

Managing the Catalyst 3920

To aid in system management, the Catalyst 3920 allows you to obtain a variety of status, statistic, and diagnostic information. This chapter provides information on the following:

- Accessing Statistics Information
- Viewing Catalyst 3920 Operating Statistics
- Viewing Port Status
- Viewing Statistics for a Specific Port
- Viewing Address Tables
- Viewing Spanning-Tree Information for a VLAN
- Viewing Statistics for Each VLAN
- Viewing CDP Neighbor Information
- Viewing VTP Statistics
- Viewing Diagnostic Test Results
- Viewing the Message Log

For information about setting up a console session, refer to the “Planning for Configuration and Management” chapter.

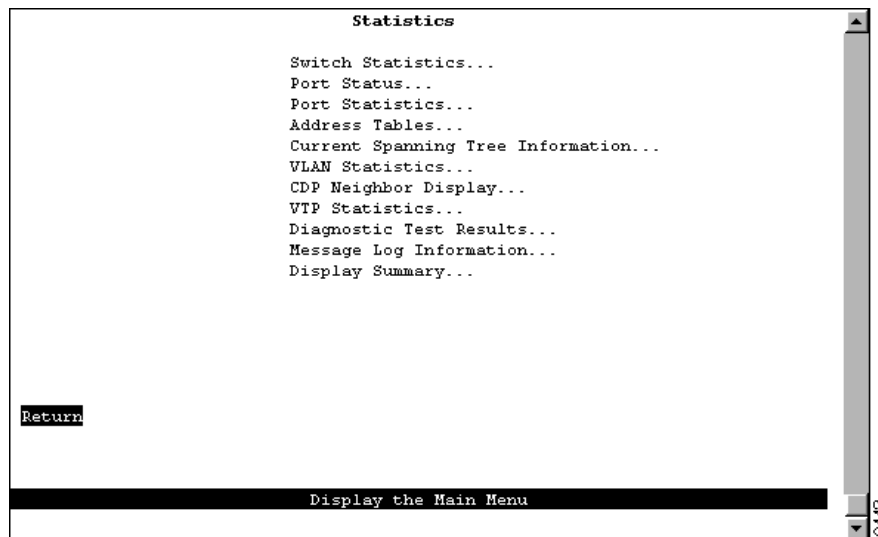
Note The Catalyst 3920 allows LAN Network Manager LLC frames to flow through the switch. Therefore, communication between LAN Network Manager and existing source-route bridges and controlled access units is maintained. However, some error reporting functions and ring map functions might be lost for the rings attached to the Catalyst 3920.

Accessing Statistics Information

The Catalyst 3920 allows you to view status information and statistics for individual ports or for the Catalyst 3920 as a whole. This information is displayed on several panels that are accessible from the Statistics Menu.

To access the Statistics Menu, select **Statistics** on the Main Menu. The Statistics Menu (Figure 7-1) is displayed.

Figure 7-1 Statistics Menu Panel



Note If the switch is a member of a stack that contains Catalyst 3900s with ATM or ISL modules, you will be able to configure the ports on these modules and obtain statistics about these modules from the Catalyst 3920 console. For information about configuring the ATM or ISL modules of a Catalyst 3900 and the types of statistical information you can obtain, see the Catalyst 3900 documentation.

Viewing Catalyst 3920 Operating Statistics

To view operating statistics for the Catalyst 3920, select **Switch Statistics** on the Statistics Menu. The Switch Statistics panel (Figure 7-2) is displayed. The information on the statistics panels is refreshed approximately every 5 seconds. To reset the information displayed on any of the statistics panels, select **Reset**.

Figure 7-2 Switch Statistics Panel

The screenshot shows a terminal window titled "Box 1 Switch Statistics". The content is as follows:

Box 1 Switch Statistics	
System Up Time	0 Hr, 27 Min, 15 Sec
Board Temperature	Normal (37.0 C)
Power Supply Status	Internal w/no backup
Frames Transmitted	4543
Frame Transmit Errors	0
Frames Received	4357
Error Frames Received	0
Frames Lost	0
Pending Send Requests	0
Currently Active Stations	55
Largest Number of Stations	62
Maximum Address Table Chain	3
Address Table Full	0
Return	Reset

At the bottom of the terminal window, there is a black bar with the text "Return to previous menu" in white. On the right side of the terminal window, there is a vertical scrollbar and the number "10445" at the bottom.

The following information is displayed on this panel:

- System Up Time—Length of time (in hours, minutes, and seconds) since the last reset or power cycle.
- Board Temperature—Indicates whether the board temperature is Normal or Unacceptably high (over 140°F or 60°C).
- Power Supply Status—Indicates the current status of the power supply. Possible values are the following:
 - Internal only—Internal power supply is acting as the main power source. The switch is not capable of being connected to an RPS unit.
 - Internal w/no backup—Internal power supply is acting at the main power source and either the switch is not connected to an RPS unit or the RPS unit is not operational.
 - Internal w/backup (will reset)—Internal power supply is acting as the main power source and the switch is connected to an RPS unit that is ready to supply backup power in the event that the main source fails. If the Catalyst 3920 power supply is changed from the internal supply to the RPS (due to a failure in the internal supply), the switch will reset.
 - External w/no backup—RPS unit is acting as the main power source and there is no backup power supply available. This is either because the switch is connected to only one of the RPS DC supplies and the internal power supply has failed or because the switch is connected to two of the RPS DC supplies and one of them has failed.
 - External w/backup (no reset)—RPS unit is acting as the main power source and is ready to supply backup power. This means that the switch is connected to two of the RPS DC supplies.
- Frames Transmitted—Number of frames transmitted from the Catalyst 3920 control processor.
- Frame Transmit Errors—Number of frames unable to be transmitted by the processor because of transmit errors.
- Frames Received—Number of frames received by the Catalyst 3920 control processor.
- Error Frames Received—Number of frames received that were too long or short.

- Frames Lost—Number of frames dropped because of errors.
- Pending Send Requests—Number of frames in the send queue.
- Currently Active Stations—Number of entries in the address table, that represent currently active stations, or nodes, on all ports of the Catalyst 3920.
- Largest Number of Stations—Largest number of addresses in the address table at any one time since the last reset or power cycle.
- Maximum Address Table Chain—Largest number of addresses that have hashed to the same location in look-up tables having the same index.
- Address Table Full—Number of times the address table has reached capacity.

Viewing Port Status

To view status information for each port of the Catalyst 3920, select **Port Status** on the Statistics Menu. The Port Status panel (Figure 7-3) is displayed.

Figure 7-3 Port Status Panel

Port	TrCRF	TrBRF	Enabled	Ins	Spd	Oper Mode	Fwd Mode
1	VLAN_0	BRF0	Yes	Yes	16	HDX port	Cut-Thru
2	VLAN_0	BRF0	Yes	Yes	16	HDX port	Cut-Thru
3	VLAN_0	BRF0	Yes	Yes	16	HDX port	Cut-Thru
4	VLAN_0	BRF0	Yes	Yes	16	HDX port	Cut-Thru
5	VLAN_0	BRF0	Yes	Yes	16	HDX port	Cut-Thru
6	VLAN_1	BRF1	Yes	Yes	16	HDX port	Cut-Thru
7	VLAN_1	BRF1	Yes	Yes	16	HDX port	Cut-Thru
8	VLAN_2	BRF1	Yes	Yes	16	HDX port	Cut-Thru
9	VLAN_2	BRF1	Yes	Yes	16	HDX port	Cut-Thru
10	VLAN_2	BRF1	Yes	Yes	16	HDX port	Cut-Thru
11	trcrf-default	trbrf-default	Yes	Yes	16	FDX port	Cut-Thru
12	trcrf-default	trbrf-default	Yes	No			
13	trcrf-default	trbrf-default	Yes	No			
14	trcrf-default	trbrf-default	Yes	No			
15	trcrf-default	trbrf-default	Yes	Yes	16	HDX port	Cut-Thru

Return More

Return to previous menu

The following information is displayed on this panel:

- Port—Port number.
- TrCRF—Name of the TrCRF to which this port belongs. The panel shows only the first 16 characters of the name.
- TrBRF—Name of the TrBRF to which this port belongs. The panel shows only the first 16 characters of the name.
- Enabled—Indicates whether the port is enabled.
- Ins—Indicates whether the port is inserted into the ring.
- Spd—Speed of the port in Mbps.

