Department of Computer Engineering

Experiment: 06

Aim:
To configure static routing in packet tracer(Simulation of router configuration).

Description:

There are two types of routing available.Static routing and Dynamic routing .

Static Routing or Non-Adaptive Routing follows user-defined routing. Here, the routing table is not changed until the network administrator changes it. Static Routing uses simple routing algorithms and provides more security than dynamic routing.

Dynamic Routing or Adaptive Routing, as the name suggests, changes the routing table if there is any change in the network topology. During network change, dynamic routing sends a signal to the router, recalculates the routes and sends the updated routing information.

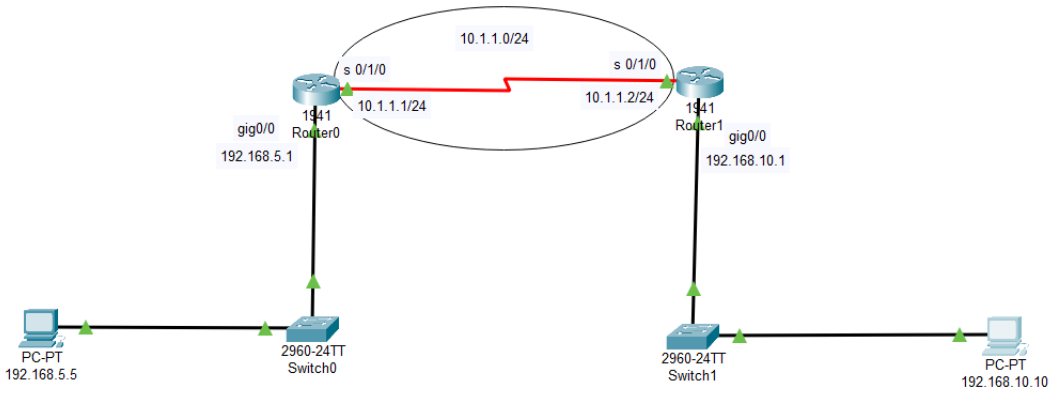
Difference between Static Routing and Dynamic Routing

The following table highlights the major differences between Static Routing and Dynamic Routing.

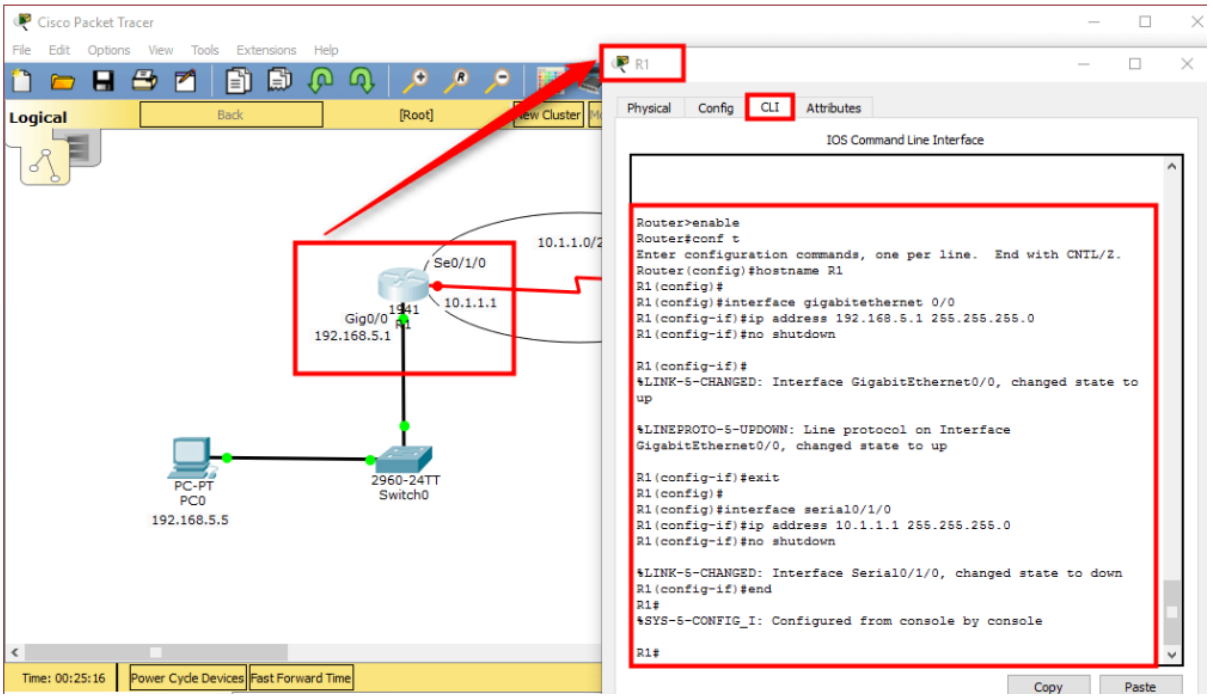
Key	Static Routing	Dynamic Routing
Routing pattern	In static routing, user-defined routes are used in the routing table.	In dynamic routing, routes are updated as per the changes in network.
Routing Algorithm	No complex algorithm used to figure out the shortest path.	Dynamic routing employs complex algorithms to find the shortest routes.
Security	Static routing provides higher security.	Dynamic routing is less secure.
Automation	Static routing is a manual process.	Dynamic routing is an automatic process.
Applicability	Static routing is used in smaller networks.	Dynamic routing is implemented in large networks.

