HEWLETT PACKARD

HP 9000
Series 700 and 800
Computers

Using the HP DTC Manager/UX

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Printing history

Note that many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

Edition 1. . . . . May 1992

Edition 2. . . . . February 1993

Edition 3. . . . . September 1993

Edition 4. . . . . February 1995

Edition 5. . . . . May 1995

Edition 6. . . . . May 1997

Edition 6 is released with software versions A.14.4A.010 (for HP-UX version 10.10), A.14.4A.020 (for HP-UX version 10.20) and A.14.4A.030 (for HP-UX version 10.30).

Comments

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You can also send comments to the following e-mail address, quoting the customer order number, the HP manufacturing part number and edition number:

doc_comments@grenoble.hp.com

Contents

About this manual

Purpose of this manual

This manual provides installation, configuration and troubleshooting information for the HP DTC Manager/UX software (Data communications and Terminal Controller) which operates on HP 9000 Series 700 and 800 systems running HP-UX 10.x. The software also operates on HP 9000 Series 800 systems running HP-UX 9.x. Information specific to a particular version is indicated when necessary.

Note

All references to directories and file paths apply only to HP-UX 10.x. The HP-UX 9.x paths and directories are described in Appendix B.

The HP DTC Manager/UX running on HP-UX 9.x cannot be used on an HP 9000 Series 700.

The HP DTC Manager/UX running on HP-UX 10.30 cannot be used on an HP 9000 Series 700.

The DTC Manager/UX is an application program that resides on the HP 9000 host system and enables you to configure and diagnose Hewlett-Packard DTCs.

Intended audience

This manual is intended for the following users:

- the HP 9000 system administrator or network administrator who defines the configurations of the DTCs
- the HP 9000 system operator or network operator who may do the tasks defined by the system or network administrator.

Prerequisites

Before reading this manual and using this software, you should have the following background:

- familiarity with the HP-UX operating system, file structure, and system administration tasks
- knowledge of networking terms and concepts such as IP address, LAN station address, and node names
- knowledge of the operation of the DTC and the devices connected to it.

Related HP Documentation

DTC hardware manuals:

- *HP 2345A Datacommunications and Terminal Controller Installation and Service Manual* (02345-90021) for the DTC 48 product
- *HP 2340A Datacommunications and Terminal Controller Installation and Service Manual* (02340-90001) for the DTC 16 product
- *HP J2060A/J2062A/J2063A DTC 16xx Terminal Server Installation Guide* (5959-4986) for the DTC 16xx family of products
- *HP J2070A DTC 72MX Terminal Server Installation Guide* (J2070-90001) for the DTC 72MX product
- *DTC Cabling and Racking Guide* (5961-0373) for information on installing the DTC in racks and cabinets and details of cable pinouts for the DTC.

HP-UX System manuals:

- *HP-UX System Administration Tasks*
- *Installing and Updating HP-UX*

LAN/9000 and Internet Services manuals:

- *Installing and Administering LAN/9000*
- *Installing and Administering Internet Services* (B1030-90000)
- *Using Internet Services* (B1030-90001)
- *DTC Device File Accesss Utilities and Telnet Port Identification (B1014-90012)*

PC-based DTC Manager manuals:

- *HP OpenView DTC Manager User's Guide (D2355-95036)*
- *DTC Planning Guide* (D2355-95017)
- *HP DTC Technical Reference Manual* (5961-9820)

Introduction to DTC Manager/UX

This chapter describes the DTC Manager/UX software and the types of DTCs it can manage.

The DTC Manager/UX software provides management functions for Data Communications Terminal Controllers (DTCs) that enable you to create and maintain DTC configuration files. The DTC Manager/UX runs on the HP 9000 Series 700[1] and 800 computer systems.

The HP 9000 system is called the *host system*. DTC Manager/UX manages DTCs that are directly connected to the host system or connected to other HP 9000 systems on the same LAN.

Note

Other HP software products are available for managing DTCs from a PC or from an HP 3000 system.

DTC overview

The HP Data communications and Terminal Controller (DTC) is a versatile communications server for connecting systems to terminals, printers, and other asynchronous devices. The types of connections available through a DTC are determined by the connector cards or boards mounted in and configured for that DTC.

A DTC controls the transfer of data between the devices connected to it and the computer systems which those devices can access. The DTC controls communications that would otherwise need to be controlled by the computer system. Therefore, the DTC frees system resources and can improve the processing performance of the Hewlett-Packard computers that use the DTC as their communications controller.

1 Except Series 700 diskless systems

As a LAN-based communications controller, each DTC can be located wherever it is most convenient for you. You may choose to locate DTCs close to the devices they control. Alternatively, you may locate them some distance away from the computer systems to which they provide access. The design of the DTC enables you to tailor your physical layout to your own needs.

The maximum number of ports available on a DTC depends on the DTC type and the combination of boards installed in it. Refer to the DTC hardware installation manuals for more detailed descriptions of the DTCs.

DTC Manager/UX overview

The DTC Manager/UX (also referred to as the DTC Manager) consists of a set of commands for configuring and troubleshooting DTCs (except DTC 16RX, DTC 16iX, DTC 48/3000 and HP ARPA Telnet Express). The firmware of the DTC itself contains only the code for self-test, self-diagnostics, and download protocol. Therefore, most of the DTC's operational software must be loaded when the DTC is first switched on through a process referred to as *software download*. The software code to be downloaded to each DTC resides permanently on the computer that is responsible for managing and controlling the operations of that DTC.

DTC Manager/UX commands

Note

All DTC Manager/UX commands require superuser privileges.

- **dtcconfig** configures, adds, deletes, and/or modifies the DTC, and produces the configuration information that is later downloaded to the DTC
- **dtclist** lists DTC configurations or lists events in the event log
- **dtcdiag** reports DTC diagnostic information and has the following command synonyms:
  - **dtcreset**—resets a DTC, board, or port
  - **dtcupload**—uploads a DTC, board, or port
  - **dtcdownload**—downloads EEPROM code to a board
  - **dtcstat**—obtains the status of a DTC
  - **dtctest**—tests a CPU/LAN board or a selected port
  - **dtcconnstat**—obtains the status from selected ports
  - **dtcquickswitch**—switches DTC management from one host to another
  - **dtctraceon**—turns on extended trace on selected ports
  - **dtctraceoff**—turns off extended trace on selected ports
- **dtcmodifyconfs** modifies, owns/disowns, and exports/imports DTC configurations and has the following command synonyms:
  - **dtcexport**—exports a DTC configuration to a file
  - **dtcimport**—imports a DTC configuration from a file
  - **dtcown**—owns a DTC
  - **dtcdisown**—disowns a DTC
- **dtcping** performs a ping operation on DTCs
- **dtccheckip** performs a check for duplicated IP addresses

Required daemons

The following daemons must be running on the HP 9000 host computer for the configuration information to be downloaded to the DTC.

Note

These daemons must be run with superuser privileges.

- `rbootd`—remote boot server daemon
- `dtcnmd`—DTC network management daemon
- `dtcnmp`—DTC state machine daemon

The `rbootd` daemon waits for a boot request packet from the DTC. When it receives the packet, it downloads the code and the configuration information that was generated using the **dtcconfig** command.

The `dtcnmd` daemon handles the transmission of network management data between the DTC management platform and the DTC.

The `dtcnmp` daemon executes the network management protocol enabling DTC requests to be sent and received between the DTC Manager/UX user interfaces (**dtcconfig**, **dtcdiag** and **dtcmodifyconfs**) and the DTC. The `dtcnmp` daemon is always started by **dtcnmd**.

If you need information on the `dtcnmd`, `dtcnmp` and `rbootd` daemons, refer to your man pages.

DTCs that can be managed by DTC Manager/UX

Five types of DTCs can be managed by the DTC Manager/UX:

DTC 16TN and DTC 16MX

The DTC 16TN has 16 asynchronous ports (separated in two eight-port groups) and does not support add-on boards. Each port group can be configured to be modem or direct-connect.

Note

The full functionality of the DTC 16MX is only available using HP OpenView DTC Manager. *When managed by the DTC Manager/UX, the DTC 16MX is configured and functions exactly like a DTC 16TN.* Therefore, only the DTC 16TN product is referred to in this manual.

DTC 16

The DTC 16 can be fitted with two boards of eight ports, giving a maximum of 16 ports. It can provide connections for up to 16 directly-connected devices, or 12 remote devices using modems, or a combination of both. The back of the DTC 16 actually has three slots; two slots for connector cards and one empty slot.

DTC 48

The DTC 48 can be fitted with six boards of eight ports, giving a maximum of 48 ports. It can provide connections for up to 48 directly-connected devices, or 36 remote devices using modems, or a combination of both.

The back of the DTC 48 contains six slots, each of which can contain one of the available connector boards. The slots are numbered 0 through 5 (from bottom to top). When connector boards are mounted in the slots, they are often referred to by their slot locations: for example, the board contained in slot 1 becomes board 1.

Note

DTC 48s with a date code less than 3110 require a memory extension and must be upgraded with the DTC 48 Upgrade Kit (HP product 2348A). DTC 48s with a date code of 3110 or later and DTC 16s do not require a hardware memory extension.

DTC 72MX

The DTC 72MX can be fitted with three boards of 24 ports, giving a maximum of 72 ports. The DTC 72 can provide connections for up to 72 directly-connected devices, or remote devices using modems, or a combination of both.

On the back, there are four slots. You must have a LAN board installed in one of the slots. Slot 0 is usually used for the LAN card. The other three slots can take boards which provide connections for up to 24 devices each.

The DTC 72MX has three port groups per board. Each port group has eight ports. Each port group can be configured to be *modem* or *direct-connect*.

IP addresses

IP (Internet Protocol) addresses are composed of 32-bit integers and are used to identify an IP node in the Internet. An IP address can be assigned to a DTC as well as to an individual port on a DTC. IP addresses are usually represented in the following form:

x.x.x.x where *x* is a decimal number in the range 0 to 255.

Be sure that you:

- Assign a unique IP address to each IP node in your network
- Do not assign network addresses or node addresses that are all 1s or all 0s. These addresses are reserved.

To obtain Class B or Class C IP addresses, contact Government Systems, Inc. at the address below:

Government Systems, Inc.
ATTN: NETWORK INFORMATION CENTER
14200 Park Meadow Drive
Chantilly, VA 22021
phone (800) 365-3642 or (703) 802-4535
FAX (703) 802-8376

or send an e-mail message to `hostmaster@nic.ddn.mil`.

Special DTC terminology

The following specialized terms are used in this manual.

Board and card

The terms *board* and *card* are used in this manual to mean the same thing. For the DTC 16 and DTC 48, the term *card* is employed, for example, SIC (Serial Interface Card) or connector card. The DTC 72MX and, in general, *all* other DTC types now use the term *board*.

CPU/LAN or LAN processor board

Each DTC has a *processor board* that handles the overall management of the DTC. The processor board is the central processing unit (CPU) of the DTC and contains the firmware and downloaded software responsible for much of the data communications processing done by the DTC. It also provides the DTC with its connection point to the LAN via an *attachment unit interface* (AUI) cable and a *medium attachment unit* (MAU) for ThickLAN connection, or a *BNC T-Connector* for ThinLAN connection.

In the DTC 16 and DTC 48, the processor board on the DTC is called a **CPU/LAN**.

In the DTC 16TN and DTC 72MX, the processor board on the DTC is called a **LAN board.**

Port groups

In the DTC 16TN and DTC 72MX, the ports are grouped into *port groups*. Each port group has eight ports. The DTC 16TN has two port groups, and the DTC 72MX has three port groups per board. Each port group can be modem or direct-connect. A port group corresponds to a connector on a board of a DTC 72MX or to a connector on a DTC 16TN.

Before installing DTC Manager/UX

This chapter describes requirements that must be satisfied before DTC Manager/UX can be installed.

Even though the product supports up to 4 LAN devices, it is recommended that all LAN devices be located on a single LAN, `lan0` (to facilitate the installation procedure), and that DTC Manager/UX be located on this same LAN. DTC Manager/UX is, however, compatible with other LAN devices that are connected to the LAN by means of a bridge or hub.

Note

DTC Manager/UX does not provide support for router-connected devices.

Hardware requirements

Ensure that you have the following:

- an HP 9000 Series 700 or 800
- LAN/9000 LINK hardware components including a minimum of one LAN interface card (LANIC) and up to 4 LAN devices
- for an 800 system, a terminal connected to a MUX
- at least 20 Mbytes of free disk space for the DTC Manager/UX software
- additional disk space depending on the number of DTCs, the DTC types, and the space you need for upload files[1] during troubleshooting

  The upload files are located in the `/var/opt/dtcmgr/upload` directory. You can save up to three upload files from each DTC. When three upload files have been saved, DTC Manager/UX overwrites the first one again. The disk space needed is:

  - 1 Mbyte for each upload file from a DTC 16 or DTC 48
  - 3 Mbytes for each upload file from a DTC 16TN
  - 5 Mbytes for each upload file from a DTC 72MX

1 Only upload DTC files if instructed to do so by an HP engineer.

Note

This note only applies to DTC 48s and DTC 16s.
DTC 48s with a date code less than 3110 require a memory extension and must be upgraded with the DTC 48 Upgrade Kit (HP product 2348A). DTC 48s with a date code of 3110 or later and DTC 16s do not require a hardware memory extension.

Note

The following DTC-installable cards are not supported on a DTC being managed on an HP 9000 system by the DTC Manager/UX software:

- X.25 Synchronous Network Processor card
- Telnet Access Card.

Software requirements

Ensure that you have the following software installed and operational on your HP 9000:

- HP-UX Operating System version 10.x or 9.x for your HP 9000 series.
- Internet Services
- LAN/9000

Supported terminals

The following terminals are supported with the DTC Manager/UX:

- HP compatible terminals with programmable function keys and on-screen display of function key labels
- HP terminals with ASCII mode
- Wyse-30, Wyse-50 and Wyse-60 terminals
- VT100 and VT200 terminals

  (The function keys are obtained by pressing the control and F keys simultaneously, followed by the appropriate key in the range 1 through 8.)

Note

Default terminal with HP Common Desktop Enviroment (CDE) “dtterm” is not supported. (use “hpterm” with this environment).

Installing DTC Manager/UX

This chapter describes how to install DTC Manager/UX software and prepare the environment for the required daemon processes. Instructions are provided for HP-UX 10.x and HP-UX 9.x.

It is presumed that the HP-UX operating system, LAN/9000, and Internet Services are installed and operational on your site.

Installation considerations

You can install the DTC Manager on an upgraded HP-UX 10.x system in much the same way as if you were installing from scratch. If you are installing DTC Manager on an upgraded system, check that the product files are in the correct location.

A DTC Manager migration will occur as part of the installation process. You will have to reset your DTCs which ensures that the upgrade and migration have been successful (see Resetting a DTC Board for more information). You can display a list of managed DTCs using the command **dtclist -c**.

For more information on migrating from HP-UX 9.x to HP-UX 10.x, refer to the document *Upgrading from HP-UX 9.x to 10.x version B.10.01*, part number B2355-90050.

Installing DTC Manager/UX with HP-UX 10.x

You install DTC Manager/UX software with the **swinstall** utility program. Refer to the man pages for instructions on how to use **swinstall**.

HP software is delivered in bundle form (bundles contain one or more software products, subproducts and related filesets). The name of the DTC Manager/UX bundle is J2120A. This bundle contains the product DTCMGR which is organized into three subproducts:

- Manuals
- MinimumRuntime
- Runtime

You can view a detailed description of the filesets that make up each of these subproducts with **swinstall** functions.

Installing the software

Note

You can use **swinstall**'s online help facility to get information about the utility's various options and functions.

1 Log in as `root`.

2 Start the installation utility by entering **swinstall** at the shell prompt.

Note

You may need to select the target system from the **Target Selection** screen (depending on your configuration).

3 At the **Specify Source** screen, enter the name of the host system where the device (used to load the software) is mounted.

4 Enter the path to the source depot in the field provided or choose **Source depot path...** and select the path from the list of available paths.

5 Select **OK** when the information is complete.

The system displays product information in the **Software Selection** screen.

Note

If you want to select certain subproducts and/or filesets for a partial installation of the software, use the **Actions** menu **Show description** and **Description** commands to display the desired components. You can then mark them for installation as described in the next step.

6 Use the space bar (or mouse) to highlight the product and then select **Mark For Install** from the **Actions** menu.

A screen appears with information about various dependencies required for the operation of DTC Manager/UX.

7 Select **OK**.

Yes appears to the left of the product name.

8 Select **Install (analysis)...** from the **Actions** menu.

The Install Analysis screen appears. The system verifies the suitability of the target environment and displays a **Ready** status when this task is completed.

9 Select the **Logfile** option and verify that no errors were recorded during the analysis phase. Select **OK** to exit the **Logfile** screen and then select **OK** again at the **Install Analysis** screen.

A confirmation screen prompts you to confirm your intention to install the selected product(s).

10 Select **Yes** to proceed with the installation.

The **Install** screen appears with a display of installation information.

When the installation is completed, verify that the **Status** line in the **Install** screen displays Completed.

11 Select **Logfile...** again and verify that no errors were recorded during the installation process.

12 Select **Done** to return to the **Software Selection** screen and then select **Exit** from the **File** menu.

13 Close all applications, log out of the current session, and then log in to a new session.

DTC Manager/UX software is now installed. Go to the following sections to ensure that the required daemon processes are present and operational.

Preparing the environment for the required daemon processes

Before you can run DTC Manager/UX, you must configure certain parameters in the `/etc/rc.config.d/netdaemons` file. This is necessary to ensure that the required daemons will be started automatically when your system is rebooted.

Checking the name of LAN device file

1 Execute the **lanscan** command to display the list of physically connected LAN devices on your system.

2 Look for the **Net-Interface Name** defined in the information displayed by **lanscan**. Identify the LAN device file name that corresponds to the LAN on which your DTCs are connected (`lan0`, for example).

Configuring the netdaemons configuration file

The `/etc/rc.config.d/netdaemons` configuration file contains data related to Internet Services.

1 Open the `netdaemons` configuration file with your text editor (or use **ch_rc**) and go to the following lines:

```
export START_RBOOTD=0
export RBOOTD_DEVICES=
```

To make the `rbootd` daemon start automatically when the system is booted, ensure that the value at the end of the `START_RBOOTD` line is set to `1` as shown below.

```
export START_RBOOTD=1
```

Note — No space is allowed after the equal (=) sign.

2 Verify that all LAN devices connected to the DTC(s) are declared in the `RBOOTD_DEVICES` line.

Note — The DTC Manager supports up to four LAN devices.

Enter the full path name of each LAN device (separate each device name with a space) as shown below:

`Version 10.00/10.01/10.10/10.20`

```
export RBOOTD_DEVICES="/dev/lan0 /dev/lan1 /dev/lan3"
```

`From Version 10.30`

```
export RBOOTD_DEVICES="lan0 lan1 lan3"
```

Note

Quotation marks are mandatory if you are declaring *more than one* device and a space is not allowed after the equal (=) sign.

Caution

Do not remove any existing LAN device declarations from this line. This information might be needed for other system functions.

3 Save the file (if you made any modifications) and exit the editor.

Running the daemons without rebooting

DTC Manager/UX cannot run without the required daemon processes.

Note

The `netdaemons` configuration file must contain the values described in the previous section before you can start the daemons without rebooting your system.

Normally, the daemons are started automatically each time you boot your system. If you do not want to reboot your system at this time you can start the daemons manually by following the steps below:

1 If the required daemons are not already running on your system, start them by entering:

```
/sbin/init.d/rbootd start
```

to start the `rbootd` daemon.

2 Enter:

```
/sbin/init.d/dtcmgr start
```

to start the `dtcnmd` and `dtcnmp` daemons.

Proceed to the next section to verify that the daemons are running.

Verifying that the daemons are running

1 Use the **ps -ef** command to check the daemons.

To check whether `rbootd` is running, use:

```
ps -ef |grep rbootd
```

To check whether `dtcnmd` and `dtcnmp` are running, use:

```
ps -ef |grep dtcnm
```

2 Look at the `rbootd` and `dtcnmd` log files to check for errors when the daemons were started up.

Execute the HP-UX **tail** command from the shell prompt to look at the log files. Make sure that the **tail** command shows enough information.

Note

The following commands are for HP-UX version 10.0 (before 10.30):

```
tail /var/adm/rbootd.log
Sat Jan 1 08:48:46 2000 : STARTUP
Sat Jan 1 08:48:47 2000 : INITIALIZATION COMPLETE
```

```
tail /var/opt/dtcmgr/log/dtcnmd.log
Sat Jan 1 08:48:55 2000 : STARTUP
Sat Jan 1 08:48:56 2000 : INITIALIZATION COMPLETE
```

Note

The following commands are for HP-UX version 10.30 (with four lan cards; lan0, lan1, lan2 and lan3):

```
tail /var/adm/rbootd.log
Sat Jan 1 08:48:46 2000 : STARTUP
Sat Jan 1 08:48:46 2000 : ppa=0 Ether
Sat Jan 1 08:48:46 2000 : lan0: type: Ether NMID = 0
Sat Jan 1 08:48:46 2000 : ppa=1 Ether
Sat Jan 1 08:48:46 2000 : lan1: type: Ether NMID = 1
Sat Jan 1 08:48:46 2000 : ppa=2 Ether
Sat Jan 1 08:48:46 2000 : lan2: type: Ether NMID = 2
Sat Jan 1 08:48:46 2000 : ppa=3 Ether
Sat Jan 1 08:48:46 2000 : lan3: type: Ether NMID = 3
Sat Jan 1 08:48:46 2000 : matched lan0 : ppa 0
Sat Jan 1 08:48:46 2000 : matched lan1 : ppa 1
Sat Jan 1 08:48:46 2000 : matched lan2 : ppa 2
Sat Jan 1 08:48:46 2000 : matched lan3 : ppa 3
Sat Jan 1 08:48:46 2000 : got 4 lan device(s)
Sat Jan 1 08:48:47 2000 : INITIALIZATION COMPLETE


tail /var/opt/dtcmgr/log/dtcnmd.log
Sat Jan 1 08:48:55 2000 : STARTUP
Sat Jan 1 08:48:55 2000 : COUNT : 4
Sat Jan 1 08:48:55 2000 : ppa = 0
Sat Jan 1 08:48:55 2000 : type: Ether ‘lan0’; index= 0
Sat Jan 1 08:48:55 2000 : ppa = 1
Sat Jan 1 08:48:55 2000 : type: Ether ‘lan1’; index= 1
Sat Jan 1 08:48:55 2000 : ppa = 2
Sat Jan 1 08:48:55 2000 : type: Ether ‘lan2’; index= 2
Sat Jan 1 08:48:55 2000 : ppa = 3
Sat Jan 1 08:48:55 2000 : type: Ether ‘lan3’; index= 3
Sat Jan 1 08:48:55 2000 : found 4 supported rbootd interface(s):
Sat Jan 1 08:48:55 2000 : nmd_main : got 4 lan devices
Sat Jan 1 08:48:55 2000 : matched lan0 : ppa 0
Sat Jan 1 08:48:55 2000 : matched lan1 : ppa 1
Sat Jan 1 08:48:55 2000 : matched lan2 : ppa 2
Sat Jan 1 08:48:55 2000 : matched lan3 : ppa 3
Sat Jan 1 08:48:56 2000 : INITIALIZATION COMPLETE
```

These **tail** commands show you the last few lines of the log files. These log files report whether the process is running. These log files also contain all the error messages that might have occurred during start-up and running of the daemons.

3 If the log files indicate **INITIALIZATION COMPLETE**, you can now use the DTC Manager/UX commands.

4 If you are upgrading from a previous release of DTC Manager/UX, reboot each DTC by switching it off and then on (power off/on).

This completes the installation of the DTC Manager/UX. You can now use DTC Manager/UX commands.

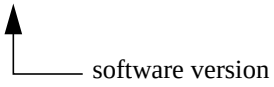
Verifying the software version

At the prompt, type the following command:

```
what /opt/dtcmgr/sbin/dtcdiag
```

You will see a line similar to the following which will show your software version:

```
DTC Manager/UX: Revision A.14.4A.030 copyright ...
```



If you don't want DTC Manager to be started automatically

DTC Manager is automatically started by default when your system reboots. You may want to disable this feature (for troubleshooting for example). To disable automatic startup you need to modify the `START_DTCMGR` parameter in the `/etc/rc.config.d/dtcmgr` configuration file.

Open the `/etc/rc.config.d/dtcmgr` file with your text editor (or use **ch_rc**) and change the `START_DTCMGR=1` parameter to `START_DTCMGR=0` and save the file.

Removing DTC Manager/UX

If you need to remove DTC Manager/UX software from your system use the **swremove** utility.

Caution If you use **swremove**, all DTC Manager files will be *permanently* removed (you cannot recover them). This includes all configuration, log and status and upload files.

Stopping the daemons

Use the command `/sbin/init.d/dtcmgr` **stop** to stop the program daemons.

Other file-handling features

For information on other file-handling features that you should consider when installing DTC Manager, see "Managing DTC configuration files" on page 38.

Installing DTC Manager/UX with HP-UX 9.x

The DTC Manager/UX software is installed using the **update** command on systems running HP-UX 9.x. The **update** command is described in the manual *Installing and Updating HP-UX*.

Installing the software

1 Ensure that you are logged in as `root` and that you are at the root directory.

2 Ensure that your fileset version matches the version of your HP-UX operating system.

3 Load the DTC Manager/UX product files on the tape drive attached to your system.

4 Note the device file name of that tape drive. You need to know the device file name of the tape drive when verifying the source location using **update**.

5 To install the software, run the HP-UX **update** utility in interactive mode by typing this command at the shell prompt:

```
update
```

6 Look at the source device file name displayed on the screen. If your source is different, then go to step 7. If your source is the same, go to step 11.

7 Select **Change Source or Destination** from the main menu.

8 Select **From Tape Device to Local System...** from the main menu.

9 Verify that the device file name in the **Source:** field refers to the tape drive with the product software tape. If necessary, change the device file name to the tape drive that you are using.

The **Destination Directory:** field contains a / (slash) and should be left as it is.

10 Press the **Done** function key.

11 Select the **Select All Filesets on the Source Media ->** menu item.

12 Select the **Start loading now ...** item.

13 The **update** utility checks available disk space and then asks you to confirm that you want to install the filesets.

The **update** utility loads the filesets, runs the customized scripts for the filesets and the migration tool to migrate to the version of DTC Manager/UX being installed.

Verifying the installation

1 After **update** has terminated, check that the installation was successful. Execute either the HP-UX **more** command or the **tail** command to look at the file `/tmp/update.log`. The file `/tmp/update.log` file contains the installation status (successful or unsuccessful). If you use the tail command make sure enough of the file is displayed for you to see the status.

```
more /tmp/update.log
```

or

```
tail /tmp/update.log
```

2 Look for the message:

```
* Customize script for fileset DTCMGR succeeded.
```

which indicates that the DTC Manager/UX software was correctly installed.

Note

The message **WARNING : No DTC configuration files have been found** indicates that there were no previous DTC configuration files to be updated from the old version to the new version. The WARNING does not mean that the installation was not successful. If any DTCs were updated, you would see the names of those DTCs.

3 If the installation is not successful, review the hardware and software requirements in chapter 2 to ensure that your environment meets the management software's requirements. Review the **update** procedures in the *Installing and Updating HP-UX* manual.

4 If you have successfully installed the software, go to the next section “Checking the Name of LAN Device File”.

Checking the name of LAN device file

The installation program assumes that the LAN device file is called `/dev/lan0`. It starts up two daemons using `/dev/lan0` as the LAN device file name. It also adds a line to the `/etc/rc` file to ensure that these daemons are automatically started up when the system is booted.

However, if your LAN device file name is **not** `/dev/lan0`, you must start the daemons manually and edit the file `/etc/rc` yourself. The steps below describe how to check the LAN device file name.

1 Execute the **lanscan** command to display the list of physically connected LAN devices on your system.

2 Look for the **Net-Interface Name** defined in the information displayed by **lanscan**. Identify the LAN device file name that corresponds to the LAN on which your DTCs are connected.

3 If the LAN device file name that corresponds to the LAN on which your DTCs are connected is indicated as `lan0` (full path name: `/dev/lan0`), your installation is correct. Take the following steps to complete the installation:

   a If you are upgrading from a previous release of DTC Manager/UX, execute the following command for each DTC:

   ```
   dtcreset dtcname
   ```

   b then configure your DTCs using DTC Manager/UX.

4 If the LAN device file name that corresponds to the LAN on which your DTCs are connected is **not** indicated as `lan0` (full path name `/dev/lan0`), go to the next section.

Modifications for LAN device file names other than /dev/lan0

If `/dev/lan0` is **not** your LAN device file name, there are two modifications required. You must:

- start the `rbootd` and `dtcnmd` daemons with the correct LAN device
- edit the file `/etc/rc` to ensure that these daemons are automatically started up when the system is rebooted.

The `rbootd` daemon handles the download of a DTC when it is switched on or reset. The `dtcnmd` daemon handles the transmission of network management data from the system to the DTC (for more information about these daemons refer to the man pages).

1 Start the `rbootd` and `dtcnmd` daemons manually by typing the following commands at the shell prompt:

```
/etc/rbootd landevice
/etc/dtcnmd landevice
```

The `landevice` is the LAN device file name that you found on page 35 in step 2. It is the LAN interface card that connects your HP 9000 to the LAN. This is the same LAN that the DTCs are on.

Example: If the LAN device file name, listed by lanscan, which corresponds to the LAN on which your DTCs are connected, is `lan1`, type the following:

```
/etc/rbootd /dev/lan1
/etc/dtcnmd /dev/lan1
```

2 Edit the `/etc/rc` file to ensure that the `rbootd` and `dtcnmd` daemons are automatically started up when you reboot the system, as follows:

a Display the file `/etc/rc`.

b Ensure that the shell variable `$RBOOTD_DEVICES` is declared and that it includes the LAN device file name corresponding to the LAN on which the DTCs are connected.

c If the shell variable `$RBOOTD_DEVICES` is set for multiple LAN device file names, replace the line in the file `/etc/rc` that reads:

```
if    /etc/dtcnmd $RBOOTD_DEVICES
```

by

```
if     /etc/dtcnmd landevice
```

Example: If the LAN device file name that corresponds to the LAN on which your DTCs are connected is `/dev/lan1`, then you would enter the following line

```
if    /etc/dtcnmd /dev/lan1
```

Verifying that the daemons are running

1 Use the **ps -ef** command to check the daemons as follows.

To check whether `rbootd` is running, use:

```
ps -ef |grep rbootd
```

To check whether `dtcnmd` and `dtcnmp` are running, use:

```
ps -ef |grep dtcnm
```

2 Look at the `rbootd` and `dtcnmd` log files to check for errors when the daemons were started up.

Execute the HP-UX **tail** command from the shell prompt to look at the log files. Make sure that the **tail** command shows enough information.

```
tail /usr/adm/rbootd.log

Tue Sep 10 14:00:23 1992 pid=1234: STARTUP
Tue Sep 10 14:00:23 1992 pid=1234: INITIALIZATION COMPLETE

tail /usr/adm/dtcnmd.log
Tue Sep 10 14:00:23 1992         : STARTUP
Tue Sep 10 14:00:23 1992         : INITIALIZATION COMPLETE
```

These **tail** commands show you the last few lines of the log file. This log file is the location that reports whether the process is running. These log files also contain all the error messages that might have occurred during startup and running of the daemons.

3 If the log files indicate **INITIALIZATION COMPLETE**, you can now use the DTC Manager/UX commands and then configure your DTCs using DTC Manager/UX.

4 If you are upgrading from a previous release of DTC Manager/UX, execute the following command for each DTC:

```
dtcreset dtcname
```

This completes the installation of the DTC Manager/UX.

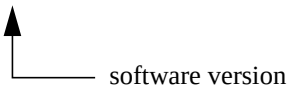
Verifying the software version

At the prompt, type the following command:

```
what /etc/dtcdiag
```

Look for a line similar to this:

```
DTC Manager/UX: Revision A.14.3B.000 copyright ...
```



Managing DTC configuration files

The following section contain information on how to manage DTC configuration files.

Automatic protection of configuration files

An automatic lock feature protects the integrity of the DTCs new data. The lock mechanism becomes effective when you run **update** in HP-UX 9.x, **swinstall** in HP-UX 10.x, or when a new DTC is added. All DTCs remain operational. However, certain DTC management and configuration functions are temporarily disabled until the related DTC is reset (rebooted).

Automatic backup of DTC Manager files

If there is a previous version of DTC Manager software installed on your system, a special script file will create a backup copy of the old version when you run the **update** or **swinstall** utility. Complete details of the software installation are recorded in the `update.log` file in HP-UX 9.x or the `swagent.log` file in HP-UX 10.x.

