Chapter 7: Testing and Troubleshooting

CBS Diagnostics and Troubleshooting

The information in this chapter assists trained NCR Customer Service personnel or other trained personnel in analyzing and isolating problems with the DecisioNet System.

Ethernet Communication Diagnostic Tools

Tools available for diagnosing Ethernet communication include the Windows NT utilities such as:

- arp (ARP table query)
  - Displays ARP table contents (ARP cache association between MAC Address and IP Address)
  - Permits permanent ARP table entries
- ipconfig (IP configuration query)
  - Displays current PC IP configuration for the system (Not the CBS)
- netstat (network status query)
  - Displays protocol statistics and current connection information
- ping (connection query)
  - Displays network traffic at the packet level
- Network Monitor
  - Displays network traffic at the packet level
- Performance Monitor

- Displays network performance information graphically

CBS Communications Diagnostic Tools

The following DecisioNet diagnostics are available:

- Status lights (LEDs) on the CBS
- dncbsmtest (CBS manager test tool)
  - Obtain configuration information from CBS
  - Obtain CBS diagnostic information
  - Obtain CBS tallies
  - Configure CBS parameters
  - Configure RF parameters
  - Configure frequency hopping tables

System Error Log

- Windows NT/2000 System Event Log
- For error code descriptions refer to Chapter 10, "DecisioNet System Messages," in the *DecisioNet User's Guide* (B005-0000-1317).

Site-specific RF Certification Reference

During the initial installation, site-specific documents are created as specified in the *Certification/Re-Certification Site Survey Policy* (497-0410343). These documents, provided to the DecisioNet Technical Support Specialist at your area Managed Care Center, include the following information:

- Installation site survey forms
- Store blueprint with RF infrastructure
- Site certification test data
- Site photos

The Managed Care Center can perform the DecisioNet System software testing and troubleshooting described in this chapter.

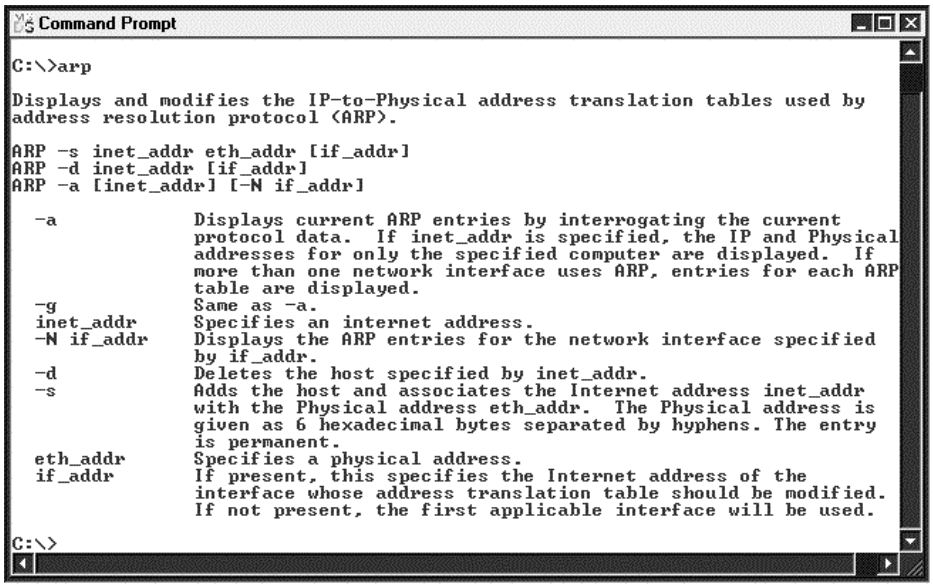
For additional information about site certification, refer to the RF Certification Utility Guide on the *DecisioNet Implementation Guide* (B005-0000-1250).

Available training for the DecisioNet System includes a class on hardware and a class on implementation.

Ethernet Communication Diagnostic Tools

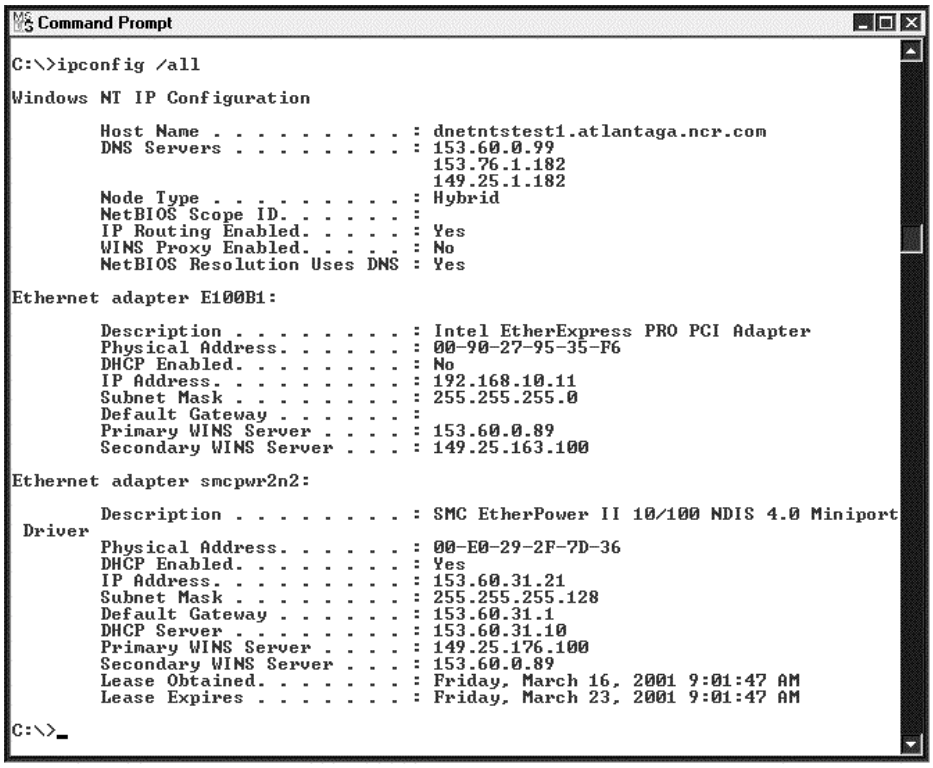
arp (ARP table query)

