DHCT Status Reporting and signonCount Utilities User's Guide

Please Read This Entire Guide

Important

Please read this entire guide. If this guide provides installation or operation instructions, give particular attention to all safety statements included in this guide.

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Preface

About This Guide

Purpose

The DHCT Status Reporting Utility and the signonCount Utility are two new programs that are included in version 4.1 of the DBDS Utilities. This guide provides instructions for running the two utilities, as well as guidelines for understanding the data generated by each.

Note: The version of the DHCT Status Reporting Utility (v2.6.0.x) included in version 4.1 of DBDS Utilities is compatible with systems supporting System Release (SR) 2.2 or later system software.

A brief description of each utility follows.

The DHCT Status Reporting Utility

Digital Home Communication Terminals (DHCTs) that are unable to establish or maintain two-way communication with the headend are known as non-responding DHCTs. The DHCT Status Reporting Utility was developed to help system operators and Cisco engineers minimize the impact of non-responding DHCTs on the DBDS network.

Note: Non-responding DHCTs are most commonly referred to as *non-responders*, both in this guide and in the field.

The signonCount Utility

DHCTs lose the contents of their volatile memory, including network configuration data, whenever they download new operating system or resident application software, or any time they reboot. As a part of the reboot process, DHCTs sign back on to the network and the contents of their volatile memory are updated. The signonCount Utility is useful in helping system operators monitor the rate at which DHCTs sign on to the network. In addition, the utility can automatically fix common problems that prevent DHCTs from signing on.

Installation of the Utilities

Installation of the DHCT Status Reporting Utility and the signonCount Utility occurs automatically when you install the DBDS Utilities. Refer to *DBDS Utilities Installation Instructions and DNCS Utilities User's Guide*, part number 740020, for installation instructions for the DBDS Utilities.

Audience

This guide is written for the system operators of Cisco's digital cable television systems and Cisco field service engineers who help system operators manage their systems.

Scope

The DHCT Status Reporting Utility, as well as the signonCount Utility, pertain to systems running either the Cisco Resident Application (SARA) or the Pioneer resident application.

Important Notice About Database Backup

Before running the DHCT Status Reporting Utility or the signonCount Utility, be sure that you have a current backup of your DNCS and Application Server database. Refer to one of the following guides for procedures to back up the database:

- *Backup and Restore Procedures for the Digital Broadband Delivery System User's Guide*, part number 736094

  Note: The backup and restore procedures in part number 736094 pertains to systems supporting software earlier than SR 2.1.1 or SR 3.0.1.

- *DBDS Backup and Restore Procedures For SR 2.1.1, SR 3.0.1, and SR 2.1.1 and SR 3.0.1 Service Pack 1*, part number 4003238
- *DBDS Backup and Restore Procedures For SR 2.2 and SR 3.2, and SR 2.2 and SR 3.2 Service Pack 1,* part number 4005871

Document Version

This is the second release of this guide.

Chapter 1
DHCT Status Reporting Utility

Overview

Introduction

The DHCT Status Reporting Utility is useful in helping system operators monitor two-way communications between DHCTs and the headend. DHCTs without two-way communications are said to be *non-responding*. Subscribers with a non-responding DHCT are unable to participate fully in the interactive features of the DHCT, while system operators are unable to maximize the revenue potential associated with a DHCT that can establish and maintain two-way communication.

Section A of this chapter develops the definition of non-responding DHCTs, from the point of view of Cisco, as well as from the point of view of the system operator. Subsequent sections of this chapter describe the interface of the utility, provide instructions on how to use the utility to poll DHCTs, and explain how to run and interpret the various lists and reports generated by the utility.

Screen-Captured Images

Some of the screens or illustrations included in this chapter may not match exactly what appears on the system you are operating. Software version numbers, build numbers, and displayed data may vary from site to site.

In This Chapter

This chapter contains the following topics.

Section A
Defining Non-Responding DHCTs

Overview

Introduction

The DHCT Status Reporting Utility helps system operators minimize system impact caused by non-responding DHCTs. This chapter provides two definitions of non-responding DHCTs, explores some of the reasons DHCTs cannot respond, and describes some of the utilities that are available for system operators to use when managing non-responding DHCTs.

In This Section

This section contains the following topics.

What is a Non-Responding DHCT?

Definition of Non-Responding DHCTs

A non-responding DHCT is a DHCT that is installed in the home of a subscriber and has been configured by the billing vendor to be capable of two-way communication. However, for some reason, the DHCT is unable to maintain or establish a two-way connection.

Note: Two-way communication (or connection) means that a working communication path exists between the headend and the DHCT, as well as between the DHCT and the headend.

What Causes DHCTs to Become Non-Responders?

Introduction

This section lists some of the conditions that may contribute to DHCTs becoming non-responders.

Conditions in the Subscriber's Home

Subscribers themselves may be responsible for causing some DHCTs to become non-responders. The following list contains a few examples of conditions that might exist in a subscriber's home that could cause the subscriber's DHCT to be a non-responder:

- Subscriber installs a one-way power amplifier—A one-way power amplifier blocks return transmissions.
- Subscriber installs a signal splitter—A signal splitter may reduce the strength of return transmissions or, in some cases, completely block the return transmission.
- Subscriber connects the DHCT to a light switch or a power strip—The DHCT receives no power when the light switch or power strip is turned off.

DHCT Memory and Hardware Issues

The following list contains some examples of DHCT memory and hardware issues that might cause a DHCT to become a non-responder:

- Outdated DHCT operating system—Early versions of the operating system used in DHCTs had memory issues that might cause a DHCT to malfunction.
- Miscellaneous internal failures—Internal components of the DHCT may fail and cause the DHCT to become a non-responder.

Return-Path Network Conditions

The following list contains some return-path network conditions that might cause a DHCT to become a non-responder:

- Laser clipping—Lasers that assist in return path communications may be calibrated incorrectly, resulting in a distortion of signal.
- Over-utilization of existing design—Installation technicians may have installed more signal splitters on the network than designed.
- Signal interference—The quality of the return transmission may be poor due to ingress or intermodulation.

  Note: Ingress refers to noise from an external source; intermodulation refers to noise generated from within the network.

Hardware Failures on the DBDS Network

The following list contains some DBDS network components that could cause DHCTs to become non-responders should the network components fail:

- QPSK Modulator/Demodulator
  - Buffers full—Available memory for the standard operation of a modulator is limited. Abnormal activity through the modulator may exhaust the available memory and cause the modulator to reboot.
  - DHCT chattering—Numerous DHCTs trying to simultaneously sign on to the network may interfere with return path transmissions and cause modulators to reboot.
  - Excessive numbers of DHCTs assigned to modulator—Too many DHCTs assigned to a single modulator may overwhelm the modulator.
- Router/switch
  - The router or switch is improperly configured.
  - The router or switch lacks sufficient processing capability. The router or switch can act as a choke-point in the communication path. In extreme cases, the QPSK modulator may reboot.

DBDS Configuration and Management Issues

The following list contains some conditions that might exist in the configuration of the DNCS that may cause a DHCT to become a non-responder:

- Improper demodulator attenuation management—To maintain a communication link with the QPSK demodulator, DHCTs should transmit at a level between (and including) 25 to 55 dBmV (decibels with respect to 1 millivolt). Over time, DHCT transmission levels may shift too high or too low. The shifting levels may cause significant numbers of DHCTs assigned to a demodulator to become non-responders.
- Improper DHCT inventory management—The DNCS database may fall out of synchronization with the database of the billing vendor. This loss of synchronization may cause the DNCS to try to poll DHCTs that are not actually in subscribers' homes.
- Failure to run the updateOUI utility—DHCTs that attempt to sign on to the network using an incorrect organizationally unique identifier (OUI) are unsuccessful.

  Note: Chapter 11, **Update the DHCT OUI With the updateOUI Utility**, of the *DNCS Utilities Installation and Operation Guide*, part number 740020, provides instructions to ensure that DHCTs have the correct OUI before they try to sign on to the network.

What Activities Can Minimize the Non-Responding Condition?

Introduction

This section summarizes some actions that system operators can take to reduce the non-responding condition on their network.

Review Network Configuration

Often, an examination of your basic network configuration can eliminate some conditions that cause DHCTs to become non-responders. Consider these points as you examine your network:

- Review your existing network topology. Verify that you have separately partitioned each hub. You do not want noise or interference on one hub to affect another hub.
- Review the concentration of DHCTs assigned to your system's QPSK modulators. Verify that DHCTs are assigned as evenly as possible to your system's modulators. Be certain that you never have more than 16,000 DHCTs assigned to any one modulator.
- Verify the integrity of all network elements. Examine your routers and switches for proper throughput. Examine your power supplies, amplifiers, nodes, and taps, elements that are frequently overlooked during an examination of a network.
- Examine and correct any laser calibration issues present on your network. A laser that is incorrectly calibrated may produce a distorted signal.

Run the signonCount Utility When Downloading DHCT Software

DHCTs lose the contents of their volatile memory when they reboot. After they reboot, DHCTs sign back on to the network and their network configuration data is then reloaded. Too many sign-on attempts by DHCTs contribute to network congestion and could cause DHCTs to become non-responders.

The signonCount utility can help the system operator monitor the following DHCT network sign-on activities:

- DAVIC connections and UN-Config requests on a minute-by-minute basis
- Excessive DHCT sign-on requests
- QPSK modulator reboots
- DHCTs signing on with an incorrect type, revision, or OUI
- Successful sign-on statistics

Note: Refer to Chapter 2 of this guide for instructions on running and interpreting the signonCount Utility.

Regularly Run the DHCT Status Reporting Utility

Run the DHCT Status Reporting Utility regularly. The DHCT Status Reporting Utility is designed to test and analyze two-way communications between the DHCT and the headend. The DHCT Status Reporting Utility provides system operators with the following data:

- Provides a current summary of the statuses of a system's DHCT population
- Polls all DHCTs that have an IP address and reports the following data:
  - DHCT transmit levels
  - DHCT delay values
  - Currently loaded resident application and operating system
- Provides the following reports:
  - DHCT non-responders by QPSK modulator and demodulator
  - DHCT transmit levels by QPSK modulator and demodulator
  - DHCT delay values by QPSK modulator and demodulator
  - Operating system and resident application by DHCT type and revision
  - General DHCT summary

Inventory Handling

Only DHCTs that are in homes of subscribers, labs, or ready to be immediately re-issued should have a status of in-service, two-way in the DNCS. DHCTs that have been returned from subscribers and are being processed in anticipation of being re-issued should have a status of out-of-service.

Section B
Interface of the DHCT Status Reporting Utility

Overview

Introduction

Two-way communication between DHCTs and the headend is vital if subscribers are to take full advantage of the interactive features of Cisco's DBDS. The DHCT Status Reporting Utility is designed to test and analyze two-way communications between the DHCT and the headend.

The information in this chapter tells you how to access the user interface of the DHCT Status Reporting Utility and how to interpret the data it displays. Subsequent chapters in this guide provide instructions for running the various features included as part of the DHCT Status Reporting Utility.

In This Section

This section contains the following topics.

DHCT Status Reporting Utility Interface

Introduction

This section provides instructions on how to access the interface of the DHCT Status Reporting Utility.

Accessing the Interface

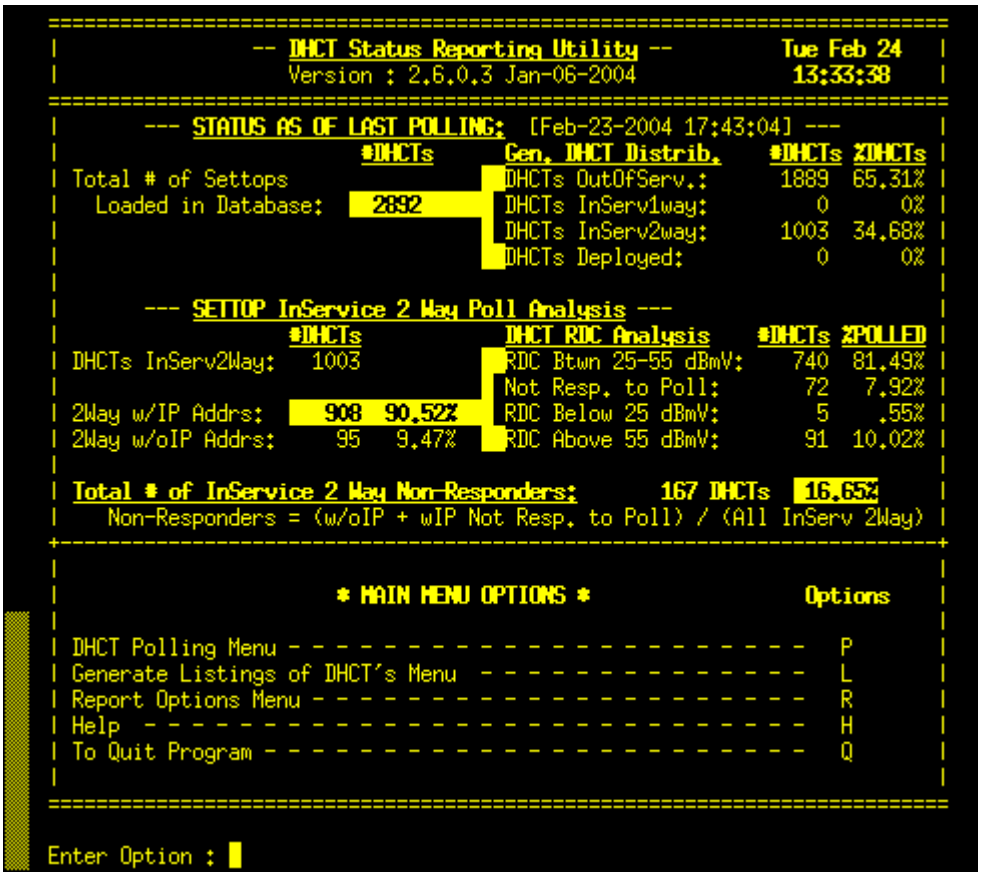
Follow these instructions to access the interface of the DHCT Status Reporting Utility.

1. If necessary, open an xterm window on the DNCS.

   Important: You must be **dncs** user in the xterm window. You cannot run the DHCT Status Reporting Utility as root user.

2. Type **dhctStatus** and then press **Enter**.

   Result: The initial screen of the DHCT Status Reporting Utility appears.

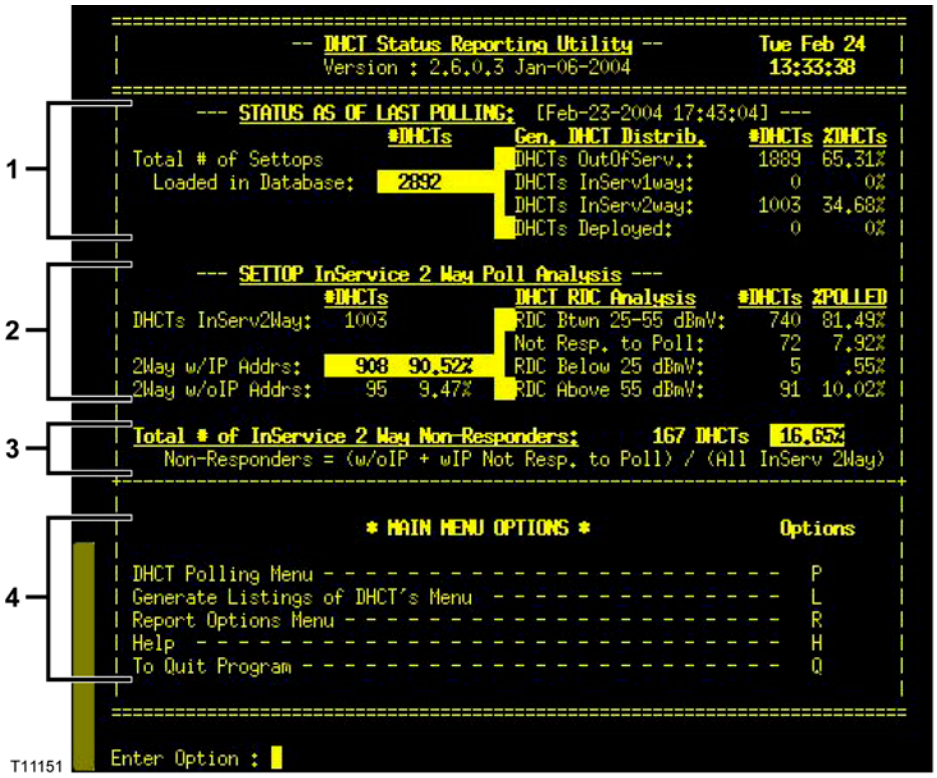


3. Go to **Understanding the Interface**, next in this chapter, for help in interpreting the information displayed on the initial window of the DHCT Status Reporting Utility.

Introduction

An example of the initial screen of the DHCT Status Reporting Utility is presented here for reference. The major sections of the initial screen are referenced by section numbers **1** through **4**. Refer to this illustration as you read the remainder of this section.

Note: Data referenced by the numbers will not appear the first time you run the utility because there is no data to report. After the system is polled for the first time, the utility populates the fields referenced by these numbers with data from the entire DHCT population.



As you progress through this guide and run the various options offered by the DHCT Status Reporting Utility, you will see that the data displayed at numbers **1** and **2** appears at the top of many DHCT Status Reporting Utility screens. By displaying this data on many DHCT Status Reporting Utility windows, system operators can readily compare new data with old.

