

## Networking H/618/5219

AC 2.3: Apply subnetting to different IP addresses.

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### Scenario

**VividBrush Creations** now has an additional network which has been created for a new branch in Derbyshire. As their IT Administrator, you have been requested to apply subnetting to ensure the network is efficient.

**Task 1)** Use the "Subnetting Derbyshire Branch Office (2.3).pkt" file within Cisco Packet Tracker, and apply subnetting using the instruction file named "Instructions - Subnetting Derbyshire Branch Office (2.3).pdf", based on the following:-

Office 1	Office 2
<p>Potentially up to 136 hosts, therefore: -</p> <ul style="list-style-type: none"> <li>● IP addresses from 192.168.1.1 to 192.168.1.254</li> <li>● 4 PCs at present</li> <li>● Subnet mask in binary is 11111111 11111111 11111111 00000000</li> <li>● Subnet mask in dotted decimal is 255.255.255.0</li> <li>● Router1 (FastEthernet0/0) with IP address 192.168.1.1 and subnet mask 255.255.255.0</li> <li>● Router1 (Serial3/0) with IP address 192.168.2.129 and subnet mask 255.255.255.252</li> </ul>	<p>Potentially up to 95 hosts, therefore: -</p> <ul style="list-style-type: none"> <li>● IP addresses from 192.168.2.1 to 192.168.2.126</li> <li>● 4 PCs at present</li> <li>● Subnet mask in binary is 11111111 11111111 11111111 10000000</li> <li>● Subnet mask in dotted decimal is 255.255.255.128</li> <li>● Router0 (FastEthernet0/0) with IP address 192.168.2.126 and subnet mask 255.255.255.128</li> <li>● Router0 (Serial3/0) with IP address 192.168.2.130 and subnet mask 255.255.255.252</li> </ul>

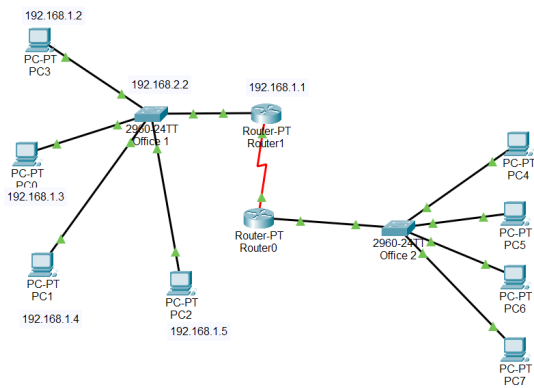
**Task 2)** Once all subnetting has been applied, from PC0 ping PC7 ensuring you get a successful response. If unsuccessful, ensure you fix the issue as this means subnetting has not been applied correctly.

**Task 3)** Complete this document.

**Task 1)** Use the "Subnetting Derbyshire Branch Office (2.3).pkt" file within Cisco Packet Tracker, and apply subnetting using the instruction file named "Instructions - Subnetting Derbyshire Branch Office (2.3).pdf".

# Subnetting Derbyshire Branch Office

Screenshot of network map will be sufficient for this.

