
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.

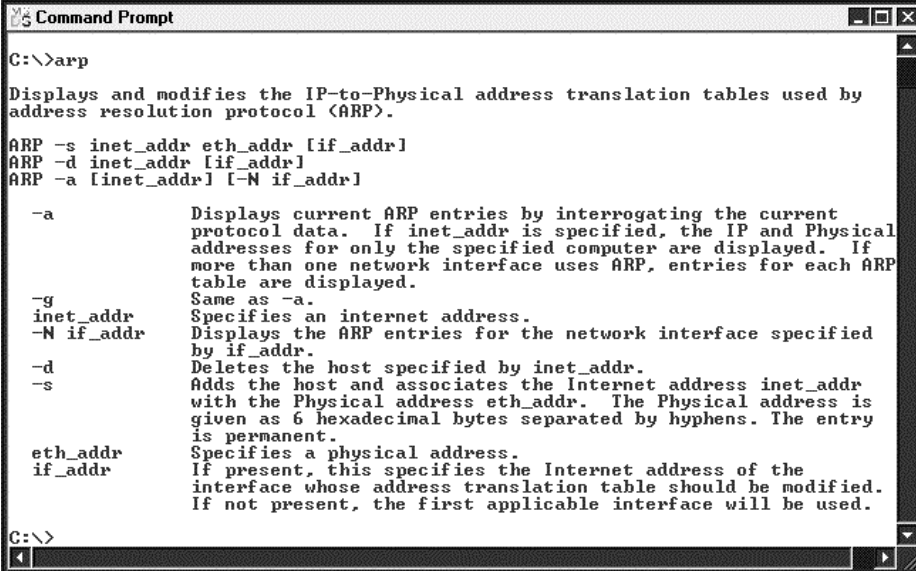
For additional information about site certification, refer to the RF Certification Utility Guide on the *DecisioNet Implementation Guide* (B005-0000-1250).

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:



```
Command Prompt
C:\>arp

Displays and modifies the IP-to-Physical address translation tables used by
address resolution protocol (ARP).

ARP -s inet_addr eth_addr [if_addr]
ARP -d inet_addr [if_addr]
ARP -a [inet_addr] [-N if_addr]

-a          Displays current ARP entries by interrogating the current
            protocol data. If inet_addr is specified, the IP and Physical
            addresses for only the specified computer are displayed. If
            more than one network interface uses ARP, entries for each ARP
            table are displayed.
-g          Same as -a.
inet_addr  Specifies an internet address.
-N if_addr Displays the ARP entries for the network interface specified
            by if_addr.
-d          Deletes the host specified by inet_addr.
-s          Adds the host and associates the Internet address inet_addr
            with the Physical address eth_addr. The Physical address is
            given as 6 hexadecimal bytes separated by hyphens. The entry
            is permanent.
eth_addr   Specifies a physical address.
if_addr    If present, this specifies the Internet address of the
            interface whose address translation table should be modified.
            If not present, the first applicable interface will be used.

C:\>
```

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.

```

C:\>ipconfig /all

Windows NT IP Configuration

    Host Name . . . . . : dnetntstest1.atlantaga.ncr.com
    DNS Servers . . . . . : 153.60.0.99
                          153.76.1.182
                          149.25.1.182
    Node Type . . . . . : Hybrid
    NetBIOS Scope ID. . . . . :
    IP Routing Enabled. . . . . : Yes
    WINS Proxy Enabled. . . . . : No
    NetBIOS Resolution Uses DNS : Yes

Ethernet adapter E100B1:

    Description . . . . . : Intel EtherExpress PRO PCI Adapter
    Physical Address. . . . . : 00-90-27-95-35-F6
    DHCP Enabled. . . . . : No
    IP Address. . . . . : 192.168.10.11
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
    Primary WINS Server . . . . . : 153.60.0.89
    Secondary WINS Server . . . . . : 149.25.163.100

Ethernet adapter smcpwr2n2:

Driver Description . . . . . : SMC EtherPower II 10/100 NDIS 4.0 Miniport
Physical Address. . . . . : 00-E0-29-2F-7D-36
DHCP Enabled. . . . . : Yes
IP Address. . . . . : 153.60.31.21
Subnet Mask . . . . . : 255.255.255.128
Default Gateway . . . . . : 153.60.31.1
DHCP Server . . . . . : 153.60.31.100
Primary WINS Server . . . . . : 149.25.176.100
Secondary WINS Server . . . . . : 153.60.0.89
Lease Obtained. . . . . : Friday, March 16, 2001 9:01:47 AM
Lease Expires . . . . . : Friday, March 23, 2001 9:01:47 AM

C:\>