Section 1 — Status As Of Last Polling

The **Status As Of Last Polling** section appears near the top of the initial screen and is referenced by the number **1**. This area of the screen lists the total number of settops (DHCTs) in the database and summarizes, by total and percentage, the number of DHCTs with the following statuses:

- Out-of-service (**DHCTs OutOfServ**)—DHCTs that are new or in inventory and may not yet be staged or installed into subscribers' homes should have a status of *out-of-service*.
- In-service, two-way (**DHCTs InServ2way**)—DHCTs with an *in-service two-way* status support communication between the headend and the DHCT, as well as return communication. DHCTs need two-way communication capability to take full advantage of Cisco's interactive services.

  Example: Cisco's interactive services include IPPV, VOD, xOD, and PPV.
- In-service, one-way (**DHCTs InServ1way**)—DHCTs with an *in-service one-way* status support communications between the headend and the DHCT, only. These DHCTs are considered to be in broadcast-only mode and have no two-way services assigned to them. These DHCTs have most-likely been staged and may have been installed into subscribers' homes.

  Note: Systems designed to have 100 percent of DHCTs with in-service, two-way status should not have any DHCTs with this configuration.
- Deployed (**DHCTs Deployed**)— DHCTs with a status of *deployed* are usually in transit. The DHCTs are not technically out-of-service, but not quite in-service, either. These DHCTs have been staged and will shortly be installed in the homes of subscribers. DHCTs with a status of deployed can sign on to the network.

  Note: Most billing vendors do not yet support the Deployed status.

For the DHCT Status Reporting Utility to retrieve and analyze non-responder data from DHCTs, the DHCTs must have a status of in-service, two-way. DHCTs that have a status of in-service, two-way can generate revenue for the system operator. Ultimately, the system operator's billing system dictates which DHCTs can generate revenue.

Section 2 — SETTOP InService 2 Way Poll Analysis

DHCT Analysis

The **SETTOP InService 2 Way Poll Analysis** section is referenced by the number **2**. This area of the interface of the DHCT Status Reporting Utility presents a detailed analysis of those DHCTs listed in the database that are capable of two-way communication. The **SETTOP InService 2 Way Poll Analysis** section includes the following items:

- The number of DHCTs with two-way capability that *have* an IP address (**2Way w/IP Addrs**) and the number of DHCTs with two-way capability that *do not have* an IP address (**2Way w/oIP Addrs**).
- For DHCTs *with* an IP address, the totals and percentages that transmit at the following transmit levels:
  - Between and including 25 and 55 dBmV (decibels referenced to 1 millivolt) (**RDC Btwn 25-55 dBmV**)—DHCTs communicate with the headend between and including 25 and 55 dBmV.
  - No response (**Not Resp. to Poll**)—The DNCS is unable to get a response after polling these DHCTs.
  - Below 25 dBmV (**RDC Below 25 dBmV**)—DHCTs respond to the poll, but respond at a transmit level below the optimum level specified by Cisco.
  - Higher than 55 dBmV (**RDC Above 55 dBmV**)—DHCTs respond to the poll, but respond at a transmit level higher than the optimum level specified by Cisco.

High or Low Transmit Levels

Even though DHCTs can transmit successfully at levels higher than 55 dBmV or lower than 25 dBmV, the fact that these DHCTs exist on a system may indicate a serious configuration problem. Occasionally, the entire population of DHCTs assigned to a specific QPSK modulator or demodulator may transmit at levels that are too high or too low. The system can support two-way communications with a portion of these DHCTs; other DHCTs assigned to this modulator or demodulator may transmit at levels that are too high or too low to even be recognized.

Consider this rule of thumb: if 3 percent or more of successfully responding DHCTs respond at levels higher than 55 dBmV or lower than 25 dBmV, you can assume that there are other DHCTs responding with signals too high or too low to be recognized.

Note: You can see an illustration of this concept in the graph under **Examples of Systems Needing Recalibration**, under the **DHCT Transmit Level Saturation Report** heading of Section E.

System operators can use the information provided by the DHCT Status Reporting Utility to identify modulators or demodulators associated with non-responding DHCTs. System operators can then take measures to adjust transmit levels so that they conform with Cisco recommendations. This issue is discussed in more detail in **DHCT Transmit Level Saturation Report** in Section E.

Section 3 — Total # of InService 2 Way Non-Responders

The **Total # of InService 2 Way Non-Responders** section is referenced by number **3**. This short section summarizes the total number and percentage of DHCTs that have two-way communication capability, but these DHCTs do not respond to poll requests from the DHCT Status Reporting Utility.

Section 4 — Main Menu Options

The **Main Menu Options** section is referenced by number **4**. This area lists the various options you can use when you run the DHCT Status Reporting Utility. Subsequent chapters in this guide provide detailed instructions for running each option.

Note: The **Help** option of the DHCT Status Reporting Utility briefly describes each of the options included in the utility. Go to **The DHCT Status Reporting Utility Help Option**, next in this chapter.

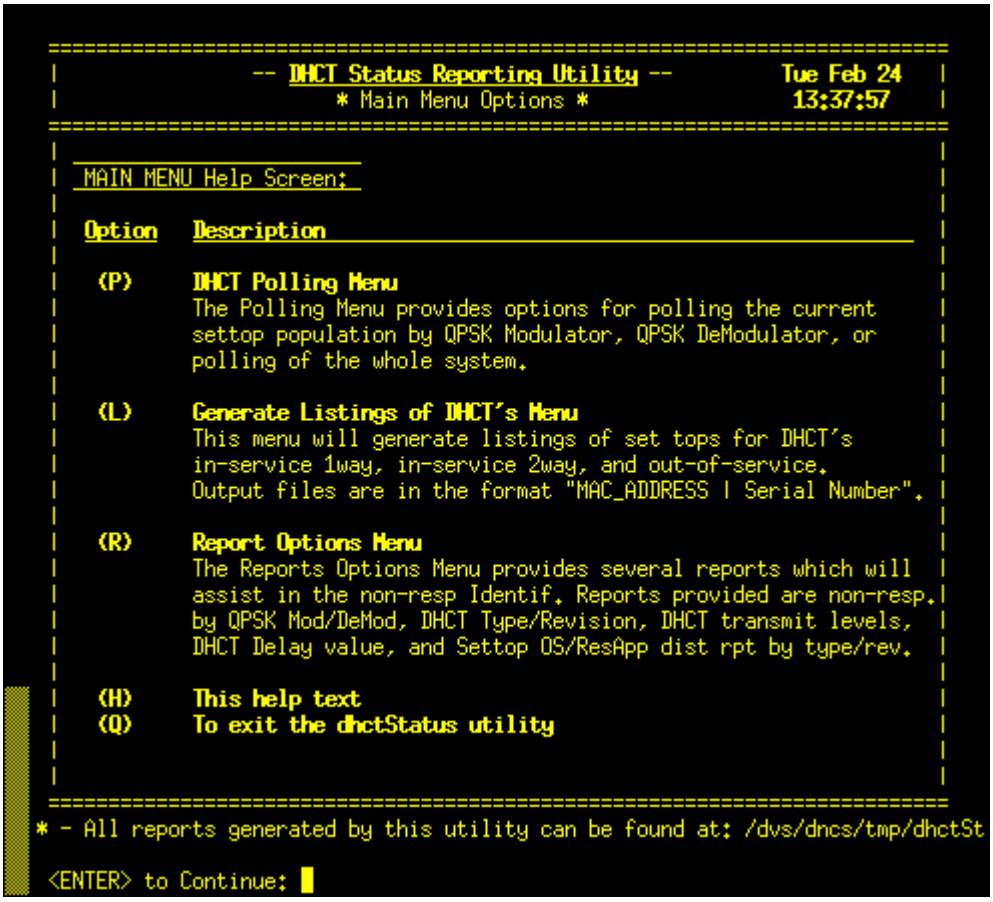
DHCT Status Reporting Utility Help Option

Displaying the Help Screen for the DHCT Status Reporting Utility

Follow these instructions to display the Help screen for the DHCT Status Reporting Utility.

1. From the DHCT Status Reporting Utility screen, type **h** and then press **Enter**.

   Result: The screen updates to display the Main Menu Help Screen, which lists information that explains the options on the main menu.



2. Read the description of the **P**, **L**, and **R** options and then press **Enter** to return to the DHCT Status Reporting Utility window. Press **Q** to exit from the Help screen.

   Note: Refer to sections C, D, and E of this chapter for detailed information (including examples) regarding these menu options.

Section C
DHCT Polling Option

Overview

Introduction

The DHCT Status Reporting Utility polls DHCTs to assess how well they are performing in the field, as well as providing the mechanism for identifying and correcting non-responding issues. By examining polling data, system operators can make changes to their system configuration that improve DHCT performance and reduce the number of non-responding DHCTs on a specific QPSK modulator or demodulator.

The information in this chapter provides instructions for using the DHCT Status Reporting utility to poll DHCTs.

In This Section

This section contains the following topic.

Poll DHCTs

Introduction

The instructions in this section describe how to use the DHCT Status Reporting Utility to poll DHCTs.

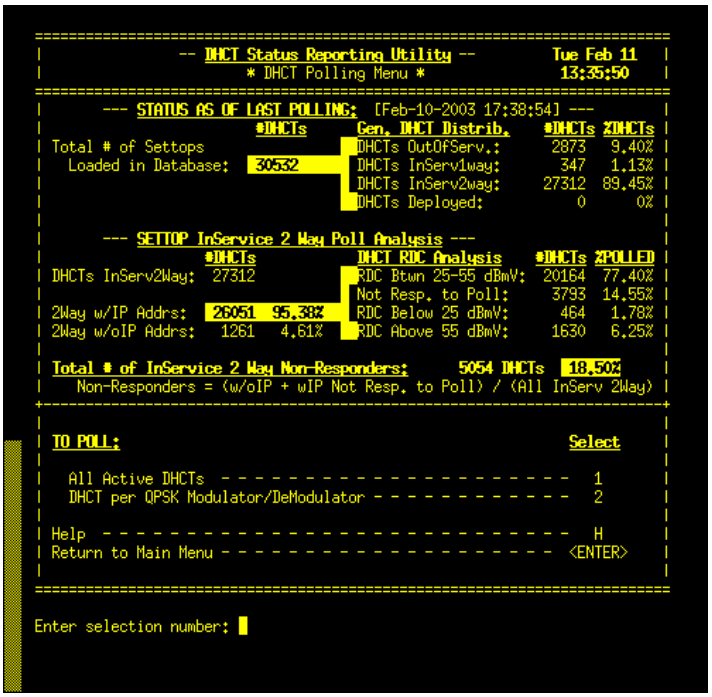
Note: All procedures in this section assume that the DHCT Status Reporting Utility screen is open on the DNCS.

Polling DHCTs

Follow these instructions to poll the DHCTs on the system.

1. From the DHCT Status Reporting Utility screen, type **p** and then press **Enter**.

   Result: The DHCT Polling Menu screen appears.



2. Choose one of the following options:

   - To poll all active DHCTs on the network, go to **Polling All Active DHCTs**, next in this section.
   - To poll DHCTs associated with a specific QPSK modulator or demodulator, go to **Polling DHCTs per QPSK Modulator or Demodulator**, later in this section.

   Note: The first time you run the DHCT Status Reporting Utility, you must poll all active DHCTs.

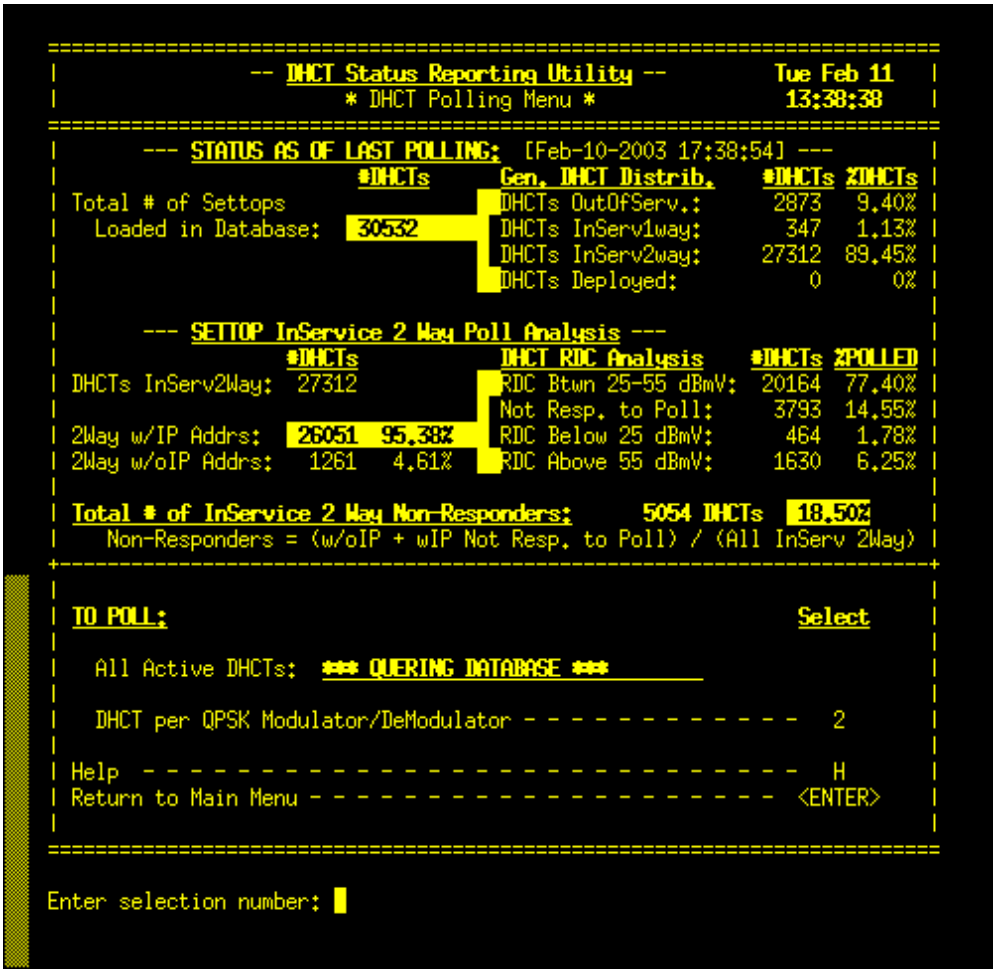
Polling All Active DHCTs

Follow these instructions to poll all active DHCTs on the network.

1. To poll all active DHCTs on the network, type **1** and then press **Enter**.

   Result: The DHCT Polling Menu screen updates to briefly display a **Querying Database** message in the **To Poll** section of the screen.

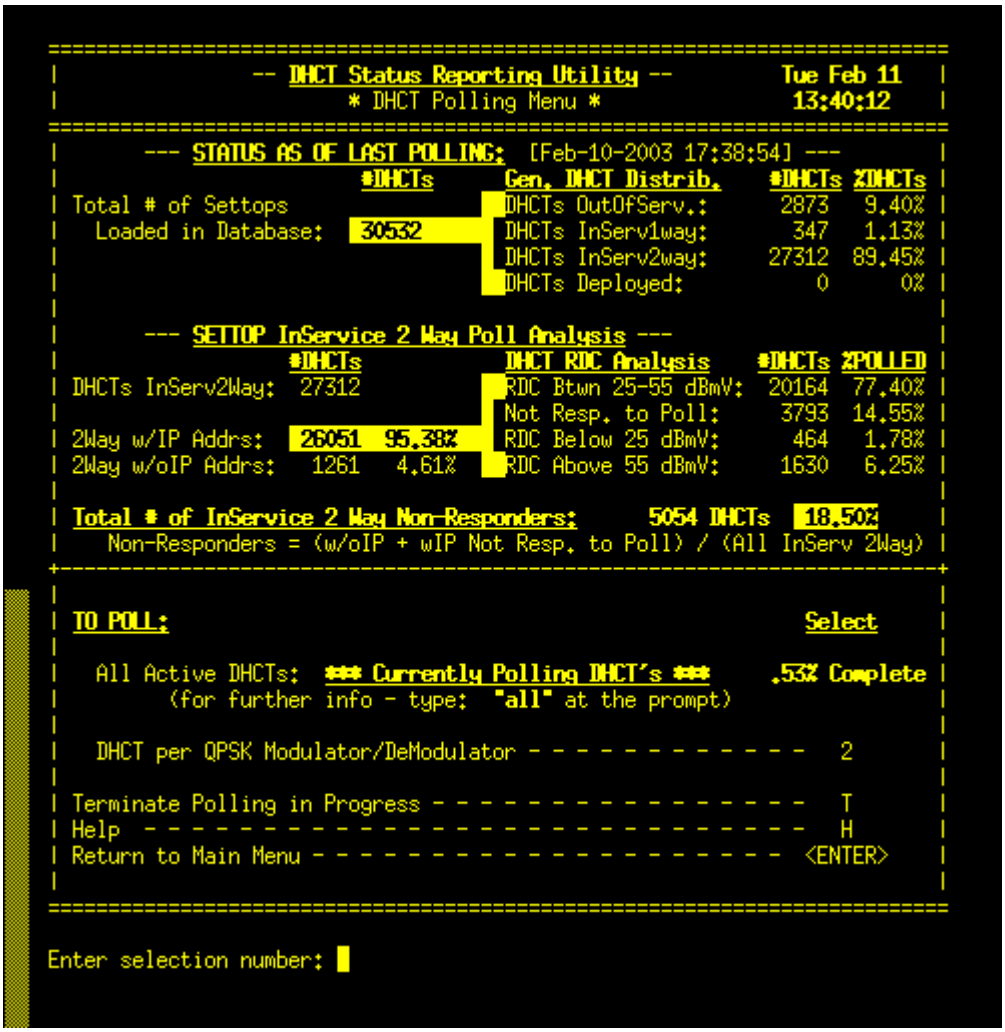
   Note: The Querying Database message means that the system is collecting information on the DHCTs so that the DHCTs can be efficiently polled.



