

Configuring and Managing Host-Based X.25 Links

HP 3000 MPE/iX Computer Systems

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Preface

This manual describes the configuration, operation, and management of X.25 network connections for users of HP 3000 Series 900 systems with host-based network management. Host-based X.25 connections are available on systems running MP EXL release 3.1 or later MPE/iX release.

You should use this manual only if the connections you are configuring are host-based X.25 connections. To configure X.25 connections for PC-based systems, refer to *Configuring Systems for Terminals, Printers, and Other Serial Devices*, *Using the OpenView DTC Manager*, and the *HP 3000/iX Network Planning and Configuration Guide* instead of this manual.

You should be familiar with X.25 concepts and know which X.25 facilities are included in your network subscription. You should also be familiar with NMMGR, the tool used to configure network connections. If not, refer to *Using the Node Management Services (NMS) Utilities* manual for information.

This manual includes step-by-step instructions to assist you in configuring all aspects of host-based X.25 connections for a system. It includes a description of DTCCNTRL, the command used to start, stop, dynamically reconfigure, and obtain status about host-based X.25 system-to-system and PAD connections. It also includes an explanation of and instructions for using the X.25 log formatting tool, EVLOG.

NOTE

MPE/iX, Multiprogramming Executive with Integrated POSIX, is the latest in a series of forward-compatible operating systems for the HP 3000 line of computers.

MPE/iX is a superset of MPE XL. All programs written for MPE XL will run without change under MPE/iX. You can continue to use MPE XL system documentation, although it may not refer to features added to the operating system to support POSIX (for example, hierarchical directories).

MPE V is the old operating system for HP 3000s, not based on the PA-RISC architecture. MPE V software can be run on the PA-RISC (Series 900) HP 3000s in what is known as *compatibility mode*.

The chapters in this manual are organized as follows:

- Chapter 1, “Introduction,” presents an overview of the host-based X.25 capabilities that are provided as part of the Fundamental Operating System (FOS). It describes network options, concepts, and diagnostic services for use with host-based X.25 links.
- Chapter 2, “Preparing to Configure DTCs,” details the information you will need before you can begin to configure DTS for systems with host-based X.25 connections. It also describes worksheets you can use to plan and record your DTS configuration.
- Chapter 3, “Configuring DTCs Step-by-Step,” provides step-by-step instructions for configuring DTCs for systems with host-based X.25 connections.
- Chapter 4, “Terminal and Printer Profiles,” describes what are terminal and printer profiles and how to create and modify your own profiles.
- Chapter 5, “Preparing to Configure X.25 iX System Access,” details the information you will need before you can begin to configure X.25 iX System Access for systems with host-based X.25 connections. It also describes worksheets you can use to plan and record your NS configuration.

- Chapter 6, “Configuring X.25 Links Step-by-Step,” provides step-by-step instructions for configuring X.25 iX System Access for systems with host-based X.25 connections.
- Chapter 7, “Managing Networks with DTCCNTRL,” describes how the DTCCNTRL command is used to start, stop, dynamically reconfigure, and obtain status about host-based X.25 system-to-system and PAD connections. Examples of command usage are included.
- Chapter 8, “Formatting Host-Based X.25 Log Files,” provides instructions for using EVLOG, the log formatter for X.25 log events. It includes a description of each of the EVLOG options.
- Appendix A, “Migrating from Previous Releases,” provides instructions for migrating your configuration. It also includes information about the migration process and issues.
- Appendix B, “Error Messages” contains validation, datacommunication configurator (DCC), and DTCCNTRL error messages.
- Glossary, contains terms applicable to the network configuration process.

Related Publications

Managing Host-Based X.25 Links Quick Reference Card

HP 3000/iX Network Planning and Configuration Guide

Using the Node Management Services (NMS) Utilities

NS 3000/iX NMMGR Screens Reference Manual

NS 3000/iX Operations and Maintenance Reference Manual

NS 3000/iX Error Messages Reference Manual

NetIPC 3000/XL Programmer's Reference Manual

NS Cross-System Network Manager's Reference Manual

Using NS 3000/iX Network Services

NS Cross-System NFT Reference Manual

Configuring Systems for Terminals, Printers, and Other Serial Devices

Troubleshooting Terminal, Printer, and Serial Device Connections

Using OpenView DTC Manager

Berkeley Sockets/iX Reference Manual

Customizing Terminal and Printer Type Files with Workstation Configurator

Asynchronous Serial Communications Programmer's Reference Manual

System Startup, Configuration, and Shutdown Reference Manual

MPE/iX Commands Reference Manual

HP2345A Datacomm and Terminal Controller Installation and Service Manual

NS Over SNA/XL Configuration Guide

HP SNMP/XL User's Guide

1 Introduction

This manual provides a complete reference for the configuration, operation, and management of X.25 network connections for users of HP 3000 Series 900 systems with host-based network management. Host-based X.25 support is provided for both system-to-system and PAD communications.

This chapter describes the host-based X.25 capabilities. It includes the following:

- X.25 network options provided with host-based network management, including both system-to-system and PAD support services.
- The concepts you need to understand when you configure host-based X.25 connections.
- Operation of host-based X.25 system-to-system and PAD support services.
- Diagnostic services provided for use with host-based X.25 links.

NOTE

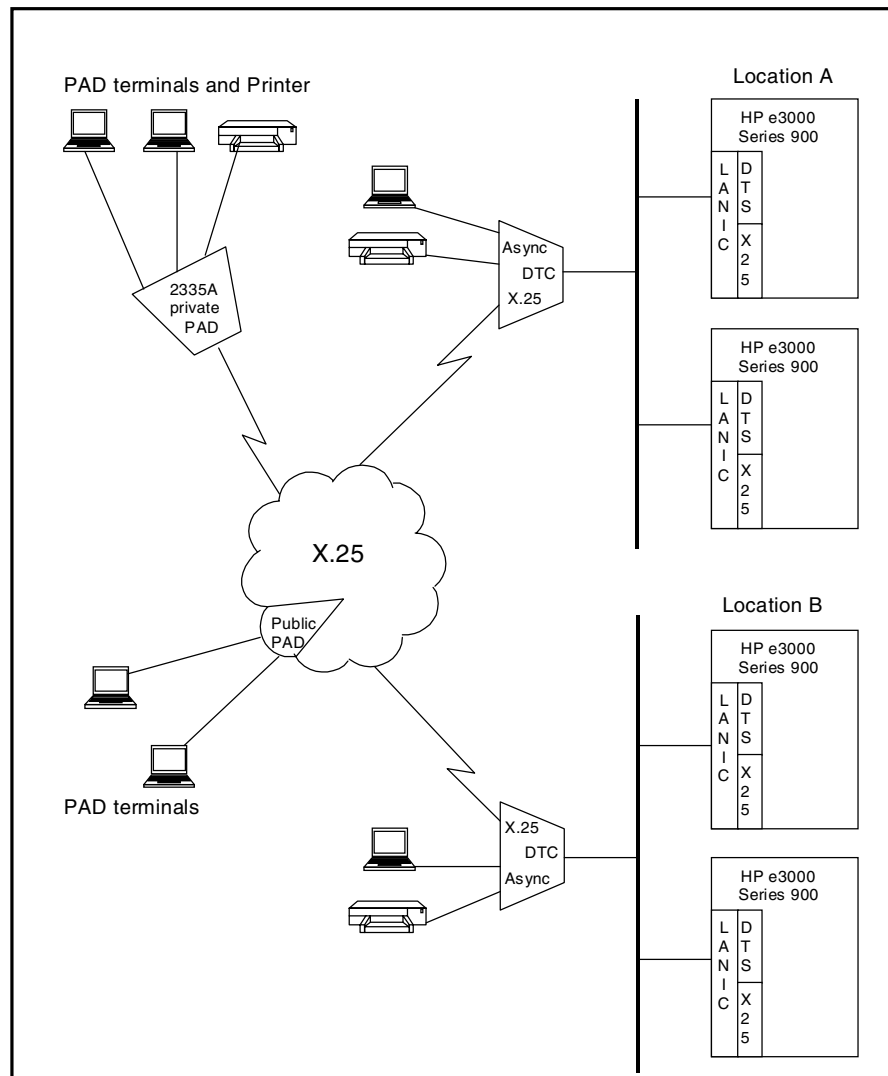
If you need to configure any host-based X.25 connections, then you can also use this manual to configure other terminal I/O connections.

Host-Based Network Connections

Many of the communications services available for HP 3000 Series 900 systems are provided through the Datacommunications and Terminal Controller (DTC). There are four types of DTCs currently supported: DTC 72MX, DTC 16iX, DTC 16MX and the DTC 16RX. The DTC 72MX, is the only currently supported DTC can support the DTC/X.25 Network Access cards that make communications over X.25 networks possible. The DTC 16iX, DTC 16MX and the DTC 16RX do not support the DTC/X.25 Network Access cards. The DTC 72MX allows up to three connector cards, plus a LAN card. Up to three DTC/X.25 Network Access cards are supported. Although the DTC 48 and DTC16 are beyond their official support life references to these DTCs have been retained in this manual for completeness because NMMGR and the DTS subsystem still allow these DTC to be configured.

Figure 1-1 shows both PAD and X.25 system-to-system connections for HP 3000 series 900 systems employing host-based network management.

Figure 1-1 X.25 Network Connections



Nailed and Non-Nailed Connections

A **nailed** device is one that is permanently associated with an ldev number through the NMMGR configuration of an MPE/iX system. Any time a connection exists between a system and one of its nailed devices the same ldev number will belong to that device. This ldev number is reserved for the use of that connection and only that connection. Serial devices attached locally or through a modem and PAD devices attached through a private or public PAD may be configured as either nailed or non-nailed ldevs. Serial devices that will be accessed programmatically at any time must be configured as nailed ldevs. Since printers are accessed programmatically, ALL printers must be configured as nailed devices.

A **non-nailed** device is a device that is able to establish a connection to an MPE/iX host system but has no permanently assigned ldev number in the NMMGR configuration file of that system. Instead, ldev numbers are dynamically associated with a device connection at the time the user requests the connection. The user of a non-nailed device is able to establish a session provided two conditions are met: a connection must be available on the host and the non-nailed device profile specified in the host configuration must match the characteristics of the device requesting the connection.

When the user at a locally or PAD-connected device with a non-nailed connection logs on to the system, an ldev number is assigned from a pool of available ldev numbers defined through the host system's NMMGR configuration. When the connection is ended (the user logs off) the assigned ldev number is returned to the pool of ldev numbers and becomes available for use by a different device connection.

Non-nailed device connections provide several major advantages. They simplify the configuration that must be done on each MPE/iX system, since configuration values do not have to be entered separately for each PAD device that will be able to access that system. Non-nailed connections also make it possible for you to add serial devices to the network without having to reconfigure each host so that it will recognize the additional devices. Finally, configuring a pool of non-nailed devices makes it possible for the number of users with potential access to a system to exceed the session limit of the system. The pool of non-nailed ports that you configure cannot exceed the session limit, and the number of users logged on at a given time must still be within the session limit.

When the user connects to the system through a public PAD, the connection will use a non-nailed device on the host.

Managed and Non-Managed DTCs

When a DTC is configured in a Host-Based environment the DTC is managed by the management platform that downloads the DTC configuration and performs all the other management functions such as DTC resets, uploads and controls the operation of all DTC functions. It is possible to configure the same DTC on another HP e3000 system so that it is a non-managed DTC on the system where the configuration is entered. A DTC would be configured as a non-managed DTC on a system in order to configure nailed devices that can be accessed from a shared DTC. In this way a terminal, printer or PAD device can be shared as a nailed device on multiple systems. This sharing of serial devices uses the Host-Based Switching features of the DTS subsystem.

The DTC is managed by the management platform that has the proper DTC LAN Station Address defined. To configure the same DTC as a non-managed DTC on another HP e3000, you create a DTC configuration with the same DTC Node Name and configure the DTC LAN station address as 00-00-00-00-00-00.

CAUTION

The DTC **MUST** be defined as being managed by one and only one management platform. If a configuration for a DTC with the same LAN Station address is configured on more than one management platform, it is a race condition as to which platform will actually respond and download the DTC when the DTC is powered on. Usage of the management features such as reset on the other platform may have unpredictable affects on the DTC's operations.

The procedures for defining a DTC as a managed or non-managed DTC are provided in Chapter 3, "Configuring DTCs Step-by-Step," of this manual.

X.25 System-to-System Connections

Host-based X.25 system-to-system connections are supported through the **DTC/X.25 iX Network Link**. This NS 3000/iX link makes it possible for you to connect a HP 3000 Series 900 system to a public or private X.25 packet switched network (PSN).

The DTC/X.25 iX Network Link requires that you have at least one DTC/X.25 Network Access card installed in a DTC. You must also purchase and install the **X.25 iX System Access** software on the system.

Device Connections Via PAD

PAD support makes it possible for asynchronous serial devices, such as terminals and serial printers, to be connected to the system through an X.25 network. Serial devices are connected to a PAD, or **Packet Assembler/Disassembler**. A PAD converts asynchronous character streams into packets that can be transmitted over a packet switched network. PAD packets follow the CCITT X.25 protocol recommendations.

The PAD support provided on MPE/iX systems conforms to the 1984 version of CCITT recommendations X.3 and X.29. Support is also provided for the 1980 recommendation. Packet sizes of 128, 256, and 512 bytes are supported. Access is provided for users of asynchronous serial devices connected to both public and private PADs.

A **public PAD** is a service provided by a **Public Data Network (PDN)**, such as TELENET or TRANSPAC. Public PADs can be used with either a dial-up or a leased line.

A **private PAD** is one that is connected to a PDN as a host node having its own X.25 network address, but behaves as a PAD when connected to another node. Private PADs require leased lines to the network. Hewlett-Packard provides several cluster controllers for use as private PADs.

All devices connected via PAD must support XON/XOFF protocol and must be configured to match the speed of the PAD and modem.

Only character mode and VPLUS applications are supported on PAD-connected devices. There are also some aspects of the way transmission occurs over PAD connections that cause differences in the way certain device control operations take place. See the *Asynchronous Serial Communications Programmer's Reference Manual* for a summary of these differences.

Host-Based X.25 and PAD Configuration Concepts

Host-based X.25 connections are configured using the **Node Management Configuration Manager (NMMGR)**. NMMGR allows you to completely configure both PAD support and system-to-system X.25 connections. For more information on NMMGR and its operation, see *Using the Node Management Services (NMS) Utilities* manual.

This section explains the principles of:

- configuring PAD incoming security
- configuring a DTC for PAD connections
- configuring X.25 system-to-system switching.

NOTE Because each PTT has different PSN limitations and requirements, it is not possible to list them all in this manual. We recommend that you use the procedures in Chapter 3 to configure X.25.

NOTE X.25 levels 1, 2, and 3 must be configured for PAD support to function if this is a managed DTC.

X.25 on the DTC has two main uses:

- connecting terminals, printers and other devices to systems via packet switching networks (PSN_x)
- connecting HP 3000 systems to each other (System-to-System connections) via packet switching networks (PSN_x).

Most of the information that you must enter for X.25 levels 1, 2, and 3 is on the subscription form for the PSN to which you are connecting; you must use the subscribed values when you configure a board.

The *DTC Technical Reference Manual* contains more information on the way X.25 has been implemented in the DTC. However, it deals only with the points in which the DTC implementation differs from the CCITT standards. Values that cannot be changed from the DTC Manager are as recommended by the CCITT. Refer to the CCITT recommendations for more information.

Configuring with NMMGR

DTS Configuration Branch

NMMGR takes you down specific configuration “branches” to allow you to enter configuration values required by various subsystems or products. The DTS branch allows you to configure the **Datacommunications And Terminal Subsystem (DTS)**, which defines the physical connections and configuration parameters for the computer, its DTCs, and all DTC-connected devices.

If you are configuring only PAD support, you need only traverse the DTS branch of NMMGR. You will use this branch to configure *both* locally connected devices and PAD connected devices. To access this branch of NMMGR, from the Main screen, answer “N”

(no) to the question “Are you using OpenView DTC Manager?” and “Y” (yes) to the question “Do you have X.25 system-to-system or PAD connections?”. Press the **[Save Data]** key, then press the **[DTS]** function key.

Using the DTS configuration branch, you configure link information for the DTCs connected to the system. For each DTC, you specify the card types the DTC contains, along with logging class and PAD access information if one of the cards is a DTC/X.25 Network Access card. For each individual card, you configure device connection parameters pertinent to the card’s type.

For each DTC/X.25 Network Access card you configure, you also specify X.25 level 1, level 2, and level 3 parameters according to your X.25 network subscription. You may also elect to configure security for PAD access.

Complete step-by-step procedures for configuring the DTS branch are provided in Chapter 3, “Configuring DTCs Step-by-Step,” of this manual.

NS Configuration Branch

Connections for system-to-system require that you traverse an NS configuration branch to configure X.25 iX System Access. You reach this branch by pressing the **[NS]** function key at the Main NMMGR screen.

Step-by-step procedures for X.25 iX System Access configuration are in Chapter 6, “Configuring X.25 Links Step-by-Step,” of this manual.

NOTE

The X.25 iX System Access procedure described in this manual assumes the use of guided configuration. While it is possible to configure this link using non-guided configuration, Hewlett-Packard strongly recommends the use of the guided configuration process.

Connections via PAD Support

Remote terminal users connecting via the DTCs PAD support use X.25 addresses to establish the connection to the DTC. When you configure PAD support on the DTC, you configure a PAD switching information table, which maps X.25 addresses to local systems. A remote terminal user who enters one of these X.25 addresses is automatically connected to the corresponding system. Users connection via PAD support can only open one session at a time

There are two methods of giving PAD-connected terminal users access to multiple systems.

- For each system to which they are to connect, you map an X.25 address to the system nodename in the PAD Switching Table. Users use the appropriate X.25 address to connect to the system. This method ensures that PAD users are restricted to the systems that you explicitly allow them to access. When the user logs off the system, they are returned to the PAD prompt, not to the DTC user interface. Up to 32 systems can be configured in this way.
- You can also configure an X.25 address that gives access to the DTC user interface. PAD users connected to the DTC user interface can connect to any system on the LAN in the same ways as asynchronously-connected terminal users, using system names or IP addresses. Note, however, that PAD users cannot use the escape-from-the-data-transfer facility of the DTC to suspend a system session and return to the DTC user interface. They must log off the system to return to the user interface.

PAD Access

The PAD access table is used:

- to map calling PAD address to nailed ldevs on MPE/iX systems
- to map PAD device numbers to X.25 addresses for the HP DTC Device Files Access utility on HP-UX systems
- for programmatic access to remote PAD devices
- for device profile selection

The PAD Access table lists device names or numbers of remote PAD devices with X.25 address, closed user group (CUG) numbers and devices profiles. This list enables an incoming call to be tied to a nailed ldev on an MPE/iX system or PAD devices access via the HP DTC Device File Access (DDFA) software on an HP-UX system. The PAD device name is used to associate with a PAD address that is downloaded to the DTC with particular nailed ldev on the MPE host. If you want to have a nailed PAD devices on a non-managed DTC, then configure the PAD device with the same device name on the system where the DTC is a non-managed DTC.

If you are configuring PAD connections, you can also configure PAD Incoming Security. The PAD incoming security feature maps X.25 addresses of remote PAD devices to access lists. The access lists list the LAN-based systems that the remote device is permitted to access. An access list may optionally have a password. The names of all the nodes to be accessed through the managed DTCs of a system must first be entered into the node names list. The access lists are subsets of the nodenames list, and only nodes that

appear in the node names list can appear in an access list. The name can be an NS nodename or an IP address. You may have to enter more than one “version” of the same address, for example both the IP address and the Internet Services address of the same device, to allow users to enter either, and still gain access.

When a remote PAD terminal calls into the DTC to connect to a local system, the DTC looks up the calling address in the PAD Incoming Security table. The call is accepted if the called host system is included in an access list defined for the calling address. A password may optionally be defined for each access list, in which case the PAD terminal user must also enter the password before the DTC establishes a connection with the requested host. If the access list corresponding to the calling address is not defined under PAD Security..., or if it is empty, the incoming call is cleared with CLR DTE 70. By listing X.25 addresses against non-existent access lists, you can prevent the corresponding remote devices from accessing any local system nodes.

The lists are downloaded to the DTC when it starts up (after being switched on or reset). Whenever you make any changes to the list in NMMGR and invoke dynamic configuration, the updated list is downloaded to all the DTCs that the system is managing and that have at least one DTC/X.25 Network Access card. Note, however, that any changes you make to PAD security has no effect on established connections; lists are checked only while a connection is being established.

The following two flowcharts how incoming and outgoing calls are processed by the entries in the PAD tables.

Figure 1-2 Incoming PAD Security Flowchart

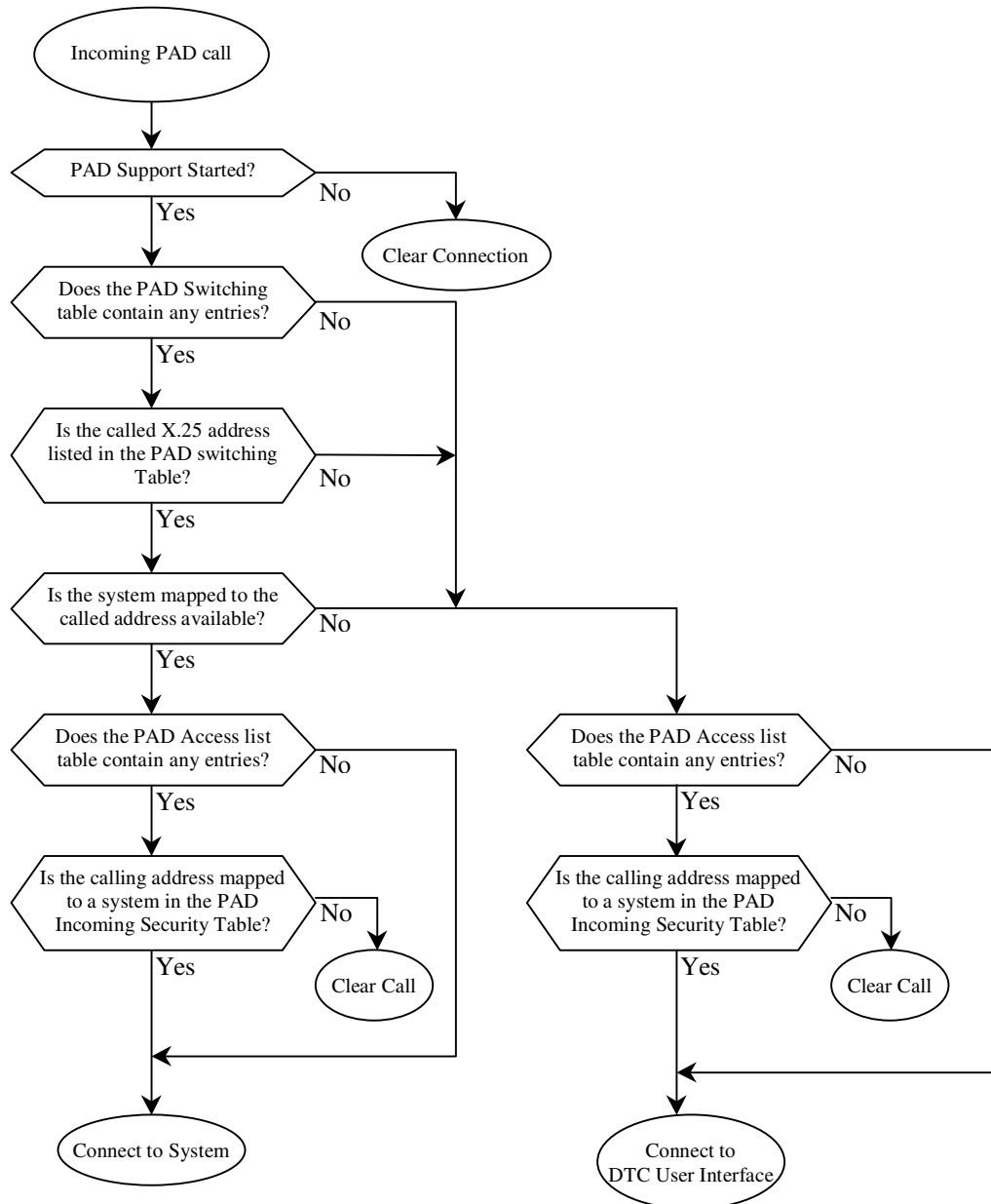
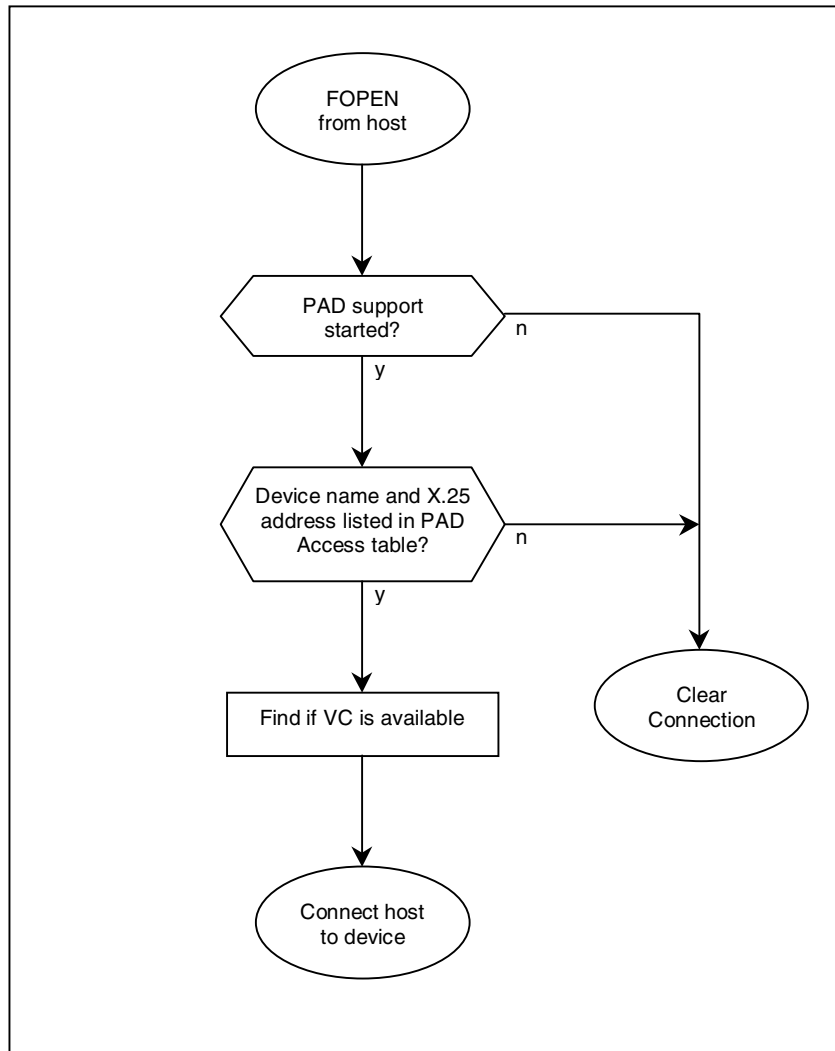


Figure 1-3 PAD Outgoing Security Flowchart



PAD Switching

The DTC PAD switching allows remote users who enter a full address at the PAD prompt to be routed directly to the associated host system from the PAD prompt. Other calls are routed to the DTC user interface. Alternatively, a remote user can enter the DTCs X.25 address, and then connect to a system through the DTC user interface in the same way as local users, using the command `connect <nodename>` or `connect <IP address>`.

The system node name can be named using either IP address or an MPE nodename.

Example of PAD switching

In this example:

- The DTCs X.25 board has the X.25 address 123456
- MPE_A has the X.25 subaddress 01

- MPE_B has the X.25 subaddress 02, but has not been entered in the PAD switching table
- System C has the IP address 128.12.100.1 and the X.25 subaddress of 03

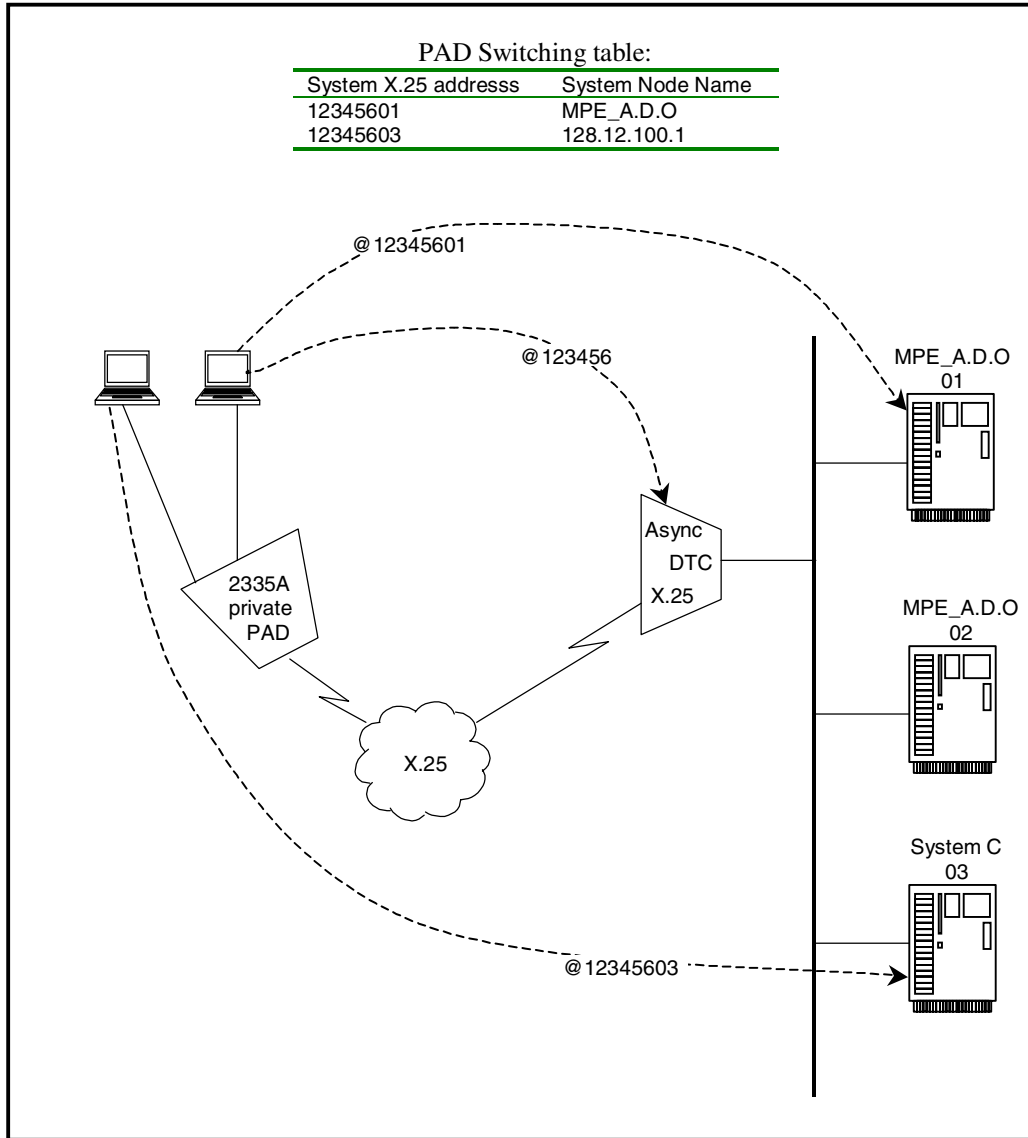
The following table and diagram show what happens depending on the address entered by the user at the terminal connected to the remote PAD.

Table 1-1

PAD Address Examples

User at terminal types	... Result
@123456	The user is connected to the DTC user interface
@12345601	The user is connected directly to MPE_A
@12345602	The X.25 address is not defined in the list, so the call is connected to the DTC user interface, and the user can connect to MPE_A or System C from there.
@12345603	The user is connected directly to System C

Figure 1-4 DTC PAD Switching examples



Configuring PAD Support and PAD Security

This section contains the principles of configuring a DTC for PAD connections, and gives examples of how to configure certain connections. X.25 levels 1, 2, and 3 must be configured for PAD Support to function.

DTC PAD support allows terminals connected to remote PADS to access LAN-based systems via the DTC, and LAN-based systems to access printers connected via DTC to remote PADs. Security lists can be implemented to prevent access by unauthorized PAD devices.

Three tables are used to control access to and from PAD devices.

Configuring DTC PAD Access Information

The PAD Access screen lists device names or numbers of remote PAD devices with X.25 addresses, closed user group (CUG) numbers and device profiles. The list enables an incoming call to be tied to a nailed ldev on an MPE/iX system or PAD device access via the HP DTC Device File Access (DDFA) software on the HP-UX system.

Refer to the network subscription form for the CUG number. If the CUG number entered here does not correspond to your network subscription, calls will be cleared by the network with the message `CLR DTE 70`. Note that CUG is a PSN service, and is not configurable from the DTC Manager.

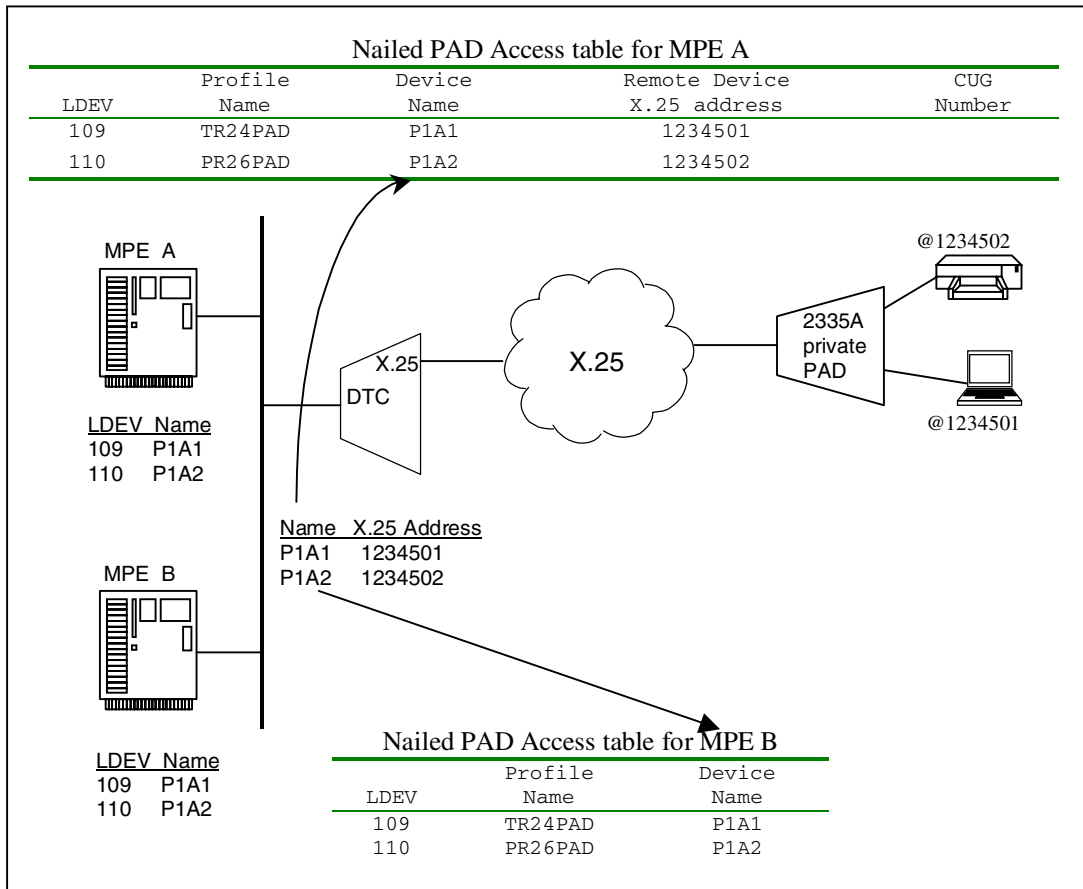
Example of PAD Access

In this example:

- The DTC is a **managed** DTC on System MPE_A
- The DTC is a **non-managed** DTC on System MPE_B
- LDEV 109 is a nailed terminal, and the PAD Device Name P1A1 has been associated with it in NMMGR on the HP 3000 Series 900
- LDEV 110 is a nailed printer, and the PAD Device Name P1A2 has been associated with it in NMMGR on the HP 3000 Series 900
- The address of the remote PAD Terminal 1234501 is mapped to the PAD Device Name P1A1 in the PAD Access List

- The address of the remote PAD Printer 1234502 is mapped to the PAD Device Name P1A2 in the PAD Access List

Figure 1-5 DTC PAD Access Example

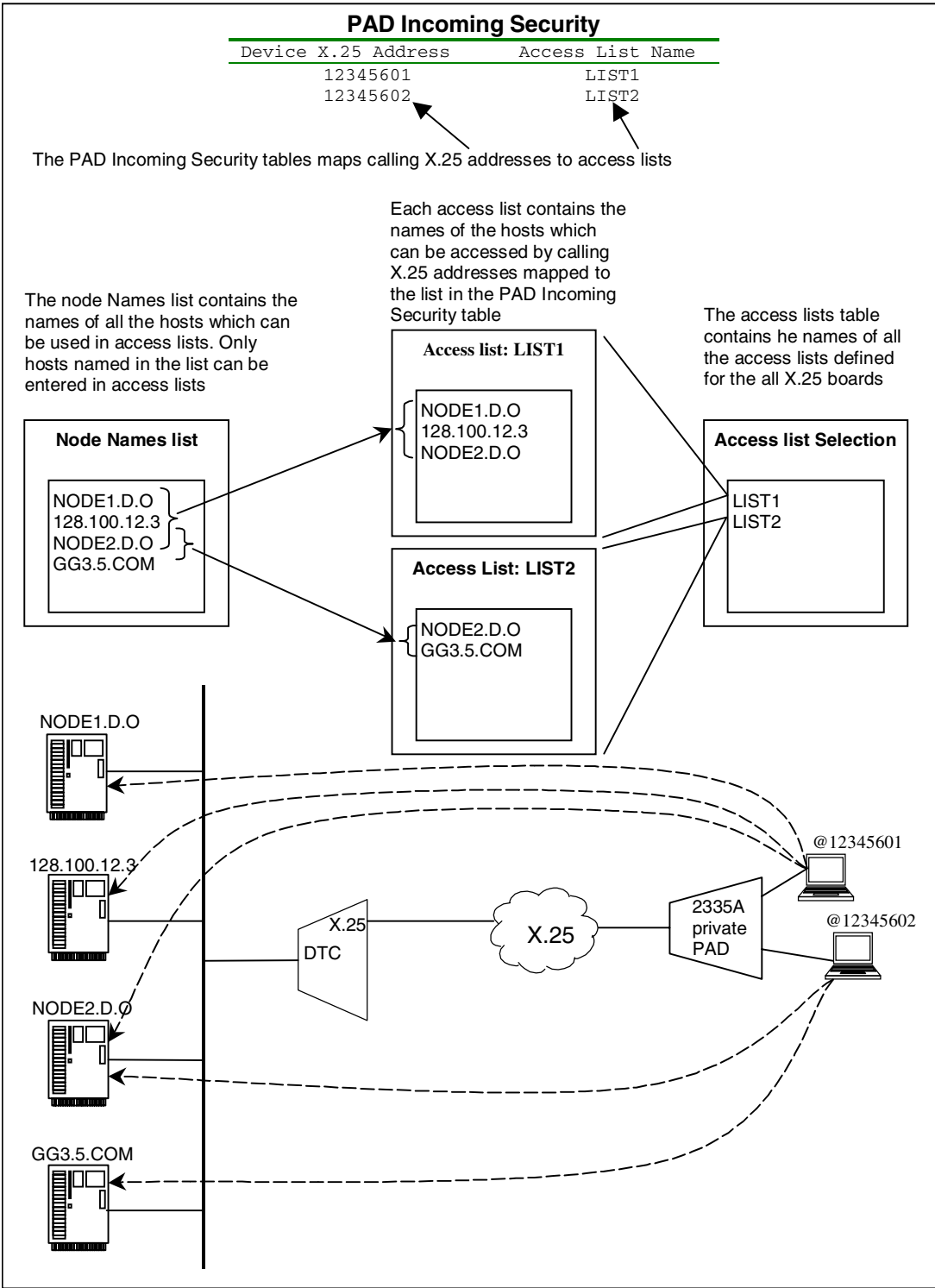


PAD Incoming Security

The PAD incoming security table controls establishment of connections from remote PAD-connected devices to local systems. The PAD incoming security maps X.25 addresses of remote PAD devices to access lists. The access lists list the systems that the remote devices is permitted to access. An access list may optionally have a password.

Example of Incoming Security

Figure 1-6 Setting Security Lists



In this example, to connect from terminal 12345601, the remote user can do one of the following (@ is the PAD prompt, DTC> is the DTC user interface prompt):

Table 1-2 PAD Security Connection Examples

@ 98765404	connects directly to GG3.5.COM
@ 987654	connects to the DTC suer interface
DTC> connect NODE4.D.O	this establishes the connection to GG3.5.COM
@98765401 descret	Connects directly to NODE1.D.O, giving the password for PAD access (assuming there is a password). If a password is required but is not present in the call user data received by the STC, the DTC will prompt the user for the password.

Configuring X.25 System-to-System Switching

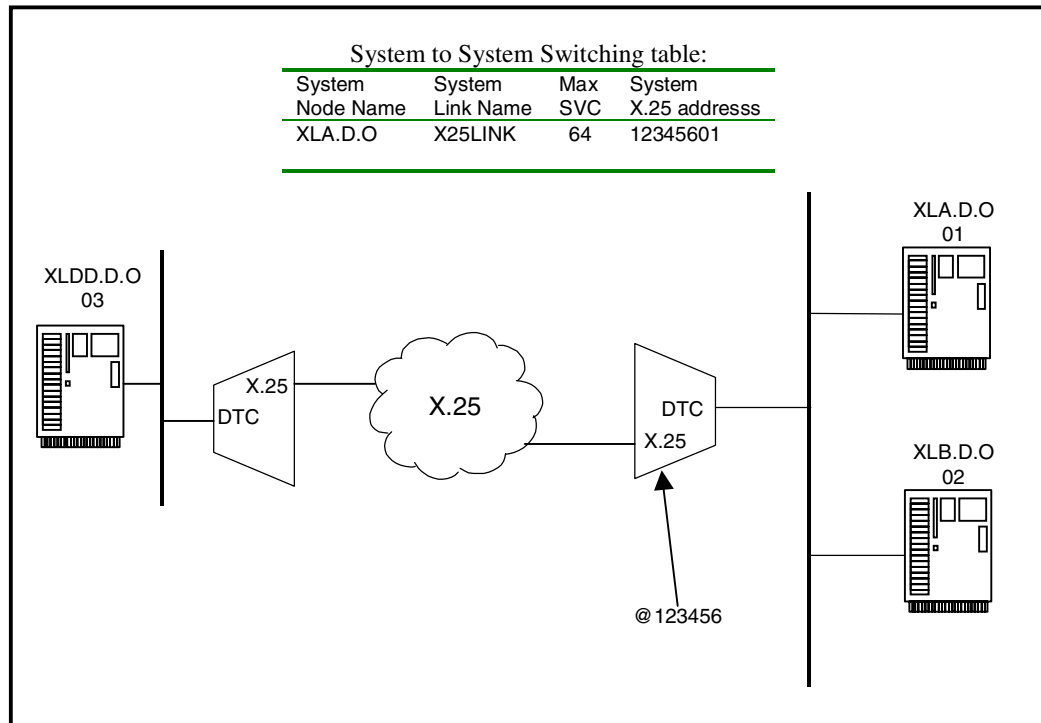
This section explains the principles of configuring X.25 connections between MPE/iX systems (system-to-system switching). The System-to System Switching table allows MPE/iX systems to access each other and other systems via X.25. The table maps nodenames configured in NMMGR on a host system to X.25 addresses. If there are no entries in the list, system-to-system switching is not allowed.

When the DTC receives an incoming call, it looks up the called address in this table, and routes the call to the appropriate host and network interface using the nodename and link name mapped to the called address. For outgoing calls from this node and link, the calling address will be the address listed in the X.25 address field.

- XLDD.D.O will be connected to XLA.D.O using X25LINK if the packet has called address 12345601.
- 12345602 cannot be accessed by other MPE/iX systems.

- If XLA.D.O tries to call XLDD.D.O, the X.25 address 12345601 will be used as the calling address

Figure 1-7 DTC System-to-System Switching Example



X.25 System-to-System Local Users Groups

A System-to-System Local Users Group filters call between remote systems and local LAN-based systems. If the list exists, only those remote systems that are listed can have access to local LAN-based systems. If there are no items in the LUG list, there is no control on incoming and outgoing calls on the DTCs X.25 board.

Remote systems can be allowed incoming-call setup only, outgoing-call setup only, or two-way call setup. Note that this list is referred to only for call setup; once a call is set up, data can be exchanged in both directions. If all systems are to be permitted both incoming and outgoing calls, you do not need to create a LUG list.

The LUG can screen incoming calls only, outgoing calls only, or both. If you list any system as IN, be sure that you list all. The same applies to systems lists as OUT or IN/OUT.

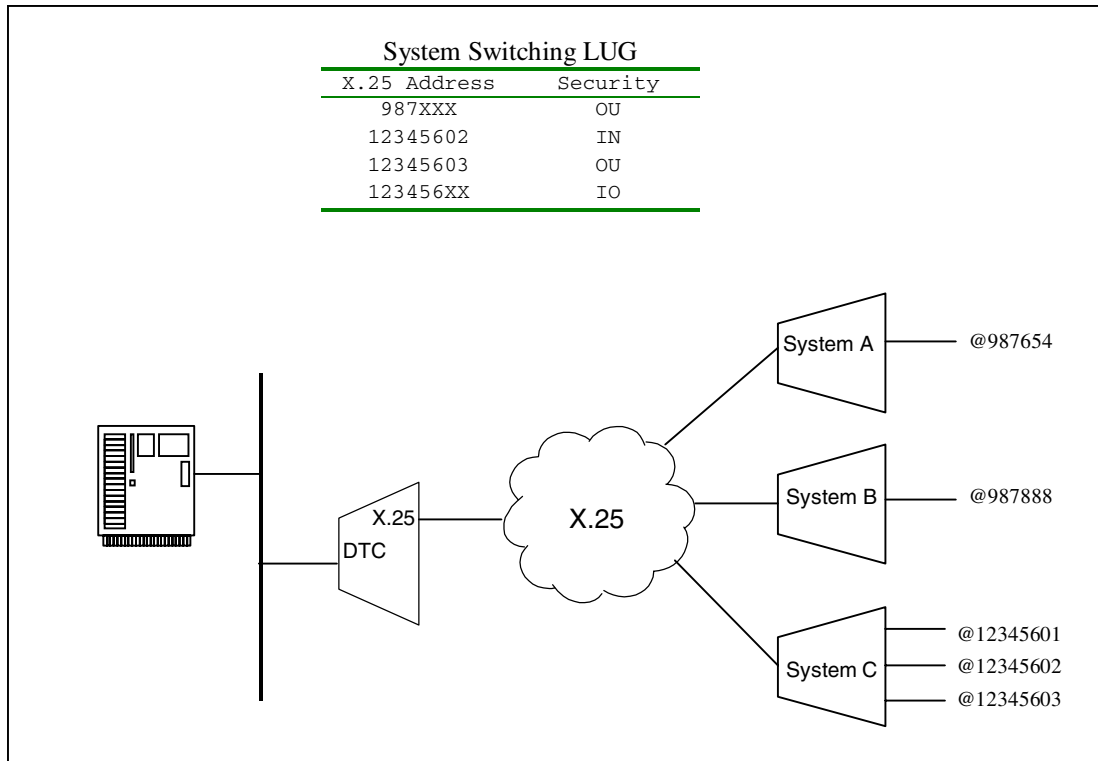
Example of a Local User Group

In the following diagram:

- 12345601 has IN/OUT access, because the 123456xx has IN/OUT access.
- 12345602 has IN only and 12345603 has OUT only, as addresses without wildcards take precedence over addresses with wildcards.

- 987654 and 987888 both have OUT permission only.

Figure 1-8 DTC System Switching LUG Example



Operation

When the HP 3000 is configured to use host-based X.25 networking configurations, the command `DTCCNTRL` is provided to allow operators to start and stop X.25 system-to-system or PAD connection support, obtain status about whether X.25 and PAD support are up, and to dynamically change many configuration parameters entered for the DTS subsystem without rebooting the system.

System Operator (OP) capability is required to obtain status and start and stop X.25 and PAD support. Network Administrator (NM) is required to perform dynamic configuration

Dynamic Configuration

You can make many DTS changes dynamically without rebooting the system, or resetting and redownloading the DTC. This capability is available if you already have a valid network configuration file, and there were no errors reported by DCC during the last system reboot, or DTS shutdown and restart. This allows you to modify the DTS configuration without impacting all the users accessing the system through the DTC that was changed.

For more information on how to invoke dynamic configuration, see Chapter 7, “Managing Networks with `DTCCNTRL`,” of this manual, or the *Configuring Systems for Terminals, Printers, and other Serial Devices* manual.

Automatic Configuration

Host-based management also gives you the capability to add and configure a new DTC automatically, without the need to specify most of the detailed configuration information, such as DTC cards and ldevs. This can be done within the `NMMGR` utility or at the session prompt with the command `DTCCNTRL`. Refer to Chapter 7, “Managing Networks with `DTCCNTRL`,” for further information on using automatic configuration to configure X.25 cards. See *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for more information on how to invoke automatic configuration.

Obtaining Status

The `DTCCNTRL` Status function displays the current status of each DTC/X.25 Network Access card installed in a specified DTC. Use the Status function to determine whether or not X.25 or PAD support is currently active for a DTC/X.25 Network Access card. See Chapter 7, “Managing Networks with `DTCCNTRL`,” for more information on obtaining status using `DTCCNTRL`.

Maintenance

To support the maintenance of host-based X.25 connections, the **Terminal Diagnostic Support Monitor (TermDSM)** utility supports additional command functions. These functions are part of the `DIag`, `DUmp`, `Reset`, and `Status` commands (capital letters indicate command abbreviations). Additionally, the `TermDSM Trace` command allows tracing of X.25 level 2 or level 3, or of a virtual circuit (VC).

Several of the `TermDSM` command functions now provide data about DTC/X.25 Network Access cards in addition to the data they provide about asynchronous cards. For example, the `Diag Selftest` function tests DTC/X.25 Network Access cards (SNPs) as well as asynchronous cards (SICs).

Terminology

`TermDSM` uses designations for the types of cards it tests that you might not be familiar with. Asynchronous cards are referred to as **SICs**, or serial interface cards. Likewise, DTC/X.25 Network Access cards are referred to as **SNPs**. SNP is an abbreviation for Synchronous Network Processor.

A number of the `TermDSM` commands use the SNP designation as a subcommand. For example, to capture information about a specific DTC/X.25 Network Access card and write it to a file you would enter the `DUmp` command in `TermDSM`, then enter the `SNP` subcommand, specifying the DTC number and card number as the SNP parameters.

Trace Command Options

The trace function has been added to `TermDSM` so that X.25 packets can be traced at the DTC and card level.

Only one trace (and one trace option) can be active at a time.

To enable tracing you enter the `TermDSM Trace` command then choose a trace option through the `TRACEON` subcommand. Each of the three trace options are described. Depending on the trace level you specify, you will then be prompted for additional information.

VC Trace

If you choose trace option 1, VC trace, you will be prompted for a VC (virtual circuit) number. Enter the number of the VC for which you want trace information. You will then be asked to specify a filter for the trace. You can choose either to trace headers only or to trace full packets. You will also be given the option of specifying a filename for the trace file.

Level 2 Trace

If you choose trace option 2, level 2 trace, you will be prompted for the filter (trace headers only or full packets) and given the option of specifying a file name. No other information is required.

Level 3 Trace

If you choose trace option 3, level 3 trace, you will be prompted for a VC type. Possible responses are `PAD`, to trace only PAD VCs, `SYS`, to trace system-to-system VCs, or `All`, to trace both PAD and system-to-system VCs that are active through the designated DTC and card. You will also need to specify the link name of the X.25 link. You will then be prompted for the filter (trace headers only or full packets) and given the option of specifying a file name.

For a complete description of TermDSM and its use with all DTC connection card options, see *Troubleshooting Terminal, Printer, and Serial Device Connections* manual.

Trace Formatting

The trace file can be formatted with the NMDUMP utility. Enter option 2 at the prompt “Would you like to format a log or trace file” then select subsystem ID 60 for DTC/X.25 Link. For more information, refer to *Using the Node Management Services (NMS) Utilities* manual.

Logging

Logging for host-based X.25 links is enabled and disabled in the NMMGR configuration file, as is the case for other link products. However, host-based X.25 log files are formatted through a tool called EVLOG (you *cannot* use the NMDUMP formatter for host-based log files). See Chapter 8, “Formatting Host-Based X.25 Log Files,” for instructions on using the EVLOG formatter.

Event Log Files

Events are logged to two alternating log files for *each* DTC. When you bring the DTC up, it immediately begins logging to the first log file. The DTC records events to that file until too few bytes are available for the next log record entry. At this point, the DTC begins recording to the second log file. Alternating log files in this manner assures that at least five hundred records are always available for formatting and evaluation.

Log File Name Format

The format of the log file names is as follows:

```
HnnnnnnA.PUB.SYS  
    (first log  
    file)
```

```
HnnnnnnB.PUB.SYS  
    (second log  
    file)
```

All the host-based X.25 log files begin with the letter H. The second through the seventh digits correspond to the last six digits of the DTC address. The A or B as the last character of the file name indicates whether it is the first or the second file.

Each file stores up to 500 records, with each record or packet having a length of 132 bytes.

If you select the file that is currently receiving the events from the DTC, the EVLOG formatter can format and display the events from the DTC as they are logged (Dynamic logging display).

Hewlett-Packard recommends that you treat the files as read-only files. Once you have information that you want to format, copy the log file to another filename and format that file with the EVLOG formatter.

NOTE

Switching to a different file only occurs when the current file runs out of space. If you are concerned about limiting the number of records written and formatted, a timestamp filtering capability is available in the formatter.

2 Preparing to Configure DTCs

This chapter details the information you will need before you can configure the datacommunications and terminal subsystem (DTS) for host-based systems that include X.25 networking. DTS defines the physical connections and configuration parameters for the computer, its DTCs, and all DTC-connected devices. Sample worksheets are included to facilitate configuration.

Hewlett-Packard recommends that you complete the DTS configuration before configuring any NS network capabilities for your system.

This chapter describes how to:

- Plan the DTS configuration.
- Determine terminal and printer characteristics.
- Determine DTC characteristics.
- Determine X.25 network characteristics for both PAD and system-to-system connections.

NOTE

If you are not configuring X.25 networking capabilities on a system using host-based network management, you should use *Configuring Systems for Terminals, Printers, and Other Serial Devices* instead of this manual to configure DTCs and DTC connections.

Plan the Network Configuration

Before you use NMMGR to configure DTS (the DTCs and DTC connections for your system), you must define the physical layout and configuration parameters for the computer, its DTCs, and all DTC-connected devices.

Configuration values that you must determine include a name for the computer and a link name and physical path for the link between the computer and its DTCs. You also need to associate a name with each DTC and define the characteristics of the devices connected to each DTC.

You must also define X.25 network values to be configured for each DTC that contains a DTC/X.25 Network Access card. You can configure each DTC/X.25 Network Access card to allow PAD device connections, system-to-system X.25 connections, or both.

On the pages that follow, information and worksheets are provided to help define these required configuration parameters.

Defining the HP 3000 System

The following configuration parameters are required to define the HP 3000 host for asynchronous device connections.

- Local HP 3000 Node Name The name by which the HP 3000 Series 900 computer is known in your network. The format of a node name is *nodename.domain.organization*, where each field can contain 16 or fewer characters (alphanumeric, underscores, or hyphens). The first character of each field must be alphabetic. For example:
ACCOUNTS.MKT2.HP.
- Link Name The link name that is used by the HP 3000's Datacommunications and Terminal Subsystem (DTS) when device connections are established. It must start with a letter and can be up to eight alphanumeric characters. DTSLINK is the default and should be used for your DTS configuration.
- Physical Path of LAN2C (Slot # of LANIC Card) The location of the LANIC (Local Area Network Interface Controller) card in the system's backplane. The physical path of the card is determined by the location of the card in the back plane. Labels on the system back panel lists the paths for the slots. See the Hardware Installation manual for your system to determine the optimum slot location.

Defining the DTC

The following parameters are required to define each DTC used for connection between the HP 3000 and its asynchronous devices (terminals and printers). You can use the DTC Configuration worksheets as shown later in this chapter to record the values selected for each DTC.

