



## CHAPTER 2

# Configuring Port Tracking

The port tracking feature is unique to the Cisco MDS 9000 Family of switches. This feature uses information about the operational state of the link to initiate a failure in the link that connects the edge device. This process of converting the indirect failure to a direct failure triggers a faster recovery process towards redundant links. When enabled, the port tracking feature brings down the configured links based on the failed link and forces the traffic to be redirected to another redundant link.

This chapter includes the following sections:

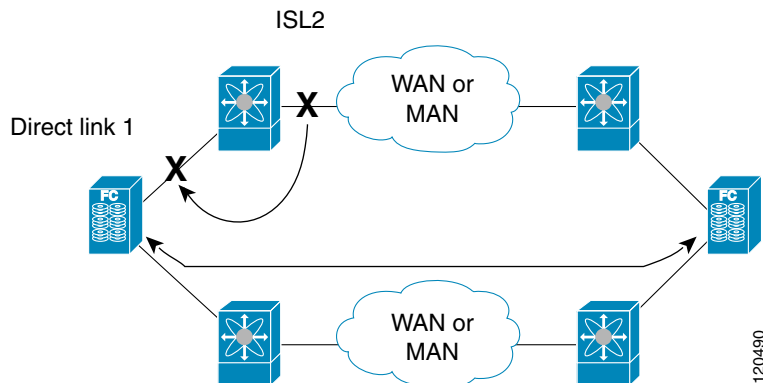
- [About Port Tracking, page 2-1](#)
- [Port Tracking, page 2-2](#)
- [Default Port Tracking Settings, page 2-6](#)

## About Port Tracking

Generally, hosts can instantly recover from a link failure on a link that is immediately (direct link) connected to a switch. However, recovering from an indirect link failure between switches in a WAN or MAN fabric with a keep-alive mechanism is dependent on several factors such as the time out values (TOVs) and on registered state change notification (RSCN) information.

In [Figure 2-1](#), when the direct link 1 to the host fails, recovery can be immediate. However, when the ISL 2 fails between the two switches, recovery depends on TOVs, RSCNs, and other factors.

**Figure 2-1** Traffic Recovery Using Port Tracking



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The port tracking feature monitors and detects failures that cause topology changes and brings down the links connecting the attached devices. When you enable this feature and explicitly configure the linked and tracked ports, the Cisco NX-OS software monitors the tracked ports and alters the operational state of the linked ports on detecting a link state change.

The following terms are used in this chapter:

- **Tracked ports**—A port whose operational state is continuously monitored. The operational state of the tracked port is used to alter the operational state of one or more ports. Fibre Channel, VSAN, PortChannel, FCIP, or a Gigabit Ethernet port can be tracked. Generally, ports in E and TE port modes can also be Fx ports.
- **Linked ports**—A port whose operational state is altered based on the operational state of the tracked ports. Only a Fibre Channel port can be linked.

## Port Tracking

Before configuring port tracking, consider the following guidelines:

- Verify that the tracked ports and the linked ports are on the same Cisco MDS switch.
- Be aware that the linked port is automatically brought down when the tracked port goes down.
- Do not track a linked port back to itself (for example, Port fc1/2 to Port fc2/5 and back to Port fc1/2) to avoid recursive dependency.

This section includes the following topics:

- [About Port Tracking, page 2-2](#)
- [Enabling Port Tracking, page 2-3](#)
- [About Configuring Linked Ports, page 2-3](#)
- [Operationally Binding a Tracked Port, page 2-3](#)
- [About Tracking Multiple Ports, page 2-5](#)
- [Tracking Multiple Ports, page 2-5](#)
- [About Monitoring Ports in a VSAN, page 2-6](#)
- [Monitoring Ports in a VSAN, page 2-6](#)
- [About Forceful Shutdown, page 2-6](#)
- [Forcefully Shutting Down a Tracked Port, page 2-6](#)

## About Port Tracking

Port tracking has the following features:

- The application brings the linked port down when the tracked port goes down. When the tracked port recovers from the failure and comes back up again, the tracked port is also brought up automatically (unless otherwise configured).
- You can forcefully continue to keep the linked port down, even though the tracked port comes back up. In this case, you must explicitly bring the port up when required.

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## Enabling Port Tracking

The port tracking feature is disabled by default in all switches in the Cisco 9000 Family. When you enable this feature, port tracking is globally enabled for the entire switch.

