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Catalyst 5000 Series Token Ring Software Release 3.2(5) Release Note

March 29, 1999

This document describes the Catalyst 5000 series Token Ring software release 3.2(5), including a list of problems fixed in this release and a list of known (open) problems for this release. This document is available on the Cisco Connection Documentation CD-ROM or in print.

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Catalyst 5000 Documentation

The following documents are available for the Catalyst 5000 series switch:

- *Catalyst 5000 Series Quick Software Configuration*
- *Catalyst 5000 Series Installation Guide*
- *Catalyst 5000 Series Module Installation Guide*
- *Catalyst 5000 Series Software Configuration Guide—Catalyst 5000 Series, Catalyst 4000 Series, Catalyst 2948G Series, Catalyst 2926G Series, and Catalyst 2926 Series*

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Token Ring Orderable Software Image Matrix

- *Catalyst 5000 Series Command Reference—Catalyst 5000 Series, Catalyst 4000 Series, Catalyst 2948G Series, Catalyst 2926G Series, and Catalyst 2926 Series*
- *Catalyst 5000 Series System Message Guide—Catalyst 5000 Series, Catalyst 4000 Series, Catalyst 2948G Series, Catalyst 2926G Series, and Catalyst 2926 Series*
- *Catalyst 5000 Series Release Notes*
- *Catalyst 5000 Series Supervisor Engine Installation Guide*
- *Enterprise MIB User Quick Reference (online only)*

For quick software configuration procedures for the Catalyst 5000 series switches, refer to the *Catalyst 5000 Series Quick Software Configuration* publication. For detailed software configuration information and procedures, refer to the *Catalyst 5000 Series Software Configuration Guide*.

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

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Token Ring Orderable Software Image Matrix

Table 1 lists the software versions and applicable ordering information for the Catalyst 5000 series Token Ring module software.

Table 1 Software Version/Orderable Product Number Matrix

Token Ring			
3.1(1)	c5token.3-1-1.bin	SFC5K-TR-3.1.1	SWC5K-TR-3.1.1=
3.1(2)	c5token.3-1-2.bin	SFC5K-TR-3.1.2	SWC5K-TR-3.1.2=
3.2(1)	c5token.3-2-1.bin	SFC5K-TR-3.2.1	SWC5K-TR-3.2.1=
3.2(2)	c5token.3-2-2.bin	SFC5K-TR-3.2.2	SWC5K-TR-3.2.2=
3.2(3)	c5token.3-2-3.bin	SFC5K-TR-3.2.3	SWC5K-TR-3.2.3=
3.2(4)	c5token.3-2-4.bin	SFC5K-TR-3.2.4	SWC5K-TR-3.2.4=
3.2(5)	c5token.3-2-5.bin	SFC5K-TR-3.2.5	SWC5K-TR-3.2.5=

Amendments to the Documentation

This section contains information that was not included in the configuration note that was shipped with the Token Ring module.

RMON Support

The descriptions of the Token Ring ring station control table and Token Ring ring station order table are incorrect. The descriptions should read as follows:

- Token Ring ring station control table

The Catalyst 5000 series Token Ring module supports the ringStationControlTable portion of the Token Ring Ring Station Group. This support allows a Catalyst 5000 series Token Ring module to gather segment information from each ring segment to which it is attached. This segment information includes Ring State, Beacon Sender, Beacon NAUN, and Active Monitor MAC Address, as well as Station Order Changes.

- Token Ring ring station order table

An ordered list of the stations on the monitored rings.

Configuring the Port Priority

The *Catalyst 5000 Series Token Ring Module Configuration Note* documents that the possible priority range for physical and logical ports is 0 through 255 (decimal) and that the default is 128.

While this information is correct for the physical Token Ring ports, it is incorrect for the logical ports (the connection between the Token Ring Bridge Relay Function [TrBRF] and Token Ring Concentrator Relay Function [TrCRF]). The valid priority range for the logical Token Ring ports is 0 through 7. The default is 4.

