



LAB 5

RIP Protocol. Version 1 and 2.

Xarxes i Protocols

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Part 1

Test the connectivity end to end

```
Pinging 147.83.3.2 with 32 bytes of data:

Request timed out.
Reply from 147.83.3.2: bytes=32 time=1ms TTL=126
Reply from 147.83.3.2: bytes=32 time=14ms TTL=126
Reply from 147.83.3.2: bytes=32 time=12ms TTL=126

Ping statistics for 147.83.3.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 14ms, Average = 9ms

C:\>ping 147.83.5.2

Pinging 147.83.5.2 with 32 bytes of data:

Request timed out.
Reply from 147.83.5.2: bytes=32 time=16ms TTL=125
Reply from 147.83.5.2: bytes=32 time=20ms TTL=125
Reply from 147.83.5.2: bytes=32 time=26ms TTL=125

Ping statistics for 147.83.5.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 16ms, Maximum = 26ms, Average = 20ms

C:\>ping 147.83.8.1

Pinging 147.83.8.1 with 32 bytes of data:

Reply from 147.83.8.1: bytes=32 time<1ms TTL=253
Reply from 147.83.8.1: bytes=32 time<1ms TTL=253
Reply from 147.83.8.1: bytes=32 time<1ms TTL=253
Reply from 147.83.8.1: bytes=32 time<1ms TTL=253

Ping statistics for 147.83.8.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 147.83.7.2

Pinging 147.83.7.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 147.83.7.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```

C:\>ping 147.83.7.2

Pinging 147.83.7.2 with 32 bytes of data:

Reply from 147.83.7.2: bytes=32 time<1ms TTL=253
Reply from 147.83.7.2: bytes=32 time=13ms TTL=253
Reply from 147.83.7.2: bytes=32 time=1ms TTL=253
Reply from 147.83.7.2: bytes=32 time<1ms TTL=253

Ping statistics for 147.83.7.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 13ms, Average = 3ms

```

Show the IP routing tables

Router 5:

```

Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
C       147.83.0.0 is directly connected, FastEthernet1/0
C       147.83.1.0 is directly connected, FastEthernet0/0
C       147.83.2.0 is directly connected, Serial2/0
R       147.83.3.0 [120/1] via 147.83.2.2, 00:00:08, Serial2/0
R       147.83.4.0 [120/1] via 147.83.2.2, 00:00:08, Serial2/0
R       147.83.5.0 [120/2] via 147.83.2.2, 00:00:08, Serial2/0
R       147.83.6.0 [120/2] via 147.83.2.2, 00:00:08, Serial2/0
R       147.83.7.0 [120/2] via 147.83.1.2, 00:00:07, FastEthernet0/0
R       147.83.8.0 [120/1] via 147.83.1.2, 00:00:07, FastEthernet0/0

```

Router 4:

```

Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
R       147.83.0.0 [120/1] via 147.83.1.1, 00:00:01, FastEthernet1/0
C       147.83.1.0 is directly connected, FastEthernet1/0
R       147.83.2.0 [120/1] via 147.83.1.1, 00:00:01, FastEthernet1/0
R       147.83.3.0 [120/2] via 147.83.1.1, 00:00:01, FastEthernet1/0
R       147.83.4.0 [120/2] via 147.83.1.1, 00:00:01, FastEthernet1/0
R       147.83.5.0 [120/3] via 147.83.1.1, 00:00:01, FastEthernet1/0
R       147.83.6.0 [120/2] via 147.83.8.1, 00:00:10, FastEthernet0/0
R       147.83.7.0 [120/1] via 147.83.8.1, 00:00:10, FastEthernet0/0
C       147.83.8.0 is directly connected, FastEthernet0/0

```

Router 3:

```

Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
R       147.83.0.0 [120/2] via 147.83.8.2, 00:00:19, FastEthernet1/0
R       147.83.1.0 [120/1] via 147.83.8.2, 00:00:19, FastEthernet1/0
R       147.83.2.0 [120/2] via 147.83.8.2, 00:00:19, FastEthernet1/0
R       147.83.3.0 [120/3] via 147.83.8.2, 00:00:19, FastEthernet1/0
R       147.83.4.0 [120/3] via 147.83.8.2, 00:00:19, FastEthernet1/0
R       147.83.5.0 [120/4] via 147.83.8.2, 00:00:19, FastEthernet1/0
R       147.83.6.0 [120/1] via 147.83.7.1, 00:00:20, FastEthernet0/0
C       147.83.7.0 is directly connected, FastEthernet0/0
C       147.83.8.0 is directly connected, FastEthernet1/0