Protocols	Static routing may not follow any specific protocol.	Dynamic routing follows protocols like BGP, RIP and EIGRP.
Additional Resources	Static routing does not require any additional resources.	Dynamic routing requires additional resources like memory, bandwidth etc.

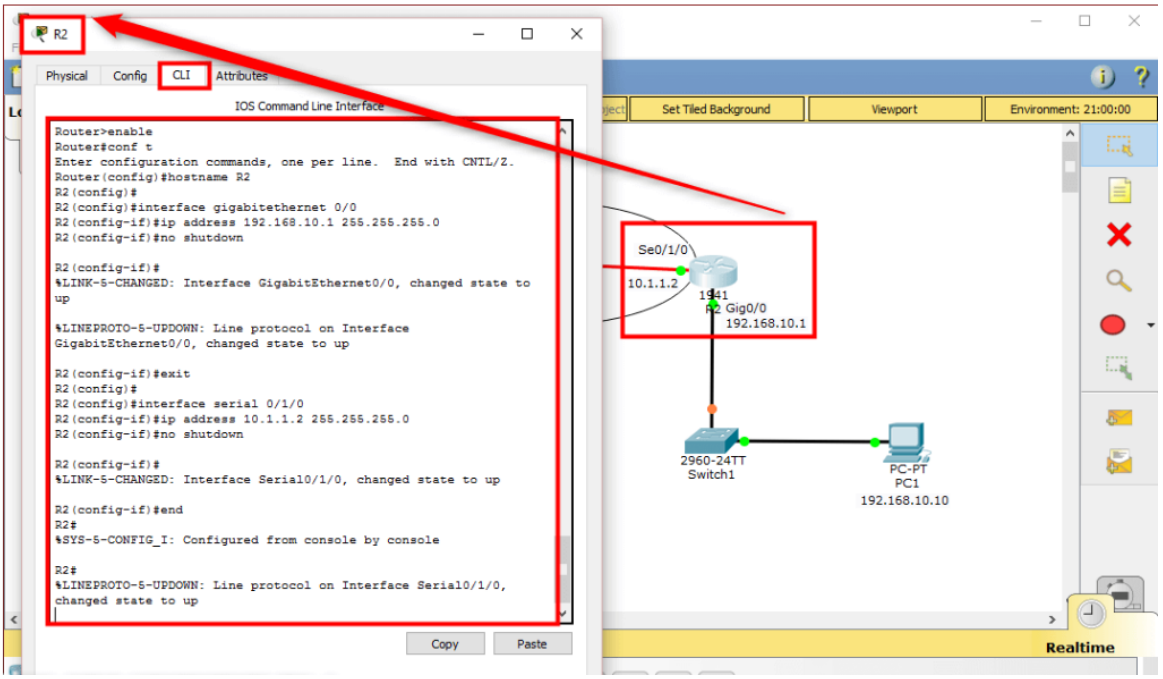
Open Cisco packet tracer and create a network as per the following design .
1.Take two 1941 routers
2.Take 2 2960 switches
3.Take two pc's
4.make a connection between all the devices .
5.Assign ip addresses to pcs
6.Configure Gigaethernet and serial interfaces as per the following instructions.



