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Deliverables

1. In the Mininet CLI, ping from h3 to h4 for *three* times (Either of the two methods is fine).

Deliverable 1 (2 Pt)

Provide a screenshot that verifies that you have successfully ping from h3 to h4 for three times.

```
*** Starting CLI:
mininet> h3 ping -c3 h4
PING 192.168.2.20 (192.168.2.20) 56(84) bytes of data.
64 bytes from 192.168.2.20: icmp_seq=1 ttl=64 time=59.0 ms
64 bytes from 192.168.2.20: icmp_seq=2 ttl=64 time=0.163 ms
64 bytes from 192.168.2.20: icmp_seq=3 ttl=64 time=0.073 ms

--- 192.168.2.20 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1999ms
rtt min/avg/max/mdev = 0.073/19.767/59.067/27.789 ms
mininet>
```

2. Ping h1 to h3 for three times. What happens when you ping from h1 to h3? Why?

Deliverable 2 (2 Pt)

Provide a screenshot that shows what happens when you try to establish a successful connectivity between computer h1 and h3. Explain why you can (or cannot) successfully connect.

```
--- 192.168.2.20 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1999ms
rtt min/avg/max/mdev = 0.073/19.767/59.067/27.789 ms
mininet> h1 ping h3
PING 192.168.2.10 (192.168.2.10) 56(84) bytes of data.
From 192.168.1.10 icmp_seq=1 Destination Host Unreachable
From 192.168.1.10 icmp_seq=2 Destination Host Unreachable
From 192.168.1.10 icmp_seq=3 Destination Host Unreachable
From 192.168.1.10 icmp_seq=4 Destination Host Unreachable
From 192.168.1.10 icmp_seq=5 Destination Host Unreachable
From 192.168.1.10 icmp_seq=6 Destination Host Unreachable
^C
--- 192.168.2.10 ping statistics ---
9 packets transmitted, 0 received, +6 errors, 100% packet loss, time 8046ms
pipe 3
mininet>
```

We cannot connect h1 to h3 as they are in different subnet. A network layer device(router or layer 3 switch is required to connect two devices in different sub network)

3. Ping h2 to server for three times. What happens when you ping from h2 to the server? Why?

Deliverable 3 (2 Pt)

Provide a screenshot that shows what happens when you try to establish a successful connectivity between computer h2 and the server. Explain why you can (or cannot) successfully connect.

```
c0 h1 h2 h3 h4 s1 s2 s3 server
mininet> h2 ping -c3 server
PING 10.0.0.5 (10.0.0.5) 56(84) bytes of data.
From 192.168.1.20 icmp_seq=1 Destination Host Unreachable
From 192.168.1.20 icmp_seq=2 Destination Host Unreachable
From 192.168.1.20 icmp_seq=3 Destination Host Unreachable

--- 10.0.0.5 ping statistics ---
3 packets transmitted, 0 received, +3 errors, 100% packet loss, time 2016ms
```

Since bot devices are present in different network it is not possible to connect or ping from h2 to server.

Deliverables:

1. Ping h1 to h3 for three times.

Deliverable 4 (2 Pt)

Provide a screenshot that verifies that you have established a successful connectivity between host h1 and h3.

```
mininet> h1 ping -c3 h3
PING 192.168.2.10 (192.168.2.10) 56(84) bytes of data.
64 bytes from 192.168.2.10: icmp_seq=1 ttl=64 time=119 ms
64 bytes from 192.168.2.10: icmp_seq=2 ttl=64 time=17.9 ms
64 bytes from 192.168.2.10: icmp_seq=3 ttl=64 time=0.839 ms

--- 192.168.2.10 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 0.839/45.982/119.124/52.190 ms
mininet>
```

2. Ping h2 to server for three times.

Deliverable 5 (2 Pt)

Provide a screenshot that verifies that you have established a successful connectivity between host h2 and server.