Automatic upgrade of DTC configuration files

You do not have to reconfigure each DTC after upgrading to a new version of DTC Manager/UX. The DTC configuration files created by older versions are automatically converted by a utility when you use the command **update** in HP-UX 9.x or **swinstall** in HP-UX 10.x.

Complete details of the procedure for HP-UX 9.x are recorded in the files `/tmp/update.log` and `/usr/adm/dtcupgrade.log`.

Complete details of the procedure for HP-UX 10.x are recorded in the files `/usr/adm/sw/swagent.log` and `/var/opt/dtcmgr/log/dtcupgrade.log`.

Using dtcconfig

This chapter provides information about the DTC configuration procedure and describes the basic use of the menu-driven configuration utility **dtcconfig**.

The following **dtcconfig** operations are covered:

- running **dtcconfig**
- choosing a menu item from the DTC Configuration Main Menu
- entering values at the DTC configuration menus
- using the DTC configuration function keys
- using the shell function key
- getting help
- exiting from a task or from **dtcconfig**.

Configuration guidelines

A DTC must have the following in order to function correctly:

- **functional software —**enables it to access the LAN, support networking protocols, and manage connections
- **configuration information —**information on how the DTC and its boards, ports and connections should behave

A DTC only contains some software in ROM, so the functional software and the configuration information must be downloaded from the DTC Manager to the DTC.

When a DTC is powered-on or reset, it runs a series of self-tests, then sends a message requesting a software and configuration download. The DTC Manager that has the files for the DTC responds by downloading the functional software and the configuration information, and the DTC is then managed by the system from which it received its download.

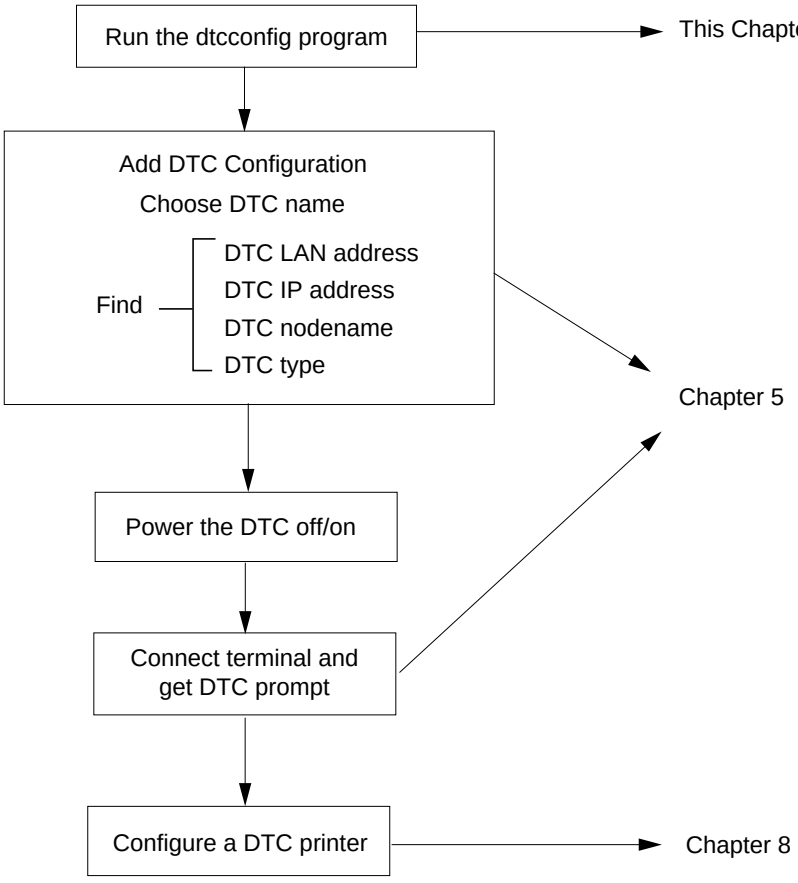
The configuration information for a DTC is contained in a file which is created, modified and stored on the DTC Manager which “owns” the DTC.

When the DTC is switched on, it is configured with:

- information that the DTC sends to the manager (such as the number of boards)
- user-defined settings
- and other parameters such as the DTC IP address that you enter when you add a new DTC to the configuration.

In most cases you can successfully configure your DTCs with information contained in chapter 5. This will enable you to connect terminals to your DTCs. If your site requires a more complex configuration refer to the appropriate chapter later in this book.

The configuration procedure



To start the dtcconfig utility

Once you have installed the DTC Manager/UX you are ready to configure your DTC.

Note

The **dtcconfig** command *requires superuser privileges*.

Make sure you logon as **root** or type the HP-UX **su** (superuser) command.

At the shell prompt, enter:

```
dtcconfig
```

The complete **dtcconfig** command syntax is as follows:

```
dtcconfig [-a] [-l loglevel] [-L logfile]
```

Parameter	Description
`-a`	Appends the log messages from this **dtcconfig** execution to the existing **dtcconfig** log file. By default, executing **dtcconfig** overwrites the log file. The default log file is `/var/opt/dtcmgr/log/dtcconfig.log`.
`-l` *`loglevel`*	Sets the amount of information that will be logged in the log file for this **dtcconfig** execution. Specify one of the following logging levels: **0** Logs only startup and termination messages of **dtcconfig**. **1** Logs serious and fatal error messages and level 0 messages. This is the default logging level. **2** Logs warning and informational messages and level 1 messages.
`-L` *`logfile`*	Specifies an alternative log file that **dtcconfig** should use to log the messages. The default file is `/var/opt/dtcmgr/log/dtcconfig.log` .

When you execute the **dtcconfig** command, the console screen will display the **DTC Configuration Main Menu**.

Using the dtcconfig menus

The DTC configuration tool (**dtcconfig**) provides menus, fields, and function keys to help you configure your DTC devices. It has three types of menus:

- **Main menu**: used to access other menus and functions.
- **Actions menu**: provides you with a selection of possible actions you can take from the current screen.
- **Data acquisition menu**: provides you with a list of possible field values. This menu is displayed by pressing the **Help (F1)** function key.

You can select a menu item in one of two ways:

- Use the arrow keys or **Tab** to move from one item to the next. Once the desired menu item is highlighted: press **Return**, or the **Select Item** or **Select Action (F4)** function key to start the operation.
- Type the first character of the menu item (for example, **a** for **Add DTC Configuration**). The DTC manager immediately executes the command associated with that letter (you do not have to press **Return**). If several options start with the same letter, enter the letters of the option until it is unique (for example, **con** for the **Configure** option and **cop** for the **Copy** function). *This abbreviated method does not work when selecting from a list of valid field options such as found in a HELP screen*.

If you enter an incorrect value for a field, an error message window appears. Read the message and press the space bar to return to the screen and to correct the entry.

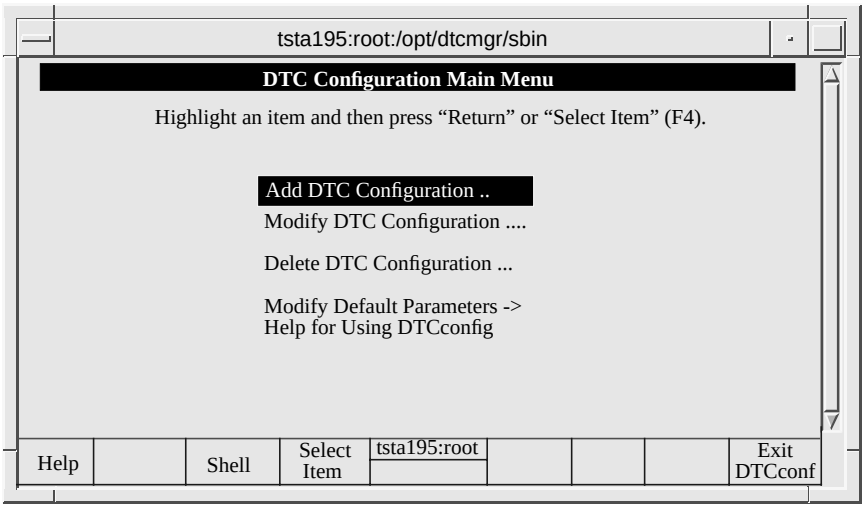
The following keyboard keys are used to enter information at the various **dtcconfig** screens:

- **Tab and arrow keys.** If the **Tab** key does not let you move to another field, try using the arrow key.
- **Space bar.** When an error message is displayed, you must press the space bar to continue.
- **Function keys.** Explained in the next section, function keys vary for different screens.
- **Return key, Perform Task (F4), and Done (F4) function keys.** Read the pop-up window message or look at the bottom of the screen to know which of these keys to press.

The main menu

The DTC configuration main menu gives you several options for configuring your DTC devices. Use the **Tab** or arrow key to choose a menu item. Press **Return** or the **Select Item (F4)** function key to start the task.

DTC Configuration Main Menu



- **Add DTC Configuration**—enables you to add one or more non-configured DTCs to your list of DTCs. Their configurations are initially the same. See chapter 5 for more information on this menu item.
- **Modify DTC Configuration**—enables you to modify or reconfigure an existing DTC configuration. You can also modify DTCs with the **dtcmodifyconfs** command (which cannot be used when **dtcconfig** is running). See chapter 6 for more information on this menu item.
- **Delete DTC Configuration**—enables you to delete one or more DTCs from your list of DTCs. See chapter 9 for more information on this menu item.
- **Modify Default Parameters**—enables you to modify the user default CPU/LAN or LAN configuration and the default port configuration. See chapter 9 for more information on these tasks.
- **Help for Using DTCconfig**—Displays help information and an overview of the DTC manager screens and navigation keys.

Using the function keys

Use the function keys (indicated at the bottom of the screen) to execute functions.

Note

Note that the function keys are context sensitive and perform different operations depending on the current screen.

The following keys have specific functions:

(F1)–Help: used to obtain a summary of information for a particular field or menu item. For the modify and delete functions of **dtcconfig**, the **Help** function key provides you with a list of DTCs to modify or delete. This function key is on almost every screen.

(F3)–Shell: Used to temporarily access the HP-UX shell. After you have finished entering shell commands, type `exit` to return to the **dtcconfig** utility. This function key does not appear on every screen. You cannot execute another **dtcconfig**, **dtcdiag**, **dtcping** or **dtcmodifyconfs** command from the shell because only one instance of these commands can run at a time.

(F4)–Multi function Key

(F5)–Actions Menu: Used to access the **Actions** Menu.

(F6)–Default Values: Used to choose a set of default values for a set of fields.

(F8)–Exit: Used to leave the current screen. Refer to see “Exiting from dtcconfig” on page 46 for more information. This function key is always available.

Using the editing keys

You use the **dtcconfig** editing keys to enter values in the various fields.

You should note that some of the editing keys do not function as they normally would if you were editing text. Specifically, the following keys behave differently:

- **[Clear Line]—**If you use this key while entering a value in a field, you do not get a response. The line is not cleared and you must return to the beginning of the field to start entering the value again.
- **[Delete Line]—**This key deletes all the data on the line. However, in order to enter a new value on that line, you must move the cursor to the beginning of the line.
- **[Insert Char]—**It is best to make sure that Insert Character mode is off. In some fields, Insert Character mode is functional. However, in most fields, using it results in no action from the keyboard (that is, the keyboard does not respond when you try to type a value into a field).
- **[Clear Display]—** This key is disabled.
- **[Insert Line]—** This key is disabled.
- **[Enter]—**This key should not be used and has unpredictable results. Use the **Return** key.

Refreshing the screen

Sometimes the screen may become difficult to read due to line or data rate problems. If this happens, type **[Ctrl]-L** and the screen will be redisplayed in its correct form. If this continues to happen, check the line rate and terminal configuration and ensure that it matches the DTC port configuration.

Getting help

There are three areas of online help:

- The **Help for Using DTCconfig** menu item from the main menu. Selecting this menu item displays general **dtcconfig** help information. This is an overview of the **dtcconfig** screens and the keyboard keys.
- **Help (F1)** function key. Almost all **dtcconfig** screens include a **Help** function key. Pressing this function key provides information about the field you are currently in.
- **List of DTCs**. From the **Delete DTC Configuration** or **Modify DTC Configuration screens**, the **Help (F1)** function key displays a list of DTCs for you to choose.

Exiting from dtcconfig

After pressing the **Exit Task (F8)** function key several times, you eventually return to the **dtcconfig** main menu. From the main menu, when you press the **Exit DTCconf (F8)** function key, a pop-up message prompts you to quit or not quit. Enter a **y** to quit. Enter an **n** to remain in **dtcconfig**.

Note

If you made modifications related to IP addresses, (for example, if you create a new DTC or modify the configuration of the LAN address for an existing DTC), **dtccheckip** will be launched automatically. You will only get output if there are duplicated IP addresses.

Adding DTCs

This chapter describes how to add one or more DTCs to the set of DTCs managed by DTC Manager/UX.

Note — 150 is the maximum number of manageable DTCs.

Note — The instructions in this chapter presume that DTC Manager/UX is already properly installed and that you are familiar with the basic use of the **dtcconfig** menus and function keys as described in chapter 4.

Procedure overview

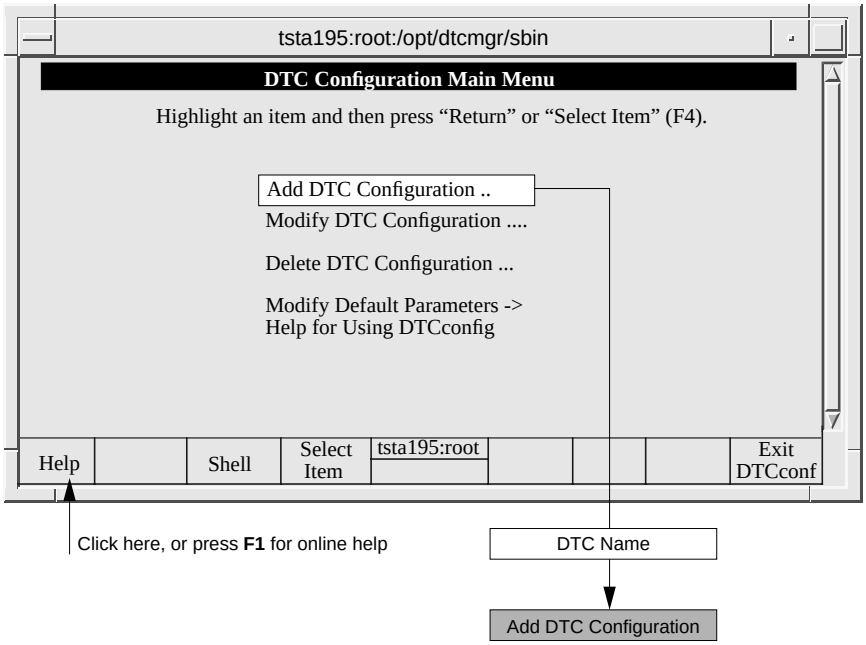
When a DTC is added, a basic configuration is created on the management system. This initial configuration is created according to the user-defined DTC default parameters.

DTC parameters are initially set to HP factory-defined default values. If you need to modify these values you can use the **dtcconfig** utility's **Modify DTC Configuration** option to do so.

Refer to chapter 9 if you want to set your own default parameters.

Before the DTC begins a download process, it communicates its hardware configuration to the management platform. The DTC Manager/UX uses this information to automatically update its system image of the DTC. Physical settings in the DTC configuration, such as added or deleted boards, as well as whether a port group is modem or direct are reported to the DTC Manager/UX. All hardware changes are automatically made to your DTCs.

Adding a DTC to the configuration



To create a default configuration for new DTCs (where all ports are configured as terminal ports):

1 Ensure that the DTCs are properly connected to the LAN and then switch them off and then on again.

2 Start the **dtcconfig** program by typing;

```
dtcconfig
```

3 Choose the **Add DTC Configuration** option from the main menu.

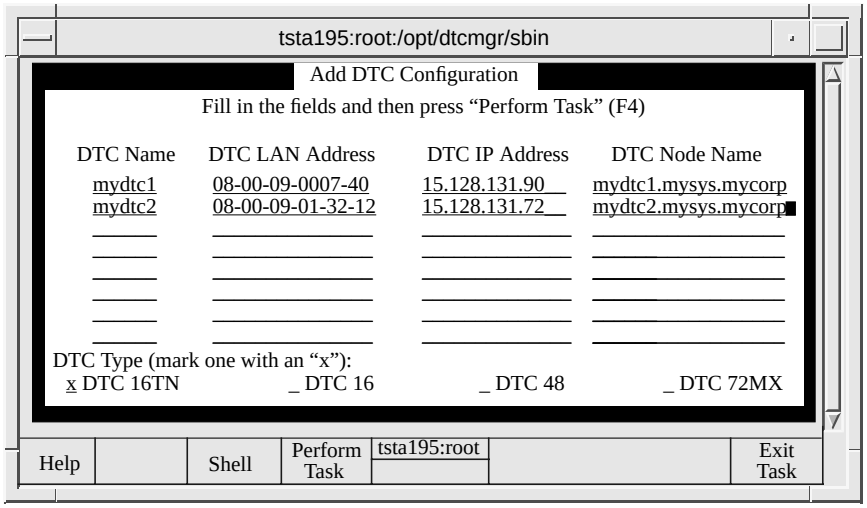
The **Add DTC Configuration** screen appears (see “Configuration parameter definitions” on page 50 for an explanation of these fields).

4 Create a DTC list containing DTCs of *one* of the four types (DTC 16TN, DTC 16, DTC 72MX or DTC 48). To configure a DTC 16MX, proceed as if you were adding a DTC 16TN. When managed by the DTC Manager/UX, the DTC 16MX is configured and functions exactly like a DTC 16TN.

- Press **Return** or **TAB**, or use the arrow keys to move to each field.
- Use the online help for more information about each field.
- Enter the number of DTCs you want in a list.

The fields of the previous DTCs scroll upward allowing you to enter more DTCs. All of the DTCs must be of the same DTC type (DTC 16TN, DTC 16, DTC 48 or DTC 72MX) and will be set to the same configuration.

Add DTC Configuration screen



5 When you have completed your list of DTCs, press the **Perform Task (F4)** function key. The DTCs in the list are automatically configured and added to the management database and the **Add DTC Configuration** screen is cleared.

6 Create another DTC list for another type of DTC on your network.

7 When you have entered all your DTCs, exit from the **Add DTC Configuration screen** by pressing the **Exit Task (F8)** function key.

You are returned to the main menu.

8 Exit from **dtcconfig**.

9 Turn each DTC's power off and then on (power off/on).

Wait a few minutes for the configuration to be downloaded to the DTC. The DTC is now operational.

Checking the terminal connections

Follow these steps for each terminal connected to the DTC.

1 Press **Return**. The DTC prompt, usually **DTC>**, should appear. Enter the **connect** command with the IP address[1] of the system you want to connect to.

```
DTC>  connect 15.13.12.12
Connection #1 established to mysystem.mygroup.mycorp
To return to DTC interface, type <CTRL>K
login:
```

2 If you are not successful, try to modify the configuration of the DTC (refer to chapter 6). If the DTC does not respond, it probably means that the DTC LAN address is not correct. Delete the DTC and then add it again.

3 If you still cannot establish a connection, go to the troubleshooting section in chapter 15.

Configuration parameter definitions

DTC Name

Enter a name consisting of up to 8 alphanumeric characters. You can include hyphens (-) and underscores (_) but the first character *must* be alphabetic. The DTC name field must not be left blank.

The DTC name is a unique name used by the DTC manager to identify a particular DTC. For simplicity, the DTC name and the *nodename* portion of the DTC node name are often the same name. However, they are used for separate tasks by the DTC Manager/UX and the system.

1 You can only use a system name here if you have configured the system name in the DNS server.

DTC LAN Address

Look for the DTC LAN address on your DTC and enter this value. *Ensure that you enter this address exactly as it is marked on the DTC.* If you enter an incorrect DTC LAN address, the DTC will not operate.

Hewlett-Packard has assigned each DTC a unique DTC LAN address which is indicated on an address label as follows:

DTC 16TN—on the back panel near the port connections
DTC 16—on the back panel in the upper right corner
DTC 48—inside the front panel
DTC 72MX—on the back panel on the LAN board

When a DTC is first added, the DTC LAN address field in the **Add DTC Configuration** screen indicates **00-00-00**. Replace this with your DTC LAN address. The format of the LAN address is usually 08-00-09-*xx-xx-xx* or 00-60-B0-xx-xx-xx where *xx* is a hexadecimal number.

Note

When configuring a DTC for connection to your HP 9000 system, the IEEE 802.3 protocol is used on the LAN connection. However, for communication between the terminal and the system, the Ethernet protocol is used. Ethernet and IEEE 802.3 LAN protocols are similar, and can coexist on the same physical LAN, using the same physical address configured in the DTC LAN Address field. The address you define here will also be used as the Ethernet address for the DTC.

DTC IP Address

Enter a value in the form *xxx.xxx.xxx.xxx* where *xxx i*s a decimal number from 0 through 255. The address cannot be 0.0.0.0 or 255.255.255.255 which are reserved addresses. Assign a unique IP address to each DTC.

If you use a DNS server, you must first add each DTCs IP address and, secondly, configure the DTC for DNS.

Note

In the “Add DTC Configuration” screen, you must enter a value for DTC IP address even if you do not use the DNS server.

Each DTCs IP address must also be added to your name database, for example the `/etc/hosts` file or the DNS (Domain Name System) server. The `/etc/hosts` file is documented in the manual, *Installing and Administering LAN/9000 Software.*

This parameter is the IP address *of the DTC itself.* Do not confuse it with the IP address of the host system, or with the IP address of a port.

DTC Node Name

Enter a name in three parts, each with a maximum of 16 characters, separated by periods as illustrated in the example syntax below.

```
nodename.domain.organization
```

Each part must start with an alphabetic character and can be followed by a combination of alphanumeric characters, hyphens (-), and underscores (_). As you enter the name, it shifts right to extend beyond the visual line.

The **DTC Node Name** is a unique node name to identify a DTC within a system or network.

For simplicity, the DTC name and the `nodename` portion of the DTC node name are often the same name. However, they are used for separate tasks by the DTC Manager/UX and the system.

DTC Type

Enter an **X** or an **x** in one of these four fields: DTC 16TN (also use this field for a DTC 16MX), DTC 16, DTC 48, or DTC 72MX. All the DTCs in a list must be of the same type.

Modifying DTCs with dtcconfig

This chapter describes how to modify a single DTC with the interactive **dtcconfig** utility. The utility's **Modify DTC Configuration** menu allows you to modify a CPU/LAN (or LAN board), board, and/or port of a *single* DTC.

You can only modify one DTC at a time with **dtcconfig**. If you want to modify multiple DTC configurations at the same time, use the **dtcmodifyconfs** command (as described in chapter 10).

Note

The instructions in this chapter presume that DTC Manager/UX is already properly installed and that the DTC you want to modify is physically present on the network and switched on. In addition, it is presumed that you are familiar with the basic use of the **dtcconfig** menus and function keys as described in chapter 4.

Once you have modified the DTC, refer to the appropriate chapter to:

- modify CPU/LAN board or LAN board parameters for a single DTC (chapter 7)
- modify terminal, printer port and other parameters on a board of a single DTC (chapter 8)
- copy DTC board and port configurations (chapter 9).

Modifying a DTC configuration

1 Run **dtcconfig** to access the **DTC Configuration Main Menu**.

2 Select **Modify DTC Configuration** from the main menu.

3 A pop-up window asks you for the name of the DTC whose configuration you want to modify.

- Type in a DTC name

  or

- Press the **Help (F1)** function key to see the list of existing DTCs. Highlight the DTC on the list you want to modify and press **Return** or the **Select Item (F4)** function key.

4 The **DTC Rear Panel Configuration** screen appears. Enter the board and port numbers to be modified.

Refer to the online help for detailed explanations of the board and port fields.

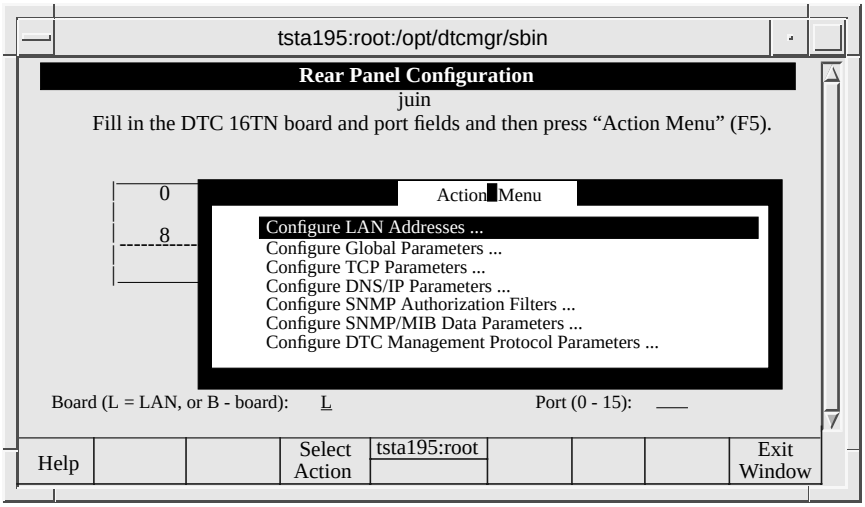
5 Press the **Action Menu (F5)** function key and select the option you want. The **Action Menu** varies depending upon the type of DTC or board.

6 When you have finished modifying parameters, press the **Action Menu (F5)** function key.

You can then either specify another board and port or exit.

7 To exit, press the **Exit Task (F8)** function key. You then leave the **Rear Panel Configuration** screen and return to the main menu of **dtcconfig**.

Modify DTC Configuration screen



If you changed any of the following:

- DTC node name
- DTC IP address
- TCP timers
- any of the following SNMP parameters:
    - contact name
    - sys name
    - sys location
    - SNMP enable authentication traps
    - trap destination IP address
- or DTC management protocol parameters

you must download the new configuration to the DTC.

There are two ways to reset the DTC and start the download:

- turn the DTC off and then on

  or

- run the command **dtcreset** `dtcname`.

Note

You must reset the DTC after modifications to save your changes. Do not use the **Modify DTC Configuration** option on this DTC again until you have reset the DTC. Otherwise you may lose the changes you have just made.

Using the Rear Panel Configuration screen

The **Rear Panel Configuration** screen represents the rear of the DTC and is the starting point for all DTC configuration procedures.

The **Rear Panel Configuration** screen allows you to perform the following tasks:

- Configure global DTC parameters on the CPU/LAN or LAN board
- Configure ports on a particular board (see “Configuring terminal and printer ports” on page 87).
- Copy a board within a DTC or to another DTC (see “Copying and pasting a board or port” on page 120).
- The **Rear Panel Configuration** screen for each type of DTC is shown on the following pages.

1 Select **Modify DTC Configuration** from the main menu of the **dtcconfig** utility.

2 A pop-up window asks you for the name of the DTC whose configuration you want to modify.

   - Type in a DTC name

     or

   - Press the **Help (F1)** function key to see the list of existing DTCs. Highlight the DTC on the list you want to modify and press **Return** or the **Select Item (F4)** function key.

   The **DTC Rear Panel Configuration** screen appears.

Entering values in the board and port fields

This section explains what you should enter in the **Board** and **Port** fields of the **Rear Panel Configuration** screen.

Configuring Global Parameters (not specific to a given port)

1 Enter the appropriate value in the board field as follows:

DTC 16TN:	**L** or **l**, for the LAN board. The LAN board is factory installed on a DTC 16TN.
DTC 16:	**C** or **c**, for the CPULAN board.
DTC 48:	**C** or **c**, for the CPU/LAN board.
DTC 72MX:	The number corresponding to the LAN board. The LAN board can be in any slot but is usually in slot 0. You can specify the LAN board using **L**, **l**, or the number of the board.

2 Press the **Action Menu (F5)** key.

3 Choose the menu item corresponding to the DTC parameter you want to change.

Use the following information to configure the DTC global parameters.

Configuring port parameters

Note

You cannot go to the port field of the Rear Panel Configuration screen if you specify **C**, **c**, **L** or **l** in the board field.

1 Specify the number of the board where the port you want to configure is located. Valid values are:

DTC 16TN:	**B** or **b** specifies the 16 ports of a DTC 16TN. A DTC 16TN has no separate boards, but is often referred to as having one board of 16 ports and a LAN board.
DTC 16:	0 or 1.
DTC 48:	0 through 5.
DTC 72MX:	0 through 3.

2 Use the arrow key, *not the TAB key*, to go to the **Port** field. Enter a port number depending upon the DTC type. The following port values are valid:

DTC 16TN:	0 through 15 direct connect or modem ports
DTC 16:	0 through 7 direct connect ports 0 through 5 modem ports
DTC 48:	0 through 7 direct connect ports 0 through 5 modem ports
DTC 72MX:	0 through 23 direct connect or modem ports

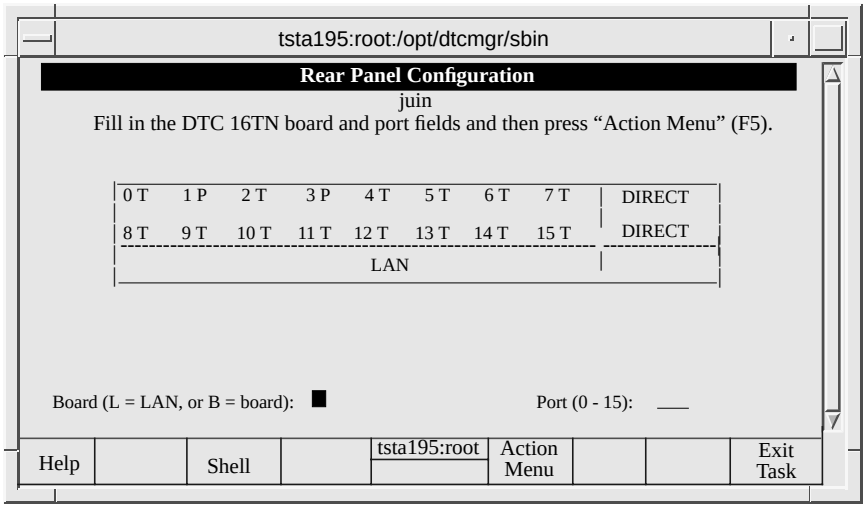
3 Press the **Action Menu (F5)**.

4 Choose the menu item corresponding to the DTC parameter you want to change.

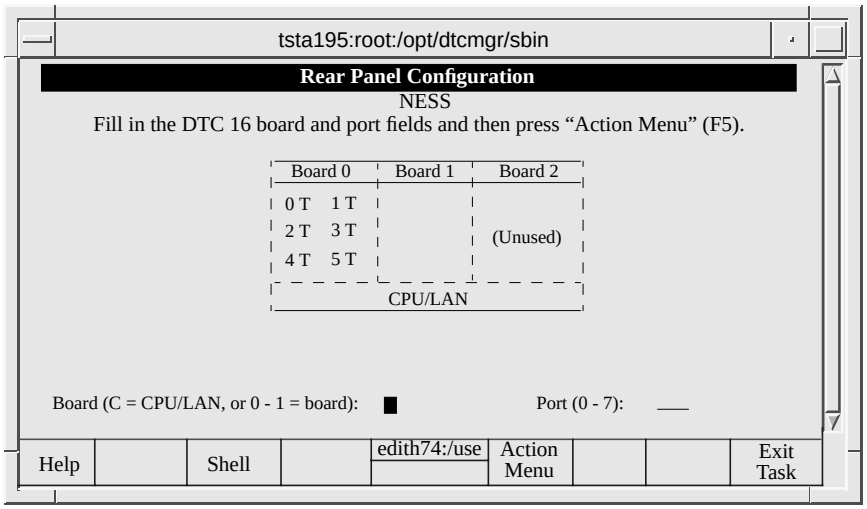
Refer to chapter 8, to configure ports.