```

netstat (network status query)

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

```

C:\>netstat -n

Active Connections

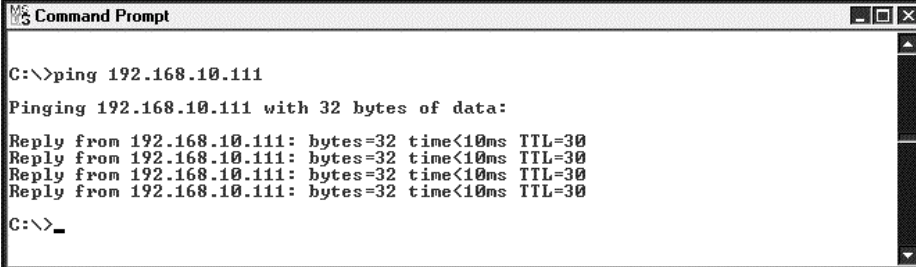
    Proto Local Address          Foreign Address        State
    TCP    127.0.0.1:1026         127.0.0.1:1037        ESTABLISHED
    TCP    127.0.0.1:1037         127.0.0.1:1026        ESTABLISHED
    TCP    127.0.0.1:2873         127.0.0.1:3306        ESTABLISHED
    TCP    127.0.0.1:2874         127.0.0.1:3306        ESTABLISHED
    TCP    127.0.0.1:3306         127.0.0.1:2873        ESTABLISHED
    TCP    127.0.0.1:3306         127.0.0.1:2874        ESTABLISHED

C:\>

```

ping (connection query)

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



```

C:\>ping 192.168.10.111

Pinging 192.168.10.111 with 32 bytes of data:
Reply from 192.168.10.111: bytes=32 time<10ms TTL=30
Reply from 192.168.10.111: bytes=32 time<10ms TTL=30
Reply from 192.168.10.111: bytes=32 time<10ms TTL=30
Reply from 192.168.10.111: bytes=32 time<10ms TTL=30

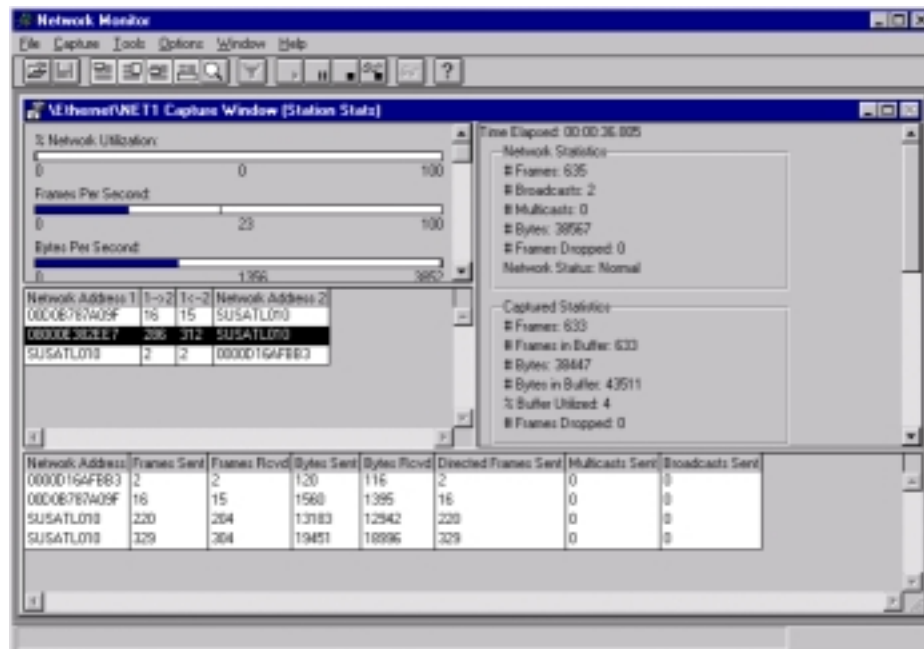
C:\>_