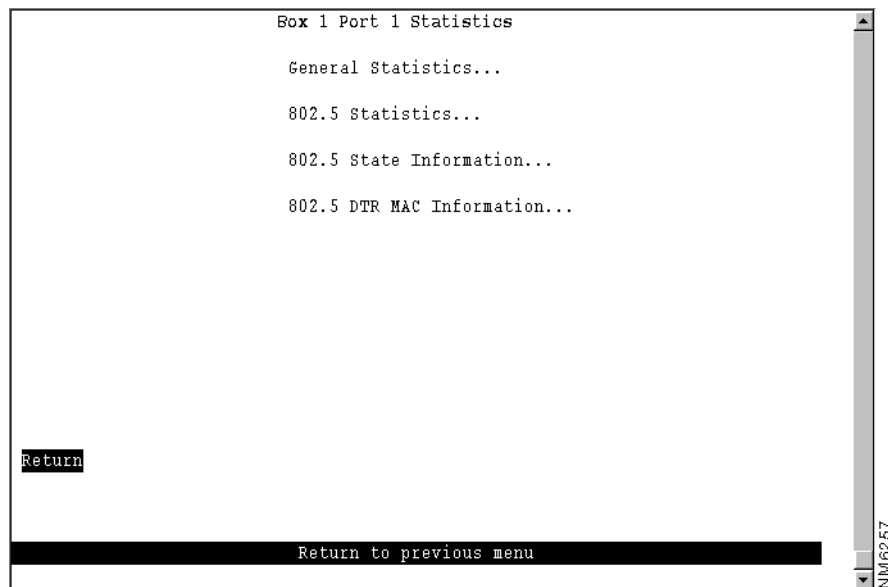
- Oper Mode—Operating mode of the port. Possible values are:
 - HDX port—Half-duplex mode in which only a dedicated connection to a station is supported. The Tx/Rx pinouts are the same as a concentrator's.
 - HDX station—Half-duplex mode in which the port operates like a station. The connection may be dedicated or shared. The Tx/Rx pinouts are the same as an adapter's.
 - FDX port—Full-duplex mode in which only a dedicated connection to a station is supported. The Tx/Rx pinouts are the same as a concentrator's.
 - FDX station—Full-duplex mode in which the port operates like a station. The connection may be dedicated or shared. The Tx/Rx pinouts are the same as an adapter's pinouts.
- Fwd Mode—Forwarding mode of the port. Possible values are Cut-thru and Store & Forward. For ports with a speed of 4 Mbps, the only possible mode is Store & Forward.

You cannot change any information on this panel. To change the port parameters, refer to the “Configuring Port Parameters” section in the “Configuring the Catalyst 3920” chapter.

Viewing Statistics for a Specific Port

To view statistics for a specific port, select **Port Statistics** on the Statistics Menu and specify the port number. The Port Statistics panel (Figure 7-4) is displayed.

Figure 7-4 Port Statistics Panel



The following options are displayed on this panel:

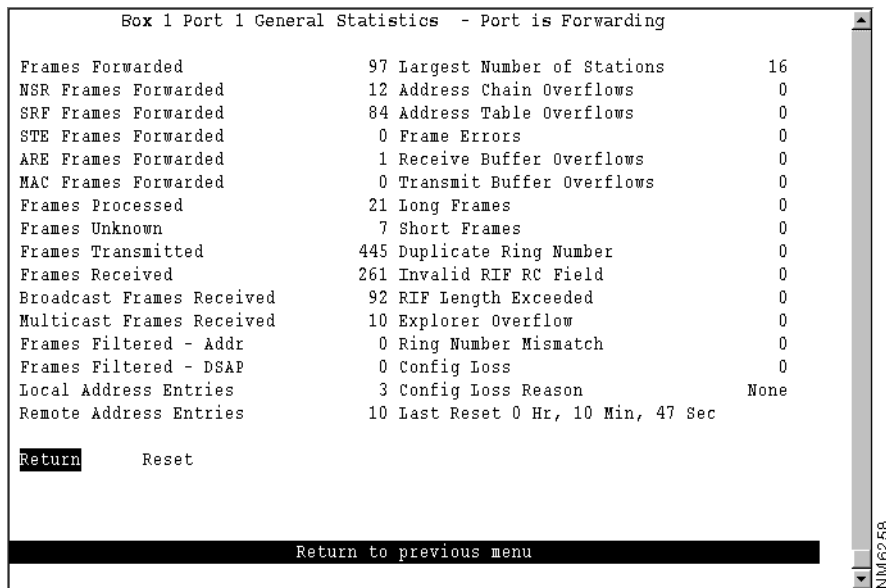
- General Statistics—Select this option to view general port statistics. For more information, refer to the “Viewing General Port Statistics” section.
- 802.5 Statistics—Select this option to view 802.5 port statistics. For more information, refer to the “Viewing 802.5 Port Statistics” section.

- 802.5 State Information—Select this option to view 802.5 state information for each port. For more information, refer to the “Viewing 802.5 Port State Information” section.
- 802.5 DTR MAC Information—Select this option to view dedicated Token Ring information for each port. For more information, refer to the “Viewing 802.5 Dedicated Token Ring MAC Information” section.

Viewing General Port Statistics

To view general port statistics, select **General Statistics** on the Port Statistics panel. The Port x General Statistics panel (Figure 7-5) is displayed. The information on the statistics panels is refreshed approximately every 5 seconds. To reset the information displayed on any of the statistics panels, select **Reset**.

Figure 7-5 Port x General Statistics Panel



The following information is displayed on this panel:

- Frames Forwarded—Number of frames received on this port and forwarded by the Catalyst 3920 hardware or processor.
- NSR Frames Forwarded—Number of non-source-routed frames received on this port and forwarded by the Catalyst 3920 hardware or processor.
- SRF Frames Forwarded—Number of source-routed frames received on this port and forwarded by the Catalyst 3920 hardware or processor.
- STE Frames Forwarded—Number of spanning-tree explorer frames received on this port and forwarded by the Catalyst 3920 hardware or processor.
- ARE Frames Forwarded—Number of all-routes explorer frames received on this port and forwarded by the Catalyst 3920 hardware or processor.
- MAC Frames Forwarded—Number of MAC frames received on this port and forwarded by the Catalyst 3920 hardware or processor.

-
- Frames Processed—Number of frames received on this port and delivered to the Catalyst 3920 system software for processing.
 - Frames Unknown—Number of frames processed by the Catalyst 3920 system software that contained either an unknown source address or unknown destination address.
 - Frames Transmitted—Number of frames transmitted by the port.
 - Frames Received—Number of frames received by the port.
 - Broadcast Frames Received—Number of broadcast frames received without errors.
 - Multicast Frames Received—Number of multicast frames received without errors.
 - Frames Filtered - Addr—Number of frames filtered by the MAC address filters.
 - Frames Filtered - DSAP—Number of frames filtered by the protocol filters.
 - Local Address Entries—Number of addresses on this port that belong to the local segment.
 - Remote Address Entries—Number of addresses on this port that belong to another segment.
 - Largest Number of Stations—Largest number of addresses active since the last reset of the Catalyst 3920.
 - Address Chain Overflows—Number of times an address hash bin has reached the maximum number of entries.
 - Address Table Overflows—Number of times the address table has reached the maximum number of entries.
 - Frame Errors—Total number of frames received or transmitted by this port that contained errors.
 - Receive Buffer Overflows—Number of frames received on this port that caused a buffer overflow.
 - Transmit Buffer Overflows—Number of frames lost because of the inability of the transmit queue to accept a frame from another port.
 - Long Frames—Number of frames received that exceed the maximum frame length limit as specified by the MTU.
 - Short Frames—Number of frames received that were less than 18 bytes.
 - Duplicate Ring Number—Number of frames received that contained a duplicate ring number.
 - Invalid RIF RC Field—Number of frames received that contained an illegal Routing Control field.
 - RIF Length Exceeded—Number of frames received that contained a RIF that was too long.
 - Explorer Overflow—Number of explorer frames dropped because the maximum explorer-forwarding rate was exceeded (as specified on the Port Configuration panel described in the “Configuring Port Parameters” section of the “Configuring the Catalyst 3920” chapter).
 - Ring Number Mismatch—Number of frames received that did not correctly include the port’s ring number.
 - Config Loss—Number of Token Ring configuration loss events after the port has completed the join process and then lost communication.
 - Config Loss Reason—Error code of the latest configuration loss event. Possible values are None, Wire Fault, Lobe Test Fail, TKP Frame Error, Heart Beat Fail, TXI New Station, TXI Prot Error, Speed Error, Remove Received.
 - Last Reset—Time (in hours, minutes, and seconds) since the port statistics were last reset.

Viewing 802.5 Port Statistics

To view 802.5 port statistics, select **802.5 Statistics** on the Port Statistics panel. The Port x 802.5 Statistics panel (Figure 7-6) is displayed. This panel is automatically refreshed every 5 seconds.