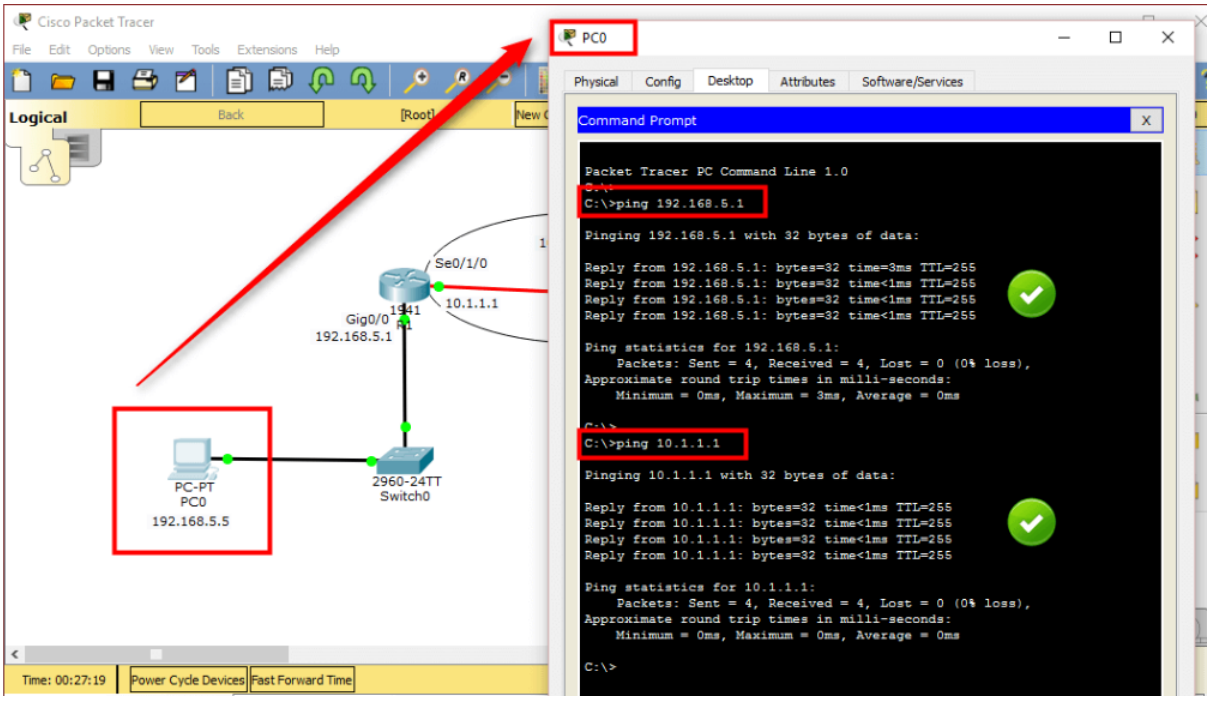
Router 1 Configuration



