PPP Back–to–Back Connections

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Introduction

This document provides a sample configuration for a PPP back–to–back connection. With such a configuration, you can verify that your connection and hardware are working properly, and even use IP routing for some testing.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on these software and hardware versions:

- This configuration is applicable to all Cisco IOS® Software Releases.
- The DCE side is connected with a WAN DCE cable.
- The DTE side is connected with a WAN DTE cable.

For more information on WAN DCE or DTE cables, refer to the Serial Cables documentation.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

For more information on document conventions, refer to Cisco Technical Tips Conventions.

Configure

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

Configuration Summary

In this configuration, Router1 uses a V35–MT cable (the Cisco reference is CAB–V35MT), and Router2 uses a V35–FC cable (the Cisco reference is CAB–V35FC). This means that the clock is provided by Router2. A clock rate of 64000 bps is used by issuing the **clock rate 64000** command under the serial 0 interface.

Note: Once this command is configured, it appears in the configuration as `clock rate 64000`. The two cables are now connected to each other.

The Ethernet interfaces are configured by issuing the **no keepalive** command. That way, it is not necessary to connect them to the LAN network in order to get them up and running. Using a static route on each router enables you to ping the IP address of the Ethernet interface of Router2, using the IP address of the Ethernet interface of Router1 (or the other way round). Of course, this is useful in a test environment.

Network Diagram

This document is based on the following configuration:

Configurations

This document uses these configurations:

- Router 1
- Router 2

Router1
| ```
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router1
!
enable password cisco
!
ip subnet-zero
!
!
!
!
interface Ethernet0
 ip address 10.1.0.1 255.255.255.0
 no keepalive
!
``` |

```
interface Serial0
 ip address 10.0.0.1 255.255.255.0
 encapsulation ppp
!
ip classless
ip route 10.2.0.0 255.255.255.0 10.0.0.2
ip http server
!
!
line con 0
line aux 0
line vty 0 4
 no login
!
end
```

Router2

```
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router2
!
enable password cisco
!
ip subnet-zero
!
!
!
!
interface Ethernet0
 ip address 10.2.0.1 255.255.255.0
 no keepalive
!
interface Serial0
 ip address 10.0.0.2 255.255.255.0
 encapsulation ppp
 no fair-queue
 clock rate 64000
!
ip classless
ip route 10.1.0.0 255.255.255.0 10.0.0.1
ip http server
!
!
line con 0
line aux 0
line vty 0 4
 no login
!
end
```

Verify

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

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

- Issue the **show controllers** command to check the cable and the clock rate:

The following is the output of the **show controllers** command:

```
Router1#show controllers serial 0 | i V.35
buffer size 1524  HD unit 0, V.35 DTE cable
Router1#
```

- Issue the **show interfaces serial 0** command to check that packets are sent and received (see `packets input`, `packets output`, `5 minute input rate`, and `5 minute output rate`. For information regarding the encapsulation used, see `Encapsulation PPP`.

The following is the output of the **show interfaces serial 0** command:

```
Router1#show interfaces serial 0
Serial0 is up, line protocol is up
  Hardware is HD64570
  Internet address is 10.0.0.1/24
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
      reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, loopback not set
  Keepalive set (10 sec)
  LCP Open
  Open: IPCP, CDPCP
  Last input 00:00:00, output 00:00:00, output hang never
  Last clearing of "show interface" counters 00:07:53
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/5/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 1158 kilobits/sec
  5 minute input rate 2000 bits/sec, 2 packets/sec
  5 minute output rate 2000 bits/sec, 2 packets/sec
     155 packets input, 55066 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     168 packets output, 60037 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
Router1#
```

- To generate a ping to 10.2.0.2 using the IP address 10.2.0.1, you can issue the **ping** command:

The following is the output of the **ping** command:

```
Router1#ping
Protocol [ip]:
Target IP address: 10.2.0.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 10.1.0.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.2.0.1, timeout is 2 seconds: Packet sent with a
Success rate is 100 percent (5/5), round-trip min/avg/max = 32/32/32 ms Router1#
```

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

- **show controllers** Displays the cable and the clock rate.
- **show interfaces serial 0** Verifies that packets are sent and received.
- **ping** Used to test the connection of devices.

Troubleshoot

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

Related Information

- **More WAN Technical Tips**
- **Technical Support – Cisco Systems**