Configuring Snapshot Routing

This chapter describes how to configure snapshot routing. It includes the following main sections:

To identify the hardware platform or software image information associated with a feature, use the Feature Navigator on Cisco.com to search for information about the feature or refer to the software release notes for a specific release. For more information, see the "Identifying Supported Platforms" section in the "Using Cisco IOS Software" chapter.

For a complete description of the snapshot routing commands mentioned in this chapter, refer to the *Cisco IOS Dial Technologies Command Reference*. To locate documentation of other commands that appear in this chapter, use the command reference master index or search online.

Snapshot Routing Overview

Snapshot routing enables a single router interface to call other routers during periods when the line protocol for the interface is up (these are called "active periods"). The router dials in to all configured locations during such active periods to get routes from all the remote locations.

The router can be configured to exchange routing updates each time the line protocol goes from "down" to "up" or from "dialer spoofing" to "fully up." The router can also be configured to dial the server router in the absence of regular traffic if the active period time expires.

Snapshot routing is useful in two command situations:

- Configuring static routes for dial-on-demand routing (DDR) interfaces
- Reducing the overhead of periodic updates sent by routing protocols to remote branch offices over a dedicated serial line

When configuring snapshot routing, you choose one router on the interface to be the client router and one or more other routers to be server routers. The client router determines the frequency at which routing information is exchanged between routers.

Routing information is exchanged during an active period. During the active period, a client router dials all the remote server routers for which it has a snapshot dialer map defined in order to get routes from all the remote locations. The server router provides information about routes to each client router that calls.

At the end of the active period, the router takes a snapshot of the entries in the routing table. These entries remain frozen during a quiet period. At the end of the quiet period, another active period starts during which routing information is again exchanged; see Figure 1.

Figure 1   *Active and Quiet Periods in Snapshot Routing*
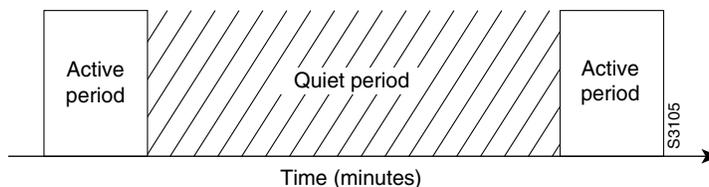
When the router makes the transition from the quiet period to the active period, the line might not be available for a variety of reasons. For example, the line might be down or busy, or the permanent virtual circuit (PVC) might be down. If this happens, the router has to wait through another entire quiet period before it can update its routing table entries. This wait might be a problem if the quiet period is very long—for example, 12 hours. To avoid the need to wait through the quiet period, you can configure a retry period. If the line is not available when the quiet period ends, the router waits for the amount of time specified by the retry period and then makes the transition to an active period. See to Figure 2.

Figure 2   *Retry Period in Snapshot Routing*
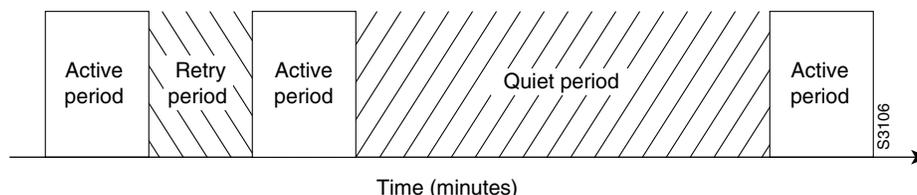
The retry period is also useful in a dialup environment in which there are more remote sites than router interface lines that dial in to a PRI and want routing information from that interface. For example, a PRI has 23 DS0s available, but you might have 46 remote sites. In this situation, you would have more **dialer map** commands than available lines. The router will try the **dialer map** commands in order and will use the retry time for the lines that it cannot immediately access.

The following routed protocols support snapshot routing. Note that these are all distance-vector protocols.