```

Network Monitor

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

Station Statistics



Detail Screen

NetworkMiner - [Capture.2 [Detail]]

Frame	Time	Src MAC Addr	Dest MAC Addr	Protocol	Description
11	0.235	08000E362EE7	SUSATL010	TCP	.A...., len: 0, seq: 1795557-1795557, ack: 829156
12	0.248	08000E362EE7	SUSATL010	TCP	.AP...., len: 3, seq: 1795559-1795559, ack: 829156
13	0.412	SUSATL010	08000E362EE7	TCP	.A...., len: 0, seq: 829172-829172, ack: 1731433
14	0.412	SUSATL010	08000E362EE7	TCP	.A...., len: 0, seq: 829156-829156, ack: 1795568
15	1.242	08000E362EE7	SUSATL010	TCP	.AP...., len: 11, seq: 1731433-1731443, ack: 829172

ETHERNET II: ETYPE = 0x0800 : Protocol = IP: 300 Internet Protocol

IP: ID = 0x22CA, Proto = TCP, Len: 51

TCP: .AP...., len: 11, seq: 1731433-1731443, ack: 829172, win: 8192, src: 2048 dst: 2401

TCP: Source Port = 0x0800

TCP: Destination Port = 0x0801

TCP: Sequence Number = 1731433 (0x1A6B69)

TCP: Acknowledgment Number = 829172 (0x3AFC04)

TCP: Data Offset = 20 (0x14)

TCP: Reserved = 0 (0x0000)

TCP: Flags = 0x18 : .AP...

TCP: Window = 8192 (0x2000)

TCP: Checksum = 0x820A

TCP: Urgent Pointer = 0 (0x0)

TCP: Data: Number of data bytes remaining = 11 (0x000B)

```

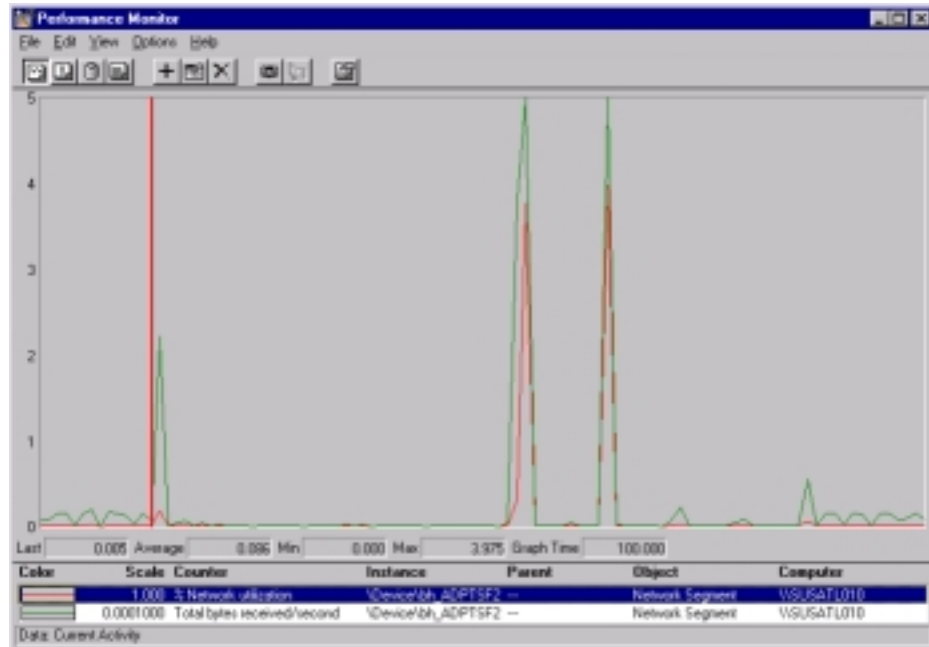
00000020 1F 0A 08 00 09 61 80 1A 6B 69 00 0C CE 04 50 10  0....a.ki..s.p.
00000030 21 00 83 3A 00 00 1A 01 44 01 02 00 00 7F 00 7F  .A...p...D.D
00000040 00 00

