

## Question 1

**Static Routing** is configuring by manually creating the routing table in the router, it's the simplest routing form, making it easy to implement on small networks, but it scales in complexity very quickly. It is inflexible as it cannot handle any changes or failures from the external networks because the routes are manually configured by the network admin. Performance wise the routers required for it don't require any significant RAM or CPU to do the work, as no processing is required. It is secure as routers to give information about their routing entries.

**Dynamic Routing** uses a set of protocols run by each router, to determine the 'best route' to choose for each network dynamically without the intervention of the network admin. Dynamic routing is more adaptable and flexible as it responds to any changes in the external networks. The need for a routing protocol means that there's an overhead posed on the router to keep the routing table up-to-date, as well as to process the protocol itself, requiring the router to have a lot of RAM and CPU compared to Static routing. Less secure as routers keep sharing information regarding their routing table's entries.

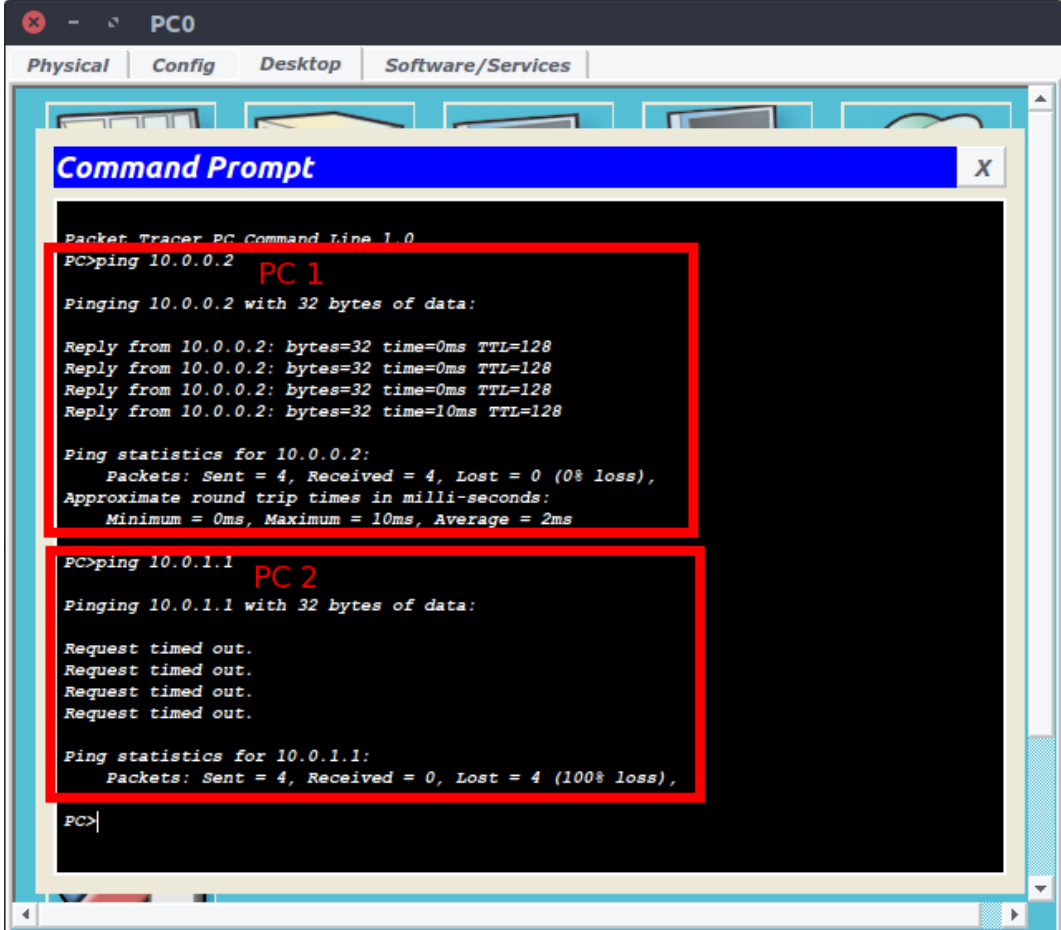
## Question 2

**Subnetting** reasons for it,

- *Distributing the network administration duty*, as each subnet can have its own admin, which collaborates with the admins of other subnets in order to maintain the whole network.
- *Security and troubleshooting*, since each subnet can be isolated from the others, and if any routing issues are faced by a host it can be detected and fixed quicker as it is known to be part of the smaller subnet.
- *To connect networks across separate geographical regions.*

### Question 3

Before configuring static routing, local ping works fine, but going to another network fails.



