

Configuring the Catalyst 3920

You might not have to configure the Catalyst 3920 for it to work in your network; it is shipped with default configuration parameters and can function with these defaults. However, if you want or need to alter the configuration of the Catalyst 3920, you can use a console session. This chapter provides information on the following:

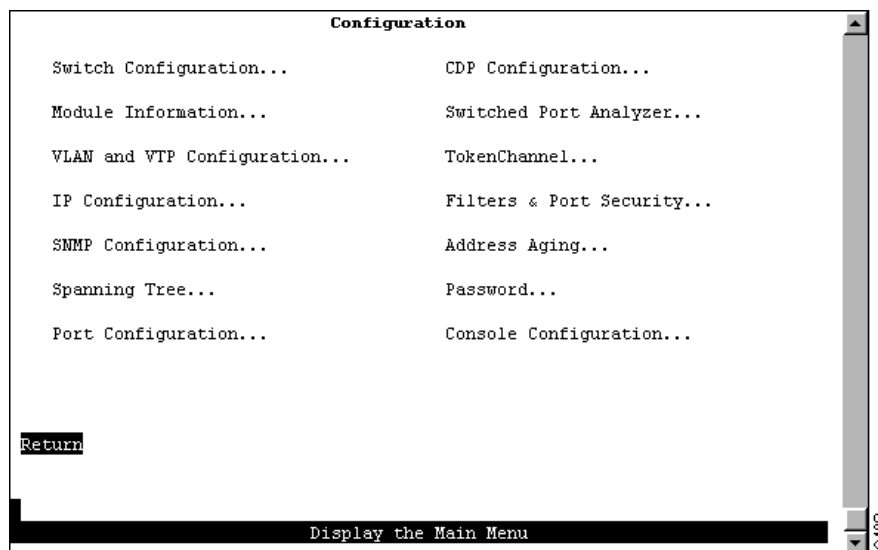
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Configuration Overview

To alter the configuration of your Catalyst 3920, follow these steps:

- Step 1** If one has not already been established, establish a console session. For information about establishing a console session, refer to the “Planning for Configuration and Management” chapter.
- Step 2** At the Main Menu, select **Configuration**. The Configuration Menu panel (Figure 5-1) is displayed.

Figure 5-1 Configuration Menu Panel



- Step 3** Select the menu option you want.
- Step 4** Change or enter values.
- Step 5** When you have changed or entered all of the required configuration parameters, save the changes and return to the Cisco Catalyst 3920 Main Menu. Configuration is complete.

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.

Guidelines for Using the Console Panels

As you move through the console panels, follow these guidelines:

- To select a menu or action item, move the cursor to the item and press **Enter**.
- To make changes to a parameter, move the cursor to the parameter name and press **Enter**. When prompted, enter the new data or select from a list of valid choices.
- To make changes to a list entry, select **Change** and specify the entry identifier (index number). When prompted, enter the new data or select from a list of valid choices. Some list entries consist of multiple parameters. To retain the current value of any parameter, enter a null value at the prompt.

- When viewing or updating parameters for a port, you will be prompted to enter either a port number or a port list.

When entering a port list, you can specify ports, a range of ports, or both. Separate each port and range by a space or comma. When entering a range of ports, enter the lowest port first and separate with a hyphen (for example, 8-10). The following are examples of entering a port list:

```
1-3 5 7-9
1-3,5,7-9
```

To enter all ports on a switch, type an asterisk (*).

- To save any changes made to the configuration panels in NVRAM, you must select **Return**. In most cases, changes will not take effect until you have exited the panel by selecting Return.
- To return to the main menu without saving your changes, press **Ctrl-P**. Changes made to the current panel will not be saved.
- To return to the previous panel without saving your changes, press the backspace key.
- To refresh the console panel at any time, press **Ctrl-L**.
- If the Catalyst 3920 is part of a stack, you will be prompted to select a box (Catalyst 3920) when you access certain configuration panels, such as the Switch/Stack Information panel.
- In some cases, more information is available than can be displayed on the panel. To scroll to the next panel of information, select **More**.

Configuring Basic Switch and Stack Parameters

To view or change basic switch and stack information, such as the system name, system location, or system contact, select **Switch Configuration** on the Configuration Menu. The Switch Configuration panel (Figure 5-2) is displayed.

Figure 5-2 Switch Configuration Panel



The following information is displayed on this panel:

- System Description—Full name and version identification of the system’s hardware.
- Build Description—Version identification of the firmware.
- Memory Installed—Amount (in megabytes) of dynamic RAM (DRAM) and Flash memory installed. You cannot change the information in this field.
- Burned-in MAC Address—Factory-assigned MAC address of the Catalyst 3920. This address is used as the basis for the MAC addresses of the ports and VLANs of the switch. You cannot change the information in this field. For more information about how MAC addresses are assigned, refer to the “Codes and IDs” appendix.
- Configured MAC Address—MAC address that is configured for the Catalyst 3920. If a locally administered address is assigned to the Catalyst 3920, this field displays that address. Otherwise, the field displays all 0s. To assign a locally administered address, select this field and enter the new address. The new address will take effect the next time the Catalyst 3920 is reset.
- Address Format—Format used for MAC addresses (non-canonical or canonical). Non-canonical is typically used in Token Ring networks and is also known as *most significant bit first*. The two parts of a non-canonical address are separated by a colon. Canonical format is typically used in Ethernet networks and is also known as *least significant bit first*. The two parts of a canonical address are separated by a dash. If you change the address format, the new format will be used for displaying addresses by all switches in the stack and will take effect immediately.
- System Name—Locally assigned name of this Catalyst 3920. This name will appear in SNMP traps.
- System Location—Location information for this Catalyst 3920. This location will appear in SNMP traps.
- System Contact—Name of system contact for this Catalyst 3920.
- Time of Day—Time according to the internal clock of the Catalyst 3920.

Note If this Catalyst 3920 is part of a stack, updates to the Address Format, System Name, System Location, and System Contact are propagated throughout the stack.

To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the new value.
View additional information about the switch...	Stack Configuration	Refer to the “Configuring Stack Parameters” section on page 5-4.
Save your changes...	Return	

Configuring Stack Parameters

To configure stack parameters, select **Stack Configuration** on the Switch Configuration panel. The Stack Configuration panel (Figure 5-3) is displayed.

Figure 5-3 Stack Configuration Panel

Note You can stack Catalyst 3920s with Catalyst 3900s. In this section, Catalyst 39xx is used to represent both.

The following information is displayed on this panel:

- **Number of Boxes**—Number of Catalyst 39xx switches currently participating in the stack. You cannot change the information in this field.
- **Local Box Number**—Number assigned to the Catalyst 39xx to which the console is connected. The local box is also the source of the information displayed on this panel. You cannot change the information in this field.
- **Remote Box Number(s)**—Number assigned to other switches (if any) in the stack. You cannot change the information in this field.
- **Stack Time-out (sec.)**—If a switch goes off line, the length of time (in seconds) during which the stack tries to re-establish communication with the switch. The default is 16 seconds.
- **Stack State**—Indicates whether the ProStack is operational. You cannot change the information in this field. Possible states are:
 - **Idle**—The initial state.
 - **Discovery**—The Catalyst 3920 is checking to see if a stack exists and, if so, what the values of the stack parameters are.
 - **Split Stack**—A stack has been detected, but the parameters are different than those configured for this Catalyst 3920. To resolve a split stack, you must reset the Catalyst 3920 by pressing the System Request button.
 - **DP Update**—Parameters for the stack are being updated.
 - **BI Update**—The Catalyst 3920 is sending out information about its configuration.

- VLAN BI Update—A port on the Catalyst 3920 has changed TrBRF assignments and the Catalyst 3920 is sending out updated configuration information.
- Operational—The stack has been formed successfully.
- Not Operational—The stack has not been formed. This may be because there is no stack port installed in the expansion slot or there is no connection between the stack port and any other Catalyst 3920 or Catalyst Matrix.
- Stack Connection—Indicates whether the Stack port is connected. Possible values are Not Connected or Primary WS-3920. You cannot change the information in this field.

Viewing Module Information

To view general information about the Catalyst 3920 and the stack port, select **Module Information** on the Configuration Menu. The Module Information panel (Figure 5-4) is displayed.

Figure 5-4 Module Information Panel

Module	Status	Model	ID	HW Rev	FW Rev	Ports	Up Time
1	up	CAT3920	31	1	1.10.0	24	2:01:54
2	up	WS-C3900-STACK	42	0.B		1	2:01:54

The following information is displayed on this panel:

- Module—Module number. The module numbers that display on the Module Information panel have the following meaning:
 - 1—Base switch
 - 2—Rear stack port
- Status—Indicates whether the module is up or down. Up indicates that the module is properly installed. A status of up does not imply that any ports on the module are connected and operational.
- Model—Type of module. CAT3920 is listed for the base switch. WS-C3900-STACK is displayed for the stack port.
- ID—Identifier of the board in decimal. The ID of the Catalyst 3920 is 31. The ID of the stack module is 42. Refer to the “Codes and IDs” appendix for a list of other IDs.

- HW Rev—Hardware revision level of the module and the associated ASICs. For the switch, the hardware revision displays in the format *x.y.z* where *x* is the revision level of the switch, *y* is the revision level of the switching ASIC, and *z* is the revision level of the MAC Processor ASIC. For the stack module, this field displays the hardware revision level of the stack module followed by the revision level of the Proprietary Fat Pipe, which is the interface to the stack module. A stack module Revision B displays as 0.B.
- FW Rev—Firmware revision level of the module.
- Ports—Number of ports on the module.
- Up Time—Amount of time (in hours, minutes, and seconds) that the module has been up since the last reset.

You cannot change the information that appears on this panel.

Configuring VLANs and VTP

You can partition a single Catalyst 3920 into multiple VLANs. A VLAN can be configured with its own IP address and managed with SNMP. A VLAN can contain ports from multiple switches in the same stack. Any VLAN can participate independently in the Spanning-Tree Protocol (STP). Once VLANs have been established, packets are forwarded between ports belonging to the same VLAN only.

You can use the VLAN Trunking Protocol (VTP) to set up and manage VLANs across an entire administrative domain. When new VLANs are added to a Catalyst switch in an administrative domain, VTP can be used to automatically distribute the information to the trunk ports of all the devices in the administrative domain. This allows VLAN naming consistency and connectivity between all devices in the administrative domain.

An *administrative or management domain* is a logical grouping of VLANs used by the VTP for the purpose of administration and management. VTP parameters are propagated throughout the VLANs within a single management domain. While you can have duplicate VLAN names in a network, each VLAN name within a management domain must be unique. A management domain is not device specific. Different devices may belong to the same management domain if the VLANs defined for the devices belong to the same management domain. Likewise, a device may belong to multiple management domains if the VLANs defined for the device belong to different management domains.

For more information about Token Ring VLANs, refer to the “Token Ring VLANs” section on page A-4 of the “Understanding Token Ring Switching” appendix.

To configure VLANs and the VTP for the Catalyst 3920, select **VLAN and VTP Configuration** on the Configuration Menu. The VLAN and VTP Configuration panel (Figure 5-5) is displayed.

Figure 5-5 VLAN and VTP Configuration Panel



The following options are displayed on this panel:

- **VTP Administrative Configuration**—Select this option to display the current VTP parameters. Refer to the “Viewing VTP Parameters” section on page 5-8 for more information.
- **VTP VLAN Configuration**—Select this option to define VLANs. Refer to the “Configuring VLANs” section on page 5-10 for more information.
- **Local VLAN Port Configuration**—Select this option to display a list of the VLAN port assignments. Refer to the “Displaying VLAN Port Assignments” section on page 5-17 for more information.

Viewing VTP Parameters

To view parameters for the VTP, select **VTP Administrative Configuration** on the VLAN and VTP Configuration panel. The VTP Administrative Configuration panel (Figure 5-6) is displayed.

Figure 5-6 VTP Administrative Configuration Panel



The following information is displayed on this panel:

- Domain Name—Name of the administrative domain the device is participating in (accepting updates from and propagating configuration changes to).
- Local Mode—VTP mode of the switch. Possible values are Server, Client, and Transparent. The default is Transparent.
 - Server mode permits configuration changes from the local device. All devices in Server mode must be capable of storing configurations for all the VLANs in the administrative domain. The switch will not allow the user to configure VLANs in excess of 63. If this number is exceeded, the switch will automatically enter Client mode.
 - Client mode accepts configuration changes only from other devices.
 - Transparent mode passes along any VTP packets received. Transparent mode also accepts and stores changes to the local VLAN configuration database, but does not propagate the changes to other devices.