Figure 7-6 Port x 802.5 Statistics Panel

Box 1 Port 1 802.5 Statistics - Port is Forwarding			
Line Errors		Soft Errors	0
Burst Errors	0	Hard Errors	0
AC Errors	0	Signal Loss	0
Abort Transmit Errors	0	Transmit Beacons	0
Internal Errors	0	Recoveries	0
Lost Frame Errors	0	Lobe Wires	0
Receive Congestion	0	Removes	0
Frame Copied Errors	0	Singles	0
Token Errors	0	Frequency Errors	0

Return Reset

Return to previous menu

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The following information is displayed on this panel:

- Line Errors—Number of times a frame or token was copied or repeated by a station.
- Burst Errors—Number of times a station has detected the absence of transitions for five half-bit timers (burst-five error).
- AC Errors—Number of times a station received an Active Monitor Present (AMP) frame or a Standby Monitor Present (SMP) frame in which both the address recognized (A) bit and the frame copied (C) bit are set to 0, indicating that no station has recognized the destination address and copied the frame, and then receives another SMP frame in which both the address recognized bit and the frame copied bit are set to 0 without first receiving an AMP frame. This condition indicates a station that cannot set the address recognized and the frame copied bits properly.
- Abort Transmit Errors—Number of times a station transmitted an abort delimiter while transmitting.
- Internal Errors—Number of times a station recognized an internal error.
- Lost Frame Errors—Number of times a station was transmitting and its return-to-repeat timer expired. This condition indicates a condition where a transmitting station in strip mode does not receive the trailer of the frame before the return to repeat timer goes off.
- Receive Congestion—Number of times a station recognized a frame addressed to its specific address, but had no available buffer space, indicating that the station is congested.
- Frame Copied Errors—Number of times a station recognized a frame addressed to its specific address and detected that the frame status field A bits are set to 1, indicating a possible line hit or duplicate address.
- Token Errors—Number of times a station acting as the active monitor recognized an error condition that required a token to be transmitted.

- **Soft Errors**—Number of soft errors the port has detected. Soft errors are those that are recoverable by the MAC layer protocols. The soft error number directly corresponds to the number of report error MAC frames that this port has transmitted.
- **Hard Errors**—Number of times this port has detected an immediately recoverable fatal error. This denotes the number of times this port has either transmitted or received a beacon MAC frame.
- **Signal Loss**—Number of times this port has detected a loss of signal condition from the ring.
- **Transmit Beacons**—Number of times this port has transmitted a beacon frame.
- **Recoveries**—Number of claim token MAC frames received or transmitted after the port has received a ring purge MAC frame. This counter signifies the number of times the ring has been purged and had recovered back into a normal operating state.
- **Lobe Wires**—Number of times the port has detected an open or short circuit in the lobe data path. The adapter will be closed and ring state will signify this condition.
- **Removes**—Number of times the port has received a remove ring station MAC frame request. When this frame is received the port will enter the closed state.
- **Singles**—Number of times the port has sensed that it is the only station on the ring. This occurs if the port is the first one up on a ring, or if there is a hardware problem.
- **Frequency Errors**—Number of times the port has detected that the frequency of the incoming signal differs from the expected frequency by more than that specified by the IEEE 802.5 standard.

Viewing 802.5 Port State Information

To view 802.5 port state information, select **802.5 State Information** on the Port Statistics panel. The Port x 802.5 State Information panel (Figure 7-7) is displayed.

Figure 7-7 Port x 802.5 State Information Panel

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Port 1 802.5 State Information - Port is Forwarding

Ring Status          0x00000-OK
Ring State           Opened
Ring Open Status     Open
Ring Speed Next Open Unknown
Upstream Neighbor    000577:01CE0E
Force Active Monitor Participate Disabled
Functional Address    C00000:000000
Last Beacon Sent     0 Hr, 0 Min, 0 Sec

Return

Return to previous menu
  
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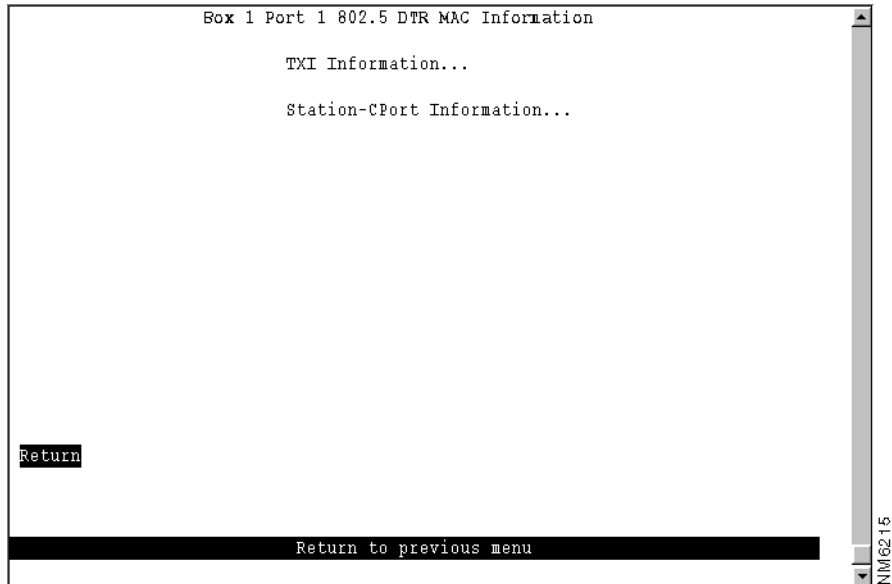
The following information is displayed on this panel:

- Ring Status—Current port status on the ring. This field has the general format *0xnnnnn-text_string* where *nnnnn* is a hexadecimal error code value, and *text_string* can be No Status, OK, or Error. Before an open is completed, the field has the value: 0x20000-No Status. If no problems are detected this field will display: 0x00000-OK. Other error conditions are indicated by: *0xnnnnn-Error*.
- Ring State—Current port state with respect to the port entering or leaving the ring. Possible values are Opened, Closed, Opening, and Closing.
- Ring Open Status—Indicates whether the station successfully entered the ring in its most recent attempt, and, if not, the reason for failure. Possible values are Open, No Open, Lobe Failed, Signal Loss, Insertion Timeout, Ring Failed, Beaconsing, Duplicate MAC Address, Request Failed, and Remove Received.
- Ring Speed Next Open—Ring speed, if known, that will be used the next time the port inserts into the ring. Possible values are Unknown, 4 Mbps, and 16 Mbps.
- Upstream Neighbor—MAC address of the nearest active upstream neighbor station on the ring.
- Force Active Monitor Participate—Indicates whether this port will seek to become the active monitor selection process. Possible values are Enabled (yes) and Disable (no). Disable does not prevent the switch from becoming the active monitor, it only means that the switch will not seek to become the active monitor.
- Functional Address—Bit mask of all Token Ring functional addresses for which this port will accept frames.
- Last Beacon Sent—Elapsed time (in hours, minutes, and seconds) since a beacon frame was last sent on this port.

Viewing 802.5 Dedicated Token Ring MAC Information

To view 802.5 port dedicated Token Ring MAC information, select **802.5 DTR MAC Information** on the Port Statistics panel. The Port x 802.5 DTR MAC Information panel (Figure 7-8) is displayed.

Figure 7-8 Port x 802.5 DTR MAC Information Panel



The following options are displayed on this panel:

- **TXI Information**—Select this option to view dedicated Token Ring TXI information. For more information, refer to the “Viewing Dedicated Token Ring MAC TXI Information” section.
- **Station-CPort Information**—Select this option to view dedicated Token Ring station-Cport information. For more information, refer to the “Viewing Dedicated Token Ring MAC Station-CPort Information” section.

Viewing Dedicated Token Ring MAC TXI Information

If you select **TXI Information** on the Port x 802.5 DTR MAC Information panel, the Port x 802.5 DTR MAC TXI Information panel (Figure 7-9) is displayed.

Figure 7-9 Port x 802.5 DTR MAC TXI Information Panel

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Box 1 Port 1 802.5 DTR MAC TXI Information - Port is Forwarding

Authorized Function Classes      0xffff
Error Report Timer(.01 sec)     200
Physical Drop Number            0x00000000
Join State                      Not Specified
Monitor State                   Not Specified
Beacon Source Address           000000:000000
Beacon UNA                      000000:000000
Beacon Physical Drop Number     0x00000000
Event Status                    Standby Received

Return

Return to previous menu
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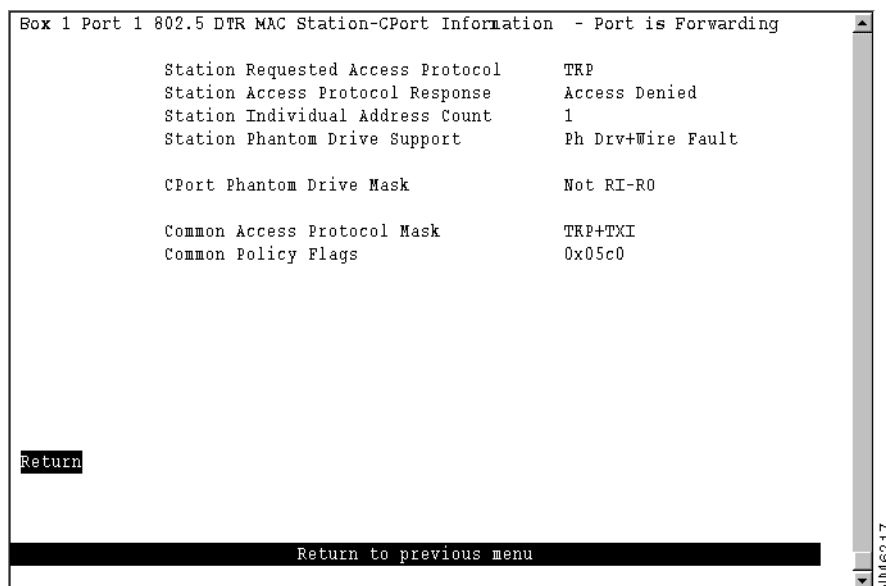
The following information is displayed on this panel:

- **Authorized Function Classes**—Functional classes that a node is enabled to transmit. This value is set in the Enabled Function Class subvector (x'06') of the Change Parameters MAC frame. Possible values are 0x0000 through 0xFFFF. Each bit that is enabled corresponds to a function class that is enabled.
- **Error Report Timer (.01 sec)**—Timeout value (in milliseconds) of the ring stations soft error report timer. This value is set in the Error Timer Value subvector (x'05') of the Change Parameters MAC frame or the Initialize Station MAC frame.
- **Physical Drop Number**—Physical location of the sending ring station. This value is set in the Assign Physical Location subvector (x'04') of the Change Parameters MAC frame or the Initialize Station MAC frame. Possible values are 0x00000000 through 0xFFFFFFFF.
- **Join State**—Present state of the join finite state machine. Possible values are Not Specified, Bypass, Registration, Lobe Test, Dup Addr Check, Dup Addr Det, Join Complete, and Await Notify.
- **Monitor State**—Present state of the monitor finite state machine. Possible values are Not Specified, Operational, Transmit Beacon, Wire Fault Delay, and Int Test Wait.
- **Beacon Source Address**—Source address used in the last beacon MAC frame transmitted or received.
- **Beacon UNA**—Individual MAC address of the sending ring station's nearest active upstream neighbor (NAUN). This value is set in the NAUN subvector x'02' used in the last beacon MAC frame transmitted or received. Possible values are either a valid individual MAC address or Unknown.
- **Beacon Physical Drop Number**—Physical location of the sending ring station. This value is set in the Physical Location subvector (x'0B') of the last beacon MAC frame transmitted or received. Possible values are 0x00000000 through 0xFFFFFFFF.
- **Event Status**—Latest event status of the TXI interface. Possible values are Insert REQ Rec, Insert RPS Rec, Report Error, Heart Beat Lost, Signal Loss, Beacon Received, Remove, Internal Error, Station/CPort Err, Wire Fault, Claim Received, Purge Received, Standby Received, Invalid SA, Act Mon Recvd, Phantom Loss, and Dup Addr Det.

Viewing Dedicated Token Ring MAC Station-CPort Information

If you select **Station-CPort**, the Port x 802.5 DTR MAC Station-CPort Information panel (Figure 7-10) is displayed.

Figure 7-10 Port x 802.5 DTR MAC Station-CPort Information Panel



The following information is displayed on this panel:

- **Station Requested Access Protocol**—Protocol requested for station access. This value is set in the Access Protocol Request subvector (x'0E') of the registration request MAC frame. Possible values are TXI and TKP.
- **Station Access Protocol Response**—Response to protocol request. This value is set in the Access Protocol Response subvector (x'0F') of the registration response MAC frame. Possible values are Access Denied and TXI+Wire Fault.
- **Station Individual Address Count**—Number of individual addresses supported by the MAC and used in the Individual Address Count subvector (x'21'). This field will always display the value 1.
- **Station Phantom Drive Support**—MAC's support of phantom drive and wire fault detection. It indicates the value of the Station Phantom Vector (Phantom Drive) [SPV(PD)] variable and the value of the phantom subvector X'0C' used in the registration request MAC frame. This field will always display Ph Drv+Wire Fault for phantom drive and wire fault support.
- **CPort Phantom Drive Mask**—Value of the C-Port policy variable Port Phantom Vector (Phantom Drive Mask [PPV(PD_MASK)]). This variable indicates the phantom drive and wire fault detection methods supported by the C-Port. The only possible is Not RI-RO.
- **Common Access Protocol Mask**—Access protocols can be supported by the PMAC. It displays the value of the PPV(AP_MASK). Possible values for this field are TKP, TXI, and TKP+TXI.
- **Common Policy Flags**—Station policy flags as a hexadecimal value of the form 0xnxxx.

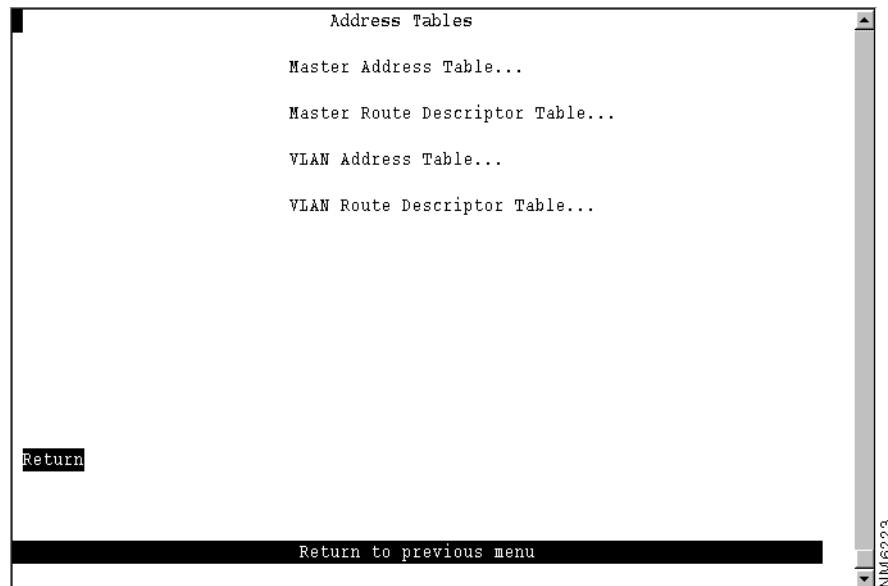
Viewing Address Tables

You can view the address and route descriptor tables, which are used in forwarding frames, for the following:

- Catalyst 3920
- Individual VLANs

To view address and route descriptor tables, select **Address Tables** on the Statistics Menu. The Address Tables panel (Figure 7-11) is displayed.

Figure 7-11 Address Tables Panel



The following options are displayed on this panel:

- **Master Address Table**—Select this option to view the contents of the master address table. For more information, refer to the “Viewing the Master Address Table” section.
- **Master Route Descriptor Table**—Select this option to view the contents of the master route descriptor table. For more information, refer to the “Viewing the Master Route Descriptor Table” section.
- **VLAN Address Table**—Select this option to view the address tables for each VLAN. For more information, refer to the “Viewing the Address Table for Each VLAN” section.
- **VLAN Route Descriptor Table**—Select this option to view the route descriptor tables for each VLAN. For more information, refer to the “Viewing Route Descriptor Table for Each VLAN” section.

Viewing the Master Address Table

To view all entries in the master address table, select **Master Address Table** on the Address Table panel. The Master Address Table panel (Figure 7-12) is displayed. The master address table can contain up to 10,000 entries.

Figure 7-12 Master Address Table Panel

Address	Type	Ports (Filtered:high-lighted, Trunks:Bold)
000030:2CEE59	Known-TR Port 16	16
000030:980F71	Known-TR Port 16	16
000030:E26144	Known-TR Port 16	16
000083:2C7F0F	Known-TR Port 16	16
000577:004F90	Known-TR Port 16	16
000577:005210	Known-TR Port 16	16
000577:005220	Known-TR Port 16	16
000577:005391	Known-TR Port 11	11
000577:01C893	Known-TR Port 16	16
000577:01CA80	Switch Base Address	11 12 13 14 15 16 17 18 19 20
000577:01CA80	Switch Base Address	1 2 3 4 5
000577:01CA80	Switch Base Address	6 7 8 9 10
000577:01CAA0	trbrf-default	11 12 13 14 15 16 17 18 19 20
000577:01CAA1	BRF0	1 2 3 4 5
000577:01CAA2	BRF1	6 7 8 9 10

Return More Search

Return to previous menu

The following information is displayed on this panel:

- Address—MAC address.
- Type—Type of address. Possible values are:
 - Switch Base Address for the address assigned to the Catalyst 3920.
 - VLAN Name for an address assigned to a VLAN domain. Only the first 16 characters of the name are displayed.
 - STP Port *x* for the switch port’s MAC address that is used by the Spanning-Tree Protocol.
 - Known-*port_type* Port *x* for a known address. Possible values of *port_type* are TR (Token Ring port) and STK (stack port).
 - Unknown for a MAC address with an unknown location.
 - STP Multicast for a BPDU multicast address reserved for the port (hello packet).
 - Multicast for a multicast address.
 - Multicast-Cisco for a Cisco multicast address.
 - STP Multicast-IBM for the IBM bridge functional address.
 - STP Multicast-Cisco for the Cisco spanning-tree address.
 - Broadcast for a broadcast address.
- Ports—Ports of the switch whose address tables include this MAC address.