Rear panel configuration screen examples

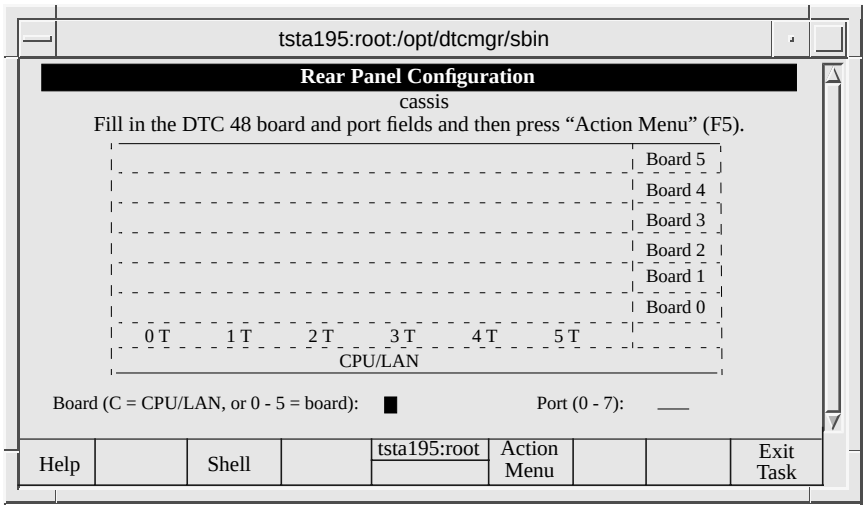
Rear Panel Configuration screen for a newly-added DTC 16TN



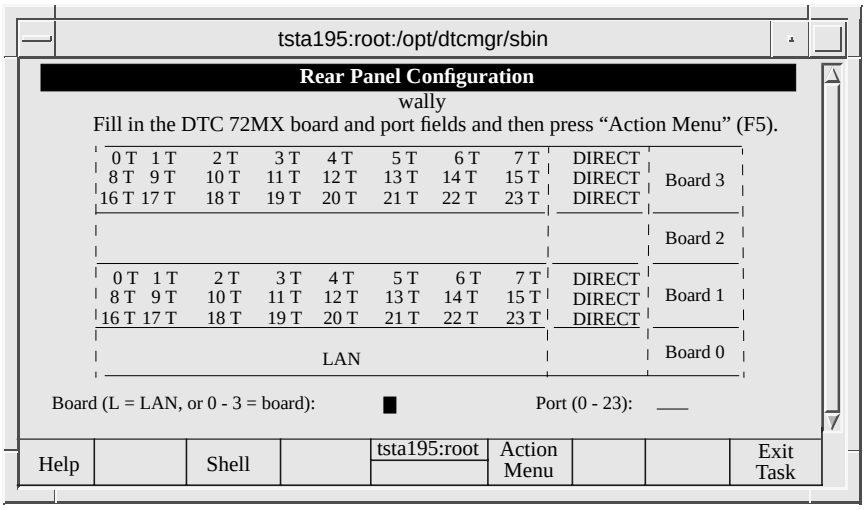
Rear Panel Configuration screen for a newly-added DTC 16



Rear Panel Configuration screen for a newly-added DTC 48



Rear Panel Configuration screen for a newly added DTC 72MX



Configuring a DTC CPU/LAN or LAN board with dtcconfig

This chapter describes how to use the **dtcconfig** utility to configure the CPU/LAN or LAN board of a DTC (the global DTC parameters). These procedures are based on the **Modify DTC Configuration** menu that provides functions to modify a single DTC.

Note

The procedures in this chapter presume that you have added at least one DTC to the list of configured DTCs. It is also presumed that you are familiar with the basic use of the **dtcconfig** menus and function keys as described in chapter 4.

If you want to modify multiple DTC configurations at the same time, use the **dtcmodifyconfs** command (as described in chapter 10).

Configuring CPU/LAN or LAN board parameters

You must configure the CPU/LAN or LAN Board in order to change the global configuration of a single DTC.

When configuring the CPU/LAN or LAN Board, you can change the following parameters for the specified DTCs:

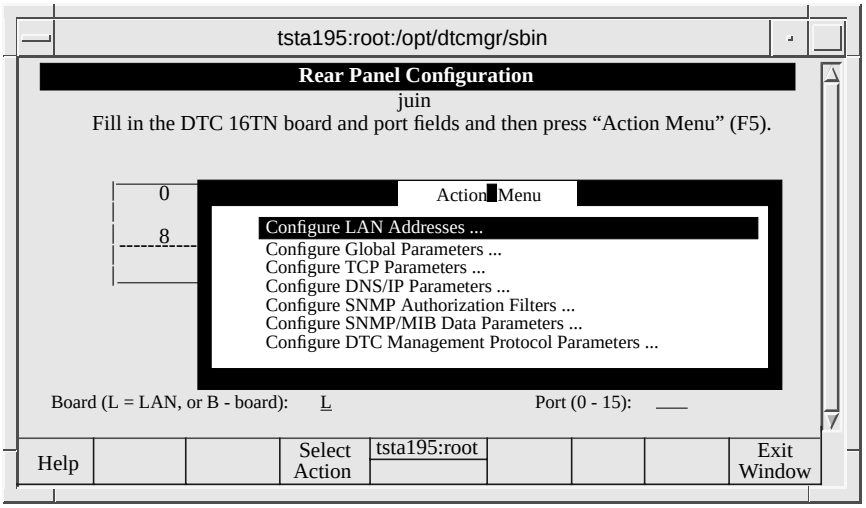
- **LAN addresses** which include:
  - DTC IP address
  - DTC node name
- **Global parameters** which include:
  - event logging classes
  - DTC user interface timeout
  - DTC user prompt
  - DTC user welcome message
  - Enable DTCDF access
  - DTCDF password
- **TCP parameters** which are TCP timers that may need to be altered for extended LAN configurations
- **DNS/IP parameters** which include:
  - default DNS (domain name server) and backups
  - default IP router addresses and backups
- **SNMP authorization filters** which include:
  - your network's SNMP management nodes, the information that these nodes can request and the rights of access to the SNMP MIB data
- **SNMP/MIB data parameters** which include:
  - the SNMP-specific data to be stored on the DTC
- **DTC management protocol parameters** which include:
  - the DTC management protocol parameters that may need to be altered for traffic over LANs with bridges

The basic steps for configuring the CPU/LAN or LAN board from the **Rear Panel Configuration** screen are explained below.

1 Specify the CPU/LAN or LAN Board in the board field of the **Rear Panel Configuration** screen.

2 Press the **Action Menu (F5)** function key for a list of action options (see the screen below for an example).

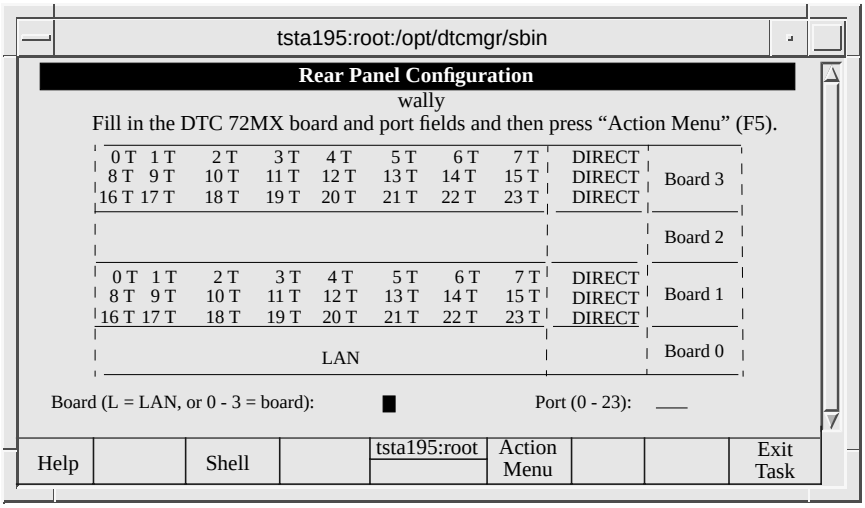
Action Menu for CPU/LAN or LAN board of a DTC



3 Press the **Select Action (F4)** function key to choose one of the menu items which are explained in the following sections.

4 A screen appears displaying the current values. Change the values you want to change and press **Done (F4)**. In some screens, you can choose HP defaults, user-defined defaults or enter other values. Press the **Default Values (F6)** function key to see the HP defaults and user-defined defaults.

Modified CPU/LAN board

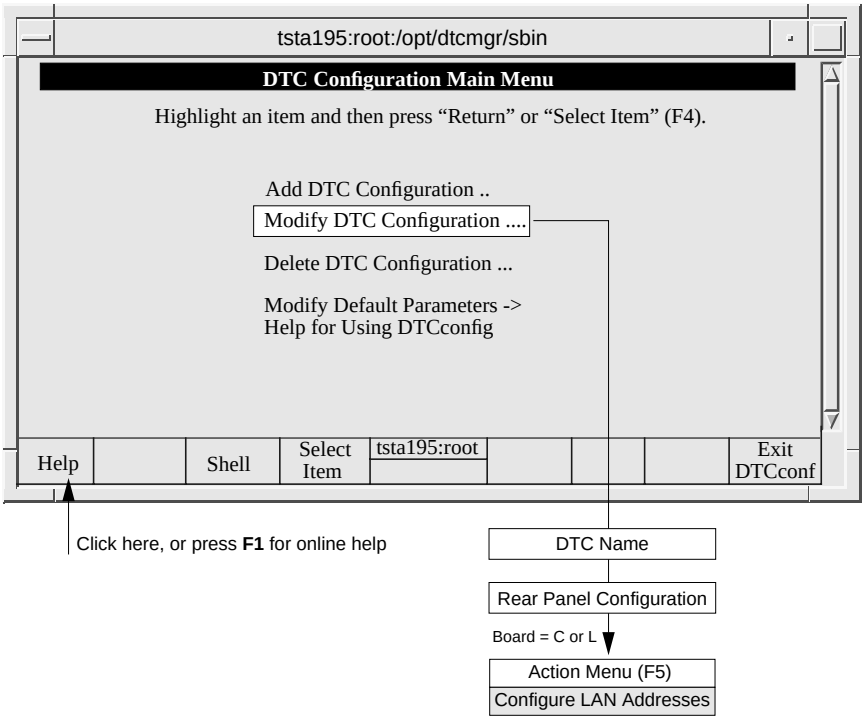


5 After entering values, press the **Done (F4)** function key. The **Rear Panel Configuration** screen appears again.

6 Press the **Action Menu (F5)** if you want to choose another menu item.

7 To exit, press the **Exit Task (F8)** function key. You then leave the **Rear Panel Configuration** screen and return to the main menu of **dtcconfig**.

Configuring LAN addresses



1 Select **Configure LAN Addresses** from the **Action Menu** as shown above. The **LAN Address Configuration** screen appears.

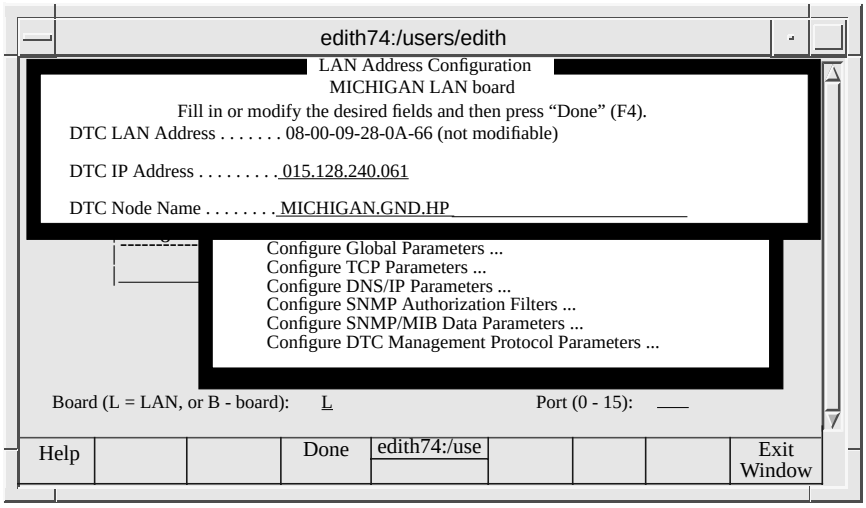
2 Enter the appropriate address information in the provided fields (see the following pages for parameter definitions).

3 When you have finished entering values, press the **Done (F4)** function key. You are returned to the **Rear Panel Configuration** screen.

4 The parameters in this screen cannot be modified dynamically. Exit from **dtcconfig** and download the changes to the DTC by executing the following command at the shell prompt:

```
dtcreset dtcname
```

LAN Address Configuration screen



LAN address parameter definitions

DTC IP Address

Enter a value in the form *xxx.xxx.xxx.xxx* where *xxx* is a decimal number from 0 through 255. The address cannot be 0.0.0.0 or 255.255.255.255 which are reserved addresses. Assign a unique IP address to each DTC. (For more information on the DTC IP address, see Chapter 5).

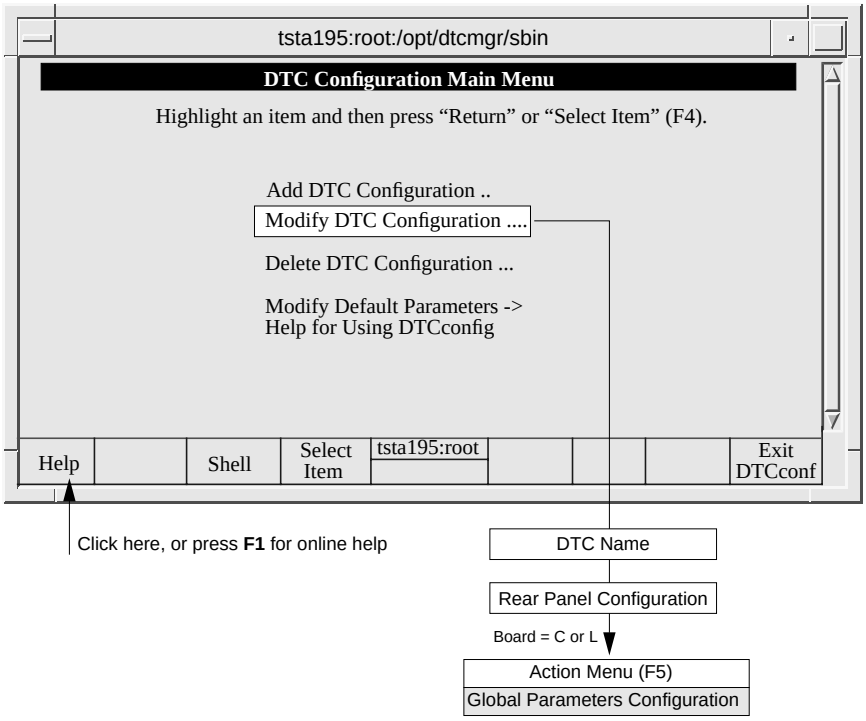
DTC Node Name

Enter a name consisting of three parts, each with a maximum of 16 characters, separated by periods (.) and in the following form:

```
nodename.domain.organization
```

For simplicity, the DTC name and the `nodename` portion of the DTC node name are often the same name. For example, the `dtcname` could be mydtc1 and the DTC node name could be `mydtc1.mysys.mycorp`.

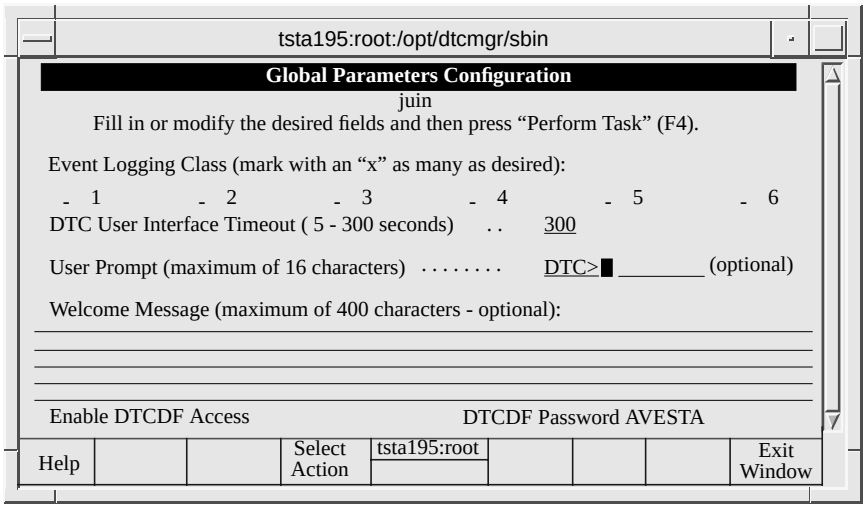
Configuring global parameters



The parameters in the **Global Parameters Configuration** screen enable you to specify the DTC user interface timeout, the DTC user prompt, and the DTC welcome message. These parameters are used by the DTC terminal user interface (described in appendix A).

Enter the appropriate values in the provided fields and then press the **F4** key.

Global Parameters Configuration screen



Global parameter definitions

Event Logging Class

Move the cursor to the logging class fields whose corresponding events you want to log. The **dtclist** command is used to display the event logs (see Appendix B).

Note

Only use log events of class 2 (and higher) for:
- troubleshooting
- one DTC at a time

The logging classes for events are as follows:

- Class 1—Catastrophic (default logging class)
- Class 2—Critical
- Class 3—Non-critical
- Class 4—Not Used
- Class 5—Informative
- Class 6—Statistical

Logging Class 1 is always selected and operational. Additional levels can also be logged by entering an **x** in the corresponding field.

Note

Currently, Logging Class 4 does not supply event information even if the field is marked.

DTC User Interface Timeout

Specify a timeout value between 5 and 300 seconds for the DTC. The default timeout is 300 seconds. A terminal user using the **connect** command to connect to a system via the DTC must attempt to connect to the system within this amount of time.

The DTC waits this amount of time before the DTC Terminal User interface is disconnected. Once the terminal has established a connection with a system via the DTC, the timeout is disabled until the user returns to the DTC user interface.

The **DTC User Interface Timeout** can be enabled and disabled from the **Enable Port Options** screen (see “Enabling port options” on page 99). By default, the **DTC User Interface Timeout** is disabled.

User Prompt

If you want a user prompt that is different from the default prompt, **DTC>**, specify a prompt of up to 16 alphanumeric characters. Non-displayable ASCII characters must be specified in caret-character format (for example, **^K** means **Ctrl-K**). Use a backslash before a literal caret (^) and a backslash (\).

The User Prompt is the DTC prompt seen by a user at a terminal connected to a DTC. You may want to change the user prompt to the name of your DTC (for example, **MYDTC1>**) to help you keep track of your DTCs. Only users connected to ports with the switching capability see the prompt. Other users connected directly to a host system do not see the DTC user prompt.

Switching is the ability to connect to more than one computer from a terminal. Switching is automatically enabled for all terminal ports.

Welcome Message

If you want to provide a welcome message, enter up to 390 alphanumeric characters. Non-displayable ASCII characters must be specified in caret-character format (for example, **^K** means **Ctrl-K**). Put a backslash (\) before a literal caret (^) or a backslash (\) to ensure these characters appear correctly on the screen. The welcome message is an optional parameter.

Do not use the keyboard **Enter** key (carriage return) to create line breaks in the welcome message. Using the **Enter** key terminates the DTC configuration steps. Use the **^M^J** (**Ctrl-M**, **Ctrl-J**) keys to force the text onto the next line.

The welcome message is the message displayed on a terminal connected to a DTC when

- a terminal user opens a connection to a port configured for system switching
- a terminal user connected to the DTC user interface issues the “status command”

Only users connected to ports with switching capability see the welcome message. The welcome message is not displayed when a user switches back from a system connection to the DTC user interface.

Enable DTCDF Access

This field enables a Hewlett-Packard support engineer to access DTC memory for troubleshooting. Access is protected by a password. Put an **X** or an **x** in this field to enable a Hewlett-Packard support engineer access your DTC and to format DTC memory dumps.

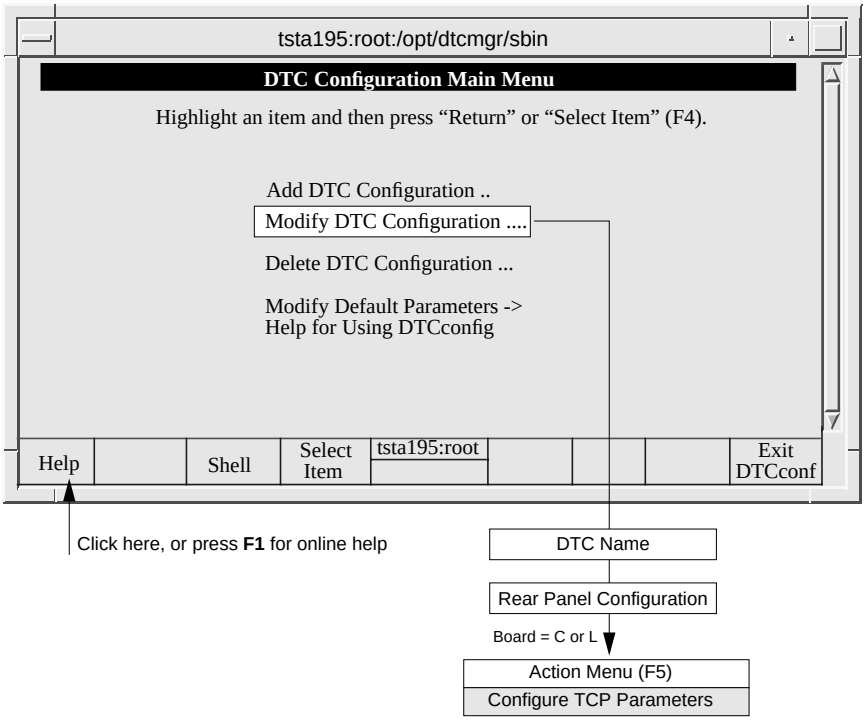
The default setting is so that Hewlett-Packard cannot access your DTC.

DTCDF Password

This field contains the password you must give to your Hewlett-Packard support engineer to allow access to DTC memory for troubleshooting.

Enter up to eight alphanumeric characters as the DTCDF password. The initial setting is **AVESTA**.

Configuring TCP parameters



The **Configure TCP Parameters** screen is used to specify TCP timing information for different LAN and extended LAN configurations.

1 Use the **TAB** key to move to a set field. Place an **x** or **X** to choose the set. The timer values are defined by the set of values that you choose (see “The five sets of TCP values” on page 73).

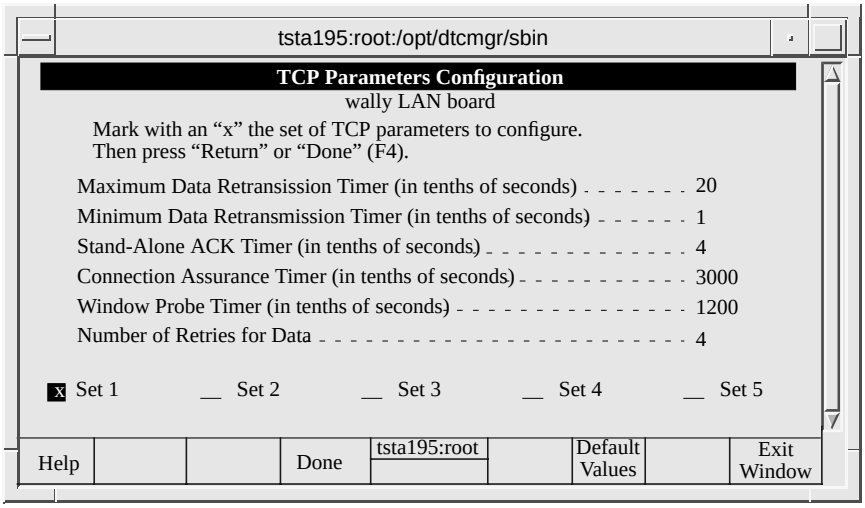
- **Set 1**—(the HP Default setting) for traffic over the LAN only.
- **Set 2**—for traffic over a LAN with bridges.
- **Set 3**—for traffic over a LAN with exceptionally high transmission times.
- **Set 4**—for networks with high data losses.
- **Set 5**—for extended switching applications over a LAN, or a LAN with bridges.

2 Press the **Done (F4)** function key to return to the **Rear Panel Configuration** screen.

3 The TCP parameters cannot be modified dynamically. Exit from **dtcconfig** and download the changes to the DTC by executing the following command at the shell prompt:

```
dtcreset dtcname
```

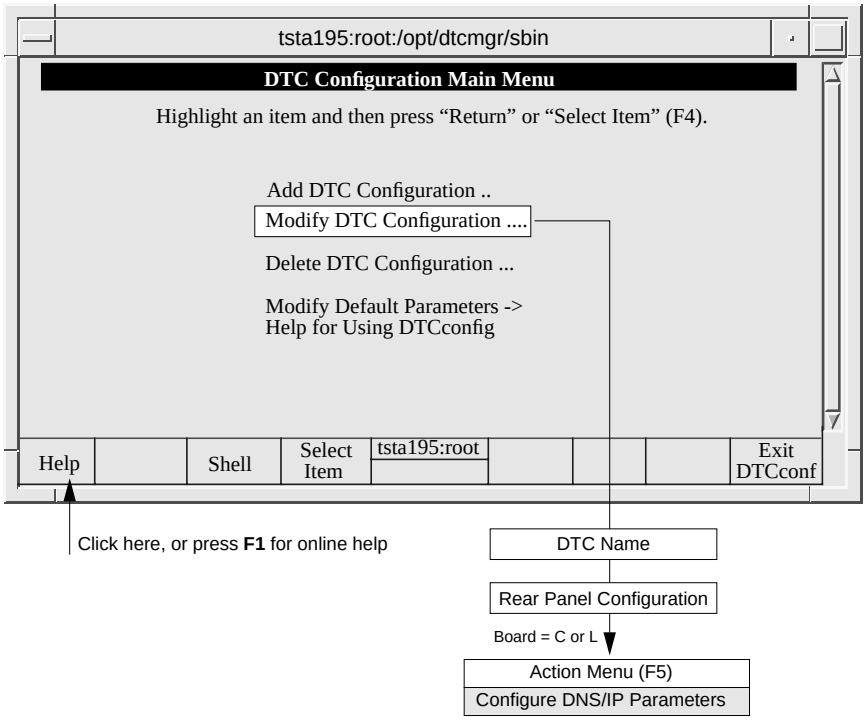
TCP Parameters Configuration screen



The five sets of TCP values

TCP Parameter	Set 1	Set 2	Set 3	Set 4	Set 5
Maximum data retransmission timer	20	100	200	200	50
Minimum data retransmission timer	1	3	5	5	1
Stand-alone acknowledgement timer	4	4	4	0	0
Connection assurance timer	3000	3000	3000	3000	3000
Window probe timer	1200	1200	1200	600	1200
Number of retries for data	4	6	6	10	6

Configuring DNS/IP parameters



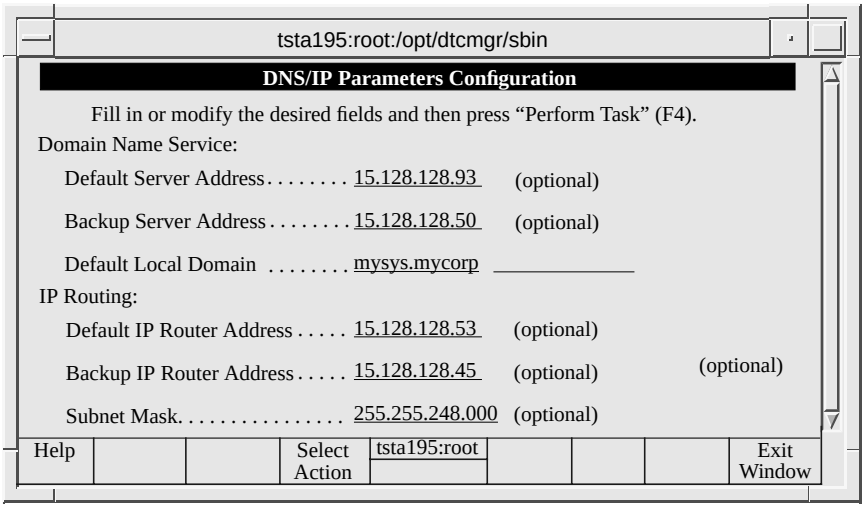
Use the **DNS/IP Parameters Configuration** to specify:

- the IP addresses for the DNS (Domain Name System) server
- the IP routing parameters

The DTC sends a DNS request to the DNS server whose IP address is specified. The DNS server returns the IP address of the requested system. If you specify the IP address of a system with the DTC **connect** command, DNS is not used.

The IP address format is *xxx.xxx.xxx.xxx* where *xxx* is a decimal number from 0 through 255. The IP address can be 0.0.0.0 but cannot be 255.255.255.255. The IP address is unique on the network. An *IP router* allows connections to nodes on different LAN networks. If an IP router is not defined, then connections cannot be made to systems outside the local subnet.

DNS/IP Parameters Configuration screen



Enter the appropriate values in the provided fields and press the **Perform Task (F4)** function key when you have finished. You are returned to the **Rear Panel Configuration** screen.

DNS parameter definitions

Default Server Address

Enter the IP address of the default server you want to use. A DNS server resolves system names to IP addresses for the entire network. For example, if you are at a terminal, you can enter the DTC **connect** command with a system name instead of an IP address:

```
DTC>  connect  host1.hp.com
```

Backup Server Address

Enter the IP address of the DNS server to be used if the default DNS server is not available.

Default Local Domain

Enter the default local domain that you want to use. The DTC uses the specified local domain name to complete the Domain node name when necessary. If a terminal user enters a node name without a period, the DTC will complete the node name with the default local domain name. For example, if the **Default Local Domain** is `hp.com` and a terminal user enters:

```
DTC> connect host1
```

the DTC will try to connect to `host1.hp.com`.

IP Routing parameter definitions

Default IP Router Address

Enter the IP address of the default router. The router routes outbound packets for destinations which are not part of the local subnet.

Backup IP Router Address

Enter the IP address of the router to be used if the default IP router is not available.

Subnet Mask

Enter the subnet mask for this network. The subnet mask has an IP address format of *xxx.xxx.xxx.xxx* where *xxx* is a decimal number between 0 and 255. It must have 255 in the first field. The subnet mask is an optional parameter.

The subnet mask provides a way to expand the network part of the IP address. The subnet mask is used by IP to check if the datagram should be sent to the destination without routing, or routed to a different destination network or subnetwork.

About subnets

A subnet is a portion of a network defined as a separate network. The subnet mask specifies how much of the address to reserve for subdividing networks into subnetworks. What defines a subnet is that **all** the bits in the IP address specified by the subnet mask (that is all the bits set to 1 in the subnet mask) are the same for all IP addresses in that subnet.

Example: If the subnet mask is:

```
255.255.255.224        (1111 1111 1111 1111 1111 1111 1110 0000)
```

then the right-most 5 bits of any address on the subnetwork indicate a node address.

Configuring SNMP parameters

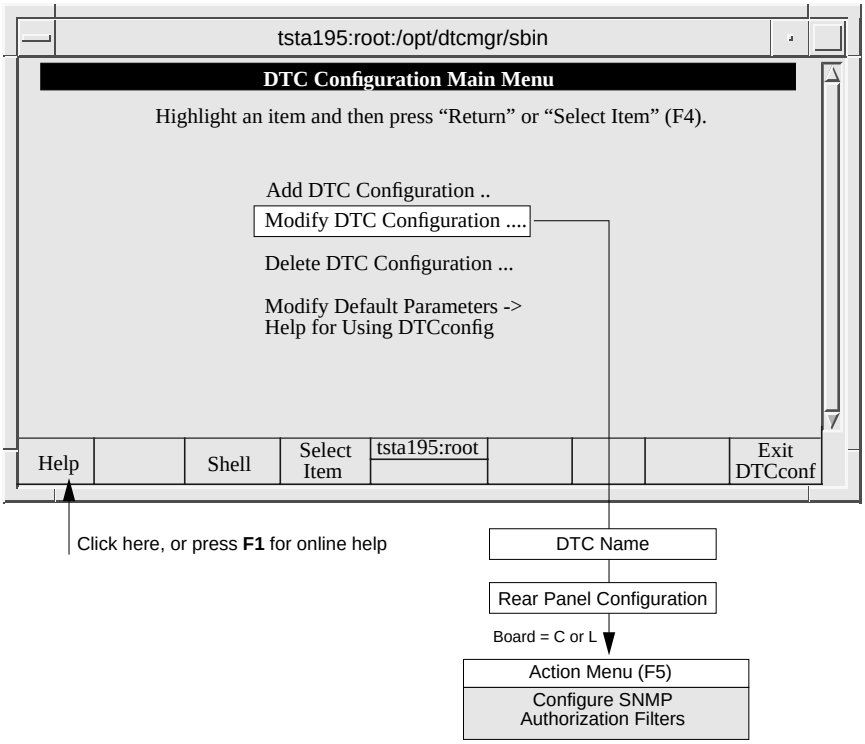
SNMP is an open-systems standard that allows a DTC to be interrogated by any authorized SNMP network management workstation, for example a workstation running HP OpenView Network Node Manager. Security is provided by authorization filters which list the network management workstations that are allowed to access the DTC.

The SNMP information about the DTC is stored in a MIB (management information base). For example, the MIB contains information such as the physical location of the DTC and whether the DTC should report unauthorized access attempts to the SNMP manager. Two types of MIB are available: MIB-II allows the SNMP manager to access the standard MIB objects; DTC MIB allows the SNMP manager to access the standard MIB objects as well as HP-UX MIB objects.

DTC Manager's **dtcconfig** utility provides two screens for SNMP configuration:

- **Configure SNMP Authorization Filters**—identifies the SNMP managers, the information that can be requested and whether the managers have write access to the SNMP MIB data.
- **Configure SNMP/MIB Data Parameters**—defines the SNMP-specific data to be stored on the DTC.