Note To enable ring number learning for TrCRFs, the Local Mode must be set to Transparent (which is the default) and the Ring Number on the VTP VLAN Parameter Configuration for the TrCRF must be set to auto (which is the default). If you have set the Local Mode to Client or Server, you cannot set the Ring Number to auto.

- Domain Password—Password of up to 64 characters common to all devices in the administrative domain. Ensure that the domain password is the same for all devices within an administrative domain because a configuration will not pass between two devices with different passwords even if they are configured with the same administrative domain name.
- Domain Revision Number—Revision number of the current configuration database implemented on this device.

- Time of Last Revision Change—Time the revision of the current configuration database implement on this device was created.
- Last Updated By—IP address of the server where the revision of the current configuration database implemented on this device was created.

Configuring VLANs

You can define VLANs for the entire network from a single switch. The VLAN configuration is propagated to all switches in the same administrative domain using the VTP advertisement protocol. To define VLANs, select **VTP VLAN Configuration** on the VLAN and VTP Configuration panel. The VTP VLAN Configuration panel (Figure 5-7) is displayed. The panel lists the VLANs with respect to their parent-child relationships. Each TrBRF is followed by an indented list of the TrCRFs for which it is a parent. You can also sort the entries on the panel by VLAN ID. This is particularly useful when you are searching for a particular VLAN or when you want to add a VLAN and need to see the IDs that have already been assigned.

Note This panel displays all VLANs in the administrative domain regardless of whether they are a VLAN type that is supported by the Catalyst 3920.

Figure 5-7 VTP VLAN Configuration Panel

TrBRF/TrCRF	ID	Brdg/Rng	Ports	Local State
BRF100	100	0x0F		preferred
crf101	101	auto	yes	preferred
BRF200	200	0x0F		preferred
crf201	201	auto	yes	preferred
crf202	202	auto	no	preferred
BRF300	300	0x0F		preferred
crf301	301	auto	yes	preferred
crf302	302	auto	no	preferred
BRF400	400	0x0F		preferred
crf401	401	auto	yes	preferred
crf402	402	auto	no	preferred
crf403	403	auto	no	preferred
crf404	404	auto	no	preferred
BRF500	500	0x0F		preferred
crf501	501	0x01	yes	preferred

Return More View... Add... Change... Change_Local_State Delete Sort

Return to previous menu

The following information is displayed on this panel:

- TrBRF/TrCRF—ASCII name associated with the VLAN, which is synonymous with the VLAN’s emulated LAN name on LANE trunks.
- ID—Numeric VTP ID, which is synonymous with the VLAN’s ISL ID associated with the VLAN packets on ISL trunks.
- Brdg/Rng—Bridge number for TrBRFs or ring number for TrCRFs. The bridge and ring numbers are displayed in hexadecimal.

- Ports—For TrCRFs, whether or not ports have been associated.
- Local State—Indicates whether a VLAN (TrCRF or TrBRF) is used on the local switch. Possible values are not-local, preferred, and automatic.
 - Not-local indicates that the VLAN is not designated for use on the local switch.
 - Preferred indicates that the VLAN is designated for use on the local switch. A preferred VLAN is guaranteed access on the switch. Any TrCRF to which ports on the local switch are assigned is designated as preferred. In addition, you can designate other TrCRFs and TrBRFs as preferred using the `Change_Local_State` option. Up to 63 TrCRFs and 63 TrBRFs can be designated as preferred. By default, STP is enabled on preferred VLANs.
 - Automatic indicates that the VLAN can be used on the local switch if access is available. An automatic VLAN is not guaranteed access on the switch. Automatic VLANs are given access as space is available (if less than 63 VLANs have been designated as preferred).

When setting the local state for a VLAN, keep the following in mind:

- New TrBRFs are assigned a local state of not-local.
- If you add a TrCRF to a TrBRF with a local state of not-local, the TrCRF is assigned a local state of not-local.
- If you add a TrCRF to a TrBRF with a local state of preferred, the TrCRF is assigned a local state of automatic.
- If you add a TrCRF to the preferred list and the parent TrBRF is not already designated as preferred, the local state of the parent TrBRF will also be changed to preferred.
- If you add a TrBRF to the preferred list and its children have a local state of not-local, the local state of the children will be changed to automatic.
- If you add a TrBRF to the preferred list, STP is on by default.
- You cannot change the state of any TrBRF that contains a TrCRF in the preferred state.
- You cannot change the state of any TrCRF to which ports are assigned.
- If you remove a TrBRF from the preferred list, the local state will be changed to not-local.
- If you remove a TrCRF from the preferred list, the local state will be changed to automatic (if there are less than 63 TrCRFs that have been granted access through the switch) or not-local.

To	Select	Then
View the current configuration of a VLAN, including a list of associated ports for a TrCRF...	View	Specify the VLAN ID.
Add a new TrBRF VLAN configuration...	Add	Specify the VLAN ID. Select TrBRF . Refer to the “Adding or Changing TrBRF VLAN Parameters” section on page 5-12.
Add a new TrCRF VLAN configuration...	Add	Specify the VLAN ID. Select TrCRF . Refer to the “Adding or Changing TrCRF VLAN Parameters” section on page 5-13.
Change an existing TrBRF VLAN configuration...	Change	Specify the VLAN ID and refer to the “Adding or Changing TrBRF VLAN Parameters” section on page 5-12.

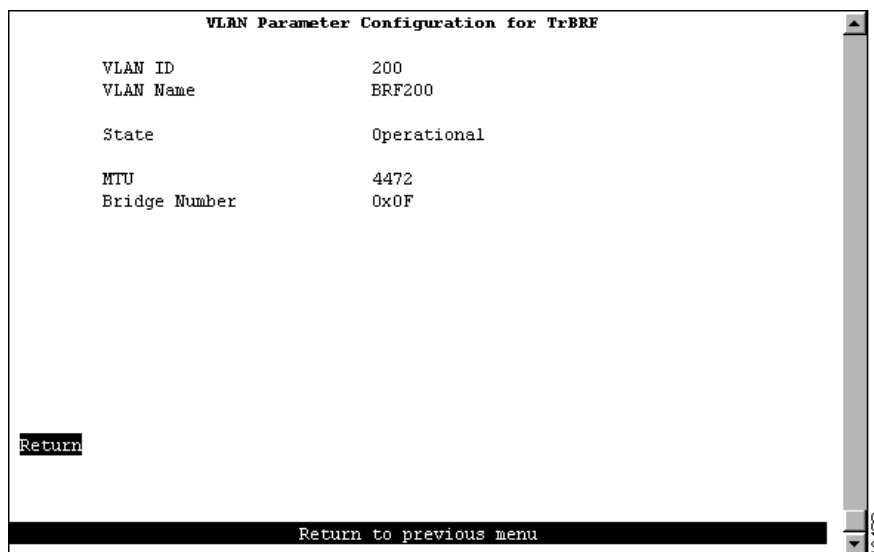
To	Select	Then
Change an existing TrCRF VLAN configuration...	Change	Specify the VLAN ID and refer to the “Adding or Changing TrCRF VLAN Parameters” section on page 5-13.
Add or remove a TrBRF or TrCRF from the list of preferred VLANs...	Change_Local_State	Specify the VLAN ID and confirm your request to add or remove the VLAN from the preferred list. Then, press any key to refresh the panel.
Delete a VLAN...	Delete	Specify the VLAN ID.
Display a list of VLANs sorted by VLAN ID...	Sort	Select Sort_by_VLAN_ID .
Save your changes...	Return	

Note The VLAN with the VLAN name of “default” is an Ethernet VLAN and is the VLAN that will be used to transmit information for Cisco proprietary protocols, such as VTP and CDP.

Adding or Changing TrBRF VLAN Parameters

To add a new TrBRF, select **Add** on the VTP VLAN Configuration panel, enter the VLAN ID (2 through 1001) and select TrBRF. To change the definition of an existing TrBRF, select **Change** on the VTP VLAN Configuration panel and specify the VLAN ID. In either case, the VLAN Parameter Configuration for TrBRF panel (Figure 5-8) is displayed.

Figure 5-8 VLAN Parameter Configuration for TrBRF Panel



The following information is displayed on this panel:

- VLAN ID—Numeric VTP ID, which is synonymous with the VLAN’s ISL ID associated with the VLANs packets on ISL trunks. For a TrBRF, possible values are 2 through 1001, and 1005 (the default).
- VLAN Name—ASCII name associated with the TrBRF. Up to 32 characters are allowed.

- **State**—Current state of the TrBRF. The possible values for the State of a TrBRF are Operational and Suspended. By default, all VLANs are Operational. You can change the states for TrBRFs and TrCRFs only. Consider the following information when changing the state of a TrBRF:
 - If you change the state of a TrBRF to Suspended, the state of any associated TrCRFs will also be changed to Suspended.
 - If you change the state of a TrBRF to Operational, the state of any associated TrCRFs will also be changed to Operational. This will cause all the ports associated with the TrBRF to begin forwarding traffic.
- **MTU**—Maximum transmission unit of the TrBRF. Possible values are 1500 through 18190. The default is 4472.

Note If you reduce the MTU for a TrBRF to a value that is less than the MTU currently configured for the individual ports in the TrBRF, the MTU for the ports will automatically be reduced to a value (1500, 4472, 8144, or 17800) that is less than that specified for the TrBRF.

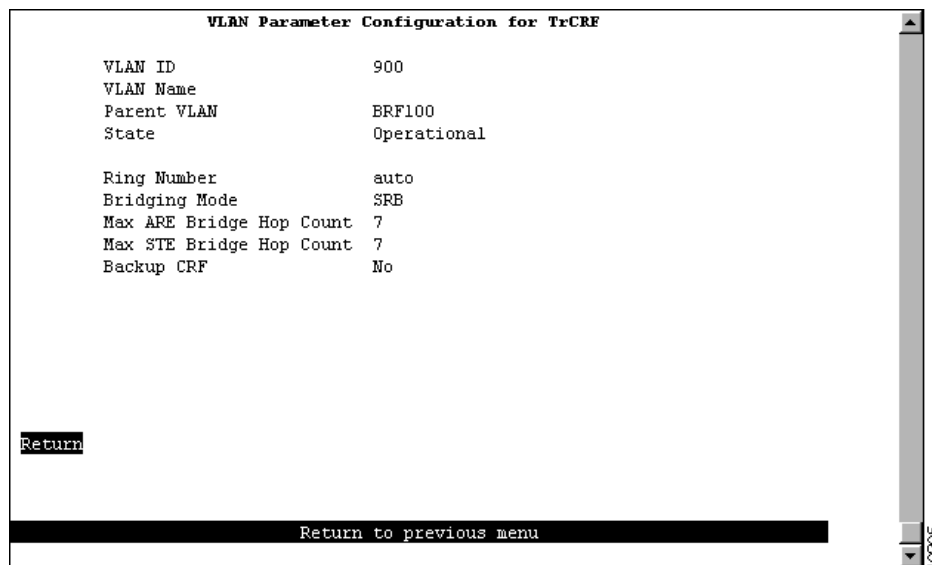
- **Bridge Number**—Source-routing bridge number (in hexadecimal format) for this TrBRF. Possible values are 00 through 0F. The default is 0F.

Adding or Changing TrCRF VLAN Parameters

To add a new TrCRF, select **Add** on the VTP VLAN Configuration panel, enter the VLAN ID (2 through 1001) and select TrCRF. To change the definition of an existing TrCRF, select **Change** on the VTP VLAN Configuration panel and specify the VLAN ID. In either case, the VLAN Parameter Configuration for TrCRF panel (Figure 5-9) is displayed.

Note If you select **View** on the VTP VLAN Configuration panel and specify the VLAN ID of a TrCRF, this panel also displays a list of the ports assigned to the specified TrCRF.