This Windows NT utility is run from the command line and displays ARP table contents showing the ARP cache association between MAC Addresses and IP Addresses. You can also make permanent ARP tables entries. Command line parameters are as follows:



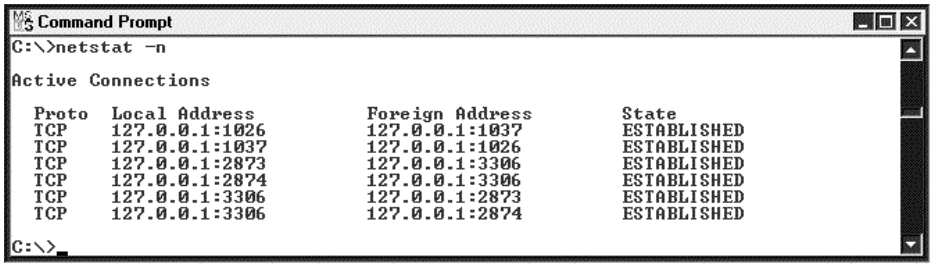
ipconfig (IP configuration query)

This Windows NT utility displays current IP configuration for the In-store processor or computer where DecisioNet is installed. It does not show IP configuration information for the DecisioNet CBS units.



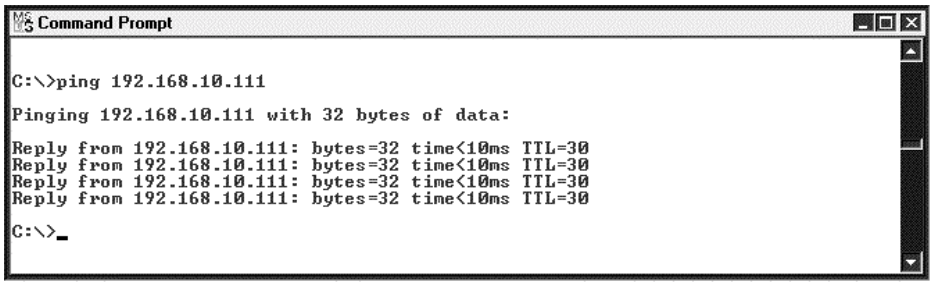
netstat (network status query)

This Windows NT utility displays protocol statistics and current connection information.



ping (connection query)

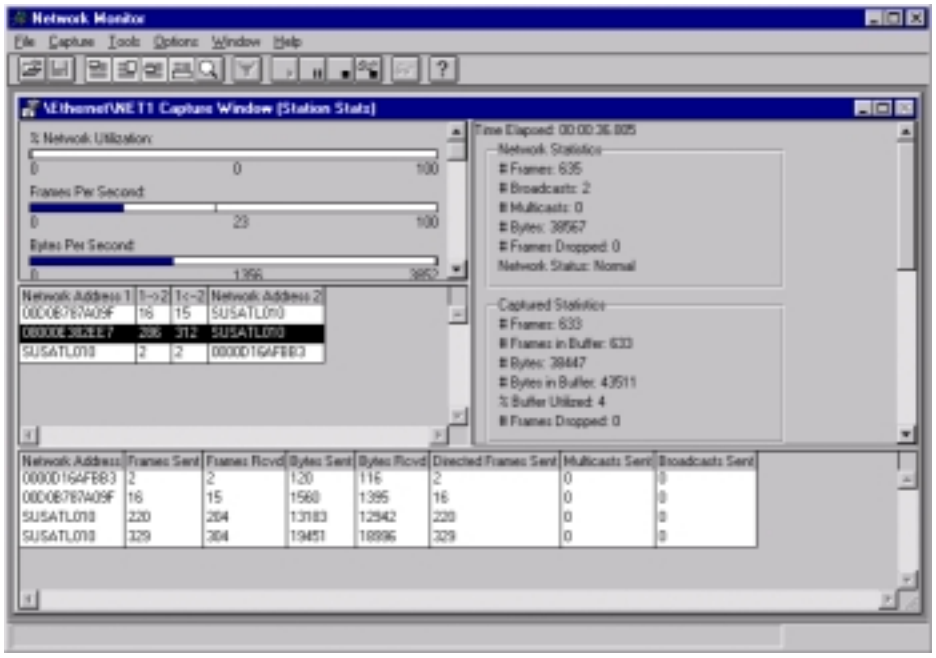
This utility can be used to display network traffic at the packet level.