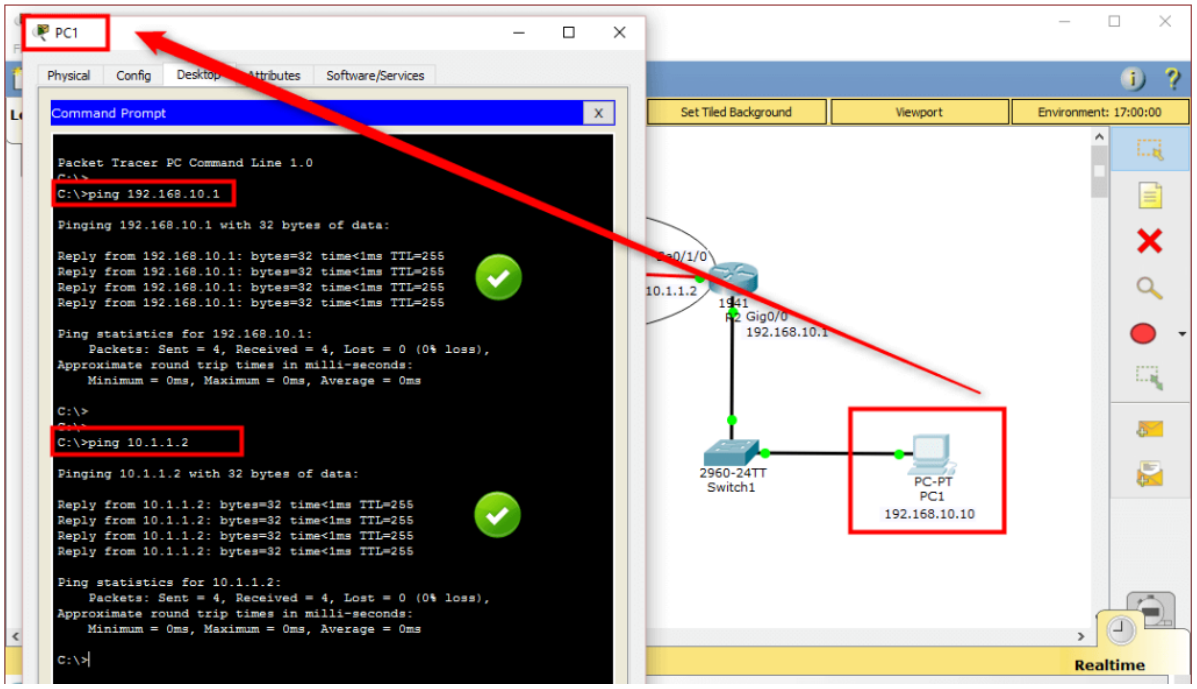
Router 2 Configuration

