Back–to–Back Frame Relay

Document ID: 14193

Contents

Introduction

This document is a sample configuration for setting up two Cisco routers back–to–back using Frame Relay (FR) encapsulation. The routers are connected using data communications equipment (DCE) and a data terminal equipment (DTE) serial cable. Back–to–back setups are useful in test environments. The simplest and preferred method for configuring back–to–back setups is described in this document.

A FR switch or DCE device is used between FR routers to provide Local Management Interface (LMI) status messages. Because there is no switch in a back–to–back scenario, LMI processing is disabled on both routers.

You also can configure a back–to–back setup with one router providing LMI status updates for the other. However, such a configuration is necessary only if the LMI debugging messages are to be checked in a back–to–back setup. In this case, LMI processing is not disabled and one side functions as a hybrid FR switch by responding to LMI status enq. For more details on this configuration, please see "Back–to–Back Frame Relay Hybrid Switching."

In the sample configuration, the router connected to the DCE cable must provide clocking. Router1 provides the clock at 64 kbps (**clock rate 64000**).

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

To implement this configuration, you need the following hardware and software components:

- Cisco IOS® Software Release 11.2 and later that supports FR encapsulation.
- Two routers, each with an interface that supports FR encapsulation.

Note: The information in this document was taken from an isolated lab environment. Make sure you understand the potential impact of a command on your network before you use it.

This configuration was developed and tested using the software and hardware versions below.

- Cisco IOS Software Release 12.1(2).
- Cisco 1604 routers.

Conventions

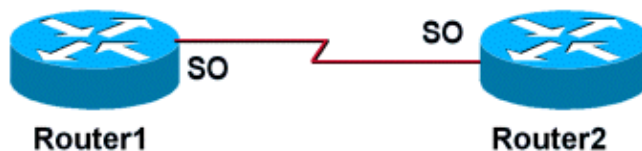For more information on document conventions, see the Cisco Technical Tips Conventions.

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

This document uses the network setup shown in the diagram below.

Configurations

This document uses the configurations shown below.

Router 1

```
!
interface Serial0
 no ip address
 encapsulation frame-
relay
 no keepalive

!--- This command disables LMI processing.

clock rate 64000
!
interface Serial0.1
point-to-point

!--- A point-to-point subinterface has been created.

ip address 172.16.120.105
255.255.255.0
frame-relay
interface-dlci 101
```

```
                                                               
!--- DLCI 101 has been assigned to this interface

!
```

Router 2

```
!
interface Serial0
 no ip address
 encapsulation frame-
relay
 no keepalive

!--- This command disables LMI processing.

!
interface Serial0.1
point-to-point

!--- A point-to-point subinterface has been created.

ip address 172.16.120.120
255.255.255.0
frame-relay
interface-dlci 101

!--- DLCI 101 has been assigned to this interface

!
```

Verify

The above configuration disables LMI processing on both routers when the **no keepalive** command is issued. Because LMI messages are not exchanged, interfaces remain up/up unless clocking is lost on the DTE cable side or data terminal ready (DTR), and Request To Send (RTS) is lost on the DCE cable side. FR map statements are not required because point−to−point subinterfaces have been configured. The data−link collection identifiers (DLCIs) specified with the **frame−relay interface−dlci** command must match.

When a DLCI is assigned to a subinterface, a frame map is created for the subinterface.

- **no keepalive** – Disables the LMI mechanism for serial lines using FR encapsulation.
- **frame−relay interface−dlci** – Assigns a DLCI to a specified FR subinterface.

FR map statements can be configured on the main interface if point−to−point subinterfaces are not desired. As long as FR map statements are correct and have matching DLCIs configured, connectivity will be maintained.

show Commands

This section provides information you can use to confirm your configuration is working properly.

Certain **show** commands are supported by the Output Interpreter tool, which allows you to view an analysis of **show** command output.

- **show frame−relay map** – Displays map entries and information about connections.
- **show frame−relay pvc** – Displays statistics about permanent virtual circuits (PVCs) for FR interfaces.

When a FR map statement is properly configured, the output from a **show frame−relay map** command should resemble the output below obtained from Router1.

```
Router1#show frame map
      Serial0.1 (up): point-to-point dlci, dlci
      101(0x65,0x1850), broadcast
      Router1#
```

Because LMI processing has been disabled, the router cannot determine the status of PVCs from LMI status messages. PVCs can only be statically defined.

```
Router1#show frame pvc

    PVC Statistics for interface Serial0 (Frame Relay
DTE)

    DLCI = 101, DLCI USAGE = LOCAL, PVC STATUS = STATIC,
INTERFACE = Serial0.1

        input pkts 98          output pkts 52
in bytes 25879
        out bytes 12160        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 37       out bcast bytes 10600
        PVC create time 00:57:07, last time PVC status
changed 00:46:13
```

If you have the output of **show frame−relay map** and **show frame−relay pvc** commands from your Cisco device, you can use to display potential issues and fixes. To use , you must be a registered user, be logged in, and have JavaScript enabled.

Troubleshoot

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

Related Information

- **WAN Technology Support Pages**
- **Technical Support – Cisco Systems**