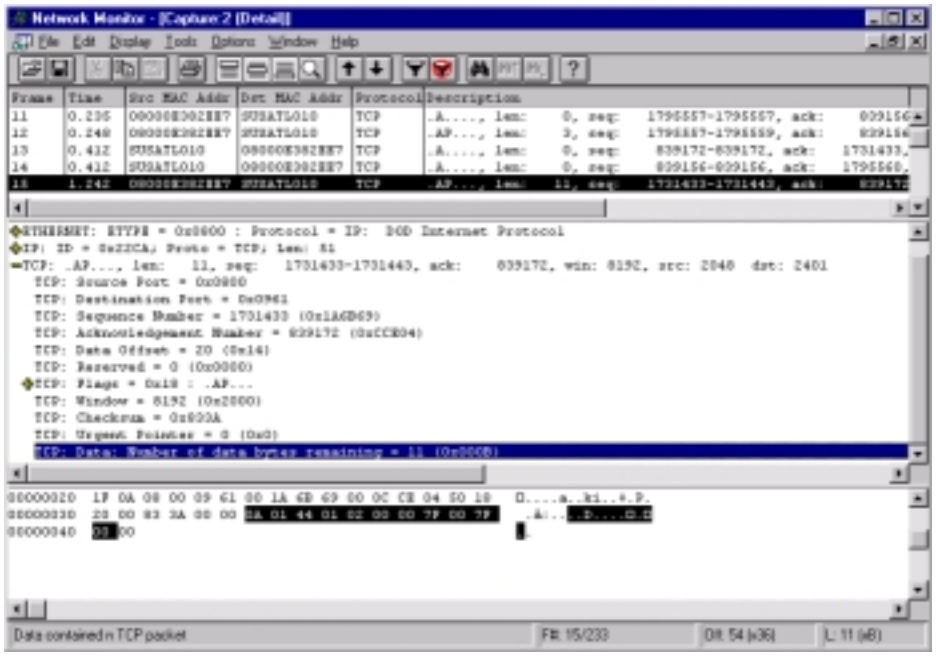
Network Monitor

This Windows utility is typically available on network servers and graphically displays network traffic at a packet level.

Station Statistics

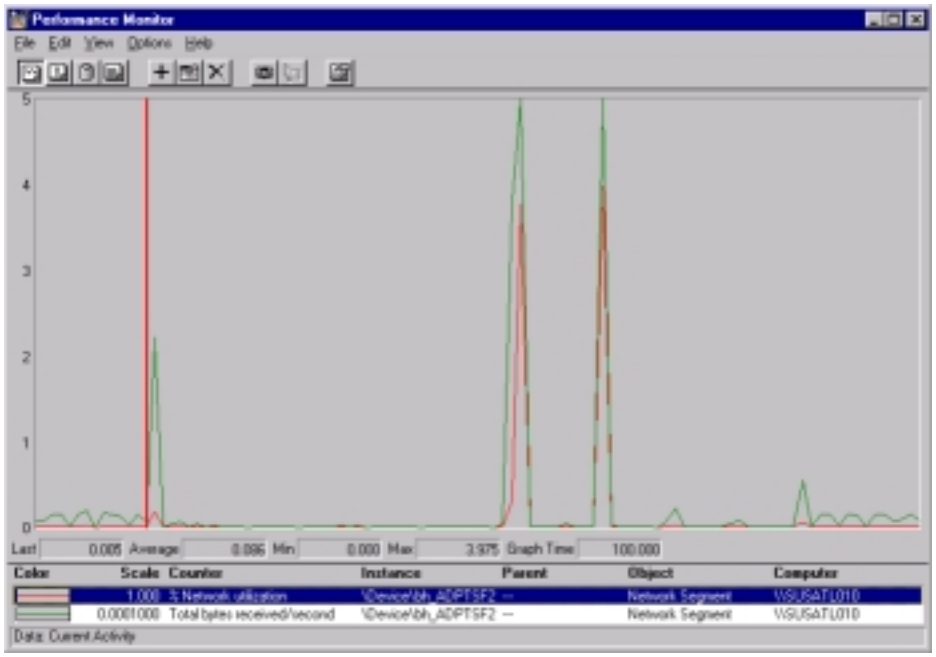


Detail Screen



Performance Monitor

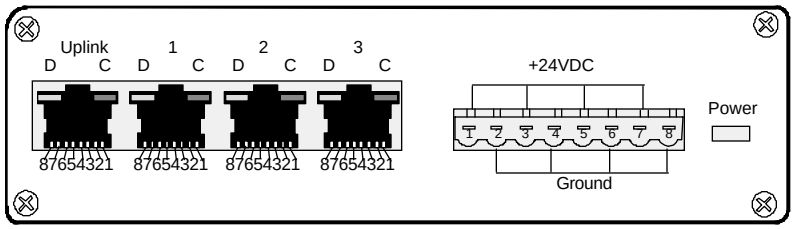
The Performance Monitor is a Windows NT/2000 Utility that displays NT/2000 performance information graphically. To access this utility click on the **Start** button on the lower left of the screen, select **Programs** > **Administrative Tools (Common)** > **Performance Monitor**.



CBS Communications Diagnostic Tools

The following DecisioNet diagnostics are available:

CBS Status Lights



18877

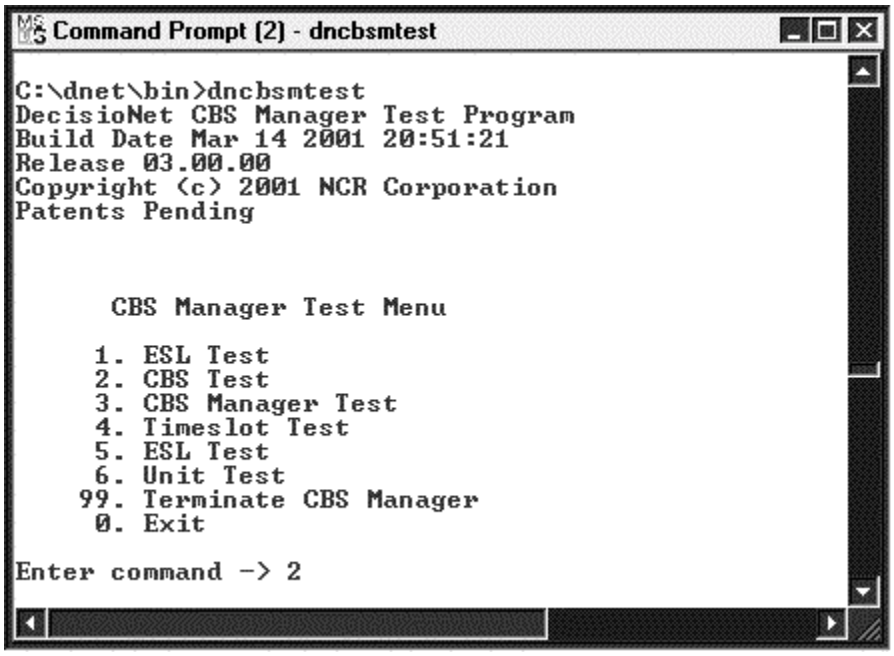
The Ethernet status lights (LEDs) are in the top corners of the data connectors. The Power status light is a red LED shown to the right of the power receptacle in the previous illustration.