- DTC Name** A name for the DTC, up to eight alphanumeric characters, beginning with a letter. Each DTC configured on the system must have a unique name.
- DTC LAN Station Address** The local station address of the DTC. The HP J2070A (DTC 72MX) and J2062A/J2063A/J2064A (DTC 16iX/16MX/16RX) station address is printed on the label located at the lower center of the back panel of the DTC. The HP 2345B (DTC 48) station address is printed inside the front cover. The HP 2340A (DTC 16) station address is printed on the label located on the upper right-hand corner of the back panel of the DTC.
- A typical LAN address looks like: 08-00-09-1A-11-11.
- If a valid LAN address is entered, then this DTC will be a **managed** DTC on this system. If you want to define this DTC as a **non-managed** DTC on this system, then use the value 00-00-00-00-00-00 as the LAN address. In this case you will only be allowed to define NAILED devices for all the connector cards.
- To configure a DTC 16RX for access to an HP 3000 in an MPE/iX host-based management environment, use the value 00-00-00-00-00-00 as the DTC 16RX LAN address. Configuration of the DTC 16RX is done on the HP 9000 host using DTC 16RX Manager.
- DTC Node Name** A fully qualified node name of the DTC, in the form *nodename.domain.organization*, where each field can contain 16 or fewer characters (alphanumeric, underscores, or hyphens). The first character of each field must be alphabetic.
- Assign meaningful node names. For example, ACCTS.IXNET.ACCTG and PAY.IXNET.ACCTG are meaningful names for two nodes on the same Local Area Network (LAN) within the accounting department. One node (ACCTS.IXNET.ACCTG) is used by the accounts staff. The other node (PAY.IXNET.ACCTG) is used by the payables staff. The *domain* field is the same because the nodes belong to the same network. The *organization* field is the same because the nodes belong to the same internetwork.
- If this DTC is a **non-managed** DTC then the DTC Node Name must match the Node Name for the DTC on the system where this DTC is a managed DTC being shared.
- DTC IP Address (optional)** The internet protocol (IP) address of the DTC. The IP address is optional. It is used if your HP 3000 is configured as part of a network and you want the DTC to be able to respond to PING/iX requests.

An IP address is made up of a network portion and a node portion. The address is formed as four fields of decimal numbers where each number is a value ranging from 000 to 255.

The following shows examples of three classes of IP addresses:

Class A: nnn.xxx.xxx.xxx

Class B: nnn.nnn.xxx.xxx

Class C: nnn.nnn.nnn.xxx

where nnn represents the network portion and xxx represents the node portion of the address. The class of the IP address is determined by the value of the left most group of nnn and has the following ranges:

Class A: 001–126

Class B: 128–191

Class C: 192–254

Network and node portions of all zeroes or 255 are not allowed for DTC addresses. These are special values. All devices configured with the same network portion are considered to be on the same network. The node portion must be unique for all nodes on a network.

You can obtain a Class B or Class C IP address from:

Government Systems, Inc.
Attn: Network Information Center
7990 Boeing Ct.
Vienna, VA 22183
(800) 364-3642 or FAX: (703) 821-6161

For DTC 16RX access to an HP 3000 in an MPE/iX host-based management environment, the IP address of the DTC16RX is configured using the DTC 16RX Manager on the HP 9000 host and not on the HP 3000. Any value entered for the DTC 16RX in NMMGR will be ignored.

DTC Cards (or DTC Boards) The number and types of connector cards in the DTC. (The cards are also referred to as **boards**.) DTC 16 can have up to 2 asynchronous cards and 1 DTC/X.25 Network Access card, DTC 48 up to 6 cards, and DTC 72MX up to 4 cards.

DTC 16iX/16MX/16RX has its two port connectors built directly onto its backplane for support of up to 16 asynchronous devices. It does not have removable cards; you do not specify the number or type of cards for a DTC 16iX/16MX/16RX.

The valid card types for DTC 72MX are:

L	for the LAN card, pre-installed in slot 0
A	for asynchronous processor boards (up to 24 ports per card for direct and modem connections)
X	for DTC/X.25 Network Access cards (for X.25 connection).

The valid card types for DTC 16 and DTC 48 are:

- D for direct connect cards (up to 8 ports per card),
- M for modem connect cards (up to 6 ports per card),
- X for DTC/X.25 Network Access cards (for connection)

DTC Event Logging For each DTC, logging class 1 logs catastrophic events and will always be enabled. Class 2 logs critical events; class 3 logs non-critical events; classes 4 and 5 log informative events and class 6 provides statistical information. It is recommended that you only enable classes 4 through 6 when you encounter problems, because they will generate and log a substantial number of events. The log files could use a significant amount of disk space.

Event logging classes do not apply for access to an HP 3000 in an MPE/iX host-based management environment using a DTC16RX; any values entered in these fields for the DTC 16RX will be ignored.

Defining the DTC Connector Cards

Connector cards (also called **boards**) in the DTC allow terminals, printers, and other serial devices to be connected to the DTC for communication with an HP 3000 Series 900. You can use the DTC Card Configuration worksheet as shown later in this Chapter, to record the values selected for each DTC card.

For each connector card in a DTC, you must define the characteristics of its ports for connection to terminals, printers, and other serial devices. The following parameters are required.

- Card Number** The card number specifies which card in the DTC is being configured.
- DTC 72MXs allow up to 3 connector cards plus a LAN card that is preinstalled in slot 0; the connector cards are labeled card # 1 through 3.
- DTC 48s allow up to 6 connector cards, labeled card # 0 to 5.
- For the DTC 48 and 72MX, card # 0 resides at the bottom of the DTC and card # 1 resides above it, and so on.
- DTC 16s allow 2 connector cards, labeled card # 0 and card # 1, with the third slot (card # 2) reserved for a DTC/X.25 Network Access card. When looking at the rear panel of the DTC, card # 0 is located on the left, card # 1 is in the middle, and card # 2 is on the right.
- Note that DTC 16iX/16MX/16RX does not have connector cards. Its port connectors are built directly onto its backplane.
- Direct or Modem Connect** You must specify whether a direct or modem connection is used for the ports on a card. Direct connections are used for devices that reside near the DTC. Modem connections are used for communications over telephone lines.
- Port Number** Each port on a connector card is assigned a number, starting with port # 0 on the left most side of the card.
- Logical Device Number (LDEV)** All I/O devices on the MPE/iX system are assigned an ldev number. Devices with ldevs permanently assigned to them are called nailed devices. Printers and UPSs, as well as devices that will be programmatically accessed, must be nailed devices. Each nailed ldev number assigned in NMMGR must be unique. For host-based DTC management, you may have both direct connect and PAD ports that are configured as non-nailed devices. Connections from non-nailed devices are assigned an ldev from a pool of available ldev numbers for the duration of the device connection to the system.
- For Async cards on a managed DTC, you may assign an ldev of (-1) to a port with a TERMINAL profile type. A port with an ldev of (-1) is a non-nailed ldev and the DTC port will be downloaded with the parameters in the specified profile. If you specify ldev of (0) and no profile, this is also a non-nailed port and the port will be downloaded with the parameters in the profile configured as the Non-nailed terminal profile name on the Host Configuration screen.

Terminal and Printer Profiles Each port needs to be assigned a profile. A profile defines a set of characteristics for a terminal, printer, or another serial device. A profile can be of five types: **terminal profile**, **printer profile**, **PAD terminal profile**, **PAD printer profile**, or **Host port profile**. See *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for more information on the characteristics determined by the profiles, and a list of the profiles that are supplied in the sample configuration file.

If the characteristics provided in the sample profiles are different from those required by the terminals and printers connected to your DTCs, then you can define new profiles.

It is suggested that you use default profiles TR10D96 for direct connect terminals and PR18D96 for direct connect printers or PR22D24 for HP printers with status checking. For PAD terminals and printer, use the defaults TR24PAD and PR26PAD, respectively. For UPSs, use the default profile UP10D12.

The name of the profile can be up to eight characters long and must start with a letter, followed by letters and numbers. At any one time, up to 1024 profiles can be configured per system.

Determine X.25 Connection Characteristics

You must define characteristics for the X.25 PAD or system-to-system connections you are configuring. Values need to be configured for each DTC/X.25 Network Access card mounted in the DTCs for the system you are configuring.

Whether you are configuring system-to-system, PAD connections, or both, you will need to define values for levels 1, 2, and 3 of the X.25 network. Most of these values are defined by your X.25 network subscription and you can transfer these values directly to the DTC X.25 Card Configuration — Level 1 and 2 Worksheet shown later in this Chapter, and the DTC X.25 Card Configuration — Level 3 and Miscellaneous Worksheet shown later in this Chapter.

If you are configuring system-to-system connections for an X.25 network, you will need to define an X.25 link name, the maximum number of SVCs, and remote X.25 addresses and security designations for each MPE system that will be allowed access through each X.25 card. Once you have decided on your system-to-system configuration, you can use the DTC X.25 Card Configuration — System-to-System Worksheet shown later in this Chapter.

If you are configuring nailed PAD connections, you can use the DTC X.25 Card Configuration — Nailed PAD Connections Worksheet shown later in this Chapter.

If you are defining nailed PAD connections, you may also wish to configure PAD Incoming Security. PAD Incoming Security is configured by mapping X.25 addresses of remote PAD devices to Access Lists. The Access lists contain a list of the local systems to which the calling address is allowed access. Once you have decided on the security to be configured, use the DTC X.25 Card Configuration – PAD Access Lists Worksheets shown later in this Chapter, to construct the security lists.

Configuring Worksheets

Before you start NMMGR, use the worksheets provided here to gather the necessary configuration information. Make copies of these worksheets and fill in the parameter information, then use the worksheets to guide you through configuration in NMMGR. Chapter 3 “Configuring DTCs Step-by-Step” contains a description of all the fields referenced in these worksheets.

Node Names and PAD Access List Worksheets

List the node names of *all* the system that will be allowed access through the PAD Access Lists. Up to 32 nodes can be entered in this table. Only those nodes added to this list will be allowed to be defined in the following PAD Access list.

Figure 2-1 **DTS Node Names Worksheet**

DTS Node Names Worksheet	
Node names	

Use additional worksheets if you have more than 8 systems.	

PAD Access List Worksheet

From the list of nodes in the Node Names list, enter those systems that will be allowed access for the PAD addresses configured with this list in the PAD Incoming Security worksheet. You can define up to 10 access lists, each with a maximum of 32 nodenames.

Figure 2-2 **PAD Access List Worksheet**

PAD Access List Worksheet	
List Name: _____	List Password: _____
Node names	

Use additional worksheets if you want more than 8 systems defined in this list.	

DTC X.25 Card Configuration — Level 1 and Level 2 Worksheet

Fill out worksheet as shown in DTC X.25 Level 1 and 2 Worksheet for each DTC X.25 Network Access card you are configuring.

Figure 2-5 DTC X.25 Card Configuration -- Level 1 and 2 Worksheet

DTC X.25 Card Configuration Level 1 and 2 Worksheet	
DTC Name: _____	Card Number: _____
Level 1	
Line speed _____	
Level 2	
Packet Switched Network Name _____	
CCITT X.25 Standard _____	(1980 or 1984)
Frame size (N1) _____	(23... 4103 bytes)
Retransmission timer (T1) _____	(milliseconds)
Timer T3 (if using 1984 CCITT) _____	(0... 1000 seconds)
Retransmission count (N2) _____	(0... 255)
Unacknowledged frame number (K) _____	(1... 7)
Modulo _____	(8 or 128)

DTC X.25 Card Configuration – Level 3 Worksheet

Fill out worksheet as shown in DTC X.25 Card Level 3 Worksheet for each DTC X.25 Network Access card you are configuring.&

Figure 2-6 DTC X.25 Card Configuration Level 3 Worksheet

DTC X.25 Card Configuration Level 3 Worksheet					
DTC Name: _____			Card Number: _____		
X.25 card address: _____					
Logical Channel Identifier (LCI) Range			Default Flow Control		
	Low	High		In	Out
PVCs	_____	_____	Packet size	_____	_____
One-way incoming SVCs	_____	_____	Window size	_____	_____
Two-way SVCs	_____	_____	Throughput class	_____	_____
One-way outgoing SVCs	_____	_____			
Network Subscribed Facilities					
Flow control negotiation	_____	(Y/N)	Throughput class negotiation:	_____	(Y/N)
Use of D-bit	_____	(Y/N)	Extended packet sequence numbering	_____	(Y/N)

DTC X.25 Card Configuration — System-to-System LUG Worksheet

Fill out worksheet as shown in DTC X.25 Card Configuration System-to-System LUG Worksheet for each DTC X.25 Network Access card for which you are configuring system-to-system connections.

Figure 2-7 DTC X.25 Card Configuration -- System-to-System LUG Worksheet

DTC X.25 Card Configuration System to System LUG Worksheet					
DTC Name: _____			Card Number: _____		
<u>Address</u>	<u>Security</u>	<u>Address</u>	<u>Security</u>	<u>Address</u>	<u>Security</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Use additional sheets if you need to list more X.25 addresses.

DTC X.25 Card Configuration -- System-to-System Switching Worksheet

Fill out worksheet as shown in DTC X.25 Card Configuration System-to-System Switching Worksheet for each DTC X.25 Network Access card for which you are configuring system-to-system connections.

Figure 2-8 DTC X.25 Card Configuration System-to-System Switching Worksheet

DTC X.25 Card Configuration System to System Switching Worksheet				
DTC Name: _____		Card Number: _____		
System Node Names		System X25link	Max SVC	System X25address
_____		_____	_____	_____
_____		_____	_____	_____
_____		_____	_____	_____
_____		_____	_____	_____
_____		_____	_____	_____
_____		_____	_____	_____
_____		_____	_____	_____
_____		_____	_____	_____
Use additional sheets if you need to list more switching table entries.				

DTC X.25 Card Configuration – Nailed PAD Worksheet

Fill out worksheet as shown in DTC X.25 Card Configuration Nailed PAD Worksheet for each DTC X.25 Network Access card for which you are configuring nailed PAD connections.

Figure 2-9 DTC X.25 Card Configuration Nailed PAD Connections Worksheet

DTC X.25 Card Configuration Nailed PAD Connections Worksheet				
DTC Name: _____			Card Number: _____	
Ldev	Profile	Device Name	Remote Device (PAD) X.25 Address	CUG No. (Optional)
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Note: The X.25 address and CUG fields do not apply if this DTC is a non-managed DTC on the system where this configuration is entered.

Use additional sheets if you need to list more nailed PAD connections.

DTC X.25 Card Configuration — PAD Switching Worksheet

Fill out worksheet as shown in DTC X.25 Card Configuration PAD Security Worksheet for each DTC X.25 Network Access card for which you are configuring PAD switching connections.

Figure 2-10 DTC X.25 Card Configuration PAD Switching Worksheet

DTC X.25 Card Configuration PAD Switching Worksheet	
DTC Name: _____	Card Number: _____
Maximum number of PAD Connections: _____	
System X.25 Address	System Nodenames
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
Use additional sheets if you need to list more PAD switching entries.	

DTC X.25 Card Configuration — PAD Security Worksheet

Fill out worksheet as shown in DTC X.25 Card Configuration PAD Security Worksheet for each DTC X.25 Network Access card for which you are configuring PAD security.

Figure 2-11 DTC X.25 Card Configuration -- PAD Security Worksheet

DTC X.25 Card Configuration PAD Security Worksheet			
DTC Name: _____		Card Number: _____	
Device X.25 Address	Access List Name	Device X.25 Address	Access List Name
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Use additional sheets if you need to list more table entries.			

Configuring With NMMGR

NMMGR, the Node Management Configuration Manager, is the utility used by HP 3000 Series 900 to configure asynchronous device connections. The parameters described previously in this chapter are entered in NMMGR through a screen-by-screen user interface. These parameters are then stored by NMMGR into the HP 3000 network configuration file `NMCONFIG.PUB.SYS`. You must have Node Administrator (NA) or Node Manager (NM) capability to run NMMGR. Additionally, you must have System Manager (SM) capability to perform automatic SYSGEN cross-validation. You must be logged on the SYS account to modify the configuration file.

To start NMMGR, type the following command at the MPE prompt:

```
NMMGR.PUB.SYS
```

Figure 2-1 shows the screen flow for configuring terminals, printers, and other serial devices in NMMGR. Use the function keys that are located at the bottom of each screen to visit the next screen on the flowchart. The **[Prior Screen]** key can be used to display the screen most recently visited prior to the current screen as shown in the flowchart.

Chapter 3, “Configuring DTCs Step-by-Step,” shows the step-by-step process for configuring terminals, printers, and other serial devices using NMMGR, for host-based management.

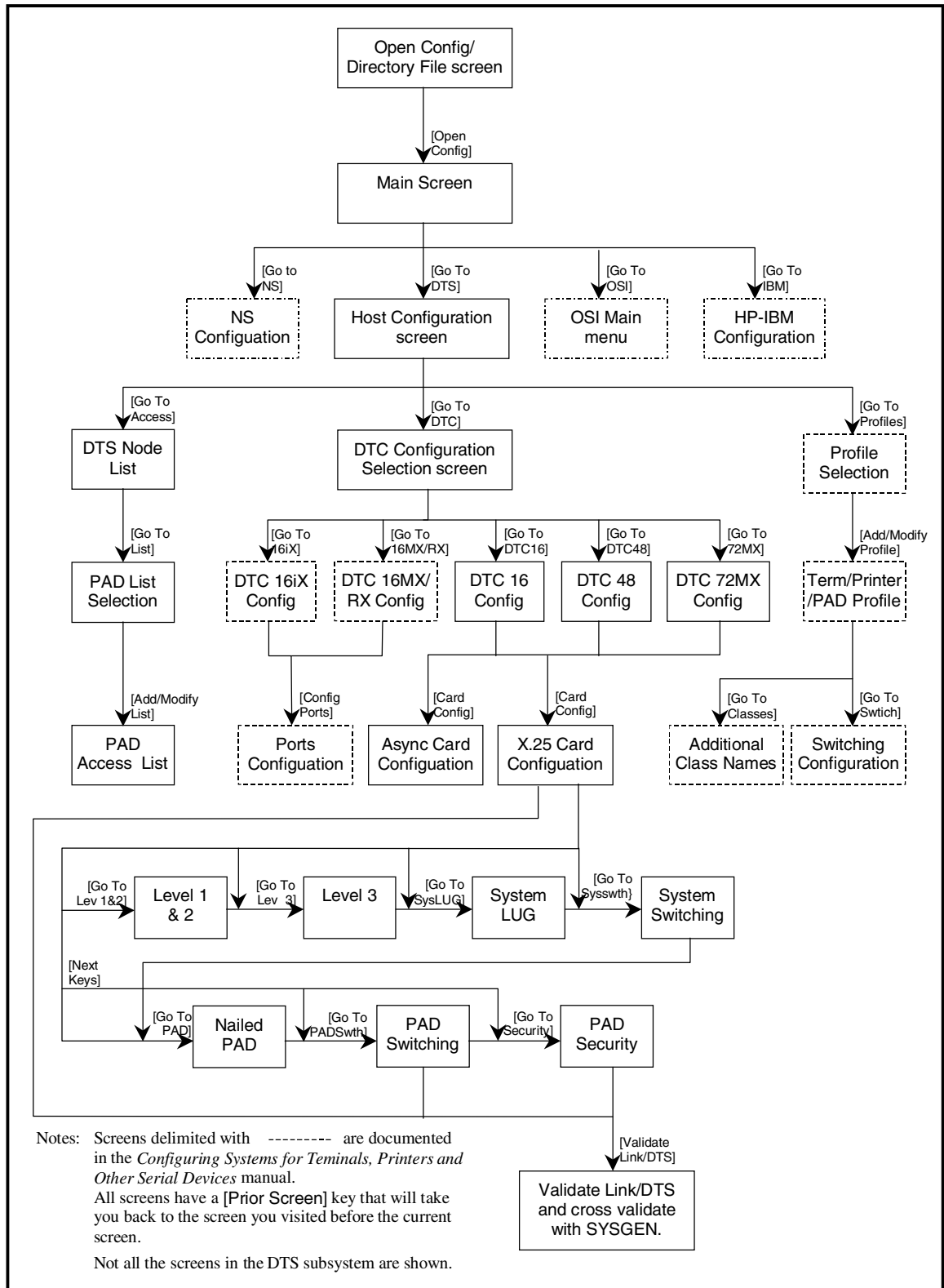
NOTE

You can use the NMMGR maintenance mode interface to manage network directory and configuration files. You can also use the interface to generate job streams to update remote network directory and configuration files. Refer to the *Configuring Systems for Terminals, Printers, and other Serial Devices* manual for more information on the maintenance mode commands and the `SUMMARYCONF` command.

NOTE

In addition to the DTS subsystem, NMMGR is used to configure other network subsystems on the HP 3000 Series 900, such as NS (Network Services), IBM, and OSI. NMMGR provides many functions and utilities that are beyond the scope of this manual. Refer to *Using the Node Management Services* for detailed information on NMMGR.

Figure 2-12 NMMGR DTS Screen Flow



3 Configuring DTCs Step-by-Step

This chapter provides step-by-step instructions for configuring Datacommunications and Terminal Controllers (DTCs) for systems using host-based network management. If you are using this manual to configure DTCs, it is assumed that X.25 network connections will be part of the host-based configuration.

Before using NMMGR to configure DTCs, you should complete the worksheets provided. See Chapter 2, “Preparing to Configure DTCs,” for more information on planning your configuration and filling out the configuration worksheets.

This chapter includes step-by-step instructions to help you perform the following tasks:

- Configure host information
- Configure PAD Access Lists
- Configure information for each direct connect and modem card contained in any DTC connected to the system.
- Configure information for each DTC/X.25 Network Access card contained in any DTC connected to the system, including:
 - X.25 level 1, 2, and 3 parameters
 - System-to-system local user group information
 - Nailed PAD connections and PAD security
 - PAD switching information
 - PAD incoming security information
 - System-to-system switching information
- Validate your network configuration (SYSGEN cross-validation is done automatically within NMMGR).

NOTE

If you are configuring a system that does not require X.25 system-to-system or PAD configuration, use *Configuring Systems for Terminals, Printers, and Other Serial Devices* instead of this manual.

Network Configuration Overview

Information required for network configuration on the host is contained in one file. The name of this configuration file is `NMCONFIG.PUB.SYS`.

When building a new configuration file, it is not necessary to define every field. This is because a sample configuration file is supplied with the MPE/iX operating system. The sample configuration file is called `NMSAMP1.PUB.SYS`. Hewlett-Packard recommends using the sample file as a template for initial configuration.

CAUTION

Use the sample configuration file for first time configurations only. Information previously configured using `NMMGR`, and stored in `NMCONFIG.PUB.SYS`, will be overwritten when the sample file is copied to `NMCONFIG.PUB.SYS`.

The `NMCONFIG.PUB.SYS` file can be modified using `NMMGR`. Only one configuration file can be active at a time and the active file must be called `NMCONFIG.PUB.SYS`. Accordingly, modified or new configuration files must be copied to `NMCONFIG.PUB.SYS` before they can be used by the system.

CAUTION

If ANY other configuration file is copied to `NMCONFIG.PUB.SYS` or `NMCONFIX.PUB.SYS` then dynamic configuration will be disabled until a DTS shutdown and restart is done or the system is rebooted. This includes other files from the same system or files copied from other systems.

Copy the Sample File

Use `NMSAMP1.PUB.SYS` as a template for first time configuration. This file is supplied with the MPE/iX operating system. Do not modify `NMSAMP1.PUB.SYS`. Instead, copy the sample configuration file into `NMCONFIG.PUB.SYS` and then modify the file as necessary.

To copy `NMSAMP1.PUB.SYS` into `NMCONFIG.PUB.SYS`, enter these commands at the MPE/iX prompt (:):

```
HELLO MANAGER.SYS,PUB
FILE CONFIG=NMCONFIG.PUB.SYS;DEV=1
FCOPY FROM=NMSAMP1.PUB.SYS;TO=*CONFIG;NEW
```

NOTE

“DEV=1” must be specified in the `FILE` equation to specify that the `NMCONFIG.PUB.SYS` file is to be stored to system disk 1.

Modify the Network Management Configuration File

The network management configuration file (`NMCONFIG.PUB.SYS`) contains information that is referenced during system boot-up. A step-by-step procedure for creating or updating the host's network management configuration file follows.

NOTE

Before modifying the `NMCONFIG.PUB.SYS` file, make a backup copy of it. If the modifications made to the configuration file are successful, purge the backup copy.

Step 1: Begin the Configuration Process

Run the NMMGR program. Node manager (NM) or network administrator (NA) capabilities are required to run this program. To run NMMGR, enter the following command at the MPE prompt and then press the **[Return]** key.

```
NMMGR . PUB . SYS
```

NOTE

You must be logged on to the SYS account to modify the configuration file.

Step 2: Open the Network Management Configuration File

The Open Configuration/Directory File screen is displayed (Figure 3-1). This screen lets you specify the configuration and backup file names.

Figure 3-1 Open Configuration/Directory File Screen

NMMGR/3000 (V.uu.ff) #1 Open Configuration/Directory File
Enter a file or directory name and press the corresponding function key.
Command:

Configuration file name [NMCONFIG.PUB.SYS]

Backup configuration file name [NMCBACK.PUB.SYS]

Network directory file name [NSDIR.NET.SYS]

If a write access password has been assigned, you must enter the password to modify the configuration file.

Write access password []

Open Config Open Directry Help Exit Program

Follow the steps listed here to enter data for this screen. Refer to “Fields” subsection on the next page for detailed information about each field on the screen.

1. NMCONFIG.PUB.SYS is the name required by the software. Verify that this name is displayed in the Configuration file name field.
2. Verify that the name of the correct backup configuration file is in the Configuration file name field. The default is NMCBACK.PUB.SYS.
3. Press the **[Open Config]** function key.
4. If the configuration file you are opening does not exist, the following message will appear on the message line at the top of the screen:

Config file does not exist; press Open Config again to create it.

Press the **[Open Config]** key again to confirm the creation of the file you specified.

Fields

Configuration file name The only valid configuration file name the system recognizes for use by the network subsystem is NMCONFIG.PUB.SYS.

You can create or modify a configuration file using a different name and save it as an **offline configuration file**. You can use offline configuration files as a means of creating and storing configurations that you want to use in the future. When you are ready to use an offline configuration file, rename it as `NMCONFIG.PUB.SYS`, validate within NMMGR (SYSGEN cross-validation is done automatically within NMMGR). Use `DTCCNTRL` to shutdown and restart DTS or reboot the system.

`Backup configuration file name` A backup file name must be specified whenever a configuration file is opened or created. The default backup configuration file name is `NMCBACK.PUB.SYS`. The backup file will be automatically updated with the contents of the configuration file each time the configuration file is successfully validated.

`Network directory file name` The Network directory file must be configured for each new X.25 node (unless you will only be accessing the node using direct level 3 access). This field is only used for X.25 network management. The network directory contains information that one X.25 node needs in order to communicate with other X.25 nodes. The only network directory file name supported by HP is `NSDIR.NET.SYS`.

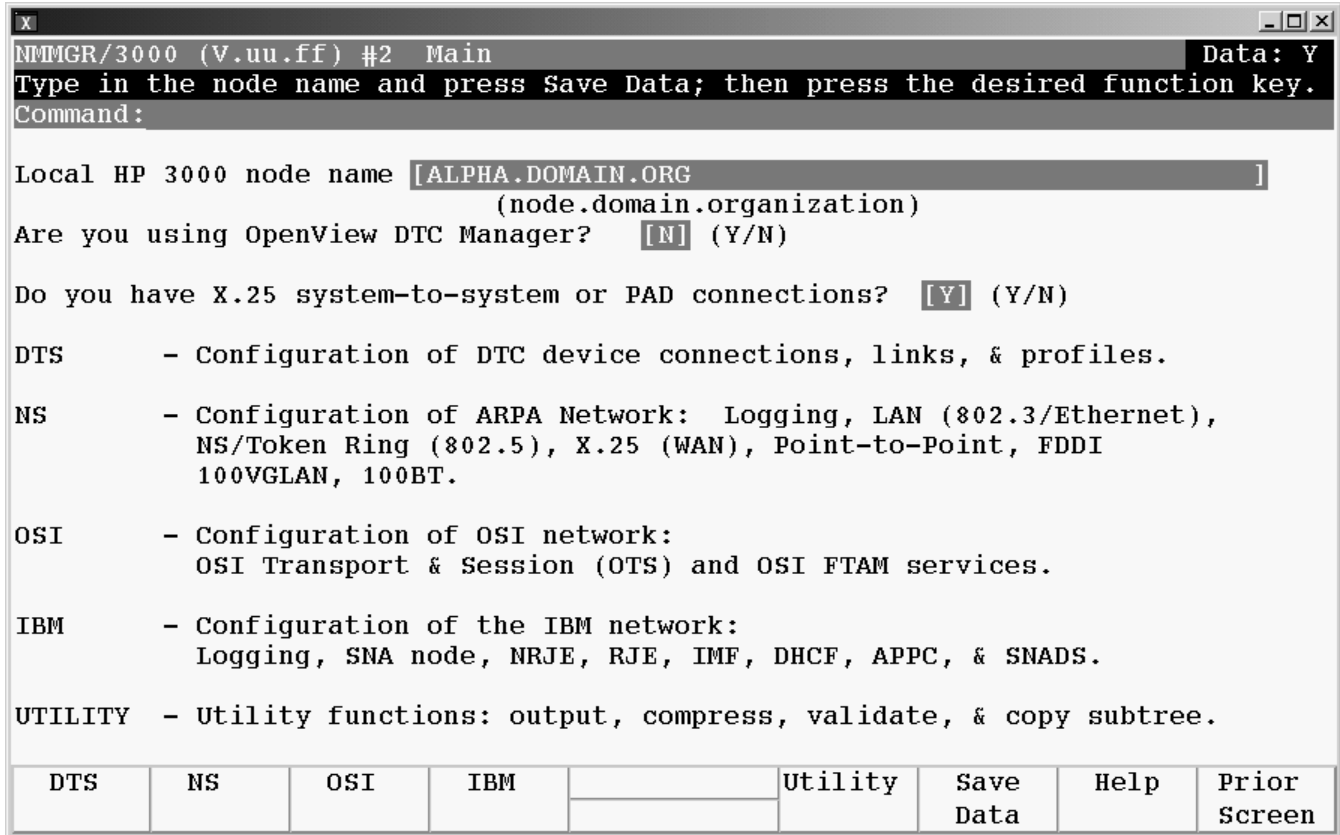
`Write access password` The password is an optional feature. If a password has been assigned, you must enter it in the password field to update the configuration file. It is possible to open the file without using an assigned password, but the file will be in read only mode and NMMGR will not accept any changes.

If a password has not been assigned, you should ignore the password field. If you want to assign a password for the system you are configuring, refer to *Using the Node Management Services (NMS) Utilities* manual.

Step 3: Configure the Local Node Name

The Main screen is displayed after you press the [Open Config] key (Figure 3-2). This screen lets you specify the HP 3000 host's name. It also asks whether you are using the HP 3000 host or an OpenView Windows Workstation (PC) for DTC management, and if you are using X.25 or PAD.

Figure 3-2 Main Screen



1. Assign a node name to the HP 3000 host in the "Local HP 3000 node name" field. Use the format *nodename.domain.organization*.
 If your HP 3000 host is the only computer in your network, you may enter any node name. If you have several computers on your network, you must make sure the node names for each host are unique.
2. In the field after the question, "Are you using the OpenView DTC Manager?", enter an N.
 This means that you will **not** use the OpenView DTC Manager (that is, use a PC to manage your DTCs).
 Instead, you will use the HP 3000 host to manage your DTCs. If you specify "Y" for using OpenView DTC Manager refer to the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual.
3. In the field after the question, "Do you have X.25 system-to-system or PAD connections?", enter an Y for yes.

4. After you enter the information on the screen, press the **[Save Data]** function key to save your entries.
5. After the data is saved (the Data flag in the upper right-hand corner is Y), press the **[DTS]** function key.

Fields

Local HP3000 node name The local HP 3000 node name is the name by which the HP 3000 Series 900 computer is known in the network. The format of a node name is *nodename.domain.organization* where the total number of characters is 50 or fewer, and each field contains 16 or fewer characters (alphanumeric, underscore, or hyphens). The first character of each field must be alphabetic.

The *nodename* portion of each node name must be unique within the node's network. The *nodename.domain* portion of each node name must be unique within the internetwork. HP recommends that all nodes on the network be assigned the same domain and organization.

Assign meaningful node names. For example, MKTG.ITG.HP and LAB.ITG.HP are meaningful names for two nodes on the same Local Area Network (LAN) within Hewlett Packard. One node (MKTG.ITG.HP) is used by the marketing department. The other node (LAB.ITG.HP) is used by the lab. The *domain* field is the same because the nodes belong to the same network. The *organization* field is the same because the nodes belong to the same internetwork.

Are you using OpenView DTC Manager? If you answer yes (Y) to this question, NMMGR assumes you are using a PC to manage your system and takes you to the corresponding set of screens. If you answer no (N), NMMGR assumes you are using host-based network management and takes you to the set of screens required for host configuration. If you are using this manual, you should enter an N in response to this question. (If you *are* using a PC to manage your network, see *Configuring Systems for Terminals, Printers, and Other Serial Devices* for the correct configuration procedures.)

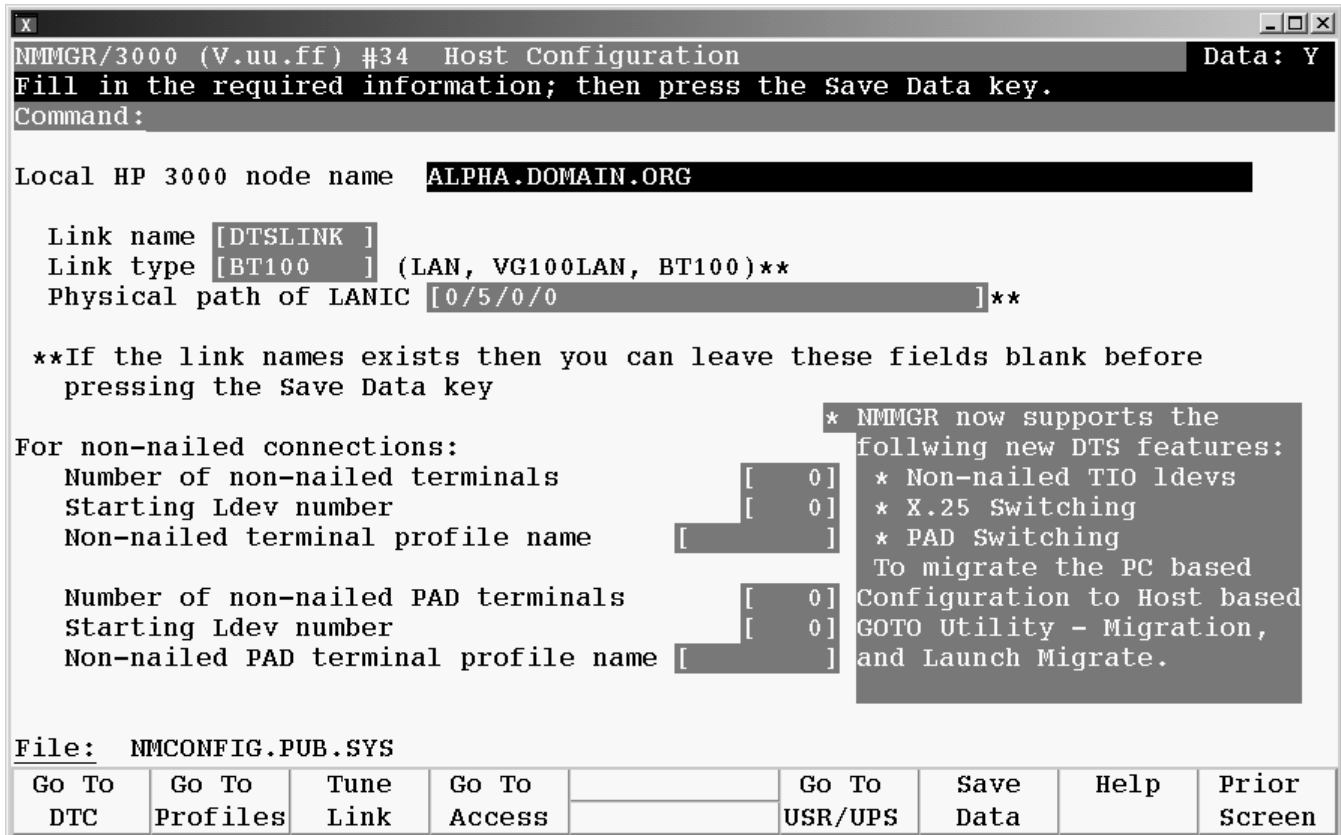
Do you have X.25 system-to-system or PAD connections? If you answer yes (Y) to this question, NMMGR assumes you are configuring X.25 connections and takes you to the set of screens required to configure DTC X.25 Network Access Cards. If you answer no (N), NMMGR assumes you have no need to configure X.25 connections and takes you to a different set of screens. If you are using this manual, you should enter a Y in response to this question. (If you are *not* configuring X.25 connections, see *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for the correct configuration procedures.)

Step 4: Configure the Link

The Host Configuration screen is displayed when you press the [DTS] function key at the Main screen (Figure 3-3).

This screen is used to configure the Datacommunications and Terminal Subsystem (DTS) on the HP 3000. DTS defines the interaction between the system and any asynchronous devices, such as terminals and printers.

Figure 3-3 Host Configuration Screen (Host-Based)



1. "Local HP 3000 node name" is a display-only field. Verify that it is correct.
2. Enter the name of the LINK that you want to be used by the HP e3000 DTS subsystem. DTSLINK is the default.
3. Enter the Link type of the LAN card you will use for the interface. If the LINK name is already defined in the LINK tree of the NMCONFIG file, then leave this field blank.
4. In the "Physical path of LANIC" field, type the slot number for the LANIC card in the host. See the default list for commonly used slot numbers. If the LINK name is already defined in the LINK tree of the NMCONFIG file, then leave this field blank.
5. Verify that the cursor is in the Number of non-nailed terminals field. Type the number of non-nailed terminals, as listed on the worksheets. This is the maximum number of terminals, not configured as nailed terminals, that can logon to the computer.

Modify the Network Management Configuration File

6. Verify that the cursor is in the `Starting Ldev Number` field. Type in the ldev number where the non-nailed pool should start. The non-nailed devices will be configured with the starting ldev number and higher.

For example, if the number of ldevs is 2 and the starting ldev number is 200, then the non-nailed ldevs would be 200 and 201. If 201 is already configured as a nailed device then the non-nailed devices would be 200 and 202.

7. Verify that the cursor is in the `Non-nailed terminal profile name` field. Type the name of the terminal profile that the non-nailed terminals will use, as listed on the worksheets.

8. Repeat paragraphs 4 through 6 for the PAD fields. No additional configuration is needed for non-nailed connections.

9. Press the **[Save Data]** function key.

If you don't want to configure PAD incoming security, press the **[Go to DTC]** function key to skip to Step 8: Select DTC Type. If you do want to configure PAD Incoming Security and create PAD Access lists, then press the **[Go to Access]** function key and continue to Step 5: Configure PAD Node Names List.

NOTE

The **[Go To USR/UPS]** key takes you to the screen to configure the HP Support Modem Port Screen. This screen is used to configure the ldev, the line speed and parity, and the Modem type, for the Support Modem Port. The default ldev number assigned is 21. The configuration of user port is only supported for the NIO LAN console card (for example, HP 3000 Series 9X7 and 9X7 LX) and the N and A Class systems. Refer to the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for more information on the user port.

NOTE

On the HP Support Modem Port screen is the key **[Go To UPS Port]** which takes you to the Uninterruptible Power Supply Port Screen where you can configure the parameters for the Uninterruptible Power Supply Port. This screen is used to configure the ldev number, line speed, and parity on the port to support an uninterruptible power supply (UPS) connection. The default ldev number is 22. This port is available and supported on HP 3000 Series 9X8 and the N and A Class systems. Refer to the *Configuring Systems for Terminals, Printers, and Other Serial Devices* and to *Performing System Manager Tasks* for more information on the UPS.

A UPS can also be connected to a DTC port via a configuration process that does NOT use the **[Go To UPS Port]** key. Refer to the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for information on how to connect a UPS to a DTC port.

Fields

This screen is used to configure the information that applies to the host system. This information defines the interaction between the system and its asynchronous devices, such as terminals and serial printers.

`Local HP 3000 node name` For display only. The local node name is configured on the Main screen.

`Link name` The link name that will be used when device connections, including PAD device connections, are established. It must start with a letter and can be up to eight alphanumeric characters. (Note that this link name is different from the X.25 link name that you will configure on the X.25 Configuration screen during NS configuration.) The default is DTSLINK

Physical path of LANIC This is the location of the DTS LANIC in the system's backplane.

The default physical path (slot numbers) for HP 3000 computers are listed below. These defaults optimize performance and use of the computer's cabinet space. Before moving the LANIC into another slot, consult an HP representative.

Number of non-nailed terminals The number of non-nailed terminals that will be allowed to establish connections with this system from terminals connected to DTC ports.

Starting ldev number The non-nailed ldevs will be configured on this ldev number and higher that are not already configured via SYSGEN, or as a nailed DTS device.

Non-nailed terminal profile name The terminal profile that will be used for all non-nailed TIO connections accepted by the system. The profile must be of type `TERMINAL` that defines the terminal type as 10.

Number of non-nailed PAD terminals The number of non-nailed PAD terminals that will be allowed to establish connections with this system over an X.25 network.

Starting ldev number The non-nailed ldevs will be configured on this ldev number and higher that are not already configured via SYSGEN, as nailed DTS device or a non-nailed TIO terminal.

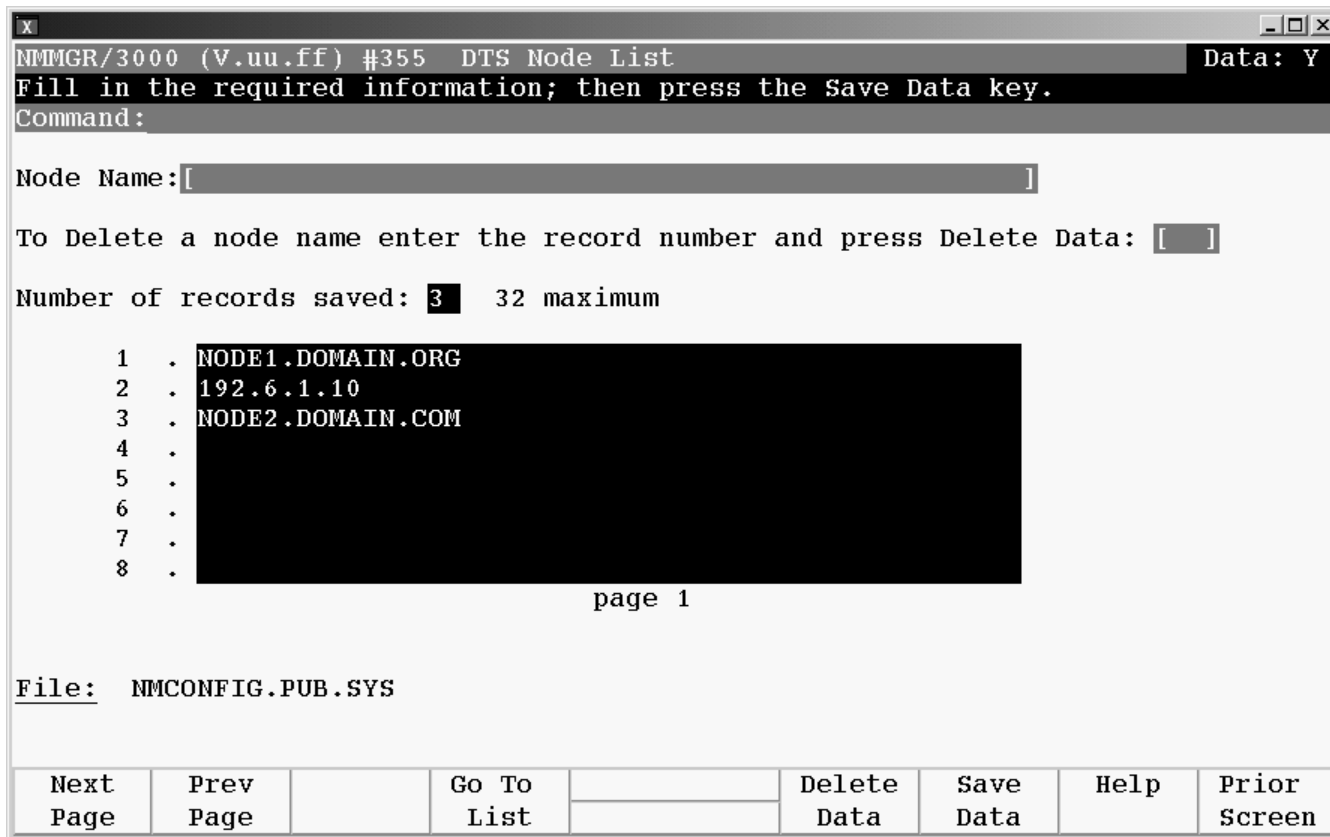
Non-nailed PAD terminal profile name The terminal profile that will be used for all non-nailed PAD connections accepted by the system. The profile must be of type `PADTERM` that defines the terminal type as 24.

Step 5: Configure PAD Node Name Lists

The DTS Node List screen is displayed after you press the **[Go to Access]** key at the Host Configuration Screen. This is where you enter all the node names or IP address of all the systems that you will want to specify in the PAD Access Lists.

PAD Node Names and Access Lists need to be configured only if you are going to configure PAD Incoming security. They are used with PAD Support configurations to restrict remote access (via PAD Support) to local systems. The names of all the nodes to be access must first be entered into the name names list. The access lists are subsets of the nomenclatures list, only nodes that appear in the nomenclatures list can appear in an access list. You can enter up to a maximum of 32 node names.

Figure 3-4 PAD Nodes Names Lists



1. Enter the node name of the desired system in the Node Name field and press **[Save Data]**. The node name will be added to the end of the list of node names. Each node must be entered one at a time.

The node name can be an NS node name of the format *nodename.domain.organization*, or an IP address of the for *xxx.xxx.xxx.xxx*.

2. To delete a node from the list, enter the record number of the node to be deleted and press the **[Delete Data]** key.
3. If you enter more than 8 nodes and want to see the other parts of the list, press the **[Next Page]** and **[Prev Page]** keys as needed to see the desired portion of the list.

4. When you have entered all the desired node names, press the **[Go to List]** key to begin defining the PAD access lists. Proceed to step 6: Create PAD Access Lists.

Fields

Node Name	The local NS node name that the system is known by on the network or the IP address that is configured for that node. The format of the NS node name is nodename.domain.organization. The format of IP is xxx.xxx.xxx.xxx where xxx is a number from 1 to 255. You can enter a maximum of 32 node names.
Press Delete Data	This field designates the record number of the node name that will be deleted when the [Delete Data] function key is pressed.

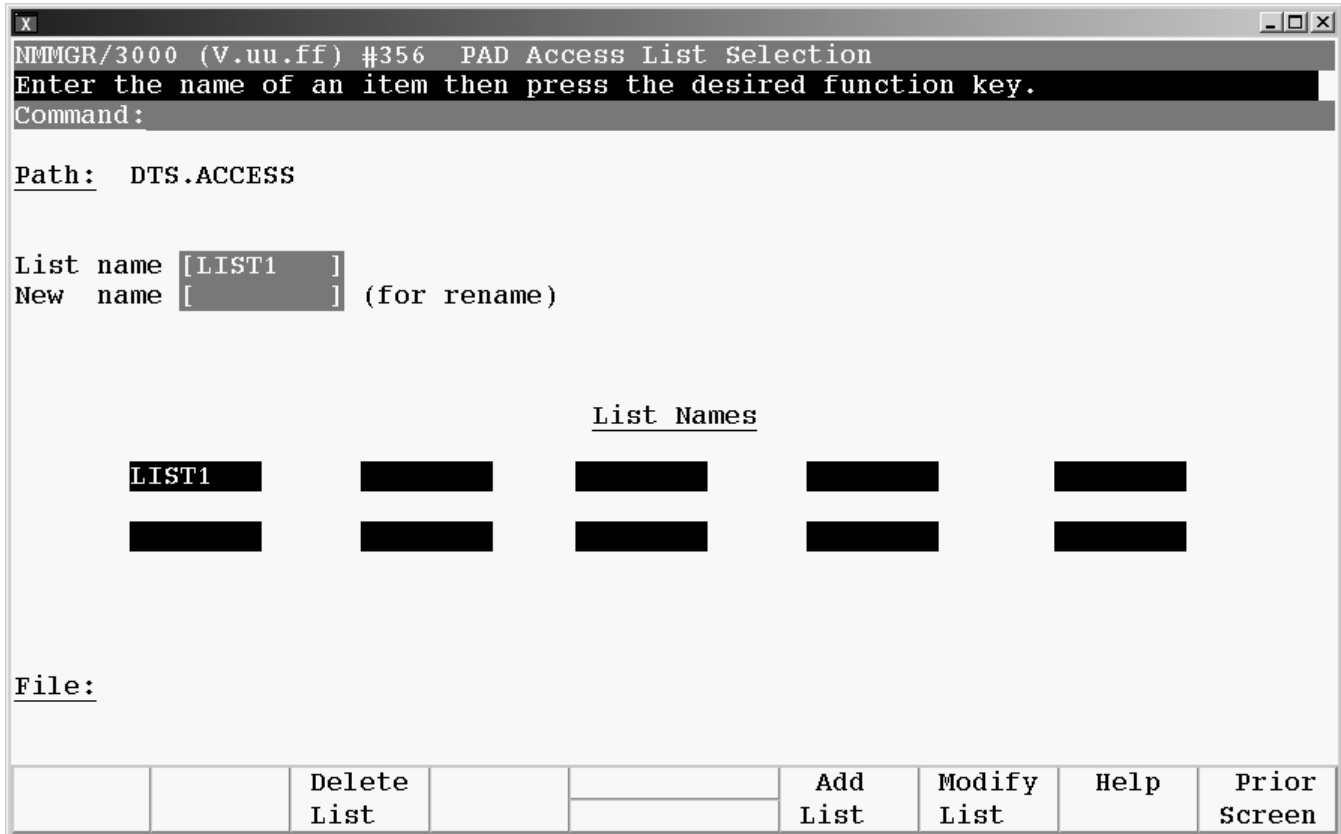
Soft Keys

Go To List	Takes you to the PAD Access List Selection screen where you can create or edit PAD access lists.
Delete Data	Deletes the node name whose record number is currently entered in the 'Press Delete Data field'. This will also delete this node from ALL the Access lists. The Node names and Access lists will be compressed so that there are no blank entries in the middle of the lists.
Save Data	This key will add the node name currently in the Node Name field to the end of the list.

Step 6: PAD Access List Selection

The PAD Access List Selection screen lists the PAD Access lists available in your configuration file. To reach this screen, press the **[Go to LIST]** key at the DTS Node List screen. From this PAD Access List Selection screen, you may review, add, delete, or modify Access Lists. You can create up to 10 lists.

Figure 3-5 PAD Access List Selection Screen



1. Enter the list name in the List Name field.
2. If you are *deleting* an Access List, press the **[Delete List]** key. You must press the key again to confirm the deletion. You are done. Exit this screen by pressing the **[Prior Screen]** key.
3. If you are *renaming* an Access List, enter the new list name in the New name field and press **[Rename List]**. You are done Exit this screen by pressing the **[Prior Screen]** key.
4. If you are *creating* a new Access List, press the **[Add List]** key. This will take you to the PAD Access List screen. Proceed to Step 7 Create and Modify the PAD Access Lists.
5. If you are modifying or reviewing an Access List, press the **[Modify List]** key. This will take you to the PAD Access List screen. Proceed to Step 7: Create and Modify the PAD Access Lists.

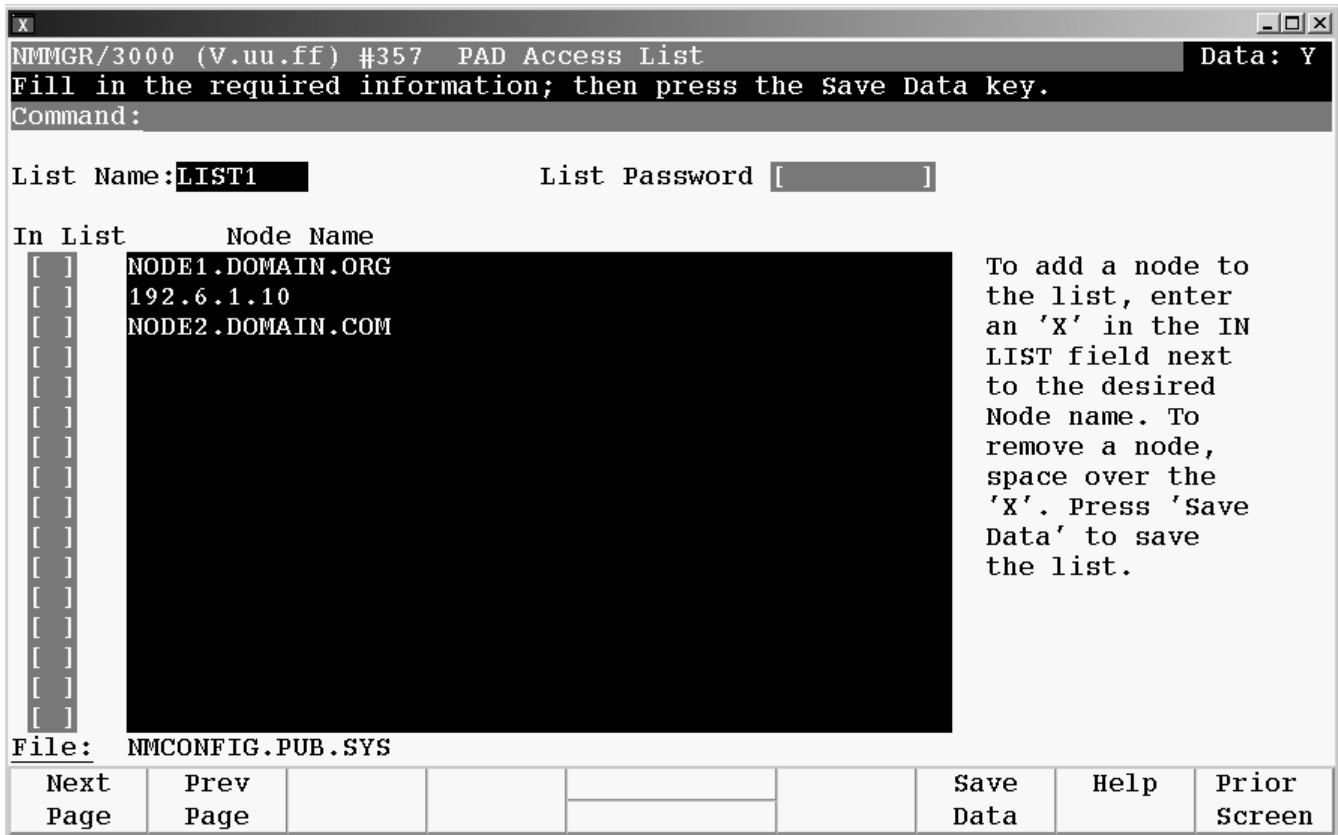
Fields

- List name The name of the list to be reviewed, added, modified, deleted, or renamed.
- New name The new name for the list. Required only when renaming a list.
- List Names Display only. Lists the name of existing PAD Access Lists. Up to 10 lists.

Step 7: Create and Modify the PAD Access Lists

The PAD Access List screen is used to define Nodes from the Nodes Names list that are contained in a PAD Access List. Figure x.x shows a typical Access List.