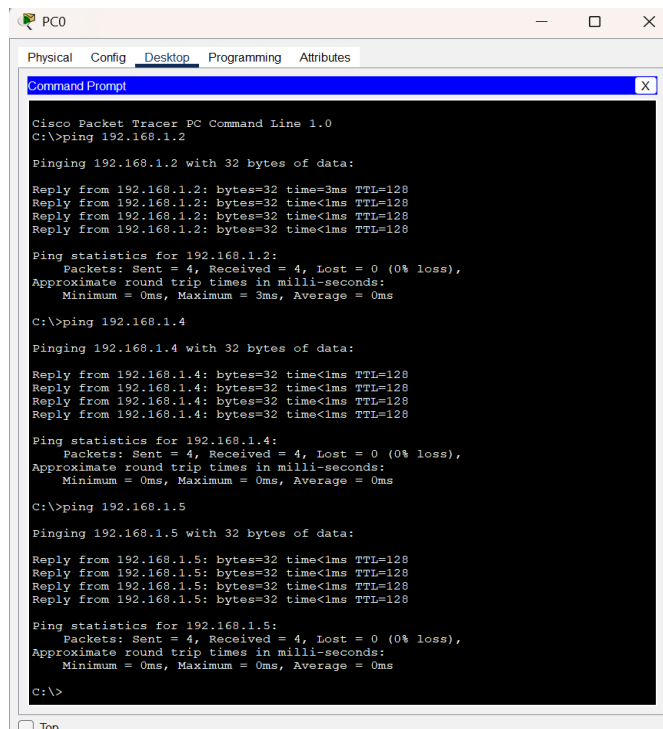


Annotation(s):

This is a screenshot of my network map showing active and direct connections between both offices.

**Task 2) Once all subnetting has been applied, from PC0 ping PC7 ensuring you get a successful response. If unsuccessful, ensure you fix the issue as this means subnetting has not been applied correctly.**

Screenshot of successful ping results will be sufficient for this.



```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=3ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 0ms

C:\>ping 192.168.1.4

Pinging 192.168.1.4 with 32 bytes of data:

Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.5

Pinging 192.168.1.5 with 32 bytes of data:

Reply from 192.168.1.5: bytes=32 time<1ms TTL=128
Reply from 192.168.1.5: bytes=32 time<1ms TTL=128
Reply from 192.168.1.5: bytes=32 time<1ms TTL=128
Reply from 192.168.1.5: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Annotation(s):

This is a successful ping from PC0 to PC1, PC2, and PC3

# Subnetting Derbyshire Branch Office



```
PC4
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.11

Pinging 192.168.2.11 with 32 bytes of data:

Reply from 192.168.2.11: bytes=32 time<1ms TTL=128
Reply from 192.168.2.11: bytes=32 time<1ms TTL=128
Reply from 192.168.2.11: bytes=32 time<1ms TTL=128
Reply from 192.168.2.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.12

Pinging 192.168.2.12 with 32 bytes of data:

Reply from 192.168.2.12: bytes=32 time<1ms TTL=128
Reply from 192.168.2.12: bytes=32 time<1ms TTL=128
Reply from 192.168.2.12: bytes=32 time<1ms TTL=128
Reply from 192.168.2.12: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 12ms, Average = 5ms

C:\>ping 192.168.2.13

Pinging 192.168.2.13 with 32 bytes of data:

Reply from 192.168.2.13: bytes=32 time<1ms TTL=128
Reply from 192.168.2.13: bytes=32 time<1ms TTL=128
Reply from 192.168.2.13: bytes=32 time<1ms TTL=128
Reply from 192.168.2.13: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

This is a successful ping from PC4 to PC5, PC6, and PC7

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Pinging 192.168.1.4 with 32 bytes of data:

Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.5

Pinging 192.168.1.5 with 32 bytes of data:

Reply from 192.168.1.5: bytes=32 time<1ms TTL=128
Reply from 192.168.1.5: bytes=32 time<1ms TTL=128
Reply from 192.168.1.5: bytes=32 time<1ms TTL=128
Reply from 192.168.1.5: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.13

Pinging 192.168.2.13 with 32 bytes of data:

Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Request timed out.
Reply from 192.168.1.1: Destination host unreachable.

Ping statistics for 192.168.2.13:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

An attempt to ping PC7 from PC1 was unsuccessful as shown in the bottom part of the screenshot.

# Subnetting Derbyshire Branch Office



The screenshot shows the configuration window for Router0. The 'Config' tab is active, and the 'Static Routes' section is selected. The 'Network' field is set to 192.168.1.0, the 'Mask' is 255.255.255.0, and the 'Next Hop' is 192.168.2.129. The 'Add' button is visible. Below the input fields, a message box displays the configured route: 'Network Address 192.168.1.0/24 via 192.168.2.129'.