2. Type **u** (for update) and then press **Enter**.

Notes:

- The **Currently Polling DHCTs** message should appear in a few minutes.
- Type **u** and then press **Enter** as often as necessary until the **Currently Polling DHCTs** message appears.

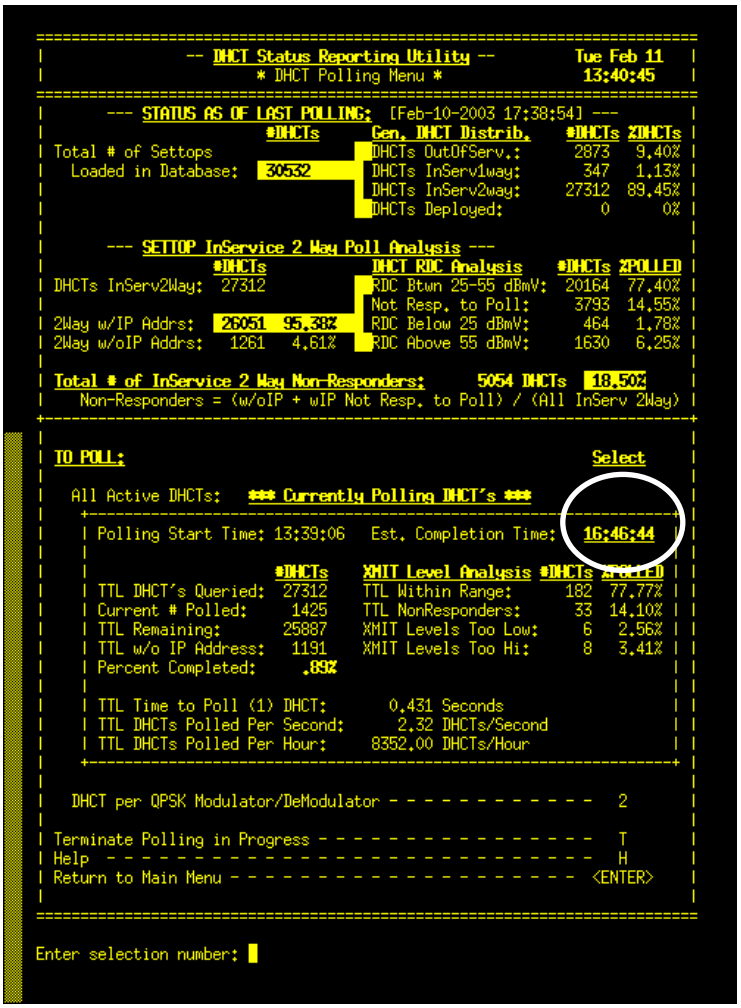


3. Type **all** and then press **Enter**.

Result: The DHCT Polling Menu screen updates to display the polling data collected so far.

Notes:

- The screen continues to display data from the previously completed polling operation, so that you can compare the newly collected data with data from the previous polling operation.
- The screen also displays the estimated poll completion time. In this example, the system expects polling to complete at 16:46:44, as indicated by the white oval, approximately 3 hours from the start of polling.
- The estimated completion time does not remain constant as the poll progresses. Type **all** and then press **Enter** again to obtain the latest estimate.



Polling DHCTs per QPSK Modulator or Demodulator

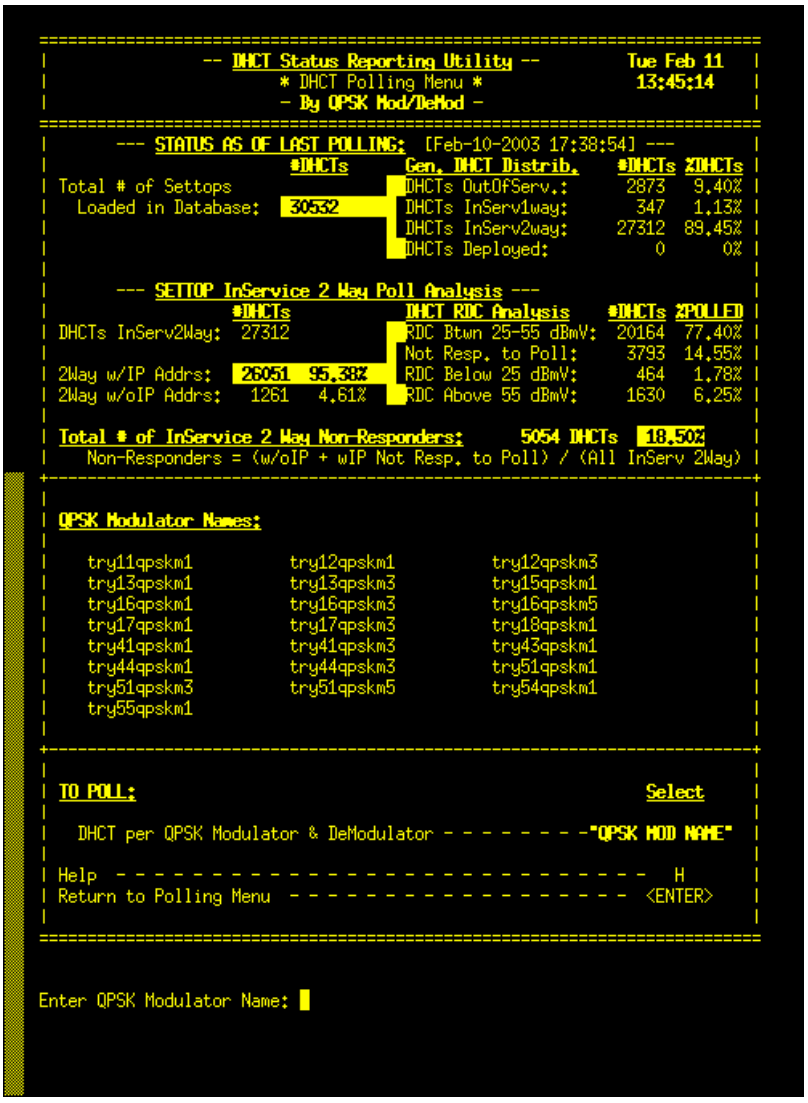
Follow this procedure to poll DHCTs associated with a specific QPSK modulator or demodulator.

1. To poll DHCTs associated with a specific QPSK modulator or demodulator, type **2** and then press **Enter**.

   Results:

   - The DHCT Polling Menu By QPSK Mod/DeMod window appears.
   - The **Enter QPSK Modulator Name** prompt appears.

     Note: Note that the screen lists the QPSK modulators on the system.

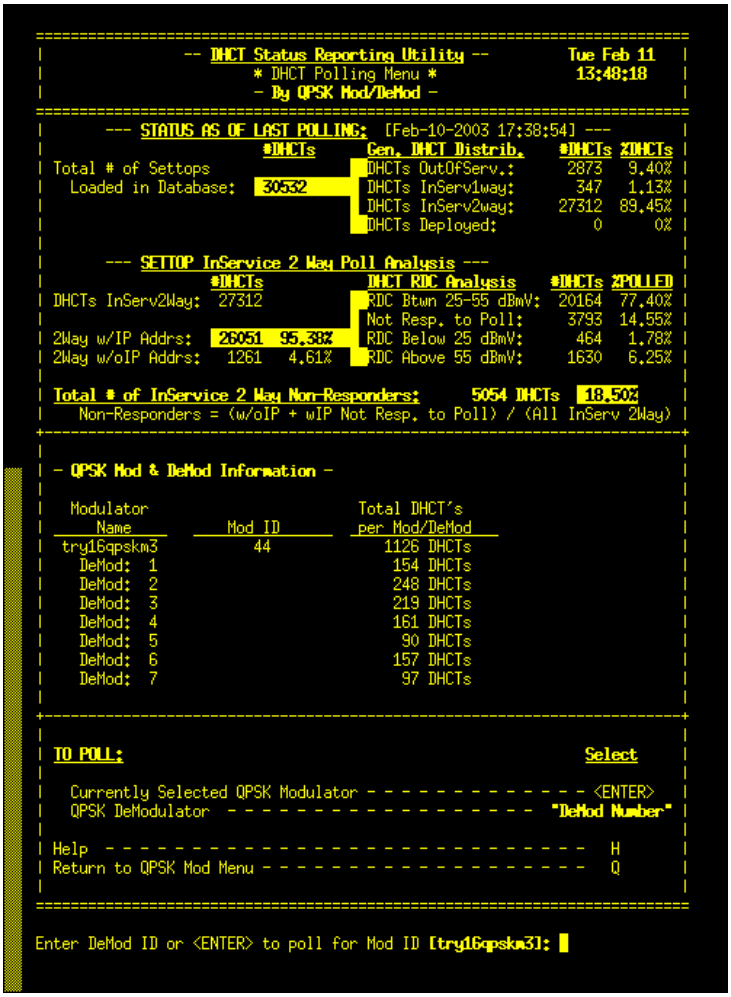


2. Type the name of a QPSK modulator and then press **Enter**.

   Important: The modulator name is case-sensitive; be sure to type it exactly as it appears.

   Results:

   - The DHCT Polling Menu By QPSK Mod/DeMod screen updates to list the QPSK demodulators associated with the selected modulator, as well as the number of DHCTs assigned to the modulator and demodulator(s).
   - The **Enter DeMod ID or <ENTER> to poll for Mod ID** prompt appears.



3. Choose one of the following options:
   - Press **Enter** to poll all of the DHCTs associated with the selected modulator.
   - Type the demodulator ID and then press **Enter** to poll DHCTs associated with a specific demodulator.

   Note: The next two steps, step 4 and step 5, develop an example based upon polling DHCTs by demodulator ID.

   Result: The utility displays polling data *after* the entire polling operation has completed.

   ⚠ CAUTION:

   Do not interrupt the polling operation while it is in progress. If you interrupt the polling operation before it has completed, you will not be able to poll this modulator or demodulator again until you remove a specific file from the /tmp directory of the DNCS that tells the DNCS that a polling operation is in progress. The file in the /tmp directory is in the form of dhctStatus.[mod ID or demod ID].

4. Open an xterm window on the DNCS and type **cd /dvs/dncs/tmp/dhctStatus2/[DATE]/ALL/GR_REPORTS** and then press **Enter**.

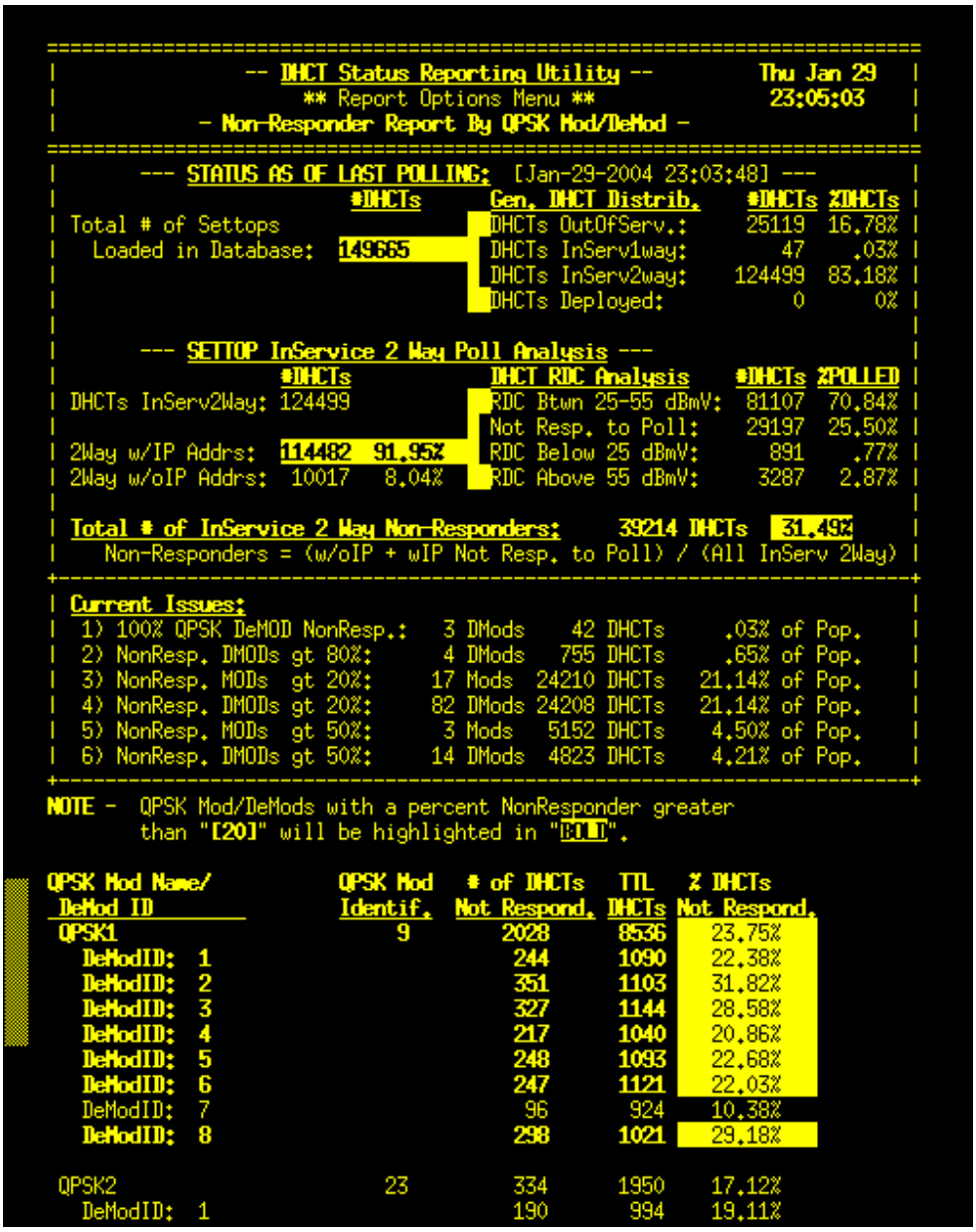
   Note: Substitute the current date (or the date you ran the poll) in YYYYMMDD format for [DATE].

   Example: For a poll conducted on February 12, 2003, type **cd /dvs/dncs/tmp/dhctStatus2/20030212/ALL/GR_REPORTS** and then press **Enter**.

   Result: The selected directory becomes the working directory.

5. To see the non-responder report associated with the poll you just completed, type **page NR_M*** and then press **Enter**.

   Result: The system displays the data associated with the poll you just completed.



Note: Refer to **Explanation of Output From Non-Responder Report**, which follows, for an explanation of some of the findings revealed in this non-responder report.

Explanation of Output From Non-Responder Report

The **Current Issues** section of the report output lists those modulators and demodulators where non-responding DHCTs make up a significant percentage of the total number of DHCTs assigned to the modulator or demodulator. Using the example in step 5, three demodulators have 100 percent of their DHCTs in a non-responding state. This constitutes 42 DHCTs, or .03 percent of the total number of DHCTs supported by the system. Using another example from step 6, fourteen demodulators have 50 percent of their assigned DHCTs in a non-responding state. This constitutes 4,823 DHCTs, or 4.21 percent of the entire DHCT population.

The lower, unlabeled section of the report output displays all the modulators and demodulators running on the system. This section lists the number of non-responding DHCTs assigned to each modulator or demodulator, the total number of DHCTs supported by the modulator or demodulator, as well as the percentage of assigned DHCTs that are non-responders. The report highlights the percentage of non-responding DHCTs whenever that percentage exceeds 20 percent.

Note: System operators may want to examine the following conditions in order to troubleshoot the significant percentage of non-responding DHCTs revealed in the data from step 5:

- The system may lack proper attenuation
- The modulator may just have rebooted
- The cabling for the modulator or demodulator may have become loose
- The system may have just experienced a power outage

Data Files Resulting From Polling Operations

The following list contains the data files that are generated by the polling operation, as well as a description of the type of data contained in the file:

Note: Type **page [file name]** and then press **Enter** from the **/dvs/dncs/tmp/dhctStatus2/[DATE]/ALL/GR_REPORTS** directory to view the output.

- OS_TypeRev.txt — OS version sorted by DHCT type and revision
- NR_TypeRev.txt — Non-responder data sorted by DHCT type and revision
- NR_ModDeMod.txt — Non-responder data sorted by QPSK modulator and demodulator
- DL_ModDeMod.txt — DHCT delay values sorted by QPSK modulator and demodulator
- TL_ModDeMod.txt — DHCT transmit levels sorted by QPSK modulator and demodulator

Section D
List DHCTs

Overview

Introduction

The DHCT Status Reporting Utility provides system operators and engineers with the ability to query the database for a listing of MAC addresses and serial numbers of DHCTs that have a specific status. The utility can generate a list for DHCTs with the following statuses:

- DHCTs with a one-way status

  Note: DHCTs with a one-way status support communication between the headend and the DHCT.

- DHCTs with a two-way status

  Note: DHCTs with a two-way status support communication between the headend and the DHCT, as well as return communication between the DHCT and the headend.

- DHCTs with an out-of-service status

  Note: DHCTs with a status of out-of-service are usually DHCTs that have yet to be installed in a subscriber's home or have been returned by subscribers. These DHCTs will eventually be redeployed to other subscribers.

- DHCTs with a deployed status

  Note: DHCTs with a status of deployed are usually in a transition period. They have been staged and are awaiting placement in a subscriber's home. Most systems do not currently use the deployed status.

