

Practical 4

Designing and configuring a network topology

Aim: Configure IP static routing

Theory:

- 1) Static routing method is most trusted by a router.
- 2) Static routing is not really a routing protocol.
- 3) Static routes do not dynamically adapt to network changes, are not particularly scalable, and require manual updating to reflect changes.

Static routing has the following advantages

- 1) There is no bandwidth usage between routers, which means you could possibly save money on WAN links.
- 2) There is no overhead on the router CPU, which means you could possibly buy a cheaper router than you would use if you were using dynamic routing.
- 3) It adds security because the administrator can choose to allow routing access to certain networks only.

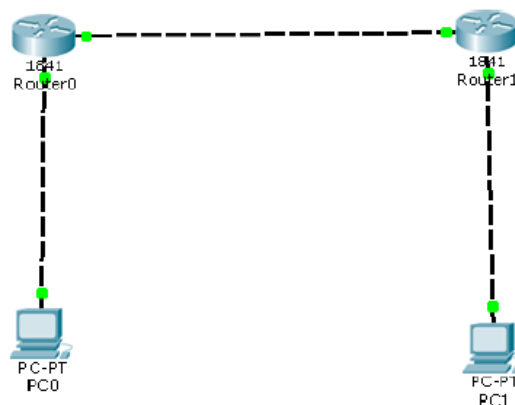
Static routing has the following disadvantages

- 1) Static routes don't dynamically adapt to network change.
- 2) If a network is added to the internetwork, the administrator has to add a route to it on all routers—by hand.
- 3) It's not feasible in large networks because maintaining it would be a full-time job in itself.
- 4) With static routing, as your network grows, it can be difficult just keep adding static routes makes sure everybody can still get everything.
- 5) The administrator must really understand the internetwork and how each router is connected in order to configure routes correctly.

There are two different styles to configure an “ip route” command:

- 1) Using a next hop IP address
- 2) Using an outgoing interface

Consider the following network topology

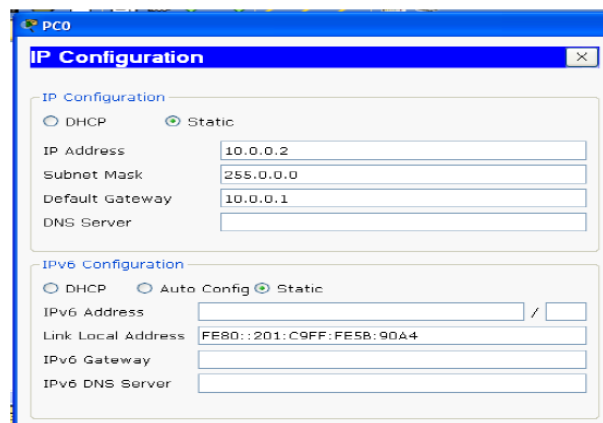


We use the following IP addresses for hosts and Routers

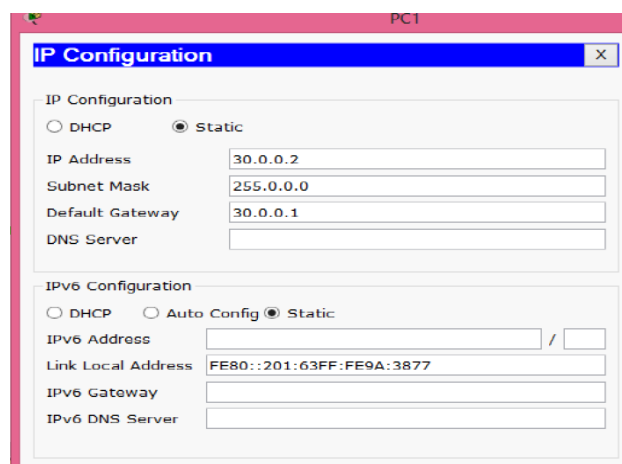
	Interface	IP address	Subnet Mask	Gateway
PC0		10.0.0.2	255.0.0.0	10.0.0.1
PC1		30.0.0.2		30.0.0.1
Router 0	FastEthernet 0/0	10.0.0.1		
	FastEthernet 0/1	20.0.0.1		
Router 1	FastEthernet 0/0	20.0.0.2		
	FastEthernet 0/1	30.0.0.1		