```

Router 2:

```
Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
R       147.83.0.0 [120/3] via 147.83.7.2, 00:00:11, FastEthernet1/0
R       147.83.1.0 [120/2] via 147.83.7.2, 00:00:11, FastEthernet1/0
R       147.83.2.0 [120/3] via 147.83.7.2, 00:00:11, FastEthernet1/0
R       147.83.3.0 [120/4] via 147.83.7.2, 00:00:11, FastEthernet1/0
R       147.83.4.0 [120/4] via 147.83.7.2, 00:00:11, FastEthernet1/0
R       147.83.5.0 [120/5] via 147.83.7.2, 00:00:11, FastEthernet1/0
C       147.83.6.0 is directly connected, FastEthernet0/0
C       147.83.7.0 is directly connected, FastEthernet1/0
R       147.83.8.0 [120/1] via 147.83.7.2, 00:00:11, FastEthernet1/0
-
```

Router 1:

```
Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
R       147.83.0.0 [120/2] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.1.0 [120/2] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.2.0 [120/1] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.3.0 [120/1] via 147.83.4.1, 00:00:05, Serial2/0
C       147.83.4.0 is directly connected, Serial2/0
C       147.83.5.0 is directly connected, FastEthernet0/0
C       147.83.6.0 is directly connected, FastEthernet1/0
R       147.83.7.0 [120/4] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.8.0 [120/3] via 147.83.4.1, 00:00:05, Serial2/0
```

Router 0:

```
Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
R       147.83.0.0 [120/1] via 147.83.2.1, 00:00:06, Serial3/0
R       147.83.1.0 [120/1] via 147.83.2.1, 00:00:06, Serial3/0
C       147.83.2.0 is directly connected, Serial3/0
C       147.83.3.0 is directly connected, FastEthernet0/0
C       147.83.4.0 is directly connected, Serial2/0
R       147.83.5.0 [120/1] via 147.83.4.2, 00:00:12, Serial2/0
R       147.83.6.0 [120/1] via 147.83.4.2, 00:00:12, Serial2/0
R       147.83.7.0 [120/3] via 147.83.2.1, 00:00:06, Serial3/0
R       147.83.8.0 [120/2] via 147.83.2.1, 00:00:06, Serial3/0
```

Try to find where the metric is in the routing table and explain the values obtained. The path chosen is always the best?