The lists of DHCTs that the DHCT Status Reporting Utility generates can become quite lengthy. For this reason, the utility does not display the lists on the screen of the DNCS. Instead, output is written to a file in the /dvs/dncs/tmp/dhctStatus2/[DATE] directory of the DNCS, where system operators and engineers can view it at their convenience. Instructions for viewing these output files are included later in this section.

In This Section

This section contains the following topics.

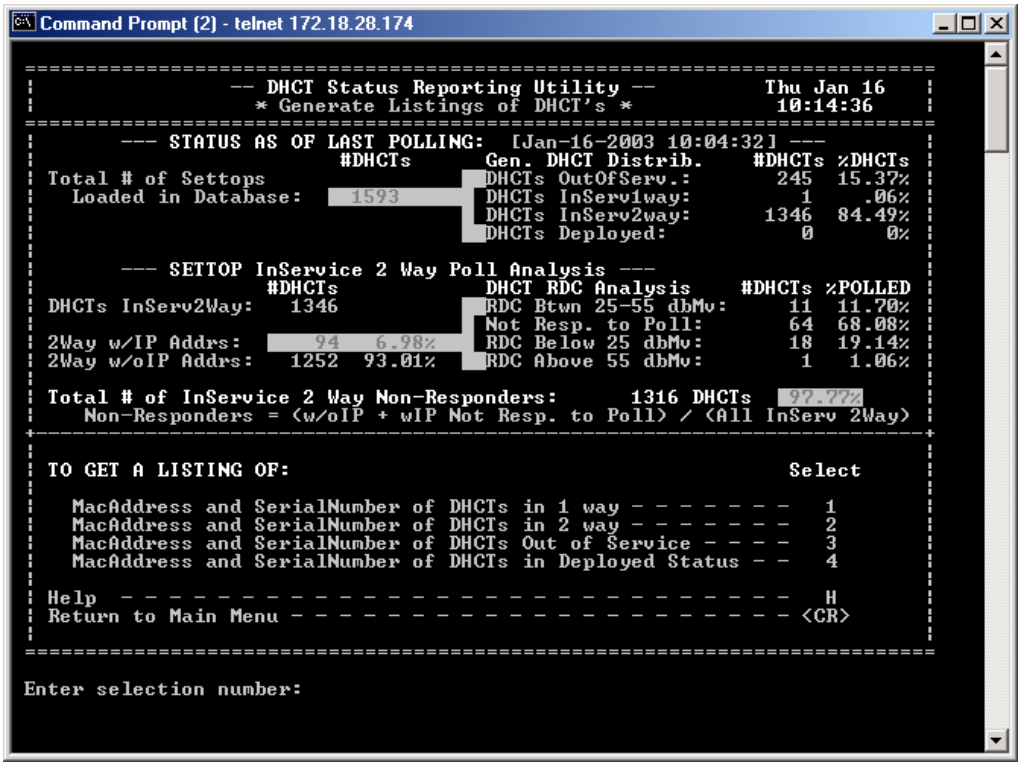
Generating a Listing of DHCTs

Follow these instructions to use the DHCT Status Reporting Utility to generate various listings of DHCTs.

1. From the DHCT Status Reporting Utility screen, type **l** and then press **Enter**.

   Note: The "l" is a lowercase L.

   Result: The Generate Listings of DHCTs screen appears.

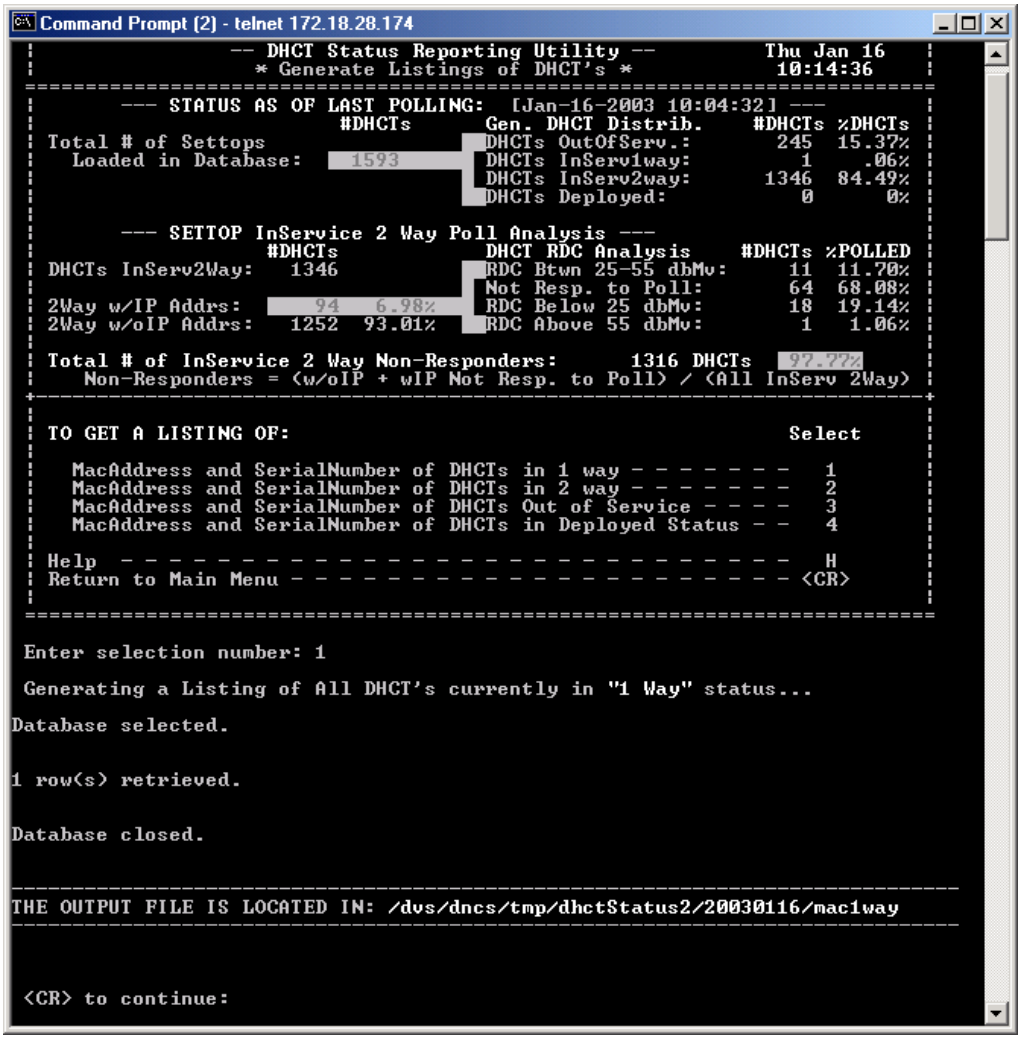


2. Choose one of the following options:
   - To generate a listing of DHCTs with a one-way status, go to step 3.
   - To generate a listing of DHCTs with a two-way status, go to step 5.
   - To generate a listing of DHCTs with a status of out-of-service, go to step 7.
   - To generate a listing of DHCTs with a status of deployed, go to step 9.

3. Type **1** and then press **Enter** to generate a listing of DHCTs with a one-way status.

   Results:

   - The system reports the number of database rows that matched the requirements of the selected list.
   - The system displays a message that indicates the directory in which the output file can be found.

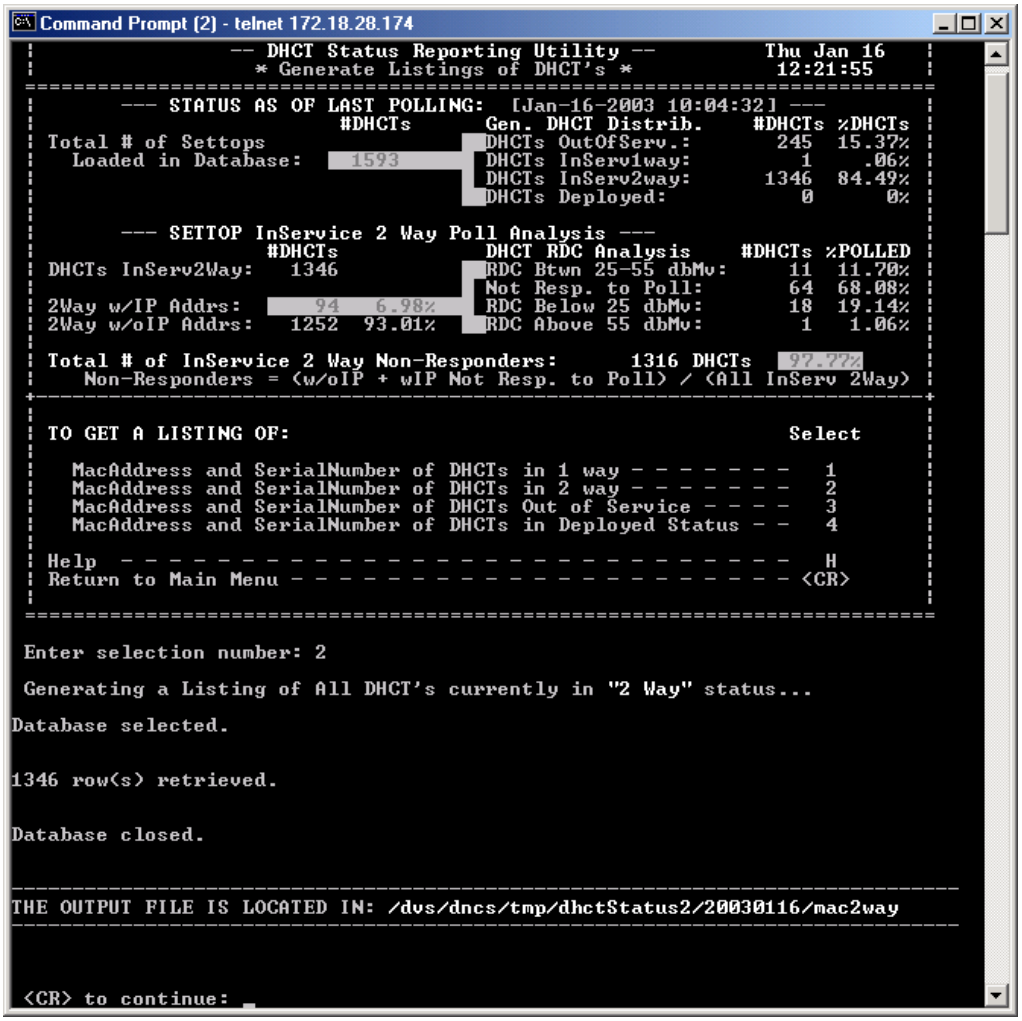


4. Go to **View the Output File**, later in this chapter, for instructions on how to view the contents of the output file generated by the DHCT Status Reporting Utility.

5. Type **2** and then press **Enter** to generate a listing of DHCTs with a two-way status.

   Results:

   - The system reports the number of database rows that matched the requirements of the selected list.
   - The system displays a message that indicates the directory in which the output file can be found.

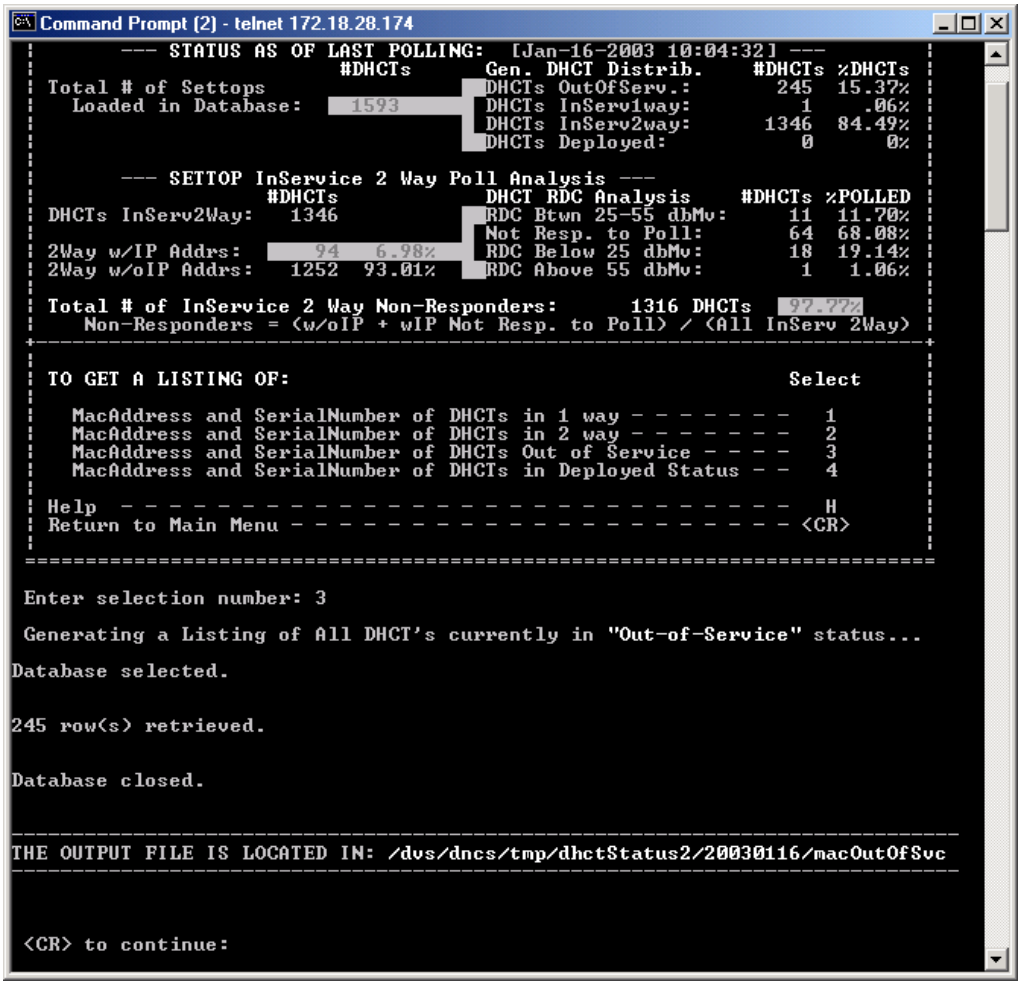


6. Go to **View the Output File**, later in this chapter, for instructions on how to view the contents of the output file generated by the DHCT Status Reporting Utility.

7. Type **3** and then press **Enter** to generate a listing of DHCTs with a status of out-of-service.

   Results:

   - The system reports the number of database rows that matched the requirements of the selected list.
   - The system displays a message that indicates the directory in which the output file can be found.

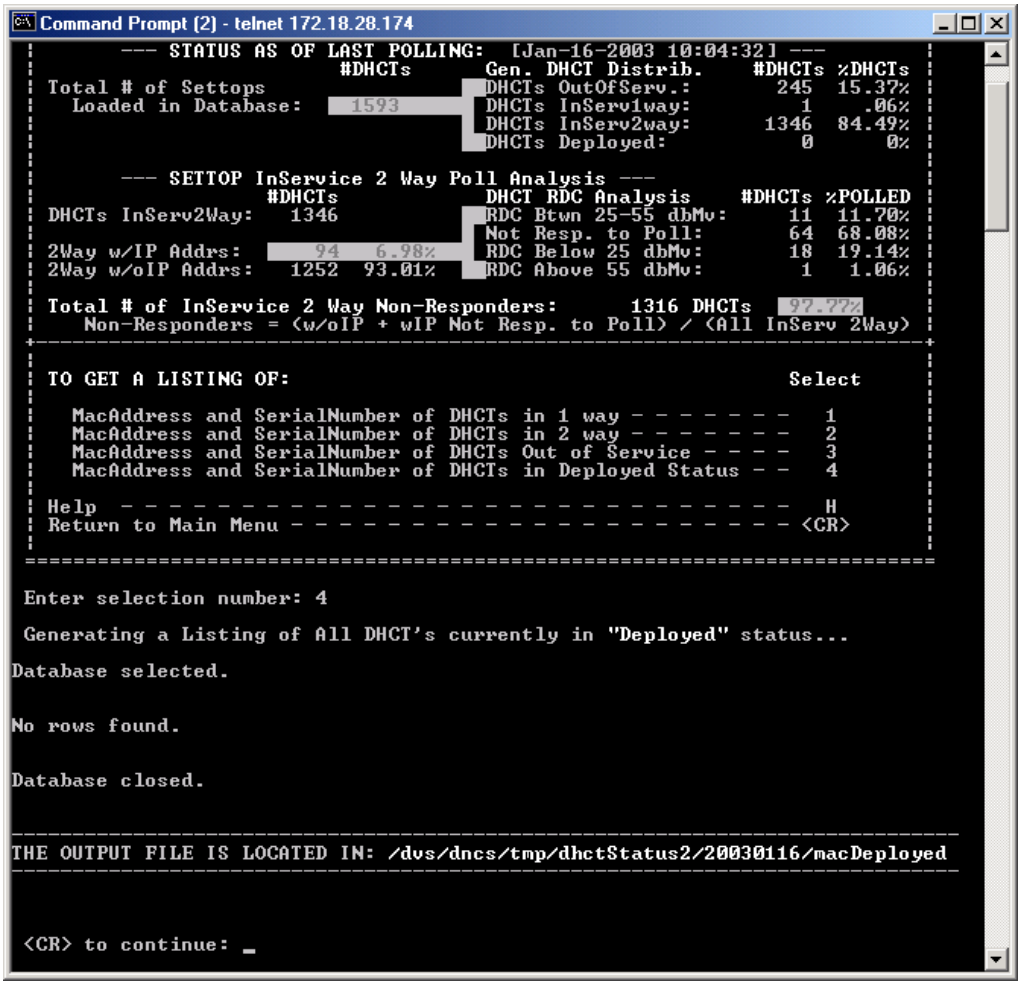


8. Go to **View the Output File**, later in this chapter, for instructions on how to view the contents of the output file generated by the DHCT Status Reporting Utility.