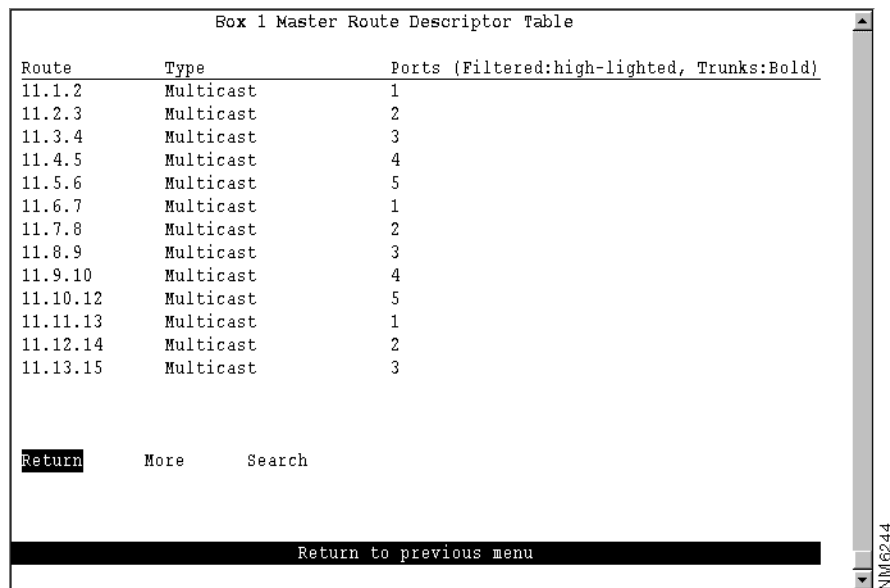
Note Filtered ports are displayed as highlighted entries. Trunk ports are displayed as bold entries.

To	Select	Then
Search for a specific MAC address...	Search	Specify the address.

Viewing the Master Route Descriptor Table

To view all the route descriptors (and their associated ports) that have been learned by the Catalyst 3920, select **Master Route Descriptor Table** on the Address Tables panel. The Master Route Descriptor Table panel (Figure 7-13) is displayed. These descriptors are contained within the 10,000 entries allowed for the master address table.

Figure 7-13 Master Route Descriptor Table Panel



The following information is displayed on this panel:

- **Route**—Route descriptor associated with a port in the format:
`local_segment_number.bridge_number.remote_segment_number`
 The local segment number is displayed in hexadecimal and is the same for all ports within a single domain. Possible ring numbers are 01 through FFF. Possible bridge numbers are 00 through 0F.
- **Type**—Type of route descriptor. Possible values are:
 - *Known-port_type* Port *x* for a known source-route descriptor. Possible values of *port_type* are TR and STK.
 - Unknown if the source route location is unknown.
- **Ports**—Ports of the switch or a feature card whose address tables include this route descriptor.

To	Select	Then
Search for a specific route descriptor...	Search	Specify the route descriptor.

Viewing the Address Table for Each VLAN

To view the entries in the address table for each VLAN, select **VLAN Address Table** on the Address Tables panel and select the desired TrCRF. The VLAN Address Table panel (Figure 7-14) is displayed. The entries are listed in the order in which they were learned.

Figure 7-14 VLAN Address Table Panel

Address	Type	Ports (Filtered:high-lighted, Trunks:Bold)
00067C:945A04	Known-TR Port	3,SRT 3
00067C:945A44	Known-TR Port	5,SRT 5
00067C:945A58	Known-TR Port	1,SRT 1
00067C:945A84	Known-TR Port	4,SRT 4
00067C:945AD8	Known-TR Port	2,SRT 2
05DA0B:E801A6	Known-TR Port	3,SRT 3
0F5C65:3AEB48	Known-TR Port	3,SRT 3
11F677:64CD82	Known-TR Port	1,SRT 1
13D049:CEEFFC	Known-TR Port	2,SRT 2
17046D:22B370	Known-TR Port	1,SRT 1
1DD223:A0591E	Known-TR Port	4,SRT 4
27943D:328300	Known-TR Port	4,SRT 4
296E0F:9CA57A	Known-TR Port	2,SRT 2
2B8821:460734	Known-TR Port	3,SRT 3
2DE273:30A92E	Known-TR Port	2,SRT 2

Return More Search

Return to previous menu

The following information is displayed on this panel:

- Address—MAC address.
- Type—Type of address. Highlighted entries indicate filtered ports. Possible values are:
 - Switch Base Address for the address assigned to the Catalyst 3920.
 - VLAN Name for an address assigned to a VLAN domain. Only the first 16 characters of the name are displayed.
 - STP Port *x* for an address reserved for a Spanning-Tree Protocol port.
 - Known-*port_type* Port *x* for a known address. Possible values of *port_type* are TR and STK.
 - Unknown for a MAC address with an unknown location.
 - STP Multicast for a BPDU multicast address reserved for the port (hello packet).
 - Multicast for a multicast address.
 - STP Multicast-Cisco for the Cisco spanning-tree address.
 - STP Multicast-IBM for the IBM bridge functional address.
 - Broadcast for a broadcast address.
- Ports—Ports of the switch whose address tables include this MAC address.

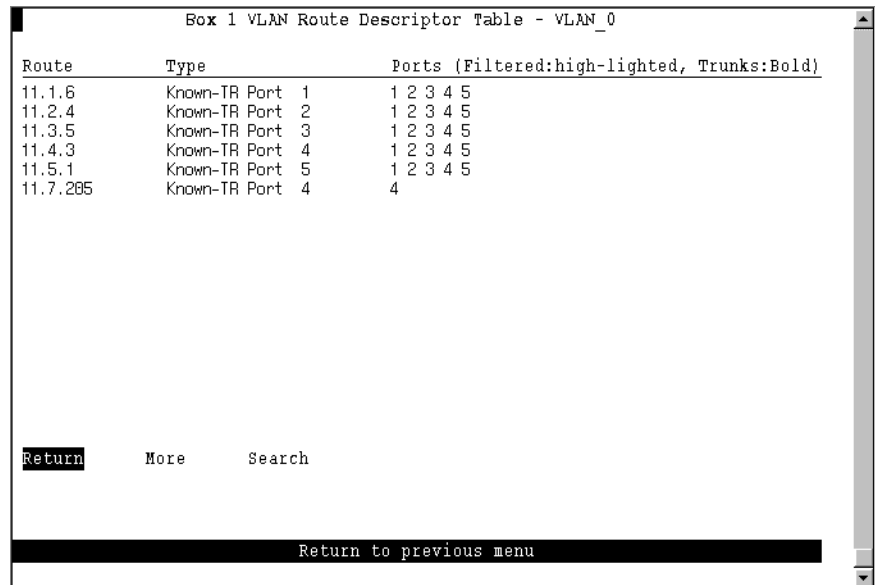
Note Highlighted entries indicate filtered ports.

To	Select	Then
Search for a specific MAC address...	Search	Specify the address.

Viewing Route Descriptor Table for Each VLAN

To view the entries in the route descriptor table for each VLAN, select **VLAN Route Descriptor Table** on the Address Table panel and specify the desired TrCRF. The VLAN Route Descriptor Table panel (Figure 7-15) is displayed.

Figure 7-15 VLAN Route Descriptor Table Panel



The following information is displayed on this panel:

- **Route**—Route descriptor associated with a port in the format:
`local_segment_number.bridge_number.remote_segment_number`
 The local segment number is displayed in hexadecimal and is the same for all ports within a single domain. Possible ring numbers are 01 through FFF. Possible bridge numbers are 00 through 0F.
- **Type**—Type of route descriptor. Possible values are:
 - *Known-port_type* Port *x* for a known source-route descriptor. Possible values of *port_type* are TR and STK.
 - Unknown if the source route location is unknown.
- **Ports**—Ports of the switch whose address tables include this route descriptor.

To	Select	Then
Search for a specific route descriptor...	Search	Specify the route descriptor.

Viewing Spanning-Tree Information for a VLAN

To display the spanning-tree parameters for a TrBRF, select **Current Spanning Tree Information** on the Statistics Menu and specify the desired TrBRF. The Current Spanning Tree Information panel (Figure 7-16) is displayed.