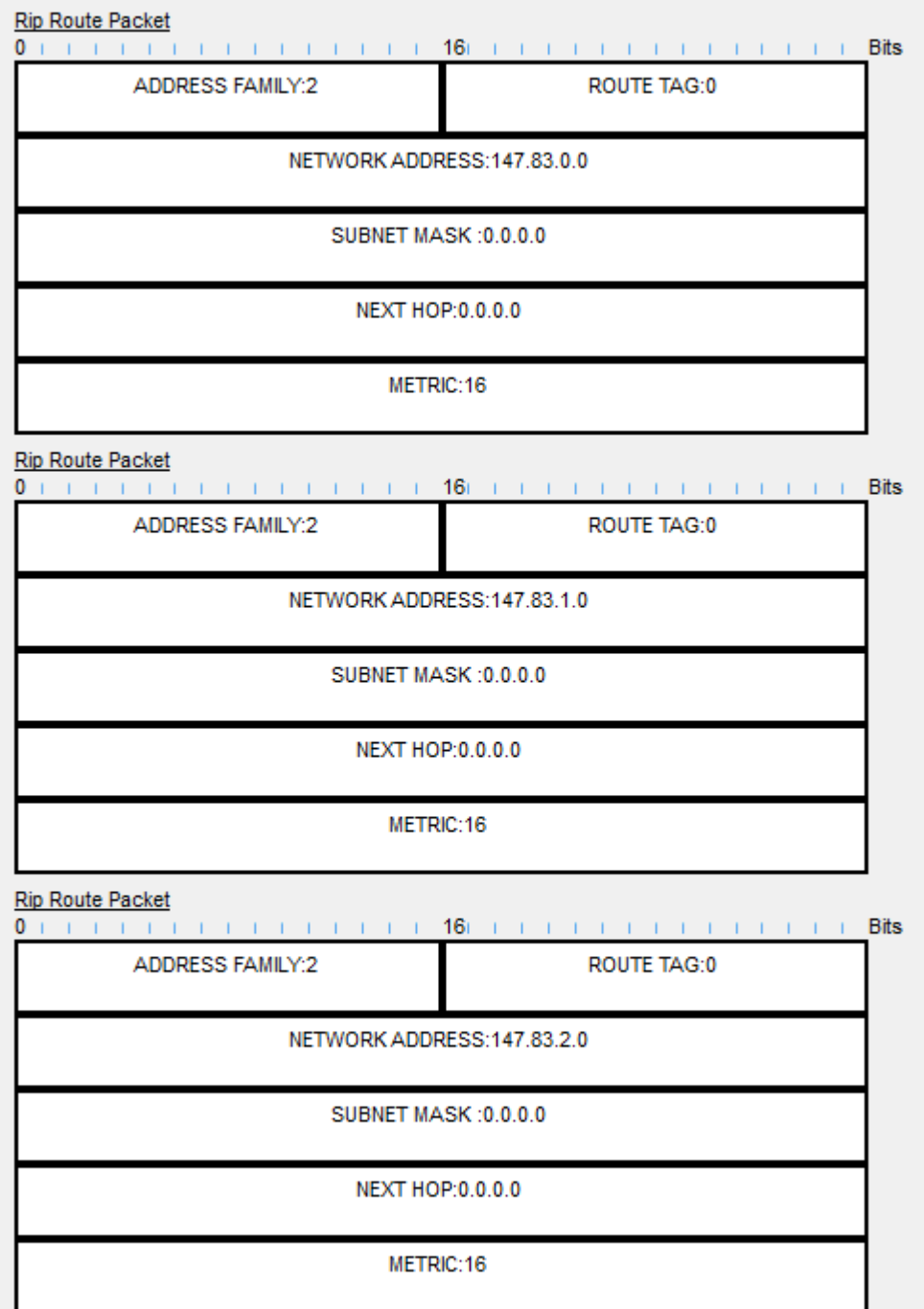
The metric is $[120/x]$. The metric is 120 and the number on the x spot is the hop count.