To configure port tracking, enable the port tracking feature and configure the linked port(s) for the tracked port.

To enable port tracking with Fabric Manager, follow these steps:

- Step 1** Expand **Switches**, expand **Interfaces**, and then select **Port Tracking** in the Physical Attributes pane. The port tracking information is displayed in the Information pane shown in [Figure 2-2](#). The default is the **Controls** tab.

**Figure 2-2** Port Tracking

Switch	Status	Command	LastCommand	Result
sw172-22-46-220	enabled	noSelection	noSelection	none
sw172-22-46-224	disabled	noSelection	noSelection	none
sw172-22-46-223	enabled	noSelection	noSelection	none
sw172-22-46-221	disabled	noSelection	noSelection	none
sw172-22-46-222	enabled	noSelection	noSelection	none
sw172-22-46-233	disabled	noSelection	noSelection	none
sw172-22-46-225	disabled	noSelection	noSelection	none
sw172-22-46-174	enabled	noSelection	noSelection	none

- Step 2** Click in the Command column to **enable** or **disable** port tracking. Depending on your selection the corresponding entry in the Status column changes.
- Step 3** Click the **Apply Changes** icon to save your changes. The entry in the Result column changes to **success**.

## About Configuring Linked Ports

You can link ports using one of two methods:

- Operationally binding the linked port(s) to the tracked port (default).
- Continuing to keep the linked port down forcefully—even if the tracked port has recovered from the link failure.

## Operationally Binding a Tracked Port

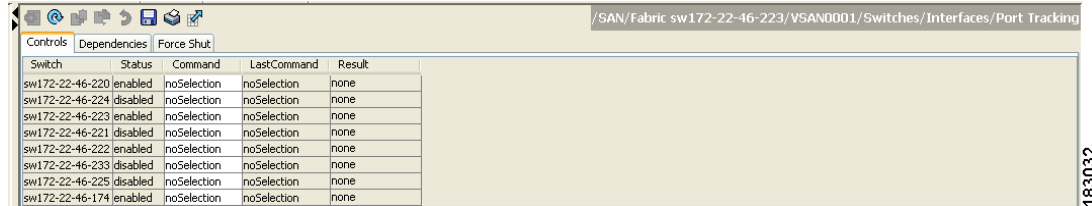
When you configure the first tracked port, operational binding is automatically in effect. When you use this method, you have the option to monitor multiple ports or monitor ports in one VSAN.

To operationally bind a tracked port, follow these steps:

- Step 1** Expand **Switches**, expand **Interfaces**, and then select **Port Tracking** in the Physical Attributes pane. The port tracking information is displayed in the Information pane. The default is the Controls tab.

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**Figure 2-3 Port Tracking Controls Tab**



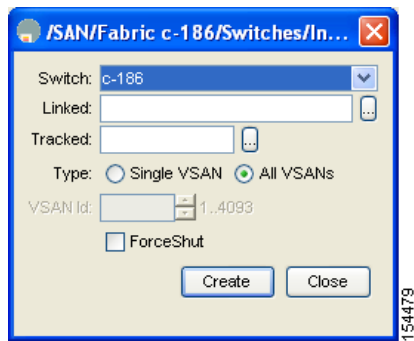
Switch	Status	Command	LastCommand	Result
sw172-22-46-220	enabled	noSelection	noSelection	none
sw172-22-46-224	disabled	noSelection	noSelection	none
sw172-22-46-223	enabled	noSelection	noSelection	none
sw172-22-46-221	disabled	noSelection	noSelection	none
sw172-22-46-222	enabled	noSelection	noSelection	none
sw172-22-46-233	disabled	noSelection	noSelection	none
sw172-22-46-225	disabled	noSelection	noSelection	none
sw172-22-46-174	enabled	noSelection	noSelection	none

**Step 2** Click the **Dependencies** tab.

**Step 3** Click **Create Row**.

You see the Create Port Tracking Dependencies dialog box shown in [Figure 2-4](#).

**Figure 2-4 Create Port Tracking Dependencies Dialog Box**



**Step 4** Select the switch whose ports you want to track by and selecting a switch from the drop-down list.

**Step 5** Select the linked port(s) that should be bound to the tracked port(s) by clicking the browse button and selecting from the list.

**Step 6** Click the **Single VSAN** radio button if you want to track these ports only in one VSAN or click the **All VSANs** radio button if you want to track these ports in all the available VSANs.

