Cisco – Configuring Hub and Spoke Frame Relay

Table of Contents

Configuring Hub and Spoke Frame Relay

Introduction

This sample configuration shows how a router learns which data−link connection identifiers (DLCIs) it uses from the Frame Relay switch and assigns them to the main interface. The router then uses **inverse arp** to find the remote IP address.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

There are no specific prerequisites for this document.

Components Used

This document is not restricted to specific software and hardware versions.

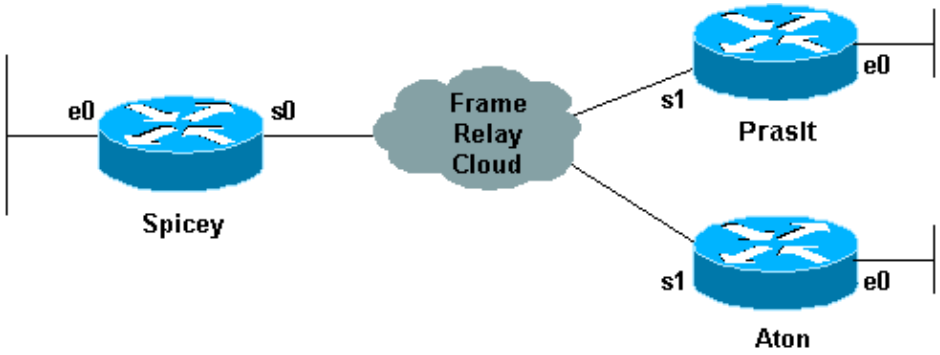
The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Configure

In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram



Note: You will not be able to ping Prasit's serial IP address from Aton unless you explicitly add in Frame Relay maps on each end. If routing is configured correctly, traffic originating on the LANs should not have a problem. You will be able to ping if you use the Ethernet IP address as the source address in an extended ping.

When **frame−relay inverse−arp** is enabled, **broadcast** IP traffic will go out over the connection by default.

Configurations

- Spicey
- Prasit
- Aton

Spicey

```
spicey#show running-config
Building configuration...
!
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname spicey
!
!
!
!
interface Ethernet0
 ip address 124.124.124.1 255.255.255.0
!
interface Serial0
 ip address 3.1.3.1 255.255.255.0
 encapsulation frame-relay
 frame-relay interface-dlci 130
 frame-relay interface-dlci 140
!
!
router rip
 network 3.0.0.0
 network 124.0.0.0
!
line con 0
 exec-timeout 0 0
 transport input none
```

```
line aux 0
line vty 0 4
 login
!
end
```

Prasit

```
prasit#show running-config
Building configuration...

Current configuration : 1499 bytes
!
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname prasit
!
!
!
interface Ethernet0
 ip address 123.123.123.1 255.255.255.0
!
interface Serial1
 ip address 3.1.3.2 255.255.255.0
 encapsulation frame-relay
 frame-relay interface-dlci 150
!
!
router rip
 network 3.0.0.0
 network 123.0.0.0
!
!
line con 0
 exec-timeout 0 0
 transport input none
line aux 0
line vty 0 4
 login
!
end
```

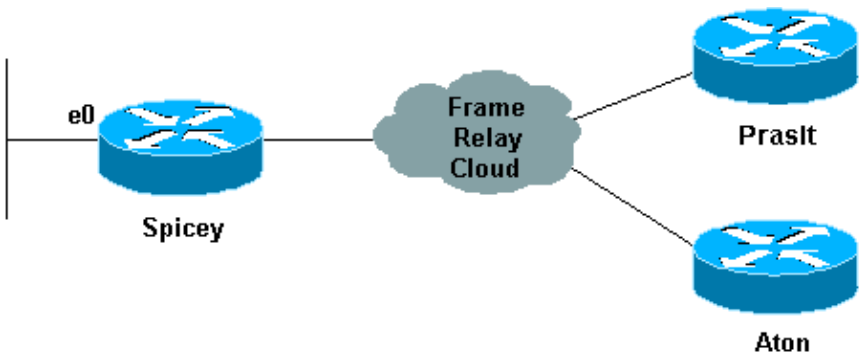
Aton

```
aton#show running-config
Building configuration...
Current configuration:
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname aton
!
!
interface Ethernet0
ip address 122.122.122.1 255.255.255.0
!
interface Serial1
```

```
 ip address 3.1.3.3 255.255.255.0
 encapsulation frame-relay
 frame-relay interface-dlci 160
!
router rip
 network 3.0.0.0
 network 122.0.0.0
!
!
line con 0
 exec-timeout 0 0
 transport input none
line aux 0
line vty 0 4
 login
!
end
```