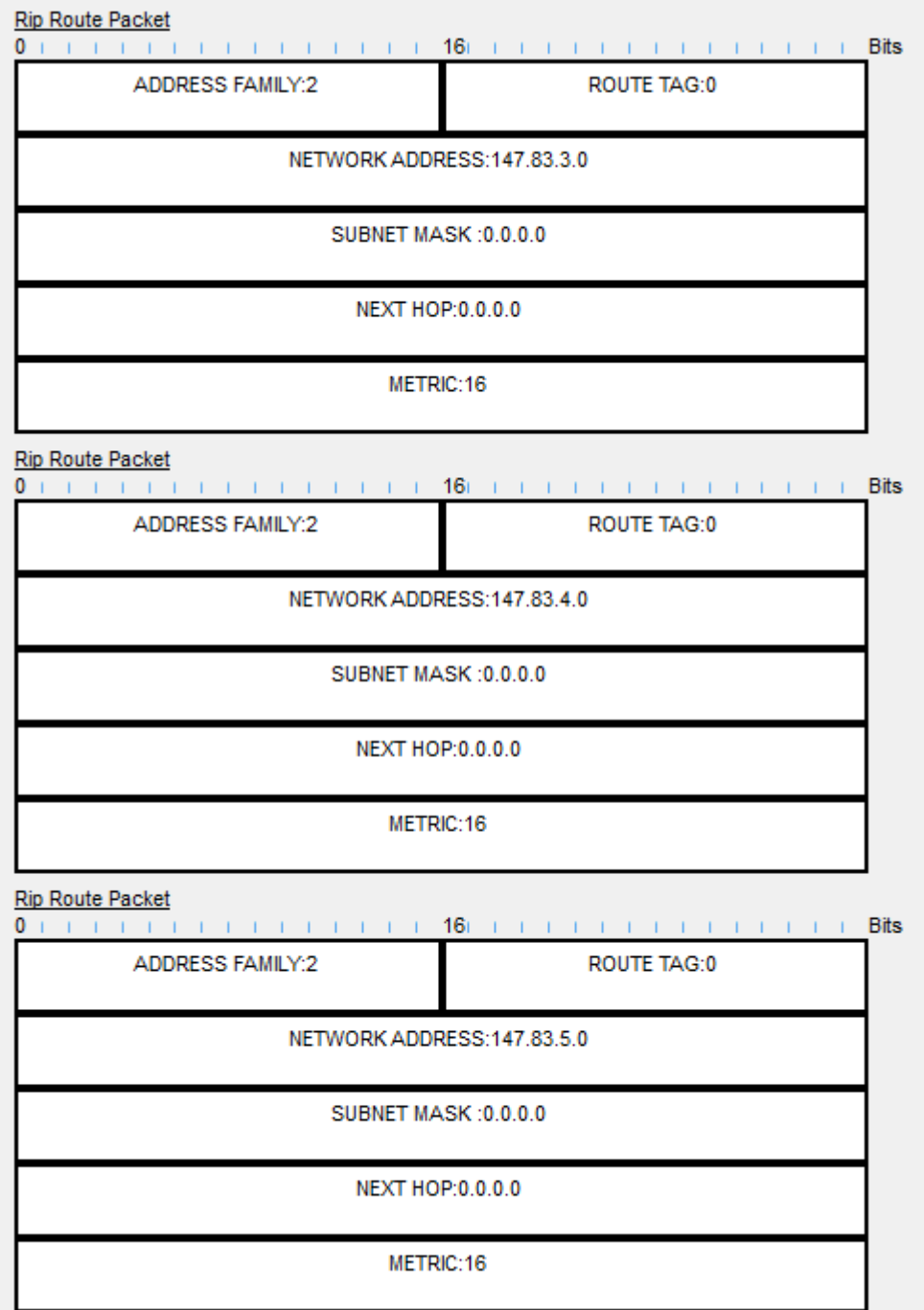
The chosen path is not always the best as it is not determined by the metric.

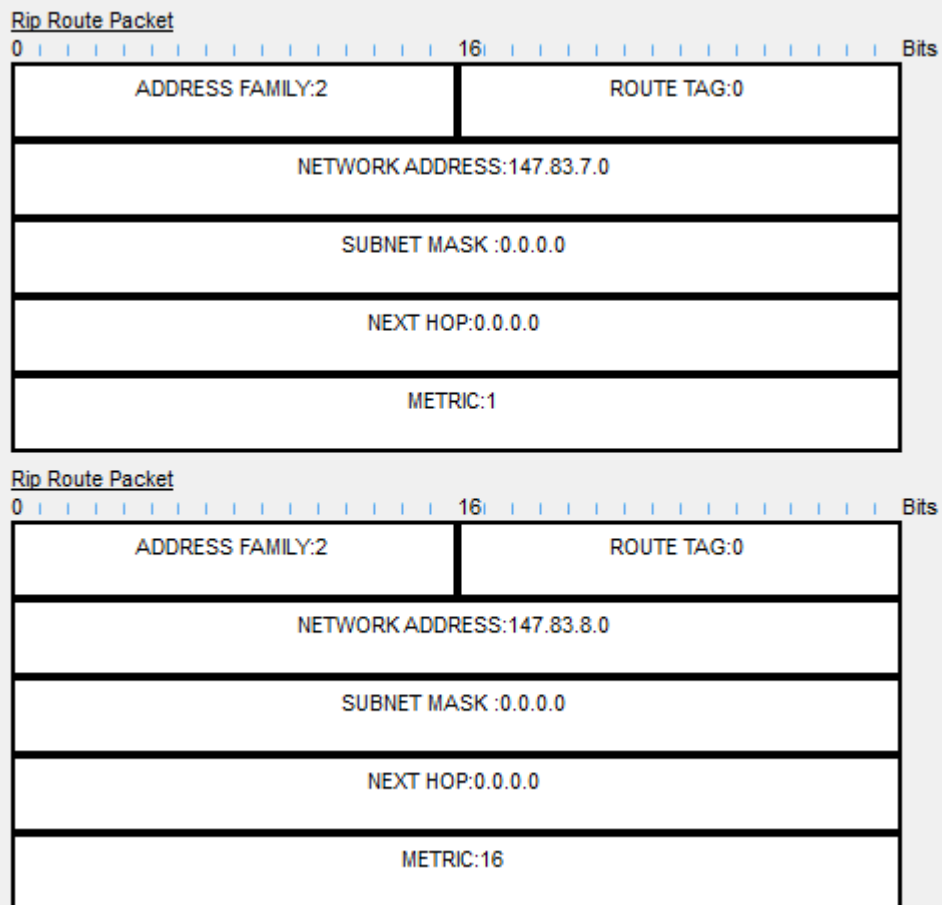
How often RIP sends its updates? Where can you obtain that information?