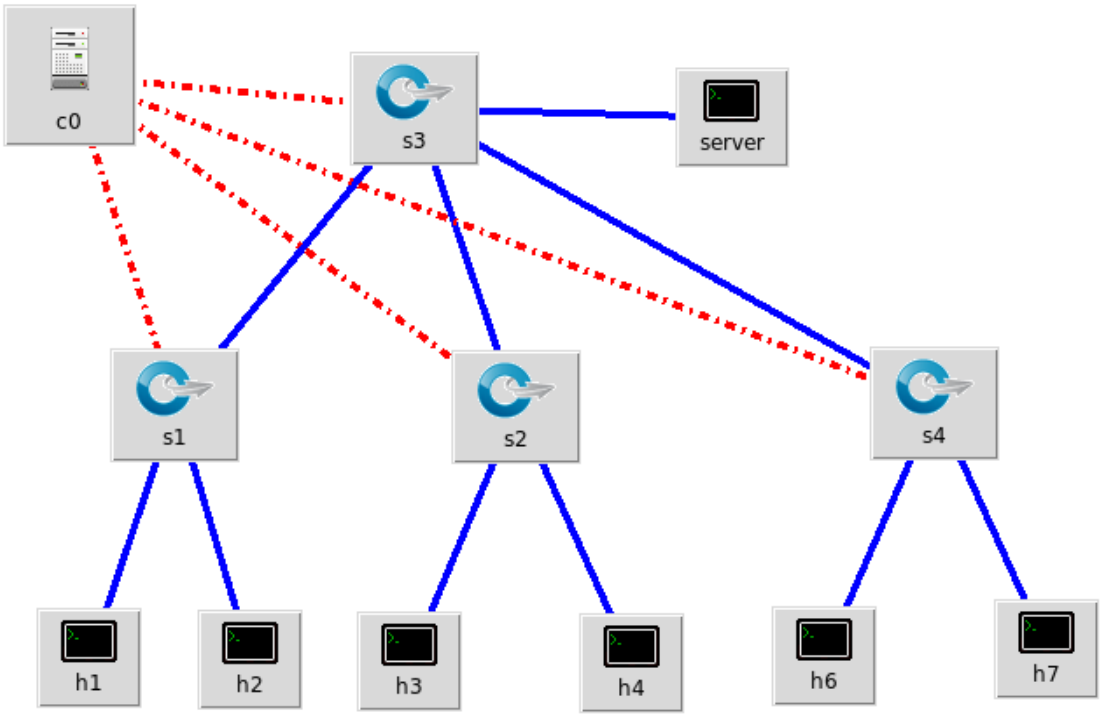
```
mininet> h2 ping -c3 server
PING 10.0.0.5 (10.0.0.5) 56(84) bytes of data.
64 bytes from 10.0.0.5: icmp_seq=1 ttl=64 time=159 ms
64 bytes from 10.0.0.5: icmp_seq=2 ttl=64 time=28.8 ms
64 bytes from 10.0.0.5: icmp_seq=3 ttl=64 time=0.575 ms

--- 10.0.0.5 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 0.575/63.080/159.791/69.354 ms
mininet>
```

Deliverables

1. Add the above new subnet into the topology with the correct IP addresses.

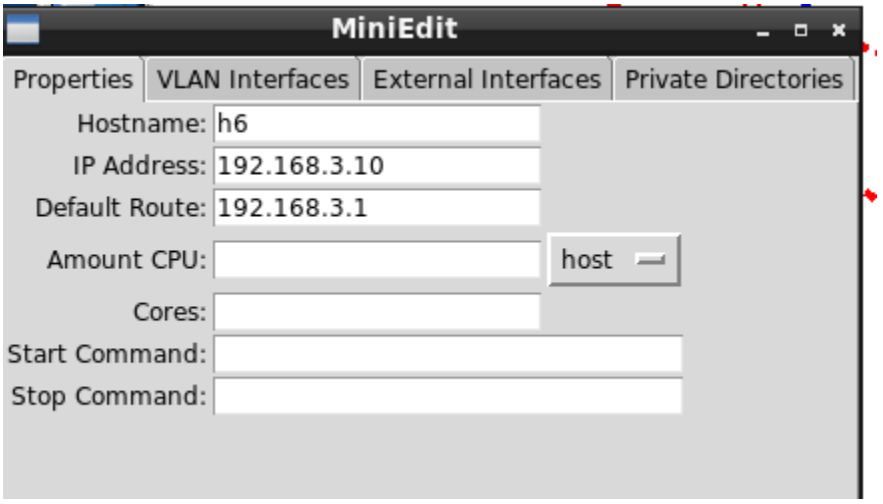
Deliverable 6 (2 Pt)