9. Type **4** and then press **Enter** to generate a listing of DHCTs with a status of deployed.

   Results:

   - The system reports the number of database rows that matched the requirements of the selected list.
   - The system displays a message that indicates the directory in which the output file can be found.



10. Go to **View the Output File**, next in this section, for instructions on how to view the contents of the output file generated by the DHCT Status Reporting Utility.

View the Output File

Viewing the Output File

After using the DHCT Status Reporting Utility to generate a list of DHCTs, follow these instructions to view the list that the utility generated.

Note: The list contains DHCT MAC addresses and serial numbers.

1. If necessary, open an xterm window on the DNCS.

   Note: You can be logged on as **dncs** user in the xterm window.

2. Type **more /dvs/dncs/tmp/dhctStatus2/[DATE]/[filename]** and then press **Enter**.

   Notes:

   - Substitute the date you polled the DHCTs, in YYYYMMDD format, for [DATE].
   - Substitute the name of the file you want to view for [filename].
     - Use **mac1way** for DHCTs with a one-way status.
     - Use **mac2way** for DHCTs with a two-way status.
     - Use **macOutofSvc** for DHCTs with a status of out-of-service.
     - Use **macDeployed** for DHCTs with a status of deployed.

   Example: more /dvs/dncs/tmp/dhctStatus2/20030114/mac2way

   Result: The output file opens for viewing.

3. Use these guidelines to navigate through the list, which may be very lengthy.
   a) Press the **Spacebar** to advance to the next page of the list.
   b) Press the **Ctrl** and **C** keys simultaneously to close the file when you are finished.

Section E
The Reporting Option

Overview

Introduction

The DHCT Status Reporting Utility includes several reports that summarize various types of DHCT polling data. System operators or Cisco engineers can run the reports and examine the data in order to assess network conditions of the system.

This chapter contains a description of each report offered by the DHCT Status Reporting Utility, as well as detailed instructions on running the reports.

In This Section

This section contains the following topics.

DHCT Status Reporting Utility Reports

The DHCT Status Reporting Utility includes the following reports that system operators can generate to summarize various DHCT polling data:

- Non-responder reports—DHCTs with an IP address that fail to respond to poll requests from the DNCS are commonly known as non-responders. The utility generates two types of DHCT non-responder reports:
  - DHCT non-responders identified by QPSK modulator and demodulator
  - DHCT non-responders identified by DHCT type and revision

  By analyzing the report, system operators can spot trends that may indicate that a disproportionate share of non-responding DHCTs are associated with a specific QPSK, or are DHCTs of a specific type or revision.
- Transmit level report—When a DHCT signs on to the network, the QPSK modulator informs the DHCT of the signal needed to maintain a communication link between the DHCT and the modulator. The DHCT Transmit Level Saturation Report summarizes the transmit levels of DHCTs associated with each QPSK modulator and demodulator in the system. By analyzing the transmit levels, system operators can quickly spot when network conditions are preventing effective communication between the headend and the DHCTs.
- Delay value report—When a DHCT signs on to the network, the QPSK modulator performs a test that evaluates the distance from the DHCT to the modulator. Based upon this distance, the modulator assigns a "delay value," which indicates how often a DHCT will check in with the QPSK modulator. The closer the DHCT is to the modulator, the greater the delay value; the farther the DHCT is from the modulator, the shorter the delay value.

  The DHCT Delay Value Saturation Report summarizes the delay values of DHCTs associated with each QPSK modulator and demodulator in the system. By analyzing the delay values, system operators can spot conditions under which it may be advantageous to configure a QPSK modulator for the QPSK Range Extension Feature.

  Note: The QPSK Range Extension Feature allows DHCTs to sign on to the system and operate properly at extended distances from the QPSK modulator.
- Operating system and resident application report—The DHCT Status Reporting Utility generates a report that lists the version of operating system (OS) and resident application code running on each DHCT type and revision supported by the system.

Accessing the Reports Menu

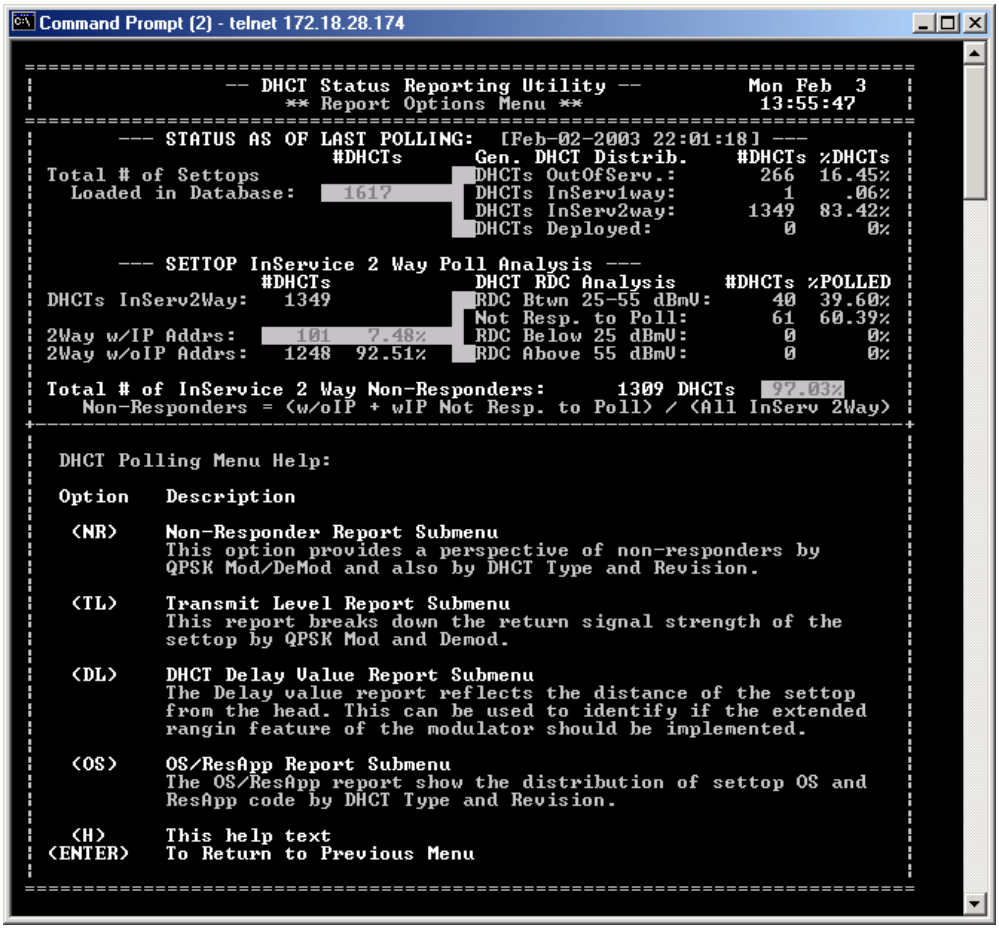
Follow these instructions to access the menu from which the various DHCT Status Reporting Utility reports can be run.

1. From the main menu of the DHCT Status Reporting Utility, type **r** and then press **Enter**.

   Result: The Report Options Menu screen appears.

2. Type **h** and then press **Enter** to display the DHCT Status Reporting Utility help screen.

   Note: The help screen summarizes the purpose of each report included in the DHCT Status Reporting Utility.



3. Choose one of the following options:

   - To generate DHCT non-responder reports, go to **Non-Responder Reports**, next in this chapter.
   - To generate a DHCT transmit level report, go to **DHCT Transmit Level Saturation Report**, later in this chapter.
   - To generate a DHCT delay value report, go to **DHCT Delay Value Saturation Report**, later in this chapter.
   - To generate a report that lists the operating system and resident application software running on each DHCT type and revision on your system, go to **DHCT OS and ResApp Evaluation by Set Top Type and Rev Report**, later in this chapter.

Generating Non-Responder Reports

Follow these instructions to generate the Non-Responder Reports.

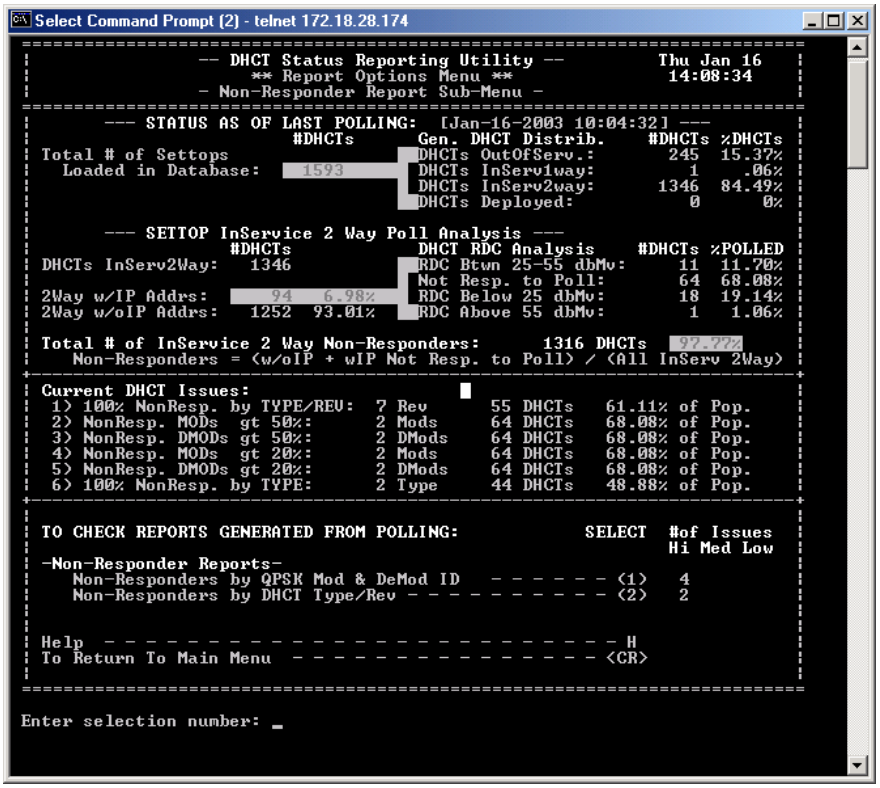
Note: A non-responding DHCT refers to a DHCT that does not respond to poll requests from the DNCS.

1. From the main menu of the DHCT Status Reporting Utility, type **nr** and then press **Enter**.

   Result: The Non-Responder Report Sub-Menu screen appears.

   Note: The Non-Responder Report Sub-Menu screen shows that you can generate the following two types of DHCT non-responder reports:

   - Non-Responders by QPSK Mod and DeMod ID
   - Non-Responders by DHCT Type/Rev



2. Choose one of the following options:

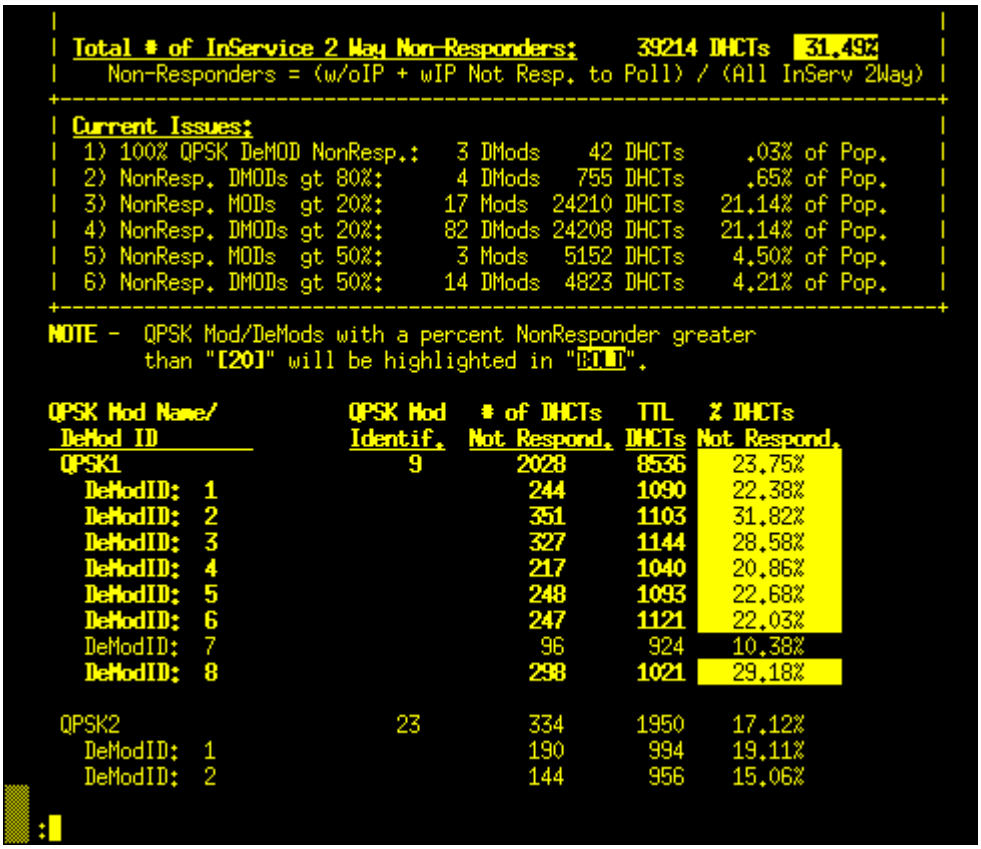
   - To generate a Non-Responder Report for DHCTs based upon QPSK modulator and demodulator ID, go to step 3.
   - To generate a Non-Responder Report for DHCTs based upon DHCT type and revision, go to step 5.

3. To generate a Non-Responder Report for DHCTs based upon QPSK modulator and demodulator ID, type **1** (for Non-Responders by QPSK Mod & DeMod ID) and then press **Enter**.

   Result: The Non-Responder Report Sub-Menu screen updates to display the following information:

   - QPSK modulator(s) name, ID, and demodulator ID
   - The number of DHCTs associated with each modulator and demodulator
   - The total number and percentage of DHCTs assigned to each modulator and demodulator that are classified as non-responders

   Note: The report automatically highlights the data when more than 20 percent of DHCTs associated with a specific modulator or demodulator are non-responders.



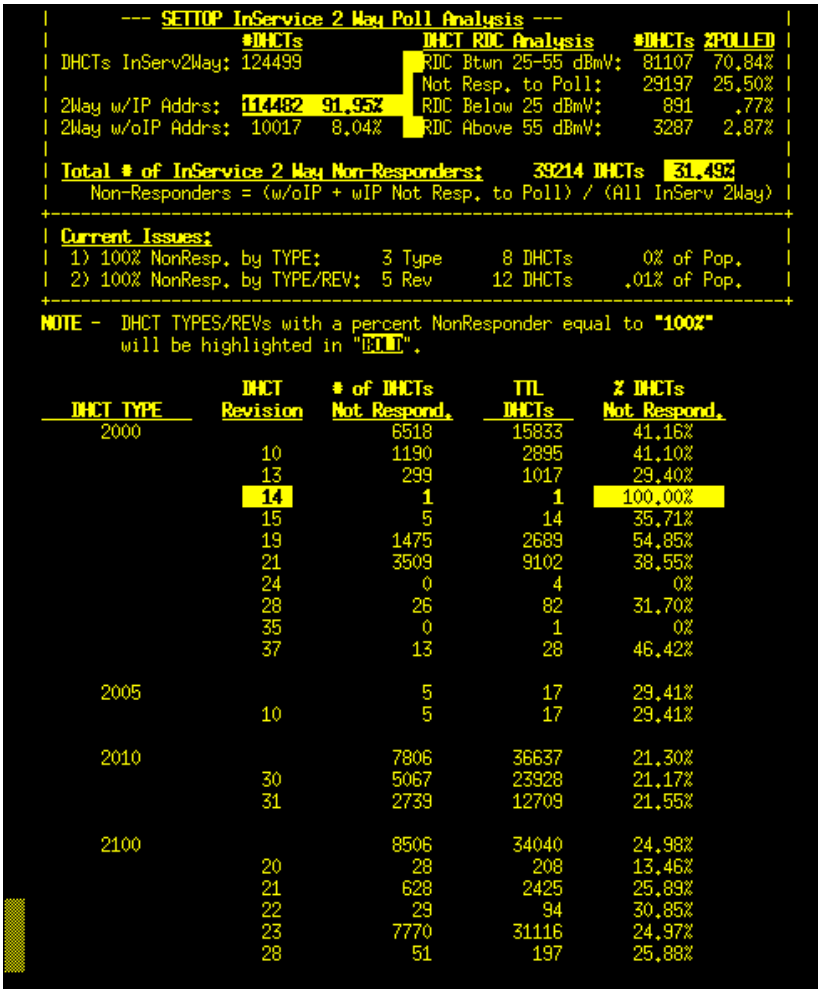
4. Press **Enter** to return to the Non-Responder Report Sub-Menu screen.

5. To generate a Non-Responder Report for DHCTs based upon DHCT type and revision, type **2** (for Non-Responders by DHCT Type/Rev) and then press **Enter**.