Every 30 seconds approximately. It is obtained on the router's user manual or documentation.

Capture an RIP packet and explain in detail







This packet contains the routing information from Router2. It contains the routing tables of this router and it compares them with the obtained routing tables so it can save the routes that it doesn't have for future operations.

Cut the serial link between R0 and R1 and show how the routing tables have been updated

Previous Router 1 routing table:

```
Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
R       147.83.0.0 [120/2] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.1.0 [120/2] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.2.0 [120/1] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.3.0 [120/1] via 147.83.4.1, 00:00:05, Serial2/0
C       147.83.4.0 is directly connected, Serial2/0
C       147.83.5.0 is directly connected, FastEthernet0/0
C       147.83.6.0 is directly connected, FastEthernet1/0
R       147.83.7.0 [120/4] via 147.83.4.1, 00:00:05, Serial2/0
R       147.83.8.0 [120/3] via 147.83.4.1, 00:00:05, Serial2/0
```

New Router 1 routing table:

```
Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 2 subnets
C       147.83.5.0 is directly connected, FastEthernet0/0
C       147.83.6.0 is directly connected, FastEthernet1/0
```

Previous Router 0 routing table:

```
Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 9 subnets
R       147.83.0.0 [120/1] via 147.83.2.1, 00:00:06, Serial3/0
R       147.83.1.0 [120/1] via 147.83.2.1, 00:00:06, Serial3/0
C       147.83.2.0 is directly connected, Serial3/0
C       147.83.3.0 is directly connected, FastEthernet0/0
C       147.83.4.0 is directly connected, Serial2/0
R       147.83.5.0 [120/1] via 147.83.4.2, 00:00:12, Serial2/0
R       147.83.6.0 [120/1] via 147.83.4.2, 00:00:12, Serial2/0
R       147.83.7.0 [120/3] via 147.83.2.1, 00:00:06, Serial3/0
R       147.83.8.0 [120/2] via 147.83.2.1, 00:00:06, Serial3/0
```