Figure 3-6 PAD Access List Screen



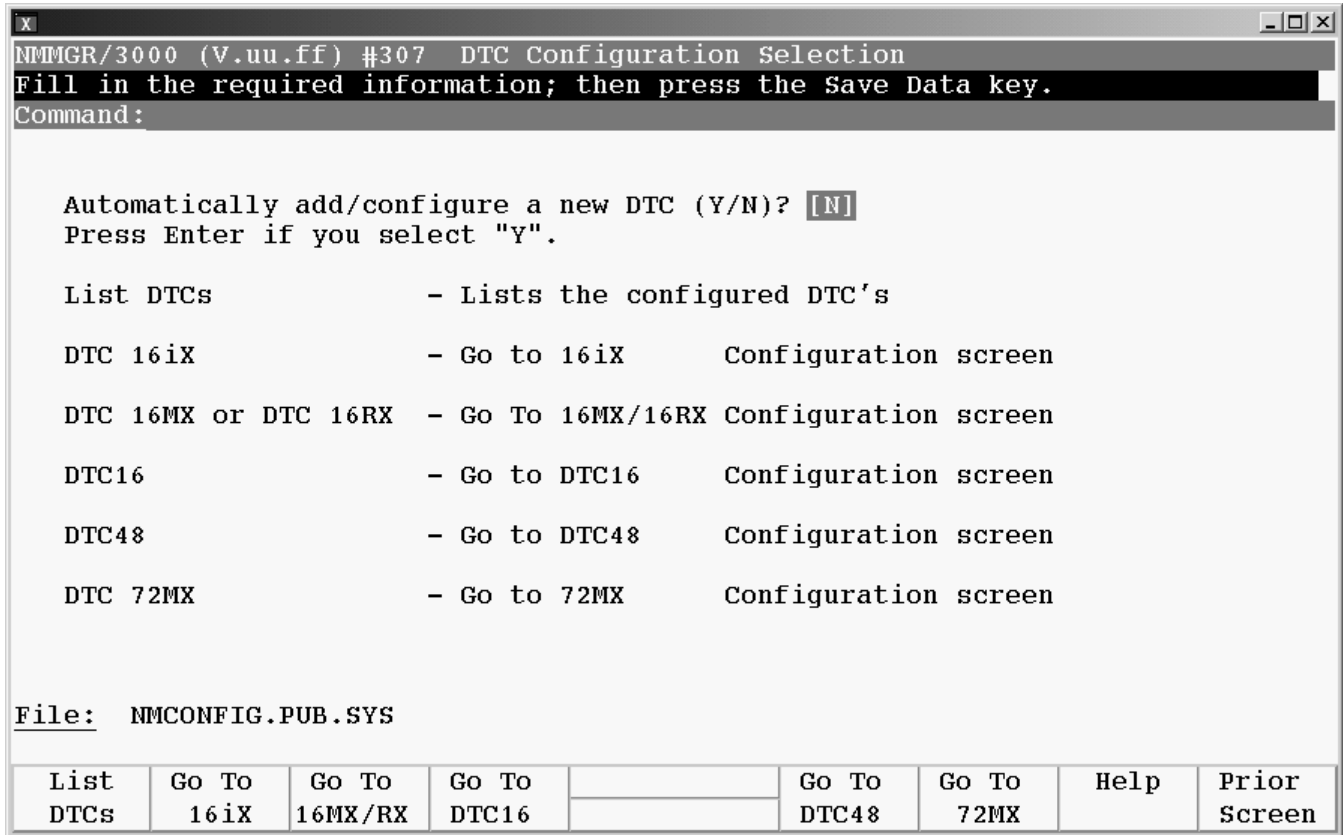
The Node Name fields are display only. These fields display all the nodes that are in the Nodes Names list.

1. To add a node to the list, press the **[TAB]** key until the cursor is next to the node name you want to add to the list. Enter an **'X'** in the `In list` field.
2. If there are more than 16 nodes defined in the Node Names list, press the **[Next Page]** key to move forward on the pages, or the **[Prev Page]** key to move back on the pages of the screen until you see the node name you want to add to the list.
3. To remove a node from the list, press the **[TAB]** key until the cursor is at the **'X'** for the node you wish to delete. Type a **[Space]** to remove the **'X'** from the `In List` field.
4. When the list contains the nodes you want in this list, press the **[Save Data]** key.

Step 8: Select DTC Type

The DTC Configuration Selection screen (Figure 3-7) is displayed when you press the **[Go To DTC]** key at the Host Configuration screen. Here you specify the type of DTC to configure.

Figure 3-7 DTC Configuration Selection Screen



1. Select the DTC type by pressing one of the function keys: **[DTC16iX]**, **[DTC16MX/RX]**, **[DTC16]**, **[DTC48]**, or **[DTC72MX]**.

NMMGR will take you to the configuration screen for the specified DTC type.

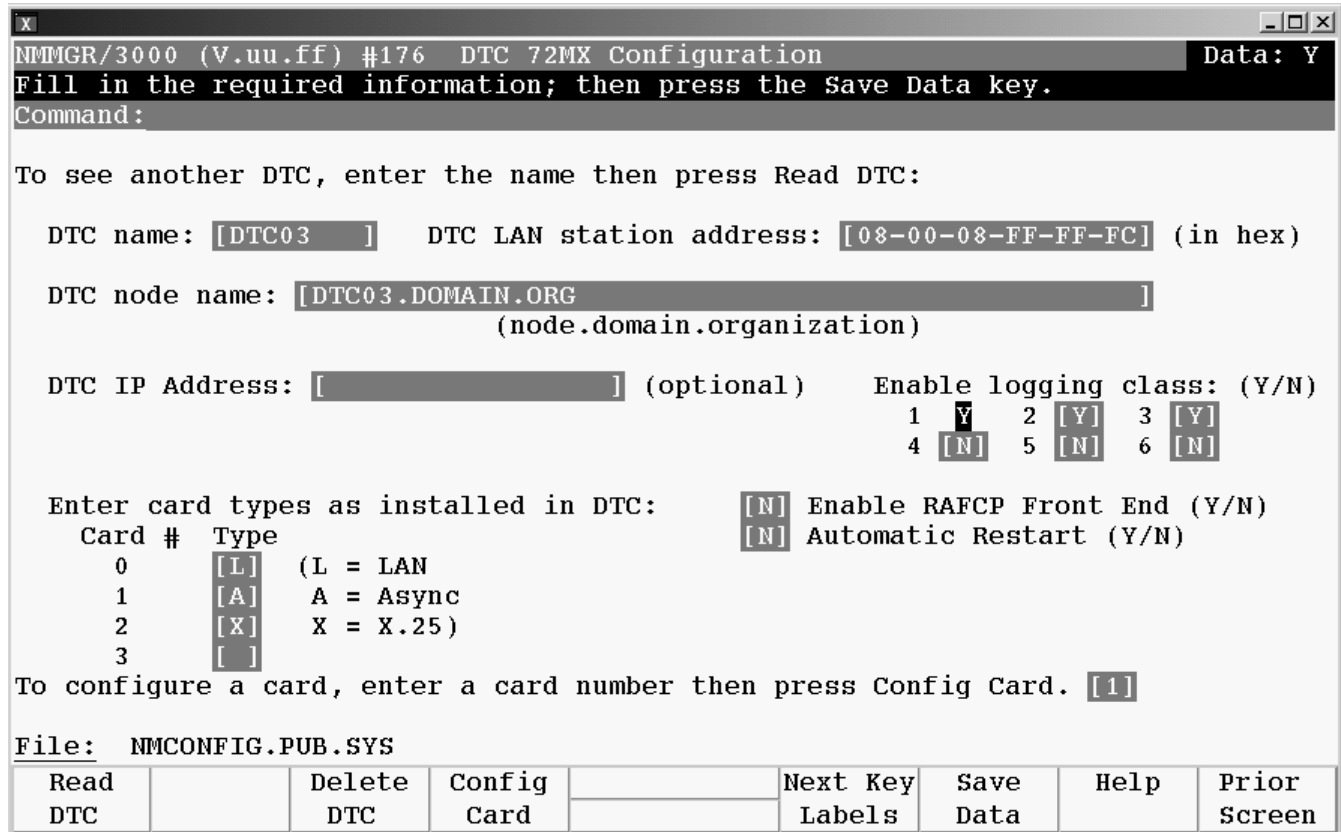
NOTE

You may use the **[List DTCs]** key on the DTC Configuration Selection screen to see a list of all DTC names configured on your system.

Step 9: Specify DTC Configuration

The DTC Configuration screen is displayed after you select the DTC type at the DTC Configuration Selection screen. Figure 3-8 shows the DTC Configuration screen for a DTC 72MX. (DTC Configuration screens for DTC 16iX, DT C16MX/RX, DTC 16, and DTC 48 vary slightly).

Figure 3-8 DTC Configuration Screen



1. Enter the DTC's name in the "DTC name" field.
2. Enter the DTC's LAN address in the "DTC LAN station address" field.

The LAN address can be found on a label inside the front cover or on the back panel of the actual DTC box.

If a valid LAN address is entered, then this DTC will be defined as a managed DTC on the system. If you want to define this DTC as a non-managed DTC on this system, then use the value 00-00-00-00-00-00 as the LAN address. In this case, you will only be allowed to define NAILED devices for all the connector cards.

For DTC 16RX access to an HP 3000 in an MPE/iX host-based management environment, you **must** use the value 00-00-00-00-00-00 as the DTC 16RX LAN address.
3. Type in the DTC's node name in the "DTC node name" field.

Use the format *nodename.domain.organization*, where *nodename* identifies the DTC. The *nodename* of each node on the network in this domain and organization must be unique. The following are examples of valid DTC node names on the same network:

```
ALPHA.ACCTG.TEKLAB
```

```
BETA.ACCTG.TEKLAB
```

Note that "DTC name" and "DTC node name" are two different fields. However, it is acceptable (and common) to use the *nodename* part of the "DTC node name" as the "DTC name", such as:

```
DTC name = ALPHA
```

```
DTC node name = ALPHA.ACCTG.TEKLAB
```

4. (Optional) Enter an IP address for the DTC, if you want this DTC to be able to respond to PING/iX requests. Otherwise, leave the "DTC IP Address" field blank. If this DTC is configured as a non-managed DTC, then any value entered will be ignored.

For DTC 16RX access to an HP 3000 in an MPE/iX host-based management environment, the IP address of the DTC 16RX is configured using the DTC 16RX Manager on the HP 9000 host and not on the HP 3000. Any value entered for the DTC 16RX in this field will be ignored.

Refer to Chapter 2, "Introductory Screens," for more information on IP addresses.

5. Enable the event logging classes that you want. It is recommended that you enable classes 2 and 3 and disable classes 4 through 6. See "DTC Event Logging" in Chapter 2, "Introductory Screens," for information on these event logging classes.

Logging class 1 is not configurable and is always enabled. Event logging classes do not apply for a DTC 16RX or a non-managed DTC; any values entered in these fields will be ignored.

Event logging classes do not apply for access to an HP 3000 in an MPE/iX host-based management environment using a DTC 16RX; any values entered in these fields for the DTC 16RX will be ignored.

6. Verify that the cursor is in the "Type" field under "Enter card types as installed in the DTC." Enter the card type for each card in the DTC. The valid card types are listed on the screen.

Note that DTC 16iX/16MX/16RX does not have cards since its port connectors are built directly onto the DTC backplane.

Refer to Chapter 2, "Introductory Screens," for more information on card types for each DTC.

7. Enter 'Y' in the Enable RAFCP Front End field if you intend to use this DTC as a front-end DTC for routeable AFCP communications. You must also go to the DNS/IP Routing screen and provide the IP addresses of the Domain Name Servers and routers that you intend to use. If this DTC is configured as a non-managed DTC, then any value entered will be ignored.
8. Enter 'Y' in the Automatic Restart field if you want to have the X.25 and PAD Access protocols automatically restarted if the DTC or board is reset or after a power failure.
9. Press the **[Save Data]** function key.

10. To configure a card in the DTC, enter the number of the card you want to configure in the "To configure a card, enter a card number..." field at the bottom of the screen.

Press the **[Config Card]** function key. Proceed to Step 7: Configure DTC Cards.

To configure the ports on a DTC 16iX/16MX/16RX, simply press the **[Config Ports]** function key. Proceed to Step 7: Configure DTC Cards.

11. Repeat steps 1 through 9 above for every newly-added DTC to be managed by the HP 3000 host. If you want to select a DTC that has already been configured, enter the DTC's name in the DTC name field and press the **[Read DTC]** function key.

Next Key Labels

When the **[Next Key Labels]** key is pressed, another set of key labels are displayed, this allows additional optional information to be configured for the DTC. Refer to *Configuring Systems for Terminals, Printers and Other Serial Devices* manual. If you want to configure this information, then you configure these screens on the system where the DTC is a managed DTC. If you are configuring a non-managed DTC, then information on these screens is ignored.

These keys provide access to the following configuration screens:

DNS/IP Routing	This key goes to a screen used to configure the DTC to use Domain Name Services for IP address resolution and IP routing configuration. These services are configured when back-to-back connection through routers are used or connections are to be made from DTC ports to HP 9000s or third party ARPA nodes.
Tune DTC	This key goes to a screen to change the AFCP, TCP and management timers for the DTC, if needed.
DTC U I	This key goes to a screen that has information that defines how the DTC user interface behaves. The DTC user interface is used when a DTC port is configured as a switched port.
Config SNMP	You may use the [Config SNMP] key on the DTC Screen to configure the DTC to act as an SNMP agent. This key goes to a screen to configure the DTC to act as an SNMP agent. Refer to the <i>DTC Technical Reference Guide</i> for more information on SNMP.

Fields

This screen is used to configure a DTC's name and node name, to specify the card types that are installed in the DTC, and to configure logging for X.25 connections, if the DTC contains one or more DTC/X.25 Network Access cards.

DTC name A name, up to eight alphanumeric characters, beginning with a letter, assigned to the DTC. For convenience, you may want to use the *nodename* portion of the DTC node name as the DTC name. Each DTC configured on the system must have its own unique DTC name.

You can call up (and modify) data for a previously configured DTC by entering an existing DTC name in the DTC name field and pressing the **[Read DTC]** key.

DTC LAN station address The local station address of the DTC. This is a twelve character hexadecimal number. Each DTC's LAN station address is printed inside the DTC's front cover on a DTC48, or on the back panel of the DTC72MX or DTC16MX/iX/RX.

- DTC node name The fully qualified node name of the DTC, in the form *nodename.domain.organization*. Each part of the name can be up to 16 characters.
- DTC IP Address (Optional) The internet protocol (IP) address of the DTC being configured. An example of an address is: C 192.191.191 009. The IP address is optional for the DTC, but one must be configured if the DTC is to be able to respond to PING requests.
- Enable logging class (Y/N) These fields, labeled 1 through 6, enable the DTC to log various classes of events. Enter a Y to enable a class, N to disable. Only events falling into classes which you have explicitly enabled will be logged. Class 1 events are the most critical and will always be logged. Note that enabling class 5 will result in a substantial number of events being logged. HP suggests that you enable class 5 only when necessary and only for short periods of time. You should also avoid enabling logging class 5 simultaneously with an X.25 trace.
- Type (of card) The type of card installed in the DTC. Verify that the cursor is in the "Type" field under "Enter card types as installed in DTC." Enter the card type for each card in the DTC. The valid card types are listed on the screen.
- Enable RAFCP Front End) Enables the DTC to act as a gateway for Routeable AFCP which is a method of encapsulating AFCP in UDP packets to permit communications between DTC ports and an HP 3000 Series 900 system across a routed IP network.
- Automatic Restart A DTC configuration facility, ensuring the restart of the DTC's X.25 and PAD Support on the installed SNP boards after a DTC reboot (if certain conditions have been met).
- To configure a card, enter a card number then press Config Card This parameter determines the next screen that will appear after you have saved the data configured on the screen. Enter the number of the card you want to configure and press the **[Config Card]** key.

Step10: Configure DTC Cards

When you press the **[Config Card]** key at the DTC Configuration screen, NMMGR will display the corresponding card configuration screen for the specified card in the DTC. Figure 3-9 shows an example of a Card Configuration screen for DTC 72MX. (Screens vary slightly for DTC 16iX/16MX/16RX, DTC 16, and DTC 48). Figure 3-10 shows the screen for configuring nailed PAD devices on an X.25 card in a non-managed DTC.

NOTE

You only need to configure these screen if you want to have nailed ports (such as printer ports) in the DTC. If you do not want to nailed ports on a card, you can skip this step.

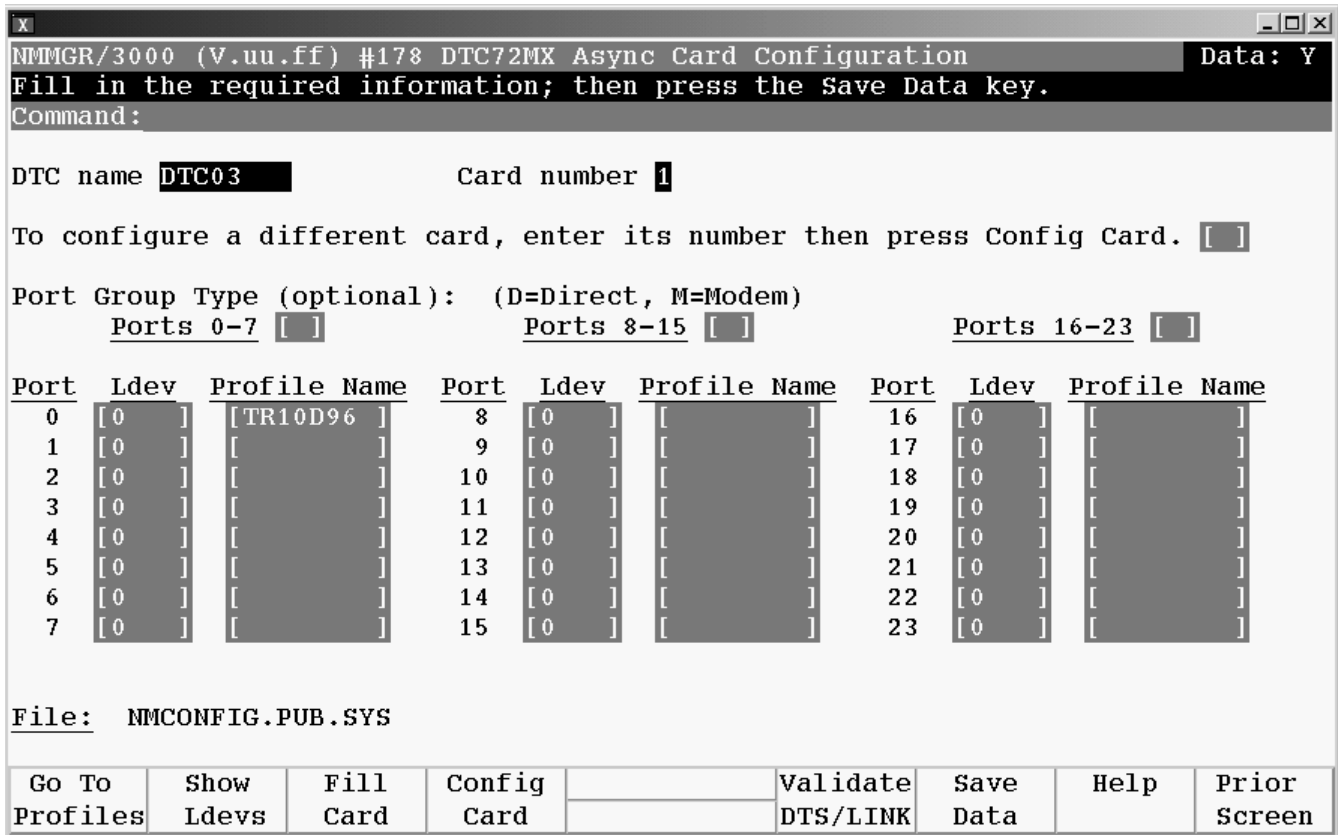
The corresponding screen for a DTC 16iX/16MX/16RX is called a Port Configuration Screen since DTC 16iX/16MX/16RX has port connectors built directly onto the backplane and does not have connector cards.

Use this screen to configure the ports in the specified card. On this screen, logical device (ldev) numbers and profile names are associated with individual ports on the card.

DTC Async Card Configuration

When you press the **[Config Card]** key at the DTC Configuration screen and the card is a direct or modem connect card, NMMGR will display the screen appropriate for the DTC. The screen for a DTC 72MX Asynchronous card is shown in Figure 3-9.

Figure 3-9 DTC Async Card Configuration



1. Verify that the DTC name and card number displayed are correct.
2. (Optional) Enter the port group type. The valid types are D for direct connect and M for modem connect. The default is D.
3. Press the **[Tab]** key to move the cursor to the first port on the card. Enter an ldev number for this port in the “Ldev” field.

Ldev numbers used for each port on the DTC must be unique.

For example, you can use ldev number 100 for port 0 of the first card, and increment the ldev number by 1 for each consecutive port.

So a DTC 72MX with 3 asynchronous cards (a total of 72 ports) would be assigned ldev numbers 100 through 123 for the 24 ports on the first card, 124 through 147 for the ports on the second card and 148 through 171 for the ports on the third card.

For the second DTC, you would start with an ldev number greater than 171.

NOTE

Pressing the **[Show Ldevs]** key will display a list of all the ldev numbers configured in NMMGR in addition to the DTC name, card type, and profile name.

4. Enter the profile name for each port in the "Profile Name" field.

A profile for the port defines the characteristics of the device to be connected to that port.

For direct terminals ports, the suggested profile to use is TR10D96. For direct printer ports, the suggested profile to use is PR18D96 (or PR22D24 for HP printers with status checking). For a UPS connected to a DTC port, the suggested profile is UP10D12.

See the Tables in Chapter 4, "Terminal and Printer Profiles," to list terminal, printer and UPS profiles supplied by the system. You may also create your own profiles. Refer to Chapter 4, "Terminal and Printer Profiles," for more information on profiles.

5. Repeat above two steps for every port in this card.

NOTE

To reduce typing ldev numbers and profiles on the screen, you can use the **[Fill Card]** key to automatically assign ldev numbers and profile names. First, enter an ldev number (and profile name if you do not wish to use the default profile name) for port 0, then press **[Fill Card]**; the system will automatically assign incremental ldev numbers to each subsequent port on the screen and copy the specified profile for each port. The system will automatically save the data it has entered.

The **[Clear Display]** key on your keyboard will clear the part of your screen that is below the cursor position. You may use this key and the **[Fill Card]** key to quickly modify a screen.

6. Press the **[Save Data]** function key to save the data on the screen.

CAUTION

Before you exit this screen, make sure you press **[Save Data]** if you want to keep the data on the screen; otherwise your screen input will be lost. This occurs even if you temporarily exit the screen to read **[Help]** information.

7. To configure another card in the DTC, use the cursor keys to move to the field on the screen: "To configure a different card, enter its number, ...". Enter the card number of the card you want to configure.
8. Press the **[Config Card]** function key. The corresponding screen for the card number entered in the last step will be displayed.
9. If all the cards have been configured, press the **[Prior Screen]** function key to return to the DTC Configuration Selection screen to select another DTC to configure. Otherwise, if every DTC has been configured, press the **[Validate DTS/LINK]** function key to validate the configuration file.

NOTE

NMMGR allows the configuration of up to 4649 terminal I/O devices. The largest valid ldev number allowed is 4679.

Fields

This screen is used to permanently associate ldev numbers and profile names with individual ports on the direct connect card.

DTC name Display only.

Card number Display only.

Port Group Type (Optional) The valid type are D for direct connect and M for modem connect. The default is D.

Ldev The logical device (ldev) number to be associated with the port. Each ldev number must be unique; it may not be duplicated by any other device configured on the system. If this is a managed DTC, you may assign an ldev of (-1) to a port with a TERMINAL or HOST profile type. A port with an ldev of (-1) and a TERMINAL profile is a **non-nailed** ldev. Ports configured using a PRINTER profile type must be configured as a **nailed** device.

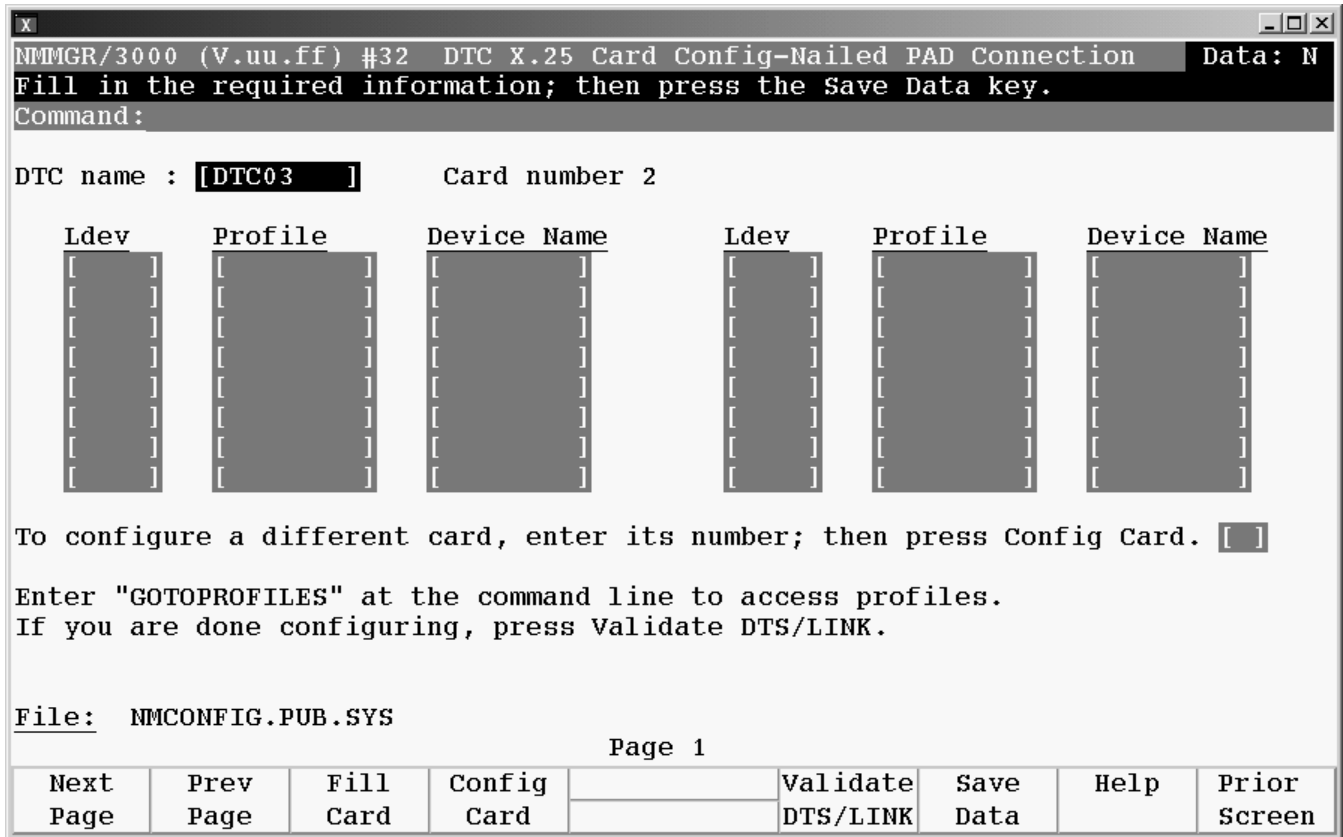
Profile Name The terminal or printer profile name to be associated with the port. If no profile name is entered, then the DTC port is assigned the parameters of the non-nailed TIO lev's profile specified on the Host Configuration screen. The features defined by the profile must correspond to the actual operating features of the port and its attached device.

To configure a different card, enter its number; then press ConfigCard
The card that you want to configure next. Use this parameter in combination with the **[Config Card]** key to select and move to a different card in the same DTC. For example, after card 0 is configured, enter a 1 in this field and press the **[Config Card]** key to move to the configuration screen for card 1.

DTC/X.25 Card Configuration -- Nailed PAD Connections

When a X.25 card is configured on a **non-managed** DTC, NMMGR will display the screen in Figure 3-10 to allow you to configure nailed PAD devices that will connect through a shared DTC. The corresponding ports must also be configured on the system where a DTC with the same DTC node name is configured as a **managed** DTC. This screen is available only for a DTC 48, DTC 16, and DTC 72MX.

Figure 3-10 DTC/X.25 Card Configuration -- Nailed PAD Connections



1. Verify that the “DTC name” and “Card number” display are correct.
2. Use the [TAB] key to move the cursor to the desired fields. Enter the ldev number, profile and device name in the fields on the screen for nailed device.

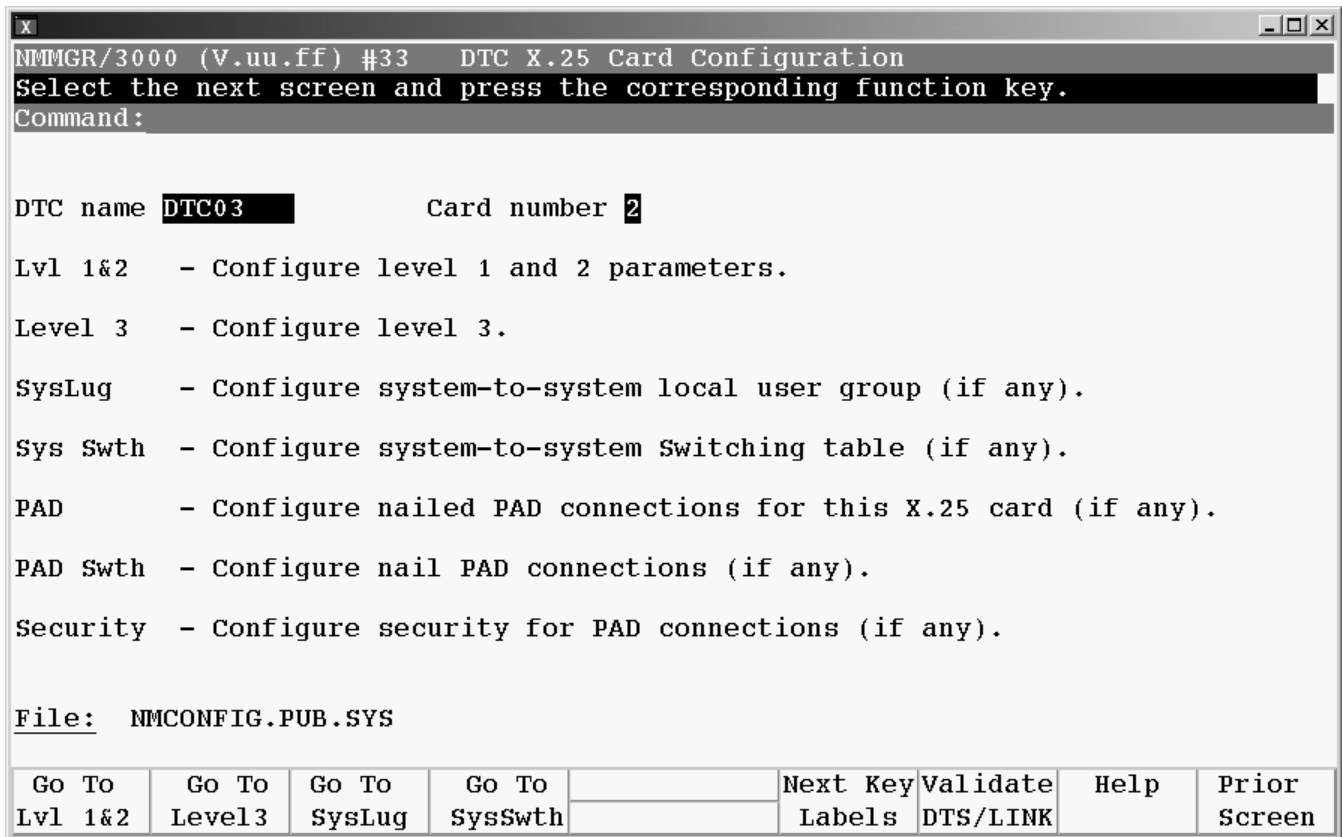
Ldev numbers used for each port on all DTCs must be unique. Up to 4649 terminal I/O devices may be configured on the HP 3000 Series 900. The largest valid ldev number is 4679.

The device name entered must match the PAD Device Name entered in the PAD Access screen on the system where this DTC is a **managed** DTC. See **Step 16: Configure Nailed PAD Connections**.

Step 11: Configure X.25 Connections

NMMGR displays the DTC X.25 Card Configuration screen (Figure 3-11) if you press the **[Config Card]** key at the DTC Configuration screen (or at a different card configuration screen) with the card number of a DTC/X.25 Network Access card in the Config Card field. From this screen, you move to the screens that let you configure DTC values for X.25 system-to-system and PAD connections.

Figure 3-11 DTC X.25 Card Configuration Screen



1. Choose the screen that you want to move to. To create a new card configuration, go to the screen that lets you configure level 1 and 2 parameters first. (If you are modifying an existing card configuration, you may choose to move to one of the other choices listed on the screen.)
2. Press the function key that corresponds to the screen that you want to configure.. To create a new card configuration, go to the screen that lets you configure level 1 and 2 parameters first. (If you are modifying an existing card configuration, you may choose to move to one of the other choices listed on the screen.)

When the **[Next Key Labels]** function key is pressed, another set of key labels is displayed that allows you to access the remaining X.25 configuration screens.

Soft Keys

This screen is used to select and move to the lower level DTC/X.25 Card Configuration screens. The function keys available for selection and the corresponding lower level screens are shown below:

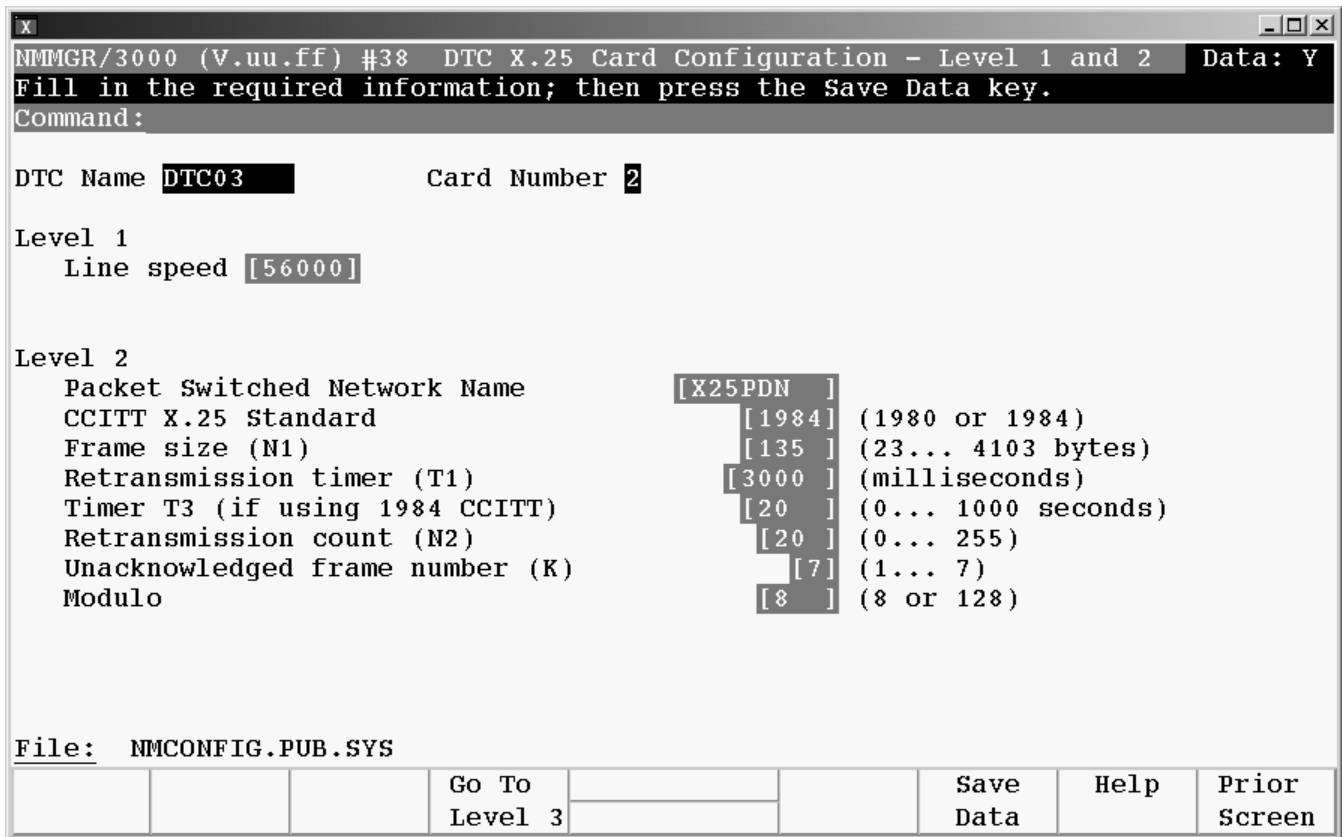
- Go to Level 1 & 2 Takes you to the DTC X.25 Card Configuration — Level 1 and 2 screen. Use this screen to configure level 1 and 2 network parameters. Most of the information you enter on this screen will be on the subscription form for the packet switched network you are connecting to. You must enter level 1 and 2 parameters for all DTC/X.25 Network Access cards whether they support X.25 system-to-system connections, PAD connections, or both.
- Go to Level 3 Takes you to the DTC X.25 Card Configuration — Level 3 screen. Use this screen to configure level 3 network values. Most of the information you enter on this screen will be on the subscription form for the packet switched network you are connecting to. You must enter level 3 parameters for all DTC/ X.25 Network Access cards whether they support X.25 system-to-system connections, PAD connections, or both.
- Go to SysLUG Takes you to the DTC X.25 Card Configuration — Sys-to-Sys LUGs screen. Use this screen to configure the X.25 link name, the maximum number of switched virtual circuits, and local user group information the DTC will need in order to support X.25 iX System Access (NS system-to-system links). Information entered on this screen must not conflict with information entered during NS link configuration. (Configure information on this screen only if you are configuring X.25 system-to-system connections.)
- Go to SysSwth Takes you to the DTC X.25 Card Configuration -- Sys-to-Sys Switching Table Screen. Use this screen to configure the System-to-System Switching Table. This table maps the incoming called X.25 addresses to the NS node name of the LAN-based host system. Information entered on this screen must not conflict with information entered during NS link configuration. (Configure information on this screen only if you are configuring X.25 system-to-system connections).
- Go to PAD Takes you to the DTC X.25 Card Configuration — Nailed PAD Connections screen. Use this screen to configure information the DTC will need in order to support terminals and printers with permanently assigned ldev numbers (nailed devices) over PAD connections. (Configure information on this screen only if you are configuring nailed PAD connections.)
- Go to PADSwth Takes you to the DTC X.25 Card Configuration -- PAD Switching Table screen. The table maps the X.25 called addresses to LAN-based host systems to allow remote users to access the host system directly from the PAD prompt by entering the full X.25 address configured in this table. (Configure information on this screen only if you are configuring PAD connections and want to allow PAD switching).
- Go to Security Takes you to the DTC X.25 Card Configuration — PAD Security screen. Use this screen to configure security if you want to allow or disallow PAD access from specific X.25 calling addresses. (Configure information on this screen only if you are configuring PAD and want to implement PAD security.)

Step 12: Configure X.25 Level 1 and 2

NMMGR displays the DTC X.25 Card Configuration — Level 1 and 2 screen (Figure 3-12) if you press the [Go To Lvl 1&2] key at the DTC X.25 Card Configuration screen. On this screen, you enter level 1 and 2 values for the X.25 card being configured. You must configure these values for both system-to-system access and for PAD access. You can also reach this screen by typing the following path at the Command line and pressing the [ENTER] key:

```
@DTS.DTC.SELECT.dtcname.X25CARDn.LEVEL12
```

Figure 3-12 DTC X.25 Card Configuration — Level 1 and 2 Screen



1. Verify that the cursor is in the Line speed field. Enter the line speed for the DTC/X.25 Network Access card as specified by your network subscription.
2. Verify that the cursor is in the Packet Switched Network Name field. Enter the name of the network you subscribe to.
3. Verify that the cursor is in the CCITT X.25 Standard field. Enter the X.25 standard you are using.
4. Verify that the cursor is in the Frame size (N1) field. Enter the frame size as specified by your network subscription.
5. Verify that the cursor is in the Retransmission timer (T1) field. Enter the value for the retransmission timer as specified by your network subscription.

6. If you are using the 1984 standard, verify that the cursor is in the `Timer T3` field. Enter the value for this timer as specified by your network subscription. If you are using the 1980 standard, skip this field (press **[TAB]** to move to the next field).
7. Verify that the cursor is in the `Retransmission count (N2)` field. Enter the value for the retransmission count as specified by your network subscription.
8. Verify that the cursor is in the `Unacknowledged frame number (K)` field. Enter the value for the number of frames that can be transferred without acknowledgment as specified by your network subscription.
9. Verify that the cursor is in the `Modulo` field. Enter the modulo value as specified by your network subscription.
10. When you have entered all level 1 and 2 values as specified by your subscription, press the **[Save Data]** key to save the configuration.
11. Press the **[Go To Level 3]** key to move to the DTC X.25 Card Configuration — Level 3 & Miscellaneous screen.

Fields

You use this screen to configure X.25 level 1 and 2 parameters for the DTC/X.25 Network Access card being configured. You must define these parameters for both X.25 system-to-system and PAD connections. Ranges for configurable values are listed on the screen.

`DTC Name` Display only.

`Card Number` Display only.

`Line speed` The line speed for the connection. Supported speeds for a card installed in a DTC16 are 1200, 2400, 4800, 9600, or 19200 bps. Supported speeds for a card installed in a DTC48 or DTC72 are 1200, 2400, 4800, 9600, 19200, 48000, 56000, or 64000 bps.

`Packet Switched Network Name` The name of the network you subscribe to. Possible network names include: DATAPAC, PSS, DATEX-P, TRANSPAC, TYMNET, TELENET, DDN, HP PPN, ITAPAC, LUXPAC, DATANET1, DCS, DCE, X25PDN. (The name must be entered exactly as shown here.)

If two X.25 systems are directly connected (for example, if you have a cable connecting one DTC X.25 card directly to another DTC X.25 card) one of the two systems must be configured as DCE and the other as DTE. To configure a card as DCE, enter `DCE` in the `Packet Switched Network Name` field. To configure a card as DTE, enter `X25PDN` in the `Packet Switched Network Name` field. (Entering `DCE` configures the X.25 card as a DCE at levels 2 and 3 of X.25. At level 1 it remains DTE.)

`CCITT X.25 Standard Version` of the CCITT X.25 standard you are using, either 1980 or 1984.

`Frame size (N1)` The frame size, in bytes, as listed on your subscription. Note that many network subscription forms give this value in bits, not bytes. In such cases, divide the number of bits by 8 to obtain the correct number of bytes to enter in this field.

Range: 23 to 4103 bytes.

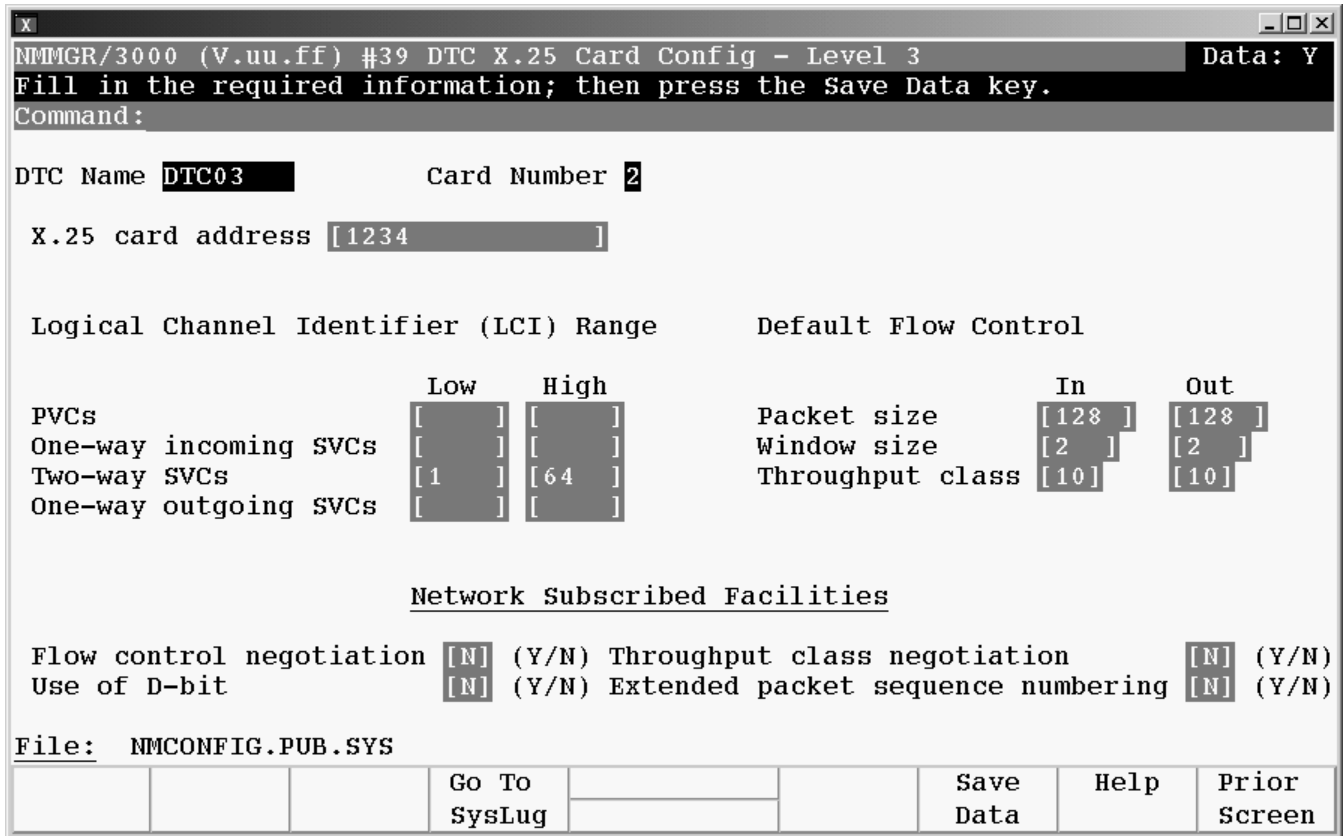
Retransmission timer (T1)	Time, in milliseconds, the transmitting node waits before retransmitting an unacknowledged frame. The default of 3000 milliseconds is adequate for most installations. Range: 1000 to 12000 milliseconds.
Timer (T3)	This value is required only if you are using the 1984 CCITT standard. Specifies the time a link will remain idle before it is automatically reset. The value of T3 must be greater than T1. The default is 20 seconds. Range: 0 to 1000 seconds.
Retransmission count (N2)	The number of times a frame is retransmitted before an error is indicated. The default is 20 times. Range: 0 to 255.
Unacknowledged frame number (K)	The maximum number of frames which can be transmitted without acknowledgment from the network. Range: 1 to 7.
Modulo	The counting cycle for the send frame sequence number. Range: 8 or 128.

Step 13: Configure X.25 Level 3

NMMGR displays the DTC X.25 Card Configuration — Level 3 screen (Figure 3-13) if you press the **[Go To Level 3]** key at the DTC X.25 Card Configuration screen or the DTC X.25 Card Configuration — Level 1 and 2 screen. On this screen, you configure level 3 values for this X.25 card including an X.25 card address. You must configure the level 3 values to enable both system-to-system access and for PAD access. You can also reach this screen by typing the following path at the Command line and pressing the **[ENTER]** key:

```
@DTS.DTC.SELECT.dtcname.X25CARDn.LEVEL3
```

Figure 3-13 DTC X.25 Card Configuration — Level 3 Screen



1. Verify that the cursor is in the X.25 card address field. Enter the address that will be appended to outgoing PAD calls. If no address should be sent in call request packets, leave this field blank.
2. Use the **[TAB]** key to move to the Logical Channel Identifier (LCI) Range fields. Enter high and low values for the permanent virtual circuits (PVCs) or switched virtual circuits (SVCs) you are configuring per your network subscription. At least one pair **must be configured. Leave the fields blank for any PVC or SVC types that are not configured.**
3. Use the **[TAB]** key to move to the Default Flow Control fields. Enter In and Out values according to your network subscription.
4. Use the **[TAB]** key to move to the Flow control negotiation field. Enter Y to enable or N to disable according to your subscription.

5. Use the **[TAB]** key to move to the `Throughput class negotiation` field. Enter `Y` to enable or `N` to disable according to your subscription.
6. Use the **[TAB]** key to move to the `Use of D-bit` field. Enter `Y` to enable or `N` to disable according to your subscription.
7. Use the **[TAB]** key to move to the `Extended packet sequence numbering` field. Enter `Y` to enable or `N` to disable according to your subscription.
8. When you have entered all level 3 values as required by your subscription, press the **[Save Data]** key.
9. Press the **[Go To SysLUG]** key to move to the DTC X.25 Card Configuration — Sys-to-Sys LUGs screen.

Fields

You use this screen to configure X.25 level 3 and miscellaneous parameters for the DTC/X.25 Network Access card being configured. You must define the level 3 parameters for both X.25 system-to-system and PAD connections.

DTC Name Display only.

Card Number Display only.

X.25 card address A calling address appended to outgoing calls. Used for programmatic access to PAD devices. Also used for network loopback test. For most network applications, this is the same as the address used for X.25 system-to-system communications.

Note that with certain networks (such as Transpac, in France) the called address is removed from incoming call packets and the calling address is added to outgoing call packets by the network. For these networks, enter only the subaddress in this field, not the full X.25 address.

PVCs Low and high values for permanent virtual circuits as listed on your X.25 subscription.

One-way incoming SVCs Low and high values for one-way incoming switched virtual circuits as listed on your X.25 subscription.

Two-way SVCs Low and high values for two-way (incoming and outgoing) switched virtual circuits as listed on your X.25 subscription.

One-way outgoing SVCs Low and high values for one-way outgoing switched virtual circuits as listed on your X.25 subscription.

Packet size Size of packet, in bytes, for incoming and outgoing data as listed on your X.25 subscription. Note that for X.25 cards on which you intend to configure PAD support, the subscribed and configured packet size must be 128, 256, or 512 bytes.

Window size Window size for incoming and outgoing data as listed on your X.25 subscription.

Throughput class Throughput class values for incoming and outgoing data. Values depend upon the speed of the link, as follows:

Throughput Class	Line Speed
7	1200
8	2400
9	4800
10	9600
11	19200
12	48000

Flow control negotiation Specifies whether or not flow control negotiation is enabled. When flow control negotiation is enabled, both packet size and window size are negotiable. Enter Y if your subscription allows flow control negotiation and you wish to enable it. Otherwise enter N.

Use of D-bit Specifies whether or not delivery confirmation is enabled. Enter Y if your subscription allows delivery confirmation and you wish to enable it. Otherwise enter N.

Throughput class negotiation Specifies whether or not throughput class negotiation is enabled. Enter Y if your subscription allows throughput class negotiation and you wish to enable it. Otherwise enter N.

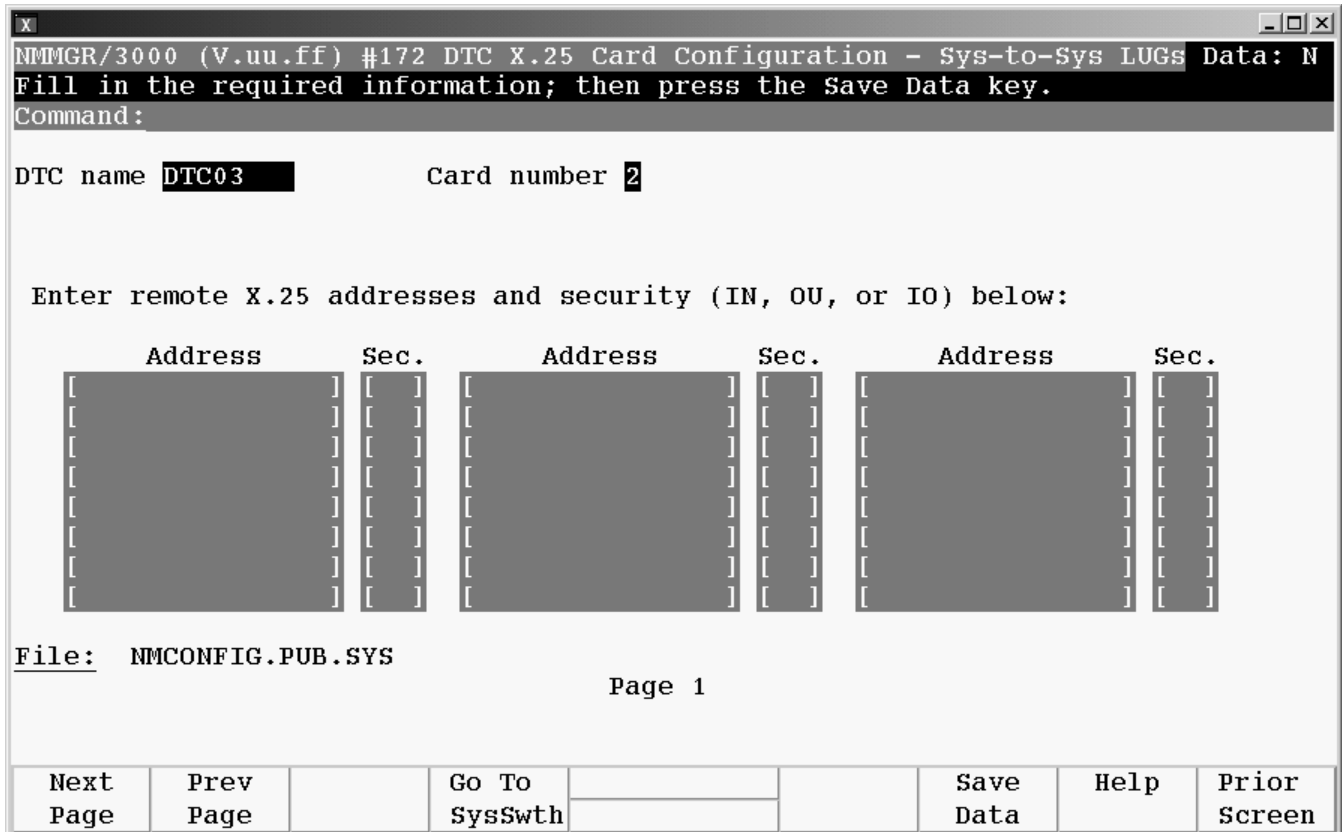
Extended packet sequence numbering Specifies whether or not extended packet sequence numbering is enabled. Enter Y if your subscription allows extended packet sequence numbering and you wish to enable it. Otherwise enter N.

Step 14: Configure X.25 System-to-System LUG

NMMGR displays the DTC X.25 Card Configuration — Sys-to-Sys LUGs screen (Figure 3-14) if you press the **[Go To SysLUG]** key at the DTC X.25 Card Configuration screen or the DTC X.25 Card Configuration — Level 3 & Miscellaneous screen. On this screen, you specify information for X.25 system-to-system Local User Groups.

A System-to-System Local Users Group filters calls between remote systems and local LAN-based systems. If the list exists only those remote systems that are listed can have access to local LAN-based systems. If there are no items in the LUG list, there is no control on incoming and outgoing calls on the DTCs X.25 board. Remote systems can be allowed incoming-call setup only, outgoing-call setup only, or two-way call setup. Note that this list is referred to only for call setup; once a call is set up, data can be exchanged in both directions. If all systems are to be permitted both incoming and outgoing calls only, you do not need to create an LUG list. The LUG can screen for incoming calls only, outgoing call only, or both. If you list any systems as **IN**, be sure that you list all. The same applies to systems listed as **OUT** or **IN/OUT**.

Figure 3-14 DTC X.25 Card Configuration — Sys-to-Sys LUGs Screen



1. Move the cursor to the first Address field under Enter remote X.25 addresses and security. Enter the X.25 address of a system that will be able to establish a system-to-system connection with the HP 3000 Series 900 you are configuring.
2. Move the cursor to the Sec. field next to the address you just entered. Enter the security level for connections between the remote X.25 address and the system you are configuring. Possible values are **IN** (accept calls from the address), **OU** (send calls to the address), and **IO** (accept calls from and send calls to the address).

3. Repeat steps 4 and 5 for each remote system that will be able to establish a system-to-system connection with the HP 3000 Series 900 you are configuring. If you need to enter more than eight remote system addresses, press the **[Save Data]** key to save the data on this screen, then use the **[Next Page]** key to move to a new data entry screen to configure additional addresses.
4. When you have entered all remote X.25 addresses and associated security, press the **[Save Data]** key to save the configuration.
5. Press the **[Go To SysSwth]** key to move to the DTC X.25 Card Configuration —Sys-to-Sys Switching Table screen.

Fields

This screen lets you configure X.25 system-to-system local user group (LUG) information for the DTC/X.25 Network Access card being configured.

- DTC name Display only.
- Card number Display only.
- Address The X.25 addresses of the remote systems in your X.25 network up to 15 digits long.

You can use the letter “X” as a wildcard character in place of any single-digit. Note that “X” represents one digit only, and the address checking is sensitive to the length of the address. Thus, for example, x=0 to 9; xx=00 to 99, but not 0 to 9. To manage addresses, you must construct pyramids, where the base is the maximum expected address length, and the peak is the minimum expected address length.

For example, to allow IN/OUT access to all six, seven, and eight digit X.25 address that start 1234, you would enter the following values:

```
1234XX      IO
1234XXX     IO
1234XXXX    IO
```

Addresses without wildcards take precedence over addresses with wildcards. So in the following example 123401 can only call in, even though all address corresponding to 1234XX are listed as having both IN and OUT access.

```
1234XX      IO
123401      IN
```

- Sec . The security level associated with each remote X.25 address. To accept only incoming calls for call setup, enter **IN** in the security field beside the address. To allow only outgoing calls for call setup, enter **OU**. To allow both incoming and outgoing calls for call setup, enter **IO**.