Adding or Changing TrBRF Parameters

The Catalyst 5000 series Token Ring software release 3.2(1) and later supports MTUs of up to 17800 bytes. The initial release of the Catalyst 5000 series Token Ring software did not support MTUs greater than 4472. Release 3.2(1) and later supports MTUs of up to 17800.

When configuring larger MTUs for the ports or TrBRFs on a Token Ring module, remember the following:

- You cannot configure a port MTU that is greater than the MTU configured for the TrBRF to which the port belongs.
- You cannot configure an LAN Emulation Client (LEC) MTU that is greater than the MTU configured for the TrBRF to which the LEC belongs.

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

Adding or Changing TrBRF Parameters

The Catalyst 5000 series supervisor engine module software Release 4.2 supports an additional **set vlan** command parameter, **decring**. The **decring** keyword enables you to specify a decimal logical ring number for TrCRFs. Previous releases of the supervisor engine module software allowed only hexadecimal ring numbers to be specified.

The syntax description for the **decring** keyword is as follows:

decring *decimal_ring_number* (Optional) Keyword to specify the logical ring number for Token Ring VLANs. Possible values are decimal numbers 1 to 4095. For Token Ring VLANs, this parameter is valid and required only when defining a TrCRF.

Adding or Changing TrCRF Parameters

The “Adding and Changing TrCRF Parameters” section of the *Catalyst 5000 Series Token Ring Module Configuration Note* defines two types of TrCRFs that you can configure. These types of TrCRFs are the undistributed TrCRF and the backup TrCRF.

However, the Catalyst 5000 series Token Ring software now allows you to configure a *distributed TrCRF*. A distributed TrCRF is TrCRF in which ports associated with the TrCRF are located on different Catalyst 5000 series switches.



Caution Use extreme caution when configuring a distributed TrCRF in your network. Ensure that no loops are configured in the network before doing so.

To enable or disable the capability to distribute a TrCRF, issue the following command while in privileged mode:

```
set tokenring distrib-crf {enable | disable}
```

After enabling the distribution of TrCRFs using the `set tokenring distrib-crf` command, you see a display similar to the following:

```
Console> (enable) set tokenring distrib-crf enable  
WARNING:Ports will NOT be inactivated for distributed crfs. NETWORK LOOPS MAY OCCUR.  
Console> (enable)
```

Monitoring Network Traffic

To aid in network management, the Catalyst 5000 series Token Ring module allows you to configure a Switched Port Analyzer (SPAN) port for monitoring port traffic. This SPAN support allows you to perform active monitoring on any single Token Ring source port. Active port monitoring allows you to copy the traffic being switched by a source port to a destination port located on the same Token Ring module. Only the logical link control (LLC) traffic that is being switched by the source port is monitored when you configure active port monitoring. The MAC frames are not monitored.



Caution For the Catalyst 5000 series Token Ring module SPAN feature to function reliably, the SPAN port and the port being monitored must be located on the same Token Ring module and the final destination for traffic received by the source port should be a port on the same Token Ring module.

When configuring SPAN for a single Token Ring source port keep in mind the following:

- If the SPAN destination port is a Token Ring port, then the source port must be a Token Ring port located on the same module.
- Any interaction between two endstations on a shared segment that is attached to a switch port configured as a SPAN source port will not be monitored at the destination SPAN port.
- For proper operation, the Token Ring module SPAN feature requires that the supervisor engine module be running software release 4.5(1).

Configuring SPAN

To configure a SPAN port, issue the following command in privileged mode, specifying the source port, the destination port, and the direction of traffic that you want to monitor that is being switched on the source port.

```
set span {src_mod/src_port | src_vlan} dest_mod/dest_port [rx | tx | both]
```



Caution If you are running a supervisor engine module software release prior to release 4.5(1), we recommend that you configure only a single source port to be monitored. With the supervisor engine module software release 4.5(1) and later, a single source port will be the standard Token Ring SPAN configuration.