To rectify this, I configured the Static Routes of both Router1 and Router1.

The screenshot shows how the Static Route for Router0 was configured. Under settings, I clicked Static, filled 192.168.1.0 for Network, 255.255.255.0 for Mask, and 192.168.2.129 for Next Hop, then Add. After that, a message popped up in the box under with a Network Address 192.168.1.0/24 via 192.168.2.129.

The screenshot shows the configuration window for Router1. The 'Config' tab is active, and the 'Static Routes' section is selected. The 'Network' field is set to 192.168.2.0, the 'Mask' is 255.255.255.128, and the 'Next Hop' is 192.168.2.130. The 'Add' button is visible. Below the input fields, a message box displays the configured route: 'Network Address 192.168.2.0/25 via 192.168.2.130'.

Repeated the same steps for Router1. Under settings, I clicked Static, filled 192.168.2.0 for Network, 255.255.255.128 for Mask, and 192.168.2.130 for Next Hop, then Add. After that, a message popped up in the box under with a Network Address 192.168.2.0/25 via 192.168.2.130.

# Subnetting Derbyshire Branch Office



```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 192.168.2.13
Pinging 192.168.2.13 with 32 bytes of data:
Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Request timed out.
Reply from 192.168.1.1: Destination host unreachable.

Ping statistics for 192.168.2.13:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.2.13
Pinging 192.168.2.13 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.13: bytes=32 time=11ms TTL=126
Reply from 192.168.2.13: bytes=32 time=17ms TTL=126
Reply from 192.168.2.13: bytes=32 time=18ms TTL=126

Ping statistics for 192.168.2.13:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 11ms, Maximum = 18ms, Average = 15ms

C:\>ping 192.168.2.13
Pinging 192.168.2.13 with 32 bytes of data:
Reply from 192.168.2.13: bytes=32 time=2ms TTL=126
Reply from 192.168.2.13: bytes=32 time=15ms TTL=126
Reply from 192.168.2.13: bytes=32 time=22ms TTL=126
Reply from 192.168.2.13: bytes=32 time=12ms TTL=126

Ping statistics for 192.168.2.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 22ms, Average = 12ms
```

Then I went back to PC1 and ping PC7. As shown in the screenshot, the first attempt successfully received 3 sent packets out of 4 with one timing out. A second attempt shows all 4 packets sent were received.

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Approximate round trip times in milli-seconds:
    Minimum = 11ms, Maximum = 18ms, Average = 15ms
C:\>ping 192.168.2.13
Pinging 192.168.2.13 with 32 bytes of data:
Reply from 192.168.2.13: bytes=32 time=2ms TTL=126
Reply from 192.168.2.13: bytes=32 time=18ms TTL=126
Reply from 192.168.2.13: bytes=32 time=22ms TTL=126
Reply from 192.168.2.13: bytes=32 time=12ms TTL=126

Ping statistics for 192.168.2.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 22ms, Average = 12ms

C:\>ping 192.168.2.12
Pinging 192.168.2.12 with 32 bytes of data:
Request timed out.
Reply from 192.168.2.12: bytes=32 time=10ms TTL=126
Reply from 192.168.2.12: bytes=32 time=10ms TTL=126
Reply from 192.168.2.12: bytes=32 time=17ms TTL=126

Ping statistics for 192.168.2.12:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 17ms, Average = 12ms

C:\>ping 192.168.2.11
Pinging 192.168.2.11 with 32 bytes of data:
Request timed out.
Reply from 192.168.2.11: bytes=32 time=23ms TTL=126
Reply from 192.168.2.11: bytes=32 time=15ms TTL=126
Reply from 192.168.2.11: bytes=32 time=9ms TTL=126

Ping statistics for 192.168.2.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 9ms, Maximum = 23ms, Average = 15ms
C:\>
```

This is a successful ping from PC0 to all other PCs at office2 i.e PC4, PC5, and PC6.