```

Data contained in TCP packet Fr: 15/233 Off: 54 (0x36) L: 11 (0xB)

Performance Monitor

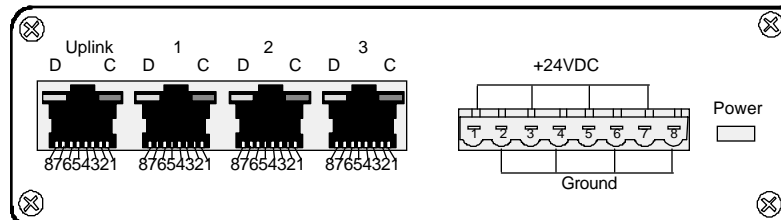
The Performance Monitor is a Windows NT/2000 Utility that displays NT/2000 performance information graphically. To access this utility click on the **Start** button on the lower left of the screen, select **Programs > Administrative Tools (Common) > Performance Monitor**.



CBS Communications Diagnostic Tools

The following DecisioNet diagnostics are available:

CBS Status Lights



18877

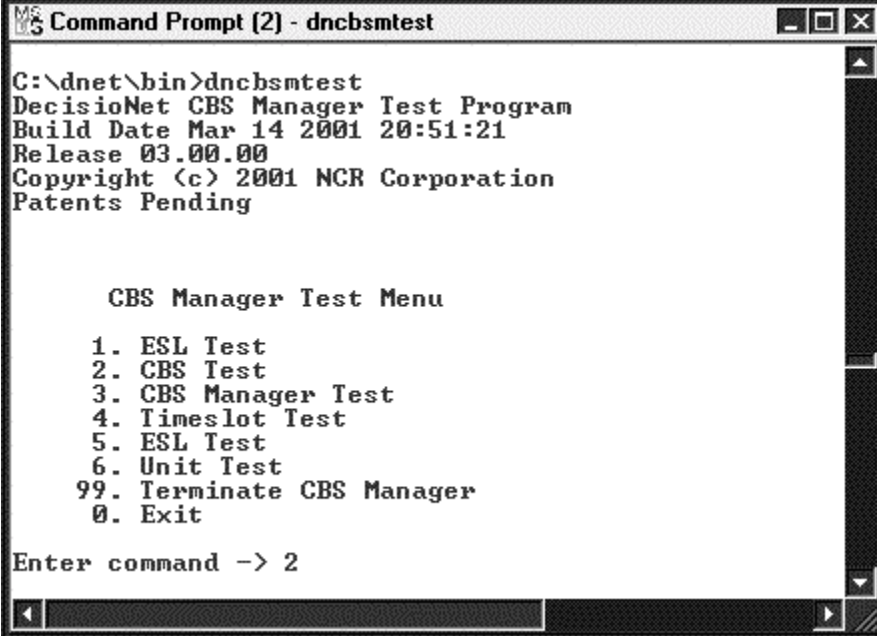
The Ethernet status lights (LEDs) are in the top corners of the data connectors. The Power status light is a red LED shown to the right of the power receptacle in the previous illustration.