Figure 5-9 VLAN Parameter Configuration for TrCRF Panel



The following information is displayed on this panel:

- VLAN ID—Numeric VTP ID, which is synonymous with the VLAN’s ISL ID associated with the VLANs packets on ISL trunks. For a TrCRF, possible values are 2 through 1001, and 1003 (the default).
- VLAN Name—ASCII name associated with the TrCRF, which is synonymous with the emulated LAN name on LANE trunks. Up to 32 characters are allowed.
- State—Current state of the TrCRF. The possible values for the state of a TrCRF are Operational and Suspended. By default, all VLANs are Operational. You can change the states for TrBRFs and TrCRFs only. Consider the following when changing the state of a TrCRF:
 - You cannot change the state of a TrCRF to which ports are assigned.
 - If you change the state of a TrCRF to Suspended or if the state is changed as a result of a change in the state of the parent TrBRF, any traffic (including BPDUs) that is received by ports assigned to the TrCRF will be discarded.
 - If you change the state of a TrCRF to Operational, the state of the parent TrBRF will automatically be changed to Operational as well. The state of any other TrCRFs associated with the parent TrBRFs will remain unchanged.
 - The fact that a VLAN is operational does not mean that you can assign spanning-tree parameters to it. You can assign certain parameters, such as IP and spanning-tree parameters, to only those TrCRFs for which ports have been assigned. And you can assign ports to only those TrCRFs that have been configured for the local switch.
- Parent VLAN—TrBRF to which this TrCRF belongs.
- Ring Number—Logical ring number (in hexadecimal format) assigned to this TrCRF. Possible values are auto and 01 through FFF. The default is auto, meaning that the ring number will be learned. If the ring number has been learned, the ring number displays in the format A-xxx.

Note To enable ring number learning for TrCRFs, the Local Mode must be set to Transparent (which is the default) and the Ring Number on the VTP VLAN Parameter Configuration for the TrCRF must be set to auto (which is the default). If you have set the Local Mode to Client or Server, you cannot set the Ring Number to auto. If the default TrCRF is the only TrCRF for which the ring number is set to auto, the ring number is automatically learned. If the ring number is not learned, it is set to 0xCCC.



Caution If the ports of the TrCRF VLAN are connected to a ring that contains only workstations, the port will be unable to learn the ring number. In this case, you must configure the ring number.

- Bridging Mode—Bridging mode for this TrCRF. Possible values are SRB and SRT. The default is SRB.
- Max ARE Bridge Hop Count—Maximum number of hops for all-routes explorer (ARE) frames. Possible values are 1 through 13. The default is 7.
- Max STE Bridge Hop Count—Maximum number of hops for spanning-tree (STE) frames. Possible values are 1 through 13. The default is 7.
- Backup CRF—Whether the TrCRF is to be used as a backup TrCRF. Possible values are No and Yes. The default is No. For more information about backup TrCRFs, see the *Catalyst 3900 Token Ring Inter-Switch Link Module Configuration Note*.

Changing Ethernet VLAN Parameters

To change the definition of the default Ethernet VLAN, select **Change** on the VTP VLAN Configuration panel and specify the VLAN ID. The VLAN Parameter Configuration for Ethernet panel (Figure 5-10) is displayed. You can change the values of the security association identifier, MTU, and the translationally bridged VLANs only.

Figure 5-10 VLAN Parameter Configuration for Ethernet Panel

VLAN Parameter Configuration for Ethernet	
VLAN ID	1
VLAN Name	default
State	Operational
MTU	1500
SAID	100001
TB VLAN 1	1002
TB VLAN 2	1003

Return

Return to previous menu

The following information is displayed on this panel:

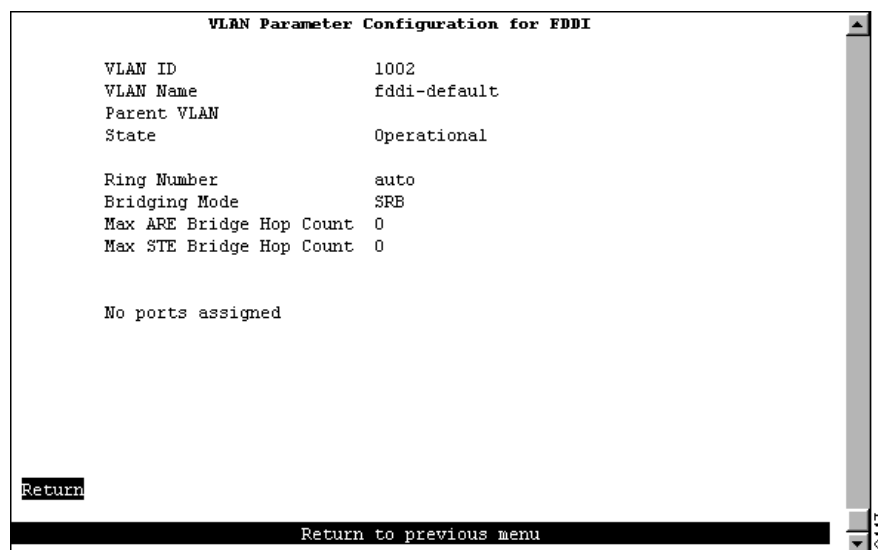
- VLAN ID—Numeric VTP ID, which is synonymous with the VLAN's ISL ID associated with the VLANs packets on ISL trunks.
- VLAN Name—ASCII name associated with the VLAN, which is synonymous with the VLAN's emulated LAN name on LANE trunks.
- State—Current state of the VLAN. Possible values are Operational and Suspended. VLANs in operational state are functional. VLANs in suspended state do not pass packets.
- MTU—Maximum transmission unit of the VLAN.
- SAID—Security association identifier. Possible values are 1 through 2147483647. The default is 100100.
- TB VLAN 1—ID of a VLAN that is translationally bridged to this VLAN. Possible values are 0 through 1005.
- TB VLAN2—ID of a VLAN that is translationally bridged to this VLAN. Possible values are 0 through 1005.

Viewing FDDI and FDDI-Net VLAN Parameters

Although you cannot configure or modify a FDDI and FDDI-Net VLAN from the Catalyst 3900, you can view the definitions of FDDI and FDDI-Net VLANs that exist in your VTP administrative domain.

To view the definition of an existing FDDI or FDDI-Net VLAN, select **View** on the VTP VLAN Configuration panel and specify the VLAN ID. The VLAN Parameter Configuration for FDDI (or the VLAN Parameter Configuration for FDDI-Net) panel (Figure 5-11) is displayed.

Figure 5-11 VLAN Parameter Configuration for FDDI Panel



The following information is displayed on this panel:

- **VLAN ID**—Numeric VTP ID, which is synonymous with the VLAN’s ISL ID associated with the VLANs packets on ISL trunks. Possible values are 2 through 1001, 1002 (the default for FDDI), and 1004 (the default for FDDI-net).
- **VLAN Name**—ASCII name associated with the VLAN. Up to 32 characters are allowed.
- **State**—Current state of the VLAN. Possible values are Operational and Suspended. VLANs in operational state are functional. VLANs in suspended state do not pass packets. The default is Operational.

FDDI VLANs

If the VLAN type is FDDI, the following additional information is displayed for FDDI VLANs:

- **Parent VLAN**—FDDI-Net to which this VLAN belongs.
- **Ring Number**—Logical ring number (in hexadecimal format) assigned to this VLAN. Possible values are auto and 01 through FFF. The default is auto, meaning that the ring number will be learned. If the ring number has been learned, the ring number displays in the format A-xxx.
- **Bridging Mode**—Bridging mode for this VLAN. Possible values are SRB and SRT. The default is SRB.
- **Max ARE Bridge Hop Count**—Maximum number of hops for ARE frames. Possible values are 1 through 13. The default is 7.
- **Max STE Bridge Hop Count**—Maximum number of hops for STE frames. Possible values are 1 through 13. The default is 7.

FDDI-Net VLANs

If the VLAN type is FDDI-Net, the following additional information is displayed for FDDI-Net VLANs:

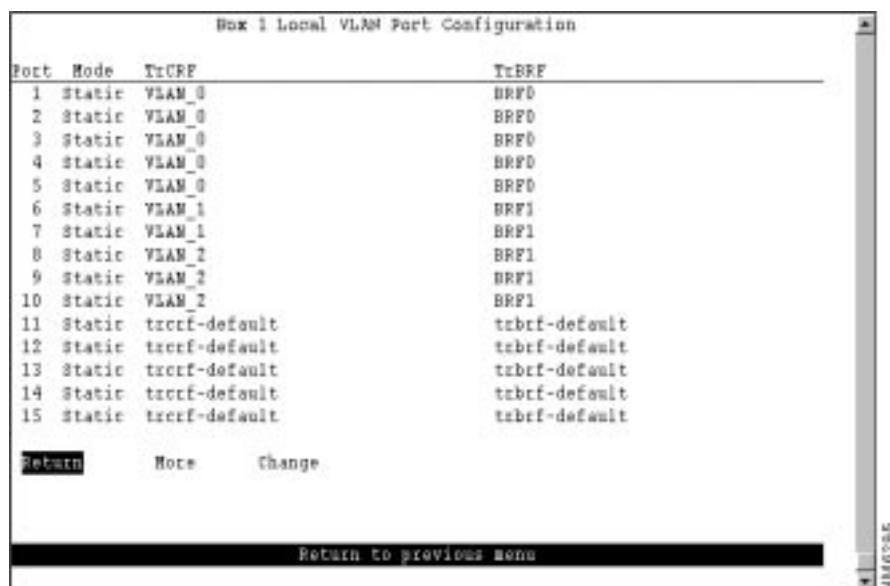
- **MTU**—Maximum transmission unit of the VLAN. Possible values are 1500 through 18190.
- **Bridge Number**—Source-route bridging number (in hexadecimal format) for this bridge. Possible values are 00 through 0F.

Displaying VLAN Port Assignments

To display a list of the VLAN port assignments, select **Local VLAN Port Configuration** on the VLAN and VTP Configuration panel. The Local VLAN Port Configuration panel (Figure 5-12) is displayed.

Note A port that is configured as a SPAN port cannot be assigned to a TrCRF until the SPAN port feature is disabled for that port. For information about disabling the SPAN feature from a port, refer to the “Monitoring Port Traffic” section on page 5-34.

Figure 5-12 Local VLAN Port Configuration Panel



This panel displays the following information about the VLAN port assignments:

- Port—Port number.
- Mode—VLAN mode of the port. Possible values are Static and Trunk.
- TrCRF—TrCRF to which the port is currently assigned. By default, all ports are assigned to trcrf-default.
- TrBRF—Parent VLAN of the TrCRF to which the port is currently assigned. The default is trbrf-default.

To	Select	Then
Change the TrCRF to which the port is assigned...	Change	Select the VLAN from the displayed list of TrCRFs.
Save your changes...	Return	

Configuring IP Information

To view or change IP information associated with a TrBRF, such as the IP address, subnet mask, or IP state, or to send PINGs, select **IP Configuration** on the Configuration Menu. The IP information that you can configure is associated with a TrBRF. Therefore, if the ports of the Catalyst 3920 are assigned to more than one TrBRF, when you select IP configuration you will be presented with a list of possible TrBRFs from which to choose. The IP Configuration panel (Figure 5-13) is displayed.

Figure 5-13 IP Configuration Panel



The following information is displayed on this panel:

- Interface MAC Address—MAC address of the switch.
- IP Address—Current IP address for the TrBRF. The default is 0.0.0.0.
- Default Gateway—Default gateway address. The default is 0.0.0.0.
- Subnet Mask—Current subnet mask. The default is 0.0.0.0.
- IP State—Current IP state. The default for the default TrBRF (trbrf-default) is “BootP When Needed”. The default for all other TrBRFs is “IP Disabled”.
 - IP Disabled—Domain will not process any IP or Address Resolution Protocol (ARP) frames it receives. It will not respond to SNMP, PING, Telnet, or ARP frames that are received.
 - BootP When Needed—If the IP address is zero (0.0.0.0), BootP requests will be broadcast by the Catalyst 3920 in an effort to learn its IP address. All other IP functions are disabled until it receives a reply. If a nonzero IP address has been configured (and stored in NVRAM), IP is enabled for the domain and will function immediately.
 - BootP Always—IP is enabled for the domain, but will not function until a BOOTP reply is received. If a nonzero IP address for the domain is stored in NVRAM, it will be cleared to zero when the Catalyst 3920 is booted.

When you select either of the BootP options for the IP state, the Catalyst 3920 repeats BootP requests at regular intervals, beginning at 1 second intervals and eventually decreasing to 5 minute intervals until it has received a valid response.

The following BootP response parameters are recognized and recorded in NVRAM:

- IP Address
- Default Gateway
- Subnet Mask
- TFTP Bootfile Name
- TFTP Server Address

The BootP requests will also cease if a valid IP address is configured via the console panels or if the IP state is set to IP Disabled. Once the Catalyst 3920 stops sending BootP requests on a domain, it does not resume sending requests or recognize BootP responses on that domain unless the Catalyst 3920 is reset.

For more information about BootP, refer to the “Understanding BootP” appendix.