We configure the given topology using Cisco Packet tracer as follows

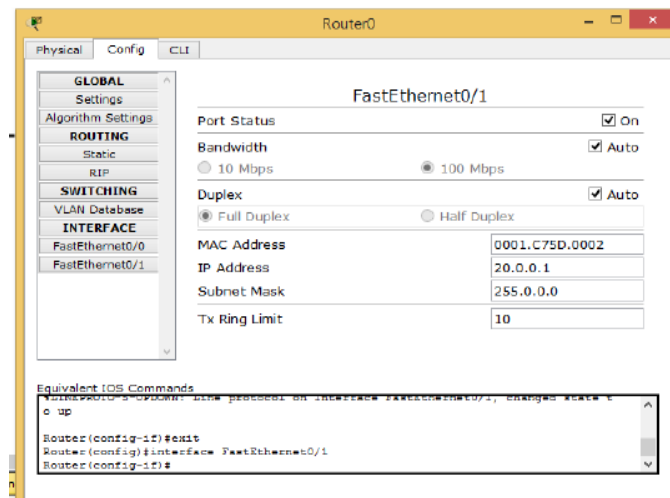
Step 1: Configuring PC 0



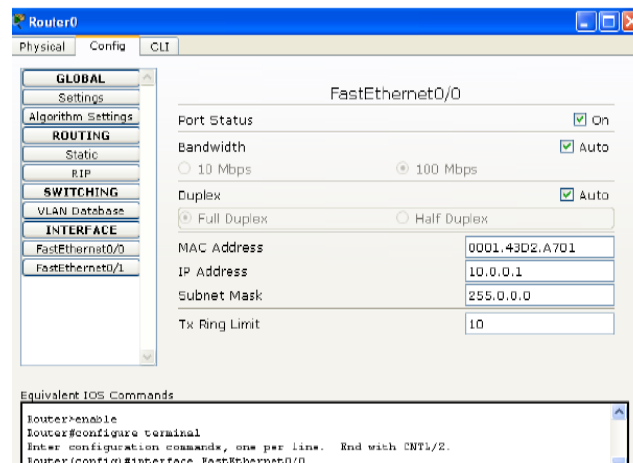
Step 2: Configuring PC 1



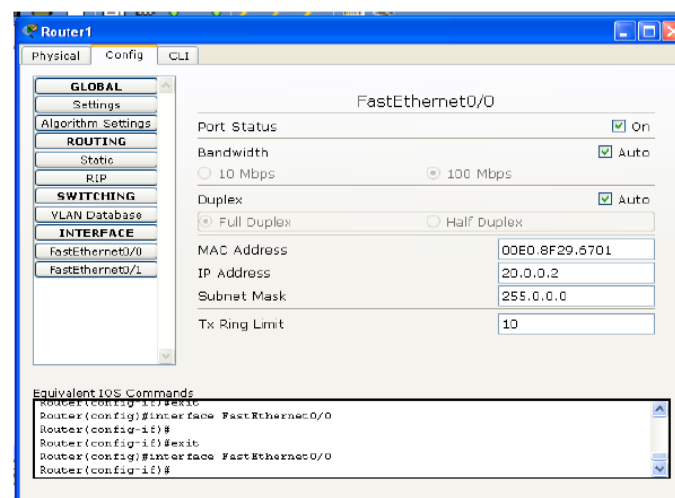
Step 3: Configuring Router 0
Interface: FastEthernet0/1