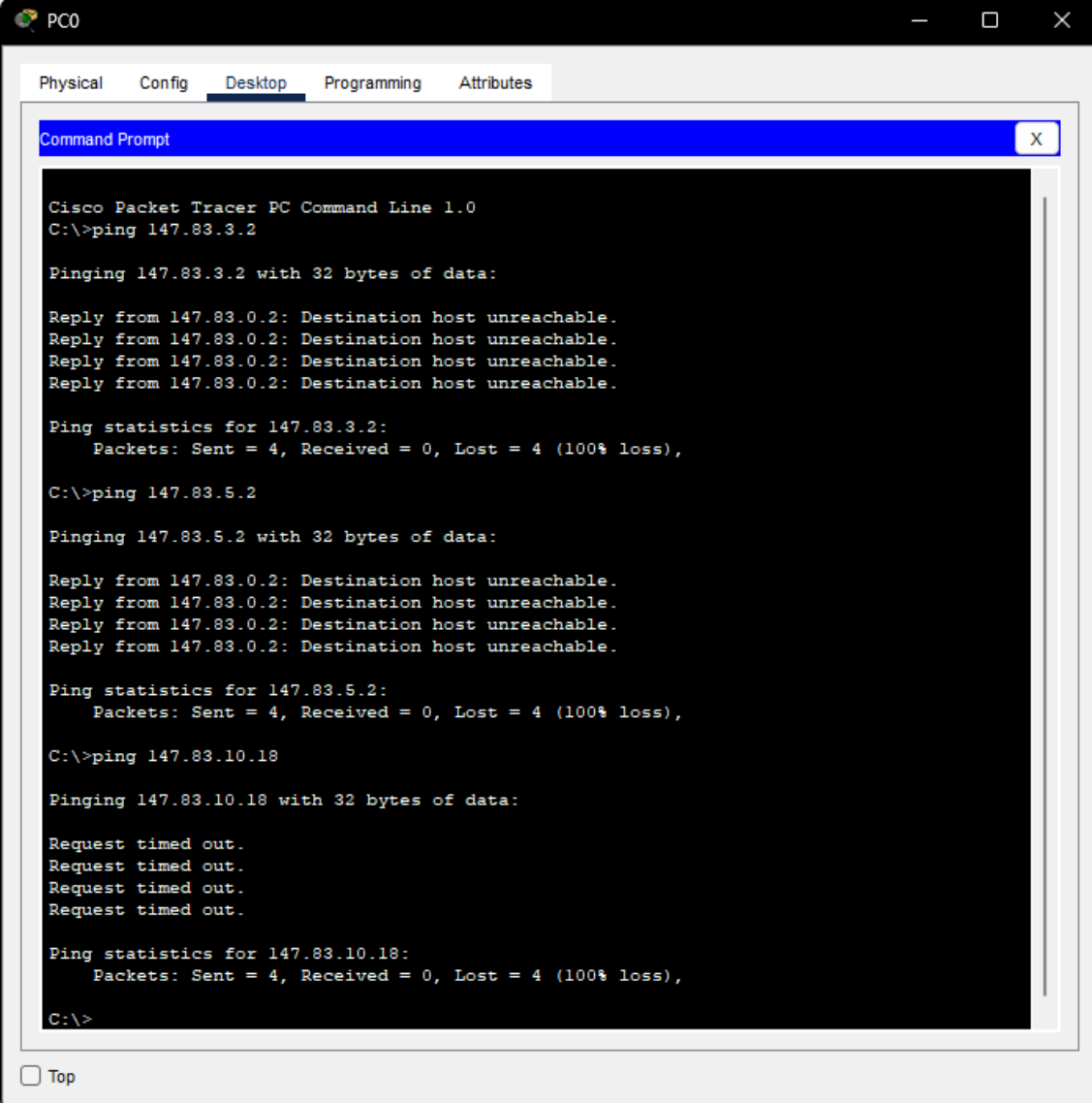
New Router 0 routing table:

```
Gateway of last resort is not set

    147.83.0.0/24 is subnetted, 7 subnets
R       147.83.0.0 [120/1] via 147.83.2.1, 00:00:29, Serial3/0
R       147.83.1.0 [120/1] via 147.83.2.1, 00:00:29, Serial3/0
C       147.83.2.0 is directly connected, Serial3/0
C       147.83.3.0 is directly connected, FastEthernet0/0
R       147.83.6.0 [120/4] via 147.83.2.1, 00:00:04, Serial3/0
R       147.83.7.0 [120/3] via 147.83.2.1, 00:00:29, Serial3/0
R       147.83.8.0 [120/2] via 147.83.2.1, 00:00:29, Serial3/0
```

Part 2

Try the connectivity end to end



The screenshot shows a Cisco Packet Tracer PC Command Prompt window for PC0. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, showing a Command Prompt window. The Command Prompt displays the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 147.83.3.2

Pinging 147.83.3.2 with 32 bytes of data:

Reply from 147.83.0.2: Destination host unreachable.
Reply from 147.83.0.2: Destination host unreachable.
Reply from 147.83.0.2: Destination host unreachable.
Reply from 147.83.0.2: Destination host unreachable.