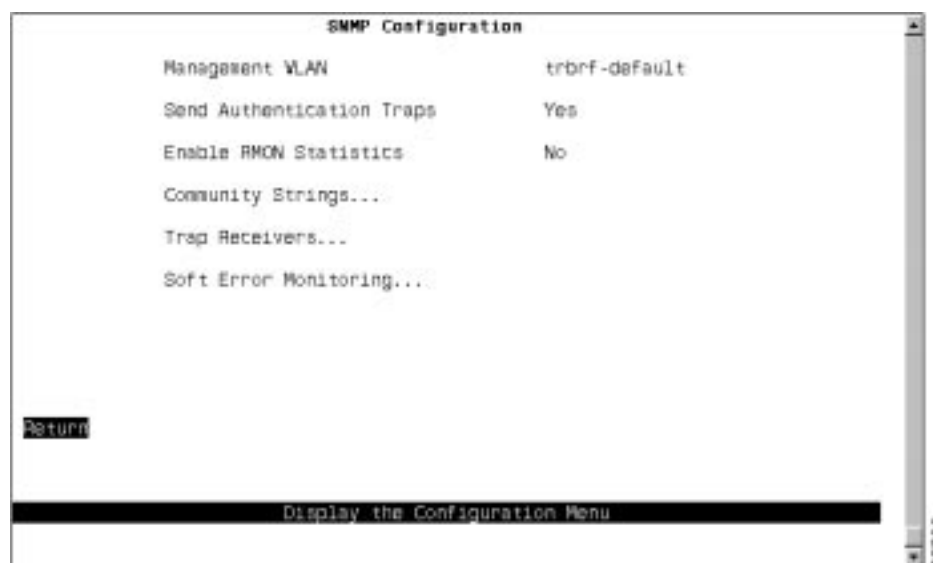
To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the value.
Verify the network availability of a particular resource...	Send PING	Specify the IP address of the resource.
Save your changes...	Return	

Note IP addresses are always entered in dotted-decimal notation (a set of 4 decimal numbers from 0 through 255 separated by periods). The default is 0.0.0.0. If the default is used, no SNMP management will be available until the switch learns its address.

Configuring SNMP Parameters

To allow the Catalyst 3920 to be managed by an SNMP manager, you must first configure the SNMP parameters. To view or set SNMP parameters, such as the community names, where traps are to be sent, and whether authentication failure traps should be sent, select **SNMP Configuration** on the Configuration Menu. The SNMP Configuration panel (Figure 5-14) is displayed.

Figure 5-14 SNMP Configuration Panel



The following information is displayed on this panel:

- Management VLAN—TrBRF used for network management functions.
- Send Authentication Traps—Indicates whether an authentication trap should be issued to Trap Receivers whenever authentication of an SNMP request fails. Traps indicating cold and warm boots are always sent. Possible values are Yes and No. The default is Yes.
- Enable RMON statistics—Enables the gathering of a subset of the RMON statistics from the RMON MIB (if you have requested the RMON option). Possible values are Yes and No. Changes to this field are effective after the switch is reset. The default is No. The following statistics are collected:
 - Token Ring Statistics
 - History
 - Events
 - Alarms

After modifying this parameter, the switch must be rebooted for the changes to take effect.

To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the value.
View or change SNMP community names and privileges...	Community Strings	Refer to the “Specifying Community Names” section on page 5-21.
View or change which SNMP managers are to receive traps for which domains...	Trap Receivers	Refer to the “Specifying Trap Receivers” section on page 5-22.
View or change the soft error monitoring configuration for the ports on the switch...	Soft Error Monitoring	Refer to the “Configuring Soft Error Monitoring” section on page 5-24.
Save your changes...	Return	

Specifying Community Names

A *community name* is a password that a set of SNMP managers use to manage a specified device. Each community name is associated with a specific privilege level of management. To view or change the community names for the domains of the Catalyst 3920, select **Community Strings** on the SNMP Configuration panel. The Community Strings panel (Figure 5-15) is displayed.

Figure 5-15 Community Strings Panel



The following information is displayed on this panel:

- Index—Identifier of the community name entry.
- Community Name—Name, or password, used to identify the SNMP managers.
- Mode—The privilege level assigned to this name. Read specifies that SNMP managers can only view SNMP information. Read/Write specifies that SNMP managers can both view and change SNMP information.

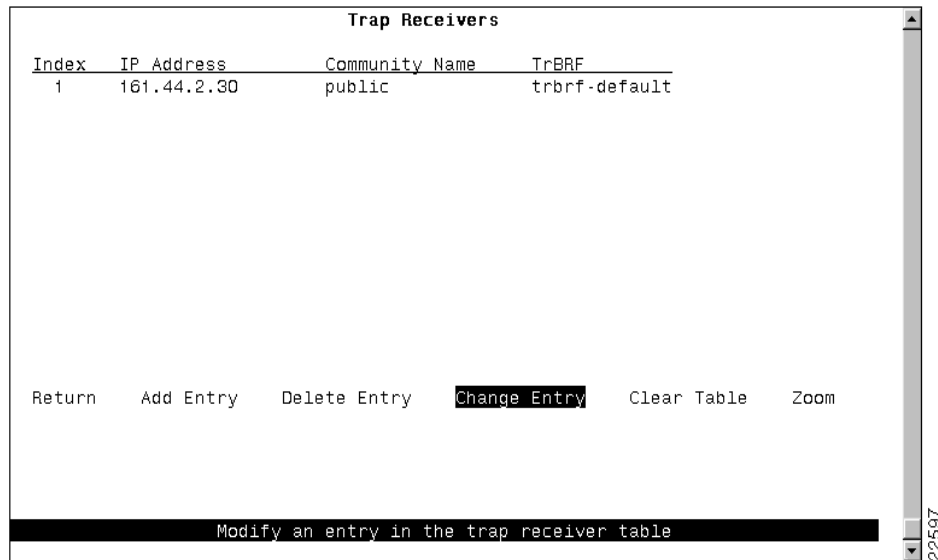
Entries are displayed in the order in which they are entered. Only five community names can be entered.

To	Select	Then
Add a community name...	Add Entry	Specify the community name and privilege.
Delete a community name...	Delete Entry	Specify the name to be deleted.
Change a community name or privilege...	Change Entry	Specify the index number of the entry to be changed and enter the new information.
Delete all community names...	Clear Table	
Save your changes...	Return	

Specifying Trap Receivers

To view or change the list of SNMP managers to which traps are sent, select **Trap Receivers** on the SNMP Configuration panel. The Trap Receivers panel (Figure 5-16) is displayed.

Figure 5-16 Trap Receivers Panel



The following information is displayed on this panel:

- Index—User-defined identifier of the trap receivers entry. Possible values are 1 through 65535.
- IP Address—IP address of the SNMP manager.
- Community Name—Name used to identify the SNMP managers.
- TrBRF—VLANs for which traps are sent to the specified SNMP manager.

The trap receivers list can contain a maximum of 10 entries.

The SNMP Trap Receivers information that you can configure is associated with a TrBRF. Therefore, if the ports of the Catalyst 3920 are assigned to more than one TrBRF and you select **Add Entry** or **Change Entry** on the Trap Receivers panel, after specifying the community name, you will be presented with a list of possible TrBRFs from which to choose.

To	Select	Then
Add an entry to the list...	Add Entry	Specify the IP address, community name, and TrBRF.
Delete an entry...	Delete Entry	Specify the index number of the entry to be deleted.
Change an entry in the list...	Change Entry	Specify the index number of the entry to be changed and enter the new information.
Delete all entries...	Clear Table	
Display the complete list of TrBRFs assigned to an IP address...	Zoom	Specify the index number.
Save your changes...	Return	

Configuring Soft Error Monitoring

To view or change the soft error monitoring configuration for a port, select **Soft Error Monitoring** on the SNMP Configuration panel. The Soft Error Monitoring panel is displayed (Figure 5-17).

Note Enabling soft error monitoring for a port without enabling RMON statistics restricts the soft error monitoring functions available via SNMP.

Figure 5-17 Soft Error Monitoring Panel

Port	Ena/Dis	Error Threshold	Timer Interval
1	Enabled	100	60
2	Enabled	100	60
3	Enabled	100	60
4	Enabled	100	60
5	Enabled	100	60
6	Enabled	100	60
7	Enabled	100	60
8	Disabled	100	60
9	Disabled	100	60
10	Disabled	100	60
11	Disabled	100	60
12	Disabled	100	60
13	Disabled	100	60
14	Disabled	100	60
15	Disabled	100	60

Return More **Change**

Change the threshold and interval for one or more ports

The following information is displayed on this panel:

- Port—Port number.
- Ena/Dis—Indicates whether the collection of soft error statistics is enabled or disabled on the port.
- Error Threshold—Number of soft errors reported from a station connected to this port that if exceeded causes a soft error exceeded trap to be issued. Possible values are 1 to 255. The default is 100.
- Timer Interval—Sampling period (in seconds) during which the number of soft errors is monitored for each station connected to this port. Possible values are 0 to 65535. The default is 60.

To	Select	Then
Change the soft error monitoring configuration for a port or ports in the list...	Change	Specify the port or port list to be changed and enter the new information as prompted. Enter the port, range of ports, or both and separate by spaces or commas. When entering a range of ports, enter the lowest port first and separate with a hyphen (for example, 8-16). To enter all ports on a switch, type an asterisk (*).
Save your changes...	Return	

Configuring Spanning-Tree Parameters

Enabling the Catalyst 3920 to participate in a spanning tree allows you to configure redundant (backup) paths in the switch topology and have the switch automatically disable redundant paths to prevent loops. If an active path is broken and a backup path is available, the switch will locate the redundant path and enable it. Without a spanning tree, a path failure means the loss of connectivity for the affected part of the network. By default, Spanning Tree Protocol (STP) is enabled on all preferred VLANs.

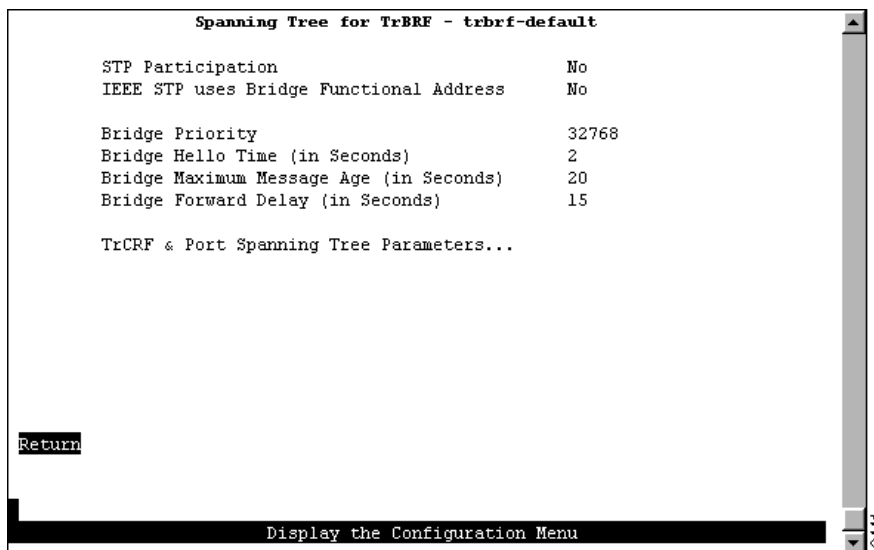
For more information about spanning tree, refer to the “Spanning-Tree Protocol” section on page A-7 of the “Understanding Token Ring Switching” appendix.

To view or change the spanning-tree parameters associated with a VLAN, such as the switch priority and the port path cost, select **Spanning Tree** on the Configuration Menu and then select the desired TrBRF. The Spanning Tree for TrBRF panel (Figure 5-18) is displayed.

When you configure spanning-tree parameters for a TrBRF, you:

- Use the STP Participation field on the Spanning Tree for TrBRF panel to specify whether the TrBRF is to participate in a spanning tree and, if so, which STP is to be used.
- Use the STP Mode field on the Spanning Tree for TrCRF panel to specify the forwarding state of each logical port in the TrBRF. The forwarding state can be forwarding, blocked, or auto. For a mode of auto, the forwarding state is determined by the STP.

Figure 5-18 Spanning Tree for TrBRF Panel



The following information is displayed on this panel:

- STP Participation—Indicates whether this TrBRF participates in the STP and, if so, the protocol to be used. Possible values are No, IEEE, IBM, and Base on Bridging Mode. The default is IBM.
 - If STP participation is set to no, then all TrCRFs with this TrBRF as a parent will be set to forwarding mode.
 - If STP participation is set to IEEE or IBM, then the selected protocol will be used to determine the forwarding/blocked mode of the TrCRFs that are configured with an STP mode of auto.
 - If STP participation is set to base on bridging mode, then the STP used is based on the bridging mode of the TrCRF. If the bridging mode is SRB, the IBM STP is used. If the bridging mode is SRT, the IEEE 802.1d STP is used.