The CBS status lights indicate the following conditions.

LED	State	Meaning
Power (red)	On	OK (power is on)
	Off	PROBLEM (no power)
	Blinking	PROBLEM (intermittent power)
C (green) Ethernet link status	On	OK (good link)
	Off	PROBLEM (no link)
	Blinking	PROBLEM (intermittent link)
D (yellow) Ethernet activity	On	NOT DEFINED
	Off	PROBLEM (no receive activity)
	Blinking	OK (receive activity)

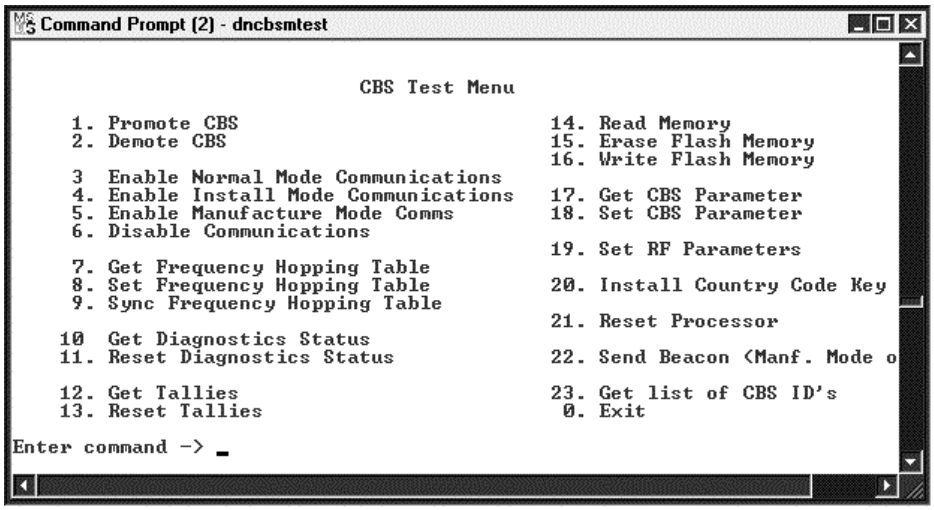
dncbsmtest

This is the CBS Manager test tool that exercises all CBS Manager functionality. This tool is most useful in isolating CBS problems or failures. Start this utility by typing **dncbsmtest** at the system prompt.



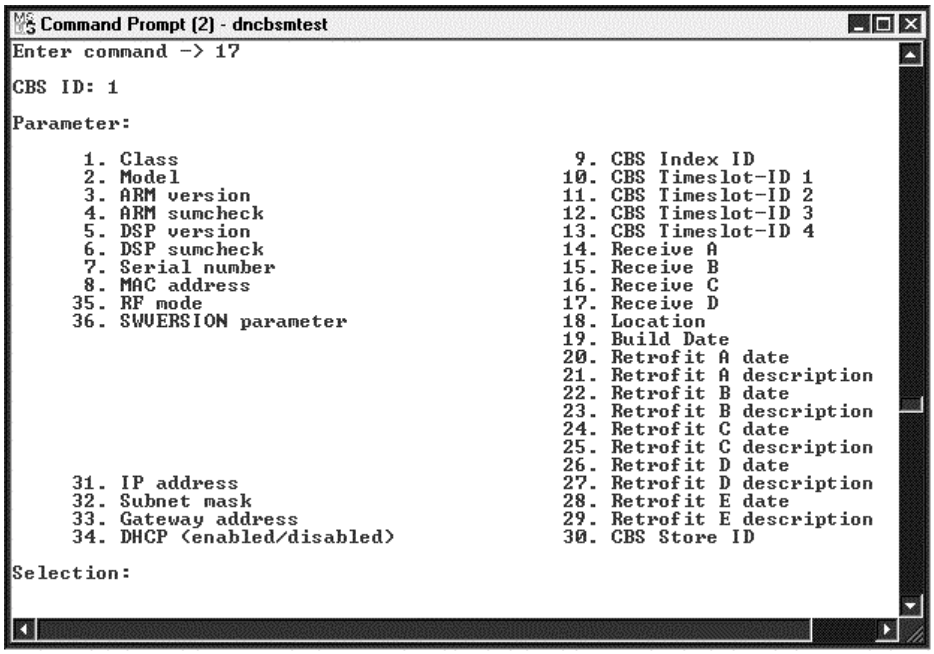
Caution: Some of the dncbsmtest options are intended for NCR internal use only. The following options are suggested to review and analyze CBS problems and also set various parameters if required.

Select Option **2** to access the CBS menu.

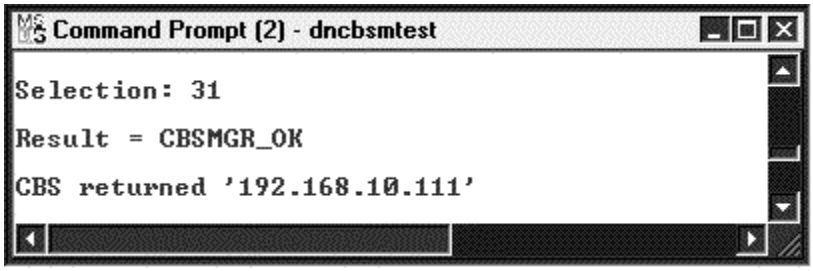


Obtain CBS Configuration Information

To view configuration information for CBS 1, enter **17** (Get CBS Parameter) and then **1** when prompted for the CBS ID.