Caution For the Catalyst 5000 series Token Ring module SPAN feature to function reliably, the SPAN port and the port being monitored must be located on the same Token Ring module and the final destination for traffic received by the source port should be a port on the same Token Ring module.

After entering the **set span** command and specifying a source port and destination port, you see a display similar to the following:

```
Console> (enable) set span 3/2 3/6 tx
Enabled monitoring of Port 3/2 transmit traffic by Port 3/6
Console> (enable)
```

Enabling and Disabling SPAN

After configuring a SPAN port, ensure that SPAN has been enabled on the switch. If SPAN is not enabled on the switch, you can enable it using the **set span** command.

To enable SPAN, issue the following command while in privileged mode:

```
set span enable
```

To disable SPAN, issue the following command while in privileged mode:

```
set span disable
```

Verifying the SPAN Configuration

To verify the SPAN configuration, issue the following command:

```
show span
```

After entering the **show span** command, you see a display similar to the following:

```
Console> (enable) show span  
Status      : enabled  
Admin Source : Port 3/2  
Oper Source  : Port 3/2  
Destination  : Port 3/6  
Direction   : transmit  
Console> (enable)
```

Table 2 describes the information returned by the **show span** command.

Table 2 Show span Command Field Descriptions

Field	Description
Status	Status of whether SPAN is enabled or disabled.
Admin Source	Source port whose traffic is being monitored.
Oper Source	Source port or the ports within a TrCRF whose traffic is being monitored.
Destination	Destination port to which the source port traffic is being copied.
Direction	Indicates whether transmit, receive, or transmit/receive information is being monitored.

Displaying Token Ring Statistics, Status, and Station Information

You can use the following commands to view statistics and status information associated with Token Ring stations that are located on monitored rings.

show station controltable

Use the **show station controltable** normal command to display a collection of statistics and status information associated with each Token Ring station on the local ring. In addition, this command provides status information for each ring being monitored.

```
show station controltable [mod_num[/port_num]]
```

Syntax Description

- mod_num* Number of the module.
- port_num* (Optional) Number of the port on the module.

Default

This command has no default setting.

Command Type

Switch command

Command Mode

Normal

Example

The following example shows how to display a collection of statistics and status information associated with each Token Ring station on Token Ring module 3:

```

Console> (enable) show station controltable 3
Port      TableSize      ActiveStation   RingState
-----
3/1       0               0               Normal Operation
3/2       0               0               Normal Operation
3/3       0               0               Normal Operation
3/4       0               0               Normal Operation
3/5       0               0               Normal Operation
3/6       0               0               Normal Operation
3/7       0               0               Normal Operation
3/8       0               0               Normal Operation
3/9       0               0               Normal Operation
3/10      0               0               Normal Operation
3/11      0               0               Normal Operation
3/12      0               0               Normal Operation
3/13      0               0               Normal Operation
3/14      0               0               Normal Operation
3/15      0               2               Normal Operation
3/16      0               0               Normal Operation

Port      BeaconSender    BeaconNAUN      OrderChanges
-----
3/1       00:00:00:00:00:00  00:00:00:00:00:00  0
3/2       00:00:00:00:00:00  00:00:00:00:00:00  0
3/3       00:00:00:00:00:00  00:00:00:00:00:00  0
3/4       00:00:00:00:00:00  00:00:00:00:00:00  0
3/5       00:00:00:00:00:00  00:00:00:00:00:00  0
3/6       00:00:00:00:00:00  00:00:00:00:00:00  0
3/7       00:00:00:00:00:00  00:00:00:00:00:00  0
3/8       00:00:00:00:00:00  00:00:00:00:00:00  0
3/9       00:00:00:00:00:00  00:00:00:00:00:00  0
3/10      00:00:00:00:00:00  00:00:00:00:00:00  0
3/11      00:00:00:00:00:00  00:00:00:00:00:00  0
3/12      00:00:00:00:00:00  00:00:00:00:00:00  0
3/13      00:00:00:00:00:00  00:00:00:00:00:00  0
3/14      00:00:00:00:00:00  00:00:00:00:00:00  0
3/15      00:00:00:00:00:00  00:00:00:00:00:00  1
3/16      00:00:00:00:00:00  00:00:00:00:00:00  0
Console> (enable)

```

Table 3 describes the fields shown in the **show station controltable** command output.