Note You can create your own spanning tree by setting the STP Participation to no and manually controlling the forwarding state of each logical and physical port using the STP Mode fields. However, if you then decide to use one of the standard STPs and change the STP Participation to a value other than no, you must set the STP Mode for each port to auto. The Catalyst 3920 will not automatically change the forwarding mode of related ports when you change the STP Participation from no to one of the STPs.

- IEEE STP uses Bridge Functional Address—Indicates whether to use the bridge functional address instead of the IEEE STP address when the TrBRF is configured to use the IEEE STP.
- Bridge Priority—Priority value for this Catalyst 3920 (0 through 65535). The lower the priority value, the higher the priority. The bridge or switch with the lowest priority value in a spanning tree becomes the root. The default is 32768.
- Bridge Hello Time (in Seconds)—Time the Catalyst 3920 waits before sending the next configuration message when this Catalyst 3920 is the root switch. The minimum value is 1. The maximum value is the lower of 10 or (Switch Maximum Message Age ÷ 2) – 1. The default is 2. The valid range for this parameter is displayed when you select Switch Hello Time.

- **Bridge Maximum Message Age (in Seconds)**—Maximum message age used when this Catalyst 3920 is the root switch. This parameter sets the time at which the configuration message used by the spanning-tree algorithm should be discarded. The minimum value is the higher of 6 or 2 x (Switch Hello Time + 1). For IEEE STP, the default is 20.

The maximum cannot be more than the lower of 40 or 2 x (Switch Forward Delay – 1).

The range limits that appear when you select this parameter are calculated using the values currently selected for Switch Hello Time and Switch Forward Delay.

- **Bridge Forward Delay (in Seconds)**—Time the Catalyst 3920 waits between transitions from listening to learning and from learning to forwarding. The minimum is the larger of 4 or (Switch Maximum Message Age ÷ 2) + 1. For IEEE STP, the default is 15. The maximum is 30.

The lower range limit that appears when you select this parameter reflects the value currently selected for Switch Maximum Age.

To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the value.
View or change the spanning-tree parameters for one of the TrCRFs associated with this TrBRF...	TrCRF & Port Spanning Tree Parameters	Refer to the “Changing Spanning-Tree Parameters for a TrCRF” section on page 5-27.
Save your changes...	Return	

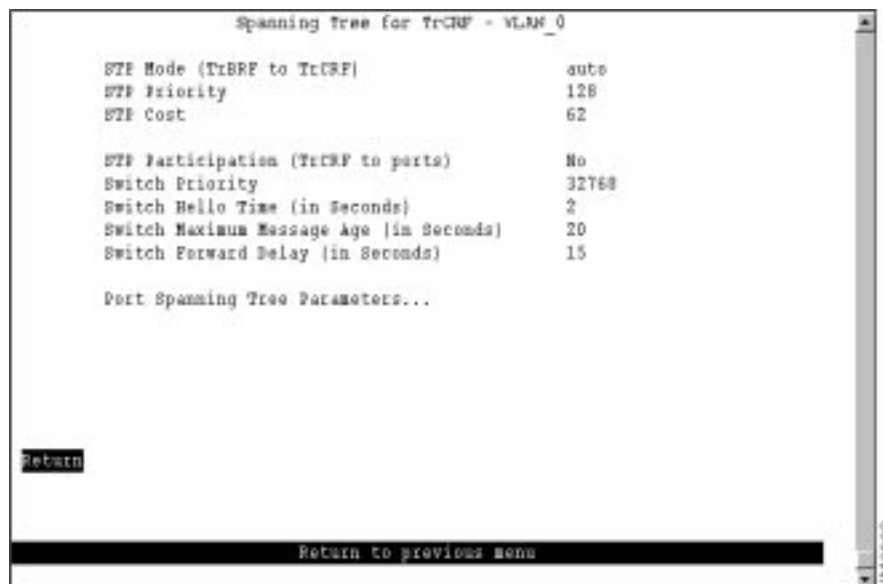
Changing Spanning-Tree Parameters for a TrCRF

To view or change the spanning-tree parameters for a TrCRF associated with the selected TrBRF, select **TrCRF & Port Spanning Tree Parameters** on the Spanning Tree panel and then select the desired TrCRF. The Spanning Tree for TrCRF panel (Figure 5-19) is displayed.

When you configure the spanning-tree parameters for a TrCRF, you:

- Use the STP Participation field on the Spanning Tree for TrCRF panel to specify whether the TrCRF is to participate in a spanning tree and, if so, which STP is to be used.
- Use the STP Mode field on the Port Spanning Tree Parameters panel to specify the forwarding state of each physical port in the TrCRF. The forwarding state can be forwarding, blocked, or auto. For a mode of auto, the forwarding state is determined by the STP.

Figure 5-19 Spanning Tree for TrCRF Panel



The following information is displayed on this panel:

- **STP Mode (TrBRF to TrCRF)**—Determines the mode of the link from this TrCRF to its TrBRF. Possible values are auto, blocked, forwarding, and auto-fast. If the parent TrBRF is participating in spanning tree, then auto is the default. If the TrBRF is not participating in spanning tree, then forwarding is the default. When in auto-fast mode, a TrCRF cycles through spanning tree states when a port state change causes it transition from blocking to forwarding state.
- **STP Priority**—Priority associated with the TrCRF. The VLAN with the lowest priority value has the highest priority and will forward the spanning-tree frames. The possible range is 0 through 255 (decimal). The default is 128. If all VLANs have the same priority value, the lowest VLAN ID forwards the spanning-tree frames. This is the port priority of the internal logical port that connects the TrCRF to its parent TrBRF. This value is used by the TrBRF only if the TrBRF and the TrCRF are both running the IEEE protocol.
- **STP Cost**—Cost associated with the TrCRF. The STP uses path costs to determine which VLAN to select as a forwarding VLAN. Therefore, lower numbers should be assigned to VLANs that use faster media (such as FDX or TokenChannel), and higher numbers should be assigned to VLANs that use slower media. The possible range is 1 to 65535. The default is 62. A rule of thumb for the path cost is $1000 \div \text{LAN speed in megabits per second}$.
- **STP Participation (TrCRF to ports)**—Indicates whether this TrCRF participates in the STP and, if so, the protocol to be used. Possible values are No, IEEE, Cisco, and Base on Bridging Mode. The default is Base on Bridging Mode. The Cisco STP is based on IEEE 802.1d, however, the bridge protocol data unit (BPDU) messages are sent to a different functional address.
 - If STP Participation is set to no, then all ports belonging to this TrCRF will be set to forwarding mode.
 - If STP Participation is set to IEEE or Cisco, then the selected protocol will be used to determine the forwarding/blocking mode of the ports that are configured with an STP mode of auto.
 - If the STP Participation is set to Base on Bridging Mode, then the STP used is based on the bridging mode of the TrCRF. If the bridging mode is SRB, the IEEE STP is used. If the bridging mode is SRT, the Cisco STP is used.

Note You can create your own spanning tree by setting the STP Participation to no and manually controlling the forwarding state of each logical and physical port using the STP Mode fields. However, if you then decide to use one of the standard STPs and change the STP Participation to a value other than no, you must set the STP Mode for each port to auto. The Catalyst 3920 will not automatically change the forwarding mode of related ports when you change the STP Participation from no to one of the STPs.

- **Switch Priority**—Priority associated with this Catalyst 3920 (0 through 65535). The lower the priority value, the higher the priority. The bridge or switch with the lowest priority value in a spanning tree becomes the root. The default is 32768. This value is used in the priority field of the Bridge ID used by the TrCRF in the STP at TrCRF level.

To change individual port properties, select **Port Spanning Tree Parameters**.

- **Switch Hello Time (in Seconds)**—Time the Catalyst 3920 waits before sending the next configuration message when this Catalyst 3920 is the root switch. The minimum value is 1. The maximum value is the lower of 10 or (Switch Maximum Message Age ÷ 2) – 1. The default is 2.

The valid range for this parameter is displayed when you select Switch Hello Time.

- **Switch Maximum Message Age (in Seconds)**—Maximum message age used when this Catalyst 3920 is the root switch. This parameter sets the time at which the configuration message used by the spanning-tree algorithm should be discarded. The minimum value is the higher of 6 or 2 x (Switch Hello Time + 1). For IEEE STP, the default is 20. For IBM STP, the default is 10.

The maximum cannot be more than the lower of 40 or 2 x (Switch Forward Delay – 1).

The range limits that appear when you select this parameter are calculated using the values currently selected for Switch Hello Time and Switch Forward Delay.

- **Switch Forward Delay (in Seconds)**—Time the Catalyst 3920 waits between transitions from listening to learning and from learning to forwarding. The minimum is the larger of 4 or (Switch Maximum Message Age ÷ 2) + 1. For IEEE STP, the default is 15. For IBM STP, the default is 6. The maximum is 30.

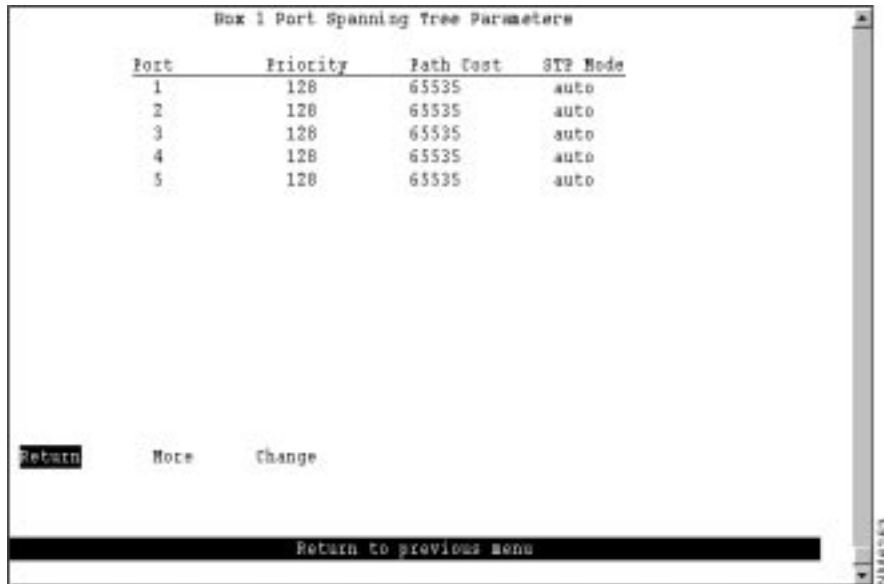
The lower range limit that appears when you select this parameter reflects the value currently selected for Switch Maximum Age.

To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the value.
View or change the spanning-tree parameters for the ports that belong to this TrCRF..	Port Spanning Tree Parameters	Refer to the “Changing Spanning-Tree Parameters for a Port” section on page 5-29.
Save your changes...	Return	

Changing Spanning-Tree Parameters for a Port

To view or change the priority, path cost, and spanning-tree mode of a port, select **Port Spanning Tree Parameters** on the Spanning Tree panel. The Port Spanning Tree Parameters panel (Figure 5-20) is displayed.

Figure 5-20 Port Spanning Tree Parameters Panel



The following information is displayed on this panel:

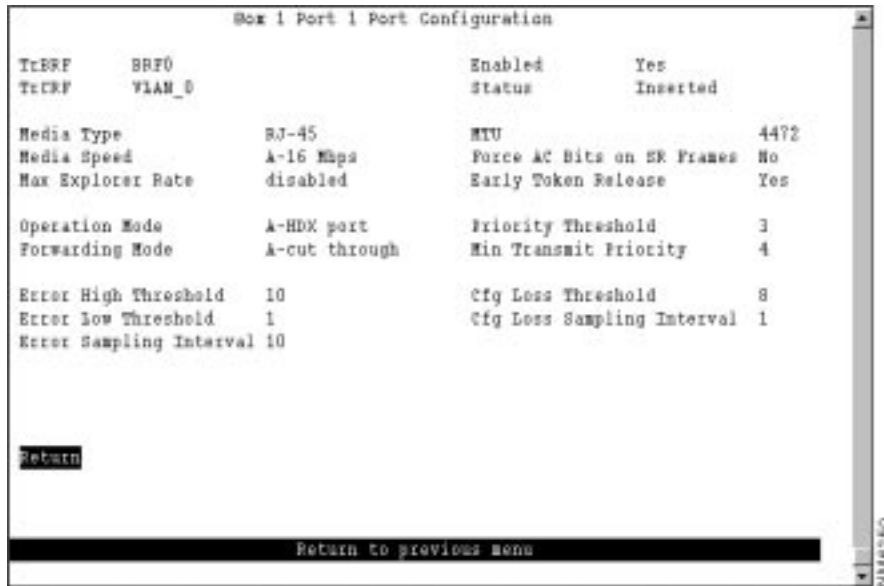
- Port—Identifier of the port.
- Priority—Priority associated with the port. The port with the lowest priority value has the highest priority and will forward the spanning-tree frames. The possible range is 0 through 255 (decimal). The default is 128. If all ports have the same priority value, the lowest port number forwards the spanning-tree frames.
- Path Cost—Cost associated with the port. The STP uses port path costs to determine which port to select as a forwarding port. Therefore, lower numbers should be assigned to ports attached to faster media (such as FDX or TokenChannel), and higher numbers should be assigned to ports attached to slower media. The possible range is 1 to 65535. The default is 62. A rule of thumb for path cost is $1000 \div \text{LAN speed in megabits per second}$.
- STP Mode—Port’s spanning-tree mode. Possible values are forwarding, blocked, and auto. If the TrCRF to which the port belongs is participating in the spanning tree (Cisco or IEEE), then auto is the default and the selected protocol will be used to determine whether the port is forwarding or blocked. If the TrCRF to which the port belongs is not participating in the spanning tree, then forwarding is the default.