Ping statistics for 147.83.3.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 147.83.5.2

Pinging 147.83.5.2 with 32 bytes of data:

Reply from 147.83.0.2: Destination host unreachable.
Reply from 147.83.0.2: Destination host unreachable.
Reply from 147.83.0.2: Destination host unreachable.
Reply from 147.83.0.2: Destination host unreachable.

Ping statistics for 147.83.5.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 147.83.10.18

Pinging 147.83.10.18 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 147.83.10.18:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

At the bottom left of the Command Prompt window, there is a checkbox labeled "Top".

Examine the ip routing tables and try to explain the results obtained

Router 5:

```
Gateway of last resort is not set

    147.83.0.0/16 is variably subnetted, 7 subnets, 2 masks
C       147.83.0.0/24 is directly connected, FastEthernet1/0
R       147.83.10.0/30 [120/1] via 147.83.10.5, 00:00:25, Serial2/0
C       147.83.10.4/30 is directly connected, Serial2/0
C       147.83.10.8/30 is directly connected, FastEthernet0/0
R       147.83.10.12/30 [120/1] via 147.83.10.10, 00:00:24, FastEthernet0/0
R       147.83.10.16/30 [120/3] via 147.83.10.5, 00:00:25, Serial2/0
R       147.83.10.20/30 [120/2] via 147.83.10.5, 00:00:25, Serial2/0
```

Router 4:

```
Gateway of last resort is not set

    147.83.0.0/30 is subnetted, 6 subnets
R       147.83.10.0 [120/2] via 147.83.10.9, 00:00:17, FastEthernet1/0
R       147.83.10.4 [120/1] via 147.83.10.9, 00:00:17, FastEthernet1/0
C       147.83.10.8 is directly connected, FastEthernet1/0
C       147.83.10.12 is directly connected, FastEthernet0/0
R       147.83.10.16 [120/4] via 147.83.10.9, 00:00:17, FastEthernet1/0
R       147.83.10.20 [120/3] via 147.83.10.9, 00:00:17, FastEthernet1/0
```

Router 3:

```
Gateway of last resort is not set

    147.83.0.0/30 is subnetted, 6 subnets
R       147.83.10.0 [120/2] via 147.83.10.18, 00:00:18, FastEthernet0/0
R       147.83.10.4 [120/3] via 147.83.10.18, 00:00:18, FastEthernet0/0
R       147.83.10.8 [120/4] via 147.83.10.18, 00:00:18, FastEthernet0/0
C       147.83.10.12 is directly connected, FastEthernet1/0
C       147.83.10.16 is directly connected, FastEthernet0/0
R       147.83.10.20 [120/1] via 147.83.10.18, 00:00:18, FastEthernet0/0
```

Router 2:

```
Gateway of last resort is not set

    147.83.0.0/30 is subnetted, 6 subnets
R       147.83.10.0 [120/1] via 147.83.10.22, 00:00:19, FastEthernet0/0
R       147.83.10.4 [120/2] via 147.83.10.22, 00:00:19, FastEthernet0/0
R       147.83.10.8 [120/3] via 147.83.10.22, 00:00:19, FastEthernet0/0
R       147.83.10.12 [120/1] via 147.83.10.17, 00:00:18, FastEthernet1/0
C       147.83.10.16 is directly connected, FastEthernet1/0
C       147.83.10.20 is directly connected, FastEthernet0/0
```

Router 1:

```
Gateway of last resort is not set

      147.83.0.0/16 is variably subnetted, 7 subnets, 2 masks
C       147.83.5.0/24 is directly connected, FastEthernet0/0
C       147.83.10.0/30 is directly connected, Serial2/0
R       147.83.10.4/30 [120/1] via 147.83.10.1, 00:00:20, Serial2/0
R       147.83.10.8/30 [120/2] via 147.83.10.1, 00:00:20, Serial2/0
R       147.83.10.12/30 [120/2] via 147.83.10.21, 00:00:08, FastEthernet1/0
R       147.83.10.16/30 [120/1] via 147.83.10.21, 00:00:08, FastEthernet1/0
C       147.83.10.20/30 is directly connected, FastEthernet1/0
```