Table 3 Show station controltable Command Field Descriptions

Field	Description
Port	Module and port number.
TableSize	Number of Token Ring station entries in the table associated with this port.
ActiveStation	Number of active Token Ring station entries in the table associated with this port.
RingState	Current status of the ring.
BeaconSender	Address of the sender of the last beacon frame received on this ring. If no beacon frames have been received, this object shall be equal to six octets of zero.
BeaconNAUN	Address of the nearest upstream neighbor in the last beacon frame received on this ring. If no beacon frames have been received, this object is equal to six octets of zero.
OrderChanges	Number of add and delete events in the table associated with this port.

Related Commands

- show counters**
- show station ordertable**

show station ordertable

Use the **show station ordertable** normal command to display a listing of the order of stations on the monitored rings.

```
show station ordertable [mod_num[/port_num]]
```

Syntax Description

- mod_num* Number of the module.
- port_num* (Optional) Number of the port on the module.

Default

This command has no default setting.

Command Type

Switch command

Command Mode

Normal

Example

The following example shows how to display:

```

Console> show station ordertable 3
Port      OrderIndex      Address
-----
 3/15     1                00:05:77:05:40:63
          2                00:00:30:cf:a0:98
Console>

```

Table 4 describes the fields shown in the **show station ordertable** command output.

Table 4 Show station ordertable Command Field Descriptions

Field	Description
Port	Module and port number.
OrderIndex	Location of the station with respect to other stations on the ring.
Address	Physical address of the station.

Related Commands

show counters

show station ordertable

Configuring Filters

With the Catalyst 5000 supervisor engine module software releases 3.2(4) and later or 4.3(2) and later image, used with the Catalyst 5000 Token Ring software release 3.2(3) and later, new parameters are supported by the **set port filter** command. These parameters provide the ability to configure a MAC address filter as both a source or a destination for a specified port.

The new syntax descriptions for configuring MAC address filters using the **set port filter** command are as follows:

set port filter <mod_num/port_num> <mac_addr> <permit|deny>

set port filter <mod_num/port_num> <mac_addr> <permit_src|permit_dst>

set port filter <mod_num/port_num> <mac_addr> <deny_src|deny_dst>

set port filter <mod_num/port_num> <mac_addr> <deny_src_learn>

Syntax Description

<i>mod_num</i>	Number of the module.
<i>port_num</i>	(Optional) Number of the port on the module.
<i>mac_addr</i>	MAC address contained in the packets to be filtered. This address can be entered in canonical format (00-11-33-44-55) or in non-canonical (00:11:22:33:44:55) format.
permit	Keyword used to specify that the filter can permit packets with the specified MAC address or protocol type.
deny	Keyword used to specify that the filter can deny packets with the specified MAC address or protocol type.
permit_src	Keyword used to specify to allow any packet with the specified MAC address as the source address.
permit_dst	Keyword used to specify to allow any packet with the specified MAC address as the destination address.
deny_src	Keyword used to specify to block any packet with the specified MAC address as the source address.
deny_dst	Keyword used to specify to block any packet with the specified MAC address as the destination address.
deny_src_learn	Keyword used to specify that the Token Ring module is not to learn the specified MAC address as a source address.

For more information on the **set port filter** command, refer to the configuration note that shipped with your Token Ring module.