   Result: The Non-Responder Report Sub-Menu screen updates to display the following information:

   - Each DHCT type and revision supported by the system
   - The number and percentage of DHCTs of each type and revision that are non-responders
   - The total number of DHCTs of each type and revision

   Note: The report automatically highlights the data when 100 percent of a specific DHCT type and revision are non-responders.



--- SETTOP InService 2 Way Poll Analysis ---

	#DHCTs		DHCT RDC Analysis	#DHCTs	%POLLED
DHCTs InServ2Way:	124499		RDC Btwn 25-55 dBmV:	81107	70.84%
			Not Resp. to Poll:	29197	25.50%
2Way w/IP Addrs:	114482	91.95%	RDC Below 25 dBmV:	891	.77%
2Way w/oIP Addrs:	10017	8.04%	RDC Above 55 dBmV:	3287	2.87%

Total # of InService 2 Way Non-Responders: 39214 DHCTs 31.49%

Non-Responders = (w/oIP + wIP Not Resp. to Poll) / (All InServ 2Way)

Current Issues:

1) 100% NonResp. by TYPE: 3 Type 8 DHCTs 0% of Pop.
2) 100% NonResp. by TYPE/REV: 5 Rev 12 DHCTs .01% of Pop.

NOTE - DHCT TYPES/REVs with a percent NonResponder equal to "100%" will be highlighted in "BOLD".

DHCT TYPE	DHCT Revision	# of DHCTs Not Respond.	TTL DHCTs	% DHCTs Not Respond.
2000		6518	15833	41.16%
	10	1190	2895	41.10%
	13	299	1017	29.40%
	14	1	1	100.00%
	15	5	14	35.71%
	19	1475	2689	54.85%
	21	3509	9102	38.55%
	24	0	4	0%
	28	26	82	31.70%
	35	0	1	0%
	37	13	28	46.42%
2005		5	17	29.41%
	10	5	17	29.41%
2010		7806	36637	21.30%
	30	5067	23928	21.17%
	31	2739	12709	21.55%
2100		8506	34040	24.98%
	20	28	208	13.46%
	21	628	2425	25.89%
	22	29	94	30.85%
	23	7770	31116	24.97%
	28	51	197	25.88%

6. Press **Enter** to return to the Non-Responder Report Sub-Menu screen.

7. Press **Enter** again to return to the Report Options Menu screen.

DHCT Transmit Level Saturation Report

Introduction

The DHCT sign-on process includes establishing the transmission level to use when communicating with QPSK modulators and demodulators. DHCTs transmit at various levels and the QPSK demodulator then measures the quality of the signal. Based upon these measurements, the QPSK modulator then sends a transaction to the DHCT that provides the DHCT with a target transmit level. The DHCT then attempts to communicate with the modulator by using the target transmit level. The DHCT may make several attempts to communicate by increasing the transmit level until the DHCT is able to maintain a communication lock with the modulator.

Over time, however, with the addition of other DHCTs to the network, signal-to-noise ratio issues are likely to affect the performance of the network. Likewise, attenuation issues are likely to surface as network configuration changes. DHCT transmission levels that were first established when the DHCT was added to the network may no longer be valid and the system may require adjustment. System operators can use the DHCT Transmit Level Saturation Report to view data pertaining to the transmission levels of DHCTs on the network and can use the data to adjust their system, if necessary.

Notes:

- DHCT transmit levels are expressed in terms of dBmV. The translation of dBmV is *decibels with respect to 1 millivolt over a characteristic impedance of 75 ohms*.
- Attenuation refers to the decrease in intensity between transmitted and received signals. The loss in intensity is usually a natural consequence of signal transmission over long distances.
- A signal-to-noise ratio is a measurement of signal strength relative to background noise. Competing transmissions from other DHCTs on the network tend to increase the background noise, thereby decreasing the signal-to-noise ratio.
- All demodulators assigned to a specific modulator should be configured to expect approximately the same transmit level from DHCTs. Compensate for variations in DHCT transmit levels by padding and combining. Do not configure transmit levels manually from the front panel of the demodulator.

Generating a DHCT Transmit Level Saturation Report

Follow these instructions to generate a DHCT Transmit Level Saturation Report.

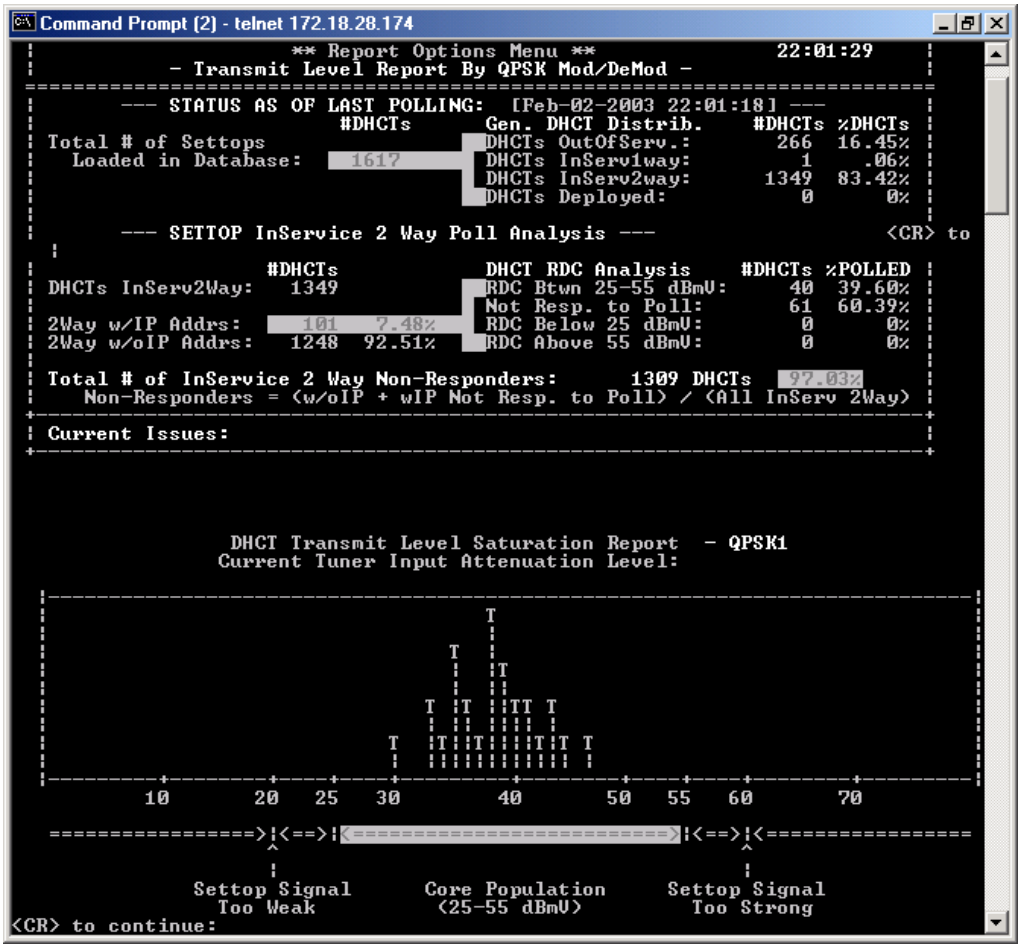
1. Maximize the xterm window.

   Note: The data in the DHCT Transmit Level Saturation Report is designed to display best if the window is maximized.

2. From the main menu of the DHCT Status Reporting Utility, type **tl** and then press **Enter**.

   Note: The "l" in "tl" is a lowercase "L."

   Result: The system generates the DHCT Transmit Level Saturation Report.



3. Go to **Understanding the DHCT Transmit Level Saturation Report**, next in this section, for help in interpreting the data displayed in the report.

Understanding the DHCT Transmit Level Saturation Report

There are two parts to the DHCT Transmit Level Saturation Report:

- A graphical representation of the distribution of the various transmission levels of DHCTs assigned to each QPSK modulator on the system

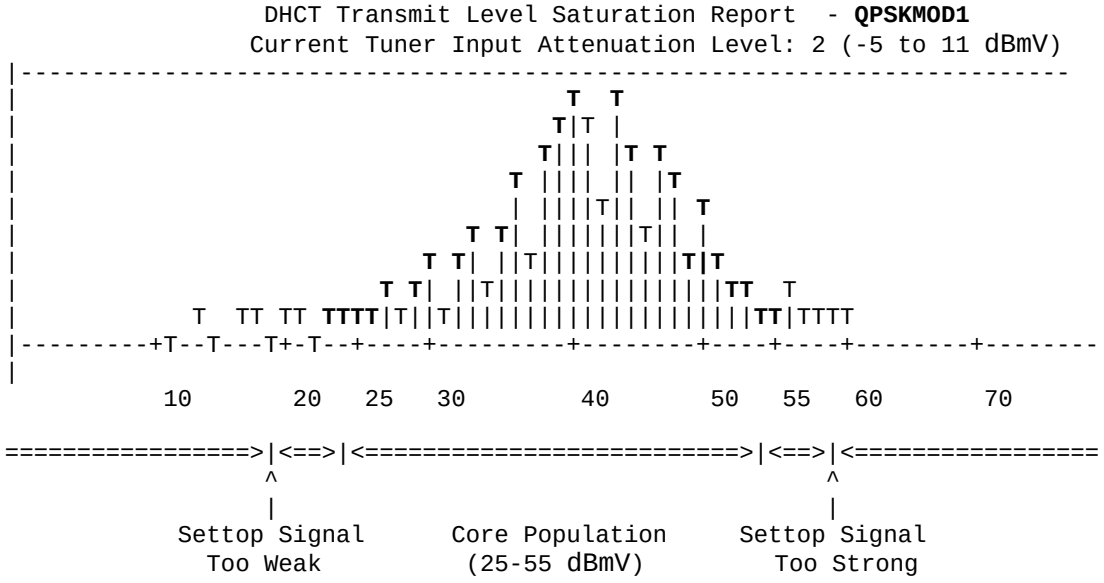
  Note: Read **Graphical Distribution of DHCT Transmission Levels**, next in this section, for help in interpreting the graphical representation.

- A numerical analysis of the graphical representation of the various transmission levels of DHCTs assigned to each QPSK modulator on the system

  Note: Read **Transmit Level Analysis**, later in this section, for help in interpreting the graphical representation.

Graphical Distribution of DHCT Transmission Levels

The first part of the DHCT Transmit Level Saturation Report contains a graph that shows the distribution of the various transmission levels of DHCTs assigned to a specific QPSK modulator. In the following example, the modulator is **QPSKMOD1.** The horizontal axis of the graph plots units of dBmV; the vertical axis (not marked on the report) plots the relative number of DHCTs transmitting at each dBmV level.



Cisco engineers have determined that DHCTs communicate best with QPSK modulators and demodulators when the DHCT transmits at a level between 25 and 55 dBmV. Notice the bell curve depicted in the illustration (and highlighted in bold for easy recognition). The peak of the bell curve centers around 40 dBmV, the midpoint between Cisco's recommended transmission level of 25 and 55 dBmV. This graph represents a healthy system; the vast majority of DHCTs assigned to this QPSK modulator transmit within Cisco's recommended range of 25 to 55 dBmV.

Notice the **Current Tuner Input Attenuation Level** of 2 in the header of this graph. This value is set at the **Tuner Input Attenuator** field, which is located on the **Advanced Parameters** tab in the Set Up QPSK Modulator window on the DNCS. A Current Tuner Input Attenuation Level of 2 corresponds to an attenuation level of -5 to 11 dBmV that currently exists on the network. DHCTs base the strength of their transmitting signal on this Current Tuner Input Attenuation Level. The higher the Current Tuner Input Attenuation Level, the stronger the transmitting signal; the lower the Current Tuner Input Attenuation Level, the weaker the transmitting signal.

Transmit Level Analysis

The second part of the DHCT Transmit Level Saturation Report provides a chart showing the detailed breakdown of the graphical data displayed in **Graphical Distribution of DHCT Transmit Levels**, earlier in this section. This part of the report contains the following data:

- Total number of DHCTs assigned to the modulator and each demodulator that transmit at each transmit level

  Note: In the following example, the QPSKMOD1 modulator is configured with eight demodulators.

- The average and the median transmit level for the modulator and each demodulator

```
                                                Transmit Level Breakdown
QPSK Mod Name ID  Avg.  Md   20db   25db   30db   50db   55db   60db
----------- --- ----- -- <-----+------+------+------+------+------+-------->
QPSKMOD1      8   41.99 42    9|    43|   219|  5865|   490|   225|      0
 DMod: 1          40.98 41    2|     5|    26|   755|    46|    18|      0
 DMod: 2          43.47 44    0|     0|     8|   633|    84|    42|      0
 DMod: 3          39.42 40    7|    23|    64|   713|    36|    16|      0
 DMod: 4          40.56 41    0|     9|    46|   718|    35|    20|      0
 DMod: 5          43.51 44    0|     2|    14|   828|    94|    34|      0
 DMod: 6          41.96 42    0|     3|    38|  1029|    84|    45|      0
 DMod: 7          43.12 43    0|     1|    15|   853|    74|    37|      0
 DMod: 8          43.33 44    0|     0|     8|   336|    37|    13|      0
                         <-----+------+------+------+------+------+-------->
```

The data confirms that the system is healthy. The average and median transmit levels (marked **Avg.** and **Md** respectively in the heading of the chart) for the modulator and each demodulator are reasonably close to the midpoint (40 dBmV) of Cisco's recommended range of 25 to 55 dBmV.

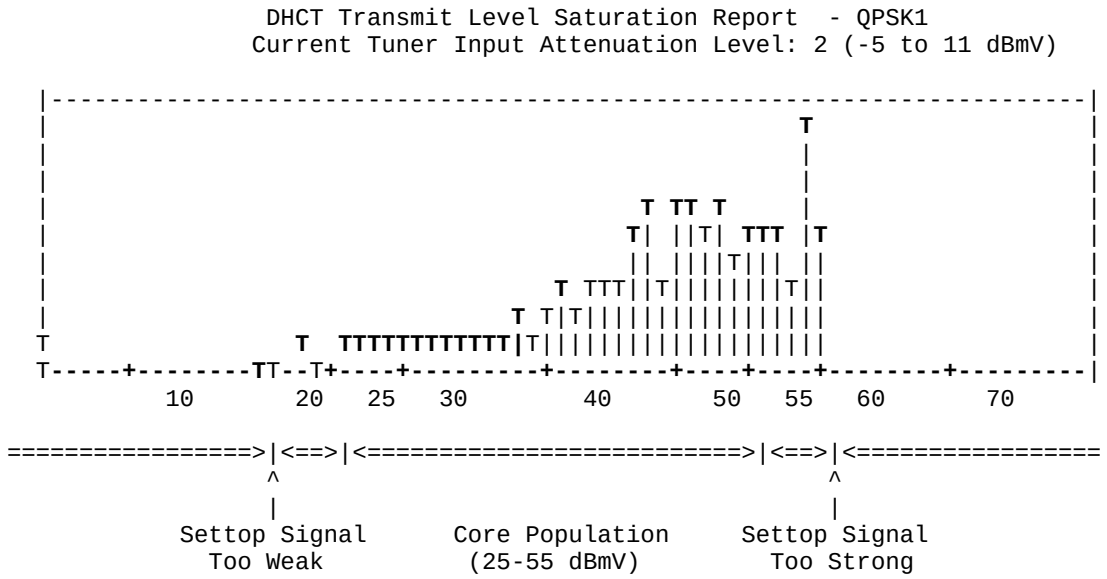
Examples of Systems Needing Recalibration

To further illustrate the value of the information contained in the DHCT Transmit Level Saturation Report, consider these two cases. The first case, **Case 1**, depicts a system where DHCTs transmit at levels higher than Cisco's recommended range of 25 to 55 dBmV. The graph clearly shows the excessively high transmit levels.

The second case, **Case 2**, illustrates a more subtle example of a system needing recalibration. The graph looks fine but the chart depicts one demodulator transmitting too low and another transmitting too high.

Case 1

This example illustrates a system where DHCTs transmit at levels higher than Cisco's recommended range of 25 to 55 dBmV.



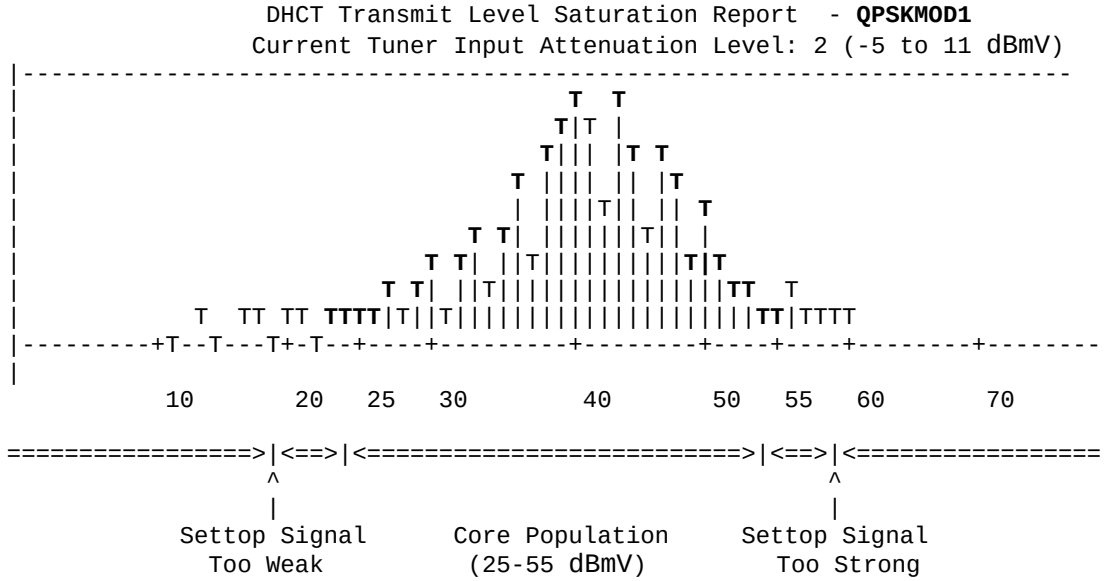
The midpoint of Cisco's recommended range of 25 to 55 dBmV is about 40 dBmV. The midpoint of the responding DHCTs depicted in the graph, and confirmed by the data in the following chart, is about 50 dBmV—too high. Furthermore, the graph illustrates a definite drop-off of responding DHCTs at about 55 dBmV, a clear sign that there are additional DHCTs transmitting at levels too high to even be recognized.