See “[About Monitoring Ports in a VSAN](#)” section on page 2-6 for details.

**Step 7** If you chose Single VSAN in the previous step, enter the ID of the VSAN where these ports will be monitored.

**Step 8** Check the **Forceshut** check box if you want to forcefully shutdown the tracked port.

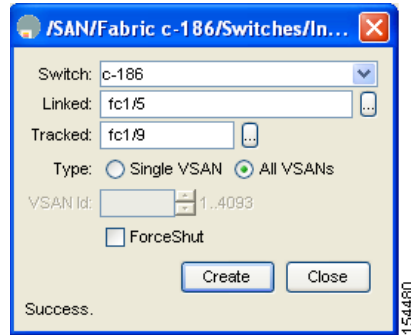
See “[About Forceful Shutdown](#)” section on page 2-6 for details.

**Step 9** Click **Create** to proceed with creating this dependency.

If tracking is established, you see **Success** in the lower left corner of the dialog box (see [Figure 2-5](#)).

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**Figure 2-5 Successful Port Tracking Established**



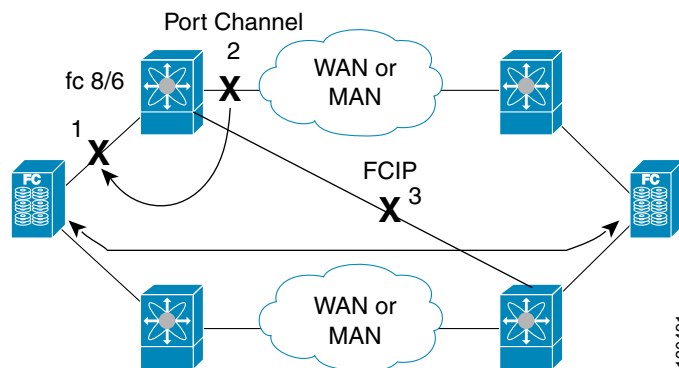
**Step 10** Click **Close** to close the dialog box.

## About Tracking Multiple Ports

You can control the operational state of the linked port based on the operational states of multiple tracked ports. When more than one tracked port is associated with a linked port, the operational state of the linked port will be set to down only if all the associated tracked ports are down. Even if one tracked port is up, the linked port will stay up.

In [Figure 2-6](#), only if both ISLs 2 and 3 fail, will the direct link 1 be brought down. Direct link 1 will not be brought down if either 2 or 3 are still functioning as desired.

**Figure 2-6 Traffic Recovery Using Port Tracking**



## Tracking Multiple Ports

To track multiple ports, see [“Operationally Binding a Tracked Port”](#) section on page 2-3.

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## About Monitoring Ports in a VSAN

You can optionally configure one VSAN from the set of all operational VSANs on the tracked port with the linked port by specifying the required VSAN. This level of flexibility provides higher granularity in tracked ports. In some cases, when a tracked port is a TE port, the set of operational VSANs on the port can change dynamically without bringing down the operational state of the port. In such cases, the port VSAN of the linked port can be monitored on the set of operational VSANs on the tracked port.

If you configure this feature, the linked port is up only when the VSAN is up on the tracked port.



Tip

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The specified VSAN does not have to be the same as the port VSAN of the linked port.

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## Monitoring Ports in a VSAN

To monitor a tracked port in a specific VSAN, see [“Operationally Binding a Tracked Port” section on page 2-3](#).

## About Forceful Shutdown

If a tracked port flaps frequently, then tracking ports using the operational binding feature may cause frequent topology change. In this case, you may choose to keep the port in the down state until you are able to resolve the reason for these frequent flaps. Keeping the flapping port in the down state forces the traffic to flow through the redundant path until the primary tracked port problems are resolved. When the problems are resolved and the tracked port is back up, you can explicitly enable the interface.



Tip

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If you configure this feature, the linked port continues to remain in the shutdown state even after the tracked port comes back up. You must explicitly remove the forced shut state (by administratively bringing up this interface) of the linked port once the tracked port is up and stable.

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## Forcefully Shutting Down a Tracked Port

To forcefully shut down a tracked port, see [“Operationally Binding a Tracked Port” section on page 2-3](#).

## Default Port Tracking Settings

[Table 2-1](#) lists the default settings for port tracking parameters.

**Table 2-1** *Default Port Tracking Parameters*

Parameters	Default
Port tracking	Disabled.
Operational binding	Enabled along with port tracking.