Configuring SNMP authorization filters



The **Configure SNMP Authorization Filter Configuration** screen enables you to:

- configure up to five SNMP filters
- define the SNMP manager(s) and the data they can request
- authorize write access to the SNMP MIB data

Use this screen to enter parameter values and then press the **Perform Task** (F4) function key to return to the **Rear Panel Configuration** screen.

SNMP authorization filter parameter definitions

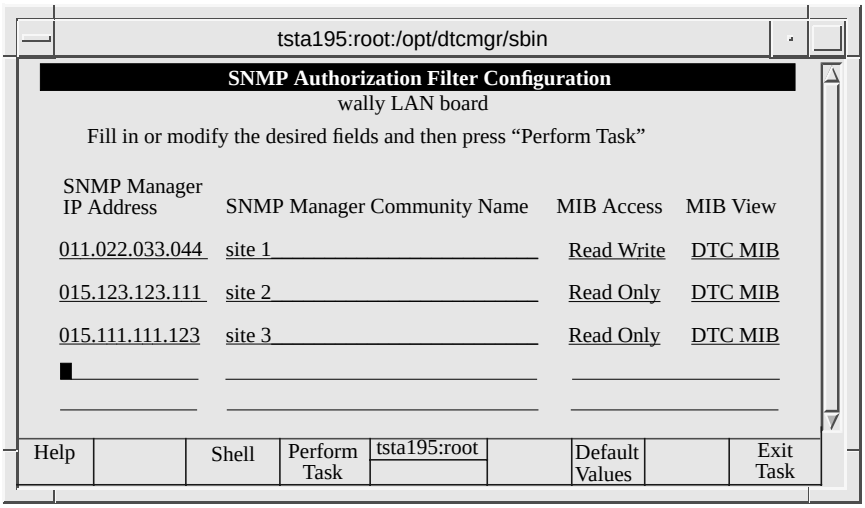
SNMP Manager IP Address

Enter the IP address of an SNMP manager that can monitor and control the DTC as an SNMP network element.

A value of 0.0.0.0 in this field means that any SNMP manager that has the same community name as the community name corresponding to this IP address can access this DTC's MIB parameters.

The IP address 255.255.255.255 is not valid in this field.

SNMP Authorization Filters Configuration screen



SNMP Manager Community Name

Enter the name of the SNMP community to which the DTC belongs (all ASCII characters are valid).[1]

MIB Access

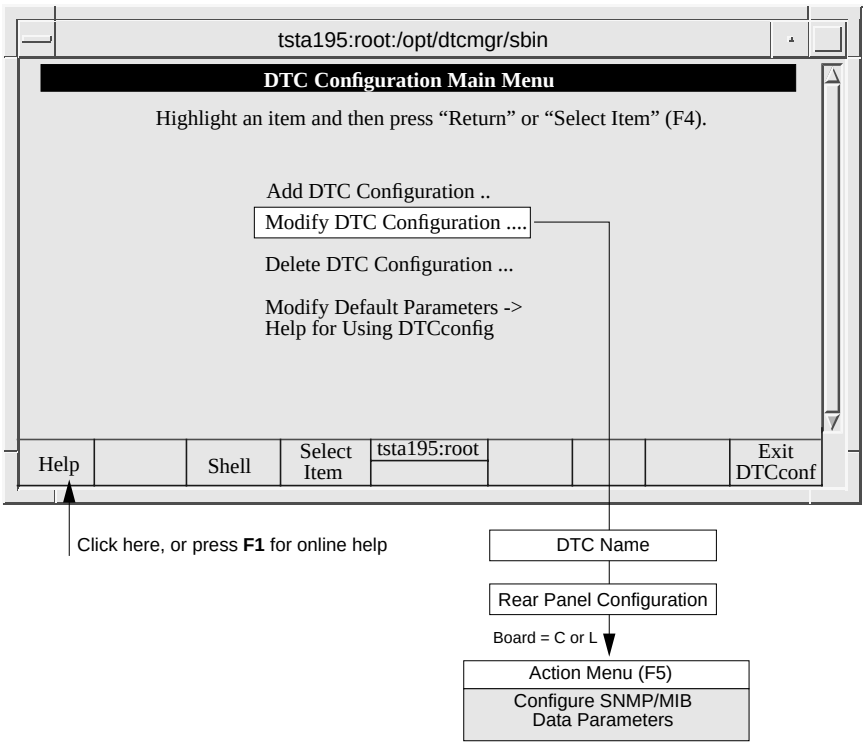
Choose **Read & Write** or **Read Only**. These values determine the access rights of the SNMP manager to the SNMP parameters of the DTC.

MIB View

Choose **DTC MIB** or **MIB-II**. These values determine the subset of MIB objects that the SNMP manager can access. Selecting DTC MIB enables the SNMP manager to access both the SNMP MIB-II and HP-UX MIB objects.

1 If two SNMP authorization filters have the same SNMP manager community name they must also have the same MIB access and MIB view values.

Configuring SNMP MIB data



The **Configure SNMP/MIB Data Configuration** screen is used to specify the SNMP-specific data to be stored on the DTC. This data can only be configured on the DTC after a hardware reset and can be modified by an authorized SNMP manager workstation after initial download.

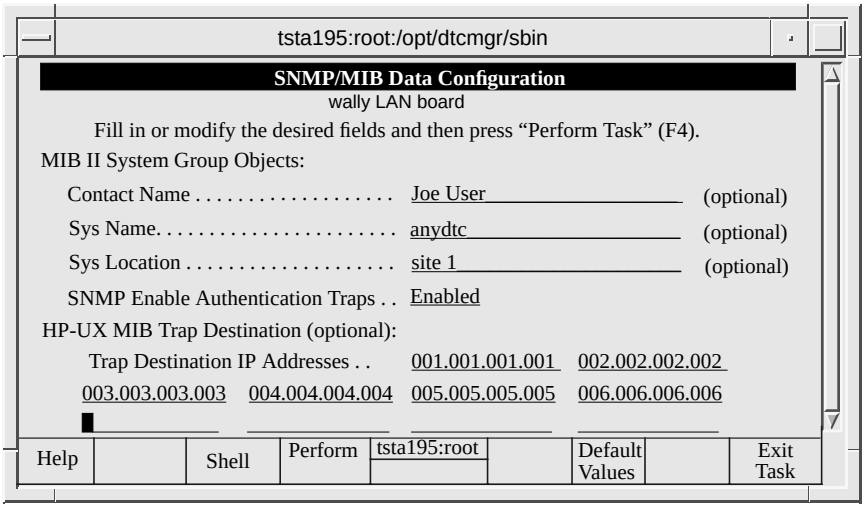
1 Use this screen to enter SNMP data values and then press the **Perform Task (F4)** function key to return to the **Rear Panel Configuration** screen.

2 You must reset the DTC when you modify these SNMP parameters.

3 Exit from **dtcconfig** and reset the DTC by typing the following command at the shell prompt:

```
dtcreset dtcname
```

SNMP/MIB Data Configuration screen



SNMP parameter definitions

Contact Name

Enter up to 255 ASCII characters. Contact the SNMP manager of your network to find the name of the contact person to enter for this DTC. This optional field can include information on how to contact the person as well as a name.

Sys Name

Enter up to 255 ASCII characters if you want to use this optional field. Contact the SNMP manager of your network to find the system name you should enter here. This name will be used to identify the DTC as an SNMP node and is by convention the same as the DTC node name.

Sys Location

Enter up to 255 ASCII characters to specify the physical location of the DTC. This is an optional field.

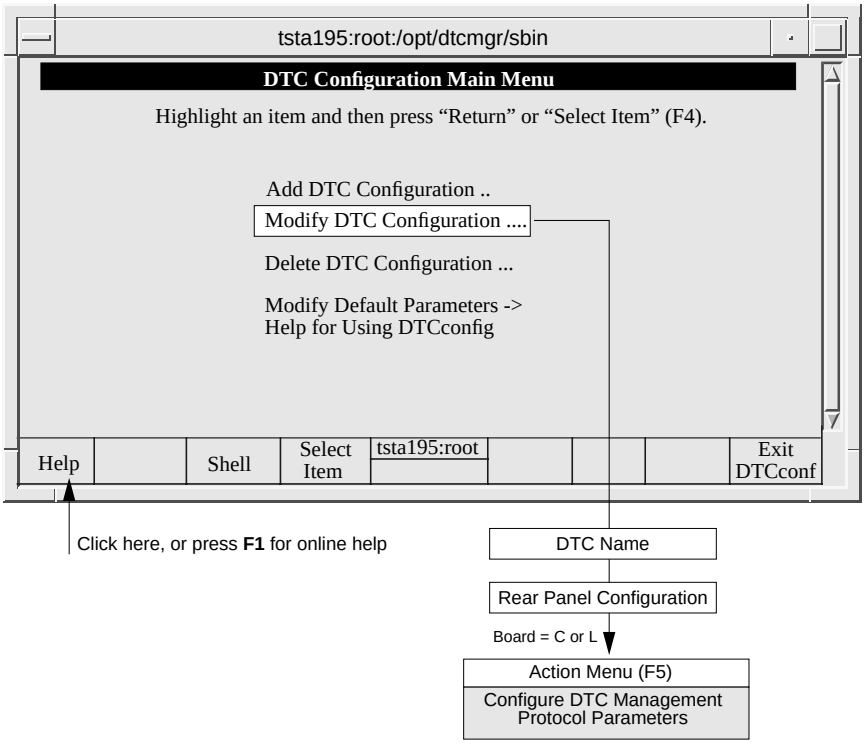
SNMP Enable Authentication Traps

Set this optional field to **Disabled** or **Enabled.** Enabled means that the SNMP process agent of the DTC can generate authentication failure traps.

Trap Destination IP Address

Enter the IP addresses (non-broadcast) that designate the SNMP network management stations on the network to which the DTC will send SNMP traps. If no trap destination IP addresses are entered, the DTC will not generate any SNMP traps.

Configuring DTC management protocol parameters



The **Configure DTC Management Protocol Parameters** screen is used to specify DTC timing information for different LAN configurations.

1 Place an **x** or **X** to choose the set. The parameter values are defined according to the set that you choose. These values are shown in table on the following page.

2 Set 1—HP default. Parameters designed for traffic over a LAN only.

Set 2—Parameters designed for traffic over a LAN with bridges.

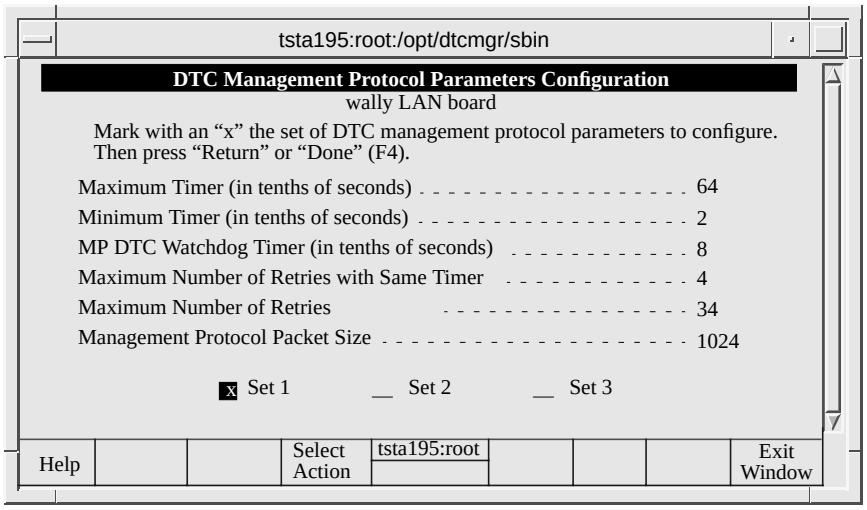
Set 3—Parameters designed with alternative values for traffic over a LAN with bridge.

3 When you have finished entering values, press the **Done (F4)** function key. You are returned to the **Rear Panel Configuration** screen.

4 The DTC management parameters can not be modified dynamically. Exit from **dtcconfig** and reset the DTC by executing the following command at the shell prompt:

`dtcreset` *`dtcname`*

Management Protocol Parameters Configuration screen



DTC management protocol timer sets

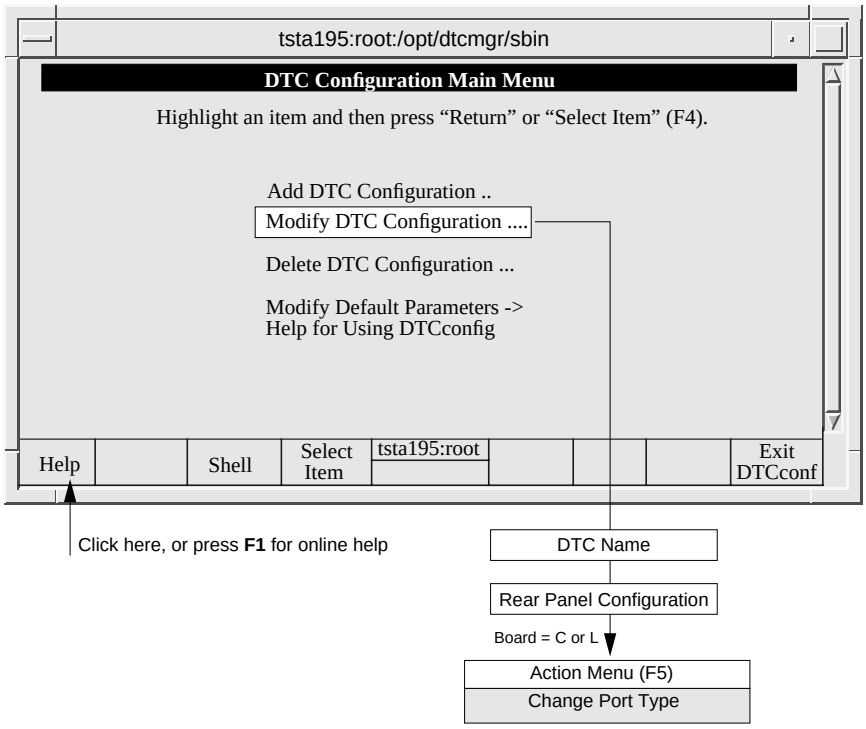
DTC Management Protocol Parameter	Set 1	Set 2	Set 3
Maximum Timer (tenths of a second)	64	224	256
Minimum Timer (tenths of a second)	2	14	8
HP DTC Watchdog Timer (tenths of a second)	8	8	8
Maximum Number of Retries with Same Timer	4	3	3
Maximum Number of retries	34	15	18
Management Protocol Packet Size	1024	512	256

Configuring DTC ports with dtcconfig

This chapter describes how to configure a port for the requirements of an attached device. For example, if you want a printer on a certain port, you must ensure that the port is set to be a printer port.

Configuring the port type

You can change a terminal port to a printer port (or vice versa) using the **Change Port Type** option which you access via the **Action Menu** as illustrated below.



The steps are as follows:

1 Enter the board and port numbers at the **Rear Panel Configuration** screen.

2 Press the **Action Menu (F5)** function key and select **Change Port Type**.

The **Change Port Type** screen appears.

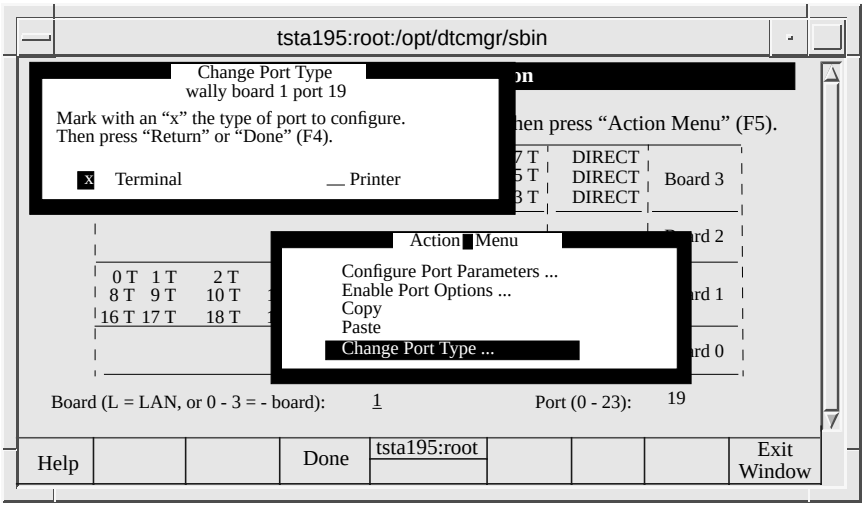
3 Indicate a printer or terminal port type by entering an **x** or **X** in the appropriate field and press **Return** or the **Done (F4)** function key.

Note

Change Port Type copies in the default port settings for the specified port type (terminal or printer) when it is used. Therefore, any data that was in the port configuration will be lost.

4 You can configure another board and port or exit from this **Rear Panel Configuration** screen.

The Change Port Type screen



Configuring terminal and printer ports

Once a port has been configured, this configuration can be copied and pasted to other ports as described in chapter 9.

To modify several DTCs simultaneously, use the **dtcmodifyconfs** command as described in chapter 10.

Note

For the purposes of the procedures described in this chapter it is presumed that you have added at least one DTC to the configuration and that it has at least one board in it. It is also presumed that you are familiar with the basic use of the **dtcconfig** menus and function keys as described in chapter 4.

Any changes you make to the port parameters take effect immediately. You do not need to download the DTC. However, if any terminal users connected to the DTC are running sessions, they will not see the changes until they close the current sessions and start new sessions.

Configurable port parameters

The following port attributes are covered in this chapter.

- **Port Parameters** are listed below and explained in the section see “Configuring terminal and printer port parameters” on page 91.
  - Terminal or Printer Name or IP address
  - Line Speed
  - Attached Device
  - Bits Parity (called “Parity” in version A.14.29)
  - Number of Stop Bits (applies to version A.14.2C and later versions)
  - Modem Behavior (for modem ports)
  - Data Transfer Mode (applies to version A.14.2C and later versions for terminal ports)
  - Escape from Data Transfer character (for terminal ports)
  - Maximum Number of Sessions (for terminal ports)
  - Number of Systems Sharing Printer (for printer ports)
  - Default Destination
  - Initialization string
- **Port Options** are listed below and explained in the section see “Enabling port options” on page 99.
  - Enable Auto Speed/Parity Sensing (for terminal ports)
  - Enable DTC User Interface Timeout (for terminal ports)
  - Enable Port
  - Enable Switching (for terminal ports)
  - Enable Dedicated Printer (for printer ports)
  - Enable Automatic Connection (for modem ports)
  - Enable Hardware Handshake (for DTC 72MX and DTC 16TN)
  - Enable Keep Alive (applies to version A.14.2C and later versions)
  - Enable Flow Control (applies to version A.14.2C and later versions)
  - Enable Port Config Saved In Binary (applies to version A.14.2C and later versions)

Configuring a port

1 Select **Modify DTC Configuration** from the **dtcconfig** main menu.

A pop-up window asks you for the name of the DTC whose configuration you want to modify.

2 Type in a DTC name or press **F1** and select a DTC from the list of existing DTCs. Press **Return** or the **Select Item (F4)** function key.

The **DTC Rear Panel Configuration** screen appears.

3 In the **Rear Panel Configuration** screen, enter the board number to configure.

4 Use the arrow key to go to the port field and enter a port number according to the DTC type:

- 0 through 15 - direct connect or modem ports for DTC 16TN
- 0 through 7 - direct connect ports for DTC 16 and DTC 48
- 0 through 5 - modem ports for DTC 16 and DTC 48
- 0 through 23 - direct connect or modem ports for DTC 72MX

5 Press the **Action Menu (F5)** function key and select one of the listed tasks.

You are taken to the appropriate screen to enter new port values. The screen and the information you provide for each task varies depending on the type of board (direct-connect or modem) and type of port (printer or terminal) you have chosen to configure.

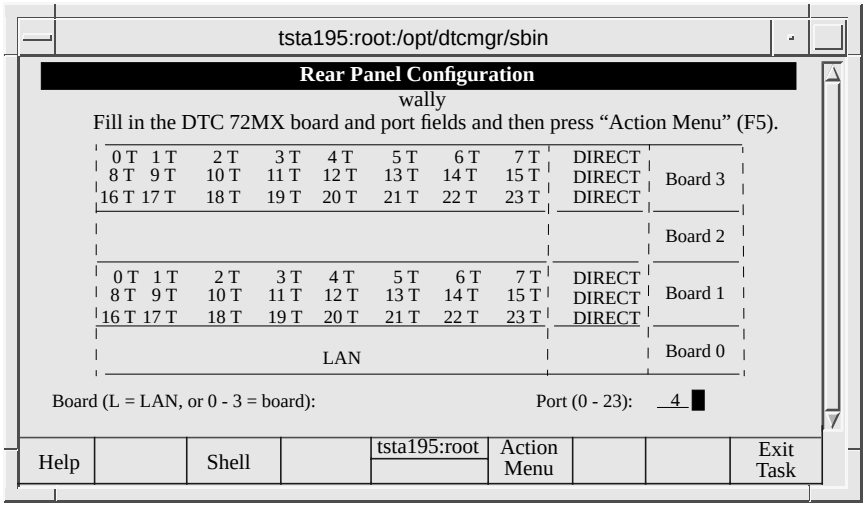
The port configuration screen displays the current defaults being used. The **Configure Port** screen and **Enable Port Options** screen allow you to choose **HP Defaults**, **User Defaults**, or enter other values.

The screens are described in the rest of this chapter.

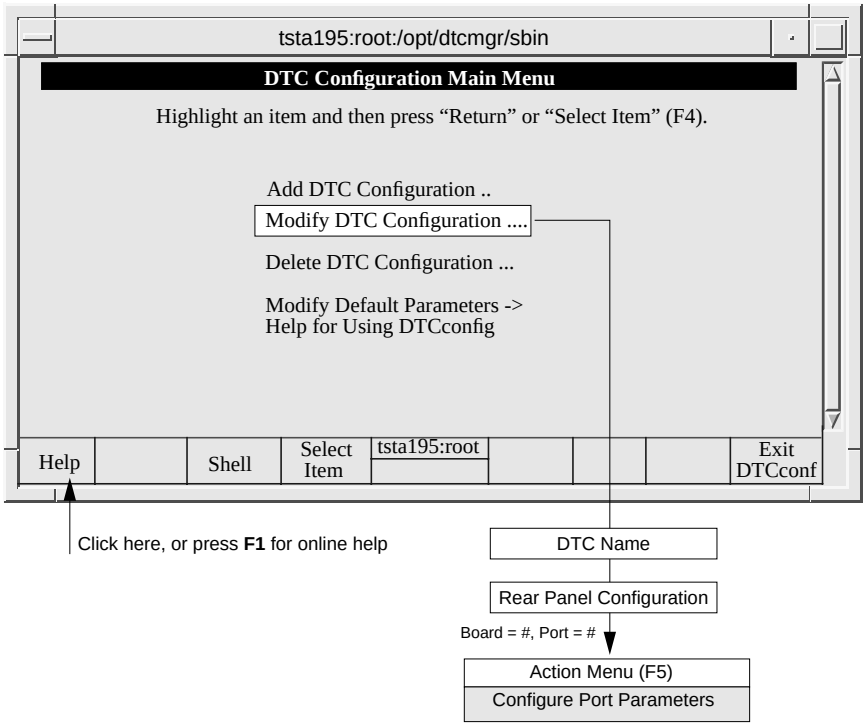
6 When you have finished making your changes, return to the **Rear Panel Configuration** screen.

7 You can configure another board and port or press **F8** to exit the **Rear Panel Configuration** screen and return the **dtcconfig** main menu.

Example of a modified port: Board 3, Port 4



Configuring terminal and printer port parameters

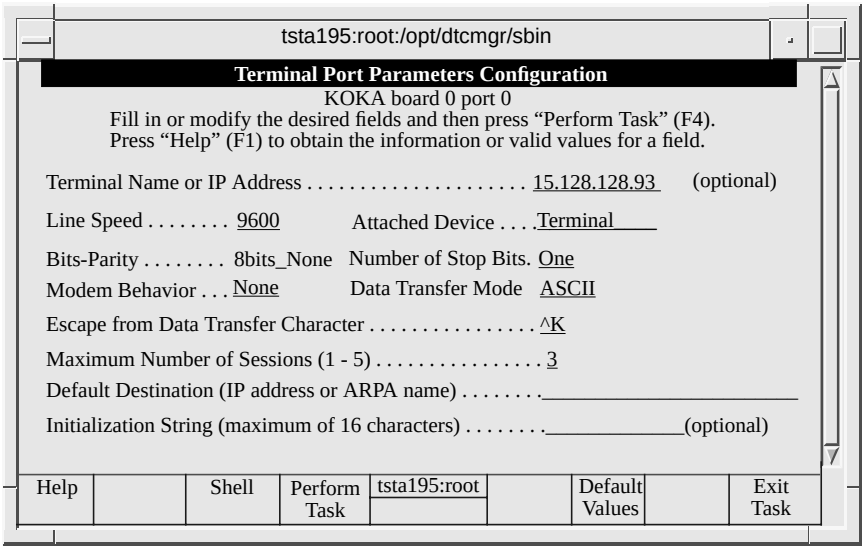


1 Use the **dtcconfig** utility **Action Menu** to access either the **Terminal Port Parameters Configuration** screen or the **Printer Port Parameters Configuration** screen (shown on the following page).

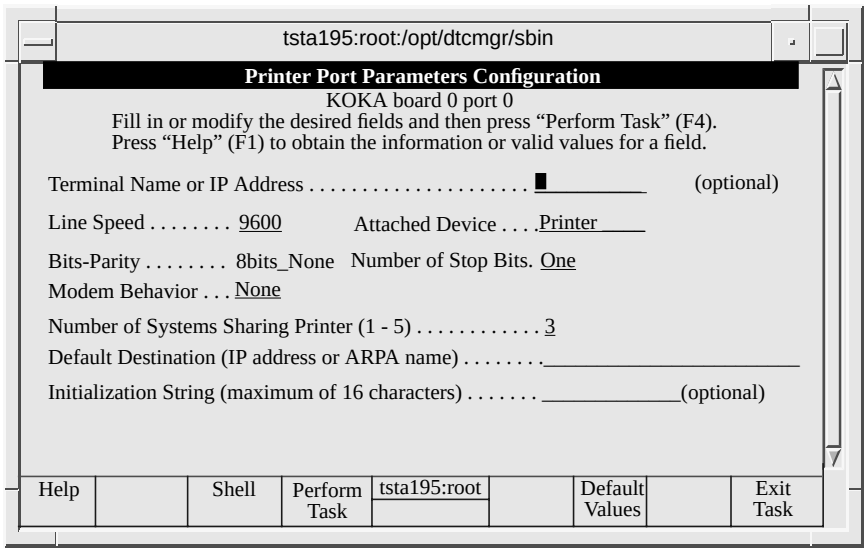
2 Use the configuration screen to enter the appropriate parameter values (the parameters are described on the following pages).

3 When you have finished entering values **F4** to return to the **Rear Panel Configuration** screen.

Terminal Port Parameters Configuration screen



Printer Port Parameters Configuration screen



Terminal and printer port parameter definitions

Terminal/Printer Name or IP Address

Enter up to 16 alphanumeric characters or an IP address in this field. The characters can include hyphens (-) and underscores (_). The first character **must** be alphabetic. This is an optional field that has no value by default.

By entering a name or IP address, you are naming or labeling the port, not the device attached to it. If you disconnect the device and connect it to another port, the device is associated with the name or IP address of the other port. If you want the device to retain its name or IP address, you must reconfigure the ports accordingly.

Some key points to consider about using a port IP address:

- The port IP address must be on the same subnet as the DTCs IP address.
- If there is a port IP address for outgoing connections, it is used as the calling address.
- If there is no IP address for the port, the DTCs IP address is used.
- You cannot use same port IP address for more than one DTC pooled port. Be careful about the IP address when you copy and paste boards.
- The per port IP address feature can be used with the Telnet port identification feature and the DTC Device File Access Utilities (DDFA). The port IP address can be associated with a specific **pty** device file name. Together, these features can be used to provide a pool of ports or identify a specific printer port to the HP-UX spooler. DDFA is part of Internet Services. Refer to the DDFA documentation for more information.

Line Speed

Set the line speed to correspond to the line speed of the attached device. To select a line speed, press the **Help (F1)** function key and a list is displayed. Line speed choices are **300**, **1200**, **2400**, **4800**, **9600**, **19200**, and **38400** bits per second. Highlight your choice and press **Return** or the **Select Item (F4)** function key.

The line speed default is 9600 baud. The 38400 bits per second speed applies only to the DTC 16TN and DTC 72MX.

Attached Device

Select the type of device physically attached to the port. This adapts the port behavior to the requirements of the physically-attached device. To select the device, press the **Help (F1)** function key and a list is displayed. Highlight your choice and press **Return** or the **Select Item (F4)** function key.

Please refer to the *HP DTC Technical Reference Manual* (5961-9820)

The choices are as follows.

- **Terminal—**the default for direct connect and modem terminal ports
- **Printer—**the default for direct connect and modem printer ports
- **HP 2334/35 Multiplexer**
- **US Modem—**for a modem port with modem behavior set to **Standard DCE**, **DCE High**, or **DTE** (see “Modem Behavior” on page 95).
- **European Modem—**for a modem port with modem behavior set to **Standard DCE**, **DCE High**, or **DTE**.
- **Data Switch**
- **US Modem IN OUT**
- **EU Modem In OUT**
- **Five Wires Modem**.

Bits Parity

Bits parity allows you to select the data length (not including start and stop bits) and the parity you want to assign to the port. Data length is also known as number of bits per character; these bits determine the number of received serial bits assembled to form a character.

The possible values are :

7 bits data length with parity even
7 bits data length with parity odd
7 bits data length with parity forced to 0
7 bits data length with parity forced to 1
8 bits data length with parity none
8 bits data length with parity even
8 bits data length with parity odd

A setting of **8 bits data length with parity none** is used by default.

Number of Stop Bits

This setting determines the number of stop bits to be used for asynchronuous characters. Possible values are :

1 stop bit
2 stop bits

The **2 stop bits** option could be required for specific device, such as a bar code reader. The setting **1 stop bit** is used by default.

Modem Behavior

If you have selected a direct connect port, modem behavior is not used and should be set to **None**. The default is **None**.

Please refer to the *HP DTC Technical Reference Manual* (5961-9820) for simple modem support.

If you have selected a port on a modem board or port group, select modem behavior by pressing the **Help (F1)** function key. A list is displayed. Highlight your choice and press **Return** or the **Select Item (F4)** function key.

The DTC checks device modem signals and sets up its own modem signals. You may want to enable the automatic connection port option for this port. If enabled, the DTC will establish a connection to the default destination as soon as it senses modem signal activity. See “Default Destination (IP Address or Internet Name)” on page 97. and see “Enable Keep Alive” on page 103.

Terminal modem ports

- **None—**use for a directly-connected terminal
- **Standard DCE—**use for a terminal connected to the DTC port via a modem/multiplexer
- **DCE high—**use for a terminal connected to a DTC 16TN or DTC 72MX port via a modem/multiplexer, and where you need an indefinite time-out before pressing **Return** to connect to the DTC user interface
- **DTE—**use when the connection to the terminal is initiated by the host

Printer modem ports

- **None—**use for a directly-connected printer.
- **Standard DCE—**use for a modem-connected printer, where a link is made at the device.
- **DCE high—**use for a terminal connected via a modem/multiplexer.
- **DTE—**use when the connection to the terminal is initiated by the host.

Data Transfer Mode

Specifies the data transfer mode to be used when opening the connection on the port. Possible values are :

ASCII
BINARY

If **BINARY** is used, the DTC does not detect special characters received from the device; all received characters from the device are sent to the system without interpretation.This is also known as *transparent mode*.

The setting **ASCII** is used by default.

Escape From Data Transfer Character

Enter the ASCII character you want to use as the escape character that signals when to escape from the data transfer process. Non-displayable ASCII characters are specified in caret-character (^character) format. The literal caret (^) and backslash (\) are escaped with a backslash. This field must be filled. The default escape (from data transfer) character is **^K (Ctrl-K)**.

The escape from data transfer character is used at a terminal to switch from the host system to the DTC terminal user interface. This value applies only to terminal ports for which switching is enabled (see “Enable Switching” on page 102).

If switching is enabled when the DTC is configured, you can logon to a terminal. Press any key on the terminal to get a DTC prompt. You can then logon to your system. Later, if you wish to leave your system but not log off, you enter the escape from data transfer character (**Ctrl-K**). You see the DTC prompt again and can enter a DTC user terminal interface command. You can even connect to another system. The number of systems you can connect to is determined by the **Maximum Number of Sessions**.

Maximum Number of Sessions

Specify a value between 1 and 5. The maximum number of sessions is the greatest number of system connections allowed on a terminal at any one time. This value applies only to terminal ports for which switching is enabled.

The default is 3 sessions per port.