Configuring VLANs

In the *Catalyst 5000 Series Token Ring Module Configuration Note* and the *Catalyst 5000 Series Fiber Token Ring Module Configuration Note*, the description of the translation parameter of the **set vlan** command is incorrectly documented as being “the keyword that specifies a translational VLAN used to translated FDDI or Token Ring to Ethernet.”

The correct description of the translation parameter of the **set vlan** command should read as follows:

translation	(Optional) Keyword that specifies a translational VLAN used to translate FDDI to Ethernet. Possible values are 1 to 1005.
--------------------	---

Fixing a Corrupted Flash

In the event of a corrupted Flash, a Catalyst 5000 series switch can operate in boot mode. However, when the switch is operating in boot mode, a version 3.1 boot ROM is required for the supervisor module to recognize the Token Ring module.

If the Flash becomes corrupted and the supervisor engine module is running a version 3.1 boot ROM, you can download a new image through a Token Ring module while the switch is in boot mode.

If the Flash becomes corrupted and the supervisor engine module is not running a version 3.1 boot ROM, you can download a new Flash image to the switch while in boot mode via either of the following methods:

- Kermit to the console port.
- Through an installed module that is supported by the boot ROM version running on the supervisor engine module.

If you do need to upgrade your boot ROM, please contact the Cisco TAC.

New Features in Token Ring Software Release 3.2(5)

The following new features were added to the Catalyst 5000 series Token Ring software release 3.2(5) or later when used in conjunction with the Catalyst 5000 series supervisor engine module software release 4.5(1) or later.

Handlings Frames Transmitted with Invalid Source MAC Addresses

In some rare circumstances, certain devices (such as a faulty protocol analyzer) might transmit a frame that contains the source MAC address of another device. Because MAC addresses are used by the switch to determine where to forward a frame, an invalid frame (one that contains the source MAC address of another device) can cause the valid frames to be forwarded to the wrong port. If this situation occurs, communication to the device to which the MAC address actually belongs can be disrupted for as long as the invalid address entry is in the Token Ring port address table.

If you are experiencing network communication problems due to a device erroneously sending frames with the source MAC address of another device, you can either choose to rapidly age the entries out of the Token Ring module port address tables using the **set tokenring portaging** command or you can ensure that the Token Ring module port address tables do not contain erroneous entries by disabling address learning entirely on the Token Ring module using the **set tokenring local learning** command.



Caution We recommend that you use the **set tokenring portaging** and **set tokenring local learning** commands *only* in those rare circumstances in which network communications are disrupted because of invalid frames.

Configuring Token Ring Port Table Address Aging

When in a network environment in which a device is sending invalid frames, you can ensure that the Token Ring module port address tables contain correct MAC address entries by *rapidly* aging out the erroneous entries using the **set tokenring portaging** command. Rapidly aging out the Token Ring module port address table ensures that the Token Ring module port address tables do not contain invalid entries which might affect the Catalyst 5000 series switch and network communication.

The aging limit you define determines when inactive MAC addresses are removed from a port address table. The aging limit is the time (in seconds) a MAC address remains in the port's address table. Possible values are 0 and 5 through 65535 seconds. The default is 0. Zero indicates the Token Ring module port address table entries are aged out using the CAM aging time for the corresponding VLAN that has been configured using the **set cam agingtime** command. For more information about the **set cam agingtime** command, see the *Catalyst 5000 Series Command Reference*.

Note To use the fast port aging feature effectively, we recommend that you configure an aging limit of 10.

To define the address aging limits for a Token Ring port, issue the following command while in privileged mode:

```
set tokenring portaging mod_num/port_num agingtime
```

After entering the **set tokenring portaging** command, you see a display similar to the following:

```
Console> (enable) set tokenring portaging 3/2 10
Agingtime set to 10 sec for port 3/2
Console> (enable)
```

Configuring Local Address Learning

The **set tokenring locallearning** command enables you to enable or disable local MAC address learning on a Token Ring port. The default is for local address learning to be enabled.