			Transmit Level Breakdown					
QPSK Mod Name	ID	Avg. Md	20db	25db	30db	50db	55db	60db
QPSK1	13	50.90 52	5	7	27	3549	2250	2421	0
DMod: 1		49.50 50	1	1	11	833	362	413	0
DMod: 2		50.97 52	0	3	0	774	531	506	0
DMod: 3		50.20 51	1	2	11	583	357	336	0
DMod: 4		52.41 53	0	1	5	649	525	725	0
DMod: 5		50.99 51	3	0	0	710	475	441	0

System operators should consider lowering the attenuation level of the QPSK demodulators associated with this QPSK modulator. When the attenuation level is lowered, DHCTs transmit at a lower level.

Case 2

In this example, a quick examination of the graph may lead the system operator to believe that the system is healthy. The graph depicts a bell curve with the peak of the bell curve centered around 40 dBmV, the midpoint between Cisco's recommended transmission level of 25 and 55 dBmV.



An examination of the chart, however, shows one demodulator (DMod 2) supports DHCTs that transmit at an average of 25.47 dBmV. Another demodulator (DMod 7) supports DHCTs that transmit at an average of 50.42 dBmV. Demodulators assigned to a specific modulator should be configured to expect approximately the same transmit level from DHCTs. Therefore, system operators should investigate whether adjustments to the combining or padding networks of these demodulators are necessary.

				Transmit Level Breakdown					
QPSK Mod Name	ID	Avg.	Md	20db	25db	30db	50db	55db	60db
QPSKMOD1	8	41.99	42	9	43	219	5865	490	225	0
DMod: 1		40.98	41	2	5	26	755	46	18	0
DMod: 2		25.47	40	0	0	8	633	84	42	0
DMod: 3		39.42	40	7	23	64	713	36	16	0
DMod: 4		40.56	41	0	9	46	718	35	20	0
DMod: 5		43.51	44	0	2	14	828	94	34	0
DMod: 6		41.96	42	0	3	38	1029	84	45	0
DMod: 7		50.42	47	0	1	15	853	74	37	0
DMod: 8		43.33	44	0	0	8	336	37	13	0

DHCT Delay Value Saturation Report

Introduction

The DHCT Delay Value Saturation Report is primarily used to determine whether the Range Extension feature needs to be enabled on a system. See *QPSK (Release C69) Software Upgrade and Installation Instructions*, part number 738174, for details on the Range Extension feature.

Generating the DHCT Delay Value Saturation Report

Follow these instructions to generate a DHCT Delay Value Saturation Report.

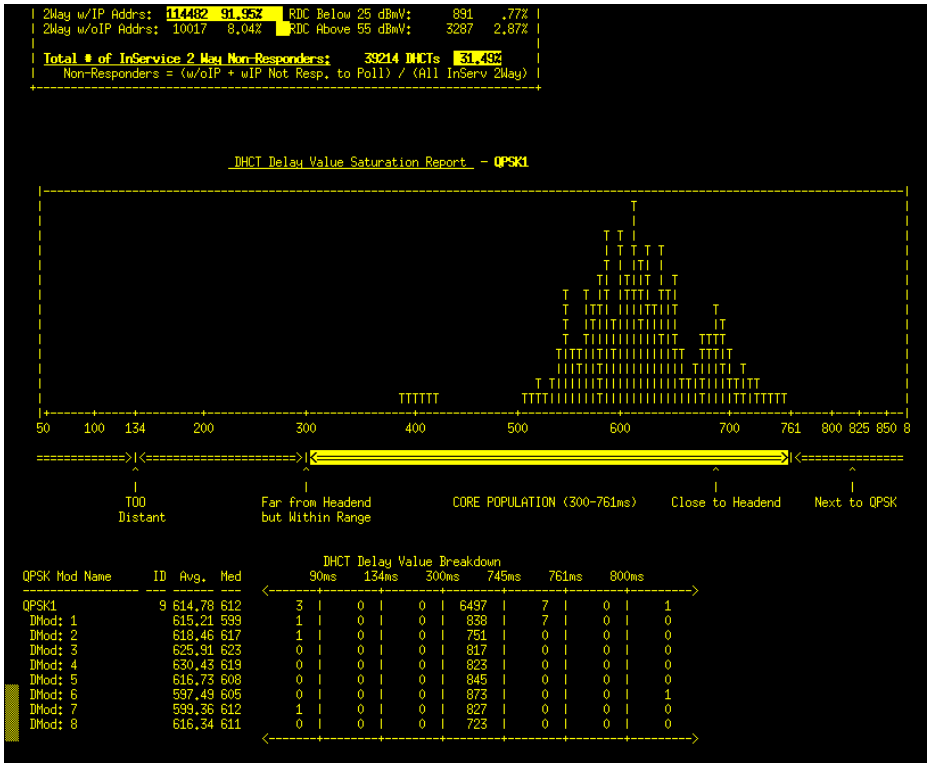
1. Maximize the xterm window.

   Note: The data in the DHCT Delay Value Saturation Report is designed to display best if the window is maximized.

2. From the main menu of the DHCT Status utility, type **dl** and then press **Enter**.

   Note: The "l" in "dl" is a lowercase "L."

   Result: The system generates the DHCT Delay Value Saturation Report.



3. Go to **Understanding the DHCT Delay Value Saturation Report**, next in this section, for help in interpreting the data displayed in the report.

Understanding the DHCT Delay Value Saturation Report

There are two parts to the DHCT Delay Value Saturation Report:

- A graphical representation of the distribution of the various delay values of DHCTs assigned to each QPSK modulator on the system

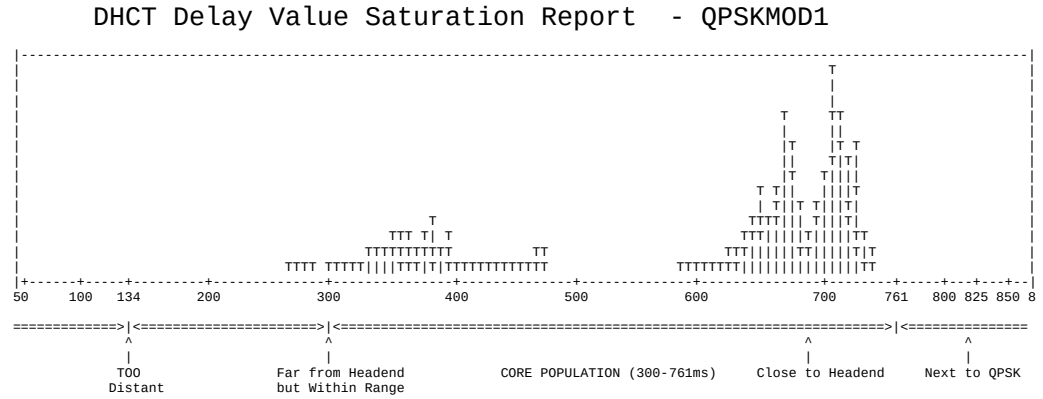
  Note: Read **Graphical Distribution of DHCT Delay Values**, next in this section, for help in interpreting the graphical representation.

- A numerical analysis of the graphical representation of the various delay values of DHCTs assigned to each QPSK modulator on the system

  Note: Read **Delay Value Analysis**, later in this section, for help in interpreting the graphical representation.

Graphical Distribution of DHCT Delay Values

The first part of the DHCT Delay Value Saturation Report contains a graph that shows the distribution of the various delay values of DHCTs assigned to a specific QPSK modulator. In the following example, the modulator is **QPSKMOD1.** The horizontal axis of the graph plots units of time in microseconds (ms); the vertical axis (not marked on the report) plots the relative number of DHCTs with each delay value.



The data in this graph shows that the QPSK called QPSKMOD1 supports two distinct clusters of DHCTs. The first cluster of DHCTs is located close to the headend, as confirmed by the **Close to Headend** label along the x-axis. These DHCTs have a delay value centered around 700 ms.

The second cluster of DHCTs is located farther from the headend, as confirmed by the **Far from Headend but Within Range** label along the x-axis. These DHCTs have a delay value centered around 400 ms.

Having multiple clusters of DHCTs, as illustrated in this example, is normally not a problem. Non-responding DHCTs begin to appear only when delay values fall below the 134 microsecond range, as designated by the **Too Distant** label along the x-axis.

Delay Value Analysis

The second part of the DHCT Delay Value Saturation Report provides a detailed breakdown of the graphical data displayed in **Graphical Distribution of DHCT Delay Values**, earlier in this section. This part of the report contains the following data:

- A listing of the QPSK modulator and associated demodulators

  Note: In the following example, Modulator QPSKMOD1 is configured with eight demodulators.

- The average and the median delay values for the modulator and each demodulator
- A detailed listing showing the number of DHCTs with each delay value

```
                                  DHCT Delay Value Breakdown
QPSK Mod Name      ID  Avg.  Med          90ms    134ms    300ms    745ms    761ms    800ms
----------------- --- ------ ---  <-------+--------+--------+--------+--------+--------+-------->
QPSKMOD1            3 618.38 671        0  |     0  |    24  |  7150  |     0  |     0  |     0
 DMod: 1              686.80 686        0  |     0  |     0  |  1086  |     0  |     0  |     0
 DMod: 2              694.62 705        0  |     0  |     0  |   813  |     0  |     0  |     0
 DMod: 3              695.50 708        0  |     0  |     0  |   792  |     0  |     0  |     0
 DMod: 4              691.04 709        0  |     0  |     0  |   783  |     0  |     0  |     0
 DMod: 5              681.21 669        0  |     0  |     0  |  1079  |     0  |     0  |     0
 DMod: 6              664.94 660        0  |     0  |     0  |  1067  |     0  |     0  |     0
 DMod: 7              367.46 369        0  |     0  |    24  |   753  |     0  |     0  |     0
 DMod: 8              390.88 381        0  |     0  |     0  |   777  |     0  |     0  |     0
                                  <-------+--------+--------+--------+--------+--------+-------->
```

The data confirms the existence of two distinct clusters of DHCTs, with each cluster located a distinct radius away from the modulator.

- 7,150 DHCTs have a delay value of approximately 745 ms

  Note: These DHCTs correspond to the cluster situated over the **Close to Headend** label along the x-axis of the graph shown under the **Graphical Distribution of DHCT Delay Values** heading, earlier in this section.

- 24 DHCTs have a delay value of approximately 300 ms

  Note: These DHCTs correspond to the cluster located over the **Far from Headend but Within Range** label along the x-axis of the graph shown under the **Graphical Distribution of DHCT Delay Values** heading, earlier in this section.

QPSK Range Extension Feature

The Model D9482 QPSK Modulator is designed to be capable of successfully connecting to and operating DHCTs within a distance of approximately 128 km round trip (64 km each way when forward and reverse paths are equal). This distance limitation is mainly due to the width of the ranging slots defined in the Digital Audio-Visual Council (DAVIC) standard for operation over the hybrid fiber-coax (HFC) plant.

Some cable service providers prefer to physically locate the QPSK hardware in the headend and extend coverage to DHCTs that are farther from the QPSK modulator than the currently allowable maximum distance. This optional feature, known as the QPSK Range Extension Feature for the Model D9482 QPSK Modulator, allows Explorer DHCTs to sign on to the system and operate properly at extended distances from the QPSK modulator.

Note: Refer to *QPSK (Release A62) Software Upgrade and Installation Instructions*, part number 740224, for additional details about distances between the QPSK modulator and DHCTs, as well as additional details about the QPSK Range Extension Feature.

DHCT OS and ResApp Evaluation by Set Top Type and Rev Report

Introduction

A typical DBDS supports DHCTs of many types and revisions. The DHCT Status utility includes an option that generates a report that lists the following data:

- The number and percentage of each DHCT type and revision supported by the system
- The version of operating system and resident application software running on each DHCT type and revision

Generating the DHCT OS and ResApp Evaluation by Set Top Type and Rev Report

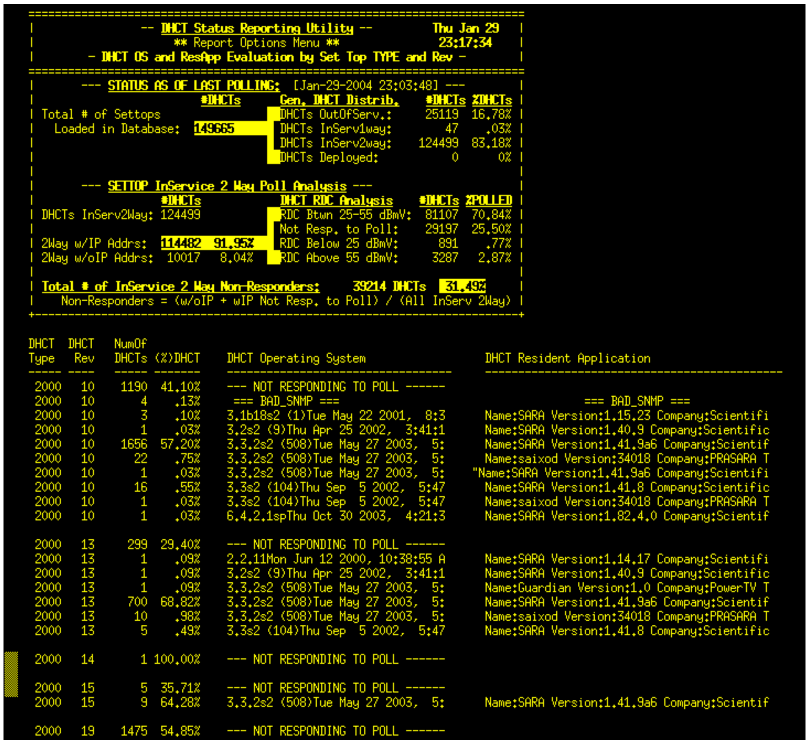
Follow these instructions to generate the DHCT OS and ResApp Evaluation by Set Top Type and Rev Report.

1. Maximize the xterm window.

   Note: The data in the DHCT OS and ResApp Evaluation by Set Top Type and Rev Report is designed to display best if the window is maximized.

2. From the main menu of the DHCT Status utility, type **os** and then press **Enter**.

   Result: The system generates the DHCT OS and ResApp Evaluation by Set Top Type and Rev Report.



3. Press **Enter** as often as required to scroll through the entire report.

Chapter 2
signonCount Utility

Overview

Introduction

When DHCTs download new software for the operating system and resident application, they lose the contents of their volatile memory. After the download, DHCTs sign back on to the network and their network configuration data is reloaded. The signonCount utility is useful in monitoring the rate at which DHCTs sign on to the network.

Because some DHCTs make repeated attempts to sign on to the network before they are successful, too many sign-on attempts by DHCTs contribute to network congestion. The signonCount utility can help system operators quickly identify those DHCTs that are having trouble signing on, and the utility can then be used to facilitate the DHCT sign-on process.

When to Use the signonCount Utility

The signonCount utility enables system operators and Cisco engineers to monitor the rate at which DHCTs sign on to the network. This monitoring is required in the following circumstances:

- When DHCTs download new software—DHCTs lose the contents of their volatile memory when the DHCT downloads new software for the operating system and resident application. DHCTs reconnect to the network after the download, and the memory that contained information about the DHCT network connection (IP address, transmit timing and level) is re-loaded. For systems that are forced to rapidly load DHCT software, the signonCount utility is useful in determining when to trigger the next group of DHCTs to load code.
- When the QPSK modulator and demodulator software is upgraded—In this case, the signonCount utility is used in the following two situations:
  - The first situation is to determine if the system is healthy enough to be upgraded. If it is not, the signonCount utility also provides a secondary mode of operation that can dramatically improve the health of the system prior to moving forward with the upgrade.
  - The second situation is to use the signonCount utility to provide more meaningful guidance regarding when you can move forward with upgrading the next QPSK modulator. Previous upgrade guides instructed you either to wait a little while between upgrading units or to monitor the log file, but they offered no real tools to help in this effort.

Two Modes of Operation

You can run the signonCount utility in two modes: **Fix Mode Off** and **Fix Mode On**.

Both modes help system operators monitor the rate at which DHCTs are trying to sign on to the network. When run in *Fix Mode Off* mode, the utility takes no corrective action regarding DHCTs that are having difficulty signing on. When run in *Fix Mode On* mode, however, the utility reboots those DHCTs that have tried to sign on more than three times during a 10-minute period.

Note: By forcing DHCTs that are having trouble signing on to reboot, the memory in the DHCT is refreshed and the sign-on process is made easier.

Important: By default, the utility runs in Fix Mode Off mode. Because the utility interacts with the database when run in Fix Mode On mode, Cisco recommends that you contact Cisco Services before switching modes.

In This Chapter

This chapter contains the following topics.