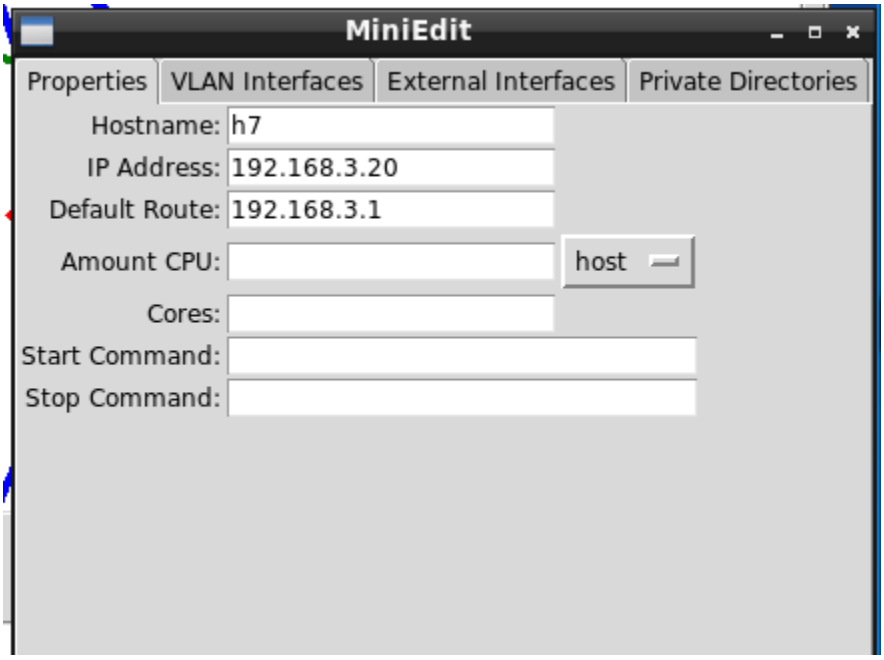
Provide a screenshot of the updated network topology with the new subnet.



Deliverable 7 (2 Pt)

Provide a screenshot to show the IP addresses of h5 and h6.





2. Following similar steps in Part II, make sure that you can connect the subnet to the whole network.

Deliverable 8 (2 Pt)

Provide a screenshot that verifies that you have established a successful connectivity between host h5 and h6.

```
mininet> h6 ping -c6 h7
PING 192.168.3.20 (192.168.3.20) 56(84) bytes of data.
64 bytes from 192.168.3.20: icmp_seq=1 ttl=64 time=91.8 ms
64 bytes from 192.168.3.20: icmp_seq=2 ttl=64 time=0.420 ms
64 bytes from 192.168.3.20: icmp_seq=3 ttl=64 time=0.077 ms
64 bytes from 192.168.3.20: icmp_seq=4 ttl=64 time=0.097 ms
64 bytes from 192.168.3.20: icmp_seq=5 ttl=64 time=0.078 ms
64 bytes from 192.168.3.20: icmp_seq=6 ttl=64 time=0.105 ms

--- 192.168.3.20 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5009ms
rtt min/avg/max/mdev = 0.077/15.436/91.844/34.170 ms
mininet>
```

Deliverable 9 (2 Pt)

Provide a screenshot that verifies that you have established a successful connectivity between host h5 and h1.

```
mininet> h6 ping h1
PING 192.168.1.10 (192.168.1.10) 56(84) bytes of data.
64 bytes from 192.168.1.10: icmp_seq=1 ttl=64 time=156 ms
64 bytes from 192.168.1.10: icmp_seq=2 ttl=64 time=0.897 ms
64 bytes from 192.168.1.10: icmp_seq=3 ttl=64 time=0.099 ms
64 bytes from 192.168.1.10: icmp_seq=4 ttl=64 time=0.090 ms
64 bytes from 192.168.1.10: icmp_seq=5 ttl=64 time=0.091 ms
64 bytes from 192.168.1.10: icmp_seq=6 ttl=64 time=0.093 ms
^C
--- 192.168.1.10 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5005ms
rtt min/avg/max/mdev = 0.090/26.270/156.350/58.174 ms
mininet>
```

Deliverable 10 (2 Pt)

Provide a screenshot that verifies that you have established a successful connectivity between host h5 and the server.

```
mininet> h6 ping -c6 server
PING 10.0.0.5 (10.0.0.5) 56(84) bytes of data.
64 bytes from 10.0.0.5: icmp_seq=1 ttl=64 time=120 ms
64 bytes from 10.0.0.5: icmp_seq=2 ttl=64 time=6.62 ms
64 bytes from 10.0.0.5: icmp_seq=3 ttl=64 time=0.414 ms
64 bytes from 10.0.0.5: icmp_seq=4 ttl=64 time=0.086 ms
64 bytes from 10.0.0.5: icmp_seq=5 ttl=64 time=0.079 ms
64 bytes from 10.0.0.5: icmp_seq=6 ttl=64 time=0.086 ms

--- 10.0.0.5 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5002ms
rtt min/avg/max/mdev = 0.079/21.235/120.122/44.286 ms
mininet>
```