Number of Systems Sharing Printer

Specify a value between 1 and 5. This field applies only to printer ports for which the dedicated printer is disabled. The number of systems sharing printer is the greatest number of systems able to use the printer port at any one time.

The dedicated printer option is enabled or disabled from the **Enable Port Option**s menu. By default, the dedicated printer option is disabled.

The default is 3 systems sharing a printer.

Total number of sessions and shared printers

	DTC 16TN	DTC 16	DTC 48	DTC 72MX
Maximum number of sessions	5 x 16 =80	5 x 16=80	(6 x 8)+40=88	5 x 72 = 360
Printer sharing	5 x 16 = 80	5 x 16=80	(6 x 8)+40=88	5 x 72 = 360

Default Destination (IP Address or Internet Name)

Enter one of the following in this field.

- Nothing—no system is identified (this is the default).
- The Internet Services node domain name—any number of non-empty fields separated by periods (.). Each field may contain alphanumeric characters and hyphens (-).
- An IP address.

The **Default Destination** field specifies the system for the device connected to the port. How you define the **Default Destination** depends on the type of device and the port options that are enabled or disabled.

Other Port Settings	Type of Port	What to Enter for "Default Destination"	Result
Switching disabled	Direct connect terminal	IP address of system or system name*	The DTC connects you to this system when it senses a carriage return at the terminal.
Switching enabled	Direct connect terminal	empty	You must type C followed by the IP address or name of the system to which you want to connect.
		IP address of system or system name*	If you type C, without specifying a system, you are connected to the default destination.
Automatic connection enabled	Modem terminal	IP address of system or system name*	The DTC connects you to this system when it detects modem or keyboard activity.
Dedicated printer enabled	Printer	IP address of system or system name*	The printer is only available to the "default destination" system.

* You can only use a system name here if a DNS server has been configured on the DTC

For information on switching, automatic connection, and dedicated printers, see "Enable terminal or printer port options parameter definitions" on page 101.

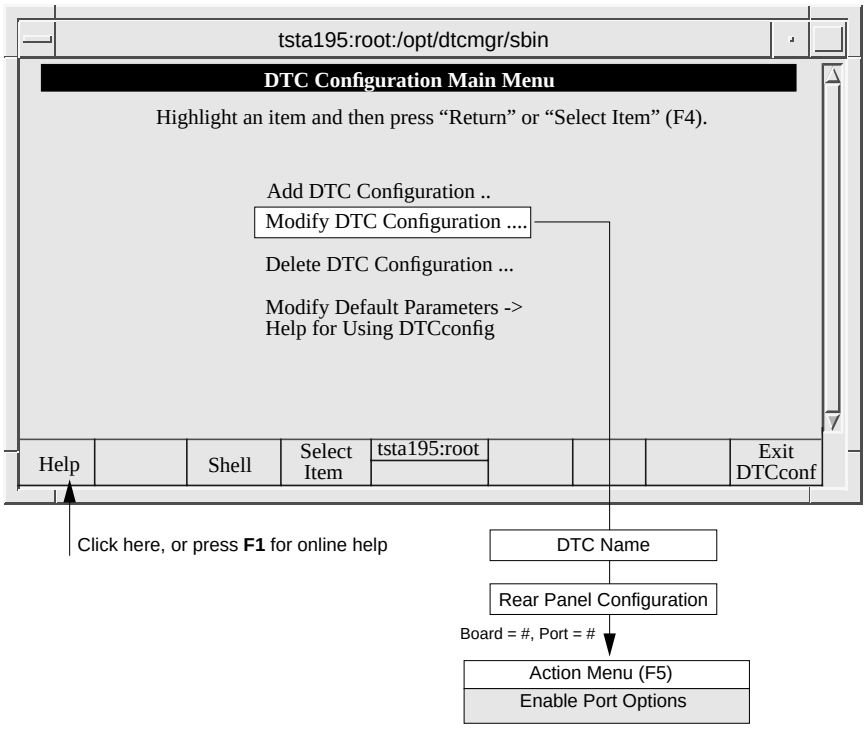
Initialization String

Enter up to 16 ASCII characters to specify the initialization string. Non-displayable ASCII characters are specified in caret-character (^character) format. For example, specify **^M^J** for **Ctrl-M** and **Ctrl-J**. The literal caret (^) and backslash (\) are escaped with a backslash. This field is optional and the default is empty.

If specified, the initialization string is the string to be sent to the connected terminal or printer port immediately after one of the following tasks:

- resetting a port
- closing a session on a host and returning to the DTC user interface
- logging into a system and typing the escape from data transfer character
- establishing a connection to the DTC user interface for modem connections: the initialization string is sent when all the modem signals are up.

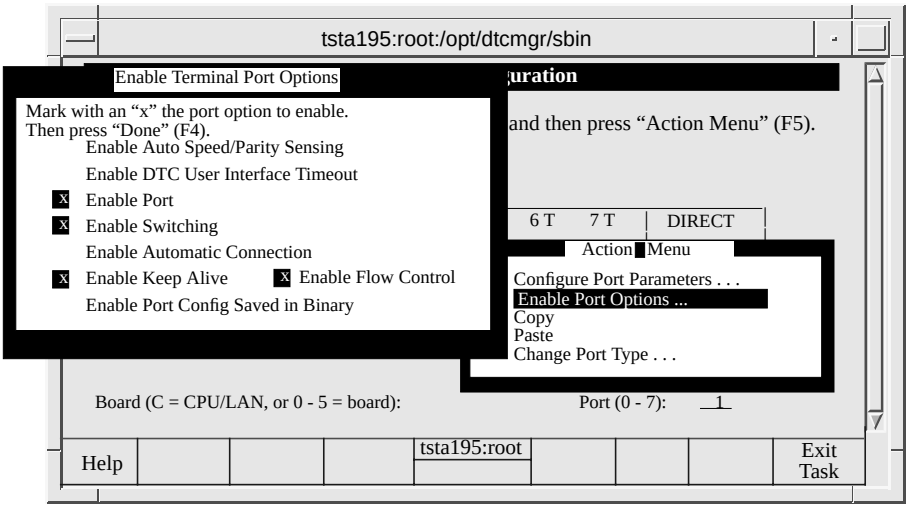
Enabling port options



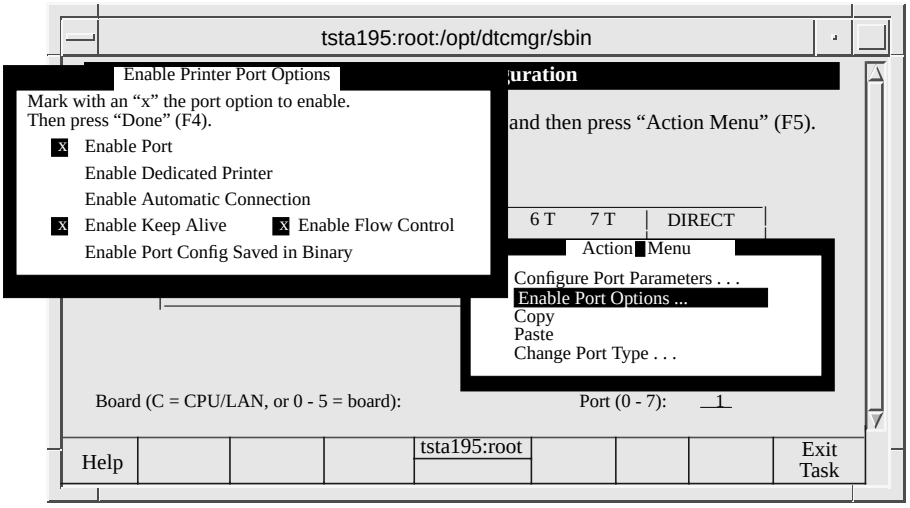
1 Use the **dtcconfig** utility **Action Menu** to access the **Enable Port Options** screen (as shown above).

2 Enter the appropriate values and press the **F4** to return to the **Rear Panel Configuration** screen.

Enable Terminal Port Options screen for a DTC 16TN



Direct Connect Printer Port Options: for a DTC 16TN



Enable terminal or printer port options parameter definitions

Enable Auto Speed/ Parity Sensing

Mark this box with an **x** or **X** to have the DTC check speed and parity. When a connection is set up by a terminal, the DTC automatically checks the speed and parity (none or even parity only). If necessary, the DTC reconfigures the port. Note that only **None** or **Even** parity settings are recognized; **Auto Speed/Parity** sensing does not work for any other terminal parity settings.

By default, **Auto Speed/Parity Sensing** is disabled and the line speed and parity settings you specified for the port are used.

Enable DTC User Interface Timeout

Mark this box with an **x** or **X** to have the DTC enable the **DTC User Interface Timeout**. When the **DTC User Interface Timeout** is enabled, the time that it takes the terminal user to connect to the DTC is monitored. The connection is automatically shut down if the DTC senses no activity at the DTC prompt for a predefined period.

This timeout is active only while the user is in the DTC user interface and applies only to users with switching enabled. Non-switching users do not see the DTC user interface, because they are connected directly to their designated host system.

Once the connection to a host system has been established, the DTC no longer monitors idle time.

By default, the **DTC User Interface Timeout** is disabled.

Enable Port

Mark this box with an **x** or **X** to enable a port. If this box is not marked, the port is disabled, and no communications can pass through.

By default, the port is enabled.

Enable Switching

Mark this box with an **x** or **X** to have the DTC enable the switching or connecting from the port to different systems. Each port can have switching enabled or disabled independently of the other ports on the board. Switching must be enabled for the terminal to access more than one system. If switching is enabled, the terminal user can connect to any system on the LAN by typing one of the following commands at the DTC prompt:

```
DTC>  connect IP address
```

or, if a DNS server is configured on the DTC, enter:

```
DTC>  connect system-name
```

The user is then connected to the specified system.

By default, switching is enabled. If switching is disabled, you can only connect to the default destination that is defined in the **Port Parameters Configuration** screen on page 92.

Enable Dedicated Printer

Mark this box with an **x** or **X** to enable a printer on this port to be available **only** to the system identified as the default destination. The default destination field is defined in the printer port parameter configuration screen.

If the dedicated printer option is enabled, the default destination port parameter must be defined with a system name or IP address. If you want several systems to access this printer, then disable the dedicated printer.

If the dedicated printer option is disabled and the default destination is defined, the default destination will not be accessible to the printer port.

By default, the dedicated printer is disabled.

Enable Automatic Connection

Mark this box with an **x** or **X** to enable automatic connection from this port to the system identified as the default destination. The default destination field must be defined in the **Port Parameters Configuration** screen. The connection is made as soon as the modem signal is emitted.

By default, automatic connection is disabled.

If you have set modem behavior to None in the modem port parameter configuration screen, the automatic connection option is not available to you.

Enable Hardware Handshake (DTC 72MX and DTC 16TN only)

Mark this box with an **x** or **X** to have the DTC enable hardware handshaking for a DTC 72MX or DTC 16TN. Hardware handshaking provides a way to control the flow of data between a terminal and the connected system.

By default, hardware handshaking is disabled. Hardware handshake is not available if attached device is set to **European Modem**.

Enable Keep Alive

When there is no data transfer between the DTC and the system, a mechanism called "keep alive" is activated to detect if the connection still exists.

To avoid extra traffic on the LAN, you can disable this function (the default setting)

Enable Flow Control

When enabled, the data flow between the DTC port and the device connected it is connected to is made with Xon/Xoff characters. This function is also known as "software handshake." This setting should be disabled if you do not want DTC to interpret Xon/Xoff characters coming from the device.

This setting is enabled by default.

Enable Port Config Saved In Binary

Specifies if the port configuration parameters **data length** and **parity** have to be forced when selecting binary mode (Telnet negotiation, user interface command). When enabled, the port configuration is used as is. When disabled, the port parameters of 8 bits for data length and parity forced to "none" are used as the port goes into binary mode.

This setting is disabled by default.

Configuring a DTC to enable a printer

This section describes how to configure a DTC for operation with an attached printer.

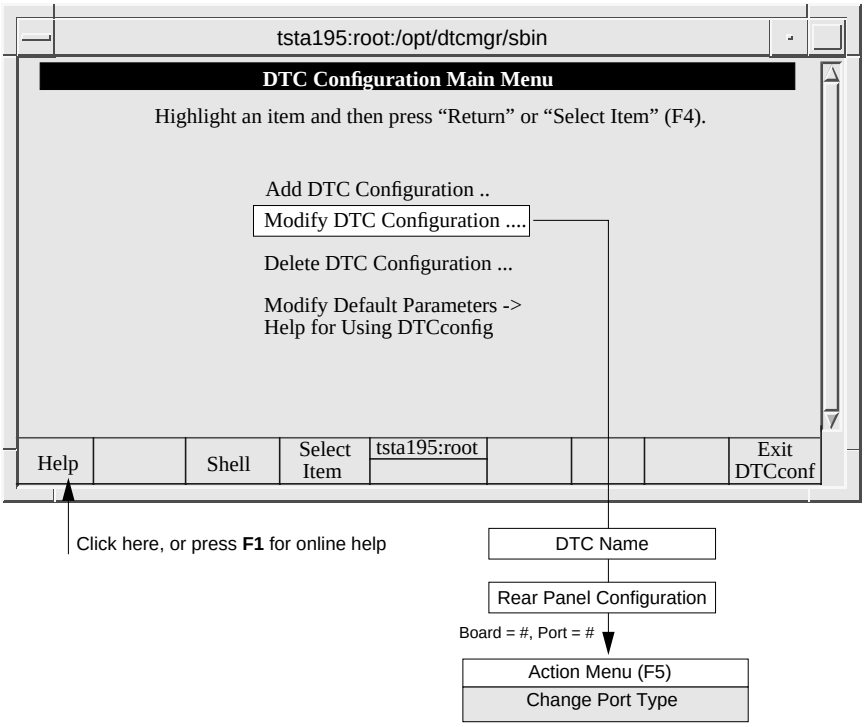
These procedures involve four related tasks:

- configuring the DTC port to be a printer port
- using the DDFA device file utilities to associate a device file with the printer
- configuring the printer for the HP-UX spooler
- testing the printing process

Note

It is presumed that you are familiar with the use of the **dtcconfig** menus and function keys (see chapter 4).

Configuring a DTC port to be a printer port



1 Either logon as `root` or type the HP-UX **su** (superuser) command.

2 Start the **dtcconfig** utility with the command:

```
dtcconfig
```

3 Select the **Modify DTC Configuration** option. A pop-up menu appears.

4 Type the name of the DTC whose port you want to configure as a printer in the pop-up (or select it from the list displayed with the **F1** key) and then press **Return** or **F4**.

The **DTC Rear Panel Configuration** screen appears showing the boards and ports and whether the ports are configured as terminal ports (T) or printer ports (P).

5 If the port you want to use for the printer is already configured as a printer port, exit from **dtcconfig**, and go to page 107. If this is not the case continue to the next step.

6 Enter the board and port values corresponding to the port you want to configure as a printer port and press **F5**.

7 Select the **Change Port Type** menu item. Another pop-up window appears.

8 Type an **x** or **X** in the printer field (use the arrow key to access this field). The terminal field automatically clears. Press **Return** or the **Done (F4)** key.

An asterisk (*****) appears at the changed port on the Rear Panel Configuration screen. If you changed port 3 for example, you would see **3*P** at that port.

9 Exit from **dtcconfig** and return to the HP-UX shell prompt.

DTC Device File Access utilities and Telnet port identification

DDFA provides an interface to remote DTC ports which is similar to the interface for local MUX ports. DDFA consists of a group of configuration files, executable files, and a daemon. The DTC Device File Access (DDFA) utilities software is part of Internet Services and is automatically installed with it on HP 9000 Series 700, and 800 systems for HP-UX 9.x or later.

DDFA is intended for those who wish to use **pty** device file names to access serial devices attached to DTCs and other terminal servers. Without DDFA, pty device file names are assigned randomly to devices on DTCs. This randomness makes it difficult to associate a specific pty device file with a specific device connected to a DTC.

DDFA allows the system or network administrator to configure a correspondence between a DTC port (or another terminal server port) and a given pty device file name. Devices on the DTC (or terminal server) can then be referred to by their pty device file names. For example, these pty device file names can be used with standard **read()**, **write()**, **open()**, **close()**, and **ioctl()** calls.

The location of a printer and an assigned device file name must be specified in a DTC Device File Access (DDFA) utilities configuration file. This chapter describes how to use DDFA to configure a printer on a DTC. Refer to the *DTC Device File Access Utilities and Telnet Port Identification Manual* and *HP-UX System Administration Tasks Manual* from your HP-UX System Administrator's documentation set for complete information about DDFA. More information is available in the following man pages:

- ddfa(7) DTC Device File Access Utilities description
- dp(4) Dedicated port file
- dpp(1m) Dedicated port file parser
- ocd(1m) Outbound connection daemon
- ocdebug(1m) Debug version of ocd
- pcf(4) Port configuration file.

Using DDFA to create a device file name for the printer port

DDFA configuration is based on the `/usr/examples/ddfa/dp` file. Follow the steps below to create a device file.

1 Ensure that you are logged in as root.

2 Check whether the file `/etc/ddfa/dp` exists.

If this file already exists, go to step 6, otherwise go to the next step.

3 Create a directory for the DDFA files. HP recommends `/etc/ddfa`, as follows:

```
# mkdir /etc/ddfa
```

4 Copy the master template dedicated port file, **dp**, to the DDFA directory:

```
# cp /usr/examples/ddfa/dp /etc/ddfa/dp
```

Do not alter `/usr/examples/ddfa/dp`, so that you keep a master template **dp** file. Altering `/etc/ddfa/dp` is explained in step 6.

5 Copy the master template port configuration file, **pcf**, to the DDFA directory:

```
# cp /usr/examples/ddfa/pcf /etc/ddfa/pcf
```

Do not alter `/usr/examples/ddfa/pcf`, so that you keep a master template **pcf** file.

6 For each DTC printer that you wish to permanently associate with a particular device file, perform the following steps:

a Find the IP Address of the DTC, the board number, and port number on the DTC to which the printer is connected.

b Choose the device file name for this printer. You can choose any name, but you might want to include some board and port information, for example you could choose `/dev/telnet/dtc1b3p2` to indicate that the device file name is associated with port 2 on board 3 of dtc1.

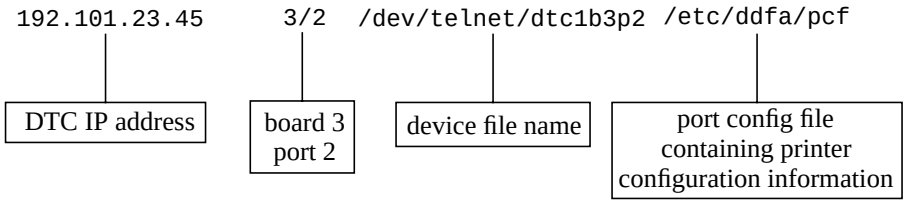
c Edit the `/etc/ddfa/dp` file, using **vi** for example, and create an entry for each printer in the file of the following form:

```
<DTC IP address> <board>/<port> <device file name> <port config file>
```

The slash (/) must separate the board and port parameters.

Example

For a printer on board 3, port 2 of a DTC with the IP address is 192.101.23.45. You would refer to this printer as `/dev/telnet/dtc1b3p2`. The entry in the **dp** file would be:



Note

For a DTC 16TN, the board number should be a `1` or `01`. The port values range from 0 to 15.

Each printer must have a **pcf** file associated with it. Several devices can have the same **pcf** file, or they can each have a unique **pcf** file. Usually, the default **pcf** file is sufficient for most applications or systems.

7 The file `/etc/ddfa/dp` is protected. In **vi**, to save your changes, use the command **wq!**.

8 Implement your changes by entering the following command.

```
# /etc/dpp  /etc/ddfa/dp -k
```

This executes the dedicated port parser (**dpp**) to scan the **dp** file and start up an **ocd** (outgoing connection daemon) process for each entry in the **dp** file.

9 Verify that the **ocd** process has been started by looking at the output of the following command:

```
ps -ef |grep ocd
```

10 Enable the DDFA variable in the `/etc/rc.config.d/netdaemons` file to ensure that the **ocd** processes are started correctly each time the system is started.

Configuring a DTC printer for the HP-UX spooler

The DTC printer must be configured for the HP-UX spooler using SAM (System Administration Manager) *or* the HP-UX **lpadmin** command. Refer to the *HP-UX System Administration Tasks Manual* for information on the HP-UX printer spooler.

Configuring a printer with SAM

To configure the HP-UX spooler from SAM, follow these steps. They are for an HP-UX 9.x system on an HP 9000 Series 800 system. The procedure may vary slightly for different versions of HP-UX.

1 Select the following menu options (starting from the SAM main menu).

a Choose **Printers/Plotters.**

b In the **Printer/Plotter Manager** screen, choose:

Actions → Local Printer Plotter

If you are using a character mode terminal, the menubar (F4 Menubar On/Off) must be on to use the **Actions** menu.

c Choose **Add Printer/Plotter Requiring Nonstandard Device File**.

2 Complete the **Add Printer** screen as follows:

Printer Name: Assign a name to the printer.

Printer Model/Interface: With this field selected, press the **Enter** key. Choose the printer model corresponding to your printer from the list of printer models displayed.

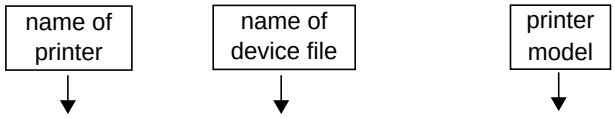
Printer Device File Name: Enter the printer device file that you entered in the file `/etc/ddfa/dp` for the DTC printer port. For the device file name in the example on page 108 you would enter:

```
/dev/telnet/dtc1b3p2
```

3 Complete the other fields as required and exit from SAM.

Configuring a printer with the lpadmin command

1 Configure the printer using the command line method with the following commands[1]:




```
# lpshut
# lpadmin  -pdtcprinter -v/dev/telnet/dtc1b3p2 -mhp2235a
# enable dtcprinter
# lpsched
# accept dtcprinter
# lpstat -t
destination dtcprinter now accepting requests
printer dtcprinter now enabled
```

2 If required, you can make `dtcprinter` the system default printer:

```
# lpadmin  -ddtcprinter
```

Testing the printer configuration

Use the **lp** command to verify that your printer configuration works.

1 If a default printer was configured, this lp command prints the `/etc/ddfa/dp` file on the default printer.

```
# lp /etc/ddfa/dp
```

2 If no default printer has been configured, type:

```
lp -d printer name /etc/ddfa/dp
```

1 Consult the *HP-UX System Administrator Tasks* manual for a list of supported printers.

Other commands with dtcconfig

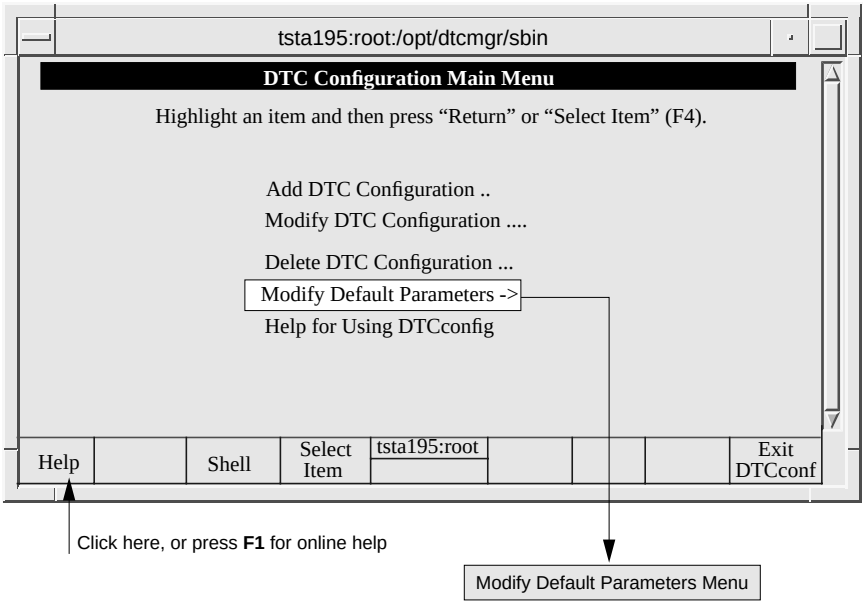
This chapter describes:

- how to modify the default DTC settings with the **dtcconfig** utility
- how to delete one or more DTCs from the listing of existing DTCs
- the procedures for adding and deleting DTC boards
- how to copy and paste configurations.

Note

It is presumed that you are familiar with the use of the **dtcconfig** menus and function keys (see chapter 4).

Modifying the default parameters



Default settings simplify DTC configuration management. When you first install and use the **dtcconfig** utility, the user defaults are the same as the HP factory settings. Once they are changed, they become the new default settings and are automatically applied when new DTCs are added.

These modified default settings will be used to configure all DTCs that you subsequently add to your configuration. The settings you can modify are:

- the user defaults for CPU/LAN board or LAN board parameters
- the user defaults for terminal and printer port parameters and options.

See the Table on page 114 which indicates the locations of parameter definitions.

Note

When you are in any of the configuration screens (accessed via the **Modify Default Parameters Menu**) you can press the **Default Values (F6)** function key. A pop-up screen appears with **HP Defaults** and the current **User Defaults**. You can toggle between the two default settings to see the differences.

The steps to modify DTC default parameters are as follows.

1 Select **Modify Default Parameters** from the **dtcconfig** main menu.

The **Modify Default Parameters Menu** appears.

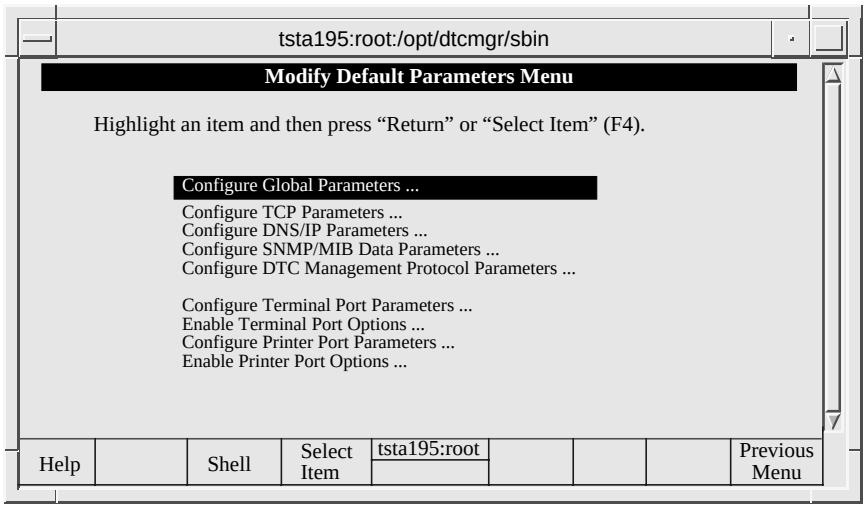
2 Choose one of these menu items and press the **Select Item (F4)** function key.

3 Enter new values to create your user defaults, or choose the HP defaults.

4 After entering values, press the **(F4)** key.

The new user defaults are now effective and you return to the main menu.

Modify Default Parameters menu



Locating parameter values for defaults settings

Parameter name	Possible settings:
Attached Device	page 94
Backup IP Router Address	page 76
Backup Server Address	page 75
Bits Parity	page 94
Contact Name	page 81
Data Transfer Mode	page 96
Default Destination	page 97
Default IP Router Address	page 76
Default Local Domain	page 75
Default Server Address	page 75
DTC IP Address	page 66
DTC User Interface Timeout	page 69
DTC Node Name	page 66
DTCDF Password	page 71
Enable Automatic Connection	page 102
Enable Auto Speed/Parity sensing	page 101
Enable Dedicated Printer	page 102
Enable DTC User Interface Timeout	page 101
Enable DTCDF Access	page 70
Enable Hardware Handshake	page 103
Enable Port	page 101
Enable Switching	page 102
Enable Keep Alive	page 103
Enable Port Config Saved In Binary	page 103
Escape from Data Transfer Character	page 96

Parameter name	Possible settings:
Enable Flow Control	page 103
Event Logging Class	page 69
Initialization string	page 98
Line Speed	page 93
Maximum Number of Sessions	page 96
Modem Behavior	page 95
MIB Access	page 79
MIB View	page 79
Number of Systems Sharing Printer	page 97
Number of Stop Bits	page 95
SNMP Enable Authentification Traps	page 81
SNMP Manager Community Name	page 79
SNMP Manager IP Address	page 79
Subnet Mask	page 76
Sys Location	page 81
Sys Name	page 81
Terminal/Printer Name or IP Address	page 93
Trap Destination IP Address	page 81
User Prompt	page 70
Welcome Message	page 70

Deleting a DTC

1 Select **Delete DTC Configuration** from the **dtcconfig** utility's main menu.

The **Delete DTC Configuration** pop-up menu appears.

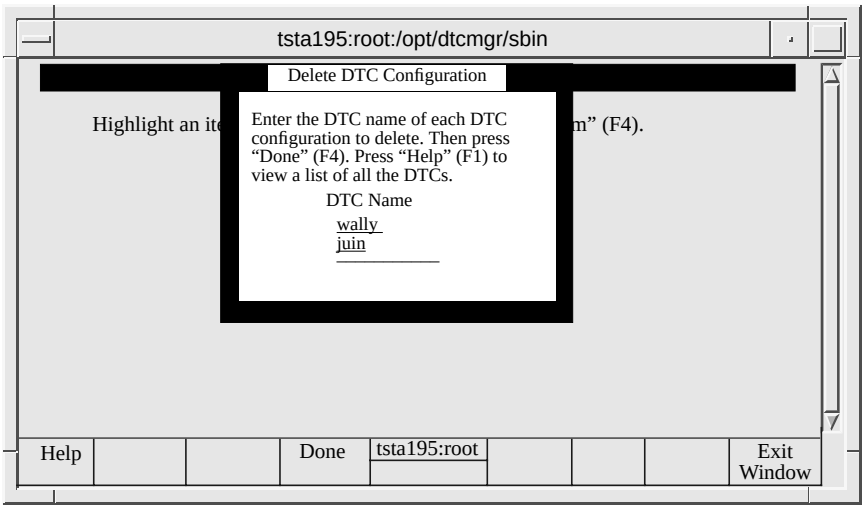
2 Enter the name of the DTC(s) you want to delete in the provided fields and press the **F4 (Done**) key

A confirmation pop-up window appears asking if you are sure you want to delete the DTC(s).

3 Enter **y** to confirm your intention to delete the specified DTC(s).

The specified DTC(s) are deleted and you are returned to the **dtcconfig** main menu.

Delete DTC configuration screen



Adding a board to a DTC

Note

The following section does not concern the DTC 16TN as you cannot add or remove boards from this DTC.

1 Switch off the DTC.

2 Insert the board in the DTC as described in the hardware manual.

3 Switch the DTC on again.

The DTC Manager/UX automatically adds the new board using the default configuration values.

Deleting a board from a DTC

Note

The following section does not concern the DTC 16TN as you cannot add or remove boards from this DTC.

1 Switch off the DTC.

2 Remove the board from the DTC as described in the hardware manual.

3 Switch the DTC on again.

DTC Manager/UX automatically recognizes that the board has been removed.

Copying and pasting configurations

This section describes how you can cut and paste DTC board and port configurations. This feature enables you to easily create identical configurations.

What you can copy and paste

- You can copy boards within the same DTC or from one DTC to another. You can copy a board from one DTC type to another DTC type if the board is compatible with both DTCs (see “Copying and pasting a board or port” on page 120).
- You can copy ports from one board to another board on the same DTC or to a board on another DTC.
- CPU/LAN or LAN configurations cannot be copied because the fields (**DTC Node Name**, **DTC LAN Address**, and **DTC IP Address**) must be unique for each DTC.
- Before you can paste a configuration to a DTC, the DTC must already have been added to your list of DTCs (using the **Add DTC Configuration** screen).

Note

If an IP address has been configured for ports, be careful when you copy and paste a board or port onto other DTCs. Remember to change the IP addresses for the ports on the different DTCs.

The following tables show the copy/paste rules for different DTC types.