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)	On	OK (good link)
	Off	PROBLEM (no link)
Ethernet link status	Blinking	PROBLEM (intermittent link)
	On	NOT DEFINED
D (yellow)	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.



```
MS-DOS Command Prompt (2) - dncbsmtest
C:\dnet\bin>dncbsmtest
DecisionNet CBS Manager Test Program
Build Date Mar 14 2001 20:51:21
Release 03.00.00
Copyright (c) 2001 NCR Corporation
Patents Pending

          CBS Manager Test Menu

1. ESL Test
2. CBS Test
3. CBS Manager Test
4. Timeslot Test
5. ESL Test
6. Unit Test
99. Terminate CBS Manager
0. Exit

Enter command -> 2
```

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.

```

Command Prompt (2) - dncbsmtest

                                CBS Test Menu

1. Promote CBS                    14. Read Memory
2. Demote CBS                     15. Erase Flash Memory
3. Enable Normal Mode Communica- 16. Write Flash Memory
4. Enable Install Mode Communica-
5. Enable Manufacture Mode Comms
6. Disable Communications
7. Get Frequency Hopping Table    17. Get CBS Parameter
8. Set Frequency Hopping Table    18. Set CBS Parameter
9. Sync Frequency Hopping Table  19. Set RF Parameters
10. Get Diagnostics Status        20. Install Country Code Key
11. Reset Diagnostics Status      21. Reset Processor
12. Get Tallies                   22. Send Beacon <Manf. Mode o
13. Reset Tallies                 23. Get list of CBS ID's
                                0. Exit

Enter command -> _

```

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.

```

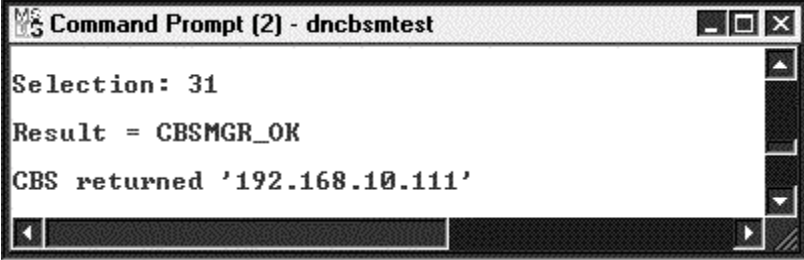
Command Prompt (2) - dncbsmtest
Enter command -> 17
CBS ID: 1
Parameter:
1. Class                          9. CBS Index ID
2. Model                          10. CBS Timeslot-ID 1
3. ARM version                     11. CBS Timeslot-ID 2
4. ARM sumcheck                    12. CBS Timeslot-ID 3
5. DSP version                     13. CBS Timeslot-ID 4
6. DSP sumcheck                    14. Receive A
7. Serial number                   15. Receive B
8. MAC address                     16. Receive C
35. RF mode                         17. Receive D
36. SWVERSION parameter            18. Location
19. Build Date
20. Retrofit A date
21. Retrofit A description
22. Retrofit B date
23. Retrofit B description
24. Retrofit C date
25. Retrofit C description
26. Retrofit D date
27. Retrofit D description
28. Retrofit E date
29. Retrofit E description
30. CBS Store ID

31. IP address
32. Subnet mask
33. Gateway address
34. DHCP <enabled/disabled>

Selection:

```

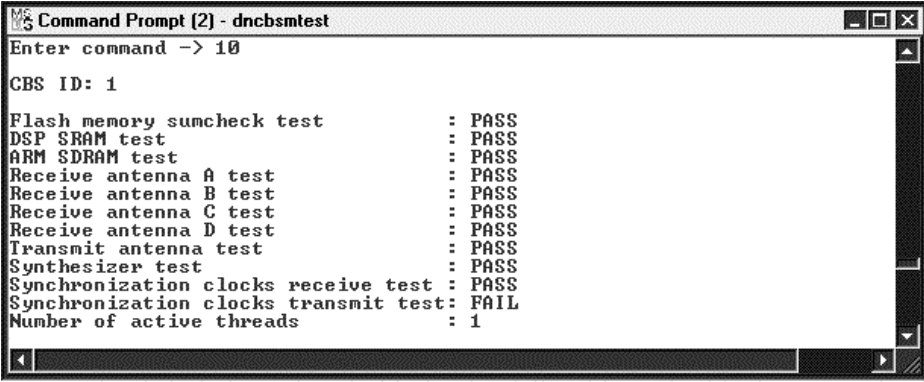
To view the IP address for CBS 1 enter 31.



```
MS Command Prompt [2] - dncbsmtest
Selection: 31
Result = CBSMGR_OK
CBS returned '192.168.10.111'
```