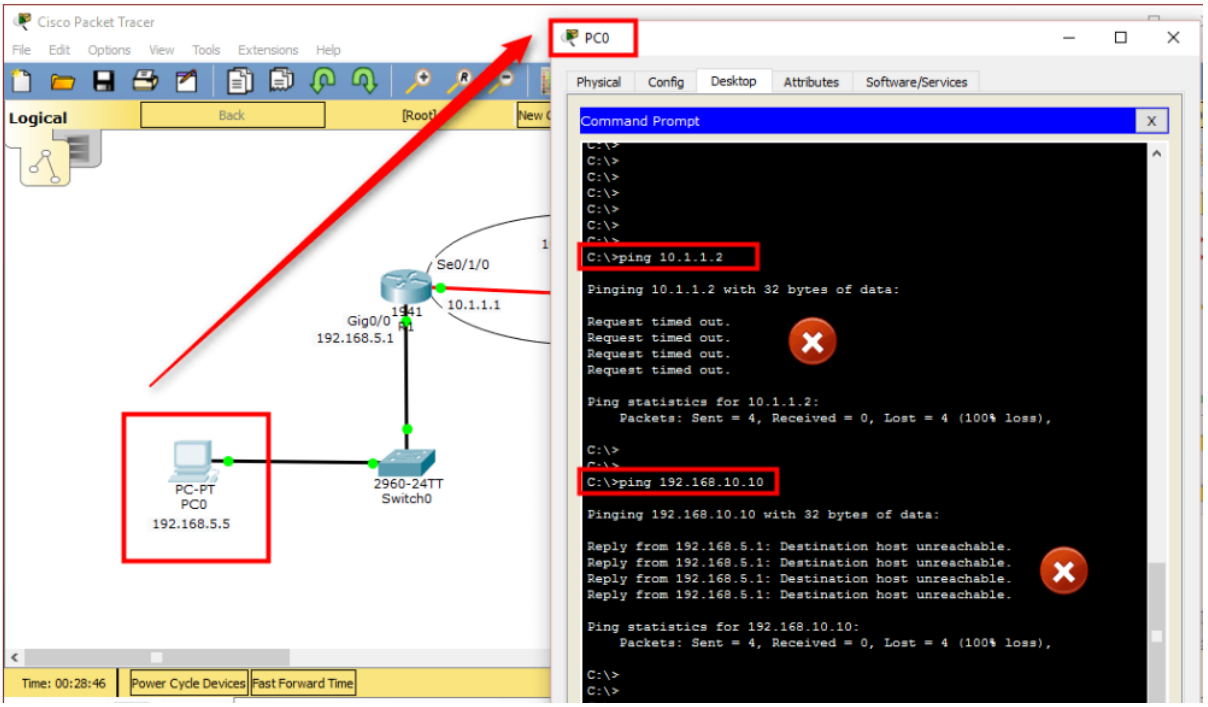


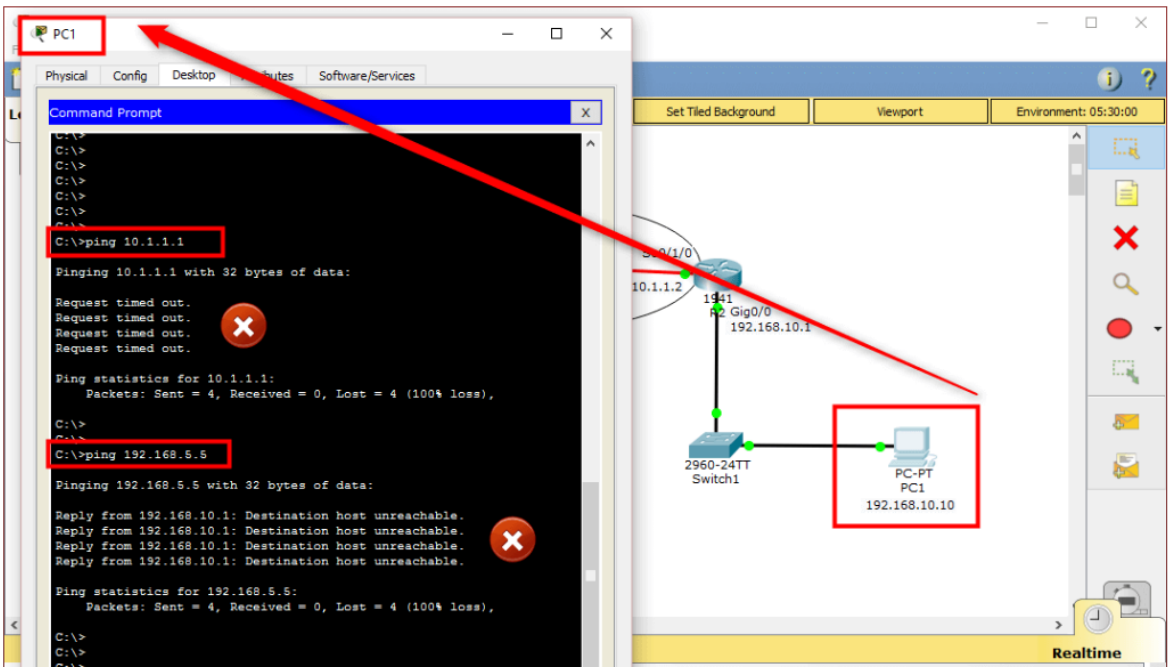
pc0