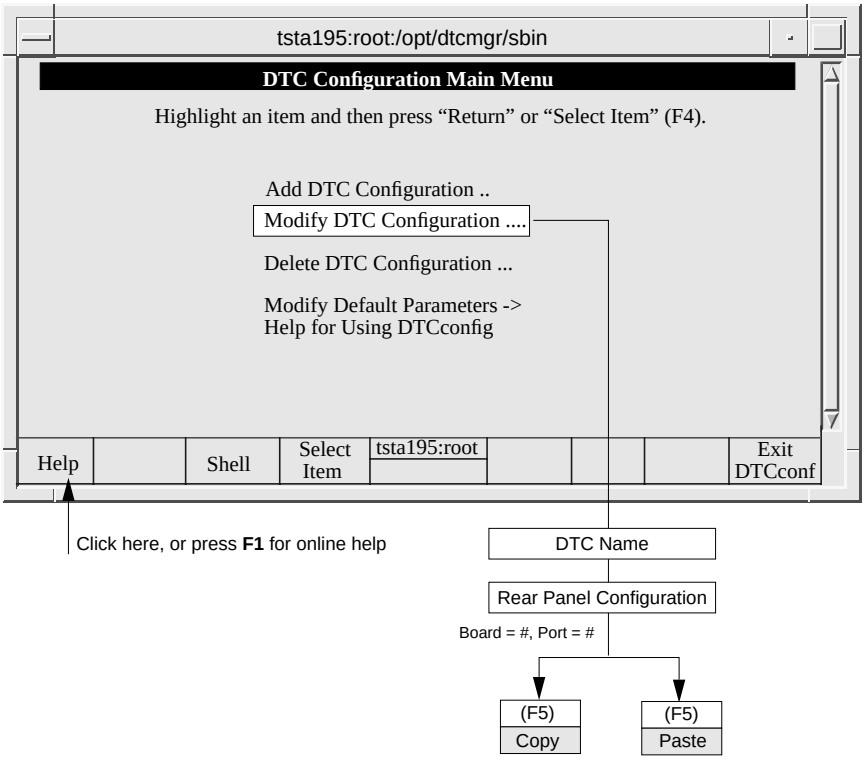
Copying boards

To From	DTC 16TN	DTC 16	DTC 48	DTC 72MX
DTC 16TN	Yes			
DTC 16		Yes	Yes	
DTC 48		Yes	Yes	
DTC 72MX				Yes

Copying ports

To From	DTC 16TN	DTC 16	DTC 48	DTC 72MX
DTC 16TN	Yes			Yes
DTC 16		Yes	Yes	
DTC 48		Yes	Yes	
DTC 72MX	Yes			Yes

Copying and pasting a board or port



The following steps describe the use of the **Copy** and **Paste** functions for a board or port on a DTC.

1 At the **Rear Panel Configuration** screen, enter values for the board field and optionally, the port field of what you want to copy. Then press the **Action Menu (F5)** function key. A small menu pops up.

2 Select the **Copy** option and press the **Select Action (F4)** function key. A **Data copied** message appears.

3 Press the space bar to continue. The **Rear Panel Configuration** screen is displayed again.

4 If you are copying a board or port to the same DTC:

   a Specify the destination board and port (if applicable).

   b Press the **Action Menu (F5)** function key.

      This time, select the **Paste** option. After a few seconds, you will see the pasted configuration on the new board.

5 If you are copying a board or port to another DTC:

   a Press the **Exit Task (F8)** function key.

      This action takes you to the **DTC Configuration Main Menu**.

   b Choose the **Modify DTC Configuration** menu item.

   c At the **Rear Panel Configuration** screen, enter values for the board field (or port field) that you want to copy. Then press the **Action Menu (F5)** function key. A small menu pops up.

   d Select the **Paste** option. After a few seconds, you will see the pasted configuration on the new board (or port).

Modifying configurations with dtcmodifyconfs

This chapter describes how to modify one or more DTC configurations in one procedure with **dtcmodifyconfs**. This command can be used as an alternative to the **dtcconfig** utility which only allows you to modify one DTC at a time.

About dtcmodifyconfs

With **dtcmodifyconfs** you can:

- modify DTC configurations that were created with **dtcconfig**
- copy data from one configuration and paste it into another (except CPU/LAN or LAN board configurations)
- import/export entire configurations from/to a file
- own/disown the management of a DTC
- modify parameters with a script

Note

The **dtcmodifyconfs** command can only be used to modify DTCs that already exist—it cannot be used to create a DTC. Use the **dtcconfig** utility to create DTC configurations.

The **dtcmodifyconfs** command enables you to modify one or more DTC configurations by creating a shell script containing the desired parameter settings for each DTC.

You must have superuser privileges. To execute **dtcmodifyconfs** commands, logon as `root` or enter the **su** (superuser) command.

Note

You can only run *one* of the following DTC Manager commands at a time: **dtcmodifyconfs** (or synonym), **dtcdiag** (or synonym), **dtcconfig**, or **dtcping**. For this reason only one user can configure and modify a DTC at a time.

Refer to the **dtcmodifyconfs** man pages for a complete description of command options.

Common uses for dtcmodifyconfs

Task	Command Syntax	Command Synonym
copy a configuration	dtcmodifyconfs -c [logging] dtcobject	
paste a configuration to DTC board(s) or port(s)	dtcmodifyconfs -p [-q] [logging] dtcobject	
export/import a configuration to/from a file	dtcmodifyconfs [-X]|[-x] [-I][-i] [filename] [logging] dtcobject	dtcexport/dtcimport
own/disown a DTC	dtcmodifyconfs [-o] [-d] [logging] dtcobject	dtcown/dtcdisown
specify a script file containing the parameters to modify	dtcmodifyconfs -m [-f scriptfile] [-e ‘parameter_name’] [-q] [logging] dtcobject	

Using dtcmodifyconfs

Copying and pasting configurations

`-c` Copies the specified `dtcobject` into an internal copy buffer. The `dtcobject` is a board or port (explained later in this chapter). Only one `dtcobject` may be copied. A `dtcobject` can be one of the following items:

- A board—specify the DTC name and board (CPU/LAN or LAN boards cannot be copied).
- A port—specify the DTC name, the board, and the port number.

`-p` Pastes the `dtcobject` from the internal copy buffer into one or more compatible `dtcobject` locations. For example, you can paste a board to another board; you can not paste a board to a port.

Example

This example shows how to copy port 3 on board 2 of `dtc1` and the paste the configuration to the same board and port on `dtc2`.

```
dtcmodifyconfs   -c  dtc1 2 3
dtcmodifyconfs   -p  dtc2 2 3
```

Exporting/importing configurations

`-x` (Synonym: **dtcexport**) Exports the entire configuration of the named DTC (includes all boards and the map record) in the directory `/var/opt/dtcmgr`. The *filename* is the name of the DTC followed by the extension `.exim`. If the file already exists, it will be overwritten.

`-X` Exports the entire configuration of the named DTC into a file with the specified filename. If a simple filename is given, with no path, the file will be stored in the `/var/opt/dtcmgr` directory. Alternatively, a full path name can be given.

`-i` (Synonym: **dtcimport**) Imports the entire configuration of the named DTC from a file in the directory `/var/opt/dtcmgr`. The filename is the name of the DTC followed by the extension `.exim`. When the file is imported, all the DTC configuration files are automatically created, and the map file is updated (or created if necessary). If the named DTC has already been configured on this system, an error condition is returned.

`-I` Imports the entire configuration of the named DTC from a file with the specified filename. If a simple filename is given, with no path, the file will be taken from the `/var/opt/dtcmgr` directory. Alternatively, a full pathname can be given.

Examples

To export an entire configuration of a specified DTC to a file named `currentconfig` located in the `/usr/dtcmgr` directory.

```
dtcmodifyconfs -X /usr/dtcmgr/currentconfig dtcname
```

To import an entire configuration from a file named `currentconfig` to the DTC from which the command is executed.

```
dtcmodifyconfs -I /usr/dtcmgr/currentconfig dtcname
```

Controlling DTC ownership

`-o` (Synonym: **dtcown**) Takes over the ownership (management) of a specified DTC. Sets the owner field in the `map802` file to **TRUE**. This should be done only when the previous manager of that DTC has failed, or has voluntarily disowned the DTC using the `-d` option.

`-d` (Synonym: **dtcdisown**) Gives up the ownership (management) of a specified DTC. Sets the owner field in the `map802` file to **FALSE**.

Using the script options

You can use the script options to specify parameters to be modified. There are two forms of scripts:

- a command-line script: specifies modification at the command line
- a script files: these contain the parameters that define the modifications

Note — Only CPU/LAN boards, LAN boards, or ports can be selected as *`dtcobjects`* for use with the script options.

Modify parameters option

`-m` Used to specify which parameters to modify for given `dtcobjects.` The parameters can be given on the command line or in a user-defined `scriptfile`. In both cases, each parameter is specified with single quotes.

Command-line scripts

`-e “script”` Executes a command-line script. Modifications to the DTC configuration are contained in the command-line script. The `script` can be specified in single or double quotes.

Example

This example shows how a command-line script is used to modify the DTC User Prompt on the DTC named `dtc1`.

```
dtcmodifyconfs   -m  -e 'User Prompt=”Hello>>";'  dtc1
```

User-defined script files

The **scriptfile** option is used to modify one or more DTCs at a time. The parameters to be modified are specified in a user-defined script file.

An explanatory text file and example script file are part of the DTC Manager fileset. These two files (located in `/opt/dtcmgr/tools` directory) are:

- **dtcmodifyconfs.sh**—a sample script file for all parameter names and values.
- **dtcmodifyconfs.txt**—explains some parameters, options and syntaxes used in the sample script file (for version A.14.3 and later versions).

You can use the `dtcmodifyconfs.sh` file as basis for creating your own customized scripts. Copy it to another file name and then adapt it to your needs.

`-f` *`scriptfile`* Executes a script file. Modifications to the DTC configuration are made by means of parameter assignment statements for particular configuration parameters. These are kept in an ASCII text file (`scriptfile`).

Example

To modify a DTC User Prompt parameter with a script file:

```
dtcmodifyconfs   -m  -f modscript  dtc1
```

In this case the file **modscript** would contain: `User Prompt="dtc1>>";`

Parameter definitions

CPU/LAN or LAN parameters

For the CPU/LAN or LAN, *parameter_name* can be any of the following.

Parameter name	Explained on:
Backup IP Router Address	page 76
Backup Server address	page 75
Default IP Router Address	page 76
Default Local Domain	page 75
Default Server Address	page 75
DTC User Interface Timeout	page 69
Subnet Mask	page 78
User Prompt	page 70
Welcome Message	page 70

Example CPU/LAN or LAN parameters

This example shows how logging class is configured.

To set the Event Logging Class parameters, put **x** or **X** for the *parameter_value* as follows. Event Logging Class 1; you do not have to set this, is as it is always set. it.

```
Event Logging Class 2="x"
Event Logging Class 3="x"
Event Logging Class 4="x"
Event Logging Class 5="x"
Event Logging Class 6="x"
```

SNMP parameters

The *parameter_name* can be any of the following:

Parameter name	Explained on:
SNMP Authorization Filters	page 79

- SNMP Authorization Filters: up to 5 values can be entered

Example SNMP parameters

This example shows how two SNMP authorization filters are configured:

```
dtcmodifyconfs -m -e 'SNMP Authorization Filters =
"015.123.123.111|Washington community|Read Write|DTC
MIB|015.123.123.122|Houston Community|Read Only|MIB-II";'dtc1
```

Port parameters

For a DTC port, port parameters and port options for *parameter_name* are listed below.

Parameter name	Explained on:
Attached Device	page 94
Bits Parity	page 94
Data Transfer Mode	page 96
Default Destination	page 97
Escape from Data Transfer Character	page 96
Initialization String	page 98
Line Speed	page 93
Maximum Number of Sessions	page 96
Modem Behavior	page 95
Number of Systems Sharing Printer	page 97
Number of Stop Bits	page 95
Terminal/Printer Name or IP Address	page 93

To enable or disable the following port options, the *parameter_value* is set as follows:

x or **X** to enable the port option
Double quotes **(“ ”)** to disable the port option

Enable Auto Speed/Parity Sensing (terminal ports only)
Enable Automatic Connection (modem ports only)
Enable Dedicated Printer (printer ports only)
Enable DTC User Interface Timeout (terminal ports only)
Enable Hardware Handshake (DTC 72MX and DTC 16TN ports only)
Enable Port
Enable Switching (terminal ports only)
Enable Keep Alive
Enable Flow Control
Enable Port Config Saved In Binary

Script examples

To enable port 3 of `mydtc1` (a DTC 16TN):

```
dtcmodifyconfs -m -e 'enable port = "x";' mydtc1 b 3
```

To change the DTC user interface timeout to 30 seconds on `mydtc1`:

```
dtcmodifyconfs -m -e 'DTC User Interface Timeout = "30";'
mydtc1
```

An example script file called `dtcscript` contains the following parameters:

```
User Interface Timeout = "9";
User Prompt = "New_DTC>";
Welcome Message = "Welcome! Type ? to get help on using the
DTC Terminal User Commands”;
```

This command will make all the changes listed in the script file.

```
dtcmodifyconfs  -m  -fdtcscript  mydtc1
```

The parameters in the example are explained as follows:

`-m` uses the modify option.

`-f` uses a file containing a script. The file name is `dtcscript`.

`mydtc1` is the name of the DTC to modify.

Key points about scripts

- A script can only contain global or port parameters. You cannot mix global and port parameters in the same script.
- When the CPU/LAN or LAN is specified as the *`dtcobject`* parameter, only the CPU/LAN or LAN parameters can be modified. Therefore, you cannot specify DTC port parameters in the *`script`* or *`scriptfile`* parameter. Likewise, the reverse is also true. If you specified a port in the *`dtcobject`* parameter, then only port parameters can be modified.
- The *`parameter_name`* is case sensitive and must be specified exactly as shown above.

Other dtcmodifyconfs parameter definitions

Controlling verbosity

`-q` Turns off the display of informational messages during the task. This is the quiet option and is useful if several DTCs are being pasted or modified and you do not want to see messages for all the DTCs.

Logging options

`logging` The **dtcmodifyconfs** command supports the following logging options:

`-a` Appends the log messages from this **dtcmodifyconfs** execution to the existing `dtcmodifyconfs` log file. By default, executing **dtcmodifyconfs** means that the existing log file is overwritten. The default log file is:

`/var/opt/dtcmgr/log/dtcmodifyconfs.log`.

`-l loglevel` Sets the amount of information to be logged for this current **dtcmodifyconfs** command. Specify one of the following logging levels:

0 Logs only startup and termination messages of **dtcmodifyconfs**.

1 Logs serious and fatal messages and level 0 messages. This is the default logging level.

2 Logs warning and informational messages and level 0 and level 1 messages.

`-L logfile` Specifies the alternative file that **dtcmodifyconfs** should use to log status and error messages. The default file is:

`/var/opt/dtcmgr/log/dtcmodifyconfs.log.`

Object parameters

`dtcobject` The *`dtcobject`* parameter specifies a board, or port(s) to be copied, pasted, or modified. For copying, only a single object can be specified. For pasting or modifying, multiple similar dtcobjects can be specified.

If you specify a board, then you must specify a DTC. If you specify a port, then you must specify a DTC and a board.

The syntax is:

```
dtc [board [port]]
```

`dtc` (Mandatory) The name of the target DTC to modify. This is the same DTC name you used when you added the DTC using **dtcconfig**. A DTC name must be from 1 to 8 alphanumeric characters, including hyphens (-) and underscores (_). Note that the first character *must* be alphabetic. An asterisk (*) is a wildcard character.

`board` The name or number of the target board to modify. The board parameter is one of the following:

C or **c**	CPU/LAN on a DTC 48 or DTC 16.
L or **l**	LAN on a DTC 72MX or DTC 16TN.
B or **b**	Board of a DTC 16TN.
0 ... **5**	Board number for a DTC 48.
0 or **1**	Board number for a DTC 16.
0 ... **3**	Board number for a DTC 72MX.

You can also specify a range of boards using a hyphen (-), such as **0**-**3** for boards **0**, **1**, **2**, and **3**.

`port` The number of the port to modify. It is one of the following:

0 ... **7**	Direct connect board on a DTC 48 or DTC 16.
0 ... **5**	Modem board on a DTC 48 or DTC 16.
0 ... **23**	For a 24-port MUX board on a DTC 72MX.
0 ... **15**	For a DTC 16TN.

You can also specify a range of ports using a hyphen (-), such as **0**-**3** for ports **0**, **1**, **2**, and **3**.

Values returned by dtcmodifyconfs or one of its synonyms

The **dtcmodifyconfs** command returns the following values:

0	No errors.
1	Command usage incorrect.
2	Error during startup or shutdown.
3	Fatal error during execution of the command.

Resetting DTC configurations

This chapter provides information about when and how to reset DTC configurations. DTC configurations are reset whenever the configuration information is downloaded to the DTC (each time the DTC is rebooted, for example). Topics covered include:

- when you need to download the DTCs configuration
- why you sometimes need to download the DTC's configuration from the DTC Manager/UX to the DTC
- how to download the DTCs configuration.

When to download the configuration

Most configuration changes are made automatically (dynamically). However, certain parameters cannot be dynamically configured. In this instance you *must download the new configuration* to the DTC in order for these changes to take effect. The parameters that require resetting the DTC are:

- DTC node name
- DTC IP address
- any of the TCP timers (if you modify the initial timer configuration)
- any of the following SNMP parameters:
  - contact name
  - sys name
  - sys location
  - SNMP enable authentication traps
  - trap destination IP address
- any of the DTC management protocol parameters (if you modify the initial management configuration)

Why downloading is necessary

The firmware of the DTC contains only the code for self-test, self-diagnostics, and download protocol. Most of the DTCs operational software must be loaded when the DTC is powered-up through a process referred to as *software download*. The software code to be downloaded to each DTC resides permanently on the computer that is responsible for managing and controlling the operations of that DTC. This download code is created from the DTC configuration files.

The parameters listed above cannot be changed without interrupting the functioning of the DTC. This is why a download is necessary to change these parameters.

Downloading the configuration

Note

You must exit from the **dtcconfig** utility before you can download the configuration.

1 Use one of these two methods to download the software.

- Reset the DTC and start the download process. This example command resets **mydtc1** (the DTC Name):

  ```
  dtcreset   mydtc1
  ```

  or

- Switch the DTC off and on again to download it with the configuration.

2 The configuration files and functional code are downloaded to the DTC. Wait for the download to finish successfully. Successful download is indicated by the following displays for each DTC type (refer to the DTC hardware manuals for complete explanations of the download).

- **DTC 16TN**—On the rear panel, the LED displays a fixed `1.` (the dot flashes).
- **DTC 16**—Green fixed LED.
- **DTC 48**—The DTC display window shows the status `F2.` which means the DTC is ready and functioning normally.
- **DTC 72MX**—On the front panel, the display is a fixed `1.` (the dot flashes) and the LED is green.

Resetting a DTC Board

To reset a DTC board, use the command:

```
dtcreset dtcname board_number
```

Resetting a DTC Port

To reset a DTC port, use the command:

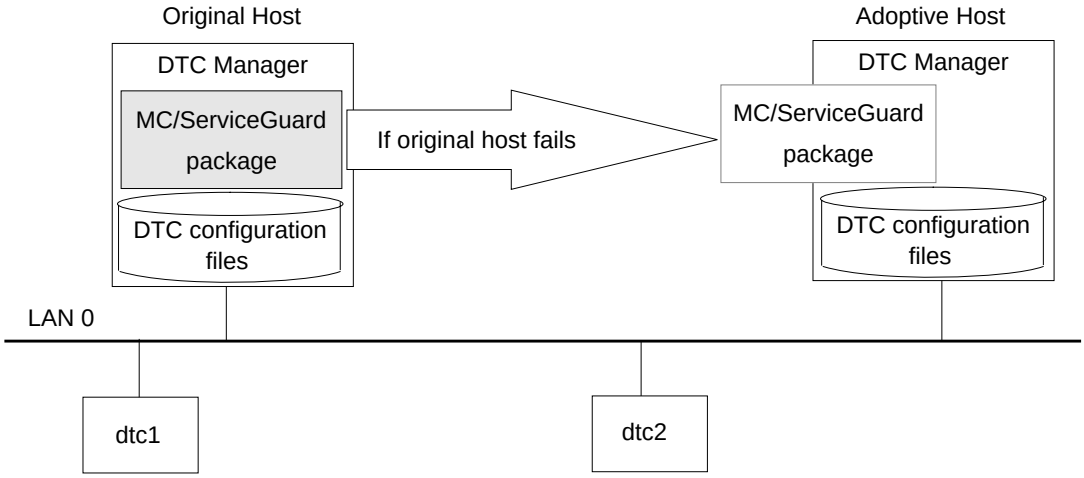
```
dtcreset dtcname board_number port_number
```

Configuring DTC Manager for operation with MC/ServiceGuard

MC/ServiceGuard ensures non-interrupted operation or “high availability” for DTC Manager/UX by providing the capability to transfer DTC management to another HP 9000 host (node) in the event of system failure.

MC/ServiceGuard manages a “package” of applications that can be relocated to another node within an MC/ServiceGuard cluster.

MC/ServiceGuard cluster



If the original host fails, another system in the cluster (the adoptive host) takes over management of the original host’s DTC(s). The original host is returned to the cluster when it is operational again. However, the adoptive host retains ownership of the DTC(s) until it fails, or until the system manager intervenes to return ownership to the original host.

The system administrator can manually transfer the management of the DTCs temporarily to another node in the cluster to perform system maintenance on the original host.

Note

DTC Manager/UX communications cannot be transferred to a backup LAN although this is supported by MC/ServiceGuard for other applications. High availability for DTC Manager/UX is provided only by MC/ServiceGuard's node transfer capability.

Refer to *Managing MC/ServiceGuard* (part number B3832-90001) for information specific to cluster management and highly-available computer systems.

Prerequisites

Before you continue with the procedures described in this chapter, verify that your site satisfies the following requirements:

- MC/ServiceGuard must be installed at your site (see the MC/ServiceGuard documentation)
- DTC Manager/UX software must be properly installed and configured on the original host system and all potential, “adoptive”, host systems (see chapter 3)
- the required daemon processes must be properly configured and operational (i.e. running) on all concerned nodes.
- each connected DTC must be properly configured on the original host (see chapter 4).

Configuring DTC Manager/UX for high availability

To configure DTC Manager/UX for high availability you must:

- transfer the DTC configurations to each adoptive host and verify that the DTCs can be managed (owned) by that host
- return DTC ownership to the original host
- create/modify an MC/ServiceGuard package to include DTC Manager/UX.

These tasks are described on the following pages.

Transferring DTC configurations to an adoptive host

To transfer DTC configurations you must export each DTC configuration to a file, copy this file to the adoptive host, and then import the configuration (contained in the file) to each adoptive host node.

Note

Before you transfer a DTCs configuration file, verify that the DTC is managed by the original host with the **dtcping** `dtcname` command.

Exporting configurations

On the *original* host system

1 Log in as superuser.

2 Execute the following command for each connected DTC:

```
dtcexport dtcname
```

This exports the DTC configuration to the `/var/opt/dtcmgr/dtcname.exim` (default) file.

Example

To export the configuration of **dtc1** to the file `dtc1.exim` you would enter:

```
dtcexport dtc1
```

3 Disown *all* DTCs connected to the original host by entering:

```
dtcdisown dtcname
```

for each connected DTC.

Copying the configuration files to the adoptive host

Use **ftp** (in binary mode) to copy the configuration (`dtcname.exim`) files to the `/var/opt/dtcmgr` directory on the adoptive host system.

Example

If you are working at a terminal attached to the original host and you want to use **ftp** to copy the configuration files for `dtc1` and `dtc2` to an adoptive host system called `new_host`, you could use the following command sequence:

```
cd /var/opt/dtcmgr
ftp new_host
binary
cd var/opt/dtcmgr
put dtc1.exim
put dtc2.exim
```

Importing the DTC configurations

On the *adoptive* host

1 Log in as superuser.

2 Import each DTC configuration to the host by entering:

```
dtcimport dtcname
```

for each DTC.

Example

To import the configuration of **dtc1** you would enter:

```
dtcimport dtc1
```

Verifying that the DTCs can be owned by the adoptive host

To be sure that the adoptive host can manage the DTC(s), you should verify that it can receive boot requests from the DTCs that it will manage (own) in the event of original host failure.

Note

This is essential, especially if the LAN device file names are not the same on all adoptive host nodes in the MC/ServiceGuard cluster.

On the *adoptive* host

1 Own all DTCs that will belong to this host in the event of original host failure.

```
dtcown dtcname
```

2 Reboot all DTCs by switching them off and then on.

3 Check that each DTC is operational by executing a command such as **dtcping *dtcname*** to verify that each DTC can be managed on this node.

4 Disown **all** DTCs belonging to the adoptive host by entering:

```
dtcdisown dtcname
```

for each DTC. This is a precaution to avoid possible conflicts of ownership.

Note — If any of these commands are unsuccessful, reboot the DTC.

Configuring other adoptive hosts

On all *additional adoptive* hosts

Repeat the procedure “Transfering configurations to an adoptive host” for *all* additional adoptive host(s).

Note — You can use **dtclist -c** command to list all configured DTCs.

You have now verified that all potential adoptive hosts can own and manage the DTCs.

Returning ownership to the original host

On the *original* host

Own *all* the DTCs and enable them to receive management instructions by entering the following commands for each DTC.

```
dtcown dtcname
dtcquickswitch IP_address_of_original_host dtcname
```

Including DTC Manager/UX in a high-availability package

You can now include DTC Manager/UX in an MC/ServiceGuard package by following the instructions below.

On the *original host*

1 Follow the instructions in the MC/ServiceGuard documentation to generate and then modify a package configuration file template.

2 For MC/ServiceGuard to work with DTC Manager/UX, you must edit the package control script, `control.sh`, as follows:

   a Go to the variable definition section labelled:

   ```
   # DTCs
   ```

   b Remove the comments from the lines:

   ```
   #DTC_IP[]=X.Y.Z.Q
   #DTC_NAME[0]=dtc_name
   ```

   c Edit the first line so that it specifies the IP address of the original host.

   d Edit the second line to specify one of the DTCs managed by the original host.

   e Add additional lines to specify the name of every DTC managed by the original host (increment the number in brackets for each additional DTC).

   Example: The system, whose IP address 15.128.5.4, manages two DTCs called, `dtc1` and `dtc2`. The following entries must be in the package control script:

   ```
   DTC_IP[]=15.128.5.4
   DTC_NAME[0]=dtc1
   DTC_NAME[1]=dtc2
   ```

   f Distribute copies of the package control script to all nodes as described in the MC/ServiceGuard documentation.

   MC/ServiceGuard can now provide high availability to DTC Manager/UX.

Future configurations

When you modify DTCs

Each time you modify the configuration of a DTC you must:

1 Create a new export file on the original host using the **dtcexport** command.

2 Copy the file to each potential adoptive host.

3 Import the file to each adoptive host using the **dtcimport** command.

When you add new DTCs

Each time you add a DTC to your configuration you must:

1 Create a new export file on the original host using the **dtcexport** command.

2 Copy the file to each potential adoptive host.

3 Import the file to each adoptive host using the **dtcimport** command.

Note

To be sure that the adoptive host can manage the DTC(s), you should verify that it can receive boot requests from the DTCs that it will manage (own) in the event of original host failure.

4 Update the information in `control.sh` script:

   a Halt the DTC Manager/UX package with the **cmhaltcl** command.

   b Add the name of the new DTC to the variable declarations in the `control.sh` script.

   c Distribute copies of the `control.sh` script to all the nodes as described in the MC/ServiceGuard documentation.

Note

Refer to your MC/ServiceGuard documentation for more on the use of the **cmhaltcl** command.

13

Diagnosing problems with dtcdiag, dtcping and dtccheckip

This chapter explains the use of three troubleshooting tools: **dtcdiag**, **dtcping** and **dtccheckip**.

The **dtcdiag** command reports DTC diagnostic information and can perform diagnostic tasks on a DTC, on a DTC board, or on a selected port of a board.

About dtcdiag

The following commands can substitute for **dtcdiag** command options:

- **dtcconnstat—**obtains the status from selected ports
- **dtcdownload—**downloads EEPROM code to a LAN board[1]
- **dtcquickswitch—**switches DTC management from one host to another
- **dtcreset—**resets a DTC, board, or port
- **dtcstat—**obtains the status of a DTC
- **dtctest—**tests a CPU/LAN board, or selected port
- **dtctraceon—**turns on extended trace on selected ports[1]
- **dtctraceoff—**turns off extended trace on selected ports[1]
- **dtcupload—**uploads a DTC, board, or port[1]

The **dtcping** command is used as a troubleshooting tool to perform a connection test. **dtcping** is similar to the networking **ping** command (refer to the **dtcping** man page) and **dtccheckip** checks for duplicated IP addresses.

The **dtcdiag** command performs diagnostic tasks on DTCs managed by the host. Tasks can be done on several *objects*. An object can be a selected DTC, a selected DTC and board, or a selected port on a board. The objects must be all of the same type.

The **dtcdiag** command is used for the following troubleshooting and maintenance tasks:

- resetting ports, boards, and the DTC
- reporting the status of the DTC and ports as well as the version numbers of the DTCs
- running the DTC or port self-tests
- uploading ports and the DTC[2].

Resetting causes a download to occur on the DTC. The download software and configuration is sent to the DTC. An upload[1] is the transfer of information from the DTC to the system.

1 Use these commands ONLY if instructed to do so by an HP engineer. Some of these commands output data to a file which can be read only with special HP formatting tools.
2 Upload a DTC configuration ONLY if instructed to do so by an HP engineer.

Note

Once you have executed **dtcdiag**, you cannot stop it. You can kill the **dtcdiag** process, but you cannot stop the operation from completing.

The **dtcdiag** command completes execution on a DTC even if it is killed (by using CTRL-C) before it is able to report the completion status. The **dtcnmp** process continues the execution of the **dtcdiag** command.

You can only run **one** of the following commands at a time: **dtcdiag** (or synonym), **dtcconfig**, **dtcmodifyconfs** (or synonym), or **dtcping**.

Refer to the **dtcdiag** man pages for a complete description of command parameters.

Common DTC diagnostics and related commands

Task	Command to use	Command Synonym
Get connection status for a port	dtcdiag -S <dtcname> <board> <port> or dtcconnstat <dtcname> <board> <port>	dtcconstat
Do a loopback test on a port	dtcdiag -t <dtcname> <board> <port> (terminal port) dtcdiag -p <dtcname> <board> <port> (printer port) or dtctest -t <dtcname> <board> <port> (terminal port) dtctest -p <dtcname> <board> <port> (printer port)	dtctest
Reset an entire DTC (or a board or port)	dtcdiag -r <dtcname> [<board> <port>] or dtcreset <dtcname> [<board> <port>]	dtcreset
Find the status of CPU/LAN boards and ports	dtcdiag -s <dtcname> [<LANboard>] [<board> <port>] or dtcstat <dtcname> [<LANboard>] [<board> <port>]	dtcstat
Test a DTC's LAN board	dtcdiag -c <dtcname> or dtctest -c <dtcname>	dtctest

Using dtcdiag

Resetting DTCs, boards and ports

The **dtcdiag** command can be used to reset a DTC, board or port.

Use the command:

```
dtcdiag -r
```

or

```
dtcreset
```

Note

The board in the DTC 16TN cannot be reset. You can only reset the entire DTC or a single port.

Examples

To reset the DTC named `dtc1`:

```
dtcdiag  -r  dtc1
```

To reset board 0 on the DTC named `dtc1`:

```
dtcdiag  -r  dtc1  0
```

To reset port 1 on board 0 of the DTC named `dtc1`:

```
dtcdiag  -r  dtc1  0  1
```

Testing DTCs, boards and ports

To test a DTC, board or port use the command:

```
dtcdiag -c
```

or

```
dtctest -c
```

Running loopback tests

The following commands and options can be used to perform loopback tests.

`dtcdiag -i [count]`
or
`dtctest -i [count]`

Performs an internal loopback test on the selected ports *count* times.

Count must be between 1 and 999 and defaults to 1.

`dtcdiag -h [count ]`
or
`dtctest -h [count ]`

Tests the data path through a DTC 48 (or a DTC 16) to the serial port and through the serial port connector. A loopback hood must be attached to the port. This option does not apply to other DTC types.

Count must be between 1 and 999 and defaults to 1.

`dtcdiag -p [count ]`
or
`dtctest -p [count ]`

Performs a printer loopback test on the selected ports *count* times. A printer must be attached to the port.

Count must be between 1 and 999 and defaults to 1.

`dtcdiag -t [count ]`
or
`dtctest -t [count ]`

Performs an terminal loopback test on the selected port *count* times. A terminal must be attached to the port.

Count must be between 1 and 999 and defaults to 1.

Example

To perform an internal loopback test 20 times on port 1 of board 0 of dtc3.

```
dtcdiag  -i  20  dtc3  0 1
```

Getting the status of a DTC LAN board or a Port

`dtcdiag -s`
or
`dtcstat`

Obtains the status of the selected *objects* and lists it to the standard output and to a file called `dtcname.LAN`. or `dtcname.PRab` (in the `/var/opt/dtcmgr/status` directory) where `a` is the number of the board on which a port is being uploaded and `b` is the number of the port being uploaded.

Only CPU/LAN boards, LAN boards, or ports can be selected for this task.

`dtcdiag -S`
or
`dtcconnstat`

Obtains the status of the connections from the selected ports and lists it to the standard output.