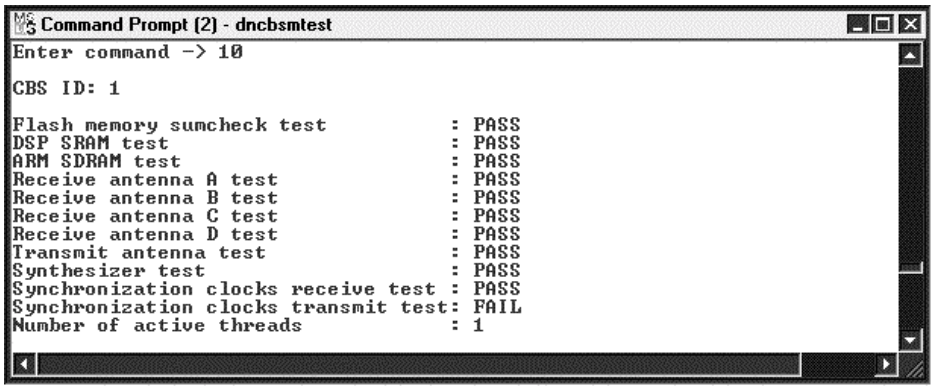


To view the IP address for CBS 1 enter 31.



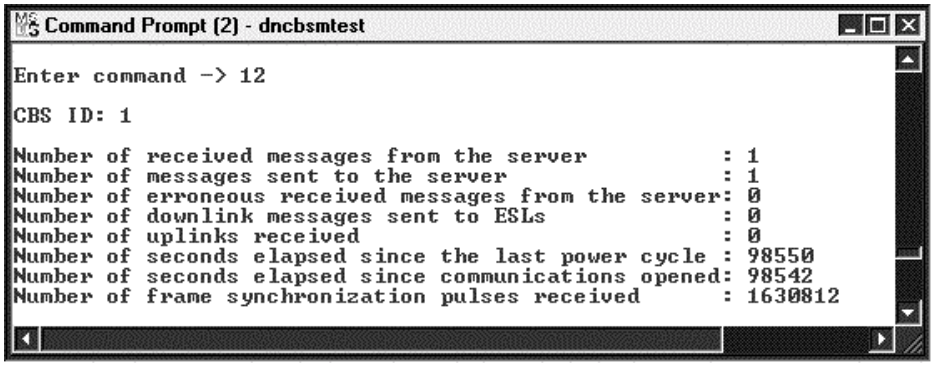
Obtain CBS Diagnostic Information

To view diagnostic information for CBS 1, on the CBS Test menu enter **10** (Get Diagnostic Status) and then **1** when prompted for the CBS ID.



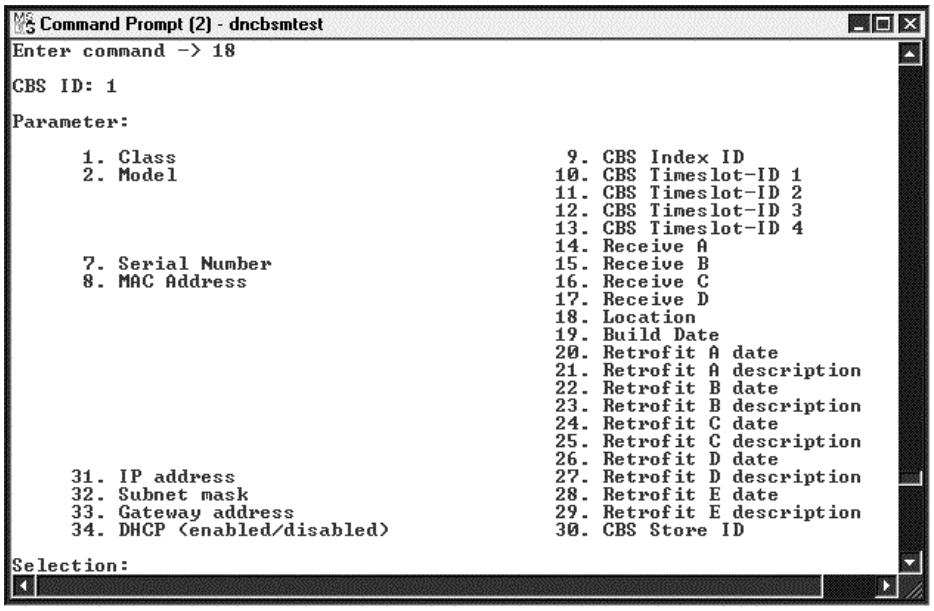
Obtain CBS Tallies

To view tallies for a CBS 1, on the CBS Test menu enter **12** (Get Tallies) and then **1** when prompted for the CBS ID.



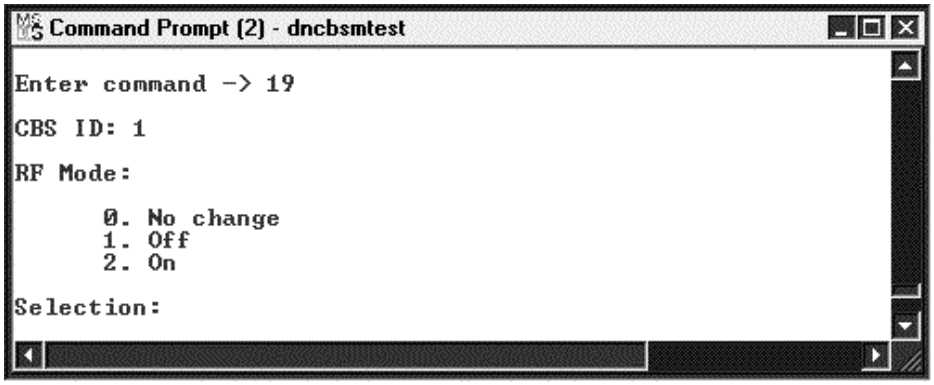
Configure CBS Parameters

You can set the following CBS parameters by entering **18** (Set CBS Parameters) on the CBS Test Menu.