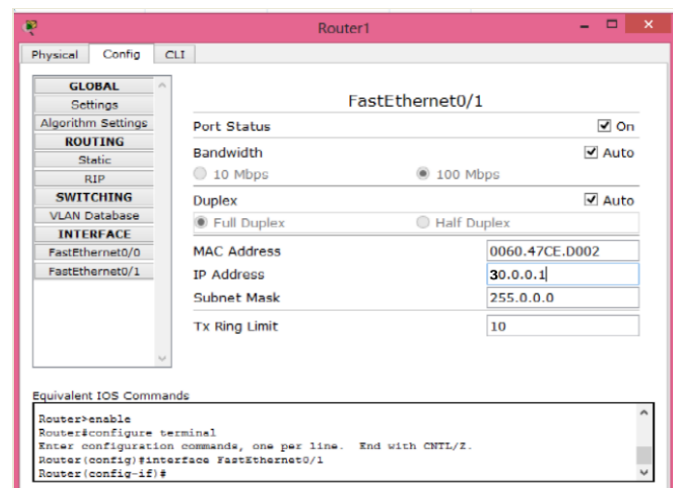
Interface: FastEthernet0/0



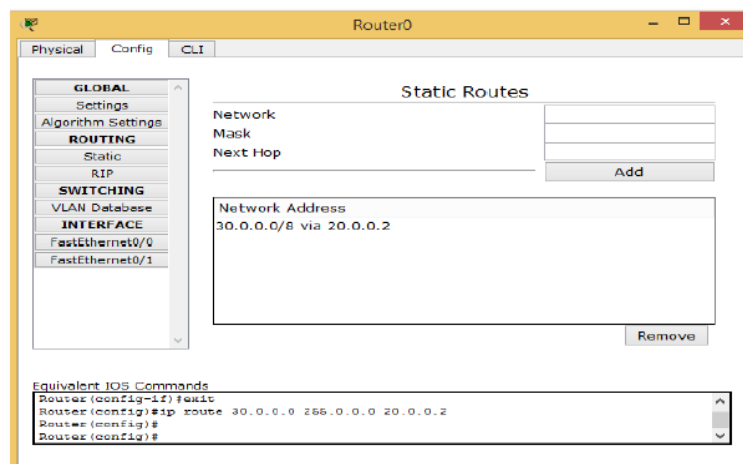
Step 4: Configure Router 1
Interface: FastEthernet0/0



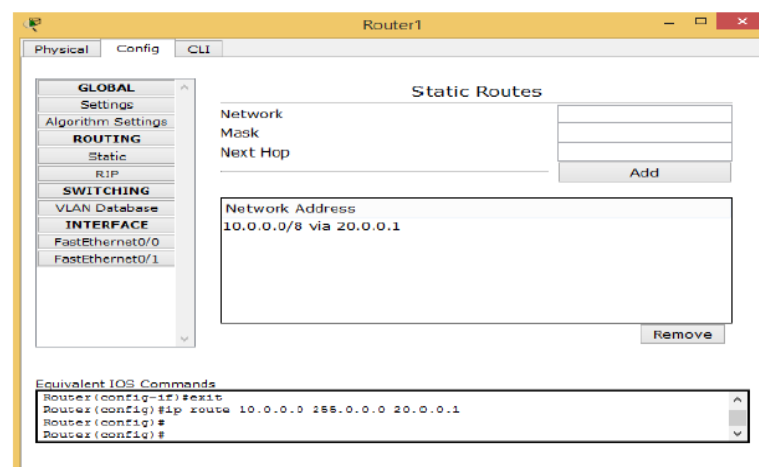
Interface: FastEthernet0/1



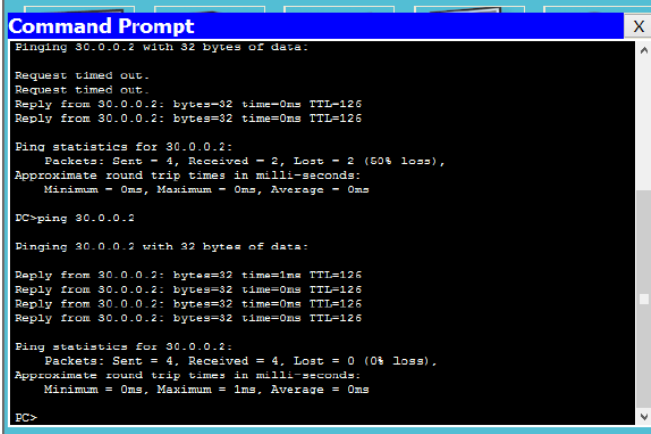
Step 5: Setting the Routing path in each Router through Static Routing
Step 5a) For Router 0



Step 5b) For Router 1



Step 6: Verifying the Connectivity using the Ping command



```
Command Prompt
Pinging 30.0.0.2 with 32 bytes of data:
Request timed out.
Request timed out.
Reply from 30.0.0.2: bytes=32 time=0ms TTL=126
Reply from 30.0.0.2: bytes=32 time=0ms TTL=126

Ping statistics for 30.0.0.2:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 30.0.0.2

Pinging 30.0.0.2 with 32 bytes of data:
Reply from 30.0.0.2: bytes=32 time=1ms TTL=126
Reply from 30.0.0.2: bytes=32 time=0ms TTL=126
Reply from 30.0.0.2: bytes=32 time=0ms TTL=126
Reply from 30.0.0.2: bytes=32 time=0ms TTL=126

Ping statistics for 30.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

Hence static routing has been studied

For Video demonstration
of the given Practical,
scan the QR code