Figure 7-16 Current Spanning Tree Information Panel

```
Current Spanning Tree Information - trbrf-default

Bridge ID: 32768.000577004AA0      Hello Time:      2
Root ID:  32768.00063AE34A00      Max Message Age: 20
Root CRF: 1003                    Forward Delay:   15

CRF   PId   PCst PSts  DCst  Dsg SwId/BrId  DsgPId  #Chgs  Last Chg
-----
1003  0.1   62  FWD   0    32768.00063AE34A00  0.21    1     15:31:57
  10   0.1   62  FWD   62   32768.000577004AA0  0.1     1     15:31:57
  12   0.1   62  FWD   62   32768.000577004AA0  0.1     1     15:31:57

Return  More  CRF-Spanning-Tree...

Return to previous menu
```

The following information is displayed on this panel:

- Bridge ID—Priority and MAC address of this bridge.
- Root ID—Priority and MAC address of the root bridge.
- Root CRF—Number of the VLAN ID of the TrCRF that is closest to the root. This Catalyst 3920 communicates with the root through this TrCRF.
- Hello Time—Time (in seconds) that the root waits between sending configuration messages. This time is advertised by the root and used by all devices and switches in the active topology of the spanning-tree network.
- Max Message Age—Time at which the configuration message used by the spanning-tree algorithm should be discarded. This time is advertised by the root and used by all devices and switches in the active topology of the spanning-tree network.
- Forward Delay—Time the root waits between transitions from listening to learning and from learning to forwarding. This time is advertised by the root and used by all devices and switches in the active topology of the spanning-tree network.
- CRF—VLAN ID of a TrCRF belonging to this TrBRF.
- PId—Port ID that is used to determine the role of the logical port in the spanning tree. The port ID is expressed in the form *port priority.port number*.
- PCst—Cost associated with each logical port. Lower numbers are generally assigned to ports attached to faster media (such as FDX or TokenChannel), and higher numbers are generally assigned to ports attached to slower media (such as 2400-baud modem links).

- PSts—Current status of this logical port within the spanning tree. Possible values are:
 - DSB (disabled)
 - BLK (blocked)
 - LSN (listening)
 - LRN (learning)
 - FWD (forwarding)

The rules that define the state of the logical port are as follows:

- A port on a network segment that contains no other switch or bridge is always forwarding.
- If two ports of the Catalyst 3920 are connected to the same network segment and there is no other bridge or switch, the port with the lower ID is forwarding and the other is blocked.
- When the switch is booted, all ports are blocked initially, and then some of them change to a different state: listening, learning, and forwarding, in that order. To see the change in states you must repeatedly exit from this menu, and then select it again. All ports that are going to change states from blocking to forwarding will have done so after two to three times the value of:

Switch Maximum Message Age + (2 x Switch Forward Delay)

- DCst—Cost for a packet to travel from this port to the root in the current spanning-tree configuration. The slower the media, the higher the cost.
- Dsg SwId/BrId—Priority and MAC address of the device through which this port has determined it must communicate with the root of the spanning tree.
- DsgPid—Port on the designated bridge through which this Catalyst 3920 will communicate with the root of the spanning tree. This information is useful if the Catalyst 3920 is the designated bridge on one or more network segments.
- #Chgs—Number of topology changes, that is, the number of times the port has entered the forwarding state plus the number of times the port has made the transition from forwarding to blocking. The counter is reset when the switch is reset or the spanning tree is turned on.
- Last Chg—Time since the port last entered the forwarding state or made the transition from forwarding to blocking.

You cannot change any information on this panel. To change the spanning-tree parameters, refer to the section “Configuring Spanning-Tree Parameters” in the “Configuring the Catalyst 3920” chapter.

Viewing Spanning-Tree Information for a TrCRF

To display the spanning-tree parameters for a TrCRF that belongs to the currently displayed TrBRF, select **CRF-Spanning-Tree** on the Current Spanning Tree Information panel for a TrBRF and specify the desired TrCRF. The Current Spanning Tree Information panel (Figure 7-17) is displayed.

Figure 7-17 Current Spanning Tree Information for a TrCRF Panel

```

Current Spanning Tree Information - trcrf-default
Bridge ID: 32768.000577004AA1          Hello Time:      2
Root ID:  32768.000577004AA1          Max Message Age: 20
Root Port: This Bridge                  Forward Delay:   5

Port  PId      PCst PSts  DCst  Dsg SwId/BrId  DsgPId  #Chgs  Last Chg
----  ---      -
 7    128.7    DWN
 8    128.8    65535 FWD   0 32768.000577004AA1 128.8    2    15:51:19
 9    128.9    DWN
10    128.10   DWN
11    128.11   DWN
12    128.12   DWN
13    128.13   DWN
14    128.14   DWN
15    128.15   DWN
16    128.16   DWN

Return      More

Return to previous menu
  
```

The following information is displayed on this panel:

- Bridge ID—Priority and MAC address of this bridge.
- Root ID—Priority and MAC address of the root bridge.
- Root Port—Number of the port on this Catalyst 3920 that is closest to the root. This Catalyst 3920 communicates with the root through this port. If this Catalyst 3920 has been accepted as the root of the spanning-tree network, this field displays “This Bridge”.
- Hello Time—Time (in seconds) that the root waits between sending configuration messages. This time is advertised by the root and used by all devices and switches in the active topology of the spanning-tree network.
- Max Message Age—Time at which the configuration message used by the spanning-tree algorithm should be discarded. This time is advertised by the root and used by all devices and switches in the active topology of the spanning-tree network.
- Forward Delay—Time the root waits between transitions from listening to learning and from learning to forwarding. This time is advertised by the root and used by all devices and switches in the active topology of the spanning-tree network.
- Port—Port number.
- PId—Port ID that is used to determine the role of the port in the spanning tree. The port ID is expressed in the form *port priority.port number*.
- PCst—Cost associated with each port. Lower numbers are generally assigned to ports attached to faster media (such as FDX or TokenChannel), and higher numbers are generally assigned to ports attached to slower media (such as 2400-baud modem links).

- PSts—Current status of this port within the spanning tree. Possible values are:
 - DSB (disabled)
 - BLK (blocked)
 - LSN (listening)
 - LRN (learning)
 - FWD (forwarding)

The rules that define the state of the port are as follows:

- A port on a network segment that contains no other switch or bridge is always forwarding.
- If two ports of the Catalyst 3920 are connected to the same network segment and there is no other bridge or switch, the port with the lower ID is forwarding and the other is blocked.
- When the switch is booted, all ports are blocked initially, and then some of them change to a different state: listening, learning, and forwarding, in that order. To see the change in states you must repeatedly exit from this menu, and then select it again. All ports that are going to change states from blocking to forwarding will have done so after two to three times the value of:

Switch Maximum Message Age + (2 x Switch Forward Delay)

- DCst—Cost for a packet to travel from this port to the root in the current spanning-tree configuration. The slower the media, the higher the cost.
- Dsg SwId/BrId—Priority and MAC address of the device through which this port has determined it must communicate with the root of the spanning tree.
- DsgPid—Port on the designated bridge through which this Catalyst 3920 will communicate with the root of the spanning tree. This information is useful if the Catalyst 3920 is the designated bridge on one or more network segments.
- #Chgs—Number of topology changes, that is, the number of times the port has entered the forwarding state plus the number of times the port has made the transition from forwarding to blocking. The counter is reset when the switch is reset or the spanning tree is turned on.
- Last Chg—Time since the port last entered the forwarding state or made the transition from forwarding to blocking.

You cannot change any information on this panel. To change the spanning-tree parameters, refer to the section “Configuring Spanning-Tree Parameters” in the “Configuring the Catalyst 3920” chapter.

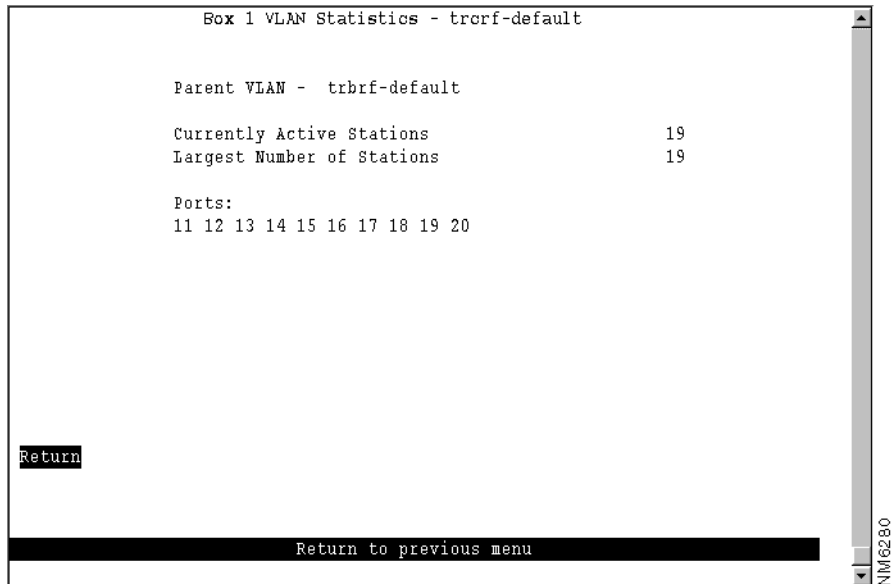
Viewing Statistics for Each VLAN

The Catalyst 3920 provides statistical information for both TrCRFs and TrBRFs. To access statistics for VLANs, select **VLAN Statistics** on the Statistics Menu.