When local address learning is enabled, the value of the address recognized (A) bit and the frame copied (C) bit in Logical Link Control (LLC) frames is set by the ports on the Token Ring module based on whether the frame was actually forwarded. However, when local address learning is disabled, the AC bits cannot be set by the ports on the Token Ring module based on whether the frame was forwarded because all frames are forwarded to the Catalyst 5000 series switching backplane.

Therefore, when local address learning is disabled on a Token Ring port, the AC bits must be set based on the type of frame that has been received. When you disable local address learning on a Token Ring port, the default is for the AC bits to always being set on LLC frames, however you can configure how the AC bits are to be set using the **set tokenring acbits** command. For more information on configuring for the setting of AC bits on frames, see the “Setting Address Recognized/Frame Copied Bits” section on page 13.

Note When local address learning is disabled on a port, the port aging limits configured using the **set tokenring portaging** command are not used.

To enable or disable local address learning, issue the following command while in privilege mode:

```
set tokenring locallearning mod_num/port_num enable | disable
```

After disabling local address learning using the **set tokenring locallearning** command, you see a display similar to the following:

```
Console> (enable) set tokenring locallearning 3/2 disable
Warning: Resetting acbit value to ALWAYS: 3/2
Local learning disabled for port 3/2
Console> (enable)
```

Setting Address Recognized/Frame Copied Bits

Using the **set tokenring acbits** command, you can specify if and how the AC bits should be set on LLC frames. When local address learning is enabled on a Token Ring port, the default is disable. When local address learning is disabled on a Token Ring port, the default is always.

To configure how the AC bits will be set for a port, issue the following command in privileged mode:

```
set tokenring acbits mod_num/port_num {enable | disable | sronly | never | always}
```

After entering the **set tokenring acbits** command, you see displays similar to the following:

```
Console> (enable) set tokenring acbits 3/2 always
Warning: Disable Local learning: 3/2
Port 3/2 acbits always
```

The syntax description for the **set tokenring acbits** command is as follows:

<i>mod_num</i>	Number of the Token Ring module.
<i>port_num</i>	(Optional) Number of the port on the Token Ring module.
enable	Keyword used to unconditionally set the AC bits on source-routed frames with a RIF length greater than 2 and on all explorer frames in addition to setting the AC bits on all frames forwarded to another port. This parameter is only valid when local address learning is enabled on a port. Therefore, specifying enable automatically enables local address learning on the port.
disable	Keyword used to specify for the AC bits to be set based exclusively on whether the frame is forwarded to another port. This parameter is only valid when local address learning is enabled on a port. Therefore, specifying disable automatically enables local address learning on the port.
sronly	Keyword used to specify for the AC bits to be set only on source-routed frames with a RIF length greater than 2 and on all explorer frames.
never	Keyword used to specify for the AC bits to never be set on LLC frames. This parameter is only valid when local address learning is disabled on the port. Therefore, specifying never automatically disables local address learning on the port.
always	Keyword used to specify for the AC bits to always be set on LLC frames. This parameter is only valid when local address learning is disabled on a port. Therefore, specifying always automatically disables local address learning on the port.

Token Ring Problems Fixed in Supervisor Engine Module Software Release 4.1(5)

The following is a list of Token Ring problems that have been resolved in the Catalyst 5000 series supervisor engine module software release 4.1(5).

Problem Identifier	Problem Description
CSCdk69087	Inserting or enabling an ISL trunk link on a Catalyst 5000 series switch on which a large number of VLANs running Spanning-Tree Protocol (STP) are configured causes a delay in the transmission of BPDUs from that switch (via the TrBRF and the TrCRF) if the switch is the root bridge in any of its defined VLANs.
CSCdk83458	TrCRF spanning tree state converges to blocking if STP is disabled on the TrBRF when the Token Ring module is reset after the Catalyst 5000 series switch is reset. This problem results in frames not being forwarded between TrCRFs. Frame forwarding within the TrCRF is not affected. Hot-inserting the Token Ring module or loading a new Token Ring software image can also cause this problem.