Examples

To obtain status of the DTC named dtc3:

```
dtcdiag  -s  dtc3
```

To obtain status of Port 1 on Board 0 of the DTC named dtc3:

```
dtcdiag  -s  dtc3  0  1
```

To obtain connection status of port 23 of board 1 of the DTC named dtc3:

```
dtcdiag -S dtc3 1 23
```

Switching DTC management to another host (in an MC/ServiceGuard cluster)

`dtcdiag -Q [IP_address]`
`dtcquickswitch [IP_address]`

Switches DTC management (ownership) to another host and informs the DTC to only accept management instructions from the new host. The IP address of the previous host must be given after the -Q option (this address is not verified).

This is one of the configuration commands used to configure MC/ServiceGuard “high availability” clusters.

Special Commands (use only when instructed by an HP engineer)

This section describes commands that an HP engineer might ask you to run.

Caution

Only use the following commands if instructed to do so by an HP engineer for troubleshooting purposes.

The information uploaded to the DTC Manager/UX during a DTC upload can only be read with special formatting tools available only to HP engineers.

Turning extended trace on or off

`dtcdiag -F` or `dtctraceoff`

Turns off an extended trace for the selected objects. For a DTC 72MX, only the name of the DTC and the number of the 24 port MUX board must be given to turn off an extended trace for a port on that board. For a DTC 16TN, only the name of the DTC must be given to turn off an extended trace for a port on that DTC.

`dtcdiag -N` or `dtctraceon`

Turns on an extended trace for the selected ports. Each port selected must be on a separate board and only ports on a DTC 72MX or a DTC 16TN can have an extended trace turned on.

Examples

To turn on an extended trace for port 0 of board 1 of the DTC named dtc3 (only a DTC 72MX or DTC 16TN can have an extended trace turned on):

```
dtcdiag -N dtc3 1 0
```

To turn off the extended trace for the DTC named dtc3 you need only specify the DTC name (together with the board number for DTC 72MX) with the **dtcdiag -F** command):

```
dtcdiag -F dtc3 1
```

Uploading files from a DTC

`dtcdiag -u`
or
`dtcupload`

Uploads the selected *`objects`*. Only a DTC 72MX can have a 24 port MUX board upload performed on it.

The following upload data files are created:

`/var/opt/dtcmgr/upload/dtc.Bx`

Contains upload data files from the CPU/LAN or the LAN of a DTC, where `x` is cycled from 1 to 3 (and then back to 1) for each new upload.

`/var/opt/dtcmgr/upload/dtc.Myz`

Contains upload data files from a 24 port DTC 72MX where `y` is the number of the port being uploaded and `z` is cycled from 1 to 3 (and then back to 1) for each new upload.

`/var/opt/dtcmgr/upload/dtc.PRab`

Contains upload data files from a port of a board of a DTC, where `a` is the number of the board with the port being uploaded and `b` is the number of the port being uploaded.

Note

Each upload data file from a specific port overwrites the last upload data file for a previous port upload from that port. To retain port uploads for a given port, you must use the HP-UX **cp** or **mv** command to copy or move each file produced into another file.

Examples

To upload the DTC named `dtc2`:

```
dtcdiag  -u  dtc2
```

To upload port 1 on board 0 of the DTC named `dtc2`:

```
dtcdiag  -u  dtc2  0  1
```

Downloading the EEPROM code to a LAN board

Caution Downloading EEPROMs incorrectly can make your DTC unusable. Only download EEPROMs if told to do so by an HP engineer.

`dtcdiag -d` or `dtcdownload` Downloads the EEPROM (Electrically Erasable Programmable Read-Only Memory) code for the selected LAN boards. Only a DTC 72MX or a DTC 16TN can have an EEPROM code download performed on them.

Example

To download the EEPROM code to the DTC named `dtc3`:

```
dtcdiag -d dtc3
```

Other dtcdiag parameter definitions

Verbosity parameter

The following options are used to inhibit the verbosity of **dtcdiag** commands:

`-f` Performs the task on each selected *`object`* without querying the user for confirmation. If this option is not specified, then for each selected *`object`*, **dtcdiag** asks the user whether it should perform a disruptive task.

`-q` Performs the task on each selected *`object`* without giving the user any progress or completion messages.

Note **dtcdiag** displays progress and completion messages to the standard output if this option is not specified.

Logging parameter

The following logging options are supported for all **dtcdiag** commands:

`-a` Appends the log messages from this **dtcdiag** execution to the existing **dtcdiag** log file. By default, executing **dtcdiag** overwrites the log file.

`-l loglevel` Specifies the amount of information that is logged in the log file for this **dtcdiag** execution. The default logfile is `/var/opt/dtcmgr/log/dtcdiag.log`. Specify one of the following logging levels:

0 Log only startup and termination messages.
1 Log serious or fatal error messages (and those of level 0). This is the default.
2 Log warning and informational messages (plus the messages of level 1).

`-L logfile` Specifies an alternative file that **dtcdiag** should use to log status and error messages. The default log file is `/var/opt/dtcmgr/log/dtcdiag.log`.

Object parameter

Specify the *object* to be diagnosed with these parameters given in the order specified:

`dtcs` The names of the DTCs on which a task is to be performed.

A DTC name must be specified. The asterisk metacharacter (*) can be used to represent any string of characters for this parameter and it normally needs to be escaped. For example, if the DTC names are `DTC1`, `DTC2` and `DTC3`, the *dtcs* parameter can be `DTC\*` to mean all those DTCs.

If this parameter is given without boards or ports, then the action with boards specified as `C` or `L` is taken.

Caution

If the DTC name is `C`, `L`, or `B`, a conflict may occur when specifying many objects. This occurs because these names are also used as the label for the CPU/LAN board of a DTC 48 or a DTC 16 (`C`), the LAN board of a DTC 72MX or a DTC 16TN (`L`), and the ports of a DTC 16TN (`B`), respectively. To resolve this conflict, if the name of a DTC is `C`, `L`, or `B`, then any such character found in the *object* of the command line will be understood as that DTC name.

`boards` The name of the DTC boards on which the task is done.

This parameter is optional. Board names are:

C or **c** the CPU/LAN on a DTC 48 or DTC 16

L or **l** the LAN on a DTC 72MX or DTC 16TN

B or **b** all ports on a DTC 16TN (a DTC 16TN does not have a separate board)

0 ... **5** the boards on a DTC 48

0, **1** the boards on a DTC 16

0 ... **3** for the boards or LAN board on a DTC 72MX.

The asterisk metacharacter (*) can be used to represent all non-CPU/LAN or non-LAN boards on a DTC and it normally needs to be escaped. For example,

```
dtcdiag  -r  DTC\*  \*
```

Additionally, a range of non-CPU/LAN or non-LAN boards can be specified by separating the number of the boards by a hyphen (-). For example,

```
dtcdiag  -r  DTC1  0-1
```

`ports` The number of the ports on which a task is to be performed. This parameter is optional. Port numbers are:

0 ... **7** for direct connect boards on a DTC 48 or DTC 16

0 ... **5** for modem boards on a DTC 48 or DTC 16

0 ... **23** for a 24 port MUX board on a DTC 72MX

0 ... **15** for the ports on a DTC 16TN

The asterisk metacharacter (*) can be used to represent all ports on a board of a DTC and it normally needs to be escaped. Additionally, a range of ports can be specified by separating the number of the ports by a hyphen (-). For example, `0-7` could be a range.

Values returned by dtcdiag or one of its synonyms

One of the following values is returned when a **dtcdiag** command is executed. To display the return value, use the HP-UX **echo** command after the **dtcdiag** command.

0 No error or no test failures.
1 Command usage incorrect.
2 Error during startup or shutdown.
3 Fatal error during execution of the command.

About dtcping

The **dtcping** command is used as a troubleshooting tool to perform a connection test. **dtcping** is similar to the networking **ping** command (refer to the online man page for **ping**). The **ping** command sends a series of packets to a remote node which are echoed back. The **dtcping** command sends a series of packets to the DTC which are echoed back. Both commands are useful to check if a DTC is still up and running at least at the IP level of the networking stack.

dtcping sends one ICMP (Internet Control Message Protocol) echo packet per second to each DTC. You specify the number and the size of the ICMP echo packets and the DTC names. For each DTC, the number of packets transmitted, the number of packets received, and the ratio of packets lost are reported. In addition, an event is generated, written into the event log, and displayed on the console for each DTC having a 100 percent packet loss.

Each packet that is echoed is reported on your terminal screen.

The **dtcping** command helps you:

- do a preliminary connectivity check when setting up the DTC connections
- do a quick check of the connectivity if the response from the DTCs seem unusually slow

You must run **dtcping** as superuser. The **dtcping** command can be scheduled using the HP-UX **at** command or the HP-UX **cron** command. Only one **dtcping** or **dtcdiag** command can be run at a time.

dtcping syntax

```
dtcping  dtcs ... [ packetsize ] [ -n numpackets ]
```

Parameter descriptions

dtcs

The names of the DTCs to which a **dtcping** is to be performed.

The asterisk metacharacter (*) can represent any string of characters for this parameter. It must usually be escaped.

packetsize

By default (when *packetsize* is not specified), the size of transmitted packets is 64 bytes. The minimum value allowed for *packetsize* is eight bytes, the maximum is 1480 bytes.

numpackets The number of packets **dtcping** transmits before terminating.

The minimum value allowed for *numpackets* is one and the maximum is 999. *Numpackets* defaults to one if it is not specified.

Examples

Send 10 packets to dtc01:

```
dtcping  dtc01 -n 10
```

Perform **dtcping** on all DTCs and send a packet size of eight bytes:

```
dtcping  \*  8
```

Values returned by dtcping

One of the following values is returned when **dtcping** is executed.

Note

These values refer only to DTC Manager errors and are not the result of the normal **ping** command output. Avoid using these values in scripts.

0 No error.
1 Command usage incorrect.
2 Error during execution of the command.

About dtccheckip

The **dtccheckip** command is used as a troubleshooting tool to check for duplicated IP addresses.

If you have added a DTC or modified information about LAN address configuration, **dtccheckip** is automatically run after the termination of dtcconfig.

When the Exit DTCconf function key is pressed in the dtcconfig menu, you are asked whether you want to quit or not. If you reply “yes”, this ends the execution of the dtcconfig command and executes the **dtccheckip** command.

You will see the following messages:

- `Check for duplicated IP addresses in progress ...`
- `Check for duplicated IP addresses finished.`

Only if you have duplicated IP addresses, the following message will appear:

Duplicated	IP Address	DTC Name
*	XXX.XXX.XXX.XXX	DTC1
*	XXX.XXX.XXX.XXX	DTC2
	YYY.YYY.YYY.YYY	DTC3
	...	
	ZZZ.ZZZ.ZZZ.ZZZ	DTCn

Note

“*” is used to show duplicated IP addresses, but the IP addresses of all DTCs are listed.

The duplicated IP addresses should be modified to ensure there are no problems with the DTCs.

You can also use the dtccheckip command in isolation to diagnose potential problems with duplicated IP addresses.

13 About dtccheckip

14

Listing configurations and events with dtclist

This chapter describes the syntax and use of the **dtclist** command which enables you to display data in the configuration and event log files.

The **dtclist** command can display one of the following:

- A summary of configuration data for a DTC.

  This can include information about the CPU/LAN or LAN, backplane, boards, and ports.
- A list of the user DTC default configurations.
- A list of events that are placed in the event log.

The event log is a text file to which DTC networking events are logged. Examples of event logs are shown at the end of this chapter.

The following sections provide information on these types of output and how to display them.

Using dtclist

1 Logon as `root` or type the HP-UX **su** (superuser) command from the shell prompt.

2 At the shell prompt, specify one of the following **dtclist** commands.

To display a summary of configuration data for a DTC, run the following command. The output can contain information about the CPU/LAN or LAN, the boards and the ports.

```
dtclist  -c  [logging]  [object]
```

To list the DTC user default configuration, run the following command.

```
dtclist  -C  [logging]
```

To display a list of events that are placed in the event log, run the following command. The event log is a text file to which networking events are logged.

The **dtclist** command lists events in the event log based on *`filter`* and *`object`*. If no parameters are specified, then all the events in the event log are displayed.

```
dtclist  [filter]  [-f]  [logging]  [object]
```

3 Pipe **dtclist** to the HP-UX **more** command to read the log files more easily.

Simple dtclist examples

The following examples show different ways of using **dtclist**. The output is easier to read if **dtclist** is piped to the HP-UX **more** command.

- To display events 8 through 10, inclusive:

  ```
  dtclist -e 8 10 | more
  ```

- To display the last eleven events recorded in the event log file (remember that there must be a "\" before the $):

  ```
  dtclist -e \$-10 $   | more
  ```

- To provide a complete list of configuration information on DTC1:

  ```
  dtclist -c DTC1   | more
  ```

- To report the configuration information on board 0 on DTC1:

  ```
  dtclist -c DTC1 0   | more
  ```

- To display a list of all currently managed DTCs:

  ```
  dtclist -c
  ```

Parameter definitions

`-c` Lists the DTC configurations. If *`object`* is not specified, then the list of DTCs managed by the host computer is displayed.

`-C` Lists the DTC user default configuration.

`logging` The **dtclist** command supports the following logging options.

`-a` Appends the log messages from the **dtclist** command to the existing **dtclist** log file. By default, the existing log file is overwritten. The default log file is `/var/opt/dtcmgr/event.log`.

`-l` *`loglevel`* Sets the amount of information to be logged for this current **dtclist** command. Specify one of the following logging levels:

- 0 Logs only startup and termination messages of **dtclist**.
- 1 Logs serious and fatal messages and level 0 messages. This is the default logging level.
- 2 Logs warning and informational messages and level 0 and level 1 messages.

`-L` *`logfile`* Specifies an alternative file that **dtclist** should use to log status and error messages of **dtclist**. The default file is /`var/opt/dtcmgr/log/dtclist.log`

filter The *filter* parameters specify the type of events to be listed:

-e [*start* *end*] The range of events in the event log to be listed with these optional parameters. If no range is given, all events are listed. To specify the last event of the event log, use the notation $ or e. To specify an event relative to the last event of the event log, use the options $-*n* or e-*n*, where *n* is the number of events from the last event. Also note that the $ symbol is usually escaped, because it is a special character for the shell.

For example, the \ backslash is used to escape the $. This command displays the last eleven events.

```
dtclist -e \$-10  $
```

- start — An integer or $ or e notation specifying the first event to be displayed.
- end — An integer or $ or e notation specifying the last event to be displayed.

-d Displays download events. A download is the transfer of software from the host system to the DTC. A download occurs when the DTC is configured by the DTC Manager/UX and has been turned on.

-u Displays upload events. An upload is the transfer of software from the DTC to the host system. DTC-triggered upload events are also displayed on the system console.

-n Displays DTC-generated events.

-p Displays ping events.

-s *logclass* Specifies the event logging class to be displayed. The *logclass* parameter can be one of the following values:

- 1 — Display catastrophic events.
- 3 — Display cautionary events.
- 5 — Display informative events.

`-t range` Specifies the range of dates and times to be displayed. The dates are in a free format, such as month-day-year all in numbers or in words. For example, `8 Apr 1997` and `Wed Apr 9 1997` are two ways to specify the same date. Quotation marks (") are used to delimit a range.

`date1<date2`	Displays events that were logged between `date1` and `date2` including those dates.
`<date1`	Displays events that were logged on `date1` and earlier.
`date1<`	Displays events that were logged on `date1` and later.

`-f` Displays events as they are logged.

`object` The *`object`* parameter specifies the DTC, board, or port to be listed. Configuration information or networking events are listed. The syntax is:

```
[dtc [board [port]]]
```

`dtc` Specifies the name of the DTC for which to list configuration information or networking events. Use the same DTC name as you used when adding the DTC using **dtcconfig**. A DTC name consists of up to 8 alphanumeric characters, including hyphens (-) and underscores (_). The first character *must* be alphabetic.

If you specify the DTC name without the *`board`* or *`port`* parameters, then the display is a rear panel summary, a list of the CPU/LAN or LAN parameters, and a list of the parameters of each configured port.

This parameter is optional.

`board` The board on the specified DTC. Although this value is optional, you can specify it only if the *`dtc`* parameter is also specified.

If you specify a board name without the *`port`* parameter, the display is a board summary and list of the parameters of each configured port (if it is not the CPU/LAN or LAN board).

The board parameter is one of the following:

C or **c**	CPU/LAN on a DTC 48 or DTC 16
L or **l**	LAN on a DTC 72MX or DTC 16TN
B or **b**	board of a DTC 16TN (a DTC 16TN has no separate boards)
0 ... **5**	board number for a DTC 48

0 or **1**	board number for a DTC 16
0 ... **3**	board number for a DTC 72MX

`port` The number of the port for which to list parameters. Although this parameter is optional, you can specify it only if both the *`dtc`* and *`board`* parameters are also specified.

The port value is one of the following:

0 ... **7**	for a direct connect board on a DTC 48 or DTC 16
0 ... **5**	for a modem board on a DTC 48 or DTC 16
0 ... **23**	for a 24-port MUX board on a DTC 72MX
0 ... **15**	for a DTC 16TN

Values returned by dtclist

One of the following values is returned when a **dtclist** command is executed.

0	No errors.
1	Command usage incorrect.
2	Error during startup or shutdown.
3	Fatal error during execution of the command.

Event log examples

In this example the **dtcdiag** command resets Board 0 of a DTC 48 named `dtc48.gnd.hp` and the events are logged in `var/opt/dtcmgr/event.log`. The events can then be displayed using **dtclist**.

Run the **dtcdiag** command:

```
dtcdiag -r dtc48aj1 0

dtc48aj1 board 0

A board reset is distruptive.
Do you still wish to perform it? (y or n)
y

Reset completed successfully
```

The HP-UX shell prompt appears. Run the **dtclist -e | more** command and you will see the following events:

- Event 1 - Download of the board code started
- Event 2 - Download of the board code completed
- Event 3 - Download of the Board 0 specific code started
- Event 4 - Download of the Board 0 specific code completed

```
dtclist -e | more
```

Event # 1

```
DTC name  : dtc48.gnd.hp
Event time: Mon Apr 7 10:06:28 1997
Event type: BoardDownloadStarted
Event data: DTC_card_num   : 0
   DTC_ROM_version: 3
   DTC_card_status:
      Board 0: portflags[0-23] 00000000 11111111 11111111
        selftest_result 0
        conn_type_0_7   DIRECT CONNECT
        conn_type_8_16  EMPTY
        conn_type_16_23 EMPTY
      Board 1: portflags[0-23] 00000011 11111111 11111111
        selftest_result 0
        conn_type_0_7   MODEM
        conn_type_8_16  EMPTY
        conn_type_16_23 EMPTY
```

```
      Board 2: portflags[0-23] 00000000 11111111 11111111
        selftest_result 0
        conn_type_0_7   DIRECT CONNECT
        conn_type_8_16  EMPTY
        conn_type_16_23 EMPTY
      Board 3: portflags[0-23] 00000000 11111111 11111111
        selftest_result 0
        conn_type_0_7   DIRECT CONNECT
        conn_type_8_16  EMPTY
        conn_type_16_23 EMPTY
      Board 4: portflags[0-23] 00000000 11111111 11111111
        selftest_result 0
        conn_type_0_7   DIRECT CONNECT
        conn_type_8_16  EMPTY
        conn_type_16_23 EMPTY
      Board 5: portflags[0-23] 00000000 11111111 11111111
        selftest_result 0
        conn_type_0_7   DIRECT CONNECT
        conn_type_8_16  EMPTY
        conn_type_16_23 EMPTY
```

Event # 2

```
DTC name  : dtc48.gnd.hp
Event time: Mon Apr 7 10:06:28 1997
Event type: BoardDownloadComplete
Event data: DTC_card_num   : 0
       DTC_ROM_version: 3
```

Event # 3

```
DTC name  : dtc48.gnd.hp
Event time: Mon Apr 7 10:06:28 1997
Event type: Board0DownloadStarted
Event data: DTC_card_num   : 0
   DTC_ROM_version: 3
   DTC_card_status:
     Board 0: portflags[0-23] 00000000 11111111 11111111
        selftest_result 0
        conn_type_0_7   DIRECT CONNECT
        conn_type_8_16  EMPTY
        conn_type_16_23 EMPTY
```

```
Board 1: portflags[0-23] 00000011 11111111 11111111
   selftest_result 0
   conn_type_0_7   MODEM
   conn_type_8_16  EMPTY
   conn_type_16_23 EMPTY
Board 2: portflags[0-23] 00000000 11111111 11111111
   selftest_result 0
   conn_type_0_7   DIRECT CONNECT
   conn_type_8_16  EMPTY
   conn_type_16_23 EMPTY
Board 3: portflags[0-23] 00000000 11111111 11111111
   selftest_result 0
   conn_type_0_7   DIRECT CONNECT
   conn_type_8_16  EMPTY
   conn_type_16_23 EMPTY
Board 4: portflags[0-23] 00000000 11111111 11111111
   selftest_result 0
   conn_type_0_7   DIRECT CONNECT
   conn_type_8_16  EMPTY
   conn_type_16_23 EMPTY
Board 5: portflags[0-23] 00000000 11111111 11111111
   selftest_result 0
   conn_type_0_7   DIRECT CONNECT
   conn_type_8_16  EMPTY
   conn_type_16_23 EMPTY
```

Event # 4

```
DTC name  : dtc48.gnd.hp
Event time: Mon Apr 7 10:06:28 1997
Event type: Board0DownloadComplete
Event data: DTC_card_num   : 0
   DTC_ROM_version: 3
```

14 Event log examples

15

Troubleshooting configuration problems

This chapter provides information about simple troubleshooting procedures that are designed to help you solve common DTC configuration problems. It does not cover procedures for resolving DTC hardware problems. Refer to your DTC hardware manual for information about how to use the DTCs diagnostics port to troubleshoot hardware problems.

Troubleshooting overview

Before you begin troubleshooting, answer the following questions to help locate the possible source of the problem:

- Does the problem seem isolated to a particular user or to a particular program?
- Can the problem be reproduced?
- Does the problem affect all users on a specific DTC, a specific board on a DTC, or a specific port on a DTC?

The **dtcdiag** command can help you isolate the problem to a specific board or port on a DTC.

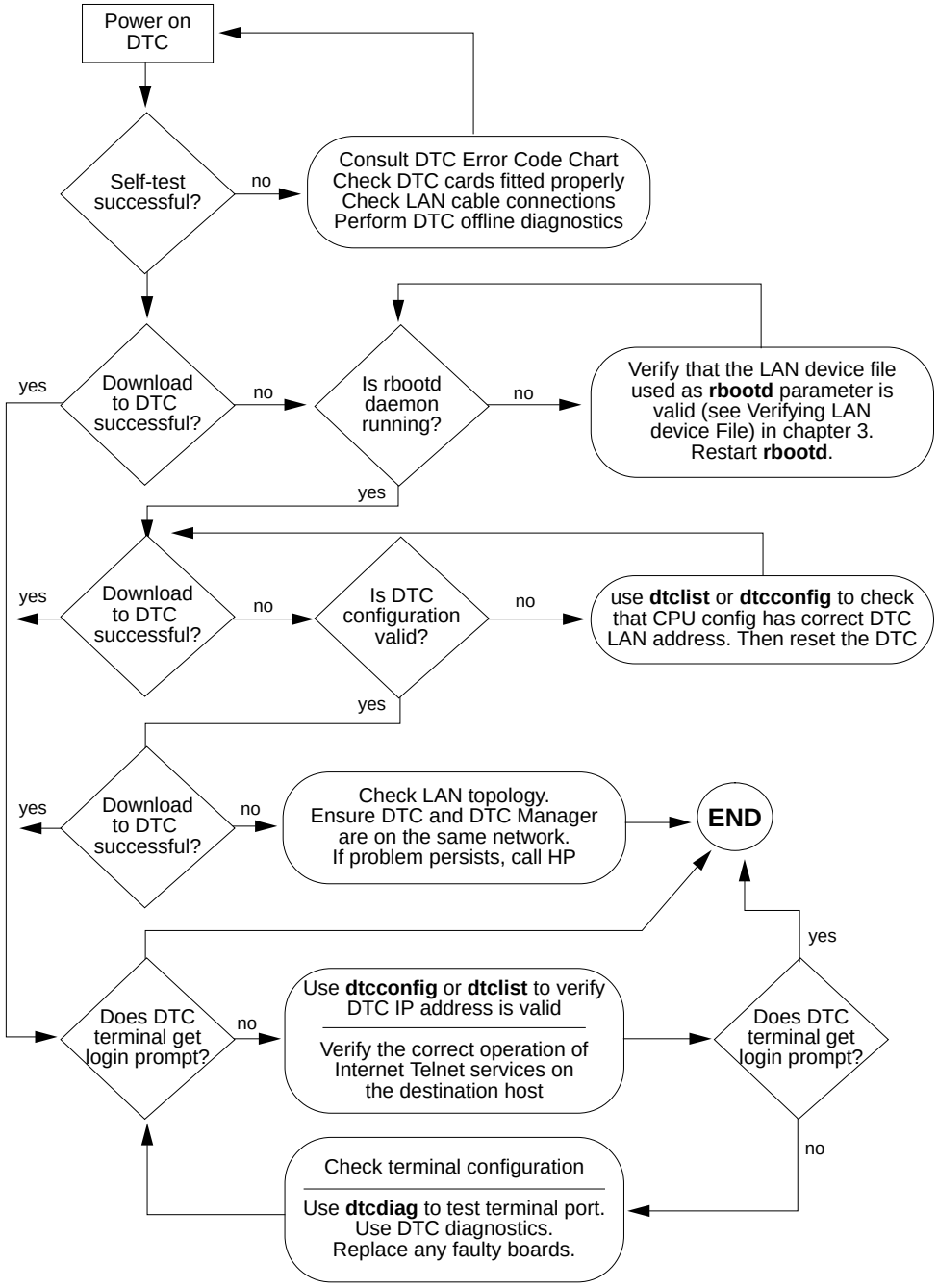
Troubleshooting procedures make use of the **dtcdiag**, **dtcping and dtccheckip** commands which are explained in chapter 13. If error messages are displayed when you try to run **dtcconfig**, **dtcdiag or dtcping refer to** “Solving dtcconfig, dtcping and dtcdiag problems” in this chapter.

Problems with DTC communication are likely to be a result of trouble with one of several distinct subsystems.

- Faulty DTC hardware.

  If you suspect a DTC hardware problem, consult the DTC hardware manual.
- Improper or invalid DTC configuration.
- Improper functioning of Internet services on the destination host.
- Improperly installed DTC Manager/UX software.

The following flowchart outlines troubleshooting procedures that may help you locate the problem. These steps are explained in the following pages.



Checking the result of the DTC self-test

When a DTC is switched on it runs a hardware self-test. Some errors which occur during the self-test are recoverable, while others are not. For example, errors 6X, 7X, 8X, 90, AX, and BX are Serial Interface Card or Connector Card errors for DTC 16s and DTC 48s. These are recoverable errors. If they occur, one or more ports of the DTC may not operate, but the self-test can complete successfully and the DTC will be downloaded.

The following steps describe how to ensure that the DTC has correctly passed its self-test and what action to take if the self-test indicates any problems.

1 Switch off the DTC and switch it on again. On the DTC 16TN you must disconnect the power cord and plug it in again.

2 Use the summary of the display codes and their meanings (located either inside the front cover of the DTC or underneath on a pull-out card) to interpret the front-panel display.

   Refer to the DTC hardware manual for a more detailed explanation of the codes displayed on the DTC.

3 If the DTC passes its self-test, go to the next stage of troubleshooting, "Checking the DTC download".

4 If the DTC does not pass the self-test, take the following steps.

   a Ensure that the DTC cards are correctly fitted in their slots.

   b Ensure that the LAN cable is connected to the DTC.

   c Use the **dtclist** command to display the DTC events during the self-test. The command **dtclist** is described in chapter 14.

   d If you cannot solve the problem, call your Hewlett-Packard representative.

5 If the DTC does pass the self-test, but some errors were indicated, take the following steps.

   a Identify any faulty boards or ports and avoid using them for connections until you can replace the board.

   b If you cannot solve the problem, call your Hewlett-Packard representative.

Checking the DTC download

If the power-on self-test is successful, the DTC broadcasts a boot request on the LAN, and waits for a host running DTC Manager/UX software to download it. The HP 9000 which on which the DTC was configured receives and responds to the boot request. The DTC is ready only after the download operation is successful.

The following steps describe how to ensure that the DTC configuration is downloaded from the DTC Manager/UX to the DTC.

1 Use the summary of the display codes and their meanings (located either inside the front cover of the DTC or underneath on a pull-out card) to interpret the front-panel display, or refer to the DTC hardware manual for a more detailed explanation of the codes displayed on the DTC.

2 If the display code indicates a successful download, go to "Checking that the Internet Services software is operational".

3 If the display code does not indicate a successful download, and you suspect that you may have a DTC 48 without a memory extension, take the following steps:

   a Look in the `rbootd` log file, `/var/adm/rbootd.log`, for the following message:

   ```
   Dropped packet: need memory extension card <type of
   current hardware>
   ```

   b If you need a memory extension card for your DTC 48, contact your Hewlett-Packard representative.

4 If the display code does not indicate a successful download, use the **Modify DTC Configuration** option in **dtcconfig** to correct the configuration information. If this DTC is not included in the list of configured DTCs, it is probably because the DTC LAN address is incorrectly configured in the DTC Manager/UX. Delete the DTC and add it again, taking care to enter the DTC LAN address exactly as it is marked on the DTC.

5 Try to download the DTC again.

6 If the display code does not indicate a successful download, go to the next stage of the troubleshooting.

Checking the log files

In general, reading the appropriate log file can provide you with a better idea of where the problem is. The log files are as follows:

- For **dtcconfig**, look in `/var/opt/dtcmgr/log/dtcconfig.log`.
- For **dtcmodifyconfs**, look in `/var/opt/dtcmgr/log/dtcmodifyconfs.log`.
- For **dtclist**, look in `/var/opt/dtcmgr/log/dtclist.log`.
- For **dtcdiag**, look in `/var/opt/dtcmgr/log/dtcdiag.log`.
- For **rbootd**, look in `/var/adm/rbootd.log`.
- For **dtcnmd**, look in `/var/opt/dtcmgr/log/dtcnmd.log` and `/var/opt/dtcmgr/log/dtcnmp.log`.

When using the commands, you can use the parameter `-l` with the number `0`, `1`, `2`, or `3` (only available with some modules) to specify the level of detail written to the log file (for example, `dtcconfig -l2`). See the man pages for more information.

Checking that the DTC management daemons are running

Download problems

The `rbootd` daemon is a process which runs on the HP 9000 host and is responsible for downloading DTCs. The `rbootd` process can be started automatically when the HP 9000 is booted. If `rbootd` is not running, the HP 9000 host cannot respond to a DTC download request. Proceed as follows:

1 Follow the procedures in chapter 3 to verify that the daemons are running.

2 If the display code still does not indicate a successful download, follow the troubleshooting procedure outlined in the hardware installation manual to try to solve the problem.

3 Contact your Hewlett-Packard representative if you cannot solve the problem.

Solving dtcconfig, dtcping and dtcdiag problems

If you see error messages about **dtcnmd** and LAN device file names when you try to run **dtcconfig**, **dtcdiag** or **dtcping**, follow the steps described for “Download problems” above.

Checking that the Internet Services software is operational

The DTC uses the Telnet and TCP/IP protocols to establish terminal and device connections from the DTC to the HP 9000 destination host. Therefore, Internet services must be correctly installed and operating on the HP 9000 host.

Details of Internet Services operation and troubleshooting are beyond the scope of this manual. However, correct operation of Internet Services on the HP 9000 can be verified as follows.

1 Use the **ps -ef** command to make sure the `inetd` daemon is running. The `inetd` daemon spawns the `telnetd` daemon.

2 From the host, attempt to establish a Telnet connection to your own node by typing the Telnet command at the shell prompt:

```
telnet   myhostname
```

where `myhostname` is the node name or IP address of your own node.

3 If you suspect problems with the Internet Services on your node, consult the *Installing and Administering Internet Services* manual.

DTC terminal user commands

This appendix explains:

- the configuration parameters that affect the DTC terminal user interface
- the commands that you can use from a terminal connected to a DTC

Type **help** at the DTC prompt to see a list of the available terminal user commands.

DTC terminal user interface parameters

The following parameters are related to the DTC terminal user interface.

- **Switching—**Only terminals which have switching enabled are connected to the DTC terminal user interface. If switching is disabled, from a terminal you are connected directly to the system and do not see the DTC prompt.
- **Welcome message—** This message is displayed when you try to logon from a terminal or when you use the **status** command. The welcome message is explained on page 70.
- **User prompt—**This prompt is displayed when you try to logon from a terminal. It is at the user prompt that you enter the DTC terminal user commands. The user prompt is explained on page 70.
- **Escape from data transfer character—** After connecting to a system, you can return to the DTC terminal user interface by using the Escape from Data Transfer character. The default is **Ctrl K** (**^k**). If you are in binary mode (see page 183), use the Break key. The escape from data transfer character is explained on page 96.
- **Default destination—** If a default destination system has been defined for the port, then you can enter the DTC **connect** command without specifying a system. You are automatically connected to the default destination system.