Viewing Statistics for a TrCRF

To view statistics for a TrCRF, select **VLAN Statistics** on the Statistics Menu, select TrCRF, and then select the desired TrCRF. The VLAN Statistics panel (Figure 7-18) is displayed.

Figure 7-18 VLAN Statistics Panel for a TrCRF



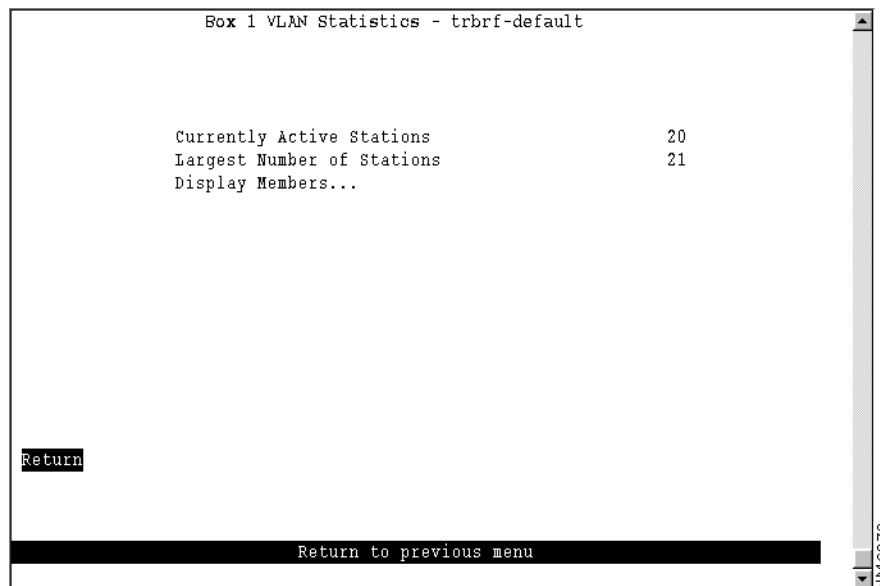
The following information is displayed on this panel:

- Parent VLAN—Name of the parent TrBRF.
- Currently Active Stations—Number of addresses currently in the master address table that are recognized by ports belonging to this domain.
- Largest Number of Stations—Largest number of addresses in the master address table since the last reset or power cycle that are recognized by ports belonging to this domain.
- Ports—List of ports that belong to this TrCRF.

Viewing Statistics for a TrBRF

To view statistics for a TrBRF, select **VLAN Statistics** on the Statistics Menu, select TrBRF, and then select the desired TrBRF. The VLAN Statistics panel (Figure 7-19) is displayed.

Figure 7-19 VLAN Statistics Panel for a TrBRF



The following information is displayed on this panel:

- **Currently Active Stations**—Number of addresses currently in the master address table that are recognized by ports belonging to this domain.
- **Largest Number of Stations**—Largest number of addresses in the master address table since the last reset or power cycle that are recognized by ports belonging to this domain.

To	Select	Then
Display a list of the TrCRFs associated with this TrBRF...	Display Members	Refer to the “Displaying the TrCRFs of a TrBRF” section.

Displaying the TrCRFs of a TrBRF

To display the TrCRFs associated with a TrBRF, select **Display Members** on the VLAN Statistics panel. The VLAN Statistics panel (Figure 7-20) is displayed.

Figure 7-20 VLAN Statistics Panel for a TrCRF

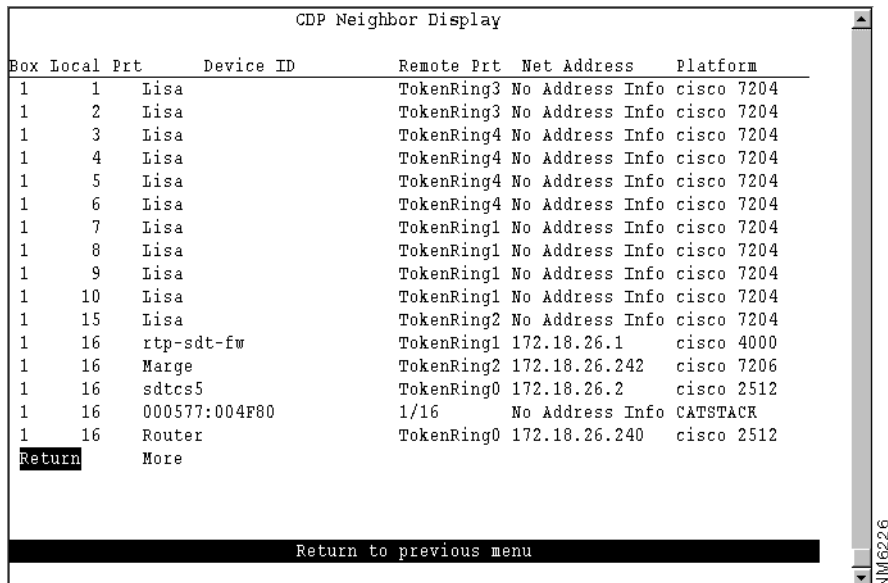


This panel lists VLAN names of all the TrCRFs associated with the parent TrBRF.

Viewing CDP Neighbor Information

To view information about other Cisco devices with which the Catalyst 3920 is communicating via CDP, select **CDP Neighbor Display** on the Statistics Menu. The CDP Neighbor Display panel (Figure 7-21) is displayed.

Figure 7-21 CDP Neighbor Display Panel



The following information is displayed on this panel:

- Box Local Prt—Port on the Catalyst 3920 that is enabled for CDP.
- Device ID—Host name or hardware serial number (in ASCII) of the remote device.
- Remote Prt—Port on the remote device that is enabled for CDP.
- Net Address—IP address of the remote device.
- Platform—Type of device (often indicated by the device name or part number).

Viewing VTP Statistics

You can view statistics about the VTP, including message counters. There are three types of VTP messages for which counters are maintained:

- Summary Advertisements—Contains the management domain name, the configuration revision number, the update timestamp and identity, the authentication checksum, and the number of Subset Advertisement messages which follow it.
- Subset Advertisements—Contains all information for one or more (but always an integral number of) VLANs, and indicates its own sequence number within those which follow the Summary Advertisement.
- Advertisement Requests—Requests information about VLANs.

If the switch is operating in Server mode, an advertisement is sent across the trunk port when the following events occur:

- Immediately upon a change in the configuration of VLAN information.
- When no other Summary Advertisement with the current configuration revision number has been received within the timeout period.

Each advertisement consists of one Summary Advertisement immediately followed by zero or more Subset Advertisements. The number of Subset Advertisement messages that follow a Summary Advertisement depends on the reason for sending the advertisement.

- If the advertisement is sent because neither this device nor any other device has recently sent an advertisement, then the Summary Advertisement is followed by zero Subset Advertisement messages.
- If the advertisement is sent because a configuration change has been made, then the Summary Advertisement is followed by the minimum number of Subset Advertisement messages required to contain all information on all VLANs and ordered in ascending order of ISL VLAN ID.
- If the advertisement is sent because an Advertisement Request for information on all VLANs was received, then the Summary Advertisement is followed by the minimum number of Subset Advertisement messages required to contain all information on all VLANs. The messages are sent in ascending order of ISL VLAN ID.
- If the advertisement is sent because an Advertisement Request for information on a subset of VLANs was received, the Summary Advertisement is followed by the minimum number of Subset Advertisement messages required to contain all information on all VLANs. The messages are sent in ascending order of ISL VLAN ID, however, the transmission of Subset Advertisements that only contain information on unrequested VLANs is suppressed.

An Advertisement Request is sent after a reboot. Also, if any of the following actions occur then a timer is started:

- A Subset Advertisement message is received that contains a configuration revision number that is higher than the device's currently known value.
- A Summary Advertisement is received that contains a configuration revision number that is greater than the device's currently known value and that is not followed by any Subset Advertisements.
- The expected number of Subset Advertisement messages is not received within a short period after receiving a Summary Advertisement message having a configuration revision number that is greater than the device's currently known value.
- A Summary Advertisement is received that contains a configuration revision number that is more than one greater than the device's currently known value.

If the timer expires before either an Advertisement Request or Summary Request is received, then an Advertisement Request is sent.

When an Advertisement Request is sent because some Subset Advertisement messages were missed, the Advertisement Request is set to request only those VLANs that were missed.

To view VTP message counters, select **VTP Statistics** on the Statistics Menu. The VTP Statistics panel (Figure 7-22) is displayed.