- AppleTalk—Routing Table Maintenance Protocol (RTMP)
- Banyan VINES—Routing Table Protocol (RTP)
- IP—Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP)
- Internet Protocol Exchange (IPX)—RIP, Service Advertisement Protocol (SAP)

How to Configure Snapshot Routing

To configure snapshot routing, perform the tasks in the following sections:

- Configuring the Client Router (Required)
- Configuring the Server Router (Required)

You can also monitor and maintain interfaces configured for snapshot routing. For tips on maintaining your network with snapshot routing, see the section "Monitoring and Maintaining DDR Connections and Snapshot Routing" later in this chapter.

For an example of configuring snapshot routing, see the section "Configuration Examples for Snapshot Routing" at the end of this chapter.

Configuring the Client Router

To configure snapshot routing on the client router that is connected to a dedicated serial line, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# **interface serial** *number*	Specifies a serial interface.
Step 2	Router(config-if)# **snapshot client** *active-time quiet-time* [**suppress-statechange-updates**] [**dialer**]	Configures the client router.

To configure snapshot routing on the client router that is connected to an interface configured for DDR, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# **interface serial** *number*	Specifies a serial interface.
Step 2	Router(config-if)# **dialer rotary-group** *number*	Configures a dialer rotary group.
Step 3	Router(config-if)# **interface dialer** *number*	Specifies a dialer interface.
Step 4	Router(config-if)# **snapshot client** *active-time quiet-time* [**suppress-statechange-updates**] [**dialer**]	Configures the client router.
Step 5	Router(config-if)# **dialer map snapshot** *sequence-number dial-string*	Defines a dialer map.

Repeat these steps for each map you want to define. Maps must be provided for all the remote server routers that this client router is to call during each active period.

Because ISDN BRI and PRI automatically have rotary groups, you need not define a rotary group when configuring snapshot routing.

To configure snapshot routing on the client router over an interface configured for BRI or PRI, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# **interface bri** *number*	Specifies a BRI interface.
Step 2	Router(config-if)# **snapshot client** *active-time quiet-time* [**suppress-statechange-updates**] [**dialer**]	Configures the client router.
Step 3	Router(config-if)# **dialer map snapshot** *sequence-number dial-string*	Defines a dialer map.

Configuring the Server Router

To configure snapshot routing on the server router that is connected to a dedicated serial line, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# **interface serial** *number*	Specifies a serial interface.
Step 2	Router(config-if)# **snapshot server** *active-time* [**dialer**]	Configures the server router.

To configure snapshot routing on the associated server router that is connected to an interface configured for DDR, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# **interface serial** *number*	Specifies a serial interface.
Step 2	Router(config-if)# **interface dialer** *number*	Specifies a dialer interface.
Step 3	Router(config-if)# **snapshot server** *active-time* [**dialer**]	Configures the server router.

The active period for the client router and its associated server routers should be the same.

Monitoring and Maintaining DDR Connections and Snapshot Routing

To monitor DDR connections and snapshot routing, use any of the following commands in privileged EXEC mode:

Command	Purpose
Router# **show dialer** [**interface** *type number*]	Displays general diagnostics about the DDR interface.
Router# **show interfaces bri 0**	Displays information about the ISDN interface.
Router# **clear snapshot quiet-time** *interface*	Terminates the snapshot routing quiet period on the client router within 2 minutes.

Command	Purpose
Router# **show snapshot** [*type number*]	Displays information about snapshot routing parameters.
Router# **clear dialer**	Clears the values of the general diagnostic statistics.

Configuration Examples for Snapshot Routing

The following example configures snapshot routing on an interface configured for DDR on the client router. In this configuration, a single client router can call multiple server routers. The client router dials to all different locations during each active period to get routes from all those remote locations.

The absence of the **suppress-statechange-updates** keyword means that routing updates will be exchanged each time the line protocol goes from "down" to "up" or from "dialer spoofing" to "fully up." The **dialer** keyword on the **snapshot client** command allows the client router to dial the server router in the absence of regular traffic if the active period time expires.

```
interface serial 0
 dialer rotary-group 3
!
interface dialer 3
 dialer in-band
 snapshot client 5 360 dialer

dialer map snapshot 2 4155556734
dialer map snapshot 3 7075558990
```

The following example configures the server router:

```
interface serial 2
 snapshot server 5 dialer
```