Step 15: Configure X.25 System-to-System Switching

When you press the **[Go To SysSwth]** key at the DTC X.25 Card Configuration screen or the DTC X.25 Card Configuration -- Sys-to-Sys LUGs screen, NMMGR displays the DTC X.25 Card Configuration -- Sys-to-Sys Switching Table screen (DTC X.25 Card Configuration Sys-to-Sys Switching Table Screen). On this screen, you specify

information for X.25 system-to-system switching table. The System-to-System Switching table maps the nodenames of LAN-based host system to X.25 addresses. Typically the X.25 address will be the X.25 address of the DTC followed by a unique subaddress.

Figure 3-15 DTC X.25 Card Configuration — Sys-to-Sys Switching Screen

NMMGR/3000 (V.uu.ff) #358 DTC X.25 Card Sys to Sys Switching table Data: N
 Fill in the required information; then press the Save Data key.
 Command:

DTC name **DTC03** Card number **2**

System Node Names	System X25link	Mx* SVC	System X25address

Page 1

* Maximum number of Switched Virtual Circuits

File: NMCONFIG.PUB.SYS

Next Page	Prev Page	Go To PAD	Save Data	Help	Prior Screen
-----------	-----------	-----------	-----------	------	--------------

1. Verify that the cursor is in the System Node Names field. Enter the NS node name of the system to which you want to allow system-to-system access.
2. Move the Cursor to the System X.25 link field. Enter the link name that will be used for X.25 iX System Access (X.25 system-to-system connections) for this system. **This link name must be the same as the link name configured on the X.25 Configuration during NS configuration on the system where these connection will be established. See Configuring X.25 Links Step-by-Step.**
3. Move the cursor to the Max SVC field. Enter the maximum number of SVC connections that will be supported for this card.
4. Move the cursor to the System X.25 address field. Enter the X.25 address that the local system will use for system-to-system connections. If this configuration is on the system where this is the **managed** DTC, then enter the same X.25 address as entered in the X.25 card address field on the Level 3 screen *unless your network application requires the address used for X.25 system-to-system communications to be different from that used for PAD communications*. If the addresses must be different, enter the X.25 address that the local system will use for system-to-system connections in this field.

Note that with certain networks (such as Transpac, in France) the called address is removed from incoming call packets and the calling address is added to outgoing call packets by the network. For these networks, enter only the subaddress in this field, not the full X.25 address.

- Repeat Steps 1 to 4 for each local HP e3000 Series 900 system that will be allowed to establish a system-to-system connection with remote systems. If you need to enter more than eight local system entries, press the **[Save Data]** key to save the data on this screen, then use the **[Next Page]** key to move to a new data entry screen to configure additional systems.

Fields

The following table provides additional information on the fields on this screen.

DTC name	Display only.								
Card Number	Display only								
System Node Names	This is the NS node name as configured as NODENAME in NMCONFIG.PUB.SYS on the system where you wish to allow connections. The format of the nodename is <i>nodename.domain.organization</i> .								
X.25 link name	The name of the link that will be used by the system being configured for X.25 system-to-system connections. Must be the same as the link name entered during NS configuration of X.25 iX System Access using the NS subbranch of NMMGR. The link name can be up to eight alphanumeric characters, beginning with a letter.								
Max SVC	The number of switched virtual circuits (SVCs) that will be allowed through this DTC/X.25 Network Access card.								
	<table border="0"> <thead> <tr> <th>DTC Type</th> <th>Max Conn Per X.25 Board</th> </tr> </thead> <tbody> <tr> <td>DTC 16</td> <td>32</td> </tr> <tr> <td>DTC48</td> <td>256</td> </tr> <tr> <td>DTC 72MX</td> <td>256.</td> </tr> </tbody> </table>	DTC Type	Max Conn Per X.25 Board	DTC 16	32	DTC48	256	DTC 72MX	256.
DTC Type	Max Conn Per X.25 Board								
DTC 16	32								
DTC48	256								
DTC 72MX	256.								

The following factors must be considered in determining how many SVCs to allow:

- The total number of SVCs which an X.25 board can establish depends on the packet size configured in the X.25 level 3 configuration. Upper limits for each DTC48 and DTC72MX card are:
 - 256 for packet sizes of 512 or less.
 - 150 for 1024 byte packets.
 - 100 for 2048 byte packets.
 - 54 for 4096 byte packets.
- Note that these limits are not affected by packet size negotiation. That is, if you have configured a packet size of 4096, and a packet size of 128 has been negotiated, you are still limited to the 54 SVCs supported with 4096 byte packets.

- If you are also configuring PAD connections on this card, remember that PAD connections use SVCs out of the pool of available SVCs. You will need to balance your PAD support requirements with your system-to-system requirements to find the optimum configuration for your network.
- The total number of SVCs available may also be limited by your PSN subscription.

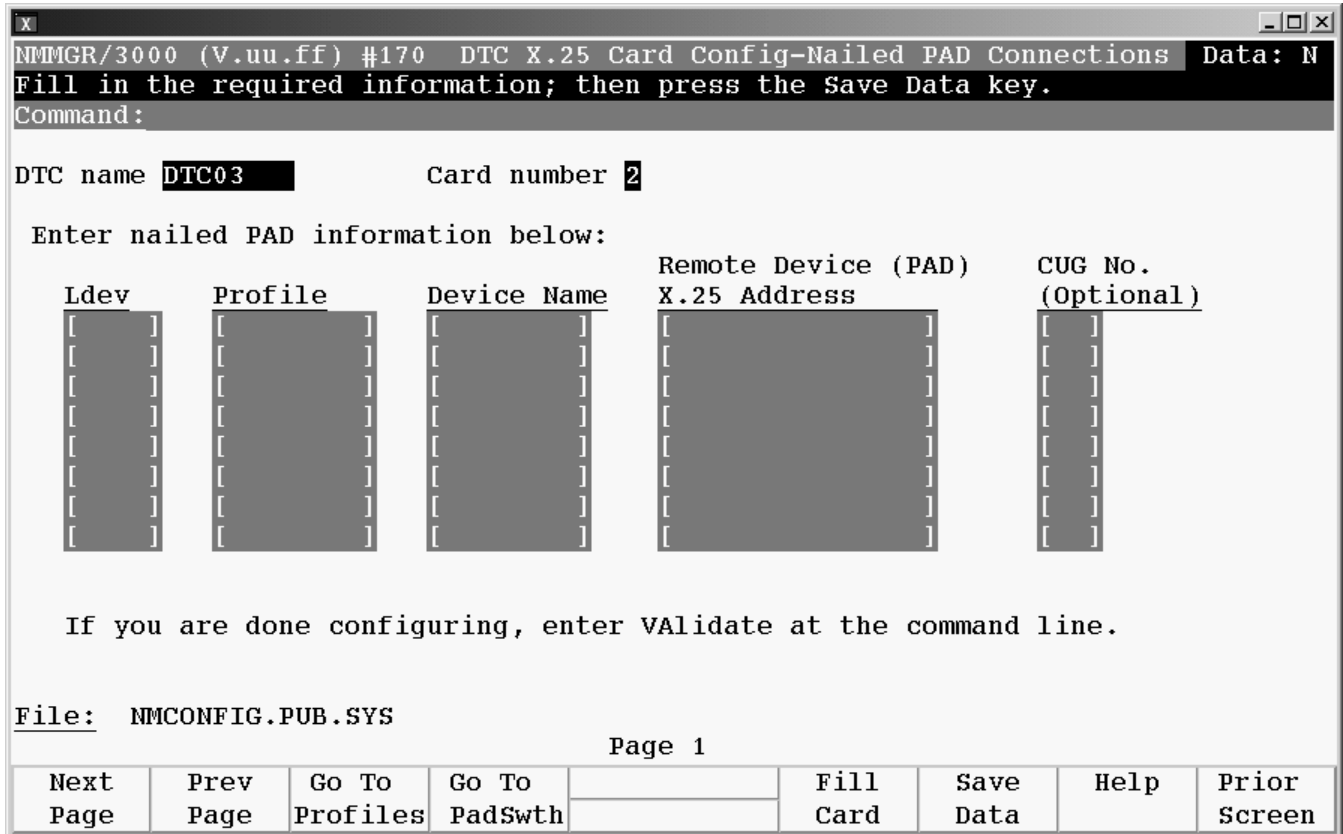
System X.25 address This is the X.25 address of the X.25 card, to be used for system-to-system connections. For most connections to public data networks, this will be the DTC/X.25 Network Access card address plus a unique subaddress for the host system. Each address in this table must be unique.

Note that with certain networks (such as Transpac, in France) the called address is removed from incoming call packets and the calling address is added to outgoing call packets by the network. For these networks, enter only the subaddress in this field, not the full X.25 address.

Step 16: Configure Nailed PAD Connections

When you press the [Go to Pad] key from the DTC Card Configuration screen or the DTC X.25 Card Configuration --Sys-to-Sys Switching Table screen, NMMGR displays the DTC X.25 Card Configuration – Nailed PAD Connections screen (Figure 3-14). On this screen, logical device (ldev) numbers, profile names, device names, and remote X.25 addresses are permanently associated with individual PAD connections allowed through the card. Configure the connections as required.

Figure 3-16 DTC X.25 Card Configuration — Nailed PAD Connections



1. Verify that the cursor is in the first field under Ldev. Type the ldev number that the nailed connection will use in the Ldev field.
2. Move the cursor to the Profile field and enter the profile name the connection will use.

NOTE

To see a list of existing profiles, press the [Go To Profiles] key. If you need to create a new profile, see Chapter 4, “Terminal and Printer Profiles.”

3. Move the cursor to the Device Name field and enter the unique name assigned to the remote device that will be using this nailed connection.
4. Move the cursor to the Remote Device (PAD) X.25 Address field and enter the X.25 address of the remote PAD that will be using this nailed connection.
5. If you want to associate a closed user group number with this nailed connection, move the cursor to the CUG No. field and enter the CUG number.

6. Repeat the above steps for every device attached to this card. (You can use the **[Fill Cards]** key to fill in ldev and profile information.) If you need to configure more than eight nailed PAD connections for this card, press the **[Save Data]** key to save the data on this screen, then use the **[Next Page]** key to move to a new data entry screen to configure additional nailed connections. You can configure up to 256 nailed PAD connections for each card.
7. When all nailed connections have been configured, press the **[Save Data]** key.
8. Press the **[Go To Security]** key to move to the DTC X.25 Card Configuration — PAD Security screen.

Fields

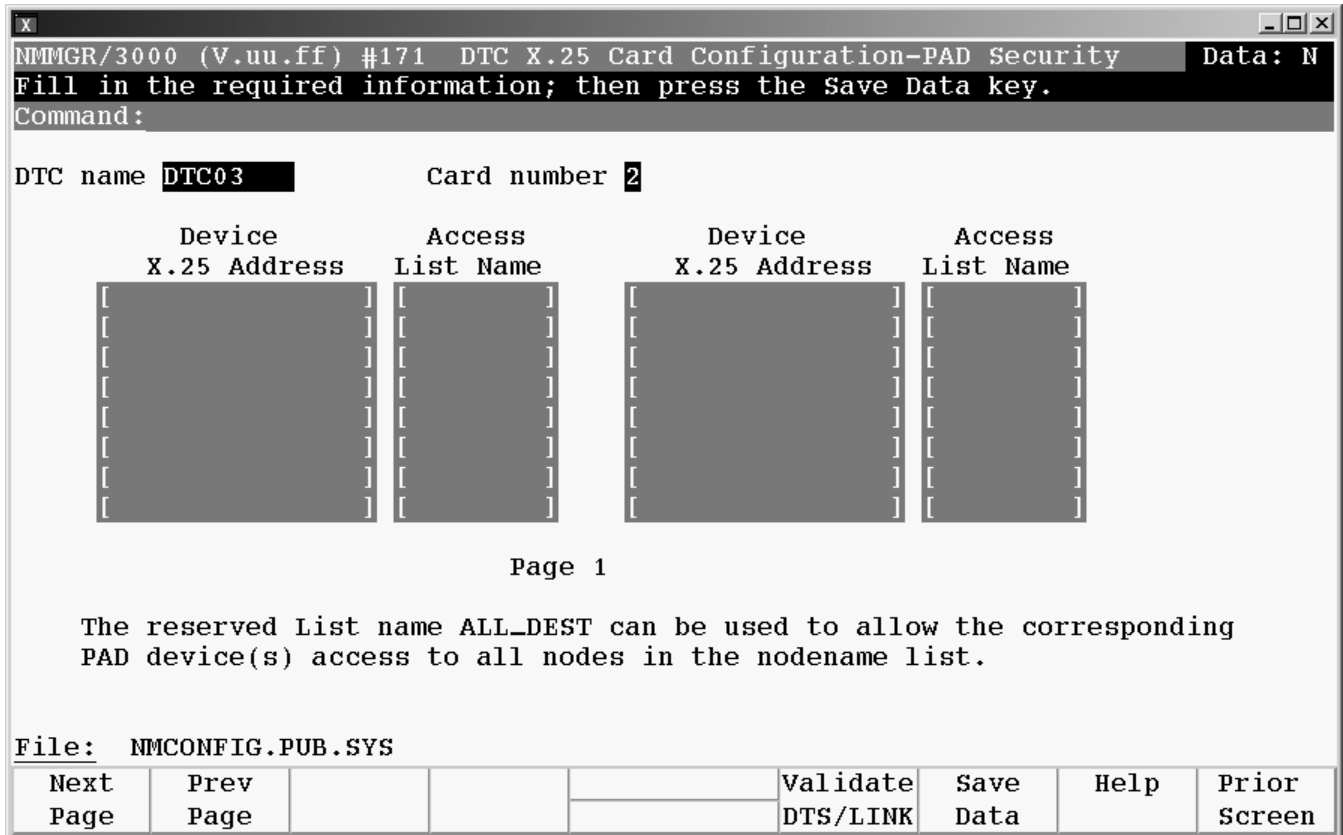
This screen is used to permanently associate ldev numbers and other information with individual connections that can be made through a DTC/X.25 Network Access card; that is, to configure **nailed** PAD connections.

DTC name	Display only.
Card number	Display only.
Ldev	The logical device (ldev) number to be associated with the connection. Each ldev number must be unique; it may not be duplicated by any other device configured on the system.
Profile	The PAD terminal or PAD printer profile name to be associated with the connection. The features defined by the profile must correspond to the actual operating features of the connection and the device. See Chapter 4 for more information on terminal and printer profiles.
Device Name	The name associated with the PAD-connected terminal or printer. The device name can be up to eight (8) characters and must be unique for each PAD connection on this DTC card. This is the device name assigned to the PAD connection. This name is used to connect to a specific ldev on the target system. If you want the PAD port to be able to connect to a PAD nailed device on a system where you have configured a non-managed DTC this name must be configured exactly the same on a system where you have configured a non-managed DTC if you want this port to be able to connect to a PAD nailed device. See Step 10: Configure DTC Cards, DTC/X.25 Card Configuration -- Nailed PAD Connections .
Remote Device (PAD) X.25 Address	The X.25 address of the remote PAD device. Where devices are connected to a multiport PAD, include port subaddresses in this field.
CUG No. (Optional)	Enter the Closed User Group (CUG) number of the remote PAD, if there is one, or leave the field blank. Refer to the network subscription form for the CUG number. If the CUG number entered here does not correspond to your network subscription, calls will be cleared by the network with the message CLR DTE 70. Note that CUG is a PSN service, and is not configurable from NMMGR.

Step 17: Configure PAD Switching

When you press the [Go to PADswth] key at the DTC X.25 Card Configuration screen or the DTC X.25 Card Configuration -- Sys-to-Sys Switch Table screen, NMMGR displays the DTC X.25 Card Configuration -- PAD Switching Table screen (DTC X.25 Card Configuration PAD Table Screen). On this screen, you specify information for the PAD switching table. The PAD Switching table maps the nodenames of LAN-based host systems to Calling address for PAD devices. The address can be the same or different from the address you entered for the system in the System to System Switching Table.

Figure 3-17 DTC X.25 Card Configuration — PAD Switching Screen



1. Move the cursor in the Maximum number of PAD connections field. Enter the maximum number of simultaneous PAD connection that you will want to allow through this card.
2. Move the cursor to the System X.25 address field. Enter the same X.25 address as entered in the X.25 card address field for this node on the System-to-System Switching table screen, *unless your network application requires the address used for X.25 system-to-system communications to be different from that used for PAD communications*. If the addresses must be different, enter the X.25 address that the local system will use for PAD connections in this field.
3. Move the cursor to the System Nodenames field. Enter the system nodename corresponding to the X.25 address. This can be an NS name or an IP address. Use the reserved name DTC_USER_IF if you want to configure an address that will route the user to the DTC's user interface.

4. Repeat steps 1 to 2 for each local HP e3000 Series 900 system that will be allowed to establish a PAD connection with local systems. If you need to enter more than eight local system entries, press the **[Save Data]** key to save the data on this screen, then use the **[Next Page]** key to move to a new data entry screen to configure additional systems.

Fields

This section contains additional information on the allowed contents of the fields on this screen.

Maximum number of PAD connections Number of PAD connections that you will allow at any given time through the card being configured. The maximum number of connections that can be allowed are:

DTC Type	Max Conn Per X.25 Board
DTC 16	32
DTC48	256
DTC 72MX	256.

NOTE

This number specifies the limit for all PAD calls through this card, including both nailed and non-nailed connections.

Consider the following points when deciding on the maximum number of SVCs.

- PAD connections use SVCs. The total available number of SVCs is limited by the number for which you subscribed with the PSN and configured in the X.25 level 3.
- The same pool of SVCs is used for HP e3000 Series 900 system-to-system switching
- The theoretical maximum of 256 may not be available if you use the maximum speed of the X.25 board.

If you are configuring system-to-system switching and PAD support on the same X.25 board, you may need to balance your PAD support requirements with your system-to-system switching requirements to find the optimum configuration for your network. If a remote device attempts to set up a connection and no SVCs are available, the call is cleared with the message **CLR DTE 70** (46 in hexadecimal).

System X.25 Address The X.25 address of the systemnode in this field, up to 15 digits. For connections to most public data networks, this will be the DTC X.25 board's subscription address, plus a unique subaddress for each system (the full address must be entered for every system).

All nodes must be entered with their full X.25 addresses; you cannot use X as a replacement of address digits in this box. The remote terminal user enters this address at the PAD prompt to connect to the corresponding system.

For one listed system only, you can enter **NONE** in this field. Incoming calls with no called address will be routed to this system. If an incoming call packet has a called address that is not listed, the call is switched to the DTC user interface.

With certain networks (such as Transpac, in France) the called address is removed from incoming call packets and the calling address is added to outgoing call packets by the network. For these networks, enter only the subaddress (or **NONE**, for one system only) in this field, not the full X.25 address.

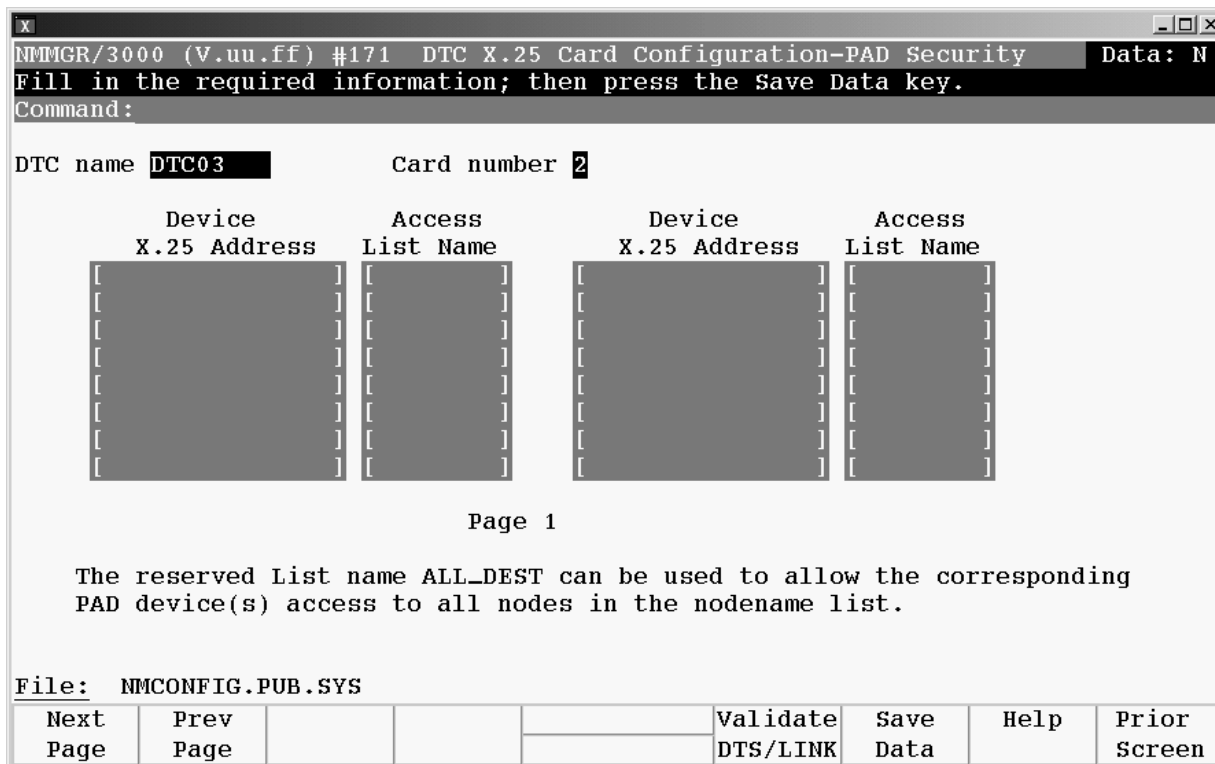
System Nodename This is the NS node name as configured as NODENAME in NMCONFIG.PUB.SYS on the system where you wish to allow connections or an IP address. The field is not case sensitive. The list can contain up to 32 system nodenames, plus the reserved nodename **DTC_USER_IF**. Incoming calls with a called X.25 address corresponding to **DTC_USER_IF** are routed to the DTC user interface. This can be useful if you want to display a message telling users to phone a certain number or for passing on new routing information.

The format of the nodename is *nodename.domain.organization*.

Step 18: Configure PAD Security

NMMGR displays the DTC X.25 Card Configuration — PAD Security screen (Figure 3-18) if you press the **[Go To Security]** key from the DTC X.25 Card Configuration screen or the DTC X.25 Card Configuration — PAD Switching Table screen. On this screen, you associate PAD calling addresses to PAD access lists. These lists control what calling addresses are allowed to establish a PAD connection through the DTC/X.25 Network Access card being configured.:

Figure 3-18 DTC X.25 Card Configuration — PAD Security Screen



1. Verify that the cursor is in the Device X.25 address field. Enter the X.25 address of the calling devices that will be associated with the following list name. You can use the letter X as a wildcard in place of any single digit.
2. Move the cursor to the Access List Name field. Enter the list name you want to associate with this address. If you want to deny access to this address, enter the name of an empty or non-existent PAD access list name.
3. Continue entering X.25 address and Access List name pairs. If you need to configure more address than there is room for on this screen, press the **[Save Data]** key, then press the **[Next Page]** key to enter more device addresses. Up to 512 X.25 calling addresses can be configured.
4. If you have finished configuring PAD security for this card, but still need to configure additional cards or DTCs, press the **[Prior Screen]** key until you return to the DTC Configuration screen so that you can select a different card or DTC to configure.
5. If all DTCs and all cards have been configured, press the **[Validate DTS/LINK]** key to validate the DTC configuration for the system. (See appendix A for validation error messages.)

Fields

DTC name Display only.

Card number Display only.

Device X.25 Address Enter the address of the remote PAD device. Enter up to 16 remote addresses per screen and up to 512 per DTC/X.25 Network Access card.

You can use the letter X as a wildcard character in place of any single digit. All systems with corresponding addresses will have the same address. The address check is sensitive to the length of the address. To manage addresses, you may enter pyramids of Xs where the base is the longest expected address and the peak is the shortest expected address.

For example, to control access to all PAD addresses of six, seven, or eight digits starting with 1234:

1234XX
1234XXX
1234XXXX

To control access to PADS with addresses of seven digits starting with 6789:

6789XXXX

Access List Name Enter the name of the corresponding PAD access list, created in **Step 7: Create and Modify the PAD Access Lists**. The reserved list name **ALL_DEST** can be used to allow the corresponding PAD device(s) access to all nodes in the nodenames list. Note that no password can be assigned to **ALL_DEST**.

Step 19: Validate/Cross-Validate the Configuration File

Validation ensures that no conflicts exist in the network configuration file (NMCONFIG.PUB.SYS) between the DTCs and other configuration parameters. After NMMGR validates the network configuration file, it will automatically cross-validate the

file with the system I/O devices configured through the SYSGEN utility. This will take place only if the file opened at the start of the NMMGR session is NMCONFIG.PUB.SYS and validation is successful. Additionally, you must have System Manager (SM) capability or the cross-validation will not occur. The commands used for SYSGEN cross-validation are in the file NMGRXVAL.PUB.SYS. If this file does not exist, NMMGR will create the file for you before cross-validating. You can edit this file as appropriate for your environment.

Refer to the MPE/iX manual, *System Startup, Configuration, and Shutdown Reference Manual*, for information on SYSGEN.

1. To validate the DTS configuration in the configuration file, press the **[Validate DTS/LINK]** key at the Card Configuration screen. You can also reach the Validate Configuration File screen by typing `validate` at the command line on top of any NMMGR screen and pressing **[Enter]**. (Note that the **[Enter]** key is not the carriage return key.) While at the Validate screen press the **[Validate DTS/LINK]** key to validate the DTS configuration.

The DTS validation procedure starts by displaying the following on the terminal:

```
-> Validation of DTS/LINK started. <-  
-> Validation of DTS/LINK finished. <-
```

If errors were encountered in the configuration file, the validation procedure will print out the total number of errors found. Error messages will also be displayed explaining the problems found. Refer to Appendix B, "Error Messages" for more information about these error messages.

2. After validation of the network configuration file is complete, the following will appear on the screen as the file is cross-validated with the files created with SYSGEN (warning messages may vary):

```
NMMGR will now cross-validate the NMCONFIG file with SYSGEN.
```

```
SYSGEN version E.00.00 : catalog version E.00.00 FRI, FEB 4, 1994, 3:32 PM
```

```
Copyright 1987 Hewlett-Packard Co. All Rights Reserved.
```

```
**warning** No NMCONFIG file in the configuration  
**warning** NMCONFIG.PUB.SYS is now the NMCONFIG file
```

```
** First level command **
```

```
io                log (lo)          misc (mi)         spu (sp)  
sysfile (sy)  
  
basegroup (ba)    keep(ke)          permyes (pe)     show (sh)  
tape (ta)  
  
clear (cl)(c)     exit (ex) (e)    help (he) (h)    oclose (oc)  
redo
```

```
sysgen> PERMYES ON {Automatically reply YES}
sysgen> SY {Go to the SYSFILE subsystem}
    ** SYSFILE configurator commands **

aauto (aa)      aboot (ab)      acmsl (ac)      asprog (as)
cmsl (cm)       dauto (da)      dboot (db)      dcmsl (dc)
dsprog (ds)    lcmsl (lc)      rauto (ra)      rboot (rb)
rcat (rc)      rcmsl (rcm)     rdcc (rd)       ripl (ri)
rnmlib (rn)    rsprog (rs)     show (sh)

clear (cl)(c)  exit (ex)(e)    help (he)(h)    hold (ho)
sysfile> RDCC {Set configuration file to NMCONFIG.PUB.SYS}
sysfile> {HO} {Remove braces to HOLD RDCC command}
sysfile> EX {EXit the SYSFILE subsystem}
    configuration changes are not kept yet!
    still want to exit (yes/no)? Automatic yes

sysgen> BA CONFIG {Set BASE group to CONFIG}
sysgen> KE (KEep the changed configuration data)
    keeping to group CONFIG.SYS
    Purge old configuration (yes/no)? Automatic yes
    ** configuration files successfully saved **
sysgen> EX {EXit SYSGEN}

Cross-validation with SYSGEN was successful.
Copying validated configuration file to backup file, please wait ***
(Press RETURN when done viewing screen contents)
```

3. After successful validation and cross-validation, and if the file in use is NMCONFIG.PUB.SYS, the following prompt will appear:

```
Do you want DTS changes to become active now (Y/N)?
Y = all changes made take effect now
N = all changes made will take effect up next dynamic
    configuration or system reboot
H = help
>
```

Answer Y if you want to invoke DTCCNTRL and make DTS changes take effect now, or answer N if you don't want DTS changes to take effect now. Note any messages that describe additional actions needed for changes to become active. After you exit NMMGR you can review any actions needed by viewing the logs at the end of the file LOGDCC.PUB.SYS.

If you answer N, the DTS changes will take effect the next time DTCCNTRL is invoked, a DTS shutdown/restart is done, or the system is rebooted.

Type H if you need more help to answer the question.

4. After viewing the messages describing what actions are required, if any, enter [RETURN] when you see the prompt:

(Press RETURN when finished view screen contents.)

You will return to the Validation screen. You may make additional configuration changes or exit NMMGR.

Step 20: Ensure DTS Changes Become Active

If you answered Y to the question “Do you want DTS changes to become active now (Y/N) ?” in Step 14, refer to in Chapter 7, “Managing Networks with DTCCNTRL,” for a list of configuration tasks and associated actions for changes to become active.

For those tasks indicating “No action; changes take effect dynamically,” no additional actions are required for the DTS changes to become active. You will see a message on the screen indicating that no other actions are required.

For other tasks requiring additional actions for changes to become active, you will see messages on the screen indicating what actions must be taken first.

NOTE

If you answered N to the question in Step 14, thus choosing not to call DTCCNTRL, refer to Chapter 7, “Managing Networks with DTCCNTRL,” for the syntax on how to invoke DTCCNTRL outside NMMGR.

Performing a DTC Reset

First, logoff any sessions. To reset the DTC, turn off the power and then turn on the power again for the DTC.

You may also use TermDSM, an online diagnostic program for host-managed DTCs, to reset the DTC. Refer to *Troubleshooting Terminal, Printer, and Serial Device Connections* for more information.

Performing a DTS Shutdown/Restart

To perform a DTS shutdown and restart, use the DTCCNTRL command. Refer to Chapter 7, “Managing Networks with DTCCNTRL,” for the command syntax of this command. Refer to the Dynamic Configuration chapter of the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for additional information on performing a DTS shutdown and restart.

4 Terminal and Printer Profiles

This chapter provides an overview of the purpose and usage of terminal and printer profiles. Additional detailed information is provided that is specific for PAD devices. This information describes the PAD profile byte, using the PAD password, and forced data forwarding. This chapter also contains a list of features controlled by the PAD profile byte.

See the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for more detailed information on the characteristics set by profiles, descriptions of terminal types, and how to create and modify profiles in NMMGR.

What is a Profile

A profile is a group of device connection specifications and characteristics that can be associated with devices. Profiles can be associated with terminals, printers, PAD terminals and printers, and UPSs.

The word profile is used in two different contexts in this chapter. When a ldev is configured on the MPE/iX system, a profile name is associated with each ldev. This association is configured on the DTC Card Configuration screens. The information in the profile name describes the characteristics of the ldev on the system and in the DTC. The information configured in the profile name is specified on the profile screens in NMMGR.

When a PAD ldev is configured, there is also a PAD profile number or value that describes certain parameters of the connection between the PAD and the X.25 card in the DTC. These additional PAD parameters are set within the profile name associated with the PAD ldev. The PAD Terminal Profile section describes these PAD parameters. See the Table in this chapter that lists the PAD profile numbers that are available.

The sample configuration file on the HP 3000 Series 900 supplies several terminal and printer profiles. You may create your own profiles, or modify those provided. This chapter contains a table that lists the terminal, printer, and PAD profiles supplied in the sample configuration file.

Profile Name

Each profile is identified by a profile name. The name can be up to eight characters long and must start with a letter followed by letters and numbers. At any one time, up to 1000 profiles can be configured per system.

The profiles supplied by the HP 3000 configuration file follow a naming convention. For example, TR10D96 denotes a terminal profile (TR) of terminal type 10 (10), for direct connect (D), with line speed of 9600 bps (96). Printer profiles starts with PR, such as PR18D96. The standard UPS profile is UP10D12 where (UP) denotes an HP PowerTrust UPS.

Terminal Profiles

Terminal profiles define the characteristics of DTC ldevs that are connected to terminals, PCs running terminal emulators, and UPSs. Devices that use these profiles are usually connected directly to the DTC ports or are connected through a modem over a phone line.

Printer Profiles

Printer profiles define the characteristics of ldevs that are connected to printers, or other devices that are intended to only receive data from the DTCs. Devices that use these profiles are usually connected directly to the DTC ports or are connected through a modem over a phone line.

PAD Terminal Profiles

PAD terminal profiles define the characteristics of ldevs that are used by devices that are connected to the HP 3000 through a PAD/X.25 connection. These devices can be terminals or PCs running terminal emulators.

PAD Printer Profiles

PAD printer profiles define the characteristics of ldevs that are used by printers that are connected to the HP 3000 through a PAD/X.25 connection.

System Supplied Terminal and Printer Profiles

The Host-Based Terminal Profiles as shown in Table 4-1 lists the terminal and printer profiles supplied by the MPE/iX system for host-based and PC-based management. You may choose these profiles for your terminal and printer configuration. You may also create your own profiles.

Table 4-1 Host-Based Terminal Profile

Profile Name	Characteristics	Suggested Devices
TR10D24	Terminal type 10 Record width of 80 bytes Modem type 0 (no modem) Parity: none Speed/Parity Sensing? N Reset HP Terminals? N Allow :HELLO logon? Y NLIO devices? N No device classes assigned	Supported HP terminals Connected directly Set at 2400 bps
TR10D96	Terminal type 10 Record width of 80 bytes Modem type 0 (no modem) Parity: none Speed/Parity Sensing? N Reset HP Terminals? N Allow :HELLO logon? Y NLIO devices? N No device classes assigned	Supported HP terminals Connected directly Set at 9600 bps
TR10E12	Terminal type 10 Record width of 80 bytes Modem type 2 (European modem) Parity: none Speed/Parity Sensing? N Reset HP Terminals? N Allow :HELLO logon? Y NLIO devices? N No device classes assigned	Supported HP terminals European modem connection Set at 1200 bps
TR10U12	Terminal type 10 Record width of 80 bytes Modem type 1 (US modem) Parity: none Speed/Parity Sensing? N Reset HP Terminals? N Allow :HELLO logon? Y NLIO devices? N No device classes assigned	Supported HP terminals US modem connection Set at 1200 bps

Table 4-1 Host-Based Terminal Profile (Continued)

Profile Name	Characteristics	Suggested Devices
TR10U24	Terminal type 10 Record width of 80 bytes Parity: none Speed/Parity Sensing? N Reset HP Terminals? N Allow :HELLO logon? Y NLIO devices? N No device classes assigned	Supported HP terminals Connected to modem port Set at 9600 bps
TR24	Terminal type 24 Record width of 80 bytes Parity: none Speed/Parity Sensing? N Reset HP Terminals? N Allow :HELLO logon? Y NLIO devices? N No device classes assigned	Supported HP terminals Connected to a PAD Set at 9600 bps
TR24PAD	Terminal type 24 Record width of 80 bytes Allow :HELLO logon? Y Reset HP Terminals? N NLIO devices? N PAD test requested? Y Send initial profile? Y X.3 setting requested? Y Data forward parm #3, 4? 10 No device classes assigned	Supported HP terminals Connected to a PAD
UP10D12	Terminal type 10 Record width of 80 bytes Parity: none Speed/Parity Sensing? N Reset HP Terminal? N Allow :HELLO logon? Y NLIO devices? N Device class: HPUPSDEV	Supported HP PowerTrust UPSs Connected directly Set at 1200 bps

The Host-Based Printer Profiles are shown in Table 4-2.

Table 4-2 Host-Based Printer Profiles

Profile Name	Characteristics	Suggested Devices
PR18D24	Printer type 18 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Printers with no status checking Connected directly Set at 2400 bps
PR18D96	Printer type 18 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Printers with no status checking Connected directly Set at 9600 bps
PR18U24	Printer type 18 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Printers with no status checking Connected to modem port Set at 2400 bps
PR18U96	Printer type 18 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Printers with no status checking Connected to modem port Set at 9600 bps
PR22D12	Printer type 22 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Supported HP printers with status checking Connected directly Set at 1200 bps
PR22D24	Printer type 22 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Supported HP printers with status checking Connected directly Set at 2400 bps
PR26D24	Printer type 26 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Supported HP printers Connected directly Set at 2400 bps

Table 4-2 Host-Based Printer Profiles (Continued)

Profile Name	Characteristics	Suggested Devices
PR26D96	Printer type 26 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Supported HP printers Connected directly Set at 9600 bps
PR26PAD	Printer type 26 Record width of 132 bytes Spooled No NLIO devices PAD test requested? Y Send initial profile? Y X.3 setting requested? Y Device class: LP	Supported HP printers Connected to a PAD
PR26U24	Printer type 26 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Supported HP printers Connected to a modem port Set at 2400 bps
PR26U96	Printer type 26 Record width of 132 bytes Spooled No NLIO devices Parity: none Device class: LP	Supported HP printers Connected to a modem port Set at 9600 bps

DTC PAD Profile Field

The profile number used by the PAD is the decimal value of the binary number calculated from Table 4-3 as done by the **[Compute Byte]** function key. An “x” in a box means that the value doesn’t matter: that is, the values of the bits are not dependent on each other. Bit 7 is reserved for future use, and is set to 0. Note that you can only use certain combinations: meaningless or dangerous combinations are blocked and cannot be entered.

```
Terminal with init profile set; Bit 0 is 1=1
Data forwarding 3:127 4:0; Bit 2 is 1=4
X.3 setting allowed; Bit 4 is 0=0
No PAD test during connection initialization; Bit 5 is 1 = 32
-----
Profile number = 37
```

Table 4-3 PAD Profile Field

7	6	5	4	3	2	1	0	Bit Position
(128)	(64)	(32)	(16)	(8)	(4)	(2)	(1)	(Bit Value)
0	x	1	x	x	x	0	0	Printer without init profile set
0	x	x	x	x	x	0	1	Terminal with init profile set
0	x	x	x	x	x	1	0	Printer with init profile set
0	x	1	x	x	x	1	1	Terminal without init profile set
0	x	x	x	0	0	x	x	Data forwarding default
0	x	x	x	0	1	x	x	Data forwarding 3:127 4:0
0	x	x	x	1	0	x	x	Data forwarding 4:1
0	x	x	x	1	1	x	x	Data forwarding 4:2
0	x	x	0	x	x	x	x	X.3 setting
0	x	x	1	x	x	x	x	No X.3 setting
0	x	0	x	x	x	x	x	PAD test during connection initialization
0	x	1	x	x	x	x	x	No PAD test during connection initialization

Table 4-3 PAD Profile Field (Continued)

7	6	5	4	3	2	1	0	Bit Position
(128)	(64)	(32)	(16)	(8)	(4)	(2)	(1)	(Bit Value)
0	0	x	x	x	x	x	x	No forced data forwarding
0	1	x	x	x	x	x	x	Forced data forwarding

PAD Profiles and Access Password

When users attempt to establish a connection from a PAD, the PAD selection command may specify a password and/or a profile number. The password will be needed if PAD incoming security has been configured and the PAD access list is associated with the calling address has had a password defined. The profile number may be specified to override the PAD profile field configured for the PAD port.

The password is configured on the PAD access list screen in Step 7: Create and Modify the PAD access lists. Refer to Chapter 3, “Configuring DTCs Step-by-Step,” for information on configuring the password.

The PAD profile number is the number displayed by the **[Compute Byte]** function key. The section DTC PAD Profiles contains a list of PAD profiles that are available. Entering a profile number in the PAD selection command causes the DTC to use the particular PAD profile when the connection is established.

The syntax to enter a password and/or profile number for the PAD selection command is:

```
@<X.25 address>,d[<password>][/<profile number>]
```

The following example supplies the password “secret” and causes the PAD profile 33 to be used.

```
@ 1234567891234,dsecret/33
```

Forced Data Forwarding

When a connection is established to a PAD device, two of the characteristics that get set, are the data forwarding parameters. The data forwarding parameters tell the PAD when a packet must be sent to the PDN. The behavior of data forwarding is set with the fields “Data forwarding parm #3 and #4” and “Forced data forwarding” on the PAD Terminal Profile screen. The Forced data forwarding field also affects how the “Data forwarding parm #3 and #4” field behaves. See the PAD Installation manual for further information on the PAD parameters.

On the PAD, Parm #3 selects the set of characters that will signal the PAD to forward data to the PDN. Parm #4 sets the idle timer in 1/20 second increments. The idle timer will signal the PAD to forward data if the time between successive characters from the terminal exceeds the idle timer value.

When “Forced data forwarding” bit is 0, the “Data forwarding parm #3 and #4” behave as described in the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual. The value specified in the field will be used when the connection to the is in:

DTC PAD Profile Field

VPLUS mode;

Telnet mode;

character mode when EOR and AEOR are not carriage return.

The value in the field is not used during a connection when in character mode and EOR or AEOR is carriage return. In this case the default values will be used: parm #3 is 2 and parm #4 is 0.

When the “Forced data forwarding” bit is 1, the data forwarding parms #3 and #4, that are set at connection time in the PAD, are ALWAYS used.

DTC PAD Profiles

Table 4-4 shows the usable DTC PAD profiles and their recommended usage. You must *not* use profiles 18, 45 and 50, even though they are available. All other numbers are blocked, and cannot be entered.

Table 4-4 Terminal PAD Profiles

Profile	Definition	Usage
1	PAD Test Init profile X.3 setting Data Forward default	Default terminal profile. Does not need to be entered in the CALL User Data. Direct replacement for the “Terminal” device type of releases prior to 12.0. Ensures backward compatibility with DTC 2.0 to 10.5.
5	PAD Test Init profile X.3 setting Data forward 3:127	Used in data transfer. Recommended for more performance of the Telnet path (X.29 SERVER profile compatibility) or for iX character mode applications which need to send each character to the host (for example, HPEDIT). The profile loads the X.25 line with many, small packets each time the application needs a termination character other than CR. The PAD must support 3:127.
9	PAD Test Init profile X.3 setting Data forward 4:1	Used in data transfer. Recommended when you need more performance in iX character mode applications which need to send each character to the host. The profile loads the X.25 line with many, small packets each time the application requires a termination character other than CR.

Table 4-4 Terminal PAD Profiles (Continued)

Profile	Definition	Usage
13	PAD Test Init profile X.3 setting Data forward 4:2	<p>Used in data transfer.</p> <p>Recommended for more performance in iX for VPLUS mode (NS/PAD compatibility) or for character mode applications which need to send few characters to the host.</p> <p>The profile loads the X.25 line with many, small packets each time the application requires a termination character other than CR.</p> <p>The PAD must support 4:2.</p>
17	PAD Test Init profile No X.3 setting Data forward default	<p>Used in data transfer.</p> <p>Recommended if you don't want to change the hardcoded initial profile set by PAD Support when an application controls requires the setting of X.3 parameters other than echo, break or flow control.</p> <p>The user must ensure that the editing characters are <BS> (ASCII 8) for backspace, and Control-X (ASCII24) for the line delete character.</p>
33	No PAD test Init profile X.3 setting Data forward default	<p>Used at connection initialization.</p> <p>Recommended for more performance at the connection initialization, or if the PAD doesn't support the setting of multiple Set and Read, or isn't able to answer during the "PAD Test" sequence in accordance with X.29 recommendations. For example, for a PAD which answers with an X.29 PAD error at a parameter setting instead of setting the "error bit".</p> <p>The PAD must support the X.3 setting needed by the applications.</p>
35	No PAD test No init profile X.3 setting Data forward default	<p>Used at connection establishment.</p> <p>Recommended if the user wants to keep the profile set before connection initialization.</p> <p>The PAD must support the X.3 setting needed by the applications.</p>

Table 4-4 Terminal PAD Profiles (Continued)

Profile	Definition	Usage
37	No PAD test Init profile X.3 setting Data forward 3:127	Used at connection initialization and during data transfer. The PAD must support the X.3 settings required by the applications and the 3:127 data forwarding. The PAD must support the X.3 setting needed by the applications.
39	No PAD test No init profile X.3 setting Data forward 3:127	Used at connection establishment and during data transfer. Recommended if you want to combine profiles 35 and 5. The PAD must support the X.3 settings needed by the applications and the 3:127 data forwarding.
41	No PAD test No init profile X.3 setting Data forward 4:1	Used at connection establishment and during data transfer. Recommended if you want to combine profiles 33 and 9. The PAD must support the X.3 settings needed by the applications.
43	No PAD test No init profile X.3 setting Data forward 4:1	Used at connection establishment and during data transfer. Recommended if you want to combine profiles 35 and 9. The PAD must support the X.3 settings needed by the applications.
45	No PAD test Init profile X.3 setting Data forward 4:2	Used at connection establishment and during data transfer. The PAD must support the X.3 settings needed by the applications and the 4:2 data forwarding.
47	No PAD test No init profile X.3 setting Data forward 4:2	Used at connection establishment and during data transfer. The PAD must support the X.3 settings needed by the applications and the 4:2 data forwarding.

Table 4-4 Terminal PAD Profiles (Continued)

Profile	Definition	Usage
49	No PAD test Init profile No X.3 setting Data forward default	Used at connection establishment and during data transfer. The PAD must support the X.3 setting needed by the applications.
51	No PAD test No init profile No X.3 setting Data forward default	Used at connection establishment and during data transfer. The PAD must support the X.3 settings needed by the applications.
85	PAD test forwarding Init profile No X.3 setting Data forward 3:127 Forced data forwarding	Used at connection initialization and during data transfer. This profile is advised when you want to force the data forwarding value selected. The PAD must support the 3:127 data forwarding.
89	PAD test Init profile No X.3 setting Data forward 4:1 Forced data forwarding	Used at connection establishment and during data transfer. This profile is advised when you want to force the data forwarding value selected.
93	PAD test Init profile No X.3 setting Data forward 4:2 Forced data forwarding	Used at connection establishment and during data transfer. This profile is advised when you want to force the data forwarding value selected. The PAD must support the 4:2 data forwarding.
117	No PAD test Init profile No X.3 setting Data forward 3:127 Forced data forwarding	Used at connection establishment and during data transfer. This profile is advised when you want to force the data forwarding value selected. The PAD must support the 3:127 data forwarding.
119	No PAD test No init profile No X.3 setting Data forward 3:127 Forced data forwarding	Used at connection establishment and during data transfer. This profile is advised when you want to force the data forwarding value selected. The PAD must support the 3:127 data forwarding.

Table 4-4 Terminal PAD Profiles (Continued)

Profile	Definition	Usage
121	No PAD test Init profile No X.3 setting Data forward 4:1 Forced data forwarding	Used at connection establishment and during data transfer. This profile is advised in character mode applications which need to send each character to the host.
123	No PAD test No init profile No X.3 setting Data forward 4:1 Forced data forwarding	Used at connection establishment and during data transfer. This profile is advised in character mode applications which need to send each character to the host.
125	No PAD test Init profile No X.3 setting Data forward 4:2 Forced data forwarding	Used at connection initialization and during data transfer. This profile is advised when you want to force the data forwarding value selected. The PAD must support the 4:2 data forwarding.
127	No PAD test No init profile No X.3 setting Data forward 4:2 Forced data forwarding	Used at connection establishment and during data transfer. This profile is advised when you want to force the data forwarding value selected. The PAD must support the 4:2 data forwarding.

The Printer PAD profiles are shown in Table 4-5.

Table 4-5 Printer PAD Profiles

Profile	Definition	Usage
2	PAD test Init profile X.3 setting Data forward default	Default printer profile. Direct replacement for the "Printer" device type of releases prior to 12.0. Ensures DTC 2.0 to 10.5 backward compatibility.
18	PAD test Init profile No X.3 setting Data forward default	Used in data transfer.

Table 4-5 Printer PAD Profiles (Continued)

Profile	Definition	Usage
32	No PAD test No init profile X.3 setting Data forward default	Used at a connection initialization. Recommended if you want to keep the profile set before connection establishment. To use this profile with iX, verify that the PAD supports the setting of the idle timer to 1/20 seconds, if you want to use terminal types such as TT22 or TT26.
34	No PAD test Init profile X.3 setting Data forward default	Used at connection initialization. Recommended for more performance at the connection initialization, or if the PAD doesn't support the setting of multiple Set and Read, or if the PAD can't answer during the "test of PAD" sequence in accordance with the X.29 recommendations. For example, a PAD which answers with an X.29 PAD error at a parameter instead of setting the "error bit". To use this profile with iX, the PAD must support the setting of the idle timer to 1/20 seconds, if you want to use a terminal type such as TT22 or TT26.
48	No PAD test No init profile No X.3 setting Data forward default	Used at connection initialization and during data transfer.
50	No PAD test Init profile No X.3 setting Data forward default	Used at connection initialization and during data transfer.

5 Preparing to Configure X.25 iX System Access

This chapter details the information you will need before you can begin to configure X.25 iX System Access for host-based systems that will include an X.25 system-to-system link. Sample worksheets are included to ease configuration.

Hewlett-Packard recommends that you configure the datacommunications and terminal subsystem (DTS) before configuring the NS X.25 link. If you have not already done so, turn to chapters 2 and 3 in this manual for information on how to configure your system's DTCs.

If you also need to configure a point-to-point link or a LAN link, see the *HP 3000/ iX Network Planning and Configuration Guide*.

This chapter describes how to:

- Plan the network configuration for X.25 iX System Access.
- Determine network characteristics for X.25 iX System Access.
- Identify Neighbor Gateways.

NOTE

If you are configuring X.25 iX System Access on a system using PC-based network management (an OpenView workstation is part of the network), you should use the *HP 3000/ iX Network Planning and Configuration Guide* instead of this manual to configure the X.25 link.

Plan the Network Configuration

Before you begin the process of configuring the X.25 iX System Access link, you must define the physical layout and configuration parameters for the system-to-system network connections that will be required for the system you are configuring. Once you have determined what the configuration should be, you can begin the process of entering the configuration values into NMMGR.

Configuration values that you must determine include a network interface name and type and an address for the system being configured. You must also determine whether any of the nodes on your network are gateway nodes, and identify neighbor gateways.

Table 5-1 shows the configuration values that you will need to enter, along with the screen on which each is entered. The parameters are listed in alphabetical order.

NOTE

This manual assumes the use of the guided configuration branch. Only the parameters configured during guided configuration are listed.

Table 5-1 Configuration Values for X.25 Link

Parameter/Value	Screen	Comment
Address key	X.25 Virtual Circuit Configuration	In the network directory, the name of each node listed in the remote node name field. HP recommends that you use the node portion of the remote node's node name as the address key.
Card number	X.25 Configuration	Slot number of the DTC/X.25 Network Access card.
DTC node name	X.25 Configuration	Node name of the DTC in the form <i>node.domain.organization</i> . Must agree with node name configured through the DTC configuration on the DTC Configuration screen. The node name must be entered for each DTC/X.25 Network Access card that allows system-to-system connections.
Facility set	X.25 Virtual Circuit Configuration	For SVCs only. In the network directory, a facility set name for a collection of X.25 connection parameters. Use the default (STDSFSET) or enter a different name then go to Facility Sets to define parameters.

Table 5-1 Configuration Values for X.25 Link (Continued)

Parameter/Value	Screen	Comment
Hops	Neighbor Gateway Reachable Networks	Number of hops (full gateways) needed to get from the system being configured to the reachable network.
IP address	X.25 Configuration	The internet protocol (IP) address of the system (node) being configured.
IP subnet mask	X.25 Configuration	Optional. Identifies which bits of the IP address will be used to define a subnetwork.
Link name	X.25 Configuration	Name of the link used by X.25 iX System Access. Must match the link name configured through the DTC configuration on the DTC X.25 Card Configuration — Sys-to-Sys LUGs screen. A link name must be entered for each DTC/X.25 Network Access card that allows system-to-system connections.
Local domain name	NS Configuration	Optional. Name of the system in ARPANET standard format.
Local HP 3000 node name	Main	Node name of the HP 3000 system you are configuring.
Neighbor gateways	MNeighbor Gateways	The name of any gateway that is on the same network as the node you are configuring. (There may not be any neighbor gateways.)
Neighbor gateway IP internet address	Neighbor Gateway Reachable Networks	IP internet address of the configured gateway(s).
Network interface (NI) name	Guided HP Configuration	Name, up to eight characters long, representing the network interface being configured.
Network interface (NI) type	Guided HP Configuration	Enter 3 to indicate an X.25 NI.
Permanent VC number	X.25 Virtual Circuit Configuration	For PVCs only. In the network directory, the number of the permanent virtual circuit on the remote node.

Table 5-1 Configuration Values for X.25 Link (Continued)

Parameter/Value	Screen	Comment
Reachable network IP network address	Neighbor Gateway Reachable Networks	The IP address of all remote nodes that can be reached through the gateway.
Reachable network IP mask	Neighbor Gateway Reachable Networks	Optional subnet mask for the reachable network.
Remote IP address	X.25 Virtual Circuit Configuration	In the network directory, the IP address of each node listed in the remote node name field.
Remote node name	X.25 Virtual Circuit Configuration	In the network directory, name of each remote X.25 node on the network.
Remote X.25 address	X.25 Virtual Circuit Configuration	For SVCs only. In the network directory, the X.25 address of the remote host for X.25 public data networks or private networks.
Security class	X.25 Virtual Circuit Configuration	For SVCs only. In the network directory, the security to be applied for connection establishment with the remote node.

Determine X.25 iX System Access Network Characteristics

You must define the characteristics of the X.25 iX System Access link or links that you will be configuring. You must specify a link name and configuration for each DTC/X.25 Network Access card that will be used for X.25 system-to-system connections.

Several of the parameters that you will configure for X.25 iX System Access through the NS configuration must match the parameters you configured for DTS (chapters 2 and 3). The common parameters are:

- Link name.
- DTC node name.
- Card number of the DTC/X.25 Network Access card in the DTC.
- If you configure user facility set parameters, these parameters should also match the parameters specified in the DTS configuration.

Once you have defined the characteristics of the X.25 network, transfer this information onto the X.25 Configuration Worksheet and the X.25 Virtual Circuit Configuration Worksheet.

X.25 Configuration Worksheet

Fill out worksheet as shown in Figure 5-1 for the X.25 iX System Access links you are configuring.

Figure 5-1 X.25 Configuration Worksheet

X.25 Configuration Worksheet		
Node name _____ (Specify local system)		
Network Interface (NI) name _____		
IP address _____ IP subnet mask _____ (optional)		
Link name	DTC Node Name	Card Number
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

X.25 Virtual Circuit Configuration Worksheet

Fill out worksheet as shown in Figure 5-2 for each X.25 iX System Access link you are configuring.