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.



```
MS Command Prompt [2] - dncbsmtest
Enter command -> 10
CBS ID: 1
Flash memory sumcheck test      : PASS
DSP SRAM test                   : PASS
ARM SDRAM test                  : PASS
Receive antenna A test         : PASS
Receive antenna B test         : PASS
Receive antenna C test         : PASS
Receive antenna D test         : PASS
Transmit antenna test          : PASS
Synthesizer test               : PASS
Synchronization clocks receive test : PASS
Synchronization clocks transmit test: FAIL
Number of active threads       : 1
```

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.

```

Command Prompt (2) - dncbsmtest
Enter command -> 12
CBS ID: 1
Number of received messages from the server      : 1
Number of messages sent to the server            : 1
Number of erroneous received messages from the server: 0
Number of downlink messages sent to ESLs        : 0
Number of uplinks received                       : 0
Number of seconds elapsed since the last power cycle: 98550
Number of seconds elapsed since communications opened: 98542
Number of frame synchronization pulses received  : 1630812

```

Configure CBS Parameters

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

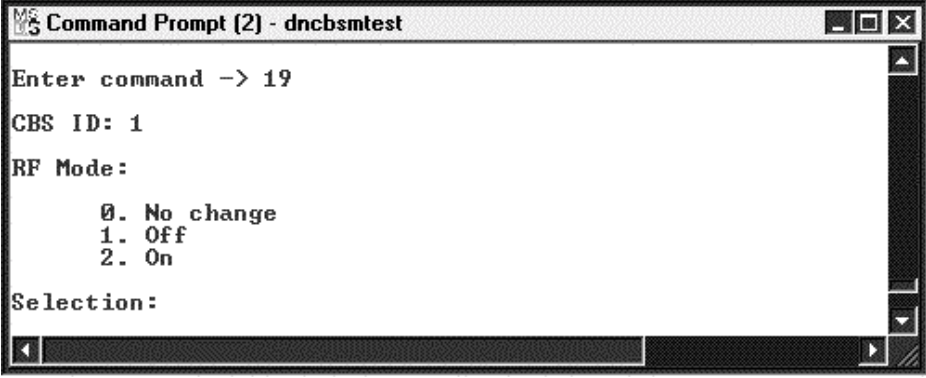
```

Command Prompt (2) - dncbsmtest
Enter command -> 18
CBS ID: 1
Parameter:
    1. Class
    2. Model
    7. Serial Number
    8. MAC Address
    9. CBS Index ID
   10. CBS Timeslot-ID 1
   11. CBS Timeslot-ID 2
   12. CBS Timeslot-ID 3
   13. CBS Timeslot-ID 4
   14. Receive A
   15. Receive B
   16. Receive C
   17. Receive D
   18. Location
   19. Build Date
   20. Retrofit A date
   21. Retrofit A description
   22. Retrofit B date
   23. Retrofit B description
   24. Retrofit C date
   25. Retrofit C description
   26. Retrofit D date
   27. Retrofit D description
   28. Retrofit E date
   29. Retrofit E description
   30. CBS Store ID
   31. IP address
   32. Subnet mask
   33. Gateway address
   34. DHCP (enabled/disabled)
Selection:

```

Configure RF Parameters

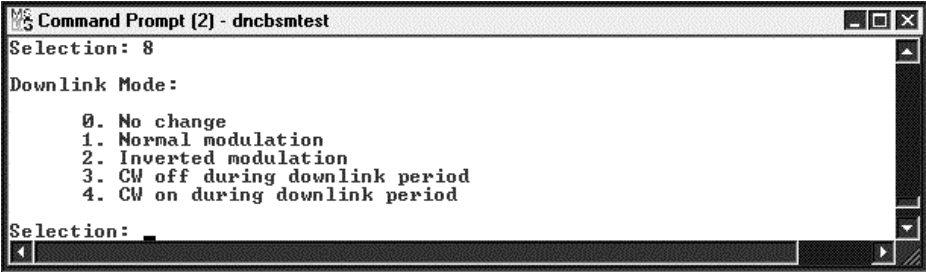
You can set the following RF parameters by entering **19** (Set RF Parameters) on the CBS Test Menu.



```
MS Command Prompt (2) - dncbsmtest
Enter command -> 19
CBS ID: 1
RF Mode:
    0. No change
    1. Off
    2. On
Selection:
```

Configure Frequency Hopping Tables

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



```
MS Command Prompt (2) - dncbsmtest
Selection: 8
Downlink Mode:
    0. No change
    1. Normal modulation
    2. Inverted modulation
    3. CW off during downlink period
    4. CW on during downlink period
Selection:
```