Connecting from Spoke to Spoke

You cannot ping from one spoke to another spoke in a hub and spoke configuration using multipoint interfaces because there is no mapping for the other spokes' IP addresses. Only the hub's address is learned via the Inverse Address Resolution Protocol (IARP). If you configure a static map using the frame−relay map command for the IP address of a remote spoke to use the local data link connection identifier (DLCI), you can ping the addresses of other spokes.



Configurations

Prasit

```
prasit#show running-config
interface Ethernet0
 ip address 123.123.123.1 255.255.255.0
!
interface Serial
 ip address 3.1.3.2 255.255.255.0
 encapsulation frame-relay
 frame-relay map ip 3.1.3.3 150
 frame-relay interface-dlci 150
```

Verify

show Commands

- **show frame−relay map**
- **show frame−relay pvc**
- **ping <*device name*>**

Spicey

```
spicey#show frame−relay map
Serial0 (up): ip 3.1.3.2 dlci 140(0x8C,0x20C0), dynamic,
              broadcast,, status defined, active
Serial0 (up): ip 3.1.3.3 dlci 130(0x82,0x2020), dynamic,
              broadcast,, status defined, active

spicey#show frame−relay pvc
PVC Statistics for interface Serial0 (Frame Relay DTE)
              Active     Inactive      Deleted       Static
  Local          2            0            0            0
  Switched       0            0            0            0
  Unused         0            0            0            0

DLCI = 130, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0
  input pkts 32            output pkts 40           in bytes 3370
  out bytes 3928           dropped pkts 0           in FECN pkts 0
  in BECN pkts 0           out FECN pkts 0          out BECN pkts 0
  in DE pkts 0             out DE pkts 0
  out bcast pkts 30         out bcast bytes 2888
  pvc create time 00:15:46, last time pvc status changed 00:10:42

DLCI = 140, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0

  input pkts 282           output pkts 291          in bytes 25070
  out bytes 27876          dropped pkts 0           in FECN pkts 0
  in BECN pkts 0           out FECN pkts 0          out BECN pkts 0
  in DE pkts 0             out DE pkts 0
  out bcast pkts 223        out bcast bytes 20884
  pvc create time 02:28:36, last time pvc status changed 02:25:14
spicey#
spicey#ping 3.1.3.2
Type escape sequence to abort.
Sending 5, 100−byte ICMP Echos to 3.1.3.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round−trip min/avg/max = 32/35/36 ms
spicey#ping 3.1.3.3
Type escape sequence to abort.
Sending 5, 100−byte ICMP Echos to 3.1.3.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round−trip min/avg/max = 32/35/36 ms
```

Prasit

```
prasit#show frame−relay map
Serial1 (up): ip 3.1.3.1 dlci 150(0x96,0x2460), dynamic,
              broadcast,, status defined, active

prasit#show frame−relay pvc

PVC Statistics for interface Serial1 (Frame Relay DTE)
              Active     Inactive      Deleted       Static
  Local          1            0            0            0
  Switched       0            0            0            0
  Unused         0            0            0            0
```

```
DLCI = 150, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial1
  input pkts 311           output pkts 233          in bytes 28562
  out bytes 22648          dropped pkts 0           in FECN pkts 0
  in BECN pkts 0           out FECN pkts 0          out BECN pkts 0
  in DE pkts 0             out DE pkts 0
  out bcast pkts 162        out bcast bytes 15748
  pvc create time 02:31:39, last time pvc status changed 02:25:14

prasit#ping 3.1.3.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 3.1.3.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 36/36/36 ms
prasit#ping 3.1.3.3
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 3.1.3.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Aton