The screenshot shows a Packet Tracer PC Command Prompt window for PC0. The window has tabs for Physical, Config, Desktop, and Software/Services. The Command Prompt title bar is blue with the text "Command Prompt" and a close button. The main area is black with white text. Two sections of the output are highlighted with red boxes. The first section shows a successful ping to 10.0.0.2, and the second section shows a failed ping to 10.0.1.1.

```
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.2
PC 1
Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=10ms TTL=128

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms

PC>ping 10.0.1.1
PC 2
Pinging 10.0.1.1 with 32 bytes of data:

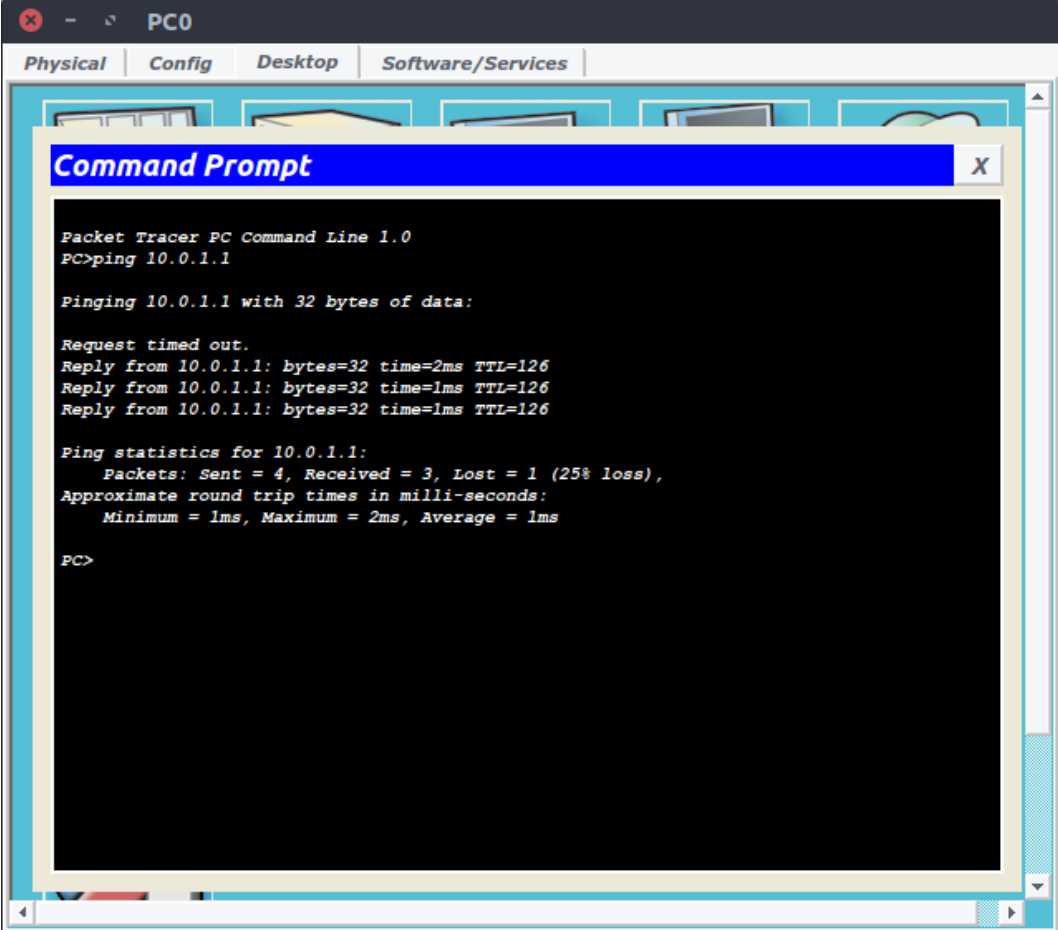
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.0.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```

## Question 4

After configuring static routing, pingging outer networks now works.



```
PC0
Physical | Config | Desktop | Software/Services

Command Prompt X

Packet Tracer PC Command Line 1.0
PC>ping 10.0.1.1

Pinging 10.0.1.1 with 32 bytes of data:

Request timed out.
Reply from 10.0.1.1: bytes=32 time=2ms TTL=126
Reply from 10.0.1.1: bytes=32 time=1ms TTL=126
Reply from 10.0.1.1: bytes=32 time=1ms TTL=126

Ping statistics for 10.0.1.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

PC>
```