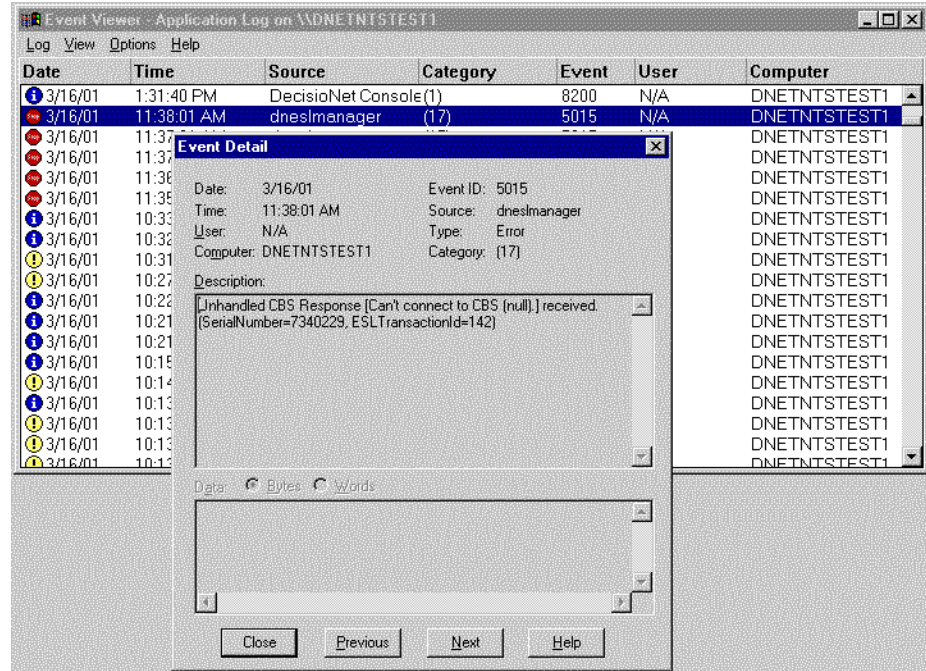
System Error Log

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

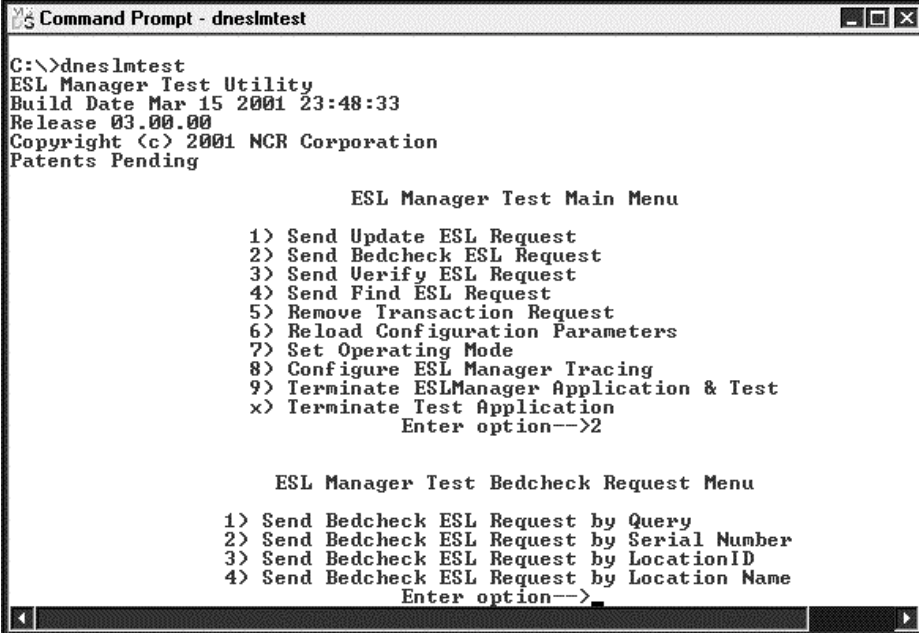
To access the event log, click on the **Start** button on the lower left of the screen, select **Programs > Administrative Tools (Common) > Event Viewer**. The following illustration shows a DecisioNet event. Double-clicking on a line in the window displays the Event Detail screen.



Bedcheck

Bedcheck verifies that ESLs are working properly. This function is initiated 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.

A screenshot of a Windows Command Prompt window titled "Command Prompt - dneslmtest". The window shows the execution of the 'dneslmtest' command, which displays the 'ESL Manager Test Utility' version information and a main menu. The user has entered '2' to select the 'Send Bedcheck ESL Request' option, which has led to a sub-menu for 'ESL Manager Test Bedcheck Request Menu'. The user has entered a blank space to select the first option, 'Send Bedcheck ESL Request by Query'.

```
C:\>dneslmtest
ESL Manager Test Utility
Build Date Mar 15 2001 23:48:33
Release 03.00.00
Copyright (c) 2001 NCR Corporation
Patents Pending

                ESL Manager Test Main Menu

    1) Send Update ESL Request
    2) Send Bedcheck ESL Request
    3) Send Verify ESL Request
    4) Send Find ESL Request
    5) Remove Transaction Request
    6) Reload Configuration Parameters
    7) Set Operating Mode
    8) Configure ESL Manager Tracing
    9) Terminate ESLManager Application & Test
    x) Terminate Test Application
        Enter option-->2

                ESL Manager Test Bedcheck Request Menu

    1) Send Bedcheck ESL Request by Query
    2) Send Bedcheck ESL Request by Serial Number
    3) Send Bedcheck ESL Request by LocationID
    4) Send Bedcheck ESL Request by Location Name
        Enter option-->
```

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.

```

Command Prompt - dnesltest
                2) Send Bedcheck ESL Request by Serial Number
                3) Send Bedcheck ESL Request by LocationID
                4) Send Bedcheck ESL Request by Location Name
                Enter option-->2

Bedcheck Type <'H'=hardware, 'S'=sumcheck, 'E' = forced> [H]: h
Bedcheck Scope <'W'=Wide, 'F'=Full, 'D' = Field> [W]:
Serial Number <in hex> [0]: 1000cd
Start Date <YYYYMMDD[hhmm[ss]]> [NOW]:
Recurrence <PnYnMnDInHnMnS> [P0Y0M0D10H0M0S]:
Recurrence End Date <YYYYMMDD[hhmm[ss]]> [ ]:
Label for request [ ]:
Priority <1-10> [5]:

Return Value: 0
Transaction ID: 48

                ESL Manager Test Main Menu

                1) Send Update ESL Request
                2) Send Bedcheck ESL Request
                3) Send Verify ESL Request
                4) Send Find ESL Request
                5) Remove Transaction Request
                6) Reload Configuration Parameters
                7) Set Operating Mode
                8) Configure ESL Manager Tracing
                9) Terminate ESLManager Application & Test
                x) Terminate Test Application
                Enter option-->

```

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.