Figure 7-22 VTP Statistics Panel

VTP Statistics	
Summary Advertisements Received	0
Subset Advertisements Received	0
Summary Advertisements Sent	0
Subset Advertisements Sent	0
Advertisements Requests Received	0
Advertisements Requests Sent	0
Revision Number Errors	0
Configuration Digest Errors	0

Return Reset

Return to previous menu

NM16289

The following information is displayed on this panel:

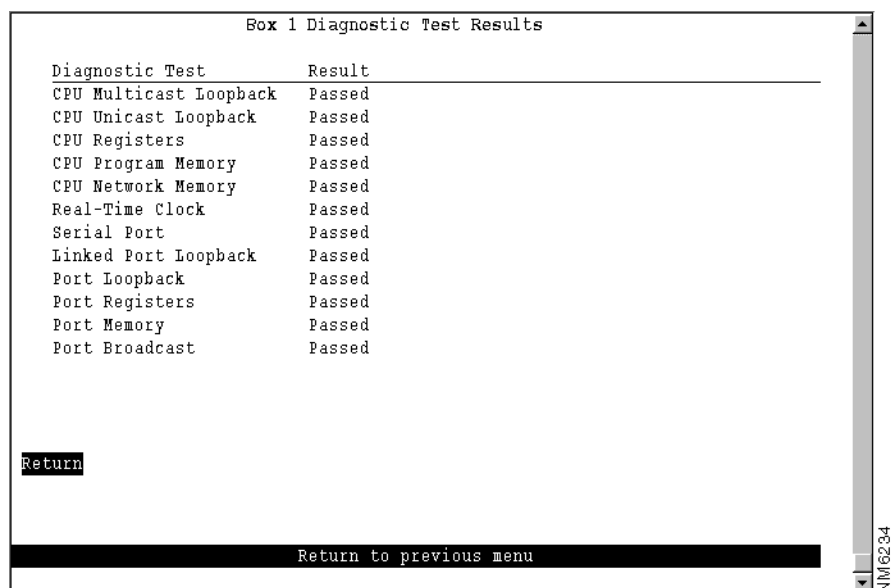
- Summary Advertisements Received—Total number of VTP Summary Advertisements received for this management domain.
- Subset Advertisements Received—Total number of VTP Subset Advertisements received for this management domain.
- Summary Advertisements Sent—Total number of VTP Summary Advertisements sent for this management domain.

- **Subset Advertisements Sent**—Total number of VTP Subset Advertisements sent for this management domain.
- **Advertisements Requests Received**—Total number of VTP Advertisement Requests received for this management domain.
- **Advertisements Requests Sent**—Total number of VTP Advertisement Requests sent for this management domain.
- **Revision Number Errors**—Number of occurrences of configuration revision number errors for this management domain. A configuration revision number error occurs when a device receives a VTP advertisement for which:
 - The advertisement's Configuration Revision Number is the same as the current locally held value.
 - The advertisement's digest value is different from the current locally held value.
- **Configuration Digest Errors**—Number of occurrences of configuration digest errors for this management domain. A configuration digest error occurs when a device receives a VTP advertisement for which:
 - The advertisement's Configuration Revision Number is greater than the current locally held value.
 - The advertisement's digest value does not match the VLAN information assumed by the receiver of the advertisement, where the information assumed is the combination of the information explicitly contained in the advertisement plus any omitted information as currently known by the receiving device.

Viewing Diagnostic Test Results

To view the results of the most recent power-on diagnostics, select **Diagnostic Test Results** on the Statistics Menu. The Diagnostic Test Results panel (Figure 7-23) is displayed.

Figure 7-23 Diagnostic Test Results Panel



The screenshot shows a terminal window titled "Box 1 Diagnostic Test Results". It contains a table with two columns: "Diagnostic Test" and "Result". All tests listed have a "Passed" result. At the bottom of the terminal, there is a "Return" prompt and a "Return to previous menu" option.

Diagnostic Test	Result
CPU Multicast Loopback	Passed
CPU Unicast Loopback	Passed
CPU Registers	Passed
CPU Program Memory	Passed
CPU Network Memory	Passed
Real-Time Clock	Passed
Serial Port	Passed
Linked Port Loopback	Passed
Port Loopback	Passed
Port Registers	Passed
Port Memory	Passed
Port Broadcast	Passed

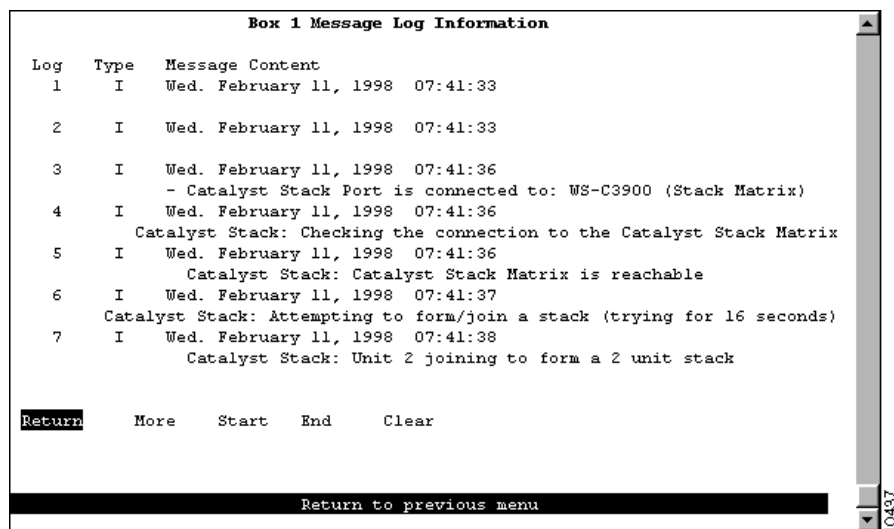
This panel displays a list of the self-diagnostic tests that the Catalyst 3920 performs and the result of each. For information about running the diagnostic tests, refer to the “Resetting the Catalyst 3920” chapter.

Viewing the Message Log

To view the message log, select **Message Log** on the Statistics Menu. The Message Log Information panel (Figure 7-24) is displayed. The data on this panel is useful to technical experts when they are solving complex problems.

The log can maintain a list of up to 200 messages. Once 200 messages have been logged, new messages received will be added to the end of the log and the oldest message will be deleted from the panel. The log entry numbers continue to increment, indicating the total number of messages received. The first (oldest) seven messages are displayed. You can use the options at the bottom of the panel to move through the message log.

Figure 7-24 Message Log Panel



The following information is displayed on this panel:

- Log—Index number identifying the log file.
- Type—Message type. Possible values are:
 - W—Warning
 - I—Informational
- Message Content—Full text of the message.

To	Select
Page forward in the message log...	More
Move to the end of the message log...	End
Return to the beginning of the message log...	Start
Delete the contents of the message log...	Clear

Displaying a Summary of Your Configuration

To display a summary of the configuration of your Catalyst 3920, select **Display Summary** on the Statistics Menu. The summary information is displayed on the console panel (Figure 7-25).

Figure 7-25 Configuration Summary

```

5  VLAN_0  BRF0      Yes  Yes 16 HDX port  Cut-Thru
6  VLAN_1  BRF1      Yes  Yes 16 HDX port  Cut-Thru
7  VLAN_1  BRF1      Yes  Yes 16 HDX port  Cut-Thru
8  VLAN_2  BRF1      Yes  Yes 16 HDX port  Cut-Thru
9  VLAN_2  BRF1      Yes  Yes 16 HDX port  Cut-Thru
10 VLAN_2  BRF1      Yes  Yes 16 HDX port  Cut-Thru
11 trcrf-default trbrf-default Yes No
12 trcrf-default trbrf-default Yes No
13 trcrf-default trbrf-default Yes No
14 trcrf-default trbrf-default Yes No
15 trcrf-default trbrf-default Yes Yes 16 HDX port  Cut-Thru
16 trcrf-default trbrf-default Yes Yes 16 HDX station Cut-Thru
17 trcrf-default trbrf-default Yes No
18 trcrf-default trbrf-default Yes No
19 trcrf-default trbrf-default Yes No
20 trcrf-default trbrf-default Yes No

[0600] Port Status for Box 2
=====
Port TrCRF      TrBRF      Enabled Ins Spd Oper Mode  Fwd Mode
-----
1  VLAN_0  BRF0      Yes  Yes 16 HDX port  Cut-Thru
2  VLAN_0  BRF0      Yes  Yes 16 HDX port  Cut-Thru
3  trcrf-default trbrf-default Yes No
  
```

You can scroll through the information to view your current configuration parameter settings. The summary includes:

- Switch and stack information
- VLAN configuration information
- IP configuration information
- SNMP configuration information
- Spanning tree configuration information
- Port status
- CDP configuration information
- Module configuration information
- Message log
- Diagnostic test results

To exit from the configuration summary and return to the Statistics menu, wait until the configuration summary dump is complete and then press any key.