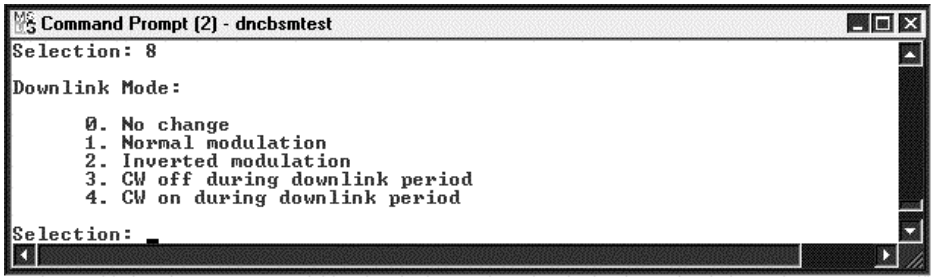
Configure RF Parameters

You can set the following RF parameters by entering **19** (Set RF Parameters) on the CBS Test Menu.



Configure Frequency Hopping Tables

You can modify the Frequency Hopping Table entries by entering **8** (Set Frequency Hopping Table) on the CBS Test Menu.



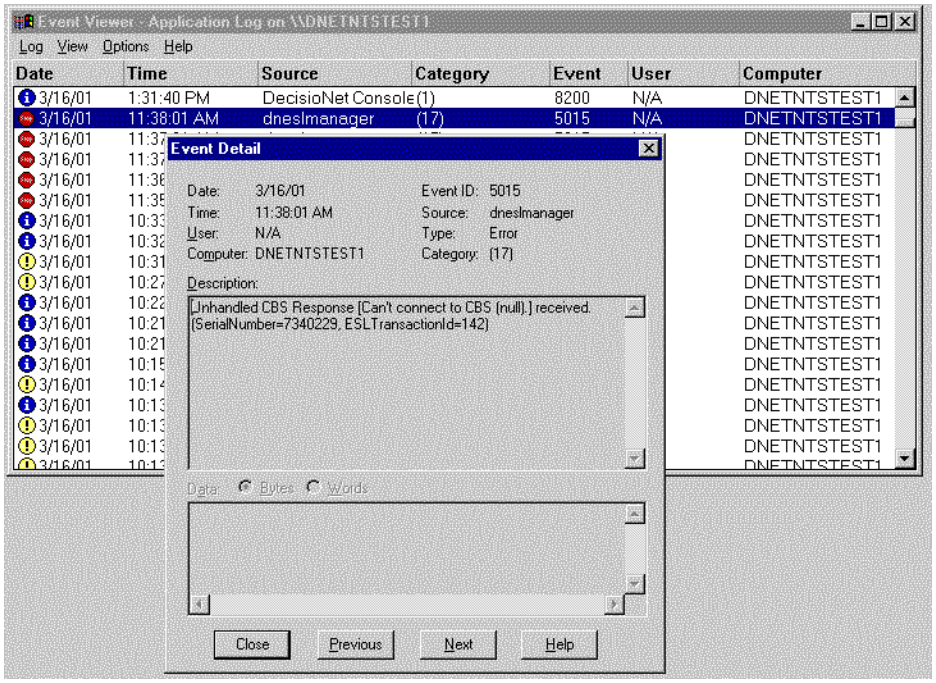
System Error Log

The DecisioNet Log and Tally Manager controls event logging. All DecisioNet events (errors and status information) are sent to the Windows NT or Windows 2000 Event Log.

Error code (event) descriptions are documented in Chapter 10, "DecisioNet System Messages," of the *DecisioNet User's Guide* (B005-0000-1317).

Windows NT System Event Log

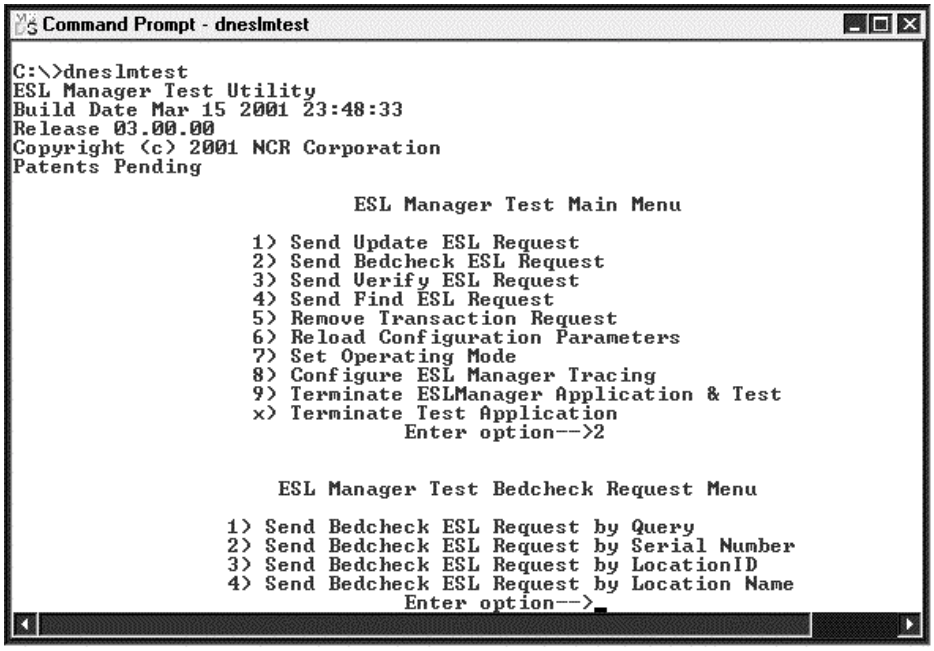
To access the event log, click on the **Start** button on the lower left of the screen, select **Programs** > **Administrative Tools (Common)** > **Event Viewer**. The following illustration shows a DecisioNet event. Double-clicking on a line in the window displays the Event Detail screen.