Figure 5-2 X.25 Virtual Circuit Configuration Worksheet

X.25 Virtual Circuit Configuration Worksheet

Network directory name _____

Remote node name _____

Remote IP Address _____

Address key _____

Network Interface (NI) name _____

If address type is switched virtual circuit, enter:

Remote X.25 address _____

Facility set _____

Security class _____ (IN, OU, IO, LK)

If address type is permanent virtual circuit, enter:

Permanent VC number _____

Identify Neighbor Gateways

This section only applies if one of the nodes on your network is a gateway. A *neighbor gateway* is a gateway that is on the same network as a given node. A non-gateway node on a network may need to go through a neighbor gateway in order to send messages to an entirely different network. Two nodes are on the same network if the network portion of their IP addresses are the same. All X.25 nodes on the same network need to know the identities of any accessible neighbor gateways. Therefore, when using NMMGR to configure any node, you will be entering the identities of all the *neighbor gateways* into the configuration of the node. Following is an example:

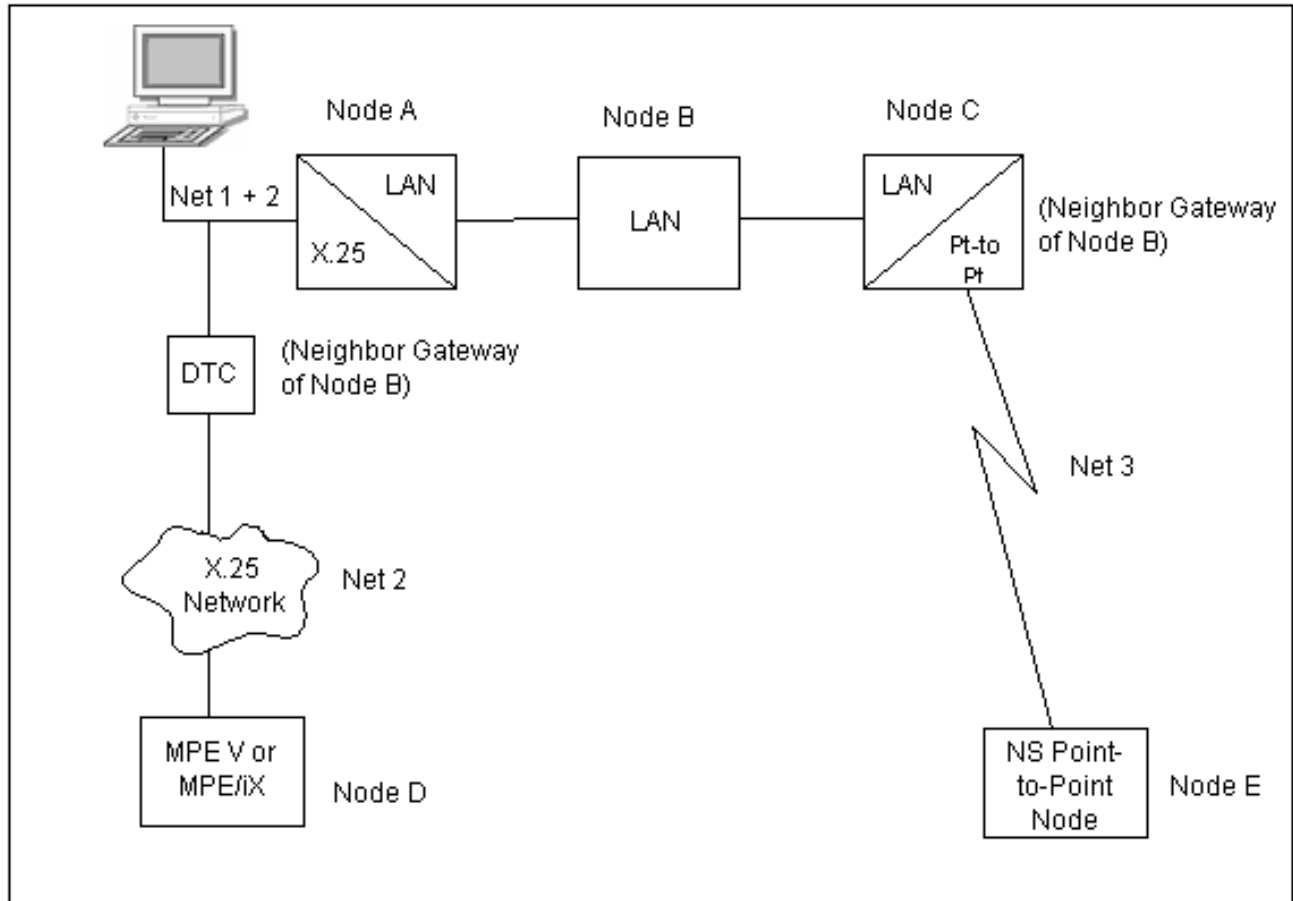
Example: Identifying Neighbor Gateways of Node B

In Figure 5-3, Net 1 is a LAN, Net 2 is an X.25 network, and Net 3 is a point-to-point network. Node A is on both Net 1 and Net 2 and is a full gateway between them. Node A is the Neighbor Gateway for all nodes on Net 1 to reach Net 2. Node C is on Net 1 and Net 3 and is a gateway half. Node C is the Neighbor Gateway for all nodes on Net 1 to reach Net 3.

If you were configuring a node such as Node B in Figure 5-3, you would enter the identities of Nodes A and C as *neighbor gateways* of Node B (at the Neighbor Gateways screen and the Neighbor Gateway Reachable Networks screen). On the Neighbor Gateway Reachable Networks screen, you would also enter the IP address of Network 2

as a Configured Reachable Network reachable through gateway Node A and the IP address of Network 3 as a Configured Reachable Network reachable through gateway Node C.

Figure 5-3 Identifying Neighbor Gateways of Node B



6 Configuring X.25 Links Step-by-Step

This chapter provides step-by-step instructions for configuring X.25 iX System Access for systems using host-based network management. This manual assumes that you are using the guided configuration capabilities of NMMGR.

Before using NMMGR to configure a link, you should complete the worksheets provided. See Chapter 5, “Preparing to Configure X.25 iX System Access,” for more information on planning your configuration and filling out the configuration worksheets.

This chapter includes step-by-step instructions to help you perform the following tasks:

- Configure the X.25 iX System Access link.
- Configure X.25 virtual circuits.
- Configure neighbor gateways, if there are any.

NOTE

If you are configuring X.25 iX System Access on a system using PC-based network management (an OpenView workstation is part of the network), you should use the *HP 3000/iX Network Planning and Configuration Guide* instead of this manual to configure the X.25 link.

Modify the Network Management Configuration File

The procedures that follow describe how to modify the NMMGR configuration file and network directory file for X.25 iX System Access configuration. These procedures assume that you have already configured the datacommunications and terminal subsystem (DTS) for this system. See Chapter 3, “Configuring DTCs Step-by-Step,” for information on DTS configuration.

Step 1: Begin the Configuration Process

Run the NMMGR program. Node manager (NM) or network administrator (NA) capabilities are required to run this program. To run NMMGR:

1. Type `NMMGR.PUB.SYS` at the MPE/iX prompt (:).
2. Press **[Return]**.

NOTE

You cannot modify the X.25 iX transport and link configurations in `NMCONFIG.PUB.SYS` if the Network Services are active. Verify that the Network Services are not running by issuing the `NETCONTROL STATUS` command. You must have NM (Node Manager) capability to issue this command.

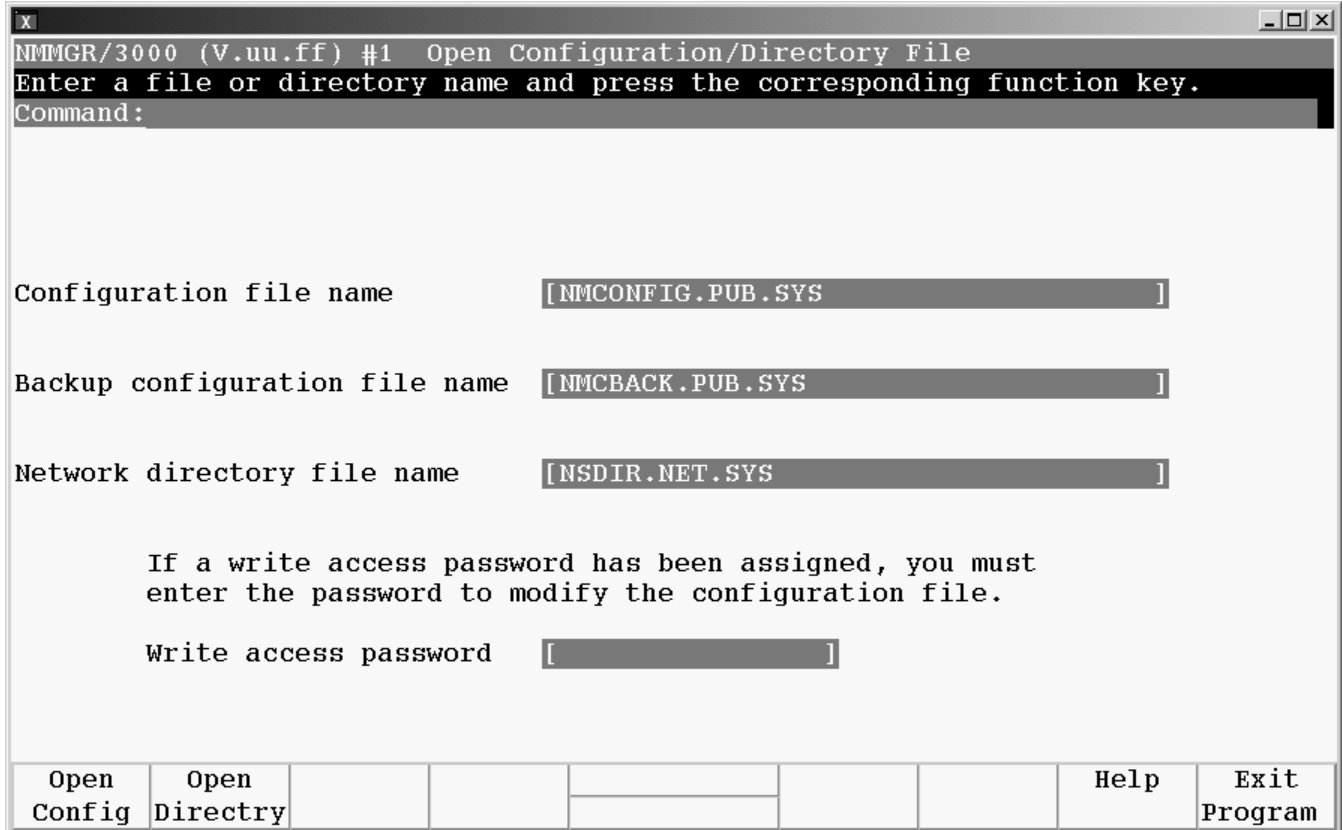
If NS is down, you will see the following two messages in response to the `NETCONTROL STATUS` command:

```
TRANSPORT NOT ACTIVE. (NETXPORTWARN
0001) ENCOUNTERED ONE OR MORE WARNINGS
WHILE PROCESSING COMMAND. (CI W ARN4437)
```

Step 2: Open the Configuration File

The first screen that NMMGR displays is the Open Configuration/Directory File screen (Figure 6-1). You should already have created the configuration file you are using when you configured DTS. (If you have not already configured DTS, stop here, and go to Chapter 3, “Configuring DTCs Step-by-Step,” for step-by-step instructions.

Figure 6-1 **Open Configuration/Directory File Screen**



1. Verify that the correct configuration file name, backup configuration file name, and network directory file name are in the appropriate fields
2. If you have assigned a write access password, enter it in this field. If you are not using the password feature, leave this field blank.
3. Press the [**Open Config**] key.

Fields

Configuration file name The only configuration file name the system recognizes for use by the network subsystem is NMCONFIG.PUB.SYS. You can, however, create or modify a configuration file using a different name and save it as an **offline configuration file**. You can use offline configuration files as a means of creating and storing configurations that you want to use in the future or that you are preparing for use on a different system. When you are ready to use an offline configuration file, rename it as NMCONFIG.PUB.SYS, validate within NMMGR (SYSGEN cross-validation is done automatically within NMMGR). Use DTCCNTRL to shutdown and restart DTS or reboot the system.

Modify the Network Management Configuration File

`Backup configuration file name` A backup file name must be specified whenever a configuration file is opened or created. The default backup configuration file name is `NMCBACK.PUB.SYS`. The backup file will be automatically updated with the contents of the configuration file each time the configuration file is successfully validated.

`Network directory file name` The network directory file must be configured for each new node (unless you will only be accessing the node using direct level 3 access). The network directory contains information that one X.25 node needs in order to communicate with other X.25 nodes. The only network directory file name supported by HP is `NSDIR.NET.SYS`. This file is part of a KSAM pair. A key file is created at the same time as this data file. The key file will automatically be named using the first six letters of the network directory file name, appended with the character K. For example, `NSDIRK.NET.SYS` is the name of the key file associated with the data file `NSDIR.NET.SYS`.

`Write access password` The password is an optional feature. If a password has been assigned, you must enter it in the password field to update the configuration file. It is still possible to open the file without using an assigned password, but the file will be in read only mode and NMMGR will not accept any changes.

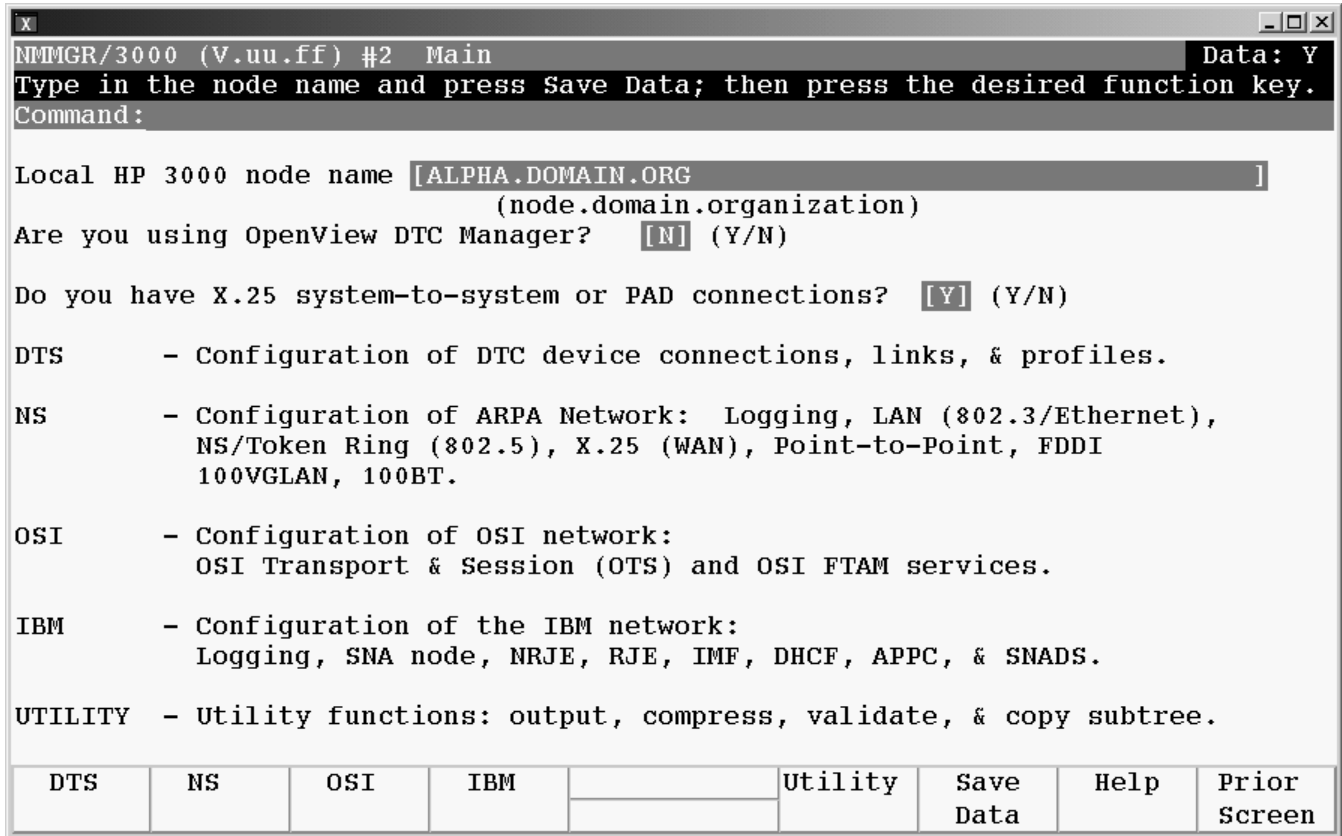
If a password has not been assigned, you should ignore the password field.

If you want to assign a password for the system you are configuring, see *Using the Node Management Services (NMS) Utilities* manual.

Step 3: Select NS Configuration

NMMGR displays the Main screen (Figure 6-2) after you create or open a configuration file.

Figure 6-2 Main Screen



1. You should already have configured a local node name and entered the other information required for this screen. Verify that the information is correct
2. Press the [NS] key to select the NS configuration branch.

Fields

Local HP3000 node name The local HP 3000 node name is the name by which the HP 3000 Series 900 computer is known in the network. The format of a node name is *nodename.domain.organization* where the total number of characters is 50 or fewer, and each field contains 16 or fewer characters (alphanumeric, underscore, or hyphens). The first character of each field must be alphabetic.

The *nodename* portion of each node name must be unique within the node's network. The *nodename.domain* portion of each node name must be unique within the internetwork. HP recommends that all nodes on the network be assigned the same domain and organization.

Assign meaningful node names. For example, MKTG.ITG.HP and LAB.ITG.HP are meaningful names for two nodes on the same Local Area Network (LAN) within Hewlett Packard. One node (MKTG.ITG.HP) is used by the marketing department. The other node

(LAB.ITG.HP) is used by the lab. The *domain* field is the same because the nodes belong to the same network. The *organization* field is the same because the nodes belong to the same internetwork.

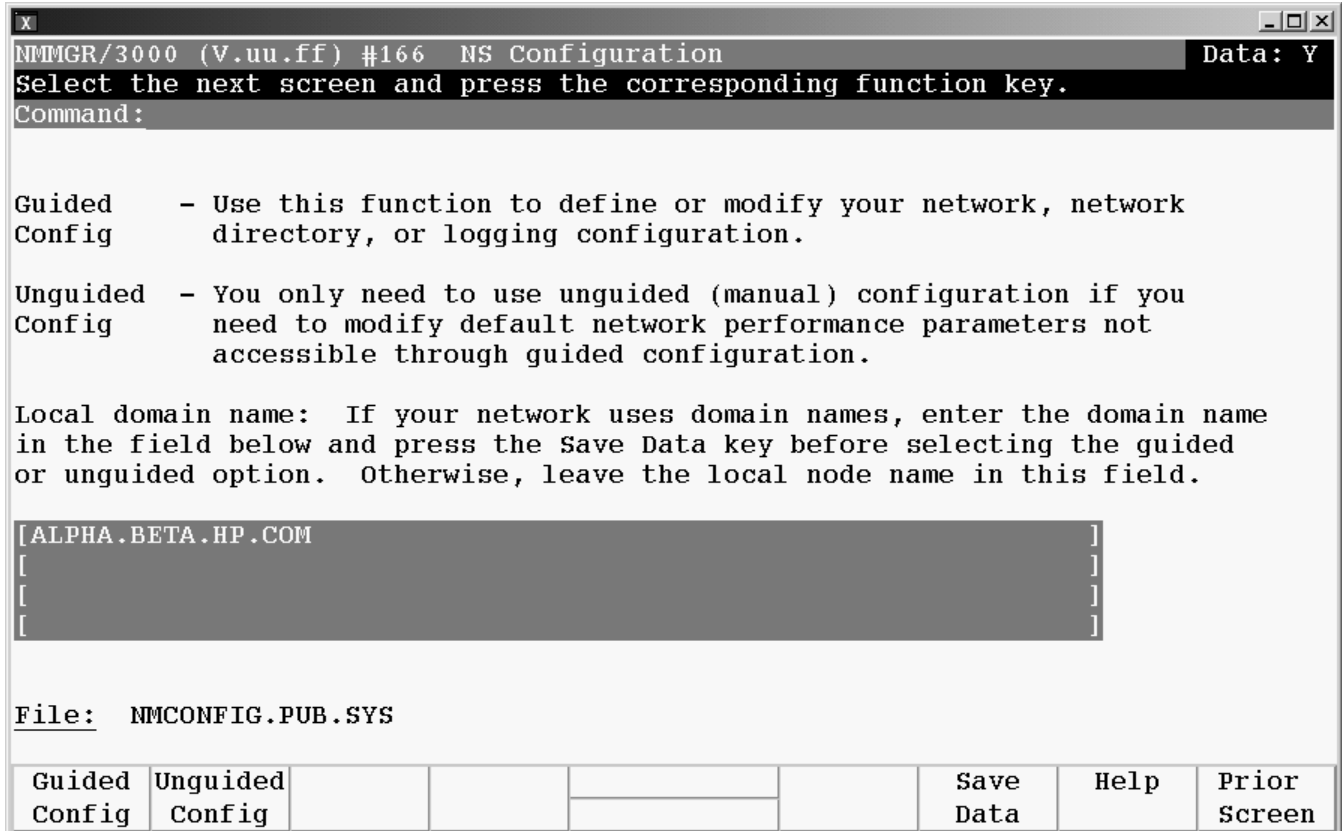
Are you using OpenView DTC Manager? If you answer yes (Y) to this question, NMMGR assumes you are using a PC to manage your system and takes you to the corresponding set of screens. If you answer no (N), NMMGR assumes you are using host-based network management and takes you to the set of screens required for host configuration. If you are using this manual, you should have entered an N in response to this question when you configured your DTCs.

Do you have X.25 system-to-system or PAD connections? If you answer yes (Y) to this question, NMMGR assumes you are configuring X.25 connections and takes you to the set of screens required to configure DTC X.25 Network Access Cards when you configure DTS. If you answer no (N), NMMGR assumes you have no need to configure X.25 connections and takes you to a different set of screens. If you are using this manual, you should have entered a Y in response to this question when you configured your DTCs.

Step 4: Select Guided Configuration

NMMGR displays the NS Configuration screen (Figure 6-3) if you press the [NS] key at the Main screen.

Figure 6-3 NS Configuration Screen



1. If you are using domain names for network access, replace the node name in the field at the bottom of the screen with this system's domain name and press the **[Save Data]** key. If not using domain names, leave the local HP 3000 node name in this field.
2. Press the **[Guided Config]** key to proceed with guided configuration of X.25 iX System Access.

Fields

Local domain name The name of this system in the ARPANET standard format. This name can be used by other nodes on the network to access this host.

The domain name is composed of labels, with each label separated by a period. Each label must start with a letter or digit, and have as interior characters only letters, digits, hyphens (-), or underbars (_). A domain name may have any number of labels, but its total length, including periods, is limited to 255 characters.

label[.label][...]

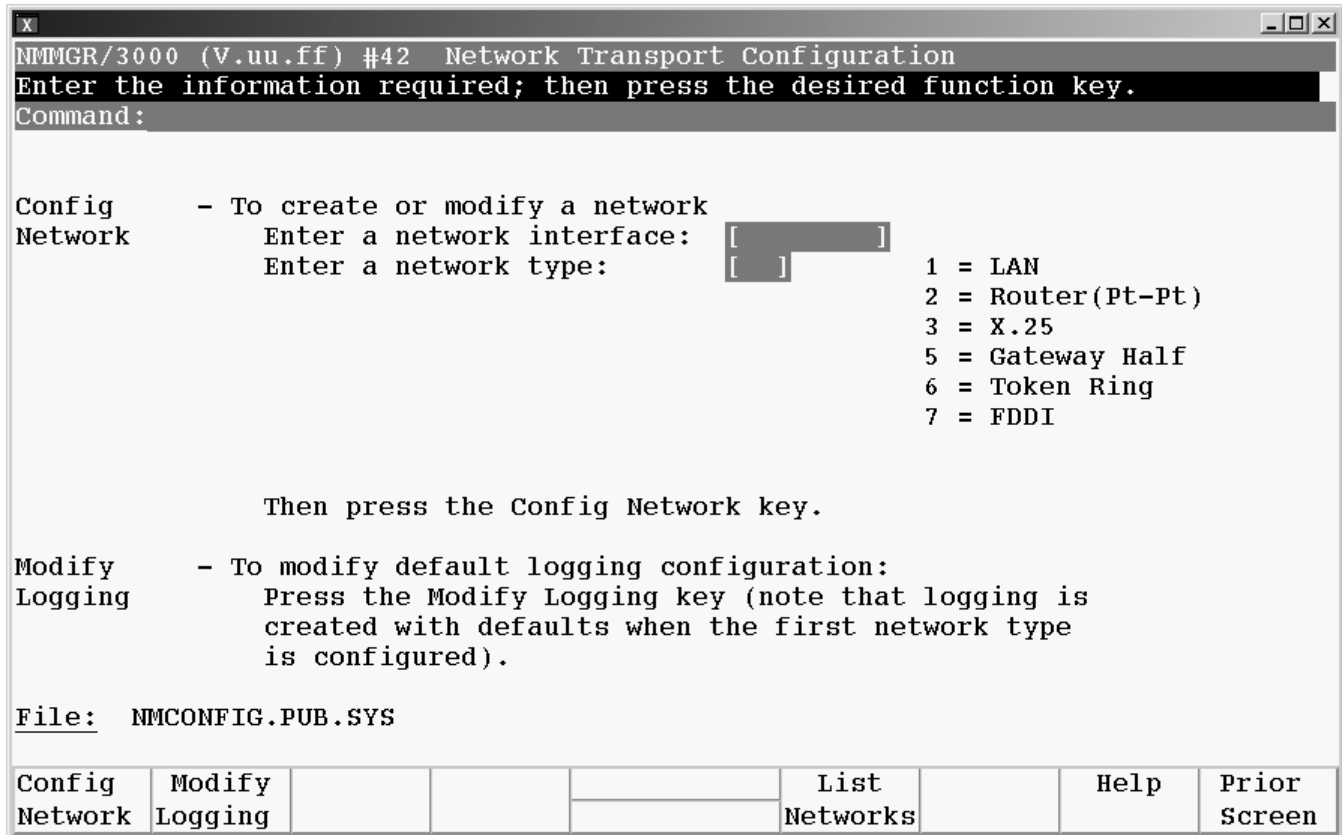
Domain names are not case sensitive.

Use of domain names is optional. If you are not using domain names for network access, leave the local HP 3000 node name in this field.

Step 5: Perform Guided Network Transport Configuration

NMMGR displays the Network Transport Configuration screen (Figure 6-4) if you press the **[Guided Config]** key at the NS Configuration screen.

Figure 6-4 Network Transport Configuration Screen



Modify the Network Management Configuration File

1. Next to the words `Enter a network interface:`, enter a name for the network interface (for example, X25NI).
2. Next to the words `Enter a network type:`, enter a 3 to indicate that the NI is an X.25 NI.
3. Press the **[Config Network]** key. (There may be a short pause before the next screen appears.)

Fields

`Enter a network interface` The network interface name (NI name) is used to easily identify one of the types of network interfaces: X.25, LAN, point-to-point (router), gateway half, SNA, or token ring. The name can be up to eight alphanumeric characters, starting with a letter. The maximum number of NIs that can be configured on a node is 12. One of the 12 allowable NIs is reserved for loopback. (Loopback is configured for you automatically.)

If a node interfaces to more than one network, give each NI on that node a unique name. Although all nodes on the same network do not have to have the same NI name, it will be easier to remember if you make the NI name the same for all nodes on the same network (for instance, X25net1). You will use the NI name with the `NETCONTROL` command to start the transport and network link.

NOTE

You can have more than one X.25 NIs configured for the same X.25 card on one MPE/iX system, but only one can be running at any one time.

`Enter a network type` Number that indicates the type of network interface you are configuring. You must enter a network type if you are configuring a new network interface. Network type 3 is the only type used when configuring host-based X.25 links.

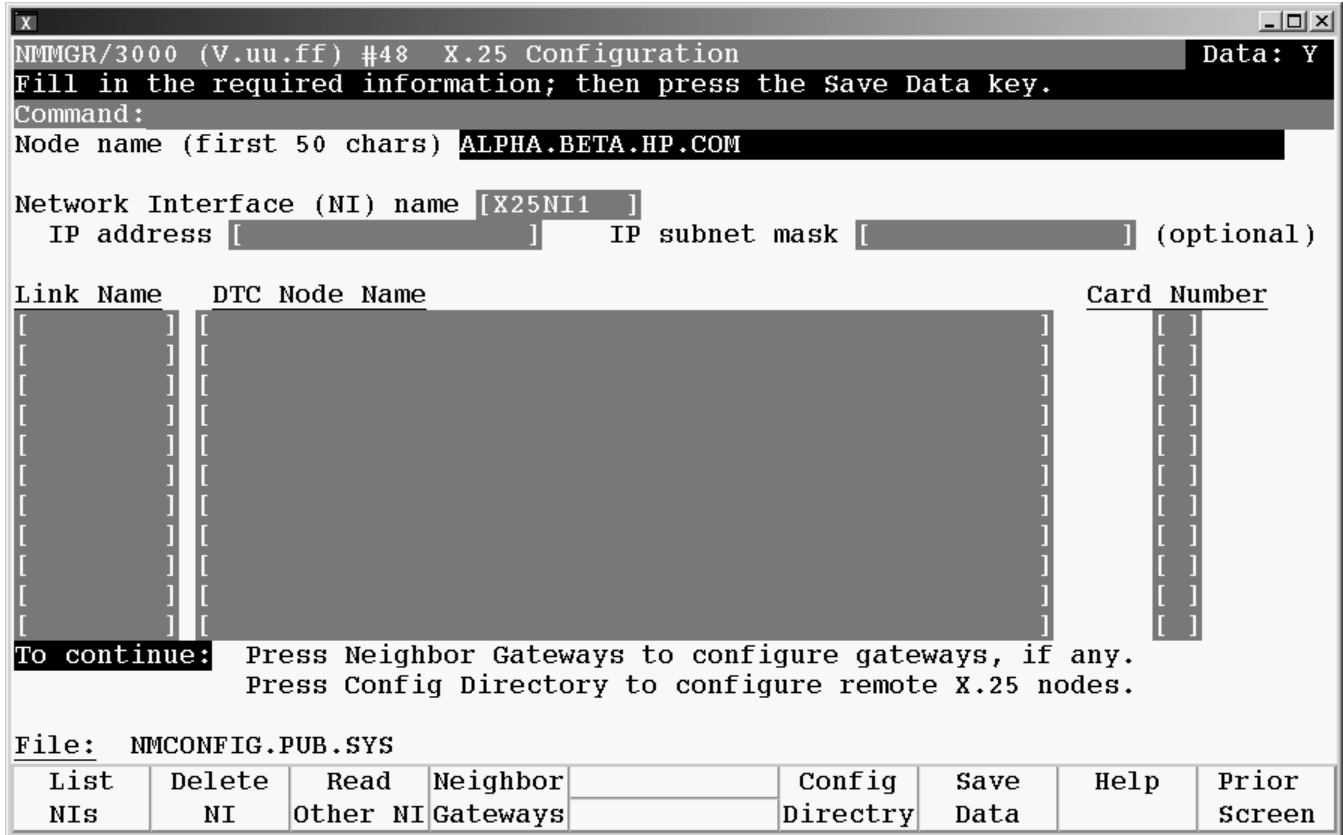
NOTE

The only link protocol that can be used as a gateway half is that of the NS Point-to-Point 3000/iX link. X.25 iX System Access cannot be configured as a gateway half. Yet, these two types of software can coexist on the same node. To configure an internetwork gateway half, refer to the *HP 3000/iX Network Planning and Configuration Guide*.

Step 6: Configure X.25 Network

NMMGR displays the X.25 Configuration screen (Figure 6-5) when you press the [Config Network] key at the Network Transport Configuration screen with an NI type of 3 (X.25).

Figure 6-5 X.25 Configuration Screen



1. In the IP address field, enter the internet protocol (IP) address for the node being configured. An example of an address is: C 192.191.191 009
2. The IP subnet mask is optional. If entering one, tab to the IP subnet mask field and enter the number in the same format as an IP address. The 32-bit mask is grouped in octets expressed as decimal integers and delimited by either a period (.) or a space. The mask identifies which bits of an IP address will be used to define a subnetwork. To determine these bits, you first need to estimate how many subnetworks and nodes per subnetwork you need. For details on deriving an IP subnet mask, refer to the *HP 3000/iX Network Planning and Configuration Guide*.
3. Move to the first Link Name field. Enter a link name to represent the DTC/X.25 Network Access card for which you are configuring a link. This name must be unique to both the node and the DTC. The link name must be the same as the link name configured for this card on the DTC X.25 Card Configuration — Sys-to-Sys LUGs screen during the DTC configuration see Chapter 3, “Configuring DTCs Step-by-Step.”

Modify the Network Management Configuration File

4. Enter the node name of the DTC that houses the DTC/X.25 Access card in the first DTC Node Name field the enter the slot number of the card in the Card Number field. Enter a link name, DTC node name, and card number for each link you are configuring.
5. When you are done adding links, press the **[Save Data]** key.
6. If the network that this node is on contains ANY internetwork gateway (either full or half) press the **[Neighbor Gateways]** key and proceed to the section in this chapter called "Configure Neighbor Gateways."
7. If the network that this node is on contains NO internetwork gateways or if you have already configured gateways for this system, press the **[Config Directry]** key and proceed to the section in this chapter called "Configure X.25 Virtual Circuits."

Fields

Node name Display only. This is the Local HP 3000 node name.

Network interface (NI) name Display only.

IP address The IP address is an address of a node on a network. An IP address has two parts: a network portion and a node portion. The network portion must be the *same* for all nodes on an X.25 network; the node portion must be *unique* for all nodes on an X.25 network.

HP assigns the network portion (initial nine digits) of IP addresses from ARPA Class C, though your addresses may also be of Classes A or B. The complete formats are:

Class A: nnn.xxx.xxx.xxx

Class B: nnn.nnn.xxx.xxx

Class C: nnn.nnn.nnn.xxx

Where: nnn = the network portion of the IP address

and

 xxx = the node portion of the IP address

Note: A space separates the network and node portions of the IP address.

For Class C, the node portion of the IP address must be between 000 and 255.

If you are adding your NS 3000/iX node to an existing NS 3000/V network, the network portion of each node's IP address should be the same. You will have to find out what this is, and use it in the network portion of the IP address of your NS 3000/iX node. Also, you will need to know the node portions of the IP addresses of each of the nodes (usually they will be numbered sequentially, such as 001, 002, and so on), so that you can specify a unique node portion for the IP address of your node. If you have a network map, it should provide a record of such items as the node name and IP address of each node. If there is no record, and if you want to find out each node's IP address, you will have to issue the following command (NM capability required) on each of the nodes:

```
NETCONTROL            NET=NIname; STATUS
```

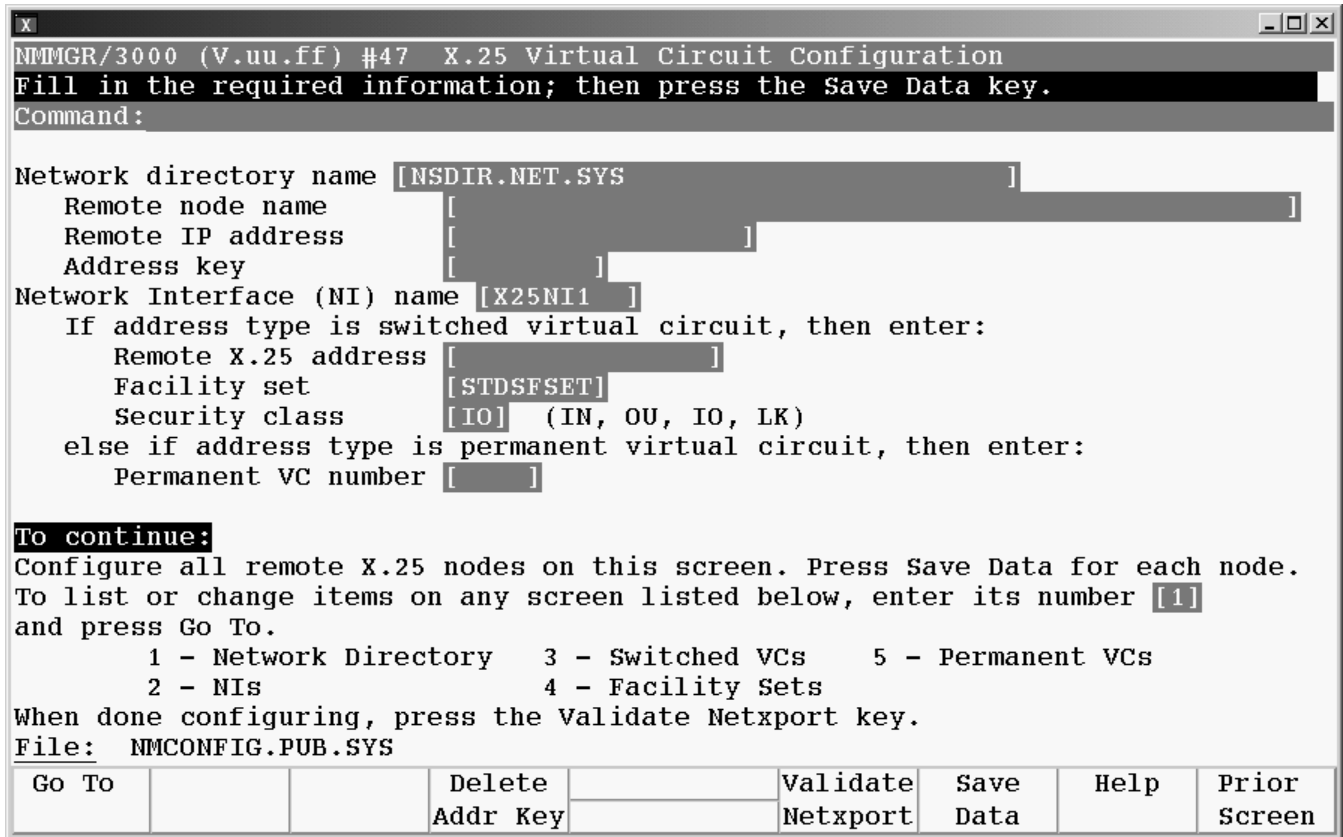
The last line of output from this command tells you what the complete IP address is for that node; the last three digits are the unique node portion of the address.

IP subnet mask	An IP subnet mask is specified in the same format as an IP address. The 32-bit mask is grouped in octets expressed as decimal integers and delimited by either a period (.) or a space. An IP mask is used when configuring subnetworks. The mask identifies which bits of an IP address will be used to define a subnetwork. To determine these bits, you first need to estimate how many subnetworks and nodes per subnetwork you need. For details on deriving an IP subnet mask, refer to the <i>HP 3000/iX Network Planning and Configuration Guide</i> .
Link Name	The link name identifies a specific DTC/X.25 Network Access card to be used for X.25 system-to-system connections. This link name must be the same as the link name you entered for this card on the DTC X.25 Card Configuration — Sys-to-Sys LUGs screen when you configured your DTCs, see Chapter 3, “Configuring DTCs Step-by-Step.”
DTC Node Name	The DTC node name is the fully qualified nodename (<i>name.domain.organization</i>) of the DTC that contains the DTC/X.25 Network Access card with the configured link name.
Card Number	The DTC card number is the number of the DTC/X.25 Network Access card in the associated DTC. If the card is contained in a DTC 48, the DTC card number can be any number from 1 to 5. If the card is contained in a DTC 16, the card number must be 2. If the card is contained in a DTC 72, the DTC card number can be any number from 0 to 3.

Step 7: Configure X.25 Virtual Circuits

NMMGR displays the X.25 Virtual Circuit Configuration screen (Figure 6-6) if you press the [Config Directry] key from the X.25 Configuration screen. This screen lets you configure the network directory.

Figure 6-6 X.25 Virtual Circuit Configuration Screen



1. In the Remote node name field, enter, in turn, the nodename of each remote X.25 node on your network in the format *nodename.domain.organization*. Also, if you need to be able to perform a loopback DSLINE command to the local node, then enter the local HP 3000 node's name here as well.
2. For each remote nodename, type the IP address of the node in the Remote IP address field.
3. To specify that calls can be made to a node, enter its address key in the Address key field. Enter the node portion of the remote node's configured nodename.

NOTE

An address key called POOL is already preconfigured for you though it doesn't show up on the screen. POOL allows the node being configured to receive any incoming calls even if the remote system's address is not configured on this screen. POOL will also allow you to use NetIPC to programmatically provide an X.25 address that is not configured on this screen. If you want to delete the POOL address key, in the last line of the X.25 Virtual Circuit Configuration screen enter a 3 (for switched VCs) and

press the **[Go To]** key. That brings you to the X.25 SVC Address Key Paths screen where you can then remove the default name `POOL` by typing over it with spaces and then saving the data.

4. If the address type is a switched virtual circuit, complete steps a through c, but if the address type is a permanent virtual circuit, skip to step 5.
 - a. In the `Remote X.25 address` field, enter the X.25 address of the remote host for X.25 public data networks or private networks.
 - b. Make sure the name of the facility set you are using is in the `Facility set` field. You may either choose the default facility set (`STDSFSET`) or enter an alternative. If you are configuring a new facility set, enter a new name. (To modify facility set parameters, enter a 5 in the last field on the screen and press the **[Go To]** key.)
 - c. In the `Security class` field, enter the level of logical security you want to have on this particular entry. The possible values are `IN` (accept calls from the address), `IO` (accept calls from and send calls to the address, default), `OU` (send calls to the address, incoming calls are rejected), and `LK` (block calls to or from the address).
5. If the address type is a permanent virtual circuit (PVC), in the `Permanent VC number` field, enter the PVC number of the PVC on the remote node. This value cannot be greater than the number of PVCs for which you are subscribed. It must be within the PVC range you defined during DTC configuration.
6. After you have finished entering new information for each remote node, press the **[Save Data]** key. (Press the key once for each remote node you are configuring.)
7. If you have completed configuration of X.25 iX System Access, press the **[Validate Netxport]** key. Otherwise, press the **[Prior Screen]** key to return to the X.25 Configuration screen.

Fields

<code>Network directory name</code>	The network directory file that will be updated by the information entered through this screen.
<code>Remote node name</code>	You must enter the remote node name of each X.25 node into the network directory. Include entries for all remote nodes and, if you want to be able to perform loopback, the local HP 3000 node as well.
<code>Remote IP address</code>	Also in the network directory, you must enter the IP Address of each node whose identity you have entered into the network directory. For the format of this parameter, see the information in the “Fields” section under “X.25 Configuration.”
<code>Address key</code>	The X.25 address key is the name of a remote node with which your local node will be communicating. Hewlett-Packard recommends that you make the name be the node portion of the remote node’s name (where its full name is <i>node.domain.organization</i>). You must configure an X.25 address key for each remote node with which your node will be communicating. You have a combined maximum of 1024 X.25 address keys in the SVC and PVC path tables. The X.25 address key name must be eight characters or less and the first character must be alphabetic. A default address key called <code>POOL</code> allows any system to access the local system even if the remote system's address is not configured. <code>POOL</code> can also be used when level 3 programmatic access (NetIPC) provides an X.25 address.

Network interface (NI) name Display only.

SVC or PVC Parameters The parameters for assigning either SVCs or PVCs are described in the following paragraphs.

For SVCs

Remote X.25 address The remote X.25 Address is the remote node's X.25 address. This address is required for SVCs if you have specified an X.25 address key. This address must be 15 digits or less.

Facility set The facility set name is a name for a set of X.25 connection parameters. The parameters are determined by the type of X.25 network that you are subscribed to. You can configure options in a facility set so that specified options are available for every virtual circuit or negotiated for each virtual circuit on a per-call basis. This facility set will be used when a connection is made from your node to the specified remote node or from the specified remote node to your node. A Facility Set is required for SVCs if you have specified an X.25 Address Key. The facility set name must be eight characters or less, and the first character must be alphabetic. You can configure up to 128 facility sets.

To modify facility set parameters, enter a 5 in the field at the bottom of the screen and press the **[Go To]** key. This will take you to the X.25 User Facility Sets screen. From this screen you can create new or modify existing user facility sets. Refer to the *NS 3000/iX NMMGR Screens Reference* manual for more information.

Security Class The security class is the level of logical security you want to have when a connection is made to or from the specified remote node. A Security level is required for SVCs if you have specified an X.25 Address Key. The possible values are as follows:

- IO—Both incoming and outgoing calls are accepted. This is the default value.
- IN—Only incoming calls are accepted from this particular remote address. Outgoing calls will be rejected.
- OU—Only outgoing calls are accepted to this particular remote address. Incoming calls will be rejected.
- LK—Entry is locked. No call is accepted, either inbound or outbound.

For PVCs

Permanent VC number The PVC number identifies a permanent virtual circuit (PVC) on the remote node. If you have entered a name in the X.25 Address Key field and are configuring PVCs, then you also have to enter a value for the PVC number.

Configure Neighbor Gateways

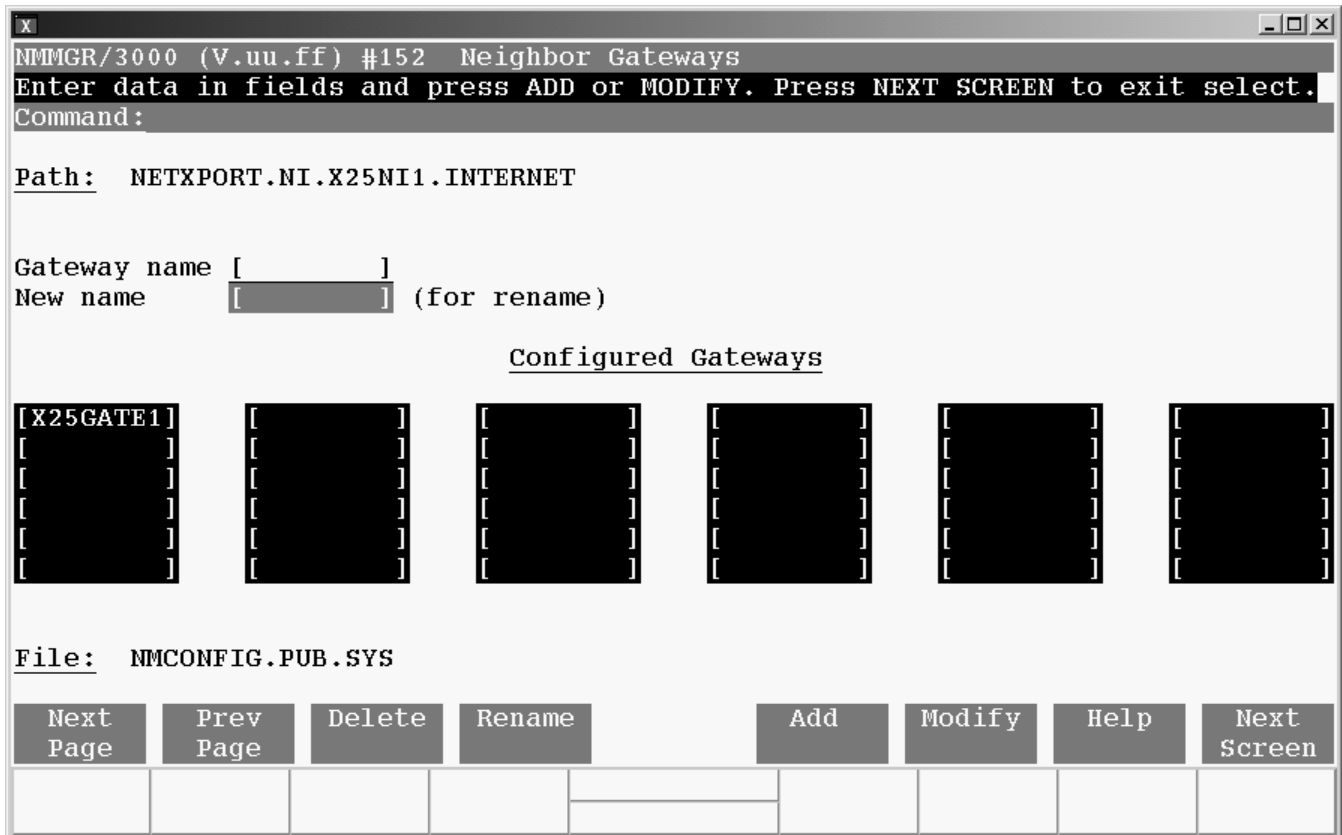
You need to visit the next two screens only if you are configuring a non-gateway node that is on the same network as a gateway. In this case, the non-gateway node needs to know the identity of any *neighbor gateway*. Neighbor gateways can be either full or half gateways. (Go back one level by pressing the [Prior Screen] key, then select [Neighbor Gateways] key).

Gateways that are on the same network are called *neighbor gateways*. A non-gateway node on an X.25 network may need to go through a neighbor gateway in order to send messages to an entirely different network. (Two nodes are on the same network if the *network* portion of their IP addresses are the same.) All X.25 nodes that are on the same network as a neighbor gateway need to know the identity of any neighbor gateways. When you configure an X.25 node, you enter into its configuration the identity of any accessible neighbor gateways that share the same network. The identified gateways may be either full or half gateways.

Identify Neighbor Gateways (If Any Are Present)

NMMGR displays the Neighbor Gateways screen (Figure 6-7) when you press the [Neighbor Gateways] key at the X.25 Configuration screen.

Figure 6-7 Neighbor Gateways Screen



Configure Neighbor Gateways

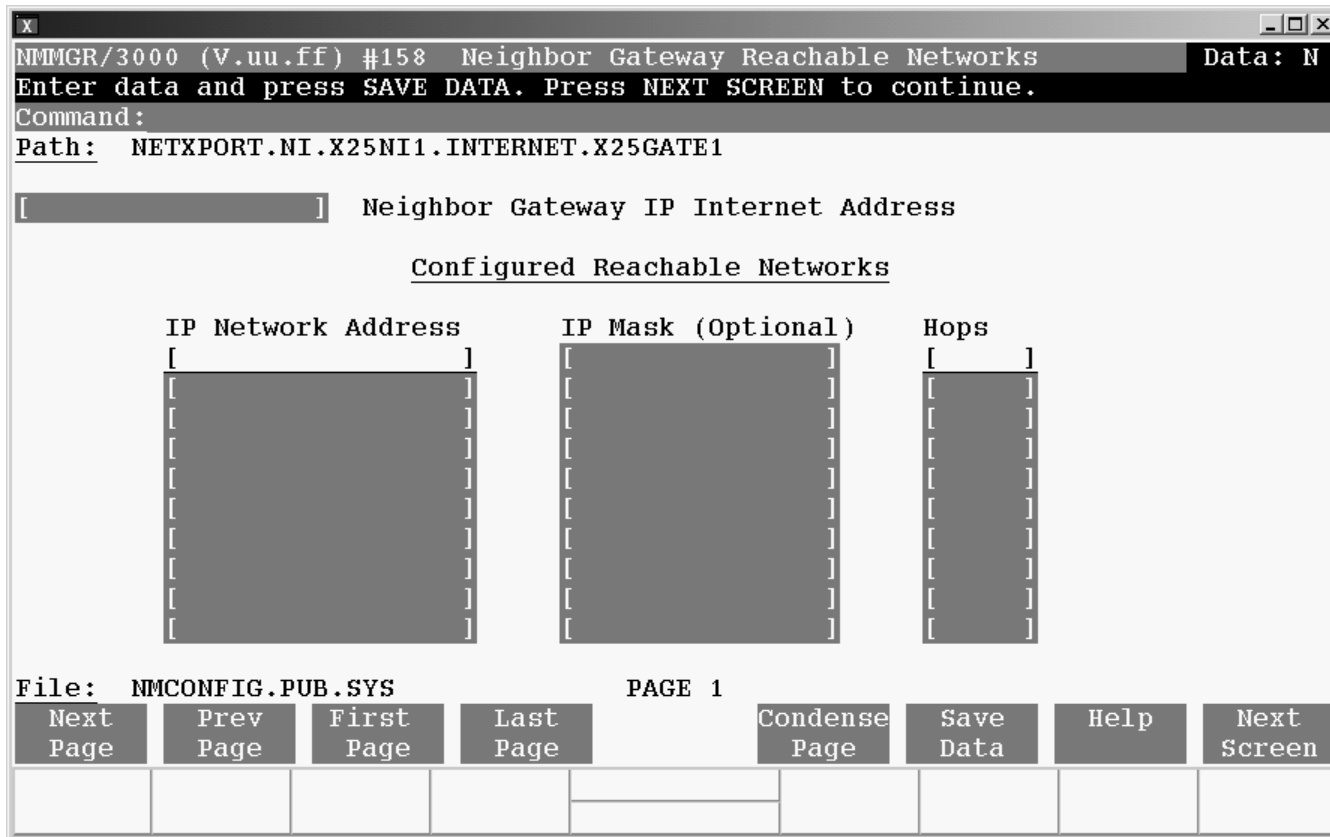
1. In the Gateway name field, enter the name of a gateway that is on the *same network* as the node that you are configuring.
2. If you are adding the identified gateway for the first time, press the **[Add]** key. If you are modifying the configuration of this node, press the **[Modify]** key. The Neighbor Gateway Reachable Networks screen will be displayed. Proceed to “Identify Neighbor Gateway Reachable Networks.”
3. Repeat steps 1 and 2 for each gateway that is on the same network as the node that you are configuring. When you have finished, press the **[Next Screen]** key to return to the X.25 Configuration screen.

Fields Gateway name Each gateway name can be as long as eight alphanumeric characters. The first character must be alphabetic.

Identify Neighbor Gateway Reachable Networks

NMMGR displays the Neighbor Gateway Reachable Networks screen (Figure 6-8) when you press the **[Add]** key or the **[Modify]** key for a valid gateway name from the Neighbor Gateways screen.

Figure 6-8 Neighbor Gateways Screen



1. In the Neighbor Gateway IP Internetnetwork Address field, enter the IP address of the gateway specified on the Neighbor Gateways screen. An example is:

C 192.007.007 001

2. In the IP Network Address fields under the title Configured Reachable Networks, enter the IP addresses of all the *remote* networks that can be reached through the gateway whose IP address is configured in the previous field.
3. The IP subnet mask is optional. If entering one, tab to the next field. In the IP subnet mask field, enter the number in the same format as an IP address. For details on deriving an IP subnet mask, refer to the *HP 3000/iX Network Planning and Configuration Guide*.
4. In the field labeled Hops, enter the number of hops (full gateways) needed to get to the target network. Two partner gateway halves count as one hop.
5. Repeat steps 2, 3, and 4 for each remote reachable network. If you need to configure more than 10 networks, press the **[Save Data]** key then press the **[Next Page]** key to enter more networks.
6. After you have finished entering the IP addresses of all the reachable networks, press the **[Save Data]** key. Press the **[Next Screen]** key to return to the Neighbor Gateways screen.
7. Back at the Neighbor Gateways screen, after you have finished adding all of the neighboring gateways, press the **[Next Screen]** key to return to the X.25 Configuration screen. Follow instruction 7 in the section in this chapter called “Step 6: Configure X.25 Network.”

Fields

If you have identified any neighbor gateways, then you will also be identifying: 1) the *IP Network Addresses* of all of the networks that you can reach through that gateway, and 2) the *number of hops* (corresponding to the number of gateways) that a packet passes through to reach a remote network from the local network. Two gateway halves count as one hop.

7

Managing Networks with DTCCNTRL

This chapter describes the syntax of the DTCCNTRL command and how it is used. DTCCNTRL is a command file that is used to start, stop, and obtain status about host-based X.25 system-to-system and PAD connections; dynamically implement changes that were made to the DTS subsystem in NMMGR; shutdown and restart the DTS subsystem; automatically add a new DTC. Additional information on dynamic configuration, automatic configuration, and DTS shutdown and restart is contained in the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual.

The capabilities required to use DTCCNTRL depends on the operation selected. System Manager (SM) is required to shutdown and restart the DTS subsystem. Network Manager (NM) or System Manager (SM) is required to perform dynamic or automatic configuration. System Operator (OP), Network Administrator (NA) or Network Manager (NM) is required to obtain dynamic configuration or X.25 card status or start and stop X.25 and PAD services.

This chapter includes the following:

- A description of the syntax and parameters of the DTCCNTRL command.
- An overview of the Dynamic Configuration capability of the DTCCNTRL command.
- An overview of the Automatic Configuration capability of the DTCCNTRL command.
- An overview of the DTS shutdown and restart capability of the DTCCNTRL command.
- A discussion of the start, stop, and X.25 status capability of the DTCCNTRL command.

DTCCNTRL Parameters

Dynamically implements DTS changes made in NMMGR. Initiates automatic configuration of DTCs. Shuts down and restarts the DTS subsystem. Starts, stops, and controls the operation of host-based X.25 connections. See the following sections for further information on each of the following functions. See the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for additional information on the functions that are not X.25 or PAD operations.

Syntax

```
DTCCNTRL {[DTC=]dtcname}  
          [, [CARD=]cardnum]  
          [, [FUNC=]function]  
          [, , [FORCED=]option]
```

Parameters

DTC=dtcname **Required if FUNC is one of STARTX25, STARTPADSUP, STARTBOTH, STOPX25, STOPPADSUP, STOPBOTH, or STATUS.** The DTC node name of the DTC on which the operation is to be performed, in the form:

```
name[.domain][.organization]
```

If the domain or organization are not provided, the domain and organization of the local node will be assumed as the default.

FUNC=function **Optional.** The function to be performed. If this parameter is omitted, DTCCNTRL will display the menu shown below. The desired function can then be selected from the menu.

The available functions are:

DCSTATUS	Displays the result of the last time DTS dynamic configuration was invoked.
DYNCONF	Dynamically implement DTS changes made in NMMGR.
AUTOCONF	Initiate automatic configuration of a new DTC.
SHUTDOWN	Shutdown the DTS subsystem and release all DTS system resources.
RESTART	Startup the DTS subsystem. DTS must be shut down first.
STARTX25	Activates X.25 services on the specified card.
STARTPADSUP	Activates PAD support services on the specified card. X.25 services must already be active.
STARTBOTH	Activates both X.25 and PAD support services on the specified card.
STOPX25	Deactivates X.25 services on the specified card. If PAD support services are active, they must be deactivated prior to entering this command.
STOPPADSUP	Deactivates PAD support services on the specified card. X.25 services remain active.