Known Problems in Token Ring Software Release 3.2(5)

This section lists the known problems for Catalyst 5000 series Token Ring software release 3.2(5).

Problem: Fiber module port might hang when trying to insert into RIRO port of a hub (CSCdk30265)

Problem Description: If the port transmission mode of a port on the fiber Token Ring module is set to auto, connecting via a Ring In/Ring Out (RIRO) port on a hub may cause the port to hang.

Recommended Action: Use the **set tokenring portmode** command to configure the port for RIRO before connecting to the hub. If the failure to insert has already caused the fiber Token Ring module to hang, disabling and enabling the port using the **set port disable** and **set port enable** commands will bring the port back online.

Problem: During heavy traffic, hot inserting a Token Ring module can cause the supervisor module to reset (CSCdk63964)

Problem Description: During heavy traffic (a traffic load greater than 50 percent), hot inserting a Token Ring module into a Catalyst 5000 series switch can cause the supervisor engine module to reset.

Recommended Action: Ensure that the switch is at a low utilization level when a Token Ring module is hot inserted into the switch, or schedule a network downtime and power off the Catalyst 5000 series switch to install the Token Ring module.

Problem: The Token Ring module SPAN port feature allows only transmitted traffic to be captured by an attached network sniffer when the port to be monitored is on a different Token Ring module than the monitoring port (CSCdk78241)

Problem Description: The SPAN port feature on the Catalyst 5000 series Token Ring module is currently allowing only transmitted traffic to be captured by an externally attached network sniffer when the port to be monitored is on a different Token Ring module than the monitoring port. Received traffic cannot be captured.

Recommended Action: To view the traffic transmitted to and received from a device on the SPAN port, use a multi-access unit between the Token Ring module and the end device.

Problem: Connectivity problems occurring in redundant ISL networks if Token Ring or ATM links are forwarding instead of an ISL link (CSCdk87396)

Problem Description: In a network in which redundant ISL links are configured, connectivity might not be possible between certain rings if a Token Ring or ATM link is the forwarding path to the root switch instead of an ISL link. This problem can cause the switch on the other end of a blocked ISL link to incorrectly limit all-routes explorer packets to the incoming TrCRF. This results in some stations not being able to communicate with other stations.

Recommended Action: Ensure that the STP path costs are configured such that the ISL port is the preferred path. In an ISL connected switch network configuration, a Token Ring or ATM link should never have a lower cost to the root bridge than the ISL link.

Availability of Catalyst 5000 Software Upgrades on CCO

When changes are made to the Catalyst 5000 software, the new image is posted to CCO. You can then obtain a copy of the image and download it to your switch.

Obtaining Service and Support

For service and support for a product purchased from a reseller, contact the reseller. Resellers offer a wide variety of Cisco service and support programs, which are described in the section “Service and Support” in the information packet that shipped with your product.

Note If you purchased your product from a reseller, you can access Cisco Connection Online (CCO) as a guest. CCO is Cisco Systems’ primary, real-time support channel. Your reseller offers programs that include direct access to CCO’s services.

For service and support for a product purchased directly from Cisco, use CCO.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems’ primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco’s customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: <http://www.cisco.com>
- WWW: <http://www-europe.cisco.com>

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- WWW: <http://www-china.cisco.com>
- Telnet: [cco.cisco.com](telnet://cco.cisco.com)
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

Ordering Documentation

Documentation for Cisco products is available in three forms: in a CD-ROM package, printed books, and on the World Wide Web. You have the option of subscribing to the CD ROM package through an update service. Or you can order printed documentation at an additional cost. Refer to the information packet included with the router for detailed ordering information. You can also access Cisco documentation on the World Wide Web URL <http://www.cisco.com>.

This document is to be used in conjunction with the documents listed in the "Catalyst 5000 Documentation" section.

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