```
aton#show frame-relay map
Serial1 (up): ip 3.1.3.1 dlci 160(0xA0,0x2800), dynamic,
              broadcast,, status defined, active

aton#show frame-relay pvc

PVC Statistics for interface Serial1 (Frame Relay DTE)

               Active     Inactive      Deleted       Static
  Local           1            0            0            0
  Switched        0            0            0            0
  Unused          0            0            0            0

DLCI = 160, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial1

  input pkts 35            output pkts 32           in bytes 3758
  out bytes 3366           dropped pkts 0           in FECN pkts 0
  in BECN pkts 0           out FECN pkts 0          out BECN pkts 0
  in DE pkts 0             out DE pkts 0
  out bcast pkts 27         out bcast bytes 2846
  pvc create time 00:10:53, last time pvc status changed 00:10:53

aton#ping 3.1.3.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 3.1.3.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 32/35/36 ms

aton#ping 3.1.3.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 3.1.3.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

show Commands for Connecting from Spoke to Spoke

- **show frame-relay map**
- **ping <*device name*>**

- **show running−config**

Prasit

```
prasit#show frame−relay map
 Serial1 (up): ip 3.1.3.1 dlci 150(0x96,0x2460), dynamic,
                   broadcast,, status defined, active
 Serial1 (up): ip 3.1.3.3 dlci 150(0x96,0x2460), static,
                   CISCO, status defined, active

 prasit#ping 3.1.3.3
 Type escape sequence to abort.
 Sending 5, 100−byte ICMP Echos to 3.1.3.3, timeout is 2 seconds:
 !!!!!
 Success rate is 100 percent (5/5), round−trip min/avg/max = 68/70/80 ms

 prasit#ping 122.122.122.1
 Type escape sequence to abort.
 Sending 5, 100−byte ICMP Echos to 122.122.122.1, timeout is 2 seconds:
 !!!!!
 Success rate is 100 percent (5/5), round−trip min/avg/max = 64/67/76 ms
```

Aton

```
aton#show running−config
 interface Ethernet0
 ip address 122.122.122.1 255.255.255.0
 !
 interface Serial1
   ip address 3.1.3.3 255.255.255.0
   no ip directed−broadcast
   encapsulation frame−relay
   frame−relay map ip 3.1.3.2 160
   frame−relay interface−dlci 160

 aton#show frame−relay map
 Serial1 (up): ip 3.1.3.1 dlci 160(0xA0,0x2800), dynamic,
                   broadcast,, status defined, active
 Serial1 (up): ip 3.1.3.2 dlci 160(0xA0,0x2800), static,
                   CISCO, status defined, active
 aton#ping 3.1.3.2

 Type escape sequence to abort
 Sending 5, 100−byte ICMP Echos to 3.1.3.2, timeout is 2 seconds:
 !!!!!
 Success rate is 100 percent (5/5), round−trip min/avg/max = 68/68/68 ms

aton#ping 123.123.123.1
Type escape sequence to abort.
Sending 5, 100−byte ICMP Echos to 123.123.123.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round−trip min/avg/max = 64/67/80 ms
```

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- **Configuring and Troubleshooting Frame Relay**
- **More Information on Frame Relay Commands**
- **More Information on Configuring Frame Relay**
- **More Information on Dial−Backup Configuration**
- **More Information on Dial−Backup Commands**
- **More Information on ISDN Debug Commands**
- **More Information on PPP Debug Commands**
- **More Information on ISDN Switch Types, Codes and Values**
- **Technical Support − Cisco Systems**