	STOPBOTH	Deactivates both X.25 and PAD support services on the specified card.
	STATUS	Displays information about the DTC, including type (16, 48 or 72MX), X.25 cards, and whether X.25 or PAD support is active on the cards.
CARD=cardnum		Required if FUNC is one of STARTX25, STARTPADSUP, STARTBOTH, STOPX25, STOPPADSUP, or STOPBOTH. Specifies the X.25 card number on which the FUNC operation is to be performed.
FORCED=foption		Optional. If FUNC is SHUTDOWN specifies whether all active ldevs will be aborted. If FUNC is one of STARTX25, STARTPADSUP, STARTBOTH, STOPX25, STOPPADSUP or STOPBOTH. Specifies whether the operation will be performed even if another user is accessing the DTC Manager.
	N	Default. If FUNC is SHUTDOWN, DTS shutdown is not attempted if there are active ldevs. If FUNC is a PAD or X.25 support service, the function is not performed if another user is accessing the DTC Manager.
	Y	If FUNC is SHUTDOWN, causes all active ldevs to be aborted on DTS shutdown. For shutdown, this option can only be invoked from the command line. If FUNC is a X.25 or PAD support function forces the X.25 or PAD support function to occur even if another user is accessing the DTC Manager.

DTCCNTRL Menu

If DTCCNTRL is invoked without the FUNC=function parameter, the following menu will be displayed. Enter the number for the desired function at the prompt. DTCCNTRL will prompt for additional information if needed. The FORCED=Y option for the DTS Shutdown function can not be selected from the menu.

```
:DTCCNTRL
```

- 0 Exit
- 1 dynamically implement DTS changes made in NMMGR
- 2 view status of last DTS dynamic configuration
- 3 automatically add a new DTC
- 4 shutdown DTS subsystem
- 5 restart DTS subsystem
- 6 manage/dynamically configure host-based X.25
- 7 help

For help on these topics, select 7 at the prompt below.

Select one of the numbers above corresponding to the desired operation.

Dynamic Configuration

Dynamic Configuration enables you to change the configuration of the DTS subsystem by applying the configuration changes made in NMMGR without rebooting the system. Such configuration changes include adding or deleting ldevs, adding or deleting DTCs, modifying most parameters of profiles, or DTCs, changing the number of non-nailed ldevs. See Table 7-1 for a complete list of changes that can be made dynamically. (Some changes will require additional action, such as resetting the DTC, before the change is completed.)

NMMGR can keep up to 70 changes. This means that you can change a maximum of 70 different screens before you invoke DTCCNTRL. After the 64th change NMMGR displays a warning that tells you the limit is near. If more than 70 changes are made NMMGR warns that the current change will not take effect using DTCCNTRL. After DTCCNTRL is invoked and the changes were successful, NMMGR can again keep up to 70 new changes. Those changes that were not successful will be saved so they can be retried at a later time. When a new DTC is added NMMGR considers this to be one change even if you save data on many screens to configure this DTC.

CAUTION

If more than 70 changes are made without invoking DTCCNTRL, then dynamic configuration will be disabled until the DTC Subsystem is shut down and restarted. This is necessary because DTCCNTRL will not know about any changes made after 70 and that can cause dynamic configuration to fail.

All operations that delete ldevs are non-destructive. This means that if an ldev to be deleted is in use, then the delete is not performed. You must take the appropriate action to free the device. For example, you must stop the spooler on a spooled serial printer or log off the session on a terminal ldev. If multiple ldevs are deleted, then only free ldevs are deleted. Those ldevs that were not free will be processed again the next time DTCCNTRL is invoked. If PAD ldevs are deleted on a card all ldevs that are to be deleted must be free for the operation to complete. A change in the PAD Device name is processed as a delete, then add of an ldev.

Some changes may affect more than one user. Usually this may happen when the change is to a DTC characteristic such as adding a card. This is because the DTC will need to be powered off or reset. Users on other DTCs are not affected.

Some changes will require additional steps to complete once DTCCNTRL has made the desired changes. These possible additional steps are: logoff any sessions or close any jobs that access the changed devices, stop and restart the spooler if the device is a printer, stop and the start X.25/PADSUP, reboot or reset the DTC. DTCCNTRL will display a message when these steps are necessary and tell you which DTCs are affected.

Refer to Table 7-1 for a list of configuration changes that can be modified dynamically.

Table 7-1 Dynamically Configurable Tasks

Task	Action Required for Change to Become Active
Add/configure new terminal/printer Add/delete class name Change DTC event logging class Host-based X.25 configuration changes: <ul style="list-style-type: none"> • System to System Local Users Group • System to System Switching • remote X.25 addresses and security • PAD Switching • PAD Incoming Security • PAD Access Lists Change SNMP filter Change NLIO from N to Y in terminal profile Increase number of non-nailed TIO/PAD ports	No action; changes take effect dynamically
Change terminal to printer or vice versa* Change device profile characteristics: <ul style="list-style-type: none"> • change line speed • change term type file name/number • change modem type • change speed/parity • change hardware handshaking • change reset HP terminal • change allow :HELLO logon • change record width Delete: <ul style="list-style-type: none"> • terminal/printer* • ldev* • DTC* Decrease number of non-nailed TIO/PAD ports*	Logoff any sessions or close any jobs associated with changed devices. If device is a printer, stop the spooler. * For these changes, the device must not be owned when dynamic configuration is invoked. The terminals must be logged off and the printers must be not spooled.

Table 7-1 Dynamically Configurable Tasks (Continued)

Task	Action Required for Change to Become Active
Host-based X.25 configuration changes: <ul style="list-style-type: none"> • change PAD access • change level 1, 2, or 3 configuration 	Use DTCCNTRL to: <ol style="list-style-type: none"> 1. Stop X.25/PADSUP 2. Start X.25/PADSUP <i>(see Configuring Systems for Terminals, Printers, and Other Serial Devices for more information)</i>
Add/configure new DTC	Reboot or reset DTC or Perform automatic configuration
Add/configure a TIO card Change DTC IP address Change AFCP/management timers Change SNMP MIB data Change SNMP trap destination	<ol style="list-style-type: none"> 1. Logoff any sessions that were logged on through the changed DTC 2. Reboot DTC You may also use TermDSM to reset the DTC (see <i>Troubleshooting Terminal, Printer, and Serial Device Connections</i> or more information)
Change from host-based TIO to host-based X.25 Change DTC LAN address Change DTC name Change DTC node name Change from PC-based to host-based or vice versa Change NLIO from Y to N in terminal profile Change initially spooled in printer profile Change HP 3000 characteristics: <ul style="list-style-type: none"> • node name • link name • physical path of LANIC Add X.25 card to DTC when none previously existed	<ol style="list-style-type: none"> 1. Use DTCCNTRL to shutdown/restart DTS 2. Reboot DTC You may also use TermDSM to reset the DTC (see <i>Troubleshooting Terminal, Printer, and Serial Device Connections</i> for more information)

NMCONFIG and NMCONFIX Files

Dynamic Configuration uses both files `NMCONFIG.PUB.SYS` and `NMCONFIX.PUB.SYS` to manage the devices created by the DTS subsystem. When users wish to make any dynamic change, NMMGR will be used to modify the configuration in `NMCONFIG.PUB.SYS`. When `DTCCNTRL` is invoked, either within or from outside of NMMGR, NMCONFIG will be compared to NMCONFIX and the desired changes will be made to the system configuration. When the operation has completed successfully, the changes will be written to NMCONFIX. The configuration in NMCONFIX will always match the actual configuration of the DTS subsystem.

If any errors are encountered, then information will be saved in the NMCONFIG file that will allow `DTCCNTRL` to be re-invoked to complete the changes at a later time. If an operation is partially successful, then those changes that are successful will be written to NMCONFIX. For example, if you delete two ldevs and the second ldev can't be deleted because it is in use, then `DTCCNTRL` will save information that will allow the second ldev to be deleted once the device is no longer in use.

CAUTION

If ANY other configuration file is copied to `NMCONFIG.PUB.SYS` or `NMCONFIX.PUB.SYS` then dynamic configuration will be disabled until a DTS shutdown and restart is done or the system is rebooted. This includes other files from the same system or files copied from other systems.

If there is some operation that fails, and you wish to undo the change, you can use NMMGR to change the appropriate screens back to what they were and then invoke `DTCCNTRL`.

Follow the steps below to dynamically configure DTS changes. Refer to chapter 3, for more detailed steps on the DTS configuration process using NMMGR for host-based and PC-based DTC management, respectively.

1. Run the NMMGR program and make all desired DTS configuration changes. The network management configuration file must be `NMCONFIG.PUB.SYS` for the configuration changes to become active dynamically.

NOTE

If you are changing profile characteristics, you can see which ldevs and DTCs will be affected by the change by pressing the **[Assoc Ldevs]** function key on the profile screen corresponding to the profile you are changing. After pressing this key, you will see a list of all ldevs using this profile in the DTCs configured in DTS.

2. After successful validation and cross-validation, NMMGR will prompt you as to whether you want DTS changes to take effect now. The following prompt will appear:

```
Do you want DTS changes to be become active now (Y/N)?
```

```
Y =    all changes made take effect now
```

```
N =    all changes made will take effect upon next dynamic      configuration or system boot
```

```
H =    help
```

```
>
```

If you type Y, dynamic configuration changes will take effect now. NMMGR calls `DTCCNTRL` which dynamically implements the DTS changes made in NMMGR.

If you type N, dynamic configuration changes will not take effect now. Your changes will take effect the next time dynamic configuration is invoked, a DTS shutdown/restart is performed, or the system is rebooted. Dynamic configuration changes can be implemented later by calling DTCCNTRL from the CI prompt any time thereafter. Or you can run NMMGR again and select validate DTS/Link. See the section “DTCCNTRL After NMMGR Exit,” for steps on how to invoke the DTCCNTRL command at the CI prompt.

If you type H, you will see help text describing the options.

3. If you selected Y in step 2 above and the DTS changes you have made are dynamically configurable, no other action is required and changes will become active automatically. You will see a message on the screen indicating that no other actions are required.

If the DTS changes you have made require additional actions before changes become active, refer to Chapter 5, “Preparing to Configure X.25 iX System Access,” and Chapter 6, “Configuring X.25 Links Step-by-Step,” step 9, for more information. If this is the case, you will see messages on the screen indicating what actions are required before changes become active.

Refer to Table 7-1 for a list of configuration changes that can be modified dynamically.

4. After viewing the messages describing what actions are required, if any, enter **[RETURN]** when you see the prompt:

(Press RETURN when finished viewing screen contents.)

You will return to the Validation screen. From here you can make further changes or exit NMMGR.

Automatic Configuration of DTCs

Automatic configuration provides the capability to add, and configure a new host-based managed DTC to the HP 3000 system without the need to specify most of the detailed configuration information. You can initiate automatic configuration using the `DTCCTRL` command at the CI prompt, or from within NMMGR. This section describes how to start automatic configuration at the CI prompt.

When the new DTC is configured, all serial cards will be configured with nailed direct connect ldevs using the profile `TR10AUTO`. You may modify this profile to suit your needs. The profile `TR10AUTO` that is provided has the same characteristics as `TR10D96`.

SNP cards will be configured with a default configuration. This configuration is not complete. You must use NMMGR to enter data for the Level 1 and 2 screen and the Level 3 screen. No PAD ldevs are created.

On the Level 1 and 2 screen you must enter the line speed for the connection. On the Level 3 screen you must enter the X.25 card address, Maximum number of PAD connections, and the Low and High values for the PVCs or SVCs. See sections “Step 9: Configure X.25 Level 1 and 2” and “Step 10: Configure X.25 Level 3 and Miscellaneous” in Chapter 3, “Configuring DTCs Step-by-Step,” for details on these fields.

Follow these steps to automatically add a DTC to DTS:

1. Turn on the DTCs power.
2. Invoke `DTCCTRL` at the CI prompt with the following command:

```
:DTCCTRL FUNC=autoconf
```

3. The following prompt will appear:

```
***Make sure your DTC is turned on NOW***
```

```
Enter the DTC LAN address in the format of xx-xx-xx-  
xx-xx-xx or press RETURN to exit:
```

First, make sure that the DTC's power has been turned on. Then, enter the LAN address of the DTC to be configured. The LAN address can be found on a label inside the front cover or on the back panel of the actual DTC box. Note that the LAN address is different from the IP address which is discussed in step 5.

4. `DTCCTRL` will create a default DTC node name structured as `DTCXXXX.domain.organization`, where “XXXX” are the last four digits of the DTC's LAN address and “domain.organization” are taken from the host's node name.

At the prompt “The default DTC node name is `DTCXXXX.domain.organization`. Press RETURN to continue or enter the DTC node name to overwrite default:” press the **[Return]** key to continue or enter a different DTC node name to overwrite the default.

5. At the prompt “Enter optional DTC IP address in the format of n.n.n.n or press RETURN to continue:” enter the optional DTC IP address or press the **[Return]** key to continue. The IP address is used if your HP 3000 is configured as part of a network and you want the DTC to be able to respond to PING/iX requests.
6. The following will appear on the screen indicating successful DTC automatic configuration:

```
DTCXXXX.domain.organization automatic configuration in progress.....  
(DTC download messages will appear here if you are at the system console.)  
DTCXXXX.domain.organization configured and downloaded successfully.  
All ports configured successfully.  
END OF PROGRAM  
:
```

7. If there are SNP cards installed in the DTC, run NMMGR and modify the configuration for Level 1 and 2 screen and Level 3 screen.
8. Modify any other X.25 card configurations as needed to complete the X.25 and PAD configurations such as PAD ldevs, SYSLUGs and security.
9. Validate the configuration.
10. Invoke DTCCNTRL to apply the modified X.25 configuration. This can be done at the prompt that is displayed after validation is complete or later at the CI prompt as described above for dynamic configuration.

Automatic configuration can also be initiated from within NMMGR. See the *Configuring Systems for Terminals, Printers, and Other Serial Devices* manual for the procedures on how this is done.

NOTE

You can only perform automatic configuration of new DTCs if you are operating in a host-based management environment. In a PC-based environment, DTCCNTRL will report an error when the command is invoked.

Obtaining Status Using DTCCNTRL

The DTCCNTRL STATUS function displays the current status of each DTC/X.25 Network Access card installed in a specified DTC. The command displays the DTC type (16, 48 or 72MX) and the software module that is currently active on any DTC/X.25 Network Access cards that are installed. (Asynchronous cards installed in the DTC are not displayed.)

Figure 7-1 shows the display resulting from a DTCCNTRL STATUS command issued against a DTC 48 containing DTC/X.25 Network Access cards in slots 3, 4, and 5. Card 3 shows no X.25 network functions active. Card 4 has both X.25 system-to-system and PAD support active. Card 5 has only system-to-system support active.

Figure 7-1 DTCCNTRL Status Display

DTC Type: DTC48	
CARD	#
3	none
4	PADSUP+X.25
5	X.25

DTS Shutdown and Restart

The DTS shutdown capability is provided by the DTCCNTRL command. It allows you to bring down the entire DTS subsystem and includes the release of all TIO-related system resources. DTCCNTRL requires that you have a minimum of System Manager (SM) capability, this operation can only be done from the system console. When combined with the DTS restart capability, you can resolve errors that may arise during Datacomm Configurator (DCC) start-up without rebooting the HP 3000 host. If you see DCC error messages, first fix any problems that caused the DCC startup error and then run DTCCNTRL to shut down and restart DTS.

NOTE

Issuing the DTCCNTRL command to perform a DTS shutdown will result in the deletion of the entire DTS/TIO subsystem from the system. No TIO users can use the system while it is shut down.

CAUTION

When the “forced” option is invoked, then all sessions logged on to TIO devices will be aborted and all spooled TIO printers will be stopped.

The DTS restart capability is provided by the DTCCNTRL command and allows you to restart the DTS subsystem. This command can only be invoked after the DTS subsystem has been shutdown. The DTS subsystem will be restarted in the same way that occurs when the system is rebooted.

X.25 and PAD Services Control

X.25 and PAD support services may both be started individually, through the `STARTX25` and `STARTPADSUP` functions respectively, or they may be started at the same time, through the `STARTBOTH` command. When they are started through individual commands, the `STARTX25` command must be entered before the `STARTPADSUP` command.

Conversely, X.25 and PAD support services may be stopped individually, through the `STOPX25` and `STOPPADSUP` functions respectively, or they may be stopped at the same time, through the `STOPBOTH` command. When they are stopped individually, the `STOPPADSUP` command must be entered before the `STOPX25` command.

`DTCCNTRL` is used in combination with the `NETCONTROL` and `NSCONTROL` commands to start X.25 iX System Access and NS Services. See the examples that follow.

DTCCNTRL Examples

Following are examples of using the DTCCNTRL command to control the operations of a DTC/X.25 Network Access card. In these examples, the card is mounted in slot 3 of a DTC with the node named DTC1.NET.IND.

Start X.25 support services:

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STARTX25
```

Start PAD support services (X.25 must already be started):

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STARTPADSUP
```

Start both X.25 and PAD support services:

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STARTBOTH
```

OR (execute commands in this order):

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STARTX25
```

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STARTPADSUP
```

Display status of DTC:

```
:DTCCNTRL DTC=DTC1.NET.IND;FUNC=STATUS
```

Stop both X.25 and PAD support services:

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STOPBOTH
```

OR (execute commands in this order):

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STOPPADSUP
```

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STOPX25
```

Start X.25 iX System Access for the network named X25NET (execute commands in this order):

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STARTX25
```

```
:NETCONTROL START;NET=X25NET
```

```
:NSCONTROL START
```

Stop X.25 iX System Access for the network named X25NET (execute commands in this order):

```
:NSCONTROL STOP
```

```
:NETCONTROL STOP;NET=X25NET
```

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STOPX25
```

Force operation of a DTCCNTRL command when another user has exclusive access to the DTCCNTRL code module:

```
:DTCCNTRL DTC=DTC1.NET.IND;CARD=3;FUNC=STARTX25;FORCED=Y
```


8 Formatting Host-Based X.25 Log Files

This chapter describes the event log formatter and provides instructions for its use. As described in Chapter 1, “Introduction,” you use a special formatting tool, EVLOG, to view and format host-based X.25 log files. EVLOG is capable of formatting and displaying the events as they are reported to DTS by the DTCs (dynamically).

Included in this chapter you will find information on the following:

- A description of the EVLOG formatter, including limitations.
- Instructions for running EVLOG.
- Descriptions of each of the EVLOG options.

The EVLOG Formatter

The EVLOG formatter provides a user interface that is similar to the NMDUMP interface with options set in the same manner as for NMDUMP. EVLOG also provides some filtering capability, including filtering on host-based time. See the descriptions of formatting options later in this chapter.

NOTE

This formatter is only intended to be used on log files with X.25 and PAD events. Use the NMDUMP formatter to format other types of logging.

EVLOG Limitations

You should be aware of the following limitations when using the EVLOG formatter:

- EVLOG does not perform error checking when it opens the message catalog (EVCAT).
- EVLOG does not format the PC event time.
- EVCAT messages for events other than X.25 or PAD events may be truncated or unreadable.
- The first 14 characters of EVCAT messages are shown for primary events.
- The first 25 characters of EVCAT messages are shown for secondary events.
- The first six characters of the DTC name are shown; domain/org are not shown.
- The first 25 characters of hostname (events 3604/3605) are shown.
- The first 25 characters of diagnostic text (event 3685) are shown.
- The first 25 characters of PcEvent info text are shown.

To Use EVLOG

You can run EVLOG using default options or interactively to select and modify specific options. Instructions for each run mode follow. The options are described in the remainder of this chapter.

To Run EVLOG Using Default Options

To format a host-based X.25 log file using the default options, enter the following MPE command:

```
:evlog logfilename
```

where *logfilename* is the name of the file that you want to format.

This command causes the entire log file to be formatted with default options. EVLOG exits when all the records have been formatted.

To Run EVLOG Interactively

To format a host-based X.25 log file and select the desired filter options, enter either of the following commands:

```
:evlog
```

or

```
:evlog logfilename,n
```

where *logfilename* is the name of the file created in step 1 and *n* is any non-zero PARM. For example

```
:evlog myfile,2
```

When EVLOG is run using the above syntax, the following menu will be displayed:

```
EVLOG C.00.00 001
File type = 7 (Version = A1200D00)
```

Options:

0 -	Set all options back to their default values	
1 -	File	(, 0 records)
2 -	Records	(1..0)
3 -	Event types	(ALL)
4 -	Subsystems	(ALL)
5 -	Event Codes	(1..2147483647)
6 -	Logical Channel Identifier (LCI)	(ALL)
7 -	Virtual Port Number (VPN)	(ALL)
8 -	Time/offset format	(HOST time)
9 -	Time/offset (1970-2020)	70-01-01-00-00-00 20-01-01-00-00-00)
?	Redisplay current options	

Each number of option or <CR> to select current options:

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To Select Formatting Options

To select the formatting option that you want to change when running EVLOG interactively, type the option number at the prompt. EVLOG will then prompt you to enter additional information. The information required depends on the option selected. Brackets displaying the current setting of the option are included in the prompt. Each of the options is described, each description includes an example of the option's use. User input is bold.

NOTE

The formatter will use default values for any options not specified by the user. The default values are listed in parentheses beside each of the options.

Option 1: File Use this option to open an event log file, if you did not specify a log file name on the command line. Whenever a file is opened, the File option will reflect file name and the number of records in the file. In the following example, the log file logfile1, contains 15 records.

```
Enter number of option or <CR> to select current options: 1
Event log name []? logfile1
Options:
 0 - Set all options back to their default values
 1 - File (logfile1, 15 records)
 2 - Records (1..0)
 . - . . . . . . . . . . . . . .
 . - . . . . . . . . . . . . . .
 . - . . . . . . . . . . . . . .
```

Option 2: Records Use this option to select which record numbers to display. In the following example, the user chooses to display records 2 through 5 of the opened log file. Notice that the Records option displays the records that were selected.

```
Enter number of option or <CR> to select current options: 2
First record [1]? 2
Last record [15]? 5
Options:
 0 - Set all options back to their default values
 1 - File (logfile1, 15 records)
 2 - Records (2..5)
 . - . . . . . . . . . . . . . .
 . - . . . . . . . . . . . . . .
 . - . . . . . . . . . . . . . .
```

Option 3: Event Types Use this option to restrict the records displayed to those of a specific event type. In the following example, the user chooses to display only DTC events. Following the selection, the Event types option displays a 3, to signify the selection of event type 3, DTC events. Note that not all of the event types are meaningful for log files on host-based systems.

Options:

- 0 - Set all options back to their default values
- 1 - File (logfile1, 15 records)
- 2 - Records (2..5)
- . -
- . -
- . -

Option 4: Subsystems Use this option to restrict the records displayed to those of a particular subsystem. In the following example, the user selects the NMP subsystem. Following the selection, the Subsystem option displays a 4, to signify the selection of subsystem 4, NMP. (Note that not all of the subsystem types are meaningful for log files on host-based systems.)

Enter number of option or <CR> to select current options: 4

Subsystem numbers:

- 0 - All
- 1 - Windows
- 2 - TICL
- 3 - RMP
- 4 - NMP
- 5 - NMLIB
- 6 - IOIF
- 7 - PROBE
- 8 - OS
- 9 - RLS
- 10 - UI
- 11 - OV

Subsystem[ALL]? 4

Options:

- 0 - Set all options back to their default values
- 1 - File (logfile1, 15 records)
- 2 - Records (2..5)
- 3 - Event type s(3)
- 4 - Subsystems (4)
- . -
- . -
- . -

Option 5: Event Codes Use this option to specify a range of event codes to be displayed. To specify the codes, you may enter either the event code numbers or the mnemonics listed in the prompt display. (The Options display will list the event code numbers whether you select by number or by mnemonic.) In the following example, the user chooses X.25 events by entering the mnemonic X25. Notice that the event code numbers are shown in the resulting display.

Enter number of option or <CR> to select current options: 5

Event code mnemonics (use for "First event code" if desired):

COM	(Common events)	=	1 -	511
AOS	(AOS events)	=	512 -	1023
MGR	(MANAGER)	=	1024 -	1279
LAN		=	1280 -	1525
AFCP		=	1536 -	1791
ADCP		=	1792 -	2303
TNR		=	2304 -	2559
LNK	(LINKMGR)	=	2560 -	2815
TCP		=	2816 -	3071
IP		=	3072 -	3327
EXT	(MGR_Extension events)	=	3328 -	3583
L3	(X.25 level 3 events)	=	3584 -	4095
L2	(X.25 level 2 events)	=	4096 -	4607
PAD	(X.25 PAD events)	=	4608 -	5119

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MON	(Monitor events)	=	5120 -	5631
X25	(L2 + L3 events)	=	3584 -	4607
X25PAD	(X.25 + PAD events)	=	3584 -	5119
SNMP		=	8960 -	8971

Event code range: First event code [1]?

Options:

- 0 - Set all options back to their default values
- 1 - File (logfile1, 15 records)
- 2 - Records (2..5)
- 3 - Event types (3)
- 4 - Subsystems (4)
- 5 - Event codes (3584..4607)
- . -
- . -
- . -

Option 6: Logical Channel Identifier (LCI) Use this option to restrict the records displayed to those for a specific Logical Channel Identifier. In the following example, the user presses **[RETURN]** to accept the default of displaying all records.

Enter number of option or <CR> to select current options: 6

Logical Channel Identifier (LCI) (1-256 0 = ALL) [ALL]?

Options:

- 0 - Set all options back to their default values
- 1 - File (logfile1, 15 records)
- 2 - Records (2..5)
- 3 - Event types (3)
- 4 - Subsystems (4)
- 5 - Event codes (3584..4607)
- 6 - Logical Channel Identifier (LCI) (ALL)
- . -
- . -
- . -

Option 7: Virtual Port Number (VPN) Use this option to restrict the records displayed to those for a particular virtual port number (VPN). (Some PAD events contain the VPN but not the corresponding LCI; some X.25 events contain the LCI but not the VPN. However, some X.25 events contain both, so usually you can logically tie the two together.) In the following example, the user presses **[RETURN]** to accept the default of displaying all records.

Enter number of option or <CR> to select current options: 7

Logical Channel Identifier (LCI) (1-255 0 = ALL) [ALL]?

Options:

- 0 - Set all options back to their default values
- 1 - File (logfile1, 15 records)
- 2 - Records (2..5)
- 3 - Event types (3)
- 4 - Subsystems (4)
- 5 - Event codes (3584..4607)
- 6 - Logical Channel Identifier (LCI) (ALL)
- 7 - Virtual Port Number (VPN) (ALL)
- . -

```
. - . : : : : : : : : : : : :
. - . : : : : : : : : : : : :
```

Option 8: Time/Offset Format There are four types of timestamps in event log records. They are:

- HOST time The time the event was logged on the host (HP 3000). Found in event type 3 (DTC).
- PC time The time the event was logged on the OV DTC MGR PC. (This type is not meaningful for log files created on systems using host-based network management.)
- DTC CPU time The time the event was sent from the DTC. Found in event type 3 (DTC).
- DTC SNP time The time the event occurred on the SNP. Found in event type 3 (DTC)

Use this option to choose whether one of these timestamp types will be displayed under the column labeled "Time/offset" or whether the offset will be from the beginning of the file. In the example that follows, the user chooses to display the time that events were logged on the host.

Enter number of option or <CR> to select current options: 8

Time formats:

- 1 - HOST
- 2 - PC
- 3 - DTC CPU
- 4 - DTC SNP
- 5 - Record offset

Time format [1]? 1

Options:

- 0 - Set all options back to their default values
- 1 - File (logfile1, 15 records)
- 2 - Records (2..5)
- 3 - Event types (3)
- 4 - Subsystems (4)
- 5 - Event codes (3584..4607)
- 6 - Logical Channel Identifier (LCI) (ALL)
- 7 - Virtual Port Number (VPN) (ALL)
- 8 - Time/offset format (Host time)

```
. - . : : : : : : : : : : : :
. - . : : : : : : : : : : : :
```

Option 9: Time/Offset Use this option to specify a range of time to be displayed. This option is available only for the HOST time. In the following example, the user selects a time range from October 4 through October 5 of 1991 by responding to the series of prompts. Note that, as usual, the current settings are displayed in brackets in the prompts.

Enter number of option or <CR> to select current options: 9

HOST time range:

- FROM year [1970]? 1991
- month [1]? 10
- day [1]? 4

To Use EVLOG

```

hour          [0]? 11
min           [0]?
sec          [0]?
TO: year      [2020]? 1991
month        [1]? 10
day          [1]? 5
hour         [0]?
min          [0]?
sec          [0]?
    
```

Options:

```

0 - Set all options back to their default values
1 - File (logfile1, 15 records)
2 - Records (2..5)
3 - Event types (3)
4 - Subsystems (4)
5 - Event codes (3584..4607)
6 - Logical Channel Identifier (LCI) (ALL)
7 - Virtual Port Number (VPN) (ALL)
8 - Time/offset format (Host time)
9 - Time/offset 1970 - 2020)) (70-01-01-00-00-00...
                               20-01-01-00-00-00)
? - Redisplay current options
    
```

Enter number of option or <CR> to select current options:

Option 10: View Log Events Live Use this option to view events as they are reported by the DTS subsystem. Whenever this option is set to 'Y' and the logfile is opened, up to the last 10 records will be displayed and the EVLOG will wait for more events to be logged. If the filename you specified on the command line or with option 1 is a file that is currently receiving log events from the DTC, then new events will be displayed as they are logged by the DTS subsystem. Enter [Ctrl]Y to end the wait for more events.

Enter number of option or <CR> to select current options: 10

Options:

```

0 - Set all options back to their default value
1 - File (logfile1, 15 records)
2 - Records (2..5)
3 - Event types (3)
4 - Subsystems (4)
5 - Event codes (3584..4607)
6 - Logical Channel Identifier (LCI) (ALL)
7 - Virtual Port Number (VPN) (ALL)
8 - Time/offset format (Host time)
9 - Time/offset (1970 - 2020)) (70-01-01-00-00-00...
                               20-01-01-00-00-00)
10 - View Event logfiles live (Y)
? - Redisplay current options
    
```

Displaying the Data

After you have set the display options, press **[RETURN]** to display the formatted logging information. Your display will look similar to the following:

Enter number of option or <CR> to select current options:

```

s
u
T b C
Time/Offset y s a V
Evt p y Evnt DTC r p
# YMMDDHHMMSS e s Code Description Name d N Variable Event
Data
-----
1 030807174920 3 4 4300 WAR3 2 00
2 030807174920 3 4 4301 WAR3 2 00

```

Control-Y Handling

If you press **[CTRL]Y** (subsystem break) while the data is being displayed, EVLOG will display the “Try Again” prompt and allow you to change the option settings and run the formatter again.

A Migrating from Previous Releases

This appendix describes the steps for migrating network configuration files to the current MPE/iX release from previous MPE/iX or MPE V releases or to migrate the network DTS configuration from PC-based DTC management to Host-based DTC management.

A utility call `NMMGRVER.PUB.SYS` is provided to convert your old network configuration file to the current release format and to migrate the DTCs configured in the PC-based tree to the Host-based tree of the network configuration file.

The process to migrate from PC-based management to Host-based Management is only available if you have installed the required patches on your system. You need to perform the PC to Host-based migration only if you wish to use the new Host-based X.25 and PAD functionality provided in the patches. See the section later in this appendix for a description of the process to perform the migration. The section also includes details of the limitations of this process and actions to take to reconfigure your network configuration file to help the migration process go smoothly.

NOTE

Customers who do not have an existing network configuration file, `NMCONFIG.PUB.SYS`, do not need to run `NMMGRVER`. Instead, they need to create a network configuration file from scratch. To do so, copy the template file `NMSAMP1.PUB.SYS` to `NMCONFIG` and then modify this network configuration file in `NMMGR`. These steps are covered in Chapter 5, “Configuring Serial Devices (for Host-Based Management).” If `NMMGR` is run on an unconverted, existing network configuration file, an error message will appear when entering the DTS subsystem indicating that a version mismatch was found and that `NMMGRVER` must be run to convert the file.

MPE/iX customers with an older version of `NMCONFIG.PUB.SYS` need to run `NMMGRVER` to convert their network configuration files to the current MPE/iX format. You need to migrate to the current version before adding a DTC 72MX to your network configuration. MPE V customers with an older version of `NMCONFIG.PUB.SYS` also need to run `NMMGRVER` to convert their network configuration file to the current MPE/iX format. `NMCONFIG.PUB.SYS` files from MPE V do not have the DTS subsystem, so `NMMGRVER` will create a default DTS subsystem for the new configuration file—with one default configuration for a DTC 48 and one default configuration for a DTC 72MX. Modify this network configuration file in `NMMGR` to fit your actual DTS and DTC configuration. These steps are covered in Chapter 5, “Configuring Serial Devices (for Host-Based Management).”

Running NMMGRVER to Update Release Version

To run NMMGRVER, logon as `MANAGER.SYS` in the `PUB` group and run the utility by entering `NMMGRVER` after the `MPE/iX` prompt. NMMGRVER will prompt you for the configuration file name. Enter `NMCONFIG`, and `Y` to the confirmation prompt.

The steps to run NMMGRVER are shown here:

```
: HELLO MANAGER.SYS, PUB
: NMMGRVER
NM Configuration File Conversion Utility 32098-20016 V.uu.ff © Hewlett-Packard Co. 1988
Utility to convert NM configuration files to be compatible with NMMGR V.uu.ff.
*****
*****
*           BE SURE TO STORE BACK UP           *
*           Copies of Config Files BEFORE Conversion           *
*****
*****
Fileset to scanned? NMCONFIG
OK to convert NMCONFIG? Y
Backup file is NMBACKn; temporary file is Nxxxx.
** Converting MPE iX config file **
The configuration for the DTS subsystem has been updated. If this file will be used as
NMCONFIG.PUB.SYS, you must restart the DTS subsystem for the configuration to take effect.
(NMMGRVERMSG 102)
CONVERSION completed successfully. (NMMGRVERMSG 0)
```

NMMGRVER generates a backup copy of you old configuration file under file name `NMBACKn`, (where `n` starts with `A`, then `B`, `C`, and so on, for multiple backup copies). It also creates a temporary file `Nxxxx`, that is purged upon completion of NMMGRVER conversion.

After converting the network configuration file with NMMGRVER, you then run NMMGR if needed to modify the DTS subsystem to fit your actual hardware configuration. Follow the steps described in Chapter 5, “Configuring Serial Devices (for Host-Based Management),” for modifying you network configuration file.

NOTE

After converting your network configuration file with NMMGRVER, you must validate and cross-validate the configuration file. You must also perform a DTS shutdown and restart to cause the DTS subsystem to use the updated configuration file. Refer to Chapter 5, “Configuring Serial Devices (for Host-Based Management),” for details to shutdown and restart DTS.

Migrating your Configuration to Host-Based Management

This section describes the process that you can use to migrate the majority of the configuration of your DTCs from PC-Based Management to Host-based Management. This process is only performed on the HPe3000 system that you want to manage your DTCs. If you have other systems that share the DTCs you do not need to make any changes to the configuration on those systems.

This section also describes the process that you can use to migrate the majority of the configuration from the OpenView DTC Manager PC to the HPe3000 Host. The tool needed to perform this migration is available as a patch to the OpenView DTC Manager product. Contact HP Support for information on how to obtain this patch.

There are two tools that are required to perform the complete process for migrating your configuration from the OpenView DTC Manager to the Hpe3000 host.

These two tools are:

- The PC Migration Tool that is integrated into the OpenView DTC Manager. This tool will be accessed via an added function of the Multiple DTC Operations tool and will create a text file that contains the NMMGR Maintenance Mode commands needed to create an equivalent configuration on the HPe3000 host
- The Host Migration Tool that is integrated into NMMGRVER. This tool will read the configuration in the PC-Based tree of the NMCONFIG file and merge it into the Host-based tree. If you have performed the process to migrate your OpenView DTC Manager configuration onto this system NMMGRVER will also merge with the configuration created by the PC tool in the Host-based tree.

The tool needed to migrate your configuration to Host-based management is included in a set of patches that also provide the enhanced features for the Host-Based DTC Management documented elsewhere in this manual. This functionality is available in the following set of patches. Future patches of each of these products will also include these features.

Table A-1 Patch ID

Patch ID	Product Name	Version
NMSHD35A	Node Management Services 32098-20014	B.00.13
NMCHD36A	Node Management Configurator 32098-20016	B.07.06
DTSHD37A	Terminal I/O 32022C	C.05.01
TSMHD38A	TermDSM	C.05.01
DCCHD39A	DCC/Validation	C.06.00.100
ODMHD45A	Open View DTC Manager	A1440E00

What the Migration Process Can/Cannot Do

The Migration process will be able to migrate the following portions of the DTC's configurations from the OpenView DTC Manager PC to DTCs configured on the HPe3000 host.

- The following DTC types are migrated: DTC16, DTC48, DTC16iX, DTC16MX, DTC72MX.
- All Global LAN configuration parameters will be migrated to the Host.
- All supported cards will be configured as the proper type and in the proper slots.
- The port group configuration of the DTC16MX and DTC72MX are maintained.
- All TIO ports and PAD devices will be configured as the same type as configured on the PC. (terminal/printer/host, padterm/padprint).
- All Terminal ports that aren't configured with an ldev on the host will configure as a non-nailed TIO port.
- All of the following X.25 and PAD tables will be migrated intact.
 - Level 1 & 2 and Level 3 data
 - System to System Switching Table
 - System to System LUG Table
 - DTC PAD Switching Table
 - PAD Device Access Table
 - PAD Incoming Security Table
- What will not be migrated:
 - The DTC Security lists: Node Names List; Define Access List
 - Unique TIO port and PAD device parameters will not be maintained. (See below)
 - TAC because it is long out of support and all functions have viable alternatives.

Assumptions and Limitations

The New Host-Based Management functionality provides a process to migrate a major portion of the configuration on the OpenView DTC Manager PC to the HP e3000 host. In order for the migration to work in the most consistent manner possible, the defined process makes the following assumptions and compromises.

The process to migrate from PC-based DTC Management to Host-Based DTC Management consists of the following major steps. These steps are described in more detail later in this document.

1. Run the PC Migration tool on the OpenView DTC Manager PC and select the DTCs that are to be managed on the HP e3000. The PC Migration tool will create a file that contains the NMMGR Maintenance Mode commands needed to create an equivalent configuration on the HP e3000 host.

2. On the HP e3000 host, remove any DTC configurations from the PC-Based configuration in the `NMCONFIG` file that aren't in use or should not be included in the migration process. Change the configuration to Host-based Management and remove all DTCs that may still exist in the Host-Based configuration.
3. Transfer the file created on the PC to the HP e3000 host and enter the following commands to use the file as input commands to `NMMGR` to create the configuration in the `NMCONFIG` file.

```
:file :file nmmgrcmd=<filename>  
:nmmgr
```

where <filename> is the name of the file transferred from the PC.

4. Run the Host Migration tool integrated into `NMMGRVER` and merge the PC-Based DTCs configured in the PC-based configuration into the Host-based configuration.
5. Create or modify any profiles that have been assigned to DTC devices if you want to apply customization to the DTC devices. The profile names assigned by the migration process will either be a default name assigned by the PC Migration tool or the profile name that was assigned to the port in the PC-Based Configuration.
6. Validate the `NMCONFIG` file and perform any changes needed to resolve any configuration discrepancies that are found. Perform a DTC Shutdown and Restart using `DTCCTRL`.

Assumptions

The migration process is designed with the following assumptions.

1. The PC Migration tool will use the DTC Label assigned to the DTC on the PC as the DTC name when the DTC is added to the `NMCONFIG` file. If a DTC with that name is present in the host-based tree of the `NMCONFIG` file the `NMMGR` commands created by the PC migration tool will overwrite the DTC configuration.
2. The Host Migration tool is designed to merge the DTCs configured in the PC-based tree into the Host-based tree. The tool will try to merge all of the ldevs from the PC-based DTC into the corresponding Host-based DTC. The DTCs in the Host based tree are matched to the DTCs in the PC-based tree by finding the matching DTC Node Name. The DTC name in the Host-based tree is maintained.
3. The PC Migration tool will assign a default profile to all Serial ports on the DTCs. This is necessary because with OpenView DTC Manager, each port on the DTC can to be assigned unique characteristics. This can easily cause the number of unique ports on the host to exceed the number of available profiles. It is also very difficult for an automated tool to merge the port configurations from the PC and the profiles from the PC-based tree into the Host-based tree.
4. The PC Migration tool will assign a default profile to all PAD devices on the DTCs. This assignment will eliminate any non-default PAD device profile number. This case has the same difficulties as was found for TIO serial devices.
5. The default profiles will be created if they don't already exist in the Host-Based tree in the `NMCONFIG` file. You can modify these profiles to apply any desired customizations to the ports to which these were assigned. The default profile assigned for each port type are:

Terminal	TR10AUTO
printer	PR18AUTO

host	HOSTAUTO
PAD Terminal	TR24AUTO
PAD Printer	PR26AUTO

6. The Host Migration tool will copy the profile name from the TIO ports and PAD devices in the PC-based DTC to the corresponding port in the Host-based DTC. The profile data itself WILL NOT be copied from the PC-based to the host-based configuration.
7. When the migration process is completed, it is likely you will need to do some manual changes to the resulting configuration file to create a valid DTS configuration and to reapply some customizations. The types of customizations include:
 - Define additional profiles to assign unique port parameters.
 - If there were profile names that were copied from DTC ports of the PC-based DTC configurations and those profiles DO NOT exist in the host-based profile tree, you will need to create the profiles.
 - If there were profile names that were copied from DTC ports of the PC-based DTC configurations, and those profiles DO exist in the Host-based tree, you MAY need to modify the profiles to match the DTC ports or to reapply any customizations you may have made to the profiles in the PC-based profiles.
 - Complete the configuration of the TIO and PAD devices if a DTC with the same DTC Node Name was not configured in the PC tree or corresponding devices were not configured on the PC-Based DTC.
 - Create the Global PAD Security Lists which consist of the Node Names List and the Access Lists.

Limitations

The migration process has the following limitations. When the Host Migration tool is run, the result could leave the following discrepancies in the NMCONFIG file that you must correct to have a valid configuration. When the Host Migration tool is run, there will be error messages displayed that indicate the nature of the error.

1. When the migration process is completed, the resulting configuration file may not successfully validate. You must manually correct any configuration discrepancies found.
2. If the PC Migration tool created a DTC in the Host-based tree that does not exist in the PC-Based tree (a DTC with a matching DTC Node Name was not found), the TIO ports will be left with the ldev assigned as (-1). This is an invalid ldev number for TIO printers and will be detected by Validation. You must manually correct the configuration.
3. If the PC Migration tool created a DTC in the Host-based tree that does not exist in the PC-Based tree (a DTC with a matching DTC Node Name was not found), any PAD devices will be assigned ldev of 1. This is an invalid ldev number for PAD devices and will be detected by Validation. You must manually correct the configuration.

4. If the card type configured in the Host-Based DTC does not match the card type in the PC-Based DTC then the card is not merged into the Host-based tree and the Host-based DTC will have the same configuration discrepancies as described in paragraph 1 and 2.
5. If the port type of TIO or PAD devices in the Host-based tree does not match the port type of the port in the PC based tree, then the PC-Based port configuration is not merged with Host-based configuration. The port will have the same configuration discrepancies as described in paragraph 1 and 2.
6. If the profile name copied from the PC-based DTC port DOES NOT exist in the Host-based DTC configuration, then the configuration is incomplete and will be detected by Validation. You must manually create the profile.
7. If the profile name copied from the PC-based DTC port DOES exist in the Host-based DTC configuration, then the parameters may not be the same as those in the PC-Based Profile. You must manually verify that the parameters in the profile are correct.
8. If a PAD device name is defined in the PC-Based DTC that is not defined in the Host-Based DTC, the device will have no X.25 address assigned. This is an invalid PAD device configuration and will be detected by Validation. You must manually correct the configuration.
9. If a DTC exists in the PC based tree that was not created in the Host-based tree (a DTC with a matching DTC Node Name was not found), then the DTC will be copied to the Host-Based tree as a non-managed DTC. (LAN Address = 00-00-00-00-00-00). All ports with an ldev number assigned in the DTC will be assigned the default profiles.
10. If you want to define unique parameters for ports, i.e., port name, you will be limited to the 1024 unique profiles available for the DTS subsystem.

Configuration Issues to Consider before Migrating

This section describes different configuration situations that you may have on your OpenView DTC Manager PC and Host systems and what you can do to reconfigure some items to make the migration go as smoothly as possible. This section also describes what configuration changes you may need to make after performing the migration process. In all situations these configuration considerations only need to be applied to the system that will become the host system that will manage DTCs. If you want, you can elect to distribute the DTC to more than one host.

Your Host's Configuration is Currently PC-Based

The migration process was designed such that this is the most likely situation that will be migrated to Host-based DTC management. In this situation, there are the following four scenarios to consider. It is possible that your configuration will have one or more of these conditions. Review both the PC-based and Host-based configurations in your `NMCONFIG` file and take the `ACTIONS` described below to reconfigure your file to best migrate your configuration.

All of the DTCs migrated from the PC are also configured in the PC-based tree on the host

This means that there is a one-to-one correspondence between the DTC migrated from the PC and those that are configured in the PC-based tree in the `NMCONFIG` file. The DTCs are matched by comparing the DTC Node Name.

All of the nailed ldevs numbers configured on the PC-Based DTCs will be merged onto the Host-based DTC. The non-nailed TIO ports and the `HOST` type ports will be retained on the Host-based DTC.

ACTION: To minimize the corrections to the configuration after the migration, check that all SIC printer ports and all PAD devices that were configured on the PC have an ldev number assigned on the corresponding DTC in the PC-based tree. The TIO ports are matched by card and port number and the PAD ports are matched by the PAD device name.

Any SIC printer or PAD device that does not have a corresponding configuration in the PC-based tree will be left with the TIO ports configured with ldev of (-1) and PAD ports configured with ldev of (1) in the Host-based tree. Both the Host Migration tool and Validation will detect the error. Use `NMMGR` to correct the configuration and rerun validation.

There is still a DTC configured in the Host-base tree

ACTION: You must delete any DTCs that are configured in the Host-based tree prior to performing the migration process otherwise the following behaviors will occur.

For each DTC remaining in the Host-based tree:

- Any DTC with the same DTC name as the DTC Label on the PC will be overwritten with the configuration from the PC.
- When the Host migration tool is run, the PC-based tree will be searched for a DTC with a matching DTC Node Name. If a DTC with the same DTC Node name exists in the PC-based tree, the configuration will be merged with the Host-based DTC.
- If a DTC with the same DTC Node name does not exist in the PC-based tree, the Host Migration tool will display an error message. The DTC configuration will be unchanged.

A DTC migrated from the PC is not configured in the PC-based tree

This means that at the time the Host Migration tool is run, there is at least one DTC migrated from the PC where a DTC does not exist with a matching DTC Node Name in the PC-based tree of the NMCONFIG file. This situation could be due to the condition that a DTC managed by the OpenView DTC Manager is configured on another host that is also configured as PC-based.

For those DTCs that are not configured in the PC-based tree, the migration process will leave all the TIO ports configured with ldev of (-1) and all PAD ports configured with ldev of (1) in the Host-based tree. When you run the Host Migration tool, you will see error message describing the DTCs that have this configuration.

ACTION: If you do want this system to manage this DTC, you must use NMMGR to assign valid ldev numbers to the TIO printer ports and PAD devices to successfully validate the file.

A DTC is configured in the PC-based tree that is not migrated from the PC

This means that at the time the Host Migration tool is run, there is at least one DTC in the PC-based tree where a DTC does not exist with a matching DTC Node Name in the Host-based tree of the NMCONFIG file. This situation could be due to the condition that the appropriate DTC was not selected when the PC Migration tool was run, or the DTC is managed by a different platform.

The Host Migration tool will copy the DTC to the Host based tree as a non-managed DTC (LAN Address=00-00-00-00-00-00) and assign the default profiles to the TIO and PAD Ports. An error message will be displayed describing this situation.

ACTION: If you want this non-managed DTC in your configuration. Then no action needs to be taken to create a valid configuration. Otherwise you can delete the DTC from the host-based configuration.

Your Host's Configuration is Currently Host-Based

This section describes the issues to consider if your host is currently configured for Host-Based DTC Management. You may have one or more managed or non-managed DTCs. In this situation, there are the following four scenarios to consider. It is possible that your configuration will have one or more of these conditions. Review the Host-based configurations in your NMCONFIG file and take the ACTIONS described below to reconfigure your file to best migrate your configuration.

You Have a Managed DTC

In this case your host has a DTC that is currently configured in the Host-based tree of your NMCONFIG file and you want to add the DTCs managed by your OpenView DTC Manager PC to the NMCONFIG file.

ACTION: If you want to keep the configuration of these DTCs run NMMGR and ensure that the DTC in the Host-based tree has a different DTC name than the DTC Label on the DTC to be migrated from the PC. Then use the migration file generated by the PC to add the configurations for the DTC from the PC.

For those DTCs that are migrated from the PC, there is no DTC configuration from which to get valid ldev numbers for nailed ldevs. The TIO ports are configured with ldev of (-1) and PAD ports configured with ldev of (1) in the Host-based tree. Validation will detect the error.

ACTION: DO NOT run the Host Migration tool. On the DTCs that are migrated from the PC, you must run NMMGR and assign valid ldev numbers to the nailed TIO Ports and PAD devices.

You have a Non-managed DTC I

In this case you can have two possibilities: The non-managed DTC is one of the DTC that you are migrating from the PC; the non-managed DTC is managed from another platform.

The non-managed DTC is being migrated from the PC The non-managed DTC is the one you are migrating from the PC and you want to keep the configuration of this DTC, the following actions will merge the port configurations into the configuration migrated from the PC.

ACTION: DO NOT run the Host Migration tool. Run NMMGR and ensure that the DTC in the Host-based tree has a different DTC name than the DTC Label on the DTC to be migrated from the PC. Then use the migration file generated by the PC to add the configurations for the DTC from the PC.

1. Use the NMMGR Copy Subtree function to copy the following paths:

```
Source Path:DTS.DTC.SELECT.<Host DTC>.CARD012
Target Path:DTS.DTC.SELECT.<PC DTC>.CARD012
```

```
Overwrite existing subtree [Y]
```

and

```
Source Path:DTS.DTC.SELECT.<Host DTC>.CARD345
Target Path:DTS.DTC.SELECT.<PC DTC>.CARD345
```

```
Overwrite existing subtree [Y]
```

Where <Host DTC> is the DTC Name of the non-managed DTC in the NMCONFIG file and <PC DTC> is the DTC Label of the DTC that was migrated from the PC.

2. After performing the Copy Subtree, delete the non-managed DTC from the NMCONFIG file.

The non-managed DTC is being managed from another platform. In this case the configuration of the DTC is managed by a management platform other than the PC from which you will migrate the DTC configuration and you want this DTC to continue to be managed by that platform.

ACTION: DO NOT run the Host Migration tool. Run NMMGR and ensure that the DTC in the Host-based tree has a different DTC name than the DTC Label on any DTC to be migrated from the PC.

Process for Migrating from PC-Based to Host-Based DTC Management

The following is the process for migrating the configuration from the OpenView DTC Manager PC to an HPe3000 host.

On the Target MPE System

1. This process will need to use FTP to transfer a file from the PC to the host. Ensure that the ARPA services are running:
: showjob

2. If you don't see a job logged on as: JINETD,MANAGER.SYS then check that FTP is properly configured on the host. Then check that the network services are running and start the ARPA process.

```
:stream jinetc.net
```

On the Open View DTC Manager PC

3. Install the OpenView DTC Manager patch with the migration tool on the Local PC.
4. On the Local PC, logon to the DTC Mgr PC where the DTCs that will be migrated are being managed (this can be the Local or a Remote DTC Manager).

NOTE

The Remote DTC Manager PC does NOT have to have the patch installed.

5. On the HP OpenView Menus select [DTC Tools] [Manage Multiple DTCs...]. Select the new button labeled 'Migrate to Host-Based Mgmt'
6. Select the DTCs from the Known DTC's List to be migrated, click OK. You will be prompted for the migration filename to be used.
7. Select or type the filename in the filename box. The extension is set to *.PUB so that the file will be copied to group PUB when it is transferred to the host.

The tool will run and display any errors it encounters. If you see the message 'Command successfully completed', then proceed to the next step otherwise fix any errors that need to be fixed. See the file c:\dtcmgr\exe\multidtc\multidtc.err for a list of all errors that occurred.

The following message is only a warning, if this was the only error displayed, then the generation of the migration file was successful:

**The TAC is not supported on Host-Based Management.
Remove the TAC before downloading the DTC from the Host.**

8. Copy the migration file to the HP3000 host:

On the START menu, select [Programs] [MS-DOS Prompt] In the MS-DOS window enter the following commands:

```
C:\> cd \dtcmgr\exe\multidtc
C:\> dir          ( you should see the migration filename created above.)
C:\> ftp <hp3000 system>
User> PC,manager.sys,pub
Password> (enter passwords, if any)
ftp> put <migration file> <MPE filename>;rec=,,v,ascii
      (<MPE filename> must be a legal MPE filename.)
Example:
ftp> put nmcfgcmd.pub nmcfgcmd.pub;rec=,,v,ascii

ftp> quit
Exit the MS-DOS window.
```

On the MPE System

9. Install the patches that contain the new Host-based Management functions. When the system is rebooted. DTS should startup normally, even though the NMCONFIG file is still the old format.

10. Save a backup copy of your NMCONFIG file.
11. Run NMMGRVER to update the NMCONFIG file to the version for these patches.
12. If your configuration is currently PC-Based, then complete the tasks in step 12a. If your configuration is Host-Based, complete the tasks in step 12b.
 - a. Run NMMGR and make the following configuration changes:
 - Make sure only those DTC that you wish to migrate to the host-based configuration are configured. DELETE any that should not be migrated.
 - Perform any of the configurations changes that are needed to account for the conditions described in the section “Your Host’s Configuration is Currently PC-Based”.
 - Execute Validate/DTS to ensure that there are no validation errors.
 - Go to the NMMGR Main screen and configure:


```
Are you using OpenView DTC Manager? [N]
```

If any DTCs on the OpenView DTCMgr PC have or if you plan to use any of the host-based DTCs for X.25 system-to-system or PAD connections then configure:

```
Do you have X.25 system-to-system or PAD connections? [Y]
```
 - b. Run NMMGR and make the following configuration changes:
 - Make sure only those DTC that you wish to remain in the host-based configuration are configured. DELETE any that should not be retained.
 - Perform any of the configurations changes that are needed to account for the conditions described in the section “Your Host’s Configuration is Currently Host-Based”.
13. On the Host-based DTS Configuration screen enter a valid profile name for the non-nailed TIO and PAD port profiles. Enter the number of non-nailed ldevs desired. Enter valid entries for the Link fields (Link name, Link Type, Physical path of LANIC).
 - Validate the configuration with Validate/DTS and ensure that there are no validation errors. Exit NMMGR.
14. Use the file created on the PC to create the new Host-Based DTC configuration:


```
:file nmmgrcmd=<MPE filename>
```

Where <MPE filename> is the file transferred from the PC. The command file will perform the configuration changes on NMCONFIG.PUB.SYS.

Run NMMGR with one of the following commands:

```
:NMMGR
```

Or to capture the output in a file:

```
:NMMGR >NMMGROUT
```

NMMGR will run and execute the commands in the file.
15. When NMMGR finishes, review the results and ensure that no errors occurred other than the following allowed messages:

```
:SAVE NMMGROUT
:RESET NMMGRCMD
Item already exists. (NMGRERR 21)
The source path was not found. (NMGRERR 280)
```

16. If your original configuration was Host-Based, then skip to step 19. If your original configuration was PC-Based and you have DTCs in the PC-Based tree that you want to merge into the Host-Based tree, then continue with the following step.

- Run NMMGRVER with the special parm that will launch the Host Migration tool:

```
:run NMMGRVER;PARM=77
```
- You will be prompted for the filename to be migrated. Enter `NMCONFIG.PUB.SYS`. This will run the tool that will take the DTCs configured in the PC-Based tree and merge them with the configuration added to the Host-Based tree by the command file created on the PC.
- The following message will be displayed if the migration was successful. If you see any other error messages, the migration was not successful. Go to the manual *Using the Node Management Services (NMS) Utilities* for more detailed descriptions and action to take to fix them.

```
CONVERSION completed successfully. (NMMGRVERMSG 0)
```

17. If the Host Migration tool finds any configuration discrepancies, then you will see the following message:

```
Migration process found configuration discrepancies. (NMMGRVERWARN 50)
```

The tool will also display messages indicating the nature of the discrepancies. You must correct them for the configuration to validate successfully. See Appendix B for the cause and action to take to correct any configuration discrepancies.

18. Run NMMGR and correct any configuration discrepancies found by the Host Migration tool. Validate the configuration with Validate/DTS and correct any configuration errors displayed.