Review the signonCount Utility Help Window

Introduction

Before you use the signonCount utility on your system, Cisco recommends that you review the information on the utility's help window. The information on the help window may supplement the information and procedures in this chapter.

Reviewing the signonCount Utility Help Window

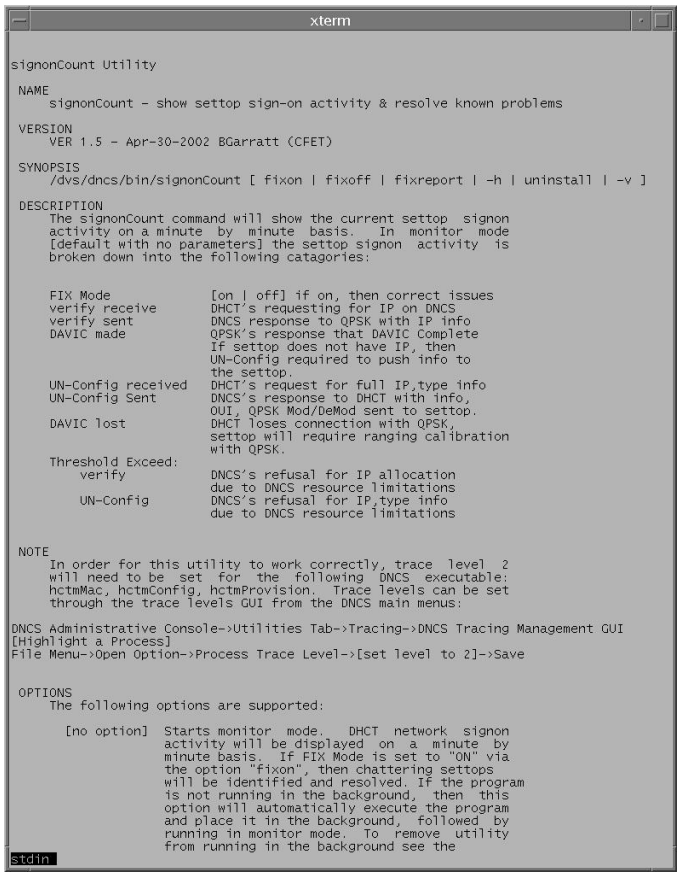
Follow these instructions to review the signonCount utility help window.

1. Open an xterm window on the DNCS and then maximize the window.

   Note: The help window for the signonCount utility is large.

2. Type **signonCount -h** and then press **Enter**.

   Result: The help window for the signonCount utility appears.



3. Press the **Spacebar** as often as necessary to page through the help window.

DNCS Tracing Levels

The signonCount utility's help window indicates that for the utility to operate properly, the tracing levels of three DNCS processes need to be set to level 2. Refer to the next section, **Set DNCS Tracing Levels**, for instructions on setting the three DNCS processes to level 2.

Set DNCS Tracing Levels

Introduction

Before you can begin using the signonCount utility, you need to set the tracing levels of three DNCS processes to level 2. By setting the tracing levels for these processes to level 2, you ensure that the DNCS captures the maximum level of detail for these processes.

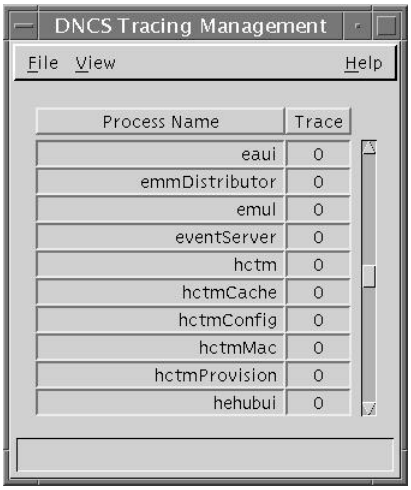
Note: The processes are hctmConfig, hctmMac, and hctmProvision.

Setting the DNCS Tracing Levels

Follow these instructions to set the tracing levels of the hctmConfig, hctmMac, and hctmProvision processes to level 2.

1. From the DNCS Administrative Console, select the **Utilities** tab.
2. Click **Tracing**.

   Result: The DNCS Tracing Management window opens.



3. Scroll down until the **hctmConfig**, **hctmMac**, and **hctmProvision** processes come into view.
4. Are the tracing levels for all three of these processes already set to **2**?
   - If **yes**, you have no need to complete the rest of this procedure; continue with **The signonCount Utility Interface**, next in this chapter.
   - If **no**, go to step 5 to begin setting the tracing levels.

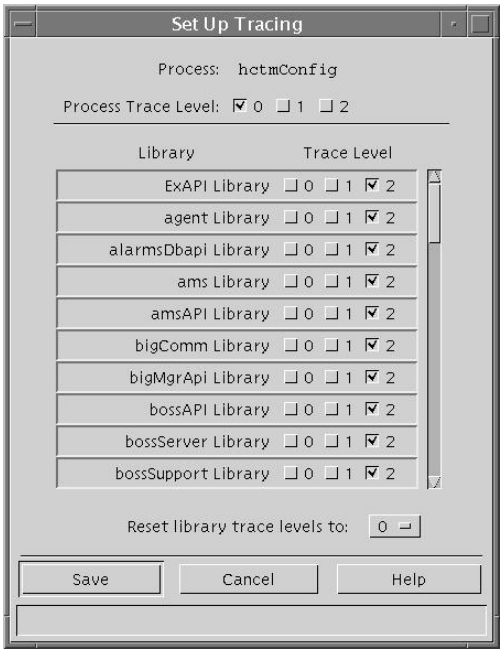
   Note: The **Trace** column lists the current tracing level.

   Example: In the example in step 2, the tracing levels are all set to **0**.

5. Double-click one of the processes.

   Example: Double-click **hctmConfig**.

   Result: The Set Up Tracing window opens.



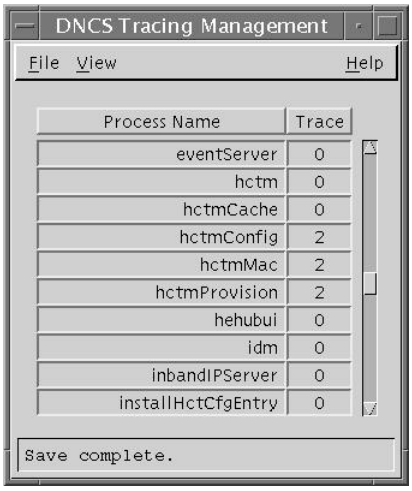
6. Follow these instructions to configure the Set Up Tracing window.
   a) In the **Process Trace Level** field, select **2**.
   b) Click **Save**.

   Results:

   - The DNCS Tracing Management window updates with the new tracing level.
   - The Set Up Tracing window closes.

7. Repeat steps 5 and 6 for the **hctmMac** and **hctmProvision** processes (if necessary) to update the tracing level to **2**.

   Example: When you are finished, the DNCS Tracing Management window should look similar to the following example.



   Note: The example shows the tracing levels for the hctmConfig, hctmMac, and hctmProvision utilities set to level 2.

8. Click **File** and select **Close** to close the DNCS Tracing Management window.

9. Go to **The signonCount Utility Interface**, next in this chapter.

signonCount Utility Interface

Introduction

The information in this section provides instructions on how to open the interface of the signonCount utility, as well as providing an explanation of the fields displayed on the interface.

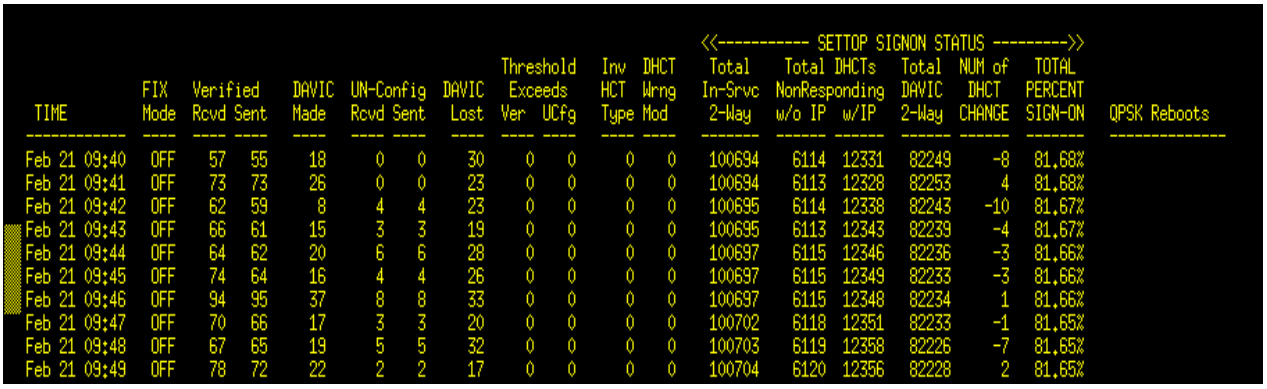
Displaying the signonCount Interface

Follow these steps to display the interface of the signonCount utility.

1. If necessary, open an xterm window on the DNCS.
2. Click and drag the edges of the xterm window to maximize the screen width.

   Note: The signonCount utility fills the width of the screen with data.
3. Type **signonCount** and then press **Enter**.

   Result: The signonCount utility interface opens.



												<<---------- SETTOP SIGNON STATUS ---------->>						
TIME	FIX Mode	Verified Rcvd	Verified Sent	DAVIC Made	UN-Config Rcvd	UN-Config Sent	DAVIC Lost	Threshold Exceeds Ver	Threshold Exceeds UCfg	Inv HCT Type	DHCT Wrng Mod	Total In-Srvc 2-Way	Total DHCTs NonResponding w/o IP	Total DHCTs NonResponding w/IP	Total DAVIC 2-Way	NUM of DHCT CHANGE	TOTAL PERCENT SIGN-ON	QPSK Reboots
Feb 21 09:40	OFF	57	55	18	0	0	30	0	0	0	0	100694	6114	12331	82249	-8	81.68%	
Feb 21 09:41	OFF	73	73	26	0	0	23	0	0	0	0	100694	6113	12328	82253	4	81.68%	
Feb 21 09:42	OFF	62	59	8	4	4	23	0	0	0	0	100695	6114	12338	82243	-10	81.67%	
Feb 21 09:43	OFF	66	61	15	3	3	19	0	0	0	0	100695	6113	12343	82239	-4	81.67%	
Feb 21 09:44	OFF	64	62	20	6	6	28	0	0	0	0	100697	6115	12346	82236	-3	81.66%	
Feb 21 09:45	OFF	74	64	16	4	4	26	0	0	0	0	100697	6115	12349	82233	-3	81.66%	
Feb 21 09:46	OFF	94	95	37	8	8	33	0	0	0	0	100697	6115	12348	82234	1	81.66%	
Feb 21 09:47	OFF	70	66	17	3	3	20	0	0	0	0	100702	6118	12351	82233	-1	81.65%	
Feb 21 09:48	OFF	67	65	19	5	5	32	0	0	0	0	100703	6119	12358	82226	-7	81.65%	
Feb 21 09:49	OFF	78	72	22	2	2	17	0	0	0	0	100704	6120	12356	82228	2	81.65%	

Data Fields

The following tables list the fields included on the interface of the signonCount utility and provide an explanation of the meaning associated with each field.

Columns	Descriptions
TIME / FIX Mode Feb 21 09:40 OFF Feb 21 09:41 OFF Feb 21 09:42 OFF Feb 21 09:43 OFF Feb 21 09:44 OFF Feb 21 09:45 OFF Feb 21 09:46 OFF Feb 21 09:47 OFF Feb 21 09:48 OFF Feb 21 09:49 OFF	• **TIME—** The system polls the communication link between the QPSK modulators and the DNCS every minute and records the date and time. • **FIX Mode—** This field reveals whether the signonCount utility is configured to automatically correct DHCT sign-on problems (*Fix Mode On*) or whether the utility is running in information-only mode (*Fix Mode Off*). **Note:** By default, the utility runs in Fix Mode Off mode. **Important:** Do not change modes unless you have been instructed to do so by Cisco Services engineers.
Verified Rcvd / Verified Sent / DAVIC Made 57 55 18 73 73 26 62 59 8 66 61 15 64 62 20 74 64 16 94 95 37 70 66 17 67 65 19 78 72 22	• **Verified Rcvd—** The QPSK modulator reports the number of DHCTs that have made sign-on requests. • **Verified Sent—** The DNCS has allocated this number of DHCT IP addresses based upon the sign-on requests. • **DAVIC Made—** The QPSK modulator reports the number of DHCTs that have connected to the QPSK modulator and are waiting for UN-Config information.
UN-Config Rcvd / UN-Config Sent 0 0 0 0 4 4 3 3 6 6 4 4 8 8 3 3 5 5 2 2	• **UN-Config Rcvd—** This number of DHCTs are requesting a UN-Config message from the DNCS. **Note:** The UN-Config message contains information, like an IP address, that allows DHCTs to sign on to the network. • **UN-Config Sent—** The DNCS has sent this number of UN-Config messages to DHCTs, allowing the DHCTs to sign on to the network. **Note:** At this point, the DHCTs are physically in two-way mode and have completed the sign-on process.

Columns	Descriptions
DAVIC Lost 30 23 23 19 28 26 33 20 32 17	• **DAVIC Lost—**This field indicates the number of DHCTs that have lost the communication link with the QPSK modulator. **Note:** The QPSK modulator then sends a message to DHCTs that have lost the communication link. The message requests that the DHCTs recalibrate themselves with the modulator so the entire sign-on process can begin again.
Threshold Exceeds Ver UCfg 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	• **Threshold Exceeds Ver—**The DNCS reports the number of DHCTs that simultaneously attempt to verify their configuration in excess of what the system queues allow. • **Threshold Exceeds UCfg—**The DNCS reports the number of DHCTs that simultaneously attempt to sign on to the system in excess of what the system queues allow. **Note:** The numbers in the Threshold Exceeds Ver and Threshold Exceeds UCfg columns should theoretically be zero.

Inv HCT Type	DHCT Wrng Mod
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

- **Inv HCT Type—** This field represents the number of DHCTs in the database with the wrong type, revision, or OUI.
- **DHCT Wrng Mod—** This field represents the number of DHCTs that have responded through a QPSK modulator that differs from the modulator through which the DHCT responded in the past.

  Note: Numbers in this column typically represent DHCTs that have been moved from one subscriber's home to another without having gone through the correct process.

Total In-Srvc 2-Way
100694
100694
100695
100695
100697
100697
100697
100702
100703
100704

- **Total In-Srvc 2-Way—** The utility reports the number of DHCTs listed in the database with a status of In-Service 2-Way**.**

  Note: These DHCTs should be capable of two-way communication.

Columns	Descriptions
Total DHCTs NonResponding w/o IP / wIP 6114 12331 6113 12328 6114 12338 6113 12343 6115 12346 6115 12349 6115 12348 6118 12351 6119 12358 6120 12356	These fields list the number of DHCTs in the database that should be capable of two-way communication, but they are listed as non-responders. • **w/o IP**—This number of non-responding DHCTs do not have an IP address. • **wIP**—This number of non-responding DHCTs have an IP address.
Total DAVIC 2-Way / NUM of DHCT Change 82249 -8 82253 4 82243 -10 82239 -4 82236 -3 82233 -3 82234 1 82233 -1 82226 -7 82228 2	• **Total DAVIC 2-Way**—This field represents the number of DHCTs that have physically signed on to the network with two-way communication ability. • **NUM of DHCT Change**—This field represents the number of DHCTs with two-way capability that have been added to or removed from the database during the last minute. **Note:** Substantial numbers in the column usually indicate staging activity.
TOTAL PERCENT SIGN-ON / QPSK Reboots 81.68% 81.68% 81.67% 81.66% 81.66% 81.66% 81.65% 81.65% 81.68% 81.68%	• **TOTAL PERCENT SIGN-ON**—The DNCS reports the percentage of DHCTs with two-way capability that are signed on to your network. • **QPSK Reboots**—In the event that a QPSK modulator reboots, the name and ID of the modulator is listed in this column.

What to Look For in the signonCount Data

Concentrate on Three Fields

Allow the system to gather signonCount data for several minutes and then examine the numbers in the following fields:

- **Verified Rcvd** (Verified Received)
- **Verified Sent**
- **DAVIC Made**

These fields track the number of sign-on requests made by DHCTs (Verified Rcvd and Verified Sent), as well as the number of sign-on requests that were successful (DAVIC Made). Ideally, the numbers in the three fields should be equal.

If you notice that the numbers in the DAVIC Made column regularly fall more than two or three below the numbers in the Verified Rcvd and Verified Sent columns, your DHCTs may be having trouble signing on and may be contributing to network congestion.

Contact Cisco Services

If you notice that the numbers in the DAVIC Made column regularly fall more than two or three below the numbers in the Verified Rcvd and Verified Sent columns, contact Cisco Services. Cisco Services engineers may log in to your system and examine the logfiles associated with the hctmConfig, hctmMac, and hctmProvision processes. Additionally, Cisco Services engineers may instruct you to run the signonCount utility in *Fix Mode On* mode.

Important: Do not run the utility in *Fix Mode On* mode unless you have been instructed to do so by Cisco Services engineers.

Chapter 3
Customer Information

Overview

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.

Access your company's extranet site to view or order additional technical publications. For accessing instructions, contact the representative who handles your account. Check your extranet site often as the information is updated frequently.

Cisco Systems, Inc.
5030 Sugarloaf Parkway, Box 465447
Lawrenceville, GA 30042

678 277-1120
800 722-2009
www.cisco.com

August 2012 Printed in USA

Part Number 78-736186-01 Rev B