Router 0:

```
Gateway of last resort is not set

      147.83.0.0/16 is variably subnetted, 7 subnets, 2 masks
C       147.83.3.0/24 is directly connected, FastEthernet0/0
C       147.83.10.0/30 is directly connected, Serial2/0
C       147.83.10.4/30 is directly connected, Serial3/0
R       147.83.10.8/30 [120/1] via 147.83.10.6, 00:00:04, Serial3/0
R       147.83.10.12/30 [120/2] via 147.83.10.6, 00:00:04, Serial3/0
R       147.83.10.16/30 [120/2] via 147.83.10.2, 00:00:13, Serial2/0
R       147.83.10.20/30 [120/1] via 147.83.10.2, 00:00:13, Serial2/0
```

Examine the routing table. Do you think that the connectivity end to end is now working correctly? Test the connectivity

Previous Router 0 routing table:

```
Gateway of last resort is not set

      147.83.0.0/16 is variably subnetted, 7 subnets, 2 masks
C       147.83.3.0/24 is directly connected, FastEthernet0/0
C       147.83.10.0/30 is directly connected, Serial2/0
C       147.83.10.4/30 is directly connected, Serial3/0
R       147.83.10.8/30 [120/1] via 147.83.10.6, 00:00:04, Serial3/0
R       147.83.10.12/30 [120/2] via 147.83.10.6, 00:00:04, Serial3/0
R       147.83.10.16/30 [120/2] via 147.83.10.2, 00:00:13, Serial2/0
R       147.83.10.20/30 [120/1] via 147.83.10.2, 00:00:13, Serial2/0
```

New Router 0 routing table:

```
Gateway of last resort is not set

      147.83.0.0/16 is variably subnetted, 9 subnets, 2 masks
R       147.83.0.0/24 [120/1] via 147.83.10.6, 00:00:13, Serial3/0
C       147.83.3.0/24 is directly connected, FastEthernet0/0
R       147.83.5.0/24 [120/1] via 147.83.10.2, 00:00:15, Serial2/0
C       147.83.10.0/30 is directly connected, Serial2/0
C       147.83.10.4/30 is directly connected, Serial3/0
R       147.83.10.8/30 [120/1] via 147.83.10.6, 00:00:13, Serial3/0
R       147.83.10.12/30 [120/2] via 147.83.10.6, 00:00:13, Serial3/0
R       147.83.10.16/30 [120/2] via 147.83.10.2, 00:00:15, Serial2/0
R       147.83.10.20/30 [120/1] via 147.83.10.2, 00:00:15, Serial2/0
```

It is now showing the routing table as it should be so it should be working now.

Test:

```
C:\>ping 147.83.5.2

Pinging 147.83.5.2 with 32 bytes of data:

Request timed out.
Reply from 147.83.5.2: bytes=32 time=34ms TTL=125
Reply from 147.83.5.2: bytes=32 time=30ms TTL=125
Reply from 147.83.5.2: bytes=32 time=37ms TTL=125

Ping statistics for 147.83.5.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 30ms, Maximum = 37ms, Average = 33ms

C:\>ping 147.83.3.2

Pinging 147.83.3.2 with 32 bytes of data:

Request timed out.
Reply from 147.83.3.2: bytes=32 time=20ms TTL=126
Reply from 147.83.3.2: bytes=32 time=24ms TTL=126
Reply from 147.83.3.2: bytes=32 time=34ms TTL=126

Ping statistics for 147.83.3.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 20ms, Maximum = 34ms, Average = 26ms
```

Capture the RIP v2 packet and examine the differences with RIP v1

Rip Route Packet																Bits													
ADDRESS FAMILY:2								ROUTE TAG:0																					
NETWORK ADDRESS:147.83.10.12																													
SUBNET MASK :255.255.255.252																													
NEXT HOP:147.83.10.17																													
METRIC:1																													

RIP v1 does not have authentication and RIP v2 does have it.

RIP v2 packet also sends the subnet mask, thanks to this, it does not route with classes.

The RIP v1 metric is based on hops, RIP v2 so does and also adds bandwidth or route delay.