19. Update the configuration to customize any TIO or PAD ports you desire.

20. Perform a DTS shutdown/restart:

```
:dtcctrl func=shutdown;forced=y
:dtcctrl func=restart
```

21. Shutdown the OpenView DTC Manager PC that WAS managing the DTCs. Remove any TACs that may still be installed in the DTCs.

22. Cycle the power OFF then ON for all the DTCs. They should reset and download successfully from this host.

23. Startup X.25 and PAD protocols on any desired DTC. You can use the new Manage Multiple DTC option in TermDSM:

```
:termdsm.diag
Connect  DIag      DTc       DUmp      EEprom   Help
Multi    Reset     Status   Trace     X25site  EXit     ?M
(multiple operations)
```

```
Current operation NONE. Selected Modules X.25 [ ] PAD [ ]
START #,#          (X.25,PAD)
STOp  #,#          (X.25,PAD)
Dtc   #            List of DTCs
(carriage return to exit) ?
```

Running NMMGRVER from NMMGR

The New Host-Based Management release provides two ways to launch NMMGRVER from within NMMGR.

- When the New Host-Based Management is first installed and the NMCONFIG file needs to be updated.
- To launch the Host Migration tool to merge the PC-based DTC configurations into the Host-based configuration.

These two methods allow you to upgrade your configuration to the latest release and to migrate the DTC configured in the PC based configuration to Host-Based Management with the minimum of interruptions in your system operations.

Upgrade NMCONFIG Version after installation of the New Host-Based Release

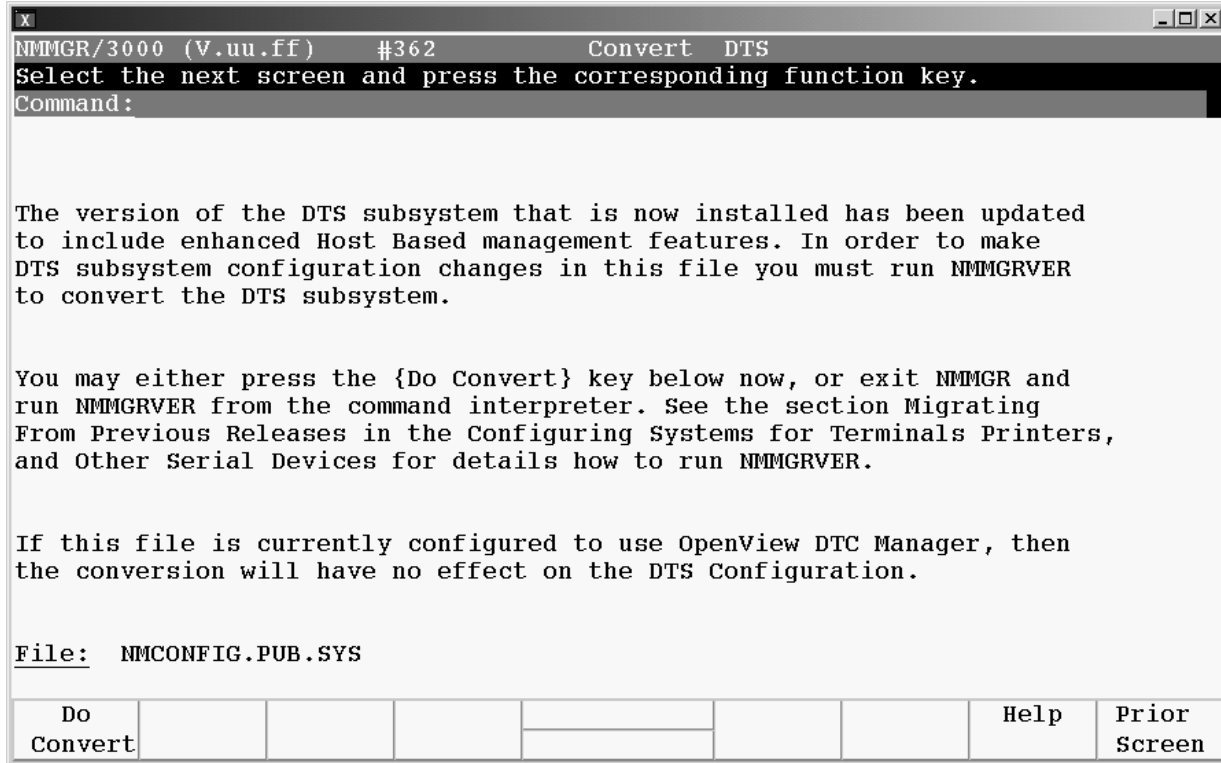
Within the New Host-Based Management release, NMMGR and the DTS subsystem utilize updated structures in the NMCONFIG file to manage the new Host-based functions. When the system is rebooted after the release is installed, the NMCONFIG file is still the old format. To allow the system to startup without error, the DTS subsystem will recognize that the NMCONFIG file is the previous release and successfully startup the DTS subsystem. You will see the following message indicating this:

```
DCC WARNING 15-22, NMCONFIG is previous version, Run NMMGRVER (DCCWARN=52)
```

If you run NMMGR but have not yet run NMMGRVER, you will see the following screen if you press the **[DTS]** key at the NMMGR Main screen. This screen indicates that the NMCONFIG file is still the old format and NMMGR can not make changes to the DTS

subsystem. Although the DTS subsystem is correctly configured, you will not be able to make changes to the DTS configuration until you update the NMCONFIG file to the latest release with NMMGRVER.

Figure A-1 Convert DTS Screen



If you press the **[Do Convert]** key, NMMGR will automatically run NMMGRVER to allow you to update the NMCONFIG file. Follow the instructions above “Running NMMGRVER to Update Release Version”. When the update is complete, you can press the **[Prior Screen]** and resume configuring the DTS subsystem.

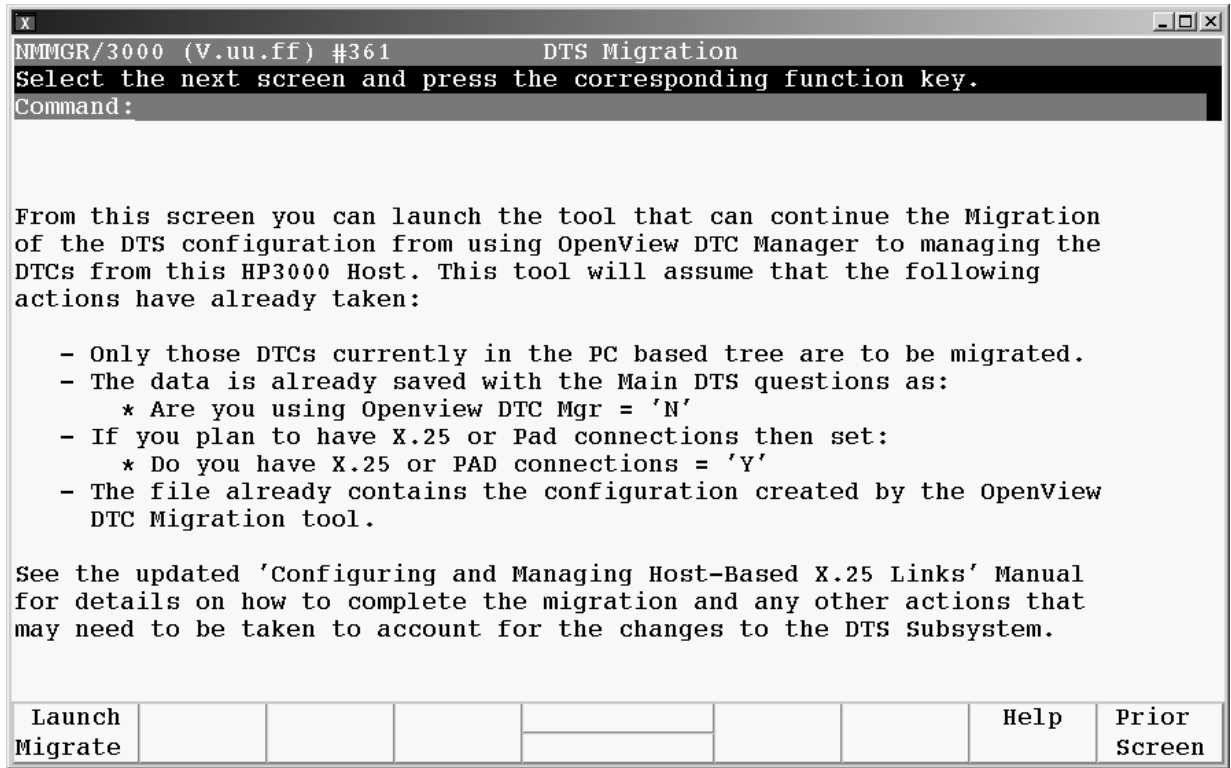
NOTE Dynamic configuration will be disabled until you run DTCCTRL and perform a SHUTDOWN and RESTART of the DTS subsystem. See Chapter 7, “Managing Networks with DTCCTRL” for detail on how to shutdown and restart DTS.

Migrate NMCONFIG file to Host-based Management

One of the steps to migrate from PC-Based management to Host-Based Management is to migrate the configuration of your DTCs from the PC-Based configuration to the Host-Based configuration using the Host Migration tool integrated into NMMGRVER. Before running the Host Migration tool review the section above “Your Host’s Configuration is Currently PC-Based” and the section “Process for Migrating from PC-Based to Host-Based DTC Management”. Complete any configuration tasks that are needed prior to running the Host Migration tool.

Once you have completed the necessary steps prior to running the Host Migration tool, you can launch the Host Migration tool from within NMMGR. To launch the Host Migration tool, press the **[Utility]** key on the NMMGR Main screen. On the Utility screen, press the **[Go To MIGRATE]** key. You will see the following screen.

Figure A-2 DTS Migration



Launch the tool by pressing the **[Launch Migrate]** key. You will be prompted for the filename to be migrated. When the tool prompts for the filename, enter `NMCONFIG.PUB.SYS`. When the Migration tool completes, review and correct any errors that may have occurred. You can press the **[Prior Screen]** key and continue to make further configuration changes.

B Error Messages

This Appendix contains validation, datacommunication configurator (DCC), and DTCCNTRL error messages.

Validation errors indicate problems with the network management configuration file. They are detected during NMMGR configuration when you attempt to validate the network management configuration file.

DCC errors indicate problems with the link or the DTS manager. They are detected when the system is rebooted.

DTCCNTRL errors indicate problems that occurred while you were attempting to use the DTCCNTRL command to manage the operation of X.25 or PAD support services.

Validation Error Messages

The network management configuration file must be validated before automatic cross-validation with SYSGEN takes place.

The DTS validation procedure starts by displaying the following:

```
-> Validation of DTS/LINK started. <-
```

Errors are then listed. When the validation procedure is complete, it will print the following:

```
nnn Encountered Errors
```

```
-> Validation of DTS/LINK finished. <-
```

where *nnn* is the total number of errors found during validation.

A numerical list of validation error messages and actions for each follows.

- (DTSERR 3) Path: NMMGRpath — A read error encountered while reading the data record (bad file).**
Cause: Either a hardware problem occurred or the data record is too long.
Action: Try to print the network management configuration file. Rebuild the file from a copy of the sample file NMSAMP1.PUB.SYS. If the problem persists, contact your Hewlett-Packard support representative.
- (DTSERR 4) Path: NMMGRpath — A write error encountered while updating the data record (bad file).**
Cause: Either a hardware problem occurred or the data record file is too small.
Action: If the data record file has been compressed, it is impossible to validate the file. Go to the UTILITY screen and use the compression utility to make the file larger. Try to validate the file. If it still fails, build the file from a copy of the sample file NMSAMP1.PUB.SYS. If the problem persists when verifying the new file, contact your Hewlett-Packard support representative.
- (DTSERR 5) Path: NMMGRpath — The data record is empty (use Update Data function key).**
Cause: The data record was not created for the *NMMGRpath*.
Action: Go back to the screen specified by the *NMMGRpath* and update the screen.
- (DTSWARN 6) Path: NMMGRpath — The same physical path is being used at LINK.linkname.**
Action: This a warning only. No action is required.
- (DTSERR 7) Path: NMMGRpath — The same station address is being used at LINK.linkname.**
Cause: The IEEE 802.3 station address is already used. Each station address must be unique.
Action: Go back to the screen specified by the *NMMGRpath* or go to the screen specified by the *linkname* and correct the station address.
- (DTSERR 8) Path: NMMGRpath — LINK.linkname is not defined.**
Cause: The *linkname* specified on the DTS Configuration screen is not defined; therefore, the link data record was not created.

Action: Verify the *linkname* on the Host Configuration screen. If the link data record does not exist, update the DTS Configuration screen.

(DTSERR 9) Path: NMMGRpath — The non-nailed device profile <name> is not defined.

Cause: The *profilename* on the screen specified by the *NMMGRpath* is not defined; therefore, the profile data record does not exist.

Action: Check that the profile name exists on the DTS Profile Selection screen and, if it does, check that the data record for this profile was created.

(DTSERR 10) Path: NMMGRpath — The same station address or node name is being used for DTC <name>.

Cause: The station address or node name used on the screen specified by the *NMMGRpath* is also used on the screen specified by the path `DTS.DTC.SELECT.DTCname` screen.

Action: Go to the screen specified by the *NMMGRpath* or to the screen specified by the *DTC name* and modify the station address or node name.

(DTSERR 11) Path: NMMGRpath — The same LDEV #nnn is being used at DTC<name> in card 0, 1, or 2.

Cause: The logical device (ldev) number is being used on the screen specified by the *NMMGRpath* and on the specified DTC and one of the three cards.

Action: Go to one of the two screens and change the ldev number. The ldev number must be unique for each port.

(DTSERR 12) Path: NMMGRpath — The same LDEV #nnn is being used at DTC <name> in card 3, 4, or 5.

Cause: The same logical device (ldev) number is being used on the screen specified by the *NMMGRpath* and on the specified DTC and one of the three cards.

Action: Go to one of the two screens and change the ldev number. The ldev number must be unique for each port.

(DTSERR 14) Path: NMMGRpath — LDEV #nnn is too big (must be <=4679).

Cause: The logical device (ldev) number is bigger than the allowed maximum ldev number.

Action: Go to the screen specified by the *NMMGRpath* and modify the ldev number.

(DTSERR 15) Path: NMMGRpath — Too many LDEVs are being used (must be <=4649).

Cause: Too many logical device (ldev) numbers are being used.

Action: Review the screens that use ldevs and delete some ldev numbers. The validation procedure allows a total of 4649 ldevs.

(DTSWARN 17) Path: NMMGRpath — Defined LINK.linkname is not being used.

Cause: The defined *linkname* is not used by DTS or the network interface.

Action: This is a warning only. No action is required.

(DTSERR 18) Path: NMMGRpath — Too many links are being used (max. number allowed = 8).

Cause: The link specified in the *NMMGRpath* cannot be processed. Too many links are already defined.

Action: Go back to the DTS Configuration screen and delete the link specified in the *NMMGRpath*. Delete all unused links so that eight or less links are being used.

(DTSERR 19) Path: NMMGRpath — Too many paths are being used (max. number allowed =8).

Cause: The link specified in the *NMMGRpath* cannot be processed. Too many physical paths are already defined.

Action: Go back to the DTS Configuration screen and delete the link specified in the *NMMGRpath*. Delete all unused links so that eight or less links are being used.

(DTSERR 20) Path: NMMGRpath — Too many DTCs are being used (max. number allowed =120).

Cause: The DTC specified in the *NMMGRpath* cannot be processed. Too many DTCs are already configured.

Action: Go back to the DTC Configuration screen and delete the DTC specified in the *NMMGRpath*.

(DTSERR 21) Path: NMMGRpath — Too many nodes are being used (max. number allowed =129).

Cause: The DTC specified in the *NMMGRpath* cannot be processed. Too many nodes are being used.

Action: Go back to the DTC Configuration screen and delete the DTC specified in the *NMMGRpath*.

(DTSERR 22) Path: NMMGRpath — Too many classes are being used (max. number allowed =1000). (DTSERR=22)

Cause: The total number of classes exceeds the maximum allowed number.

Action: Delete class names so that no more than 1000 different class names are associated with asynchronous devices.

(DTSERR 23) Path: NMMGRpath — Too many profiles are being used (max. number allowed =1024). (DTSERR=23)

Cause: The total number of defined profiles exceeds the maximum allowed.

Action: Delete profiles so that no more than 1024 are specified.

(DTSWARN 24) No link is defined. (DTSWARN=24)

Cause: A link is not configured.

Action: Without a configured link, the network management configuration file is useless. Return to the configuration screens and add a link, making sure that all necessary data records are created.

(DTSWARN 25) No DTC is defined.

Cause: A DTC is not configured.

Action: An action is not required if neither terminals, printers, nor both are needed. If terminals and printers are required, return to the configuration screens and add a DTC, making sure that all necessary data records are created.

(DTSWARN 26) Path: NMMGRpath — LINK.linkname is shared with network interface. (DTSWARN=26)

Cause: The same link is shared between the DTS and NS subsystem. A separate link must exist for each of the two subsystems.

Action: Decide which of the two subsystems should use the existing link and configure an additional link for the remaining subsystem.

- (DTSERR 30) Path: NMMGRpath — Modem type not supported.**
Cause: The modem type specified on the DTS Terminal Profile screen is not 0, 1, or 2. A problem occurred while adding the ldev to a device class. This could be caused because the class is used by a different type of device such as a HPIB printer.
Action: Remove the class name from the profile for the ldev and delete and re-add the ldev. Cross-validate the NMCONFIG.PUB.SYS file with SYSGEN. Correct any problems found then restart DTS.
- (DTSERR 32) Path: NMMGRpath — Must supply a Physical Path.**
Cause: A physical path was not specified in the Physical Path of LANIC field.
Action: Go to the DTS Configuration screen and enter the appropriate physical path.
- (DTSWARN 34) Path: NMMGRpath — Duplicate profile class name profilename used.**
Cause: The same class name is used in several terminal profiles or the same class name is used in several printer profiles.
Action: No action is required. Informational message only.
- (DTSERR 35) Path: NMMGRpath — Class name duplicated between printer and terminal profiles.**
Cause: The same class name is used for both a terminal profile and a printer profile.
Action: Remove the duplicate class name from the terminal profile or the printer profile.
- (DTSERR 36) Path: NMMGRpath — Profile profilename specified for non-nailed terminals is of PRINTER type.**
Cause: A printer profile is specified where only a terminal profile is allowed.
Action: Change the printer profile to be a terminal profile.
- (DTSERR 37) Path: NMMGRpath — Profile profilename specified for non-nailed PAD terminals is of PRINTER type.**
Cause: A printer profile is specified where only a terminal profile is allowed.
Action: Change the printer profile to be a terminal profile.
- (DTSERR 38) Path: NMMGRpath — PAD device name for LDEV #nnn is being used in DTC <name> on Card x.**
Cause: A PAD name is used more than once on the specified DTC and card number.
Action: Remove all of the duplicate references to the PAD name.
- (DTSERR 44) Path: NMMGRpath — The same PAD LDEV #nnn is being used in DTC <name> on Card x.**
Cause: The same logical device (ldev) number is configured on the PAD card screen specified by the *NMMGRpath* and on the specified DTC and card number.
Action: Remove the duplicate ldev number.
- (DTSERR 52) Path: NMMGRpath — The same node name is being used at linkname.**
Cause: The same node name is used more than once.
Action: Remove the duplicate reference to the node name.
- (DTSERR 53) Path: NMMGRpath — Blank NODENAME.**

Cause: A host node name is not specified on the screen specified in the path.

Action: Enter a host node name on the screen specified in the path.

(DTSERR 54) Path: NMMGRpath — The profile for LDEV #nnn, profilename, is not defined.

Cause: An incorrect profile name was used for the logical device (ldev).

Action: Verify the profile name for the logical device in the DTS Profile Selection screen.

(DTSERR 57) Path: NMMGRpath — Profile profilename specified for non-nailed PAD terminals is of PRINTER or PADPRINT type.

Cause: A printer or PAD printer profile is specified where only a terminal or pad terminal profile is allowed.

Action: Change the printer profile to be a terminal profile.

(DTSERR 58) Path: NMMGRpath — The profile for LDEV #nnn, <profilename>, is for a PAD device type.

Cause: A PAD terminal or PAD printer profile is specified where only a terminal or printer profile is allowed.

Action: Change the PAD terminal or PAD printer profile to be a terminal or printer profile.

(DTSERR 71) Path: NMMGRpath — Modem behavior DCE high for LDEV #nnn, defined in Profile profilename, is not supported on DTC16 and DTC48.

Cause: DCE high modem behavior is not supported for devices on a DTC 16 or DTC 48. DCE high is being specified for LDEV #nnn, which is on a DTC 16 or DTC 48.

Action: Modify the modem behavior to one that is supported for the DTC, or make sure you have specified the right DTC type (not a DTC 16 or DT C48) for the device with LDEV #nnn.

(DTSERR 72) Path: NMMGRpath — Hardware handshaking for LDEV #nnn, defined in Profile profilename, is not supported on DTC16 and DTC48.

Cause: Hardware handshaking is not supported for devices on a DTC 16 or DTC 48. Hardware handshaking is being specified for LDEV #nnn, which is on a DTC 16 or DTC 48.

Action: Make sure you have specified the right DTC type (not a DTC 16 or DT C48), or if you are configuring ports on a DTC 16 or DTC 48, do not use a profile that specifies hardware handshaking.

(DTSERR 73) Path: NMMGRpath — Modem behavior is not supported.

Cause: An invalid modem behavior has been specified. Valid modem behavior values are: 0, 1, 2, or 3. The configuration file may be corrupt.

Action: Modify the modem behavior specified on the Terminal Profile or Printer Profile screens to a valid value.

(DTSERR 74) Path: NMMGRpath — Invalid AFCP timer selection.

Cause: You have specified an invalid AFCP timer selection.

Action: Go to the Tune DTC — Timer Selection Screen and choose a value from 1 to 6 for an AFCP timer selection.

(DTSERR 75) Path: NMMGRpath — Invalid Management timer selection.

Cause: You have specified an invalid management timer selection.

Action: Go to the Tune DTC — Timer Selection Screen and choose a value of 1 or 2 for a management timer selection.

(DTSERR 76) Path: NMMGRpath — Baud rate 38400 for LDEV #nnn, defined in Profile profilename, is not supported on DTC16 and DTC48.

Cause: You have used a profile that specified a baud rate of 38400 for a device that is connected to a DTC 16 or DTC 48.

Action: Make sure you specified the right DTC type (not a DTC 16 or DTC 48), or do not use this profile for the port with LDEV #*nnn*.

(DTSERR 77) Internal error. Failed to get memory.

Cause: The operating system was unable to allocate the memory needed to store data used during validation.

Action: Build a new file from the sample file `NMSAMP1.PUB.SYS`. Try to validate the file. If the same error message appears when verifying the new file, contact your Hewlett-Packard support representative.

(DTSERR 78) Path: NMMGRpath — A HOST profile is currently configured on LDEV #nnn, must use LDEV # -1.

Cause: A profile of type `HOST` has been configured on a DTC port and the ldev specified is not `-1`.

Action: Ports using `HOST` profiles are for back-to-back and must have an ldev of `-1`. Go to the screen specified in *NMMGRpath* and change the ldev to `-1` or use a different profile that is not of type `HOST`.

(DTSERR 79) Path: NMMGRpath — X.25 card is not allowed in slot s.

Cause: An X.25 card has been configured in a slot that is not allowed for the DTC type.

Action: Go to the DTC specified in the *NMMGRpath* and delete the X.25 card from the slot number *s*.

(DTSERR 80) Path: NMMGRpath — Too many X.25 cards are configured. Maximum is 3. (DTSERR=80)

Cause: Too many X.25 cards have been configured in the DTC specified in *NMMGRpath*.

Action: Go to the DTC specified in the *NMMGRpath* and delete one or more X.25 cards.

(DTSERR 81) Path: NMMGRpath — LAN cardtype is not allowed on DTC16 or DTC48.

Cause: The configuration for the DTC specified in *NMMGRpath* has a cardtype of “L” configured. This is not allowed for DTC16 or DTC48.

Action: Go to the DTC Configuration screen specified in *NMMGRpath* and enter the correct cardtypes.

(DTSERR 82) Path: NMMGRpath — Too many LAN cards configured. Only one is allowed.

Cause: The configuration for the DTC specified in *NMMGRpath* has more than one LAN card specified in the cardtypes.

Action: Go to the DTC Configuration screen specified in *NMMGRpath* and change the extra “L” cardtypes to another valid type.

(DTSERR 83) Path: NMMGRpath — Unknown cardtype specified for card c.

Cause: The configuration for the DTC specified in *NMMGRpath* has been corrupted.

Action: Delete the DTC specified in *NMMGRpath* and re-enter the data for this DTC.

(DTSERR 84) Path: NMMGRpath — Cardtype for card c does not match DTC card configuration.

Cause: The configuration for the DTC specified in *NMMGRpath* has been corrupted.

Action: Delete the DTC specified in *NMMGRpath* and re-enter the data for this DTC.

(DTSERR 85) Path: NMMGRpath — Cardtype configured on card c not allowed on dtctype.

Cause: The configuration for the DTC specified in *NMMGRpath* has been corrupted.

Action: Delete the DTC specified in *NMMGRpath* and re-enter the data for this DTC.

(DTSERR 86) Path: NMMGRpath — Ldev #nnn> is not valid (must be >= -l and <=4679).

Cause: The logical device (ldev) number is outside the allowed range.

Action: Go to the screen specified in *NMMGRpath* and modify the ldev number.

(DTSERR 87) Path: NMMGRpath — Non-nailed Ldev of -l is not allowed with printer profile.

Cause: An ldev number of -l has been specified on a port that has a profile configured that is of type terminal or printer.

Action: Go to the screen specified in *NMMGRpath* and change the ldev or specify a profile that is a type HOST.

(DTSERR 88) Path: NMMGRpath — Profile for ldev #nnn, <profname>, is of HOST type.

Cause: Profile <profname> is of type HOST and has been configured on a DTC port where ldev specified is not -l.

Action: Ports using HOST profiles are for back-to-back and must have an ldev of -l. Go to the screen specified in *NMMGRpath* and change the ldev to -l or use a different profile that is not of type HOST.

(DTSERR 89) Path: NMMGRpath — Too few non-nailed ldevs available above TIO start ldev.

Cause: There are not enough ldevs available above the TIO start ldev number to configure the number of ldev specified.

Action: Lower the number of TIO non-nailed ldevs or delete all TIO non-nailed ldevs and specify a lower starting ldev number. Then add the desired number of ldevs.

(DTSERR 90) Path: NMMGRpath — Too few non-nailed ldevs available above PAD start ldev.

Cause: There are not enough ldevs available above the PAD start ldev number to configure the number of ldev specified.

Action: Lower the number of PAD non-nailed ldevs or delete all PAD non-nailed ldevs and specify a lower starting ldev number. Then add the desired number of ldevs.

(DTSERR 92) Path: NMMGRpath — Attached device for LDEV#nnn, defined in Profile <profilename>, is not supported on DTC 16 and DTC 48.

Cause: Modem devices configured (either US inout modem or European inout modem) are not supported on DTC16 or DTC48.

Action: Go to DTC specified in *NMMGRpath* and change the modem type to required modem type other than US inout or European inout.

(DTSERR 93) Path: NMMGRpath — Eight bit with parity for LDEV #nnn, defined in Profile <profilename>, is not supported on DTC16 and DTC48.

Cause: Eight bit data length with odd/even parity (“8odd” or “8even”) feature is not supported on DTC 16 or DTC48.

Action: Go to DTC specified in *NMMGRpath* and change the entry for the parity to the required value other than “8odd” or “8even”.

(DTSERR 94) Path: NMMGRpath — Two stop bits for LDEV#nnn, defined in Profile <profilename>, is not supported on DTC 16 or DTC 48.

Cause: Modem Two stop bits feature is not supported on DTC16 or DTC 48.

Action: Go to DTC specified in *NMMGRpath* and change the entry for the stop bits to one.

(DTSERR 95) Path: NMMGRpath — Binary port config for LDEV#nnn, defined in Profile <profilename>, is not supported on DTC 16 or DTC 48.

Cause: Modem The feature for forcing data length and parity when binary mode is selected is not supported on DTC 16 or DTC 48.

Action: Go to DTC specified in *NMMGRpath* and change the entry for the binary port config filed to “N”.

(DTSERR 98) Path: NMMGRpath — Duplicate IP address or Node name found on card n.

Cause: Two entries on the screen specified by *NMMGRpath* have the same IP address configured on the specified card.

Action: Go to specified screen and change one of the entries.

(DTSERR 100) Path: NMMGRpath — Invalid IP address found on card n for X.25 address xxxxx.

Cause: The format of the IP address for the entry on the screen specified by *NMMGRpath* with the specified X.25 address is invalid.

Action: Go to specified screen and fix the format of the entry.

(DTSERR 101) Path: NMMGRpath — Invalid IP address or Node name found on card n for X.25 address xxxxx.

Cause: The format of the IP address for the entry on the screen specified by the *NMMGRpath* with the specified X.25 address could not be determined to be a valid IP address of NS or ARPA Node Name format.

Action: Go to specified screen and fix the format of the entry.

(DTSERR 102) Path: NMMGRpath — Too many Sys-to-Sys LUG entries found. Maximum is 256.

Cause: The X.25 table in the DTC specified in *NMMGRpath* cannot be processed. Too many System-to-System Local User Group entries are already configured.

Action: Go to DTC configuration screen and delete the entries until only the specified number remain in *NMMGRpath*.

(DTSERR 103) Path: NMMGRpath — Too many Sys-to-Sys Switching table entries found. Maximum is 32.

Cause: The X.25 table in the DTC specified in *NMMGRpath* cannot be processed. Too many System-to-System Switching entries are already configured.

Action: Go to DTC configuration screen and delete the entries until only the specified number remain in *NMMGRpath*.

(DTSERR 104) Path: NMMGRpath — Too many PAD Switching table entries found. Maximum is 32.

Cause: The X.25 table in the DTC specified in *NMMGRpath* cannot be processed. Too many PAD Switching entries are already configured.

Action: Go to DTC configuration screen and delete the entries until only the specified number remain in *NMMGRpath*.

(DTSERR 105) Path: NMMGRpath — Too many PAD Incoming Security table entries found. Maximum is 512.

Cause: The X.25 table in the DTC specified in *NMMGRpath* cannot be processed. Too many PAD Incoming Security table entries are already configured.

Action: Go to DTC configuration screen and delete the entries until only the specified number remain in *NMMGRpath*.

(DTSERR 106) Path: NMMGRpath —Node Name field must begin with a letter on card c for X.25 address xxxxx.

Cause: The format of the Node Name on the screen specified by *NMMGRpath* for the entry with the specified X.25 address is invalid.

Action: Go to specified screen and fix the format of the entry.

(DTSERR 107) Path: NMMGRpath —Invalid ldev number for PAD device on card c.

Cause: The logical device (ldev) number is outside the allowed range of 2 to 4679.

Action: Go to the screen specified in *NMMGRpath* and modify the ldev number.

DTSERR 108) Path: NMMGRpath — Did not find expected X.25 address in an entry on card c.

Cause: An entry on the screen specified by *NMMGRpath* does not have the required X.25 address filled in.

Action: Go to the screen specified in *NMMGRpath* and add an X.25 address to the entry.

DCC Error Messages

As system start-up nears completion, the Datacomm Configurator (DCC) creates the LINK and DTS managers. If the procedure is successful, the following message will be displayed on the console:

```
DCC STARTUP OK!
```

If the procedure is not successful, the message above is replaced by one or more error messages.

When looking up an error message, note that the following strings of characters are used to represent information that is inserted when the message is generated.

- P-L — is replaced by a DCC procedure number and a DCC location number; used for detailed diagnostics by Hewlett-Packard support representative.
- SSSSSSSS — is replaced by an eight-digit hexadecimal value; also used for detailed diagnostics.
- MMM and LLL — are replaced by decimal values; used for detailed diagnostics.
- PATH — is replaced by an NMCONF path or LLIO physical path

(DCCERR 1) DCC ERROR P-L, (LLIO status SSSSSSSS).

Cause: A problem exists with the low-level I/O services.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 2) DCC ERROR P-L, (reply status SSSSSSSS, msg descriptors MMM).

Cause: A problem exists with interprocess communication.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 3) DCC ERROR P-L, Configuration file open error SSSSSSSS.

Cause: The configuration file does not exist or it is locked.

Action: Check to see if NMCONFIG.PUB.SYS exists. If it exists, verify that it is the proper file type and that it is not locked.

(DCCERR 4) DCC ERROR P-L, (NMCONF record error SSSSSSSS). NM Path: NMMGRpath

Cause: The DCC surrogate cannot read a record in NMCONFIG.PUB.SYS, or data in the file was not validated or the data is corrupt.

Action: Validate the NMCONFIG.PUB.SYS file and restart DTS. If the error persists, replace the file, validate it, and restart DTS.

(DCCERR 5) DCC ERROR P-L, configuration record data was invalid. NM Path: NMMGRpath

Cause: Data in the NMCONFIG.PUB.SYS file was not validated or the data is corrupt.

Action: Validate the NMCONFIG.PUB.SYS file and restart DTS.

(DCCERR 6) DCC ERROR P-L, (HLIO status SSSSSSSS, ldev LLL).

Cause: A problem exists with the high-level I/O services.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 7) DCC ERROR P-L, (Buffer manager status SSSSSSSS).

Cause: A problem exists with the datacomm buffers.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 8) DCC ERROR P-L, (External procedure not found, status SSSSSSSS).

Cause: A problem exists with DCC execution.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 9) DCC ERROR P-L, (Memory management error status SSSSSSSS).

Cause: A problem with the system occurred; the DCC cannot obtain memory.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 10) DCC ERROR P-L, (Ports status SSSSSSSS).

Cause: A problem with the DCC or the port's subsystem occurred.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 11) DCC ERROR P-L, time out on reply msg, descriptors MMM.

Cause: The DCC did not receive a reply message within the allotted time.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 12) DCC ERROR P-L, too many DTCs configured.

Cause: The NMCONFIG.PUB.SYS file contains more than the supported number of DTCs.

Action: Delete the excess DTCs from the NMCONFIG.PUB.SYS file and restart DTS.

(DCCERR 13) DCC ERROR P-L, link name specified for the DTS does not exist.

Cause: The link name configured in NMMGR on the DTS Configuration screen does not exist.

Action: Go to the DTS Configuration screen and enter the link name, then restart DTS.

(DCCERR 14) DCC ERROR P-L, link name specified for the DTS is not available (link status SSSSSSSS).

Cause: A problem occurred with the link hardware; the LANIC might be in the wrong slot or it might not be connected to the LAN.

Action: Check the hardware configuration and connections, then restart DTS.

(DCCERR 15) DCC ERROR P-L, too many links configured.

Cause: More than eight links are configured.

Action: Delete all unused links so that eight or less links are used, then restart DTS.

(DCCERR 16) DCC ERROR P-L, message received on wrong subque.

Cause: A problem exists with the interprocess communication.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 17) DCC ERROR P-L, unrecognized message received.

Cause: A problem exists with the interprocess communication.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 18) DCC ERROR P-L, internal DCC logic error.

Cause: A problem internal to the DCC exists.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 19) DCC ERROR P-L, Link error status SSSSSSSS. LLIO path: NMMGRpath.

Cause: A problem occurred while configuring the link manager.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 20) DCC ERROR P-L, Add LDEV to class failure (HLIO status SSSSSSSS, ldev LLL).

Cause: A class contains more than 255 devices, or a conflict in class names exists, or NMCONFIG.PUB.SYS was not cross-validated with files created with SYSGEN.

Action: Run SYSGEN to verify the conflict.

(DCCERR 21) DCC WARNING P-L, Configuration file close error SSSSSSSS.

Cause: A problem occurred while closing the NMCONFIG.PUB.SYS file or the NMCONFIG.PUB.SYS file.

Action: Check that the files exist, and that adequate disk space is available for them. If the files exist and the disk space is large enough, check for file system or hardware problems.

(DCCERR 22) NLIO status SSSSSSSS, ldev LLL).

Cause: A problem exists in the NLIO services.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 23) DCC ERROR P-L, Blank NODENAME.

Cause: A host node name was not configured.

Action: Configure a host node name.

(DCCERR 24) DCC ERROR P-L, Configuration file not validated, status SSSSSSSS.

Cause: Either modifications were made to the network management configuration file and the file was not validated, or the file was validated but the errors listed to the console were not corrected.

Action: Either validate the network management configuration file, or correct the errors listed to the console when the file was first validated and then revalidate the file.

(DCCERR 25) DCC ERROR P-L, X.25 Level 1&2 not configured in NMMGR, status SSSSSSSS.

Cause: Level 1&2 of the X.25 network management structure have not been configured in NMMGR.

Action: Supply the required information in the X.25 Level 1&2 screen in NMMGR.

(DCCERR 26) DCC ERROR P-L, X.25 Level 3 not configured in NMMGR, status SSSSSSSS

Cause: Level 3 of the X.25 network management structure have not been configured in NMMGR.

Action: Supply the required information in the X.25 Level 3 screen in NMMGR.

(DCCERR 27) DCC ERROR P-L, Invalid card number specified, (DCC status SSSSSSSS, card number = cardnumber).

Cause: You have specified an invalid card number for the DTC type.

Action: For DTC 72MX, the valid range for card number is 0 to 3. For DTC 48, the valid range for card number is 0 to 5. For DTC 16, you may use card 0 and 1 for connector cards and card 2 for X.25 card.

- (DCCERR 28) DCC ERROR P-L, Invalid DTC type specified, (DCC status SSSSSSSS).**
Cause: The NMCONFIG.PUB.SYS file may be corrupt.
Action: Use a backup configuration file, verify and update your configuration, validate and cross-validate with SYSGEN, and restart DTS. Keep the corrupt configuration file and report this condition to your HP representative.
- (DCCERR 29) DCC ERROR P-L, DTC is not configured, NM path: NMMGRpath.**
Cause: A dynamic configuration change was attempted on a DTC that DCC has not yet created.
Action: Delete the DTC from the NMCONFIG file and run DTCCNTRL. Then add the DTC back to the NMCONFIG.PUB.SYS file.
- (DCCERR 30) DCC ERROR P-L, Ldev is already configured, (ldev: LLL).**
Cause: The ldev #LLL is already configured on the system.
Action: Validate the NMCONFIG.PUB.SYS file and then cross-validate with SYSTEM and then restart DTS.
- (DCCERR 31) DCC ERROR P-L, Duplicate node address or DTC node name. N Mpath: NMMGRpath**
Cause: The node address or DTC nodename of a DTC that was added dynamically or automatically is already configured on an existing DTC.
Action: Verify the node address and nodename of the new DTC and retry the operation. If the error occurs again, check the configurations of the other DTCs that are in the NMCONFIG.PUB.SYS file. If the duplicate entry is not found then restart DTS.
- (DCCERR 32) DCC ERROR P-L, DTC name is already configured. NMPATH: NMMGRpath**
Cause: The DTC name of a DTC that was added dynamically or automatically is already configured.
Action: Verify that the DTC name doesn't already exist in the NMCONFIG file. If the DTC name doesn't exist in the NMCONFIG file then restart DTS or pick a different name for the DTC.
- (DCCWARN 33) DCC WARNING P-L, Ldev not added to class. (HLIO status SSSSSSSS, ldev vLLL).**
Cause: A class contains more than 255 devices, a conflict in class names exists, or NMCONFIG.PUB.SYS was not cross-validated with files created with SYSGEN.
Action: The ldev is still usable but will not be in the class. Validate the NMCONFIG.PUB.SYS file and run SYSGEN to verify conflict.
- (DCCERR 34) DCC ERROR P-L, Delete Ldev from class failure. (HLIO status SSSSSSSS, ldev LLL).**
Cause: The DTC name of a DTC that was added dynamically or automatically is already configured.
Action: A problem occurred while deleting the ldev from a class.
- (DCCWARN 35) DCC WARNING P-L, Ldev not deleted from class. (HLIO status SSSSSSSS, ldev LLL).**
Cause: The ldev has already been deleted from the class or the class no longer exists on the system.
Action: This is a warning. If it persists, make sure no other system utilities are being used to delete classes or remove devices from classes.
- (DCCERR 36) DCC ERROR P-L, Failed to delete ldev LLL. Ldev still in use.**

Cause: An attempt was made to delete an ldev that is logged on or is SPOOLED.

Action: Logoff the session using the device or stop the spooler on the device and retry the operation.

(DCCERR 38) DCC ERROR P-L, Failed to delete ldev LLL. (HLIO status SSSSSSSS).

Cause: An internal error occurred while deleting an ldev. The ldev is probably unusable.

Action: Do a DTS shutdown and restart. If the problem persists, then reboot the system.

(DCCERR 39) DCC ERROR P-L, Unable to stop spooler on ldev LLL. (Status SSSSSSSS).

Cause: An internal error occurred while stopping the spooler during a DTS shutdown with forced=y.

Action: Do a DTS restart and check the device. If the device is not operating then shutdown and restart DTS.

(DCCERR 40) DCC ERROR P-L, nn dev(s) are owned, shutdown not done.

Cause: While attempting a DTS shutdown, nn ldevs were found to be still logged on or spooled. The shutdown operation was aborted.

Action: Logoff or stop the spooler on the devices that are still in use. Retry the DTS shutdown.

(DCCERR 41) DCC ERROR P-L, LLIO error (Status: SSSSSSSS, path: NMMGRpath)

Cause: A problem exists with the low-level I/O services.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 42) DCC ERROR P-L, Too few non-nailed ldevs found.

Cause: While deleting non-nailed ldevs, there were fewer unused non-nailed ldevs found to delete than requested.

Action: Logoff sessions that are using non-nailed ldevs and retry the operation.

(DCCWARN 43) DCC ERROR P-L, Unexpected procedure label status. (Status SSSSSSSS)

Cause: A internal problem exists with process management.

Action: Contact your Hewlett-Packard support representative.

(DCCERR 44) DCC ERROR P-L, Can't update data in NMCONFIG file. (Status SSSSSSSS) NM Path: NMMGRpath.

Cause: While performing Automatic configuration of a DTC, DCC was not able to add the configuration to the NMCONFIG.PUB.SYS file.

Action: Make sure the NMCONFIG file is not in use by another session. Check that the file is not full. Compress the file to free unused space.

(DCCERR 45) DCC ERROR P-L, Not enough room in NMCONFIG file. (Status SSSSSSSS)

Cause: There is not enough room left in the NMCONFIG.PUB.SYS file to successfully add a new DTC automatically.

Action: Compress the NMCONFIG.PUB.SYS file to free unused space and optionally expand the size with NMMGR. Retry the operation.

(DCCERR 47) DCC ERROR P-L, Time out waiting for DTC boot request.

Cause: While automatically adding a new DTC no boot request was received within the allowed time. The DTC is either powered off or the LAN address specified is not correct.

Action: Make sure the DTC is powered on and the correct LAN address is specified.

(DCCWARN 48) DCC WARNING P-L, (LLIO status SSSSSSSS)

Cause: An internal problem has occurred with low-level I/O.

Action: This is a warning. If it persists contact your Hewlett-Packard support representative.

(DCCWARN 49) DCC WARNING P-L, Ldev LLL is unusable until next DTS restart.

Cause: The ldev was being accessed programmatically when a DTS Shutdown was performed and the forced=y option was specified.

Action: Logoff the session or job that was accessing the device and restart DTS. Perform another DTS shutdown and restart.

(DCCWARN 50) DCC WARNING P-L, Waiting 30 sec for ldevs to become free.

Cause: One or more ldevs were in use when DTS shutdown with the forced=y option specified. DCC is waiting for the reset and/or STOPSPPOOL to complete.

Action: No action needed. DCC will proceed automatically.

(DCCWARN 51) DCC WARNING P-L, Dynamic configuration is disabled.

Cause: DCC could not find the Dynamic ID in the config file.

Action: Perform a DTS shutdown and restart. If the warning persists, contact your Hewlett-Packard support representative.

(DCCWARN 52) DCC WARNING P-L, NMCONFIG is previous version. Run NMMGRVER.

Cause: You have installed DTC patches that contain the new Host-Based DTC functionality. DCC has determined that the version of the DTS tree in the NMCONFIG file is still the previous one.

Action: The DTS subsystem will startup normally, but you must run NMMGRVER to update the version of the NMCONFIG file in order to make configuration changes to the DTS configuration.

(DCCERR 53) DCC ERROR P-L, NMCONFIG version mismatch. Can't start DCC.

Cause: DCC has determined that the version of the DTS tree in the NMCONFIG files is not the version supported on the Release of the OS currently installed. DCC could not configure the DTS subsystem.

Action: You must run NMMGRVER to update the version of the DTS tree to the current version. If this fails, you must use NMMGR to create a new NMCONFIG file and rebuild the DTS configuration. Or restore a backup of your configuration that has the correct version configured.

(DCCWARN 100) WARNING: I/O config from last START NORECOVERY will be used.

Cause: A routine message; this indicates that a start recovery is being attempted.

Action: No action is required.

(DCCWARN 101) DCC WARNING P-L, (Startup) can not open NMCONFIG, status SSSSSSSS.

Cause: Cannot open the NMCONFIG.PUB.SYS file.

Action: Check that the file exists and that it is not locked. If the file exists and is not locked, check for file system or hardware problems.

(DCCWARN 102) DCC WARNING P-L, (Startup) can not purge NMCONFIG, status SSSSSSSS.

Cause: The NMCONFIG.PUB.SYS file cannot be purged.

Action: Check that the file exists. If the file exists, check for file system or hardware problems.

(DCCWARN 103) DCC WARNING P-L, (Startup) can not open NMCONFIG, status SSSSSSSS.

Cause: The NMCONFIG.PUB.SYS file exists but it cannot be opened.

Action: Check that the file is not locked. If the file is not locked, check for file system or hardware problems.

(DCCWARN 104) DCC WARNING P-L, (Startup) can not create NMCONFIG, status SSSSSSSS.

Cause: A disk space problem, a file system problem, or a hardware problem exists.

Action: Verify that enough disk space is available. If enough disk space is available, verify that no file system problems exist. Then, verify that no hardware problems exist.

(DCCWARN 105) DCC WARNING P-L, (Startup) can not copy record from NMCONFIG, status SSSSSSSS.

Cause: The NMCONFIG.PUB.SYS does not exist, or a file system or hardware problem exists.

Action: Check that the NMCONFIG.PUB.SYS file exists. If it does not, restore it. If the file exists, check for file system or hardware problems.

(DCCWARN 106) DCC WARNING P-L, (Startup) can not copy record to NMCONFIG, status SSSSSSSS.

Cause: The NMCONFIG.PUB.SYS file does not exist, or a file system or hardware problem exists.

Action: If the file does not exist, create it. If the file exists, check for file system or hardware problems.

(DCCWARN 107) DCC WARNING P-L, (Startup) can not close NMCONFIG, status SSSSSSSS.

Cause: The NMCONFIG.PUB.SYS file does not exist, or a disk space, a file system, or hardware problem exists.

Action: Check that the NMCONFIG.PUB.SYS file exists. If it does not exist, restore it. If the file exists, check for a disk space problem, a file system problem, or a hardware problem.

(DCCWARN 108) DCC WARNING P-L, (Startup) can not close NMCONFIG, status SSSSSSSS.

Cause: The NMCONFIG.PUB.SYS file does not exist, or a disk space, file system, or hardware problem exists.

Action: Check that the NMCONFIG.PUB.SYS exists. If it does not exist, restore it. If the file exists, check for a file system problem or a hardware problem.

DTCCNTRL Error Messages

Two types of error messages can occur when a DTCCNTRL command is issued.

The first type of error message is generated by the command interpreter (CI) process when a DTCCNTRL command is issued incorrectly. CI errors are listed first below.

The second type of DTCCNTRL error message is generated when a DTCCNTRL operation fails (CTLERR messages) or when a warning is generated (CTLWARN messages). These messages are listed below following the CI errors.

CIERR 615

PARAM VALUE MUST BE BETWEEN -32768 AND 32767.

Cause: The CARD parameter is not an integer. For example, the command was entered as:

```
DTCCNTRL DTC=DTC.ITG.HP;CARD=A;FUNC=STOPBOTH
```

Action: Reenter the command with a valid DTC card number. For a DTC 16, the card number must be 2. For a DTC 48, the card number must be between 1 and 5.

CIERR 10007

THIS IS NOT A VALID KEYWORD FOR THIS COMMAND. (CIERR 10007) PARAMETERS DO NOT MATCH USER COMMAND DEFINITION. (CIERR 2039)

Cause: An undefined parameter was entered. For example, the command was entered as:

```
DTCCNTRL BTC=DTC.ITG.HP;CARD=4;FUNC=STOPBOTH
```

Action: Reenter the command using valid DTCCNTRL parameters.

CIERR 10015

THE DTC PARAMETER IS REQUIRED. (CIERR 10015) PARAMETERS DO NOT MATCH USER COMMAND DEFINITION. (CIERR 2039)

Cause: The DTC parameter was missing when the DTCCNTRL command was entered. For example, the command was entered as:

```
DTCCNTRL CARD=4;FUNC=STARTX25
```

Action: Reenter the command specifying a valid, configured DTC name in the DTC parameter. For example:

```
DTCCNTRL DTC=DTC.ITG.HP;CARD=4;FUNC=STARTX25.
```

CIERR 10015

THE FUNC PARAMETER IS REQUIRED. (CIERR 10015) PARAMETERS DO NOT MATCH USER COMMAND DEFINITION. (CIERR 2039)

Cause: The FUNC parameter was missing when the DTCCNTRL command was entered. For example, the command was entered as:

```
DTCCNTRL DTC=DTC.ITG.HP;CARD=4
```

Action: Reenter the command specifying a valid function in the FUNC parameter. For example:

```
DTCCNTRL DTC=DTC.ITG.HP;CARD=4;FUNC=STARTX25
```

Valid functions are STARTX25, STARTPADSUP, STARTBOTH, RC, STOPX25, STOPPADSUP, STOPBOTH, and STATUS.

CIERR 10051

ENCOUNTERED AN UNEXPECTED END-OF-LINE. (CIERR 10051) PARAMETERS DO NOT MATCH USER COMMAND DEFINITION. (CIERR 2039)

Cause: More parameters were entered than are defined by the DTCCNTRL command. For example, the command was entered as:

```
DTCCNTRL DTC=DTC . ITG . HP ; CARD=4 ; FUNC=RC ; FORCED=Y ; RECONF=ALL ; A=4
```

Action: Reenter the command without the invalid parameter. For example:

```
DTCCNTRL DTC=DTC . ITG . HP ; CARD=4 ; FUNC=RC ; FORCED=Y ; RECONF=ALL
```

CTLERR 01 Failed to open the catalog file DTCCAT.PUB.SYS.

Cause: The catalog file does not exist or could not be opened at the time the command was executed.

Action: If the catalog file is missing or has been corrupted, try to restore DTCCAT.PUB.SYS from the system backup. If this is not successful, contact your Hewlett-Packard support representative.

CTLERR 02 Operator capability required to issue this command.

Cause: A user without the proper capabilities attempted to issue a DTCCNTRL command. OP capability is required.

Action: Obtain the required capabilities and reissue the command.

CTLERR 03 Invalid function specified in FUNC.

Cause: The FUNC parameter was not a valid DTCCNTRL function.

Action: Reenter the command specifying a valid function in the FUNC parameter. For example:

```
DTCCNTRL DTC=DTC . ITG . HP ; CARD=4 ; FUNC=STARTX25
```

Valid functions are STARTX25, STARTPADSUP, STARTBOTH, RC, STOPX25, STOPPADSUP, STOPBOTH, and STATUS.

CTLERR 04 System is not Host-Based X.25.

Cause: The DTCCNTRL command was issued on a system that is not configured as a host-based X.25 system (either the system is PC-based or it is host-based but is not configured for X.25 connections).

Action: None. If attempting to control X.25 operation on a PC-based system, refer to the documentation for PC-based networks.

CTLERR 05 Missing parameter: CARD not specified.

Cause: The DTCCNTRL command was issued with a FUNC parameter that requires a card number, but no CARD parameter was specified. The STARTX25, STARTPADSUP, STARTBOTH, RC, STOPX25, STOPPADSUP, and STOPBOTH functions all require the CARD parameter. CARD is optional only for the STATUS function.

Action: Reissue the command with the correct card number specified in the CARD parameter.

CTLERR 06 This DTC doesn't contain X25 cards.

Cause: A DTCCNTRL command was issued specifying the DTC name of a DTC that does not contain any X.25 iX Network Access cards.

Action: Obtain the correct DTC name for the DTC containing the X.25 iX Network Access card and reenter the command using the correct DTC specification.

CTLERR 07 DTC not accessible. Use FORCED option.

Cause: The DTCNTRL command was issued at a time when another user had exclusive access to the DTC (for example, TermDSM was running).

Action: Either reissue the DTCNTRL command using the FORCED option to force access to the DTC or wait until the DTC is no longer being exclusively accessed.

CTLERR 08 Non-existing DTC.

Cause: A DTCNTRL command was issued for a DTC that is not configured for the host system.

Action: Reissue the command with a correct DTC name specified in the DTC parameter.

CTLERR 09 Invalid card number.

Cause: A DTCNTRL command was issued with an out-of-range card number specified in the CARD parameter.

Action: Reenter the command with a valid DTC card number. For a DTC 16, the card number must be 2. For a DTC 48, the card number must be between 1 and 5.

CTLERR 10 Stop PAD first.

Cause: An attempt was made to stop X.25 services prior to PAD services being stopped. PAD services must be stopped first.

Action: Issue a DTCNTRL command with a function of STOPBOTH to stop both X.25 and PAD services.

Or

Issue a DTCNTRL command with a function of STOPPADSUP, followed by a second DTCNTRL command with a function of STOPX25.

CTLERR 11 PAD switching list download failed.

Cause: An attempt was made to reconfigure PAD switching list values using the RC function of DTCNTRL. A problem occurred with the DTC while the PAD support values were being downloaded.

Action: Check the DTC. Correct any problems then reenter the DTCNTRL command with FUNC=RC to download the reconfigured PAD switching list values.

CTLERR 12 PAD incoming security download failed.

Cause: An attempt was made to reconfigure incoming PAD security values for the DTC using the RC function of DTCNTRL. A problem occurred with the DTC while the new configuration values were being downloaded.

Action: Check the DTC. Correct any problems then reenter the DTCNTRL command with FUNC=RC to download the reconfigured incoming PAD security values.

CTLERR 13 PAD access download failed.

Cause: An attempt was made to reconfigure PAD access using the RC function of DTCNTRL. A problem occurred with the DTC while PAD access values were being downloaded.

Action: Check the DTC. Correct any problems then reenter the DTCNTRL command with FUNC=RC to download the reconfigured PAD access values.

CTLERR 14 DTC Global Data configuration download failed.

Cause: An attempt was made to reconfigure global data values for the DTC using the RC function of DTCCNTRL. A problem occurred with the DTC while the new configuration values were being downloaded.

Action: Check the DTC. Correct any problems then reenter the DTCCNTRL command with FUNC=RC to download the reconfigured global data values.

CTLERR 15 Global physical security download failed.

Cause: An attempt was made to reconfigure the PAD access password for the DTC using the RC function of DTCCNTRL. A problem occurred with the DTC while the new configuration values were being downloaded.

Action: Check the DTC. Correct any problems then reenter the DTCCNTRL command with FUNC=RC to download the reconfigured PAD access password.

CTLERR 16 SYS-TO-SYS switching download failed.

Cause: An attempt was made to reconfigure the system-to-system switching information (X.25 link name or number of switched virtual circuits) for the DTC using the RC function of DTCCNTRL. A problem occurred with the DTC while the new configuration values were being downloaded.

Action: Check the DTC. Correct any problems then reenter the DTCCNTRL command with FUNC=RC to download the reconfigured system-to-system switching information.

CTLERR 17 LUG download failed.

Cause: An attempt was made to reconfigure local user group (LUG) information (remote X.25 address or security level) for the DTC using the RC function of DTCCNTRL. A problem occurred with the DTC while the new configuration values were being downloaded.

Action: Check the DTC. Correct any problems then reenter the DTCCNTRL command with FUNC=RC to download the reconfigured local user group information.

CTLERR 18 Start X25 first.

Cause: An attempt was made to start PAD support or to download card-specific X.25 configuration values but X.25 support is not active.

Action: Start X.25 support using the STARTX25 function of DTCCNTRL then retry the operation. (To start both X.25 and PAD support, use the STARTBOTH function.)

CTLERR 19 X25 download failed.

Cause: An attempt was made to start X.25 support. A problem occurred with the DTC while the X.25 support values were being downloaded.

Action: Check the DTC. Correct any problems then re-download. Reenter the command to start X.25 support.

CTLERR 20 The specified card is not an X.25 card.

Cause: The card specified in the DTCCNTRL command is not an X.25 iX Network Access card.