To	Select	Then
Change a parameter associated with a port...	Change	Specify the port number, select the appropriate parameter, and then specify the new value.
Save your changes...	Return	

Configuring Port Parameters

To view or change the configuration parameters of a port such as the mode, type, and speed, select **Port Configuration** on the Configuration Menu and specify the port number. The Port Configuration panel (Figure 5-21) is displayed.

Figure 5-21 Port Configuration Panel



The following information is displayed on this panel:

- **TrBRF**—TrBRF that is the parent of the TrCRF to which the port is assigned.
- **TrCRF**—TrCRF to which this port is assigned. A value of None indicates that the port is configured as a SPAN port or was previously configured as a SPAN port and left unassigned to a TrCRF when the SPAN port feature was disabled.
- **Enabled**—Indicates whether the port is currently enabled. Possible values are Yes (to enable) and No (to disable). The default is Yes. If a port has been disabled by the Catalyst 3920 software, this field displays No (auto-disabled). To manually enable the port, select this field and then select **Yes**.
- **Status**—Current status of the port. Possible values are Inserted, Not Inserted, Wire Fault, Lobe Test Fail, HDX Frame Error, Heart Beat Fail, FDX New Station, FDX Prot Error, Speed Error, Remove Received.
- **Media Type**—Media type. The only possible value is RJ-45.
- **Media Speed**—Token Ring media speed. Possible values are 4 Mbps, 16 Mbps, and auto. The default is auto.

Note A port configured with a media speed of auto will not insert into an empty ring as the port will be unable to determine the media speed.

- **Max Explorer Rate**—Maximum explorer frame-forwarding rate (in frames per second). Possible values are 0 through 5000 and disabled. The default is disabled. If you set this parameter to 0, no explorers are forwarded. To change the value from a numeric value to disabled, select the field and enter a null value when prompted.

- **MTU**—Maximum transmission unit. Possible values are 1500, 4472, 8144, and 17800. The default is 4472. You cannot configure a port MTU that is greater than the MTU configured for the TrBRF to which the port belongs.
- **Force AC Bits on SR Frames**—Indicates whether the address recognized (A) bit and the frame copied (C) bit should be set unconditionally on repeated source-routed LLC frames. These include source-routed frames with RIF length greater than 2 and all spanning-tree explorer and all-routes explorer frames. The default is no. If this parameter is set to no, the setting of these bits is based on whether the frame was actually forwarded.
- **Early Token Release**—Indicates whether the port is enabled for Early Token Release. Possible values are Yes and No. The default is Yes. Early Token Release is valid for 16 Mbps media only. If the Early Token Release is set to Yes and the media speed is 4 Mbps, the switch will force Early Token Release to No.
- **Operation Mode**—Port operation mode. Possible values are auto, HDX port, HDX station, FDX port, and FDX station. The default is auto.
- **Forwarding Mode**—Forwarding mode that the port is to use to transmit frames. Possible values are auto, cut through, and store & forward. The default is auto. If you set the forwarding mode to auto, the actual mode the port uses depends on the number of errors that occur during the error sampling interval that you define. Errored frames include frames with cyclic redundancy check (CRC) errors, aborted frames, and frames that are considered too short. If the error rate is below the error low threshold you define, then cut-through mode is used. If the error rate exceeds the error high threshold, then the port transitions to store & forward mode. Store & forward mode is always used for ports with a media speed of 4 Mbps.
- **Priority Threshold**—Highest Token Ring frame priority in the Frame Control field of the frame that the switch should place in the low-priority transmit queue. Possible values are 0 through 7. The default is 3.
- **Min Transmit Priority**—Minimum reservation priority used when requesting a token on a busy ring. Possible values are 0 through 6. The default is 4.
- **Error High Threshold**—Value (in percentage) used to force a port to store & forward mode. When the percentage of errors detected in the error sampling interval is more than the error high threshold, then the port is forced to store-and-forward mode. Possible values are 0 through 100. The default is 10. This field is valid only when the forwarding mode is set to auto.
- **Error Low Threshold**—Value (in percentage) used to return a port to cut-through mode. When the percentage of errors detected in the error sampling interval is less than the error low threshold, then the port is allowed to return to cut-through mode. Possible values are 0 through 100. The default is 1. This field is valid only when the forwarding mode is set to auto.
- **Error Sampling Interval**—Sampling period (in minutes) used when counting errors to determine a port's forwarding mode. Possible values are 1 through 60. The default is 10. This field is valid only when the forwarding mode is set to auto.
- **Cfg Loss Threshold**—Value used to control the number of configuration losses that can occur within the configuration loss sampling interval. Configuration loss occurs when a port completes a connection, allows data traffic to flow, and subsequently closes. When the threshold is exceeded, the port is disabled and must be enabled via this panel or an SNMP manager. Possible values are 1 through 100. The default is 8.
- **Cfg Loss Sampling Interval**—Sampling period (in minutes) used when measuring the number of configuration losses occurring. Possible values are 1 through 60. The default is 1.

Note If you change any configuration parameters of a connected port, the port will close and reopen and you will lose all address information and statistics for that port.

To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the new value.
Save your changes...	Return	

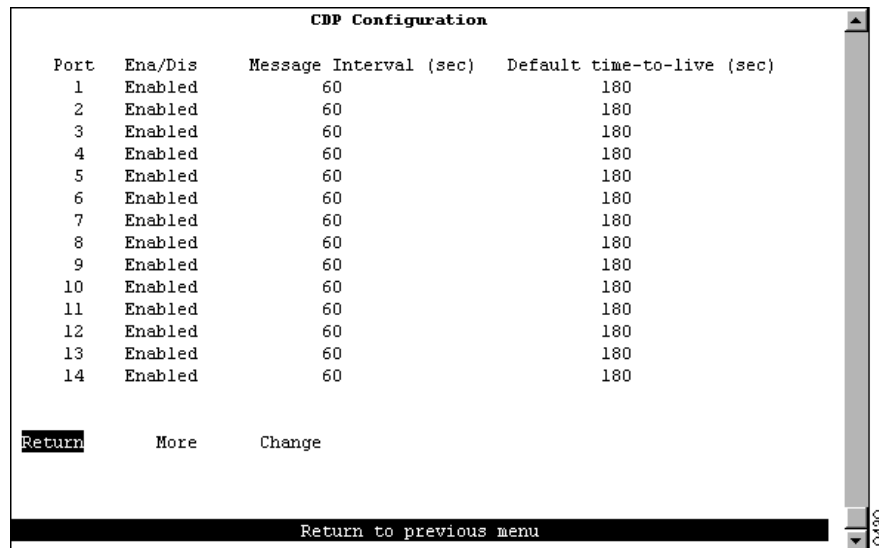
Configuring the Cisco Discovery Protocol Parameters

The CDP is used with Cisco IOS software to establish communication between different models of Cisco equipment (such as between a Cisco Catalyst 3920 switch and a Cisco 7000 router).

Each device configured for CDP sends periodic messages to a multicast address. Each device advertises at least one address at which it can receive SNMP messages. The advertisements also contain time-to-live, or holdtime, information, which indicates the length of time a receiving device should hold CDP information before discarding it.

To configure CDP parameters, select **CDP Configuration** on the Configuration Menu. The CDP Configuration panel (Figure 5-22) is displayed.

Figure 5-22 CDP Configuration Panel



The following information is displayed on this panel:

- Port—Identifier of the port.
- Ena/Dis—Indicates whether CDP is enabled for the port. The default is Enabled.

- Message Interval (sec)—Time (in seconds) between CDP messages. The default is 60.
- Default time-to-live (sec)—Time (in seconds) that a receiving device should hold a CDP packet from your switch before discarding it. The CDP hold time must be set to a greater number of seconds than the time between CDP transmissions (the transmission frequency time). The default is 180.

To	Select	Then
Change a parameter associated with a port...	Change	Specify the port number, select the appropriate parameter, and then specify the new value.
Save your changes...	Return	

Monitoring Port Traffic

The Catalyst 3920 allows you to configure a Switched Port Analyzer (SPAN) port for monitoring port traffic. A SPAN port performs the function of port mirroring. Traffic on the monitored port is copied to the monitoring port, thereby allowing you to monitor traffic on any of the Token Ring ports.

An active port monitor allows you to use a customer-supplied trace tool, such as a Network General Sniffer, to monitor only the LLC traffic that is switched by the monitored port. The MAC frames are not monitored.

Configuring a port to be a SPAN port removes the port from the TrCRF to which it is currently assigned. If you then disable the SPAN port, or configure a new port to be the SPAN port, the port remains unassigned to a TrCRF until you reassign it to a TrCRF.

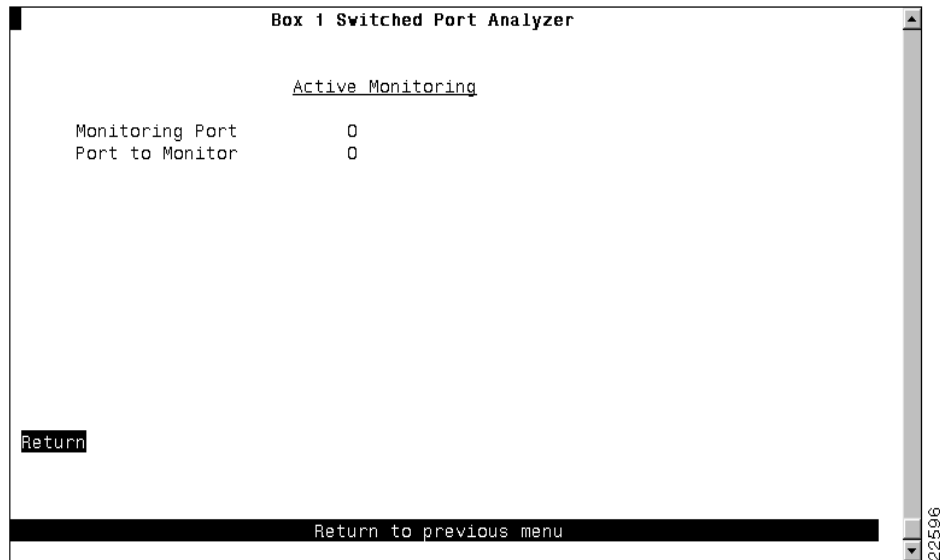
To be inserted into a ring, ports must be assigned to a TrCRF unless they are configured as a SPAN port. Therefore, ports that are not configured as SPAN ports and are unassigned will not be able to be inserted into the ring until you reassign them to a TrCRF or configure them as a SPAN port.

For information about how to assign a port to a TrCRF, refer to the “Displaying VLAN Port Assignments” section on page 5-17.

Note A port configured as a SPAN port must be disabled as the SPAN port before you can reassign the port to a TrCRF.

To configure a SPAN port, select **Switched Port Analyzer** on the Configuration Menu. The Switched Port Analyzer panel (Figure 5-23) is displayed.

Figure 5-23 Switched Port Analyzer Panel



The following information is displayed on this panel:

- **Monitoring Port**—Port to which the network analyzer or RMON probe will be attached. Possible values are 0 through 24. You cannot specify a port that is a member of a TokenChannel as a monitoring port. Likewise, you cannot add a port that has been specified as a monitoring port to a TokenChannel.
- **Port to Monitor**—Port that will be monitored. Possible values are 0 through 24.

