiring PC-based management. DTC 16MX and 16RX require DTC Manager 14.1 or later.

² Routable AFCP requires MPE/iX 5.0 or later, and DTC Manager 14.2 or later. A DTC is required on the local LAN with the HP e3000, in addition to DTC(s) on remote LANs.