Action: Obtain the correct card number for the X.25 iX Network Access card and reenter the command using the correct card number specification.

CTLERR 21 Invalid RECONF specification. Must be All, X25, Card, Pass, or Logcl.

Cause: A DTCCNTRL command was entered using the RC function but an invalid option was specified in the RECONF parameter.

Action: Reenter the command with a valid RECONF specification. Valid values are ALL, X25, CARD, PASS, and LOGCL.

CTLERR 22 Invalid specification for FORCED parameter. Must be y or n.

Cause: A DTCNTRL command was entered using the FORCED option but an invalid value was specified in the FORCED parameter.

Action: Reenter the command with a valid FORCED specification. Valid values are Y for “yes” and N for “no”.

CTLERR 23 PAD download failed.

Cause: An attempt was made to start PAD support. A problem occurred with the DTC while the PAD support values were being downloaded.

Action: Check the DTC. Correct any problems then re-download. Reenter the command to start PAD support.

CTLERR 24 X25 could not be stopped.

Cause: The DTC failed while X.25 support was being deactivated.

Action: Correct any problems with the DTC or its system connection then reenter the command to stop X.25 support.

CTLERR 25 PAD could not be stopped.

Cause: The DTC failed while PAD support was being deactivated.

Action: Correct any problems with the DTC or its system connection then reenter the command to stop PAD support.

CTLERR 26 Start PAD first.

Cause: An attempt was made to download card-specific PAD configuration values but PAD support is not active.

Action: Start PAD support using the STARTPAD function of DTCNTRL then retry the operation.

CTLERR 27 Start X25 and PAD first.

Cause: An attempt was made to download card-specific configuration values but X.25 and PAD support were not active.

Action: Start X.25 and PAD support using the STARTBOTH function of DTCNTRL then retry the operation.

CTLERR 100 System error: failed to create a port for DTCPROG, info = !, su b sys=!

Cause: Internal error.

Action: Contact your Hewlett-Packard support representative.

CTLERR 101 System error: NDM nm_find_port error, err_num = !, proc_num = !.

Cause: Internal error.

Action: Contact your Hewlett-Packard support representative.

CTLERR 102 System error: NDM get_sysbase error, err_num = !, proc_num = !.

Cause: Internal error.

Action: Contact your Hewlett-Packard support representative.

- CTLERR 103** **System error: bad status received from io_info_list, err_num = !, proc_num = !.**
Cause: Internal error.
Action: Contact your Hewlett-Packard support representative.
- CTLERR 104** **System error: bad NDM port number returned.**
Cause: Internal error.
Action: Contact your Hewlett-Packard support representative.
- CTLERR 105** **System error : bad Send_msg status received, info = !, subsys = !.**
Cause: Internal error.
Action: Contact your Hewlett-Packard support representative.
- CTLERR 106** **System error: bad Extend_receive status received, info = !, subsys = !.**
Cause: Internal error.
Action: Contact your Hewlett-Packard support representative.
- CTLERR 107** **System error: bad reply received.**
Cause: Internal error.
Action: Contact your Hewlett-Packard support representative.
- CTLERR 108** **System error : bad error number returned by DTCM.**
Cause: Internal error.
Action: Contact your Hewlett-Packard support representative.
- CTLWARN 01** **PAD already stopped.**
Cause: A DTCCNTRL command was entered to stop PAD support but PAD support was not active.
Action: No action required. This message is for information only.
- CTLWARN 02** **PAD already started.**
Cause: A DTCCNTRL command was entered to stop PAD support but PAD support was already active.
Action: No action required. This message is for information only.
- CTLWARN 03** **X25 already started.**
Cause: A DTCCNTRL command was entered to start X.25 support but X.25 support was already active.
Action: No action required. This message is for information only.
- CTLWARN 04** **X25 already stopped.**
Cause: A DTCCNTRL command was entered to stop X.25 support but X.25 support was not active.
Action: No action required. This message is for information only.
FUNC specification is not RC, no configuration will be done.
- CTLWARN 05** Cause: A DTCCNTRL command was issued with the RECONF option specified but the function was not RC.

Action: To cause reconfigured values to be downloaded, issue a `DTCNTRL` command using the `RC` function. If no reconfigured values are to be downloaded, no action is required.

Host Migration Tool Status Messages

The following message will be displayed if the migration was successful. If you see any other error messages the migration was not successful. Go to the manual *Using the Node Management Services (NMS) Utilities* for more detailed descriptions and actions to take to fix them.

```
CONVERSION completed successfully. (NMMGRVERMSG 0)
```

When the Host Migration tool is run, the tool may find configuration discrepancies that it can't resolve. You must correct these discrepancies before the configuration will successfully validate. If the Host Migration tool finds any configuration discrepancies, then you will see the following message:

```
Migration process found configuration discrepancies (NMMGRVERWARN 50)
```

You can either correct the configuration in the Host-Based configuration or modify the configuration in the PC-based tree and rerun the tool.

If you see this message, the Host migration tool will have also generated one or more of the following messages. Take the action specified to correct the configuration so that the configuration file will successfully validate.

MSG 150

The Host-Based DTC type does not match the PC-Based DTC type for DTC <DTC node name>

Cause: The DTC type configured in the Host-Based DTC does not match the DTC type in the PC-Based DTC. The DTC in the PC-Based configuration will not be merged into the Host-based configuration. If the DTC in the Host-based configuration was migrated from the OVDTCMGR, then the TIO devices will be assigned ldev of (-1) and any PAD devices will be assigned ldev of (1). These are invalid ldev numbers for TIO printers and PAD devices and errors will be detected by Validation.

```
DTCCTRL DTC=DTC.ITG.HP;CARD=A;FUNC=STOPBOTH
```

Action: You can take either of the following actions:

- Run NMMGR to examine and enter the correct ldevs in the configuration for all cards in this DTC in the Host-based configuration.
- Change the configuration of the DTC in the PC-based configuration to the correct type and with the cards and port type configuration that matches the DTC in the Host-based configuration. Then run the Host Migration tool with the command `NMMGRVER;parm=77`.

MSG 151

Host Based cardtype does not match the PC-Based cardtype in DTC <DTCname>, for card <x>.

Cause: The card type configured in the Host-Based DTC does not match the card type in the PC-Based DTC. The card will not be merged into the Host-based tree. The Host-Based DTC configuration for DTC <dtcname> card <x> may have device configurations that are invalid for Host-Based management. If the DTC in the Host-based configuration was migrated from the OVDTCMGR, then the TIO devices will be assigned ldev of (-1) and any PAD devices will be assigned ldev of (1). These are invalid ldev numbers for TIO printers and PAD devices and errors will be detected by Validation.

Action: Run NMMGR to examine and enter the correct ldevs in the configuration for specified card in the DTC with the listed DTC Name in the Host-based configuration.

- MSG 152** **Cannot copy DTC <DTCname> from PC-Based to Host based. Duplicate DTC name.**
- Cause: The Host Migration tool found a DTC in the Host-Based tree that has the same DTC name as the DTC in the PC-Based tree, but with a different DTC Node Name. The DTC node name of the DTC in the PC-based configuration was not found in the Host-based configuration so the Host migration tool was attempting to create a non-managed DTC in the Host-based configuration.
- Action: Run NMMGR and rename the DTC in the Host-based tree to a different name and re-run the Host Migration tool with the command: NMMGRVER;parm=77.
- MSG 153** **Host Based device type does not match PC-Based device type in DTC <DTCname>, card x for port yy**
- Cause: The port type of the TIO devices in the Host-based configuration does not match the port type of the TIO device in the PC based configuration, i.e., terminal/printer/host type. The TIO device will be assigned ldev of (-1).
- Action: Run NMMGR to examine and enter the correct ldev in the configuration for specified port in the DTC with the listed DTC Name in the Host-based configuration.
- MSG 154** **No ldev was found for printer in <dtcname>, card x or Port yy**
- Cause: The Host Migration tool found a printer device in the Host-based configuration but the corresponding port doesn't have an ldev assigned in the PC-Based configuration. The printer port will be assigned ldev of (-1). This is an invalid ldev number for TIO printers and will be detected by Validation.
- Action: Run NMMGR and change the printer ldev to a valid ldev number in the Host-based configuration.
- MSG 155** **No ldev was found for PAD device name <PAD name> in DTC <dtcname>, card x.**
- Cause: A PAD device with the displayed name is defined on a X.25 card in the PC-Based DTC configuration that is not defined in the Host-Based DTC, the PAD device in the Host-Based configuration will be assigned ldev of (1). This is an invalid ldev numbers for PAD devices and an error will be detected by Validation.
- Action: Run NMMGR and change the PAD device ldev to a valid ldev number in the Host Based tree.
- MSG 157** **No PAD device name was found for ldev xxx on DTC <dtcname>, card x.**
- Cause: A PAD device was configured on the PC-Based DTC that was not configured on the matching DTC in the Host-Based configuration. The ldev will be copied to the Host-based DTC but the PAD device will not have a valid X.25 address assigned. The invalid X.25 address will be detected by Validation
- Action: Run NMMGR and assign a valid X.25 address to the device or delete the device.
- MSG 158** **Host Based Device type does not match PC-Based device type in DTC <DTCName>, card x for PAD name <PADName>.**
- Cause: The type of the PAD devices with the displayed PAD Name in the Host-based configuration does not match the type of the PAD device in the PC based configuration, i.e., padterm/padprint type. The PAD devices will be assigned ldev of (1). This is an invalid ldev numbers for PAD devices and an error will be detected by Validation.
- Action: Run NMMGR to examine and enter the correct ldev in the configuration for specified PAD device in the DTC with the listed DTC Name in the Host-based configuration.

MSG 159

No DTC was found in the PC-Based tree with the matching DTC node name <DTC node name>.

Cause: The Host Migration tool found a DTC with the displayed DTC Node Name in the Host-based configuration that does not exist in the PC-Based configuration. If the DTC in the Host-based configuration was migrated from the `OVDTCMGR`, then the TIO devices will be assigned ldev of (-1) and any PAD devices will be assigned ldev of (1). These are invalid ldev numbers for TIO printers and PAD devices and errors will be detected by Validation.

Action: Run `NMMGR` to examine and enter the correct ldevs in the configuration for all cards in the DTC with the displayed DTC Node Name in the Host-based configuration.

Error Messages

Host Migration Tool Status Messages

Glossary

access port A special interface card in the system cabinet through which the system console is connected.

address A numerical identifier defined and used by a particular protocol and associated software to distinguish one node from another.

address key *See* **X.25 address key**.

address resolution In NS networks, the mapping of node names to IP addresses and the mapping of IP addresses to subnet addresses.

address resolution protocol ARP. A protocol used by LAN links with Ethernet enabled that provides a means of exchanging addressing information between Ethernet nodes.

adjacent A node on a point-to-point network that is connected to another node by a single link with no intervening nodes.

ARPA Advanced Research Projects Agency. It is the former name of the Defense Advanced Research Project Agency (DARPA). The Internet suite of protocols was developed under ARPA guidance.

ARPA Telnet Access An HP product which is a board that can be installed in a DTC 48 and DTC 72MX. The Telnet Access board performs protocol translation. Calls to the IP address of an MPE/iX system are detected by the Telnet Access board and are retransmitted on the LAN using AFCP, allowing connections from terminals on ARPA systems to HP 3000s.

APRA Telnet Express An HP product which is a standalone hardware platform dedicated to performing protocol translation. Calls to the IP address of an MPE/iX system are detected by the Telnet Express and are retransmitted on the LAN using AFCP, allowing connections from terminals on ARPA systems to HP 3000s.

ARPANET The (Advanced Research Projects Agency) computer network.

ASCII American National Standard Code for Information Interchange. A character set using 7-bit code used for information interchange among data processing and data communications systems. The American implementation of International Alphabet No. 5.

asynchronous Term used to describe a device's mode of operation whereby a sequence of operations are executed irrespective of time coincidence with any event. Devices that are directly accessible by people (for example, terminal keyboards) operate in this manner.

asynchronous processor board The new 24-port mux board for the DTC 72MX. Allows up to 24 direct and modem connections per board. A DTC 72MX can have up to 3 asynchronous processor boards (for a total of 72 connections).

attachment unit interface The cable that runs between each node (host, DTC, or other device) and the Medium Attachment Unit (MAU) that connects it to the LAN in a ThickLAN configuration.

AUI *See* **attachment unit interface**.

autodial A dial link in which the remote node's telephone number is automatically dialed by a modem or other device with this capability.

automatic configuration The addition and configuration of a host-based managed DTC to the HP 3000 system without needing to specify detailed configuration information such as DTC cards/boards and ldevs.

backbone LAN A thick LAN cable conforming to the IEEE 802.3 Type 10 BASE 5 standard.

back-to-back configuration A DTC configuration whereby MPE users connected to one DTC can communicate with a non-MPE/iX system connected to another DTC via the LAN. (*See also* **Local Switching**)

backup configuration file A file that contains a copy of the information contained in the configuration file. The backup file, called `NMCBACK.group.account` by default, is updated each time the configuration file is successfully validated.

banner A welcome message displayed on your screen. On the local OpenView workstation a banner appears when a remote connection is established with the OpenView DTC Manager. A banner also can appear when you log on to MPE.

baud Measure of the speed at which information travels between devices, most commonly used in reference to terminal speed settings. Baud represents signal events per second. When one bit represents each signal change, baud is the same as “bits per second”.

binary mode Data transfer scheme in which no special character processing is performed. All characters are considered to be data and are passed through with no control actions being taken.

bit Binary digit. A unit of information that designates one of two possible states, which are represented by either 1 or 0.

block mode Terminal processing mode in which groups, or “blocks,” of data are transmitted all at once.

BNC T-Connector Connector used to connect a computer or a component such as a DTC to the LAN in a ThinLAN configuration.

boundary *See* **network boundary**.

bps Bits per second. The number of bits passing a point per second.

broadcast Communication method of sending a message to all devices on a link simultaneously.

byte A sequence of eight consecutive bits operated on as a unit.

call In X.25, a call is an attempt to set up communication between two DTEs using a virtual circuit. Also known as a virtual call.

call collision A conflict that occurs at a DTE/DCE interface when there is a simultaneous attempt by the DTE and DCE to set up a call using the same logical channel identifier.

called address When a node sends out a call request packet, the packet contains the address of the destination node. The address of the destination node is the called address.

calling address When a node receives an incoming call packet, the packet contains the address of the sending node. The address of the sending node is the calling address.

carrier A continuous wave that is modulated by an information bearing signal.

catenet *See* **internetwork**.

CCITT Consultative Committee for International Telephony and Telegraphy. An international organization of communication carriers, especially government telephone monopolies, responsible for developing telecommunication standards by making recommendations. No carrier is *required* to adhere to a CCITT recommendation, although most do so in their own interest.

CIB The channel input/output bus in the backplane of an HP 3000.

circuit-switching network A type of data communications network wherein a physical and exclusive link is maintained between two communicating devices for the call duration. An all-digital, circuit-switching network is often referred to as an X.21 network.

closed user group An X.25 user facility that allows communication to and from a pre-specified group of users and no one else.

compatibility mode Processing mode on HP 3000 Series 900 computers that allows applications written for MPE V/E-based systems to be ported and run without changes or recompilation.

computer network A group of computer systems connected in such a way that they can exchange information and share resources.

configuration 1) The way in which computer equipment is physically interconnected and set up to operate as a system.

2) The layout of the computer system, including the MPE table, memory, and buffer sizes, that tells which peripheral devices are (or can be) connected to the computer and how they can be accessed.

3) The process of defining the characteristics of a network in software. For MPE/iX-based computers, the operating systems are configured through use of the SYSGEN utility. Next, the datacommunications and terminal subsystem (DTS) link is configured by using NMMGR (running on the host) and may, in addition, be configured using the OpenView DTC Manager software (running on the OpenView

Windows Workstation) depending on the type of network management you use. If any of the NS link products are installed on the system, network configuration is accomplished through use of NMMGR and, if PC-based X.25 connections are required, through the OpenView DTC Manager.

configuration file The configuration file, which you create and update using the NMMGR utility, contains:

- 1) the information that the network needs in order to operate.
- 2) Information necessary for link-level and NetIPC logging.
- 3) Information required to connect terminals and printers to the system through one or more DTC.

The only file name that the system recognizes as the configuration file is NMCONFIG.PUB.SYS.

control-X echo Three exclamation marks (!!!) output to the terminal screen when the cancel character (normally [CTRL]-X) is entered.

control-Y trap User-written procedure to which control is passed when the subsystem break character (normally [CTRL]-Y) is entered during execution of a program with subsystem break enabled.

cross-validate The process of assuring that information contained in two locations is consistent where it is imperative that it be consistent. For example, an automatic cross-validation occurs when you enter SYSGEN to assure that information contained in NMCONFIG.PUB.SYS agrees with system configuration data.

CSMA/CD Carrier Sense Multiple Access with Collision Detect, transmission access method used by the IEEE 802.3 LAN standard.

CSN See **circuit-switching network**.

CTB The cache transfer bus in the backplane of an HP 3000.

CUG See **closed user group**.

data Basic elements of information that can be processed or produced by a computer.

Datacommunications and Terminal Controller

See **DTC**.

data overrun Transmitted data that is sent faster than the equipment on the receiving end is capable of receiving it. The resulting overflow data is lost.

See also **flow control**.

Datapac The national public PSN of Canada.

Datex-P The national public PSN of West Germany.

D bit Delivery confirmation bit. Used in the X.25 protocol, the setting of the D bit in DATA packets indicates whether delivery acknowledgment of the packet is required from the local DCE or from the remote DTE. It therefore allows the choice between local and end-to-end acknowledgment.

DCE Data circuit-terminating equipment. The interfacing equipment required in order to interface to data terminal equipment (DTE) and its transmission circuit. Synonyms: data communications equipment, dataset.

DDX The national public PSN of Japan.

dedicated printer A printer that can be used by only one host on the LAN; the one specified in the Destination Node Name in that printer's configuration screen.

default gateway One (and only one) gateway accessible by a system may be designated as a default gateway. The network will then send any transmitted messages for which it is unable to locate a destination through normal means to the default gateway in a final effort to determine a transmission route.

demodulation The process by which the information-bearing signal is retrieved from a modulated carrier wave. The inverse of modulation.

destination node name In DTS configuration, it is either 1) the name of a host that a user can be connected to by default (if switching is not enabled for that user, or if automatic modem connection is enabled), or 2) the name of the only host that can access a dedicated printer.

device class A collection of devices that have some user-defined relation. Device classes are assigned through use of the NMMGR configuration utility.

device-dependent characteristic A file specification for which modifications are restricted because of the type of device on which the file is opened. For example, data directed to terminals must have a blocking factor of one.

device driver Software module that controls a specific type of input/output device including NS 3000/iX links.

device file A file being input to or output from any peripheral device except a disk. MPE allows operations to be performed on the device itself as if it were a file.

device independence A characteristic of the operating system that allows users to selectively redirect input/output from a program, session, or job without regard to the nature of the device.

device name *See* **PAD name**.

Dial ID protocol A proprietary Hewlett-Packard protocol that provides security checking and address exchange for dial links.

dial link A connection made through public telephone lines.

direct-connect device Asynchronous device that is connected directly to a DTC through an RS-232-C or RS-422 cable, with no intervening communications equipment. Also referred to as a "local connection."

direct connection A leased line, private line, or other non-switched link in a network.

direct dial A dial link through which only one remote node can be reached.

direct-path branching The process of directly accessing any screen in NMMGR by entering path names in the Command: field. The path name must be preceded by an at sign (@).

domain name A name designated for a system in ARPANET standard format. This name can be used by other nodes on the network to access the host for which it is configured.

download The process of loading operating code and configuration files into the DTC's memory. The DTC is downloaded by the host computer for LANs using host-based network management, and by the PC for DTCs managed by the OpenView DTC Manager.

driver *See* **device driver**.

DTC Datacommunications and Terminal Controller. The DTC is a hardware device, configured as a node on a LAN, that enables asynchronous devices to access HP 3000 Series 900 computers. Terminals can either be directly connected to the DTC, or they can be remotely connected through a Packet Assembler Disassembler (PAD). The DTC can be configured with DTC/X.25 Network Access cards and DTC/X.25 Network Access software. A DTC/X.25 iX Network Link consists of two software modules: the X.25 iX System Access software (running on the host) and the DTC/X.25 Network Access software (running on the DTC).

DTCCTRL A command file you can use to manage DTS configurations. Using DTCCTRL, you can dynamically implement DTS changes, automatically add a new DTC, shutdown/restart DTS, and manage/dynamically configure host-based X.25 connections.

DTC 16 HP 2340A product. A DTC that provides 2 slots for asynchronous connections with each slot allowing up to 8 direct connections or 6 modem connections, plus an optional X.25 link supporting up to 32 virtual circuits at speeds of up to 19.2 Kbps.

DTC 16iX HP J2062A product. A DTC terminal server for HP 3000 systems. It allows up to 16 asynchronous (direct and modem) LAN connections to HP 3000 systems.

DTC 16MX HP J2063A product. A DTC terminal server for HP 3000 and Telnet systems. It allows up to 16 asynchronous (direct and modem) LAN connections for the HP 3000 environment and for computer systems running ARPA, such as HP 9000s and third party systems. When managed by the HP 3000, the DTC 16MX is configured and functions exactly like a DTC 16iX. The full functionality of the DTC 16MX is only available when it is managed by the OpenView DTC Manager.

DTC 16RX HP J2064A product. A routable communications server that enables up to 16 asynchronous connections for the HP 3000 environment and computer systems running ARPA, such as HP 9000s and third party systems.

DTC 16RX Manager An application program that resides on the HP 9000 host system and enables you to configure and diagnose the HP DTC 16RX Routable Communications Server.

DTC 16TN HP J2060A product. A DTC terminal server for Telnet systems. It allows up to 16 asynchronous connections to computer systems running ARPA, such as HP 9000s and third party systems.

DTC 48 HP 2345B product. A DTC that provides 6 slots for asynchronous connections, X.25 links, or Telnet Access. Each slot allows up to 8 direct connections or 6 modem connections. A DTC 48 may have up to 3 slots used for X.25 links, each supporting up to 256 virtual circuits at speeds of up to 64 Kbps or one Telnet Access card with 40 Telnet connections to HP 3000 Series 900 connections.

DTC 72MX HP J2070A product. A DTC that provides 3 slots allowing up to 72 asynchronous connections. Each slot accommodates up to 24 direct or modem connections. A DTC 72MX may have up to 3 slots used for X.25 links, each supporting up to 256 virtual circuits at speeds of up to 64 Kbps. It may also use one slot for Telnet Access card with 40 Telnet connections to HP 3000 Series 900 computers.

DTC identifier An identifier used only within NMMGR to define the branch of the configuration file containing information about a particular DTC. The identifier must begin with a letter and can be up to eight characters long.

DTC Manager See **OpenView DTC Manager**.

DTC node name Unique name used to identify a DTC on the LAN. Node name format is *nodename.domain.organization*, with each of the three parts having up to 16 characters and beginning with either a letter or a digit.

DTC station address (802.3 address) 12-digit hexadecimal number used to identify the DTC as a node belonging to the network configuration. Also called the LAN address.

DTC switching A facility enabling terminal users to select any host system that they want to connect to. DTC switching is available only when the OpenView DTC Manager is used for network management.

DTC/X.25 Network Access The X.25 software that resides on the Datacommunications and Terminal Controller (DTC). To configure access to an X.25 network, you must configure two software components: the X.25 iX System Access (residing on the HP 3000 host), and the DTC/X.25 Network Access. DTC/X.25 Network Access is configured through use of the OpenView DT CManager software for systems using PC-based network management or through NMMGR for systems using host-based network management.

DTC/X.25 Network Access card This is the hardware card and channel adapter that provides X.25 Network Access. It resides in the Datacommunications and Terminal Controller (DTC).

DTC/X.25 iX Network Link Software and hardware that provides access to private and public X.25 networks. The X.25 iX System Access software resides on an HP 3000 host and is configured through use of NMMGR.

DTE Data Terminal Equipment. Equipment that converts user information into data-transmission signals or reconverts received data signals into user information. Data terminal equipment operates in conjunction with data circuit-terminating equipment.

DTS Datacommunications and Terminal Subsystem. This consists of all the Datacommunications and Terminal Controllers (DTCs) on a LAN, their LANIC cards (attached to the host), the LAN cable, and the host and DTC software that controls all related DTS hardware.

DTS restart The startup of the DTS subsystem, including the release of all TIO-related resources, using the DTCCNTRL command file.

DTS shutdown The shutdown of the DTS subsystem, including the release of all TIO-related resources, using the DTCCNTRL command file.

duplex Transmission method that allows two-way communication. If both ends of the transmission link can transmit simultaneously, it is called full duplex. If only one end can transmit at a time, it is half-duplex transmission.

dynamic configuration The ability to make DTS configuration changes using NMMGR without rebooting the HP 3000 system.

entry priority The ranking that identifies the most desirable route used to reach a given remote node from a given local node in a point-to-point network.

environment A session that is established on a remote node.

escape from data transfer character A character that allows a user who is connected to a host system through the DTC to break that connection and return to the DTC switching user interface. The default is **[CTRL]-K**. This character is used only on networks managed by the OpenView Windows Workstation.

escape sequence A sequence of characters beginning with the escape character and followed by one or more other characters, used to convey control directives to printers, plotters, or terminals.

Ethernet A Local Area Network system that uses baseband transmission at 10 Mbps over coaxial cable. Ethernet is a trademark of Xerox Corporation.

event log One of three circular files stored on the OpenView workstation containing lists of all significant events reported by the DTCs for which it is the owner; that is, whose operating software/configuration it has downloaded.

extended packet sequence numbering One of the optional network subscribed facilities that provides packet sequence numbering using modulo 128. If not subscribed, modulo 8 is used.

facility An optional service offered by a packet switching network's administration and requested by the user either at the time of subscription for network access or at the time a call is made. Also known as user facility.

facility set A facility set defines the various X.25 connection parameters and X.25 facilities that can be negotiated for each virtual circuit on a per-call basis.

fast select An optional packet-switching network facility by which user data may be transmitted as part of the control packets that establish and clear a virtual connection.

FCS Frame Check Sequence. A sequence of bits generated by X.25 at level 2 that forms part of the frame and guarantees the integrity of its frame's content. The FCS is also used by the IEEE 802.3 protocol to check the validity of frames.

file equation Assignment statement used to associate a file with a specific device or type of device during execution of a program.

file number Unique number associated with a file when the file is opened. The file number is returned in the FOPEN or HPFOPEN call used to open the file. It can be used to access that file until the file is closed.

file specification The name and location of a file. The full specification for a file includes the file name, group, and account.

file system The part of the operating system that handles access to input/output devices (including those connected through the DTC), data blocking, buffering, data transfers, and deblocking.

flow control A means of regulating the rate at which data transfer takes place between devices to protect against data overruns.

flow control negotiation One of the network subscribed facilities, selected at subscription time. This facility allows the flow control parameter to be negotiated at call set-up time, as opposed to having a predefined value.

formal file designator Name that can be used programmatically or in a file equation to refer to a file.

FOS Fundamental Operating System. The programs, utilities, and subsystems supplied on the master installation tape that form the basic core of the operating system.

full gateway A full gateway is a node that belongs to more than one network and has one IP address for each network. It uses store and forward to transfer packets between each network that it belongs to.

gateway A node that connects two dissimilar network architectures. A gateway can be either a single node (full gateway) or two gateway halves.

gateway half A node that works in conjunction with another node on another network to form an internetwork. The only protocol used by gateway halves is the NS Point-to-Point 3000/iX Link. *See also full gateway.*

gateway-half link A link between the two nodes of a gateway-half pair. Each of the two nodes of a gateway-half pair has a configured link (hardware interface card) that is used for the gateway half network interface. The NS Point-to-Point 3000/iX Link is the only link that can be used as a gateway-half link.

gateway-half pair A set of two nodes that are joined by a gateway-half link. Each node in the pair must have a gateway-half network interface configured, using the link.

guided configuration A method of configuring a node in which a subset of the complete NMMGR interface is presented and defaults of configurable values are used automatically.

handshaking A communications protocol between devices or between a device and the CPU. Provides a method of determining that each end of a communications link is ready to transmit or receive data and that transmission has occurred without error.

hardware handshake Uses modem signals CTS and RTS to pace the data transfer from the DTC to the attached device. (For DTC 16iX/MX/RX and DTC 72MX only.)

hop count *See internet hop count and intranet hop count*

host-based network management Method of managing asynchronous communications for HP 3000 Series 900 computers. All of the control software is configured on a single host and is downloaded to the DTCs that are managed by that host. With host-based management, there is a

permanent relationship between each DTC and the host, and terminal users can access only the single system that owns the DTC their terminal is connected to.

host-based X.25 The management of X.25 network connections from a host computer. Host-based X.25 network connections are made through a DTC Network Access card installed in a DTC managed by the host. All configuration is accomplished using the NMMGR utility. It is not necessary for a PC to be part of the LAN when you are using host-based X.25.

host computer The primary or controlling computer on a network. The computer on which the network control software resides. For HP purposes, it may also be used to distinguish the HP 3000 Series 900 system (host) from the DTC.

HP ARPA Telnet Express A DTC dedicated to providing protocol conversion between Telnet on TCP/IP and AFCP to allow incoming calls from the ARPA environment to HP 3000 systems.

HP block mode Block mode transmission method employed by HP computers where the system controls the block mode handshake. When HP block mode is used, the user program need not concern itself with data transfer protocol.

HP PPN Hewlett-Packard Private Packet Network. Hewlett-Packard's own packet-switching X.25 network, which gives users full control over the administration and security of their data communications.

HP TS8 A terminal server that can support up to eight asynchronous serial connections. When used in back-to-back configuration, users can access HP 3000 MPE/V systems on it via a DTC.

idle device timeout Timeout defined by the Configure: CPU command. When the timer lapses, a device connected to the DTC user interface that is still inactive will be disconnected.

IEEE 802.3 A standard for a broadcast local area network published by the Institute for Electrical and Electronics Engineers (IEEE). This standard is used for both the ThinLAN and ThickLAN implementations of the LAN.

IEEE 802.3 multicast address A hexadecimal number that identifies a set of nodes. This address is used for multicast delivery.

IEEE 802.3 nodal address A unique hexadecimal number that identifies a node on an IEEE 802.3 LAN.

IEEE 802.5 A standard for a token ring network published by the Institute for Electrical and Electronics Engineers (IEEE). This standard is used for the Token Ring 3000/iX Network Link.

initialization string A sequence of control characters used to initialize a terminal, printer, or plotter when a connection is established from a host on the network.

interactive communications Processing that allows users to enter commands and data at the terminal and receive an immediate response.

internet communication Communication that occurs between networks.

internet hop count The number of full gateways plus the number of gateway-half links that a packet must pass through in moving from source node to destination.

Internet Protocol A protocol used to provide routing between different local networks in an internetwork, as well as among nodes in the same local network. The Internet Protocol corresponds to layer 3, the network layer, of the OSI model. *See also IP address.*

internet routing Internet routing involves all the processes required to route a packet from a node on one network to a destination node on another network.

internetwork Two or more networks joined by gateways, bridges, or routers.

intranet communication Communication that occurs between nodes in a single network.

intranet hop count The number of intermediate nodes that lie between a source and destination node on the same point-to-point network.

intranet routing Intranet routing involves all the processes required to route a packet from one node in a network to another node in the same network.

intrinsic System routine accessible by user programs which provides an interface to operating system resources and functions. Intrinsic routines perform common tasks such as file access and device control.

IP *See Internet Protocol.*

IP address Internet Protocol address. An address used by the Internet Protocol to perform internet routing. A complete IP address comprises a network portion and a node portion. The network portion of the IP address identifies a network, and the node portion identifies a node within the network.

IP subnet mask *See subnet mask.*

ISO International Standards Organization. An international federation of national standards organizations involved in developing international standards, including communication standards.

LAN Local Area Network. A collection of data communication systems sharing a common cable whereby each system can communicate directly with another.

LAN address *See station address.*

LANIC *See Local Area Network Interface Controller.*

LANIC physical path The physical location (slot number) of the LANIC within the SPU.

LANIC self-test A ROM-based program on a LANIC card that tests and reports the status of the LANIC hardware.

LAP Link Access Protocol. The data link protocol specified by older versions (prior to 1980) of X.25 at level 2 but still permitted and therefore usable. All new implementations of X.25 must use LAP-B, and all old implementations must migrate to LAP-B at a future date.

LAP-B Link Access Protocol – Balanced. The data link protocol specified by the 1980 version of X.25 at level 2 that determines the frame exchange procedures. LAP-B must also be used over direct-connect NS Point-to-Point 3000/iX Links.

LCI Logical Channel Identifier. Local value on a network node which identifies the channel used to establish a virtual circuit (SVC or PVC) through an X.25 network.

ldev *See* **logical device number**.

leased line Data-grade telephone line leased directly to a subscriber and allocated specifically for the subscriber's needs.

line speed Speed at which data is transferred over a specific physical link (usually measured in bits or kilobits per second).

link name The name that represents a hardware interface card. The link name can contain as many as eight characters. All characters except the first can be alphanumeric; the first character must be alphabetic.

Local Area Network Interface Controller (LANIC) A hardware card that fits into the backplane of the HP 3000 Series 900 computer and provides a physical layer interface for local area networks.

local connection *See* **direct connection**.

local node The computer that you are configuring or that you are logged on to.

local switching Feature of the DTC which permits back-to-back configuration (for connections to an HP 3000 MPE/V host), using two ports of the same DTC.

local user group A list defined for a particular DTC and card that specifies which *remote* nodes this DTC can send data to and also which *remote* nodes this DTC can receive data from. (*See also* **Closed User Group**).

logging The process of recording the usage of network resources. Events can be logged to both the OpenView workstation and to the MPE host.

logging class A number defining the severity of any given event logged. An operator uses the logging classes to specify which events are to be logged. Class 1 (catastrophic event) is always logged.

logical device number (ldev) A value by which the operating system recognizes a specific device. All DTC devices that are configured as nailed devices

through the NMMGR configuration have ldev numbers permanently assigned. The DTC devices can then be accessed programmatically through use of their ldev number. Non-nailed devices have ldev numbers that are assigned from a pool of available ldev numbers for the life of their connection to a system. You cannot access non-nailed devices programmatically.

log off The termination of a job or session.

log on The process of initiating a job or session.

logon device *See* **session-accepting device**.

loopback The routing of messages from a node back to itself.

LUG *See* **local user group**.

maintenance mode An NMMGR character mode interface used to manage both network directory and configuration files. It can be used interactively, from within the screen mode interface, or as a set of commands entered via a batch job.

map, network A drawing that shows the topology of the network. For networks managed by the OpenView DTC Manager, a network map must be created through use of the OVDRAW capability provided with the management software. A network map is also a hardcopy drawing used when planning a network. It shows network topology, node and network names, addresses, network boundaries (for an internetwork map), and link types.

mapping A set of characteristics that describe a route taken by messages to reach a destination node. This set of characteristics is configured with NMMGR at every node on a point-to-point network. One mapping is configured at each node for every other node on the network to which messages will be sent.

MAU *See* **medium attachment unit**.

M bit More data bit. Setting this bit in a DATA packet indicates that at least one more DATA packet is required to complete a message of contiguous data.

medium attachment unit A device attached to a ThickLAN coaxial cable that provides the physical and electrical connection from the AUI cable to the coaxial cable.

MIB Management Information Base. A database of information about a network node used by SNMP.

MIT Master Installation Tape. Magnetic tape containing the fundamental operating system for a HP 3000 Series 900 computer.

modem Modulator/demodulator. A device that modulates and demodulates signals. Primarily used for modulating digital signals onto carriers for transmission and for performing the inverse function at the receiving end. Modems are essential for transmitting and receiving digital signals over telephone lines.

modulo Value used as the counting cycle for determining the send sequence number (N(S)) of frames sent across an X.25 network.

modulation Process in which certain characteristics of a carrier signal are altered in accordance with the changes of an information-bearing signal.

MPE/iX MultiProgramming Executive/ integrated POSIX. The operating system of HP 3000 Series 900 computers. The NS 3000/iX network services operate in conjunction with the MPE/iX operating system.

multiplexer A device that allows multiple communication links to use a single channel.

nailed device A device with a permanently associated ldev that was assigned through the NMMGR configuration of the host system on which the association is established. Nailed devices can be accessed programmatically through their ldev number. In contrast, non-nailed devices have ldev numbers that are assigned from a pool of available ldev numbers for the life of their connection to a system.

native mode The run-time environment of MPE/iX. In Native Mode, source code has been compiled into the native instruction set of the HP 3000 Series 900 computer.

neighbor gateway A gateway that is in the same network as a given node.

NetIPC Network Interprocess Communication. Software that enables programs to access network transport protocols

network A group of computers connected so that they can exchange information and share resources.

network address This can be either 1) the network portion of an IP address as opposed to the node portion, or 2) when referring to X.25 networks, it is a node's X.25 address.

network boundary The logical division between networks in an internetwork.

network directory A file containing information required for one node to communicate with other nodes in 1) an internetwork, 2) an X.25 network, or 3) a network that contains non-HP nodes. The active network directory on a node must be named NSDIR.NET.SYS.

network interface NI. The collective software that enables data communication between a system and a network. A node possesses one or more network interfaces for each of the networks to which it belongs. Network interface types are LAN, point-to-point (router), X.25, token ring, SNA, loopback, and gateway half. The maximum number of supported NIs is 12, one of which is reserved for loopback.

network management The collective tasks required to design, install, configure, maintain, and if necessary, change a network.

network map A drawing that shows the topology of the network. For networks managed by the OpenView DTC Manager, a network map must be created using the OVDRAW capability provided with the management software. A network map is also a hardcopy drawing used when planning a network. It shows network topology, node and network names, addresses, network boundaries (for an internetwork map), and link types.

Network Services NS. Software application products that can be used to access data, initiate processes, and exchange information among nodes in the network. The NS 3000/iX Network Services include RPM, VT, RFA, RDBA, and NFT.

network subscribed facilities A set of parameters that the user chooses when he subscribes to the X.25 network; they include flow control negotiation, use of D-bit, throughput class negotiation and extended packet sequence numbering.

network transport Software that corresponds to layers 4 and 3 of the OSI network architecture model. The function of this software is to send data out over the appropriate communications link, to receive incoming data, and to route incoming or outgoing data to the appropriate destination node.

NFT Network File Transfer. The network service that transfers disk files between nodes on a network.

NI *See* **network interface**.

NMCBACK.PUB.SYS The default file name for the file that contains a copy of the information contained in the configuration file (NMCONFIG.PUB.SYS). The backup file is updated each time the configuration file is successfully validated.

NMCONFIG.PUB.SYS A file that contains all the network configuration data for the HP 3000 Series 900 computer on which it resides. It includes information about the DTCs that can access the system as well as information about any Network Services (NS) products running on the system. This is the only file name allowed.

NMDUMP Node management services trace/log file analyzer. A utility used to format log and trace files.

NMMAINT Node management services maintenance utility. A utility that lists the software module version numbers for all HP AdvanceNet products, including NS 3000/iX. It detects missing or invalid software modules.

NMMGR Node management services configuration manager. A software subsystem that enables you to configure DTC connectivity and network access parameters for a HP 3000 Series 900 computer.

NMMGRVER Node management services conversion utility. A conversion program that converts configuration files created with NMMGR from an earlier version to the latest format.

NMSAMP1.PUB.SYS Sample configuration file supplied with FOS that can be used as a template for DTS configuration.

node A computer that is part of a network. The DTC is also considered to be a node and has its own address.

node address The node portion of an IP address, which consists of a node portion and a network portion.

Node Management Services Configuration Manager *See* NMMGR.

node name A character string that uniquely identifies each system in a network or internetwork. Each node name in a network or internetwork must be unique; however, a single node can be identified by more than one node name.

node names list List defined on the OpenView workstation and subsequently downloaded to all DTCs for which it is the "owner." The list specifies all the HP 3000 Series 900 hosts on the LAN that are accessible from the DTCs.

non-adjacent Describes a node on an NS Point-to-Point 3000/iX network that is separated from a given node by intervening or intermediate node.

non-nailed device A session accepting device that is not permanently associated with an ldev number at configuration time. When the user at such a device logs on to a HP 3000 Series 900, an ldev is assigned from a pool of ldevs set aside for this purpose at configuration time. The association between a non-nailed device and this temporarily assigned ldev exists only for the duration of the session. One advantage of the use of non-nailed device connections is that configuration is simplified, since it is not required that each non-nailed device be individually configured.

NS 3000/iX A Hewlett-Packard data communication product that provides minicomputers. NS 3000/iX consists of one or more links and network services.

NS 3000/iX Link Software and hardware that provides the connection between nodes on a network. Some of the NS 3000/iX links available are the ThinLAN 3000/iX Link and its ThickLAN option,

the DTC/X.25 iX Network Link, the NS Point-to-Point 3000/iX Link, and the Token Ring 3000/iX Network Link.

NS 3000/iX Network Services Software applications that can be used to access data, initiate processes, and exchange information among nodes in a network. The services are RPM, VT, RFA, RDBA, and NFT.

NS Point-to-Point 3000/iX Link Hardware and software necessary to create networks in which data is transmitted from node to node over a defined route until it reaches its destination. This technique is referred to as store and forward. Systems in a point-to-point network are connected by means of leased or dial-up telephone lines. HP 3000 systems attach to the point-to-point network via HP 3000 Programmable Serial Interface (PSI) cards that fit into the back of each system's SPU.

NSDIR.NET.SYS Name of the active network directory file. *See also* **network directory**.

octet An eight-bit byte operated upon as an entity.

OpenView Admin An OpenView Windows program that enables you to configure how your OpenView Windows applications will function. For example, it enables you to set a default map for the OpenView DTC Manager.

OpenView Draw An OpenView Windows program that enables you to draw the network map, and to label the components on it.

OpenView DTC Manager OpenView Windows application that enables you to configure, control, monitor, and troubleshoot the operation of the Datacommunications and Terminal Subsystems on the LAN.

OpenView Run An OpenView Windows program that covers most of the control features used by the DTC Manager, including monitoring and diagnostic functions.

OpenView Windows The set of three programs: OV Admin, OV Draw and O VRun, running on the OpenView workstation under MS Windows, that acts as the platform for all OpenView applications, such as DTC Manager.

OpenView Windows Workstation The personal computer that provides software downloads to enable operation of the Datacommunications and Terminal Controller (DTC). The configuration software that runs on this workstation is called the OpenView DTC Manager software.

OSI model Open Systems Interconnection model. A model of network architecture devised by the International Standards Organization (ISO). The OSI model defines seven layers of a network architecture, with each layer performing specified functions.

packet A block of data whose maximum length is fixed. The unit of information exchanged by X.25 at level 3. There are DATA packets and various control packets. A packet type is identified by the encoding of its header.

Packet Exchange Protocol PXP. A transport layer protocol used in NS 3000/iX links to initially establish communication between nodes when NetIPC socket registry is used.

packet-switched network name The name of a data communication network adhering to the CCITT X.25 recommendation. This can be a PDN or a private network, such as the HP PPN.

PAD (Packet Assembler/Disassembler) A device that converts asynchronous character streams into packets that can be transmitted over a packet switching network (PSN).

PAD name A name of up to eight characters that is associated with a configured PAD device. The PAD name is known to both the DTC and the host systems that the device can access.

PAD profile Terminal or printer profile that specifies the configuration characteristics for PAD-connected devices.

PAD support A software module which can be downloaded to an X.25 board in a DTC. The software is used to manage connections with remote PAD devices.

partner gateway half When gateway halves are used, two gateway halves are required in order to provide communication between two networks. Each is the partner of the other.

path name When configuring with NMMGR, you can type a string in the `COMMAND:` field on display screens to branch to another screen. Each screen has a unique path name that corresponds to its location in the hierarchy of configuration screens presented by NMMGR.

PDN Public Data Network. A data communication network whose services are available to any user willing to pay for them. Most PDNs use packet switching techniques.

Point-to-Point A link that connects either two nodes in an NS Point-to-Point 3000/iX network or two gateway halves.

port An outlet through which a device can be connected to a computer, consisting of a physical connection point and controlling hardware, controlling software, and configurable port characteristics. Ports can be thought of as data paths through which a device communicates with the computer.

Precision Architecture The hardware design structure for the HP 3000 Series 900 computer family.

printer name Character string of up to 16 characters specified in the DTC Manager configuration (for networks using OpenView Network Management) to define a printer by name. Can be shared by several printers (port pool).

printer profile A set of configuration characteristics that can be associated with one or more printers through the NMMGR configuration. Printer profile specifications include the printer type, line speed, device class assignment, and other values relevant to printers connected through a DTC.

printer type A collection of characteristics that cause a printer connected to a HP 3000 Series 900 system to act and react in a specified manner. You can configure a printer to use one of the system-supplied printer types or you can create custom printer types using workstation configurator.

privileged mode A capability assigned to accounts, groups, or users allowing unrestricted memory access, access to privileged CPU instructions, and the ability to call privileged procedures.

probe protocol An HP protocol used by NS 3000/iX IEEE 802.3 networks to obtain information about other nodes on the network.

probe proxy server A node on an IEEE 802.3 network that possesses a network directory. A probe proxy server can provide a node with information about other nodes on the same or other networks of an internetwork.

profile A method of grouping device connection specifications and characteristics so that the set of characteristics can be easily associated with groups of like devices. *See also* **printer profile**, **terminal profile**.

program captive device *See* **programmatic device**.

Programmable Serial Interface PSI. A hardware card that fits into the backplane of the HP 3000 Series 900 computer. It provides a physical layer interface for NS Point-to-Point 3000/iX Links.

programmatic device A device operating under control of a program running on a computer. Programmatic devices can be used for input, output, or both, depending on the device and how it is opened by the controlling program.

protocol A set of rules that enables two or more data processing entities to exchange information. In networks, protocols are the rules and conventions that govern each layer of network architecture. They define what functions are to be performed and how messages are to be exchanged.

PSN Packet-Switching Network. Any data communication network using packet-switching techniques wherein data is disassembled into packets at a source interface and reassembled into a data stream at a destination interface. A public PSN offers the service to any paying customer.

PSS Packet-Switching System. The national public PSN of the United Kingdom.

PVC Permanent Virtual Circuit. A permanent logical association between two physically separate DTEs that does not require call set-up or clearing procedures.

PXP *See* **Packet Exchange Protocol**.

Q bit Qualified bit. When set in DATA packets the Q bit signifies that the packet's user data is a control signal for the remote device, not a message for its user.

QuickVal A software program that tests whether Network Services are operating correctly between nodes.

RDBS Remote Data Base Access. A network service that allows users to access data bases on remote nodes.

reachable network A network that can be accessed (with additional internet hops possibly required) by a particular gateway.

remote connect device Asynchronous device that is connected to a DTC indirectly, using a modem and telephone hook-up, or a PAD.

remote node A node on an internetwork other than the node you are currently using or referring to.

retransmission count (N2) The maximum number of times a frame will be retransmitted following the expiration of the retransmission timer, T1.

retransmission timer (T1) Length of time the transmitter will wait for an acknowledgment from the destination address before attempting to retransmit the frame. When choosing this value, factors like the line speed and maximum frame size should be taken into account.

RFA Remote File Access. A network service that allows users to access files and devices on remote nodes.

router network *See* **Point-to-Point**.

routing The path that packets, or fragments of a message, take through a network to reach a destination node.

RPM Remote Process Management. A network service that allows a process to programmatically initiate and terminate other processes throughout a network from any node on the network.

RS-232-C Electronic Industries Association (EIA) level 1 protocol specification that defines electrical circuit functions for 25 connector pins. HP provides

two implementations of this standard: a 3-pin version for direct connections up to a distance of 15 meters (50 feet), and a version which makes use of additional circuits and can be used for either modem or direct connections.

RS-422 Electronic Industries Association (EIA) level 1 protocol specification implemented by HP in a 5-pin version which can be used for direct device connection up to a distance of 1500 meters (4000 feet).

security string An alphanumeric character string that functions as a password for dial links. The security string is used by the dial IP protocol.

serial device Any device that is attached to and communicates with a computer by means of a serial transmission interface. Terminals, printers, and plotters are among the devices that communicate serially with HP 3000 Series 900 computers.

serial transmission Method of transferring data in which characters are transmitted one bit at a time and received one bit at a time in the order of transmission. This transmission scheme is employed by devices connected to the system via the DTC.

session-accepting device A terminal or personal computer running in terminal-emulation mode that is able to establish an interactive (conversational) session with an HP 3000 computer. Also referred to as a logon device.

shared dial A dial link that provides connection to more than one remote system, although to only one at a time.

shared-line access Feature that allows two or more HP 3000 Series 900 hosts to use the same DTC/X.25 Network Access card on a DTC to access an X.25 network.

SIC Serial Interface Card. Card installed in the front of the DTC that acts as an interface between a corresponding connector card (CC) and the DTC's processor.

slaved device A device that shares the same DTC port as another device and is connected to the other device, referred to as its master, by a cable. The actions of the slaved device are controlled by the master device.

SNMP Simple Network Management Protocol. An industry standard for managing networked computers in a multi-vendor environment.

SNMP agent A network node, such as a DTC, that is able to respond to SNMP requests.

SNP Synchronous Network Processor card; an alternative name for an X.25 board.

spooled device A printer that is accessed through the spooling facility. The spooling facility allows a nonsharable device to be shared among several users by temporarily storing output data on disk and managing the selection of output spool files destined for the spooled device.

start bit Data bit used to signal the start of a character being transmitted in an asynchronous communication mode.

station address A 12-digit hexadecimal link-level address used by the IEEE 802.3 protocol. Every node on an IEEE 802.3 network has its own station address.

stop bit Data bit used to signal the end of a character being transmitted in an asynchronous communication mode.

store and forward A technique in which messages are passed from one node to another in a network to reach their destination. Point-to-point networks use the store and forward technique to transmit messages.

subnet Another name for a network, especially if the network is part of an internetwork. The word subnet is also a synonym for intranet.

subnet mask Grouping of bits that determines which bits of the IP address will be used to define a subnetwork. The subnet mask is configured using the NMMGR utility and specified in the same format as an IP address.

SVC Switched Virtual Circuit. Path through an X.25 network that is established at call set-up time.

switching *See* **DTC switching**.

Switching user interface User interface available when DTC switching is enabled that allows terminal users to choose the HP 3000 Series 900 computer with which they want to establish a communication link.

synchronous A mode of operation or transmission whereby a continuous data stream is generated without intervals between characters. The data stream is synchronized by clock signals at the receiver and transmitter. As a result, fast transmission speeds (above 9600 bps) are attainable.

SYSGEN The software program that allows you to configure the operating system on HP 3000 Series 900 computers.

system configuration The way you tell the operating system what peripheral I/O devices are attached and what parameters are required for system operation.

TCP *See* **Transmission Control Protocol**.

telenet A proprietary public data network in the USA.

Telnet Access Card (TAC) A card that resides in the DTC 48 and provides protocol conversion between Telnet and AFCP.

Telnet Express *See* **HP ARPA Telnet Express**.

TermDSM Terminal online diagnostic support manager. A utility that provides diagnostic services for DTC connections by means of a series of commands accessible through the SYSDIAG utility. TermDSM is used only when DTCs are managed by a host system.

terminal name Character string of up to 16 characters specified in the OpenView DTC Manager configuration (for networks using OpenView Network Management) to define a terminal by name. May be shared by several terminals (pool port).

terminal profile A set of configuration characteristics that can be associated with one or more terminals through the NMMGR configuration. Terminal profile specifications include the terminal type, line speed, device class assignment, and other values relevant to terminals connected through a DTC.

terminal type A collection of characteristics that cause a terminal connected to an MPE system to act and react in a specified manner. You may configure a terminal to use one of the system-supplied terminal types, or you may create custom terminal types using the workstation configurator.

ThinLAN A LAN media that conforms to the IEEE 802.3 Type 10 BASE 2 standard LAN.

ThinLAN 3000/iX Link Hardware and software necessary to create a broadcast network, which uses the IEEE 802.3 LAN cable to transmit messages to all the nodes on the network. The messages are then accepted only by the node or nodes to which they are addressed. Also includes the ThickLAN and StarLAN 10 options.

throughput class A value assigned to a given virtual circuit that defines how many network resources should be assigned to a given call. It is determined by the access line speed, packet and window sizes, and the local network's internal mechanisms.

throughput class negotiation One of the network subscribed facilities defined at subscription time. This allows the user to negotiate the throughput class at call set-up time.

timer (T3) Length of time that a link can remain in an idle state. After the expiration of the timer, the link is considered to be in a non-active, non-operational state and is automatically reset. The value should be chosen carefully. In particular, it must be sufficiently greater than the retransmission timer (T1) so that no doubt exists about the link's state.

token ring A collection of data communication systems sharing a common cable and communicating by means of the IEEE 802.5 protocol. In a token ring network, access is controlled by the passing of a token from node to node. Outgoing messages are attached to the token and passed with the token until they arrive at the node to which they are addressed.

Token Ring 3000/iX Network Link Hardware and software required to connect a HP 3000 Series 900 system to a token ring network.

topology The physical arrangement of nodes in a network. Some common topologies are bus, star, and ring.

Transmission Control Protocol TCP. A network protocol that establishes and maintains connections between nodes. TCP regulates the flow of data, breaks messages into smaller fragments if necessary (and reassembles the fragments at the destination), detects errors, and retransmits messages if errors have been detected.

Transpac The national public PSN of France.

transparent mode Data transfer scheme in which only a limited number of special characters retain their meaning and are acted on by the system. All other characters are considered to be data and are passed through with no control actions being taken.

transport, network Software that corresponds to layers 3 and 4 of the OSI network architecture model. The function of this software is to send data out over the appropriate communications link, to receive incoming data, and to route incoming or outgoing data to the appropriate destination node.

TTUTIL Also known as the Workstation Configurator. A program, TTUTIL.PUB.SYS, on the HP 3000 that is used to create and modify terminal and printer type files.

Tymnet A proprietary public data network in the USA.

typeahead A facility that allows terminal users to enter data before a read is actually posted to the terminal.

UPS *See* **uninterruptible power supply**.

unacknowledged frame number (K) The number of frames that can be transmitted without receiving an acknowledgment from the destination address. When this number (K) frame is reached, the same K frames are retransmitted.

unedited mode *See* **transparent mode**.

uninterruptible power supply A hardware device that protects equipment from power failures and contains an internal storage battery to supply reserve power.

V.24 The CCITT recommendation that defines the function of the interchange circuits between a DTE and a DCE.

validation The process of ascertaining whether the network transport configuration file has been correctly configured. In guided NMMGR, you do this by pressing the Validate Netxport key.

VAN Value-Added Network. A data communication network that uses and pays for facilities belonging to another carrier. The value-added package is then sold to a user.

VC See **virtual circuit**.

virtual circuit A logical association between two physically separate DTEs.

Virtual Terminal A network service that allows a user to establish interactive sessions on a node.

VPLUS Software used to generate screens such as those displayed by NMMGR.

V-Series (V.##) CCITT A set of CCITT recommendations related to data communication over a voice-grade telephone network.

VT See **Virtual Terminal**.

Workstation Configurator A utility (TTUTIL) that allows users to create customized terminal and printer types by entering data through a series of VPLUS screens.

X.3 Defines the user facilities that should be internationally available from the packet assembler/disassembler (PAD) facility when this is offered by a public data network.

X.21 Defines the physical interface between a DTE and a DCE of a public data network where the access to the network is made over synchronous digital lines.

X.25 Defines the interface between a DTE and a DCE for packet mode operation on a public data network (PDN).

X.25 address The X.25 address provided by the network administration if you are connected to a public data network (PDN).

X.25 address key An X.25 address key is a label that maps a node's IP address to its X.25 address and its associated X.25 parameters. You have a combined maximum of 1024 X.25 address keys in the SVC and PVC path tables.

X.25 LUG address X.25 address of a node belonging to a local user group (LUG).

X.25 iX System Access The software that works in conjunction with the DTC/X.25 Network Access software to provide access to X.25. The software resides on an HP 3000 host and is configured through use of NMMGR. To configure access to an X.25 network, you must configure two software components: the X.25 iX System Access (residing on the HP 3000 host), and the DTC/X.25 Network Access. DTC/X.25 Network Access is configured through use of the OpenView DTC Manager software for systems using PC-based network management or through NMMGR for systems using host-based network management.

X.29 Defines the interface for data exchange between a packet-mode DTE and a remote Packet Assembly/Disassembly (PAD) facility over a packet switching network.

XON/XOFF protocol Flow control used by MPE/iX systems to protect against data overruns. XON/XOFF protocol is controlled by the data recipient who sends an XOFF character (ASCII DC3) to the sender if it is unable to continue to receive data. The sender suspends transmission until it receives an XON character (ASCII DC1).

X.Series (X.##) CCITT recommendations A set of recommendations for data communication networks governing their services, facilities, and the operation of terminal equipment and interfaces.

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