DTC user interface commands

This section describes the commands that are available at the DTC user interface.

Each command can be abbreviated. The commands are not case-sensitive. For example, enter either `C`, `c`, `connect`, or `CONNECT` to connect to a system.

If you have several connections open simultaneously, when you execute one of these commands, connection information is displayed on the screen and you are prompted to specify the connection to which you want the command to apply.

Connect

Opens a connection to a system.

```
C[ONNECT]     [ IP address]
```

or

```
C[ONNECT]   [ system  name]
```

The system can be a node name or an ARPA domain name. If a system is not specified, you are connected to the Default Destination system. If the DNS server is not defined, you must enter an IP address for a system other than the default destination system.

Note

Never include the leading zeros in an IP address when using the **connect** command. If the IP address you want to connect to is 128.10.11.12, *do not* type 128.010.011.012 or the connection will fail.

Using the connect command

DNS parameters (DNS/IP Parameters Configuration screen in dtcconfig)		What to enter for connect command
Default server specified	Default local domain specified	
No	No	**connect** with the system's IP address
Yes	No	**connect** with full ARPA domain name
Yes	Yes	**connect** with node name portion of any node on the LAN

Note — The DNS must be up and running at the boot time of the DTC.

Disconnect — Closes the system connection. Each connection is identified as a number (*xx*) in the **status** command display. Only the connection number can be used. The connection name cannot be used. If the connection number is not specified, the current system connection is closed.

```
D[ISCONNECT]  [ xx ]
```

Help or **?** — Displays a list of available commands, their abbreviations, and a brief explanation.

```
H[ELP]
```

Logout — Logs you out of the DTC user interface. If the connection is via modems, the line is dropped. If the connection is open on a system, it is closed.

```
L[OGOUT]
```

Recall — Resumes a connection that you left open when you used the escape from data transfer character to leave a connection without logging off.

```
R[ECALL]   [ xx ]
```

Each connection is identified as a number (*xx*) in the **status** command display. Only the connection number can be used. The connection name can not be used. If the connection number is not specified, the specified system connection is recalled.

Set ASCII — Sets the data transfer mode to ASCII.

```
[SET ]A[SCII]   [ xx ]
```

Each connection is identified as a number (*xx*) in the **status** command display. Only the connection number can be used. The connection name can not be used. If the connection number is not specified, the specified system connection is set.

Set Binary — Sets the data transfer mode to binary.

```
[SET ]B[INARY]   [ xx ]
```

Each connection is identified as a number (*xx*) in the **status** command display. Only the connection number can be used. The connection name can not be used. If the connection number is not specified, the specified system connection is set.

Status

Displays a table showing information about the open connections from the terminal. The connection number is displayed by **status**.

```
S[TATUS]
```

Examples of DTC user interface commands

The following examples show the DTC Terminal User **help**, **status**, and **connect** commands you can enter. User input is **bold** type. The DTC prompt on the DTC in the examples is DTC1>.

Examples of the connect command

```
DTC1>CONNECT ALPHA <return>
DTC1>C rainbow connection3<return>

DTC1> connect mysystem
Connection #1 established to MYSYSTEM.MKTG.COMPANY

To return to DTC interface, type <Ctrl>K
login:

DTC1> connect 15.13.13.13
```

Example of the disconnect command

```
DISCONNECT 1 <return>
```

Example of the help command

```
DTC1> help

Command [Opt. Parameters]  | Abbr.  |  Meaning
CONNECT [destination       |   C    | Opens a connection.
[connection name]|         |
DISCONNECT  [xx]           |   D    | Closes connection xx.

HELP                       | H or ? | Lists available commands.

LOGOUT                     |   L    | Logs out from the DTC.

RECALL  [xx]               |   R    | Resumes connection xx.
SET ASCII  [xx]            |   A    | Enables ASCII mode.*

SET BINARY  [xx]           |   B    | Enables BINARY mode.*

STATUS                     |   S    | Displays port status.

*: Not applicable for MPE iX connections
```

Example of the status command

```
DTC1> status

          STATUS:    Board 3 (SIC)    Port 6

DTC name                          : DTC1.MKTG.COMPANY
Default Destination               : MYSYSTEM.MKTG.COMPANY
Maximum number of connections     : 3
DNS Default Local Domain          : SYSTEM1.MAIN.HUB
DTC multivendor

No connection established
```

B

DTC Manager/UX file system

This appendix contains listings of all HP-UX 10.x and HP-UX 9.x files and directories used by DTC Manager/UX.

HP-UX 10.x file system

File listing (by directory)

/opt/dtcmgr/sbin/ **DTC Manager commands**

dtccheckip
dtcconfig
dtcconnstat
dtcdiag
dtcdisown
dtcdownload
dtcexport
dtcimport
dtclist
dtcmodifyconfs
dtcnmd
dtcnmp
dtcown
dtcping
dtcquickswitch
dtcreset
dtcstat
dtctest
dtctraceoff
dtctraceon
dtcupload
lanstat
tiostat

/sbin/init.d/ **Start/kill scripts**

dtcmgr

/opt/dtcmgr/code **DTC code**

cpuconv.cod
lan.cod
mux68k.cod
rom16.cod
rom72.cod
sic.cod
sic2.cod
sic3.cod
sic4.cod
ts16.cod

/opt/dtcmgr/tools/ **DTC tools**

dtcmodifyconfs.sh
dtcmodifyconfs.txt

/opt/dtcmgr/jam_data/ **Keyboard and video data**

hpansikeys.bin
hpansivid.bin
hpitevid.bin
hpkeys.bin
hpvid.bin
msgfile.bin
vt100keys.bin
vt100vid.bin
vt220keys.bin
vt220vid.bin
wy30keys.bin
wy30vid.bin
wy50keys.bin
wy50vid.bin
wy60keys.bin
wy60vid.bin

/opt/dtcmgr/jam_screens/ Screen descriptions

data.dic
global.ini
screenlib

/etc/rc.config.d/ System configuration

dtcmgr

/etc/opt/dtcmgr/ Configurations

acclist

/etc/opt/dtcmgr/default/ Default configurations

confext.def
cpuconv.def
globhdr.def
mgr.def
ncpu.def
nprinter.def
nterm.def
printer.def
tcp.def
term.def

/opt/dtcmgr/lib/nls/msg/C/ Message catalogs

dtcmgr.cat
dtcnmd.cat
dtcnmp.cat
lanstat.cat
tiostat.cat

/opt/dtcmgr/share/man/man1m.Z/ Man pages

dtcconfig.1m
dtccannstat.1m
dtcdiag.1m
dtcdisown.1m
dtcdownload.1m
dtcexport.1m
dtcimport1m
dtclist.1m
dtcmodifyconfs.1m
dtcnmd.1m
dtcnmp.1m

dtcown.1m
dtcping.1m
dtcquickswitch.1m
dtcreset.1m
dtcstat.1m
dtctest.1m
dtctraceoff.1m
dtctraceon.1m
dtcupload.1m

/opt/dtcmgr/doc/

Error messages

dtcconfig.err
dtcdiag.err
dtclist.err
dtcmodifyconfs.err
dtcnmd.err
dtcnmp.err
dtcping.err
global.err

Files maintained during runtime

/var/opt/dtcmgr/

<dtcname>.dtc
<dtcname>.exim
temp*
dtcconfig.lock
event.log
copyhdr (optional)
./copy/ (optional)
./ipc/
./log/
./status/
./tmp/ (optional)
./upload/

/etc/opt/dtcmgr/

map802
./default/*.cus

Alphabetical file listing (HP-UX 10.x)

File	Path
*.cus	/etc/opt/dtcmgr/default
acclist	/etc/opt/dtcmgr/
confext.def	/etc/opt/dtcmgr/default/
connstatformat	/opt/dtcmgr/sbin/ (version A.14.2A.000 only)
copyhdr	/var/opt/dtcmgr/
cpuconv.cod	/opt/dtcmgr/code/
cpuconv.def	/etc/opt/dtcmgr/default/
data.dic	/opt/dtcmgr/jam_screens/
dtccheckip	/opt/dtcmgr/sbin
dtcconfig	/opt/dtcmgr/sbin/
dtcconfig.1m	/opt/dtcmgr/share/man/man1m.Z/
dtcconfig.err	/opt/dtcmgr/doc/
dtcdiag	/opt/dtcmgr/sbin/
dtcdiag.1m	/opt/dtcmgr/share/man/man1m.Z/
dtcdiag.err	/opt/dtcmgr/doc/
dtcdisown	/opt/dtcmgr/sbin/
dtcexport	/opt/dtcmgr/sbin/
dtcimport	/opt/dtcmgr/sbin/
dtclist	/opt/dtcmgr/sbin/
dtclist.1m	/opt/dtcmgr/share/man/man1m.Z/
dtclist.err	/opt/dtcmgr/doc/
dtcmgr	/etc/rc.config.d/
dtcmgr	/sbin/init.d/
dtcmgr.cat	/opt/dtcmgr/lib/nls/msg/C/
dtcmodifyconfs	/opt/dtcmgr/sbin/
dtcmodifyconfs.1m	/opt/dtcmgr/share/man/man1m.Z/
dtcmodifyconfs.err	/opt/dtcmgr/doc/
dtcmodifyconfs.sh	/opt/dtcmgr/tools/
dtcmodifyconfs.txt	/opt/dtcmgr/tools/
dtcnmd	/opt/dtcmgr/sbin/
dtcnmd.1m	/opt/dtcmgr/share/man/man1m.Z/

dtcnmd.cat . . . . . ./opt/dtcmgr/lib/nls/msg/C/
dtcnmd.err . . . . . ./opt/dtcmgr/doc/
dtcnmp . . . . . ./opt/dtcmgr/sbin/
dtcnmp.1m . . . . . /opt/dtcmgr/share/man/man1m.Z/
dtcnmp.cat . . . . . ./opt/dtcmgr/lib/nls/msg/C/
dtcnmp.err . . . . . ./opt/dtcmgr/doc/
dtcown . . . . . ./opt/dtcmgr/sbin/
dtcping . . . . . ./opt/dtcmgr/sbin/
dtcping.1m . . . . . ./opt/dtcmgr/share/man/man1m.Z/
dtcping.err . . . . . ./opt/dtcmgr/doc/
global.err . . . . . ./opt/dtcmgr/doc/
global.ini . . . . . ./opt/dtcmgr/jam_screens/
globhdr.def . . . . . ./etc/opt/dtcmgr/default/
hpansikeys.bin . . . . . ./opt/dtcmgr/jam_data/
hpansivid.bin . . . . . .opt/dtcmgr/jam_data/
hpitevid.bin . . . . . ./opt/dtcmgr/jam_data/
hpkeys.bin . . . . . ./opt/dtcmgr/jam_data/
hpvid.bin . . . . . ./opt/dtcmgr/jam_data/
lan.cod . . . . . ./opt/dtcmgr/code/
lanstat. . . . . ./opt/dtcmgr/sbin/
lanstat.cat . . . . . ./opt/dtcmgr/lib/nls/msg/C/
map802 . . . . . ./ect/opt/dtcmgr/
mgr.def . . . . . ./etc/opt/dtcmgr/default/
msgfile.bin . . . . . ./opt/dtcmgr/jam_data/
mux68k.cod . . . . . ./opt/dtcmgr/code/
ncpu.def . . . . . ./etc/opt/dtcmgr/default/
nprinter.def . . . . . ./etc/opt/dtcmgr/default/
nterm.def . . . . . ./etc/opt/dtcmgr/default/
printer.def . . . . . ./etc/opt/dtcmgr/default/
rom16.cod . . . . . ./opt/dtcmgr/code/
rom72.cod . . . . . ./opt/dtcmgr/code/
screenlib . . . . . ./opt/dtcmgr/jam_screens/
sic.cod . . . . . /opt/dtcmgr/code/
sic2.cod . . . . . /opt/dtcmgr/code/

sic3.cod	/opt/dtcmgr/code/
sic4.cod	/opt/dtcmgr/code/
tcp.def	/etc/opt/dtcmgr/default/
term.def	/etc/opt/dtcmgr/default/
tiostat	/opt/dtcmgr/sbin/
tiostat.cat	/opt/dtcmgr/lib/nls/msg/C/
ts16.cod	/opt/dtcmgr/code/
vt100keys.bin	/opt/dtcmgr/jam_data/
vt100vid.bin	/opt/dtcmgr/jam_data/
vt220keys.bin	/opt/dtcmgr/jam_data/
vt220vid.bin	/opt/dtcmgr/jam_data/
wy30keys.bin	/opt/dtcmgr/jam_data/
wy30vid.bin	/opt/dtcmgr/jam_data/
wy50keys.bin	/opt/dtcmgr/jam_data/
wy50vid.bin	/opt/dtcmgr/jam_data/
wy60keys.bin	/opt/dtcmgr/jam_data/
wy60vid.bin	/opt/dtcmgr/jam_data/

HP-UX 9.x file system

File listing (by directory)

/etc/ — DTC Manager commands

dtccheckip
dtcconfig
dtcconnstat
dtcdiag
dtcdisown
dtcdownload
dtcexport
dtcimport
dtclist
dtcmodifyconfs
dtcnmd
dtcnmp
dtcown
dtcping
dtcquickswitch
dtcreset
dtcstat
dtctest
dtctraceoff
dtctraceon
dtcupload
lanstat
tiostat

/usr/dtcmgr/default/ — Default configurations

*.def
*.cus

/usr/dtcmgr/code/ — DTC code

cpuconv.cod
lan.cod
mux68k.cod
rom16.cod
rom72.cod
sic.cod
sic2.cod
sic3.cod
sic4.cod

ts16.cod

/usr/dtcmgr/tools/ DTC tools

dtcmodifyconfs.sh
dtcmodifyconfs.txt

/usr/dtcmgr/jam_data/ Keyboard and video data

hpansikeys.bin
hpansivid.bin
hpitevid.bin
hpkeys.bin
hpvid.bin
msgfile.bin
vt100keys.bin
vt100vid.bin
vt220keys.bin
vt220vid.bin
wy30keys.bin
wy30vid.bin
wy50keys.bin
wy50vid.bin
wy60keys.bin
wy60vid.bin

/usr/dtcmgr/jam_screens/ Screen descriptions

data.dic
global.ini
screenlib

/usr/man/man1m.Z/ Man pages

dtcconfig.1m
dtcconnstat.1m
dtcdiag.1m
dtcdisown.1m
dtcdownload.1m
dtcexport.1m
dtcimport.1m
dtclist.1m
dtcmodifyconfs.1m
dtcnmd.1m
dtcnmp.1m
dtcown.1m
dtcping.1m

dtcquickswitch.1m
dtcreset.1m
dtcstat.1m
dtctest.1m
dtctraceoff.1m
dtctraceon.1m
dtcupload.1m

/usr/lib/nls/C/ Message catalogs

dtcnmd.cat
dtcmgr.cat
dtcnmp.cat
lanstat.cat
tiostat.cat

/usr/dtcmgr/doc/ Error messages

dtcconfig.err
dtcdiag.err
dtclist.err
dtcmodifyconfs.err
dtcnmd.err
dtcnmp.err
dtcping.err
global.err

Files maintained during runtime

/usr/dtcmgr/

<dtcname>.dtc
<dtcname>.exim
temp*
dtcconfig.lock
event.log
copyhdr (optional)
./copy/ (optional)
./ipc/
./log/
./status/
./tmp/ (optional)
./upload/

/usr/adm/

*.log

Alphabetical file listing (HP-UX 9.x)

File	Path
*.def	/usr/dtcmgr/default/
*.cus	/usr/dtcmgr/default/
*.log	/usr/adm/
<dtcname>.dtc	/usr/dtcmgr/
<dtcname>.exim	/usr/dtcmgr/
acclist	/usr/dtcmgr/
catalog	/usr/dtcmgr/
copyhdr.	/usr/dtcmgr/
cpuconv.cod	/usr/dtcmgr/ipc/ code/
data.dic	/usr/dtcmgr/jam_screens/
dtccheckip	/etc/
dtcconfig	/etc/
dtcconfig.1m	/usr/man/man1m.Z/
dtcconfig.lock	/usr/dtcmgr/
dtcconnstat.1m	/usr/man/man1m.Z/
dtcconnstat	/etc/
dtcdiag.1m	/usr/man/man1m.Z/
dtcdiag	/etc/
dtcdownload.1m	/usr/man/man1m.Z/
dtcdownload	/etc/
dtclist.1m	/usr/man/man1m.Z/
dtclist	/etc/
dtcmgr.cat	/usr/lib/nls/C/
dtcmodifyconfs.1m	/usr/man/man1m.Z/
dtcmodifyconfs.	/etc/
dtcmodifyconfs.sh	/usr/dtcmgr/tools/
dtcmodifyconfs.txt	/usr/dtcmgr/tools/
dtcnmd.1m	/usr/man/man1m.Z/
dtcnmd.cat	/usr/lib/nls/C/
dtcnmd	/etc/
dtcnmp.1m	/usr/man/man1m.Z/

dtcnmp.cat . . . . . /usr/lib/nls/C/
dtcnmp . . . . . /etc/
dtcping.1m . . . . . /usr/man/man1m.Z/
dtcping . . . . . ./etc/
dtcreset.1m . . . . . ./usr/man/man1m.Z/
dtcreset. . . . . ./etc/
dtcstat.1m . . . . . ./usr/man/man1m.Z/
dtcstat. . . . . ./etc/
dtctest.1m. . . . . /usr/man/man1m.Z/
dtctest/etc . . . . . ./
dtctraceoff.1m . . . . . ./usr/man/man1m.Z/
dtctraceoff . . . . . .etc/
dtctraceon.1m. . . . . ./usr/man/man1m.Z/
dtctraceon. . . . . ./etc/
dtcupload.1m . . . . . /usr/man/man1m.Z/
dtcupload . . . . . ./etc/
event.log . . . . . ./usr/dtcmgr/
global.ini . . . . . ./usr/dtcmgr/jam_screens/
hpansikeys . . . . . ./usr/dtcmgr/jam_data/
hpansikeys.bin . . . . . ./usr/dtcmgr/jam_data/
hpansivid . . . . . ./usr/dtcmgr/jam_data/
hpansivid.bin . . . . . ./usr/dtcmgr/jam_data/
hpitevid . . . . . ./usr/dtcmgr/jam_data/
hpitevid.bin . . . . . ./usr/dtcmgr/jam_data/
hpkeys . . . . . ./usr/dtcmgr/jam_data/
hpkeys.bin . . . . . ./usr/dtcmgr/jam_data/
hpvid . . . . . ./usr/dtcmgr/jam_data/
hpvid.bin . . . . . ./usr/dtcmgr/jam_data/
lan.cod . . . . . ./usr/dtcmgr/ code/
lanstat. . . . . ./etc/
lanstat.cat . . . . . ./usr/lib/mb/c/
msgfile . . . . . ./usr/dtcmgr/jam_data/
msgfile.bin . . . . . ./usr/dtcmgr/jam_data/
mux68k.cod . . . . . ./usr/dtcmgr/code/

rom16.cod . . . . . /usr/dtcmgr/code/
rom72.cod . . . . . /usr/dtcmgr/code/
screenlib . . . . . /usr/dtcmgr/jam_screens/
sic.cod . . . . . /usr/dtcmgr/code/
sic2.cod . . . . . /usr/dtcmgr/code/
sic3.cod . . . . . /usr/dtcmgr/code/
sic4.cod . . . . . /usr/dtcmgr/code/
temp* . . . . . /usr/dtcmgr/
tiostat . . . . . /etc/
tiostat.cat . . . . . /usr/lib/mb/c/
ts16.cod . . . . . /usr/dtcmgr/code/
vt100keys . . . . . /usr/dtcmgr/jam_data/
vt100vid . . . . . /usr/dtcmgr/jam_data/
vt220keys . . . . . /usr/dtcmgr/jam_data/
vt220vid . . . . . /usr/dtcmgr/jam_data/
vt220vid.bin . . . . . /usr/dtcmgr/jam_data/
wy30keys.bin . . . . . /usr/dtcmgr/jam_data/
wy30vid . . . . . /usr/dtcmgr/jam_data/
wy50vid . . . . . /usr/dtcmgr/jam_data/
wy50vid.bin . . . . . /usr/dtcmgr/jam_data/
wy60keys . . . . . /usr/dtcmgr/jam_data/
wy60keys.bin . . . . . /usr/dtcmgr/jam_data/
wy60vid . . . . . /usr/dtcmgr/jam_data/

Error messages

All DTC Manager/UX error messages and their descriptions are listed in `*.err` files (one for each command) located in the `/opt/dtcmgr/doc/` directory. An error file is provided for each DTC command and daemon. You can print or view these files when you need information on a particular error message.

Following is an example of an error:

```
<<577>> MESSAGE Name of DTC is already specified
CAUSE the DTC name specified is already on the screen
ACTION specify a unique name for each DTC.
```

You can display the file in which the error is located as follows:

1 Change to the directory where the error files are located (`/opt/dtcmgr/doc/`)

2 Use the command **grep** to display the error information line. For example:

```
grep 577 *.err;
```

3 Display the contents of the error file using the command **vi** with the file error number (for example, `/577`).

Glossary

A

address A numerical identifier defined and used by a particular protocol and associated software to distinguish one node from another.

address resolution In networks, the mapping of node names to IP addresses and the mapping of IP addresses to low-level hardware addresses.

address resolution protocol (ARP) A protocol used to convert an IP address to a low-level hardware address. ARP can be used only over a single physical network and is limited to networks that support hardware broadcast.

ARP *See* **address resolution protocol**.

asynchronous A device's mode of operation in which a sequence of operations are executed irrespective of coincidence with any event. Devices that are directly accessible by people (for example, terminal keyboards) operate in this manner.

asynchronous processor board The 24-port mux board for the DTC 72MX, which 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 AUI. 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.

B

baud rate The 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 A 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.

block mode A terminal processing mode in which groups, or "blocks," of data are transmitted all at once.

bridge A device used to connect LAN segments. Bridges are protocol-transparent and do not alter the data they receive but simply transmit it to the other network.

broadcast Communication method for sending a message to all devices on a link simultaneously. Broadcast may be implemented with hardware (for example as in Ethernet) or with software.

C

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 system 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.

CPU/LAN Processor Board Each DTC has a **processor board** that handles the overall management of the DTC. The processor board is the central processing unit (CPU) of the DTC and contains the firmware and downloaded software responsible for much of the data communications processing done by the DTC. It also provides the DTC with its connection point to the LAN via an **attachment unit interface (AUI)** cable and a **medium attachment unit (MAU) for ThickLAN** connection, or a **BNC T-Connector** for ThinLANconnection.

CSMA/CD Carrier Sense Multiple Access with Collision Detect, transmission access method used by the IEEE 802.3 LAN standard.

D

Data communications and Terminal Controller — *See* **DTC**.

datagram — A self-contained packet that is independent of other packets. It does not require an acknowledgment and it carries information which is sufficient to route it from the source device to the destination device. The DTC Manager/UX uses HP-proprietary datagram protocols.

DDFA — DTC Device File Access utilities. A set of HP-UX utilities used by systems and user-written applications to programmatically access devices attached to DTC ports.

DDP — Direct Distribution Panel. A distribution panel that serves as the electrical and physical interface between a DTC 72MX MUX board (asynchronous processor board) and up to eight asynchronous devices for direct connections. See **MDP** for modem connections.

dedicated printer — A printer that can be used only by one host on the LAN—the one specified in the destination node name in that printer port's configuration screen.

destination node name — In DTC 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-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 file — A file being input to or output from any peripheral device except a disk. HP-UX 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 irrespective of the nature of the device.

device name — *See* **device file**.

D

direct-connect device An asynchronous device that is connected directly to a DTC through an RS-232-C or RS-423 cable, with no intervening communications equipment. Also referred to as a “local connection.”

DNS (Domain Name Server) A system on a network that resolves names into IP addresses, so that connections can be made using names rather than IP addresses.

download The process of loading operating code and configuration files into the DTC's memory. The DTC is downloaded by the host system running DTC Manager/UX.

DTC Data communications and Terminal Controller. The DTC is a hardware device, configured as a node on a LAN, that enables asynchronous devices to access HP computers. Terminals can either be directly connected to the DTC, or they can be remotely connected through modems.

DTC 16 The HP 2340A product. A DTC that provides two slots for asynchronous connections, each slot allowing up to eight direct connections or six modem connections.

DTC 16TN The HP J2060A product. A DTC terminal server for Telnet systems. It allows up to 16 asynchronous connections to computer systems running Internet Services, such as HP 9000s and third party systems.

DTC 16MX The HP J2063A product. A DTC terminal server for Telnet systems. It allows up to 16 asynchronous connections to computer systems running Internet Services, such as HP 9000s and third party systems. When managed by the DTC Manager/UX, the DTC 16MX is configured and functions exactly like a DTC 16TN. The full functionality of the DTC 16MX is only available when it is managed by the HP OpenView DTC Manager.

DTC 48 The HP 2345A product. A DTC that provides six slots for asynchronous connections. Each slot allows up to eight direct connections or six modem connections.

DTC 72MX The HP J2070A product. A DTC that provides three slots and up to 72 asynchronous connections. Each slot accommodates up to 24 direct or modem connections.

DTC LAN station address (802.3 address) A 12-digit hexadecimal number used to identify the DTC (as a node belonging to the network configuration). Also called the LAN address or node address.

DTC node name A unique name used to identify a DTC on a LAN. The node name format is *nodename.domain.organization*, with each of the three parts having up to 16 characters. The name must begin with either a letter or a digit.

DTC switching A facility enabling terminal users to select any host system that they want to connect to.

DTC user interface The interface accessed by users of terminals connected to a DTC. The default DTC user interface prompt is DTC>

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.

E

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 character is **[Ctrl]-K**.

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. Escape sequences are used when, for example, you need to include special characters in a screen message, such as a welcome message.

Ethernet A Local Area Network system that uses baseband transmission at 10 Mbps over coaxial cable and unshielded twisted pair. Ethernet is a trademark of Xerox Corporation.

event log A file on the DTC Manager/UX containing a list of events that are reported by the DTCs for which it is responsible.

F

file system The organization of files and directories on a hard disk.

flow control A means of regulating the rate at which data transfer takes place between devices, to protect against data overruns.

H

handshaking A communications protocol between devices or between a device and the CPU. It 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 72MX and DTC 16TN only.)

host-based network management A method of managing asynchronous communications for HP computers. All of the control software is configured on a single HP host and is downloaded to the DTCs that are managed by that host. The DTC Manager/UX is a host-based management product.

host computer The primary or controlling computer on a network. The computer on which the network control software resides. For HP purposes, it can also be used to distinguish the system (host) from the DTC.

I

ICMP Internet control message protocol. An integral part of the Internet protocol that handles error and control messages. Gateways and hosts use ICMP to send reports of problems about datagrams back to the original source that sent the datagram. ICMP also includes an echo request/reply used to test whether a destination can be reached and will respond.

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.

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.

Internet Protocol (IP) 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**.

IP *See* **Internet Protocol**.

IP address Internet Protocol address. An address used by the Internet Protocol to perform internet routing. A complete IP address consists of 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. The IP address of each node in the network must be unique within that network.

IP datagram The basic unit of information passed across the Internet. It contains a source and destination address together with the data.

Internet Services A range of network services comprising File Transfer Protocol (FTP), Virtual Terminal Protocol (TELNET), and Simple Mail Transfer Protocol (SMTP).

L

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* **DTC LAN station address**.

line speed The speed at which data is transferred over a specific physical link (usually measured in bits or kilobits per second).

local area network interface controller (LANIC) A hardware card that fits into the backplane of the HP 9000 and provides a physical layer interface for IEEE 802.3 local area networks.

local connection *See* **direct connection**.

local node The computer that you are configuring or that you are logged on to.

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.

loopback The routing of messages from a node back to itself.

M

MC/ServiceGuard Software that provides control and coordination for high availability systems. It ensures that applications are still available after a host system failure.

MAU *See* **Medium Attachment Unit**.

medium attachment unit (MAU) A device attached to a ThickLAN coaxial cable that provides the physical and electrical connection from the AUI cable to the coaxial cable.

MDP Modem Distribution Panel; a distribution panel that serves as the electrical and physical interface between a DTC 16TN or a DTC 72MX MUX board (asynchronous processor board), and up to eight asynchronous devices for direct or modem connections. Also called **ADP**.

MIB Management information base. A database of information about a network node which is used by the SNMP manager.

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.

multicast A technique that allows copies of a single packet to be passed to a selected subset of all possible destinations. Some hardware, for example Ethernet, supports multicast by allowing a network interface to belong to one or more multicast groups. Broadcast is a special form of multicast in which the subset of devices to receive a copy of a packet consists of the entire set.

multiplexer (MUX) A device that allows multiple communication links to use a single channel.

N

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, a node's X.25 address.

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.

network management The collective tasks required to design, install, configure, maintain, and if necessary, change a network.

Network Services Software application products that can be used to access data, initiate processes, and exchange information among nodes in the network.

NFT Network File Transfer. The network service that transfers disk files between nodes on a network.

NI *See* **network interface**.

node A device on 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. An IP address consists of a node portion and a network portion.

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.

O

OpenView HP OpenView Windows is HP's network management environment. It provides the basic services for accessing and managing networks used by the DTC Manager, and other applications, such as Switch/PAD Manager and Hub Manager.

OpenView DTC Manager An OpenView Windows application on a PC that enables you to configure, control, monitor, and troubleshoot the operation of the DTCs on the LAN.

OV workstation A personal computer on which OpenView windows and one or more OpenView applications, such as OpenView DTC Manager, are running.

P

ping The name of a program used in the Internet to test if a destination can be reached. It sends an ICMP echo request and waits for a reply.

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.

port groups In the DTC 16TN and DTC 72MX, the ports are grouped into **port groups**. Each port group has eight ports. The DTC 16TN has two port groups, and the DTC 72MX has three port groups per board. Each port group can be modem or direct-connect. A port group corresponds to a connector on a board of a DTC 72MX or to a connector on a DTC 16TN.

printer name A character string of up to 16 characters specified in the DTC Manager configuration to define a printer by name. A printer name can be shared by several printers (port pool).

program captive device *See* **programmatic device**.

programmatic access Access to devices by software running on a system. The HP DTC Device File Access product, for example, allows HP-UX hosts to programmatically access devices connected to a DTC.

programmatic device A device operating under the 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.

R

remote node Any network node that is physically separate from the node you are currently using or referring to.

RMP Remote Maintenance Protocol. HP proprietary protocol used in DTC management.

RS-232-C The Electronic Industries Association (EIA) Level 1 protocol specification that defines electrical circuit functions for 25 connector pins. Hewlett-Packard 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-423 The 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).

S

serial device Any device that is attached to and communicates with a computer by means of a serial transmission interface. Terminals, some printers, and plotters are among the devices that communicate serially with computers.

serial transmission A 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 systems via the DTC.

SIC Serial Interface Card. A card installed in 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 can respond to SNMP requests.

SNMP manager A network management workstation that is running software which allows it to manage SNMP nodes, for example HP OpenView Network Node Manager.

spooled device A printer that is accessed through the HP-UX spooling facility. The spooling facility allows a 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.

station address A link-level address used by the IEEE 802.3 protocol that is assigned to every node on an IEEE 802.3 network.

subnet A portion of a network that is defined as a separate network. *All* the bits in the IP address specified by the subnet mask (that is, all the bits set to 1 in the subnet mask) are the same for any two IP addresses in that subnet.

subnet address The portion of the IP address that identifies a physically distinct subnetwork of a network. It is also called a subnet number.

subnet mask A 32-bit number that enables the node address portion of an IP address in a subnetwork to be identified. Bits in the subnet mask are set to 1 if the network treats the corresponding bit in the IP address as part of the network address, and to 0 if the network treats the corresponding bit in the IP address as part of the node address. The subnet mask 11111111 11111111 11111111 00000000 (or 255.255.255.0) indicates that the first three bytes identify the network and the fourth byte identifies the node.

switching *See* **DTC switching**.

synchronous A mode of operation or transmission in which 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.

system configuration The method for telling the operating system which peripheral I/O devices are attached to the DTC and which parameters are required for system operation.

T

TCP *See* **Transmission Control Protocol**.

terminal name A character string of up to 16 characters specified in the DTC Manager configuration to define a terminal by name.

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.

transparent mode A 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.

U

unedited mode *See* **transparent mode**.

X

XON/XOFF protocol The flow control used by 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).

D

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Printed in

Customer order number
J2120-62000

HP Manufacturing part number
J2120-90024
Mfg. number is for HP internal use only