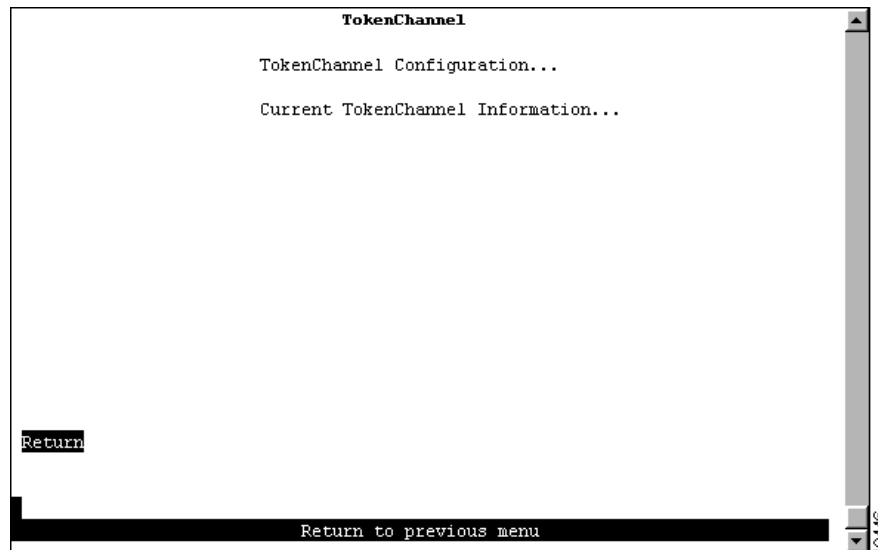
Note You cannot monitor a TokenChannel, however, you can monitor a single port within the channel.

To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the value.
Disable the SPAN port...	Port to Monitor	Specify 0.
Save your changes...	Return	

Using TokenChannels

To view or change the TokenChannel definitions, select **TokenChannel** on the Configuration Menu. The TokenChannel panel (Figure 5-24) is displayed.

Figure 5-24 TokenChannel Panel



The following options are displayed on this panel:

- **TokenChannel Configuration**—Select this option to configure a TokenChannel. Refer to the “Configuring TokenChannels” section on page 5-36 for more information.
- **Current TokenChannel Information**—Select this option to view the configuration and status of current TokenChannels. Refer to the “Viewing Current TokenChannel Configuration” section on page 5-38 for more information.

Configuring TokenChannels

To configure one or more TokenChannels, select **TokenChannel Configuration** on the TokenChannel panel. The TokenChannel Configuration panel (Figure 5-25) is displayed.

Using TokenChannels provides the following benefits:

- Logical aggregation of bandwidth up to 256 Mbps (128 Mbps full duplex)
- Load balancing
- Fault tolerance

A single TokenChannel can consist of a combination of HDX and FDX connections. For example, a TokenChannel consisting of three connections can have one HDX and two FDX connections. However, both ports in each interconnected pair must be either HDX or FDX. In addition, all ports in a single TokenChannel must belong to the same TrCRF on the Catalyst 3920.



Caution While you can use a TokenChannel to interconnect Catalyst 3900s and Catalyst 3920s, you cannot use a TokenChannel to interconnect other different models of switches. For example, you cannot use a TokenChannel to interconnect a Catalyst 2600 and a Catalyst 3900. Likewise, you cannot use a TokenChannel to interconnect a Catalyst 3900 and a non-Cisco switch.

Catalyst 3920 TokenChannels are *fault tolerant*. This feature enables the TokenChannel to continue to function as long as there is at least one link active in the channel. This capability ensures that large portions of a network are not disrupted in the event a port or cable fails within the channel by transferring the traffic to one or more of the remaining ports in the channel. A TokenChannel displays in a *reduced* state when some, but not all of the ports assigned to the channel are up.

Before you configure a TokenChannel, be aware of the following guidelines:

- You must define the TokenChannel for both connected Catalyst 3920s before physically connecting the linked ports. Therefore, make sure that you have either disabled the ports or disconnected the cables before you configure the channel. Failure to disable the ports or disconnect the cables results in loops.
- You can configure only up to eight channels at one time.
- Manually enabling or disabling a port in a channel enables or disables all the ports in the channel.
- Enabling or disabling a VLAN on one of the ports in a channel enables or disables the same VLAN on all the ports in the channel.
- You cannot configure a SPAN port to monitor a channel. However, you can configure a SPAN port to monitor a single port within a channel.
- For fault-tolerant support, both connected Catalyst 3920s must be running software release 4.1(1) or later.

Figure 5-25 TokenChannel Configuration Panel

TokenChannel	Ports
1	1 4
2	not defined
3	not defined
4	not defined
5	not defined
6	not defined
7	not defined
8	not defined

Return Add Entry Delete Entry Change Entry Clear Table

Return to previous menu

The following information is displayed on this panel:

- TokenChannel—Identifier of the TokenChannel (1 through 8).
- Ports—List of ports assigned to this TokenChannel.

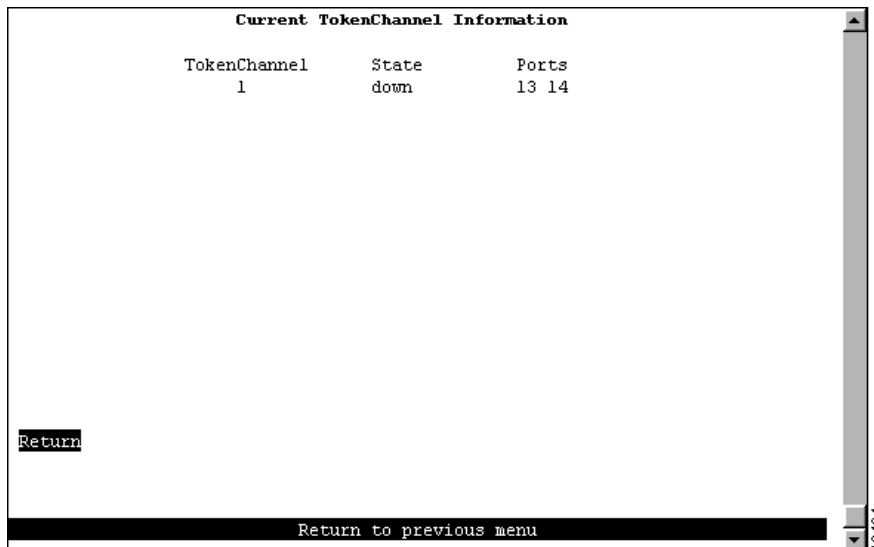
Note When you physically connect the linked ports, make sure that the ports with the lowest port numbers are connected. For example, if a TokenChannel links ports 3, 6, and 7 of one Catalyst 3920 and ports 2, 4, and 5 of another Catalyst 3920, the ports must be connected to each other in the following manner: port 3 to port 2, port 6 to port 4, and port 7 to port 5.

To	Select	Then
Define a new TokenChannel...	Add Entry	Specify the ports that compose the new TokenChannel, separated by spaces. You cannot specify more than 8 ports.
Delete the definition for a TokenChannel...	Delete Entry	Specify the identifier of the TokenChannel to be deleted.
Change the definition of a TokenChannel...	Change Entry	Specify the identifier of the TokenChannel to be changed and enter the new information. The ports associated with a TokenChannel must be disabled or disconnected before you change the TokenChannel definition.
Delete all TokenChannel definitions...	Clear Table	Confirm the deletion of all TokenChannel definitions.
Save your changes...	Return	

Viewing Current TokenChannel Configuration

To view the configuration of currently defined TokenChannels, select **Current TokenChannel Information** on the TokenChannel panel. The Current TokenChannel Information panel (Figure 5-26) is displayed.

Figure 5-26 Current TokenChannel Information Panel



The following information is displayed on this panel:

- TokenChannel—Identifier of the TokenChannel.
- State—Indicates whether the TokenChannel is up, down, or in a reduced state. A TokenChannel is in a reduced state when some but not all of the ports assigned to the channel are up.
- Ports—List of ports assigned to this TokenChannel.

Limiting Scope and Access

For network security, you can isolate parts of your network by limiting the scope and access of your users. For example, you might want to limit access to a specific file server to a select group of users.

To limit access, you can do the following:

- Attach the printer to a single port on the Catalyst 3920.
- Create a filter that blocks all data to a port except that which is explicitly allowed (using Port Security).
- Define a filter that explicitly allows data from the select group of users (based on MAC address) to be sent to that port (using MAC Filters).

To limit the scope and access of users on segments attached to the Catalyst 3920, select **Filters & Port Security** from the Configuration Menu. The Filters & Port Security panel (Figure 5-27) is displayed.

Figure 5-27 Filters & Port Security Panel



The following options are displayed on this panel:

- MAC Address Filters—Select this option to configure MAC address filters, block communication at selected ports, or to view currently defined filters.
- Protocol Filters—Select this option to define protocol classes and to define the behavior attributes for a protocol filter. Select this option to configure protocol filters. For more information, refer to the “Filtering Data Based on Protocol” section on page 5-44.

Filtering Data Based on MAC Address

To restrict certain users from communicating with other users or resources (such as printers or servers), select **MAC Address Filters** on the Filters & Port Security panel. The MAC Address Filters panel (Figure 5-28) is displayed.

Figure 5-28 MAC Address Filters



The following options are displayed on this panel:

- **Configure Filters**—Select this option to configure MAC address filters. For more information, refer to the “Filtering Data Based on MAC Address” section on page 5-40.
- **Configure Port Security Mode**—Select this option to block communication at selected ports. For more information, refer to the “Securing Ports” section on page 5-42.
- **View Port Filters**—Select this option to view the currently defined filters. For more information, refer to the “Viewing Filters for a Specific Port” section on page 5-43.

Configuring a MAC Address Filter

To configure a new MAC address filter, select **Configure Filters** on the MAC Address Filters panel. The Configure Filters panel (Figure 5-29) is displayed.

Note When configuring MAC address filters for a port, you cannot configure multiple filters for a port that includes the same MAC address. For example, you cannot specify the same MAC address in both a block destination address filter and a block source address filter for the same port. Also, you cannot specify the same MAC address in both an allow destination address filter and an allow source address filter for the same port.

Figure 5-29 Configure Filters Panel

Index	MAC Address	Type	Applied Ports	Exit Ports
1	000102:030304	block src	1 2 3	
2	000304:050000	allow src	1 10 14	
3	000450:070902	block src	1 2	
4	020301:070001	allow lma	10	1 2 3 4
5	0A0405:0F0310	force dest	3 5 9	Box 1, Port 4

Return Zoom Help Add Entry Delete Entry Clear Table

Applied Ports shows trunks as hold -- Filters are not applied to trunks

Return to previous menu

The following information is displayed on this panel:

- Index—Identifier of the filter.
- MAC Address—MAC address contained in packets to be filtered.
- Type—Possible types are:
 - block src—Block any packet with source address.
 - block dest—Block any packet with destination address.
 - allow src—Allow any packet with source address.
 - allow dest—Allow any packet with destination address.
 - allow lma—Allow any packet with limited multicast address to port(s).
 - force dest—Force any packet with the designated destination address to port.
- Applied Ports—Input port where the filtering takes place. You specify applied ports for all filters.
- Exit Ports—Port, if any, that is to receive the filtered packets. This applies only to filters defined as “Allow any packet with the designated Source address to port(s)” or “Force any packet with the designated Destination Address to port(s).”

You can define up to 250 source or destination MAC addresses to be filtered at the port of entry into the Catalyst 3920. MAC addresses can be unicast, multicast (group), or broadcast. All 250 addresses can be associated with one port or divided among the available ports.

To	Select	Then
Display the complete list of Entry Ports and Exit Ports for a filter...	Zoom	Specify the index number.
Add a filter...	Add Entry	Specify the filter type, the MAC address, and the ports. The port numbers should be listed from lowest to highest and be separated by spaces. If you do not specify a port number, the filter will be applied to all ports.
Delete a filter...	Delete Entry	Specify the index number of the filter to be deleted.
Delete all filters...	Clear Table	Confirm the deletion of all filters.
Save your changes...	Return	

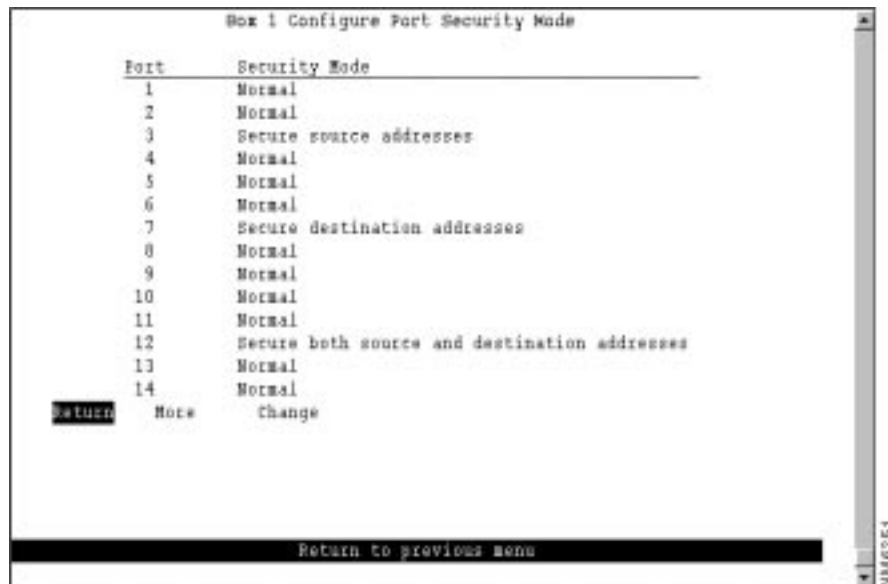
Note If you set up a filter for broadcast packets, hosts on the other side of the Catalyst 3920 will not see the ARP broadcast packets. To prevent this, allow time for the Catalyst 3920 to learn the host addresses before implementing the filter.

Note If you are defining a filter for a TokenChannel, the filter must be defined for all ports in the TokenChannel.

Securing Ports

The Catalyst 3920 also allows you to totally block (secure) communication at selected ports, unless explicitly allowed by a MAC filter. Addresses that have been allowed or forced by a configured filter are not blocked. To define the security attributes of each port, select **Configure Port Security Mode** on the MAC Address Filters panel. The Configure Port Security Mode panel (Figure 5-30) is displayed.

Figure 5-30 Configure Port Security Mode Panel



The following information is displayed on this panel:

- Port—Identifier of the port.
- Security Mode—Level of security defined for that port. Possible values include:
 - Normal—No security mode is defined for a port. This mode is the default.
 - Secure source addresses—Block all source addresses, except those allowed by a configured filter.
 - Secure destination addresses—Block all destination addresses, except those forced by a configured filter.
 - Secure both source and destination addresses—Block all source and destination addresses, except those allowed or forced by a configured filter.

To	Select	Then
Change the security mode for a port...	Change	Specify the port and the desired security mode.
Save your changes...	Return	

Viewing Filters for a Specific Port

To display the defined filters for a specific port, select **View Port Filters** on the Filters & Port Security panel and specify the port number. The View Port Filters panel (Figure 5-31) is displayed.

Figure 5-31 View Port Filters Panel



The following information is displayed on this panel:

- Index—Identifier of the filter entry.
- MAC Address—MAC address contained in the packets to be filtered.
- Description—Filter action to take on the packet with the specified MAC address.

You cannot change any information on this panel.

Filtering Data Based on Protocol

To filter data based on protocol, you can define protocol classes and then assign filtering attributes to these classes on a per-port basis. In protocol filtering, each incoming frame is assigned to one of the protocol classes based on the DSAP or Ethertype of the frame. If the DSAP is 0xAA (which indicates SNAP) the assignment is based on the Ethertype of the SNAP header. The mapping from DSAP or Ethertype to protocol class is common for all switch ports in a stack.

To filter data based on protocol, select **Protocol Filters** on the Filters & Port Security panel. The Protocol Filters panel (Figure 5-32) is displayed.

Figure 5-32 Protocol Filters Panel

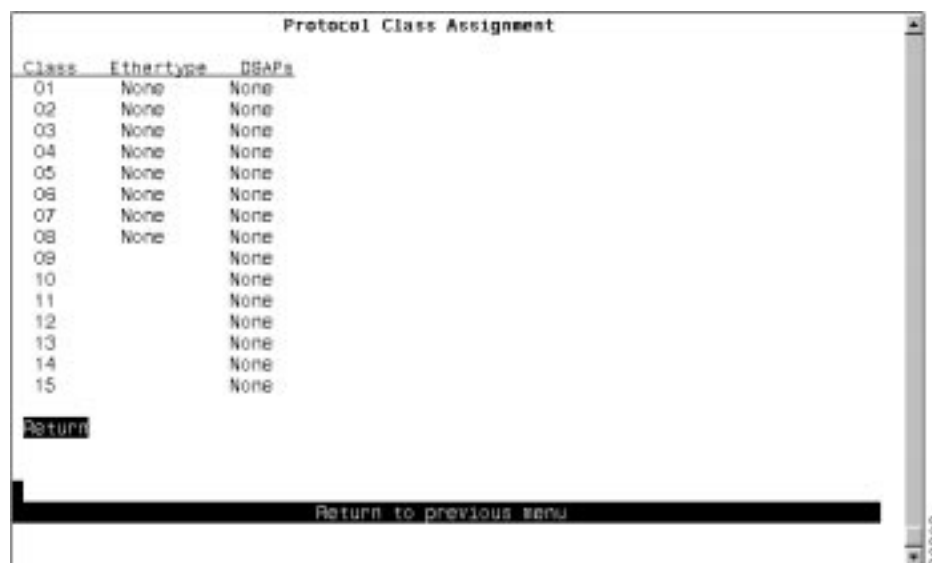
The following options are displayed on this panel:

- Protocol Class Assignment—Select this option to define protocol classes. For more information, refer to the “Assigning Classes for Protocol Filtering” section on page 5-45.
- Port Filtering Attributes—Select this option to define the behavior attributes for a protocol filter. For more information, refer to the “Defining Protocol Filter Behavior for a Port” section on page 5-46.

Assigning Classes for Protocol Filtering

To use protocol filtering, you must first define the protocol classes. You can define up to 15 protocol classes for use in protocol filtering. To define the protocol classes, select **Protocol Class Assignment** on the Protocol Filters panel. The Protocol Class Assignment panel (Figure 5-33) is displayed.

Figure 5-33 Protocol Class Assignment Panel



The following information is displayed on this panel:

- **Class**—Identifier of the protocol class. By default, the names are 01 through 15.
- **Ethertype**—List of the Ethernet protocol types that you want to filter. You can specify a single Ethertype (in its 4-digit hexadecimal format). You cannot specify an Ethertype for protocol classes 9 through 15. For a list of possible Ethertypes, refer to the “Ethertypes” section on page E-4 of the “Codes and IDs” appendix.
- **DSAPs**—List of the DSAPs that you want to filter. You can specify up to 16 DSAPs (in hexadecimal format) separated by spaces. For a list of possible service access points (SAPs), refer to the “Service Access Points” section on page E-3 of the “Codes and IDs” appendix.

Note All DSAPs that are not specifically assigned to a protocol class are assigned to class 0.

To	Select	Then
Change the current settings...	The appropriate port...	Specify the value.
Save your changes...	Return	

Defining Protocol Filter Behavior for a Port

After you have defined your protocol classes, you can define how a port handles frames for each protocol class. To define how each class is handled, select **Port Filtering Attributes** on the Protocol Filters panel and specify the port number. The Port Filtering Attributes panel (Figure 5-34) is displayed.

Figure 5-34 Filtering Attributes for a Port Panel

Class	Block	SRT	Ethertype	DSAPs
01	None	Yes	8137	42
02	None	Yes	7034	10
03	None	Yes	0600	08
04	None	Yes	2000	0a
05	None	Yes	6004	2a
06	None	Yes	7030	3c
07	None	Yes	0805	c2
08	None	Yes	008a	1a
09	None	Yes	None	4e
10	None	Yes	None	28
11	None	Yes	None	44
12	None	Yes	None	e6
13	None	Yes	None	1c
14	None	Yes	None	26
15	None	Yes	None	66

The following information is displayed on this panel:

- Class—Identifier of the class.
- Block—How the port handles frames that fall into this protocol class. Possible values are:
 - All—Block all frames in this protocol class.
 - SR—Block all source-routed frames in this protocol class.
 - NSR—Block all non-source-routed frames in this protocol class.
 - None—Allow all frames in this protocol class.

The default is None.

- SRT—Indicates whether the port allows transparent bridging of frames in this protocol class.
- Ethertype—Ethertypes defined for this class.
- DSAPs—DSAPs defined for this class.

Note For protocol class 0, Block is set to None and SRT is set to Yes.

To	Select	Then
Change the current settings...	The appropriate parameter...	Specify the value.
Save your changes...	Return	

Configuring Address Aging

To ensure that the address tables (per port and master) are kept to a minimum size, you can configure an *aging limit*. The aging limit is used to determine when inactive MAC addresses are removed from the address table. To define address table aging limits, select **Address Aging** from the Configuration Menu. The Address Aging panel (Figure 5-35) is displayed.

Figure 5-35 Address Aging Panel



The following options are displayed on this panel:

- Port Address Table Aging—Select this option to define the address aging limits for each port address table. For more information, refer to the “Defining Address Aging Limits by Port” section on page 5-48.
- Master Address Table Aging—Select this option to define the address aging limits for the master address table. For more information, refer to the “Defining Address Aging Limits for the Master Address Table” section on page 5-49.

Note To completely disable address aging, you must disable address aging for the ports and the master address table.

Defining Address Aging Limits by Port

To define the address aging limits of each port, select **Port Address Table Aging** on the Address Aging panel. The Port Address Table Aging panel (Figure 5-36) is displayed.

Figure 5-36 Port Address Table Aging Panel

Port	Aging Time (min.)	Demand Aging Level
1	15	90%
2	15	90%
3	15	90%
4	15	90%
5	15	90%
6	5	90%
7	5	90%
8	5	90%
9	5	90%
10	5	90%
11	5	90%
12	5	90%
13	5	90%
14	5	90%

Return More Change

Return to previous menu

The following information is displayed on this panel:

- **Port**—Identifier of the port.
- **Aging Time (min.)**—Time (in minutes) an inactive MAC address will remain in the port's address table. Possible values are 0 through 9999 minutes. The default is 5 minutes. Zero indicates that address aging is disabled.
- **Demand Aging Level**—Percentage threshold of address table capacity to ensure that the port's address table is populated only by the most frequently used addresses. Addresses are stored until reaching the maximum capacity of the table, then discarded in a specific order until the set percentage of table capacity is reached and then cycles in the same manner. Possible values are 50, 60, 70, 80, 90 percent, and Disable. The default is 90 percent.

To	Select	Then
Change the aging time limit and the address table aging level...	Change	Specify the port, the new aging time, and the new aging level.
Disable address removal for a port based on address age...	Change	Specify an Aging Time of 0.
Disable address removal for a port based on address table capacity...	Change	Specify a Demand Aging Level of Disable.
Save your changes...	Return	

Defining Address Aging Limits for the Master Address Table

To define the address aging limits of the master address table, select **Master Address Table Aging** on the Address Aging panel. The Master Address Table Aging panel (Figure 5-37) is displayed.

Figure 5-37 Master Address Table Aging Panel



The following information is displayed on this panel:

- **Table Aging Time**—Time (in minutes) an inactive MAC address will remain in the master address table. Possible values are 0 through 9999 minutes. The default is 5 minutes. A value of 0 will disable the removal of addresses based on age.
- **Demand Aging Level**—Percentage threshold of address table capacity to ensure that the master address table is populated only by the most frequently used addresses. Addresses are stored until reaching the maximum capacity of the table, then discarded in a specific order until the set percentage of table capacity is reached and then cycles in the same manner. Possible values are 50, 60, 70, 80, 90 percent, and Disable. The default is 90 percent.

To	Select	Then
Change the aging time limit or the address table aging level...	The appropriate parameter	Specify the new value.
Disable address removal based on address age...	Aging Time	Specify 0.
Disable address removal based on address table aging level...	Demand Aging Level	Specify Disable.
Save your changes...	Return	

Setting a Password

The Catalyst 3920 allows you to set a password to protect its configuration. If you establish a password, users must enter it to obtain access to the Main Menu. To set a password, select **Password** on the Configuration Menu. The Password panel (Figure 5-38) is displayed.

Figure 5-38 Password Panel



To	Select	Then
Add a password...	Set Password	Press Enter at the Old Password prompt and specify a new password.
Change the password...	Set Password	Specify the current password and the new password.
Delete the password...	Delete Password	Specify the current password.
Save your changes...	Return	

Note If you have forgotten your password, press the System Request button to access the System Request menu, and then select **Clear the system password**. This will clear only the system password. All other configuration parameters saved in NVRAM will be retained.