Bedcheck

Bedcheck verifies that ESLs are working properly. This function is intitiated using the ESL Manager Test utility (dneslmtest). You can do hardware checks and existence checks.

Enter `dneslmtest` at a system prompt. The ESL Manager Test menu displays.

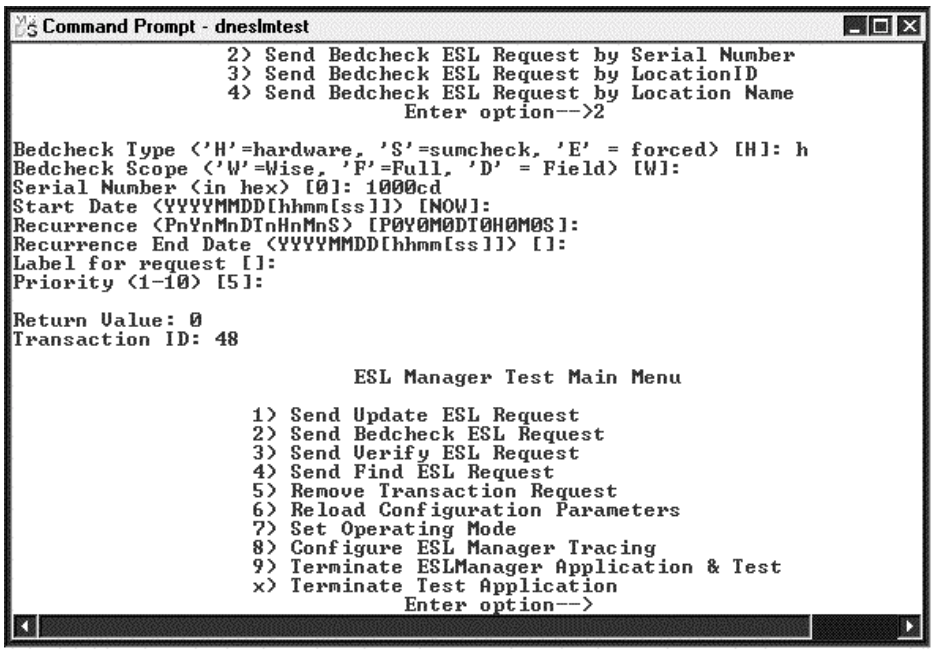


Enter a **2** to select the Send Bedcheck ESL Request option.

You can send Bedcheck requests by one of 4 methods: Query, Serial Number, Location ID, or Location Name.

Sending a Bedcheck Request by Serial Number

Enter a 2 and then complete each prompt as required to send the request. The following screen shows a Hardware check sent to an ESL with serial number of 1000cd.



The results of the request display followed by the ESL Manager Test Menu.

Troubleshooting DecisioNet System Problems

The following tables help you troubleshoot the DecisioNet System.

ESL Troubleshooting

Problem	Causes	Possible Remedies
ESL displays dashes.	Defective ESL.	Replace ESL.
ESL flashes power-on diagnostics.	Defective ESL.	Replace ESL.
ESL displays low battery symbol (▟).	Battery is low.	Release I ESL: replace ESL. Release II ESLs: replace batteries.
ESL displays broken characters or missing segments.	Defective ESL.	Replace ESL.
ESL displays are severely scrambled.	Poor coverage.	Refer to tables in the following section, Coverage Problems.
Single ESL does not synchronize. ESL displays sync dot (●).	Defective ESL.	Replace ESL.
	ESL outside coverage area.	Bring ESL into coverage area.
	CBS was recently power cycled.	Wait. A ESL can take several minutes to re-synchronize after CBSs have been power cycled.
	Poor coverage.	Refer to tables in the following section, Coverage Problems.
Multiple ESLs do not synchronize. ESLs display sync dot (●).	ESLs outside coverage area.	Add or modify infrastructure to cover area.
	Poor coverage.	Refer to tables in the following section, Coverage Problems.
	CBSs are turned off.	Turn on CBS system.
	CBS communications are closed or software is not running.	Re-start software.

Problem	Causes	Possible Remedies
	CBS was recently power cycled.	Wait. ESLs can take several minutes to re-synchronize after a CBS power cycle.
ESL shows wrong price, but software reports ESL successfully acknowledged last price update.	Defective ESL.	Replace ESL.
	Software problem.	Debug software.
	Store contains 2.4 GHz LAN device, and 7730 system does not conform to co-existence guidelines.	Make sure you are following the wireless LAN co-existence guidelines. Make sure price verifier is running.
	ESL has duplicate ID number due to incorrect initload.	Check for duplicate ID numbers in ESL table and resolve.
Software reports ESL did not acknowledge price update.	Defective ESL.	Replace ESL.
	Software problem.	Debug software.
	ESL outside coverage area.	Bring ESL into coverage area.
	Poor coverage.	Refer to tables in the following section, Coverage Problems.
	ESL does not exist.	Replace ESL.
Cannot initialize a new ESL.	ESL outside coverage area.	Move ESL back into coverage area.
	Poor coverage.	Refer to tables in the following section, Coverage Problems.
	Defective ESL.	Replace ESL.
ESLs in freezers fail more frequently than ESLs in other parts of store.	Standard ESL used in freezer.	Replace standard ESL with freezer ESL.
Promotional messages in freezer look dim or sluggish.	Standard ESL used in freezer.	Replace standard ESL with freezer ESL.

General Performance Troubleshooting

Problem	Causes	Possible Remedies
Promotional messages frequently fail. Price updates seem to work okay.	ESLs outside coverage area.	Move ESLs back into coverage area.
	Poor coverage.	Refer to tables in the following section, Coverage Problems.
Initload is extremely slow.	ESLs outside coverage area.	Move ESLs back into coverage area.
	Poor coverage.	Refer to tables in the following section, Coverage Problems.
Promotional updates are very slow.	ESLs outside coverage area.	Move ESLs back into coverage area.
	Poor coverage.	Refer to tables in the following section, Coverage Problems.

Note: If troubleshooting fails to diagnose the problem, power cycle the CBSs and ISP.

CBS Troubleshooting

Step 1. Do any CBSs communicate?

Problem	Causes	Possible Remedies
Cannot communicate with primary CBS. RX/TX lights on Ethernet Hub or primary CBS are not blinking.	Primary CBS is defective.	Replace primary CBS.
	Defective Power or communications cabling to primary CBS or between primary and secondary CBSs.	Check cabling.
	CBS power is off.	Power up CBS system.
	CBS communications are closed or software is not running.	Initiate CBS communications on start software.

Step 2. Do some CBSs communicate and some not?

Problem	Causes	Possible Remedies
Primary CBS communications are OK, but other CBSs do not communicate at all.	Defective cable or incorrectly wired connector caused a break in communication somewhere in CBS chain.	Check cables.
	Two CBSs are configured with the same address.	Check CBS address settings.
	CBS is defective.	Replace CBS.
CBS communication is unreliable.	Power or communication cable run is too long.	Check cable length guidelines. Shorten cable run if necessary.
	CBS is defective.	Replace CBS.
	Communication cabling is damaged or defective.	Check communication cabling.
CBS shows RF Off and RF Power low diagnostics while other CBSs operate correctly.	Excessive power cable length.	Decrease power cable length.

Step 3. Are the CBS diagnostics OK?

Problem	Causes	Possible Remedies
All secondary CBSs report "sync lost" diagnostic.	Primary CBS sends a timing signal that is used by all secondary CBSs.	
	Bad communication cable.	Check communication cabling.
	Bad primary CBS.	Replace primary CBS.
Single CBS reports CBS sync lost.	Bad communication cable.	Check communication cabling.
	Bad CBS.	Replace CBS.

Problem	Causes	Possible Remedies
	RX and TX antennas are too close together.	Move antennas to maintain minimum RX to TX distance of 9.1 m (30 ft.), except for the 100 mW EIRP CBS which can be 3.7 m (12 ft.). This problem is common in back offices.
CBS reports intermittent or continuous low output power diagnostic without RF power off diagnostic.	Damaged TX cable or antenna.	Replace TX cable or antenna.
	Defective CBS.	Replace CBS.
CBS reports low output power diagnostic and RF power off diagnostic.	dncbsconfig.xml not configured to include problem CBS.	Fix dncbsconfig.xml.
	CBS communications are closed.	Re-start software.
	CBS system has not fully powered up and initialized.	Wait 30 seconds and re-check diagnostics.
	Power cable run length exceeds guidelines.	Check cable length guidelines. Shorten cable run if necessary.

Coverage Troubleshooting

Step 1. Do any CBSs communicate?

Problem	Causes	Possible Remedies
Cannot communicate with primary CBS. RX/TX lights on Ethernet hub or Primary CBS not blinking.	ISP or CBS in quasi-state due to unknown problem.	Re-start base software. If no improvement, power the CBS hardware off and then on. If no improvement, re-boot ISP.
	Primary CBS is defective.	Replace primary CBS.
	Defective Power or communications cabling to primary CBS or between primary and secondary CBSs.	Check cabling.
	CBS power is off.	Power up CBS system.
	CBS communications are closed or software is not running.	Initiate CBS communications on start software.

Step 2. Check for sources of RF noise.

Problem	Possible Remedies
Site planning did not follow wireless LAN or microwave oven co-existence guidelines.	Verify that the site conforms to the wireless LAN co-existence guidelines in the Implementation Guide.
Store contains 2.4 GHz wireless LAN system that was missed during the site survey or added after infrastructure install.	Locate the wireless LAN access points and modify the infrastructure according to the wireless LAN co-existence guidelines in the Implementation Guide.

Step 3. Improve the infrastructure.

Problem	Causes	Possible Remedies
All secondary CBSs report "sync lost" diagnostic.	Primary CBS sends a timing signal that is used by all secondary CBSs.	
	Bad communication cable.	Check communication cabling.
	Bad primary CBS.	Replace primary CBS.
RX antenna configuration diagnostics do not match site plan.	Antenna not connected.	Connect antenna.
	Antenna damaged or missing.	Replace antenna.
Some CBSs report RF board sync lost. Problem may be intermittent.	Bad communication cable.	Check communication cabling between CBSs, in particular the MCLK wire pair.
	Bad CBS.	Replace CBS.
CBS reports DSP ROM version V0 with checksum V0.	CBSs were powered on while communications were closed.	Open CBS communications using DNCBSMTEST.
	Bad communication cable.	Check communication cabling between CBSs, in particular MCLK wire pair.
	Defective CBS.	Replace CBS.
CBS reports intermittent or continuous low output power diagnostic without RF power off diagnostic.	Damaged TX cable or antenna.	Replace TX cable or antenna.
	Power or communication cable run is too long.	Check cable length guidelines. Shorten cable run if necessary.
	Defective CBS.	Replace CBS.
CBS reports low output power diagnostic and RF power off diagnostic.	dncbsconfig.xml not configured to include problem CBS.	Fix dncbsconfig.xml.

Problem	Causes	Possible Remedies
	CBS communications are closed.	Re-start software.
	CBS system has not fully powered up and initialized.	Wait 30 seconds and re-check diagnostics.
	Power cable run length exceeds guidelines.	Check cable length guidelines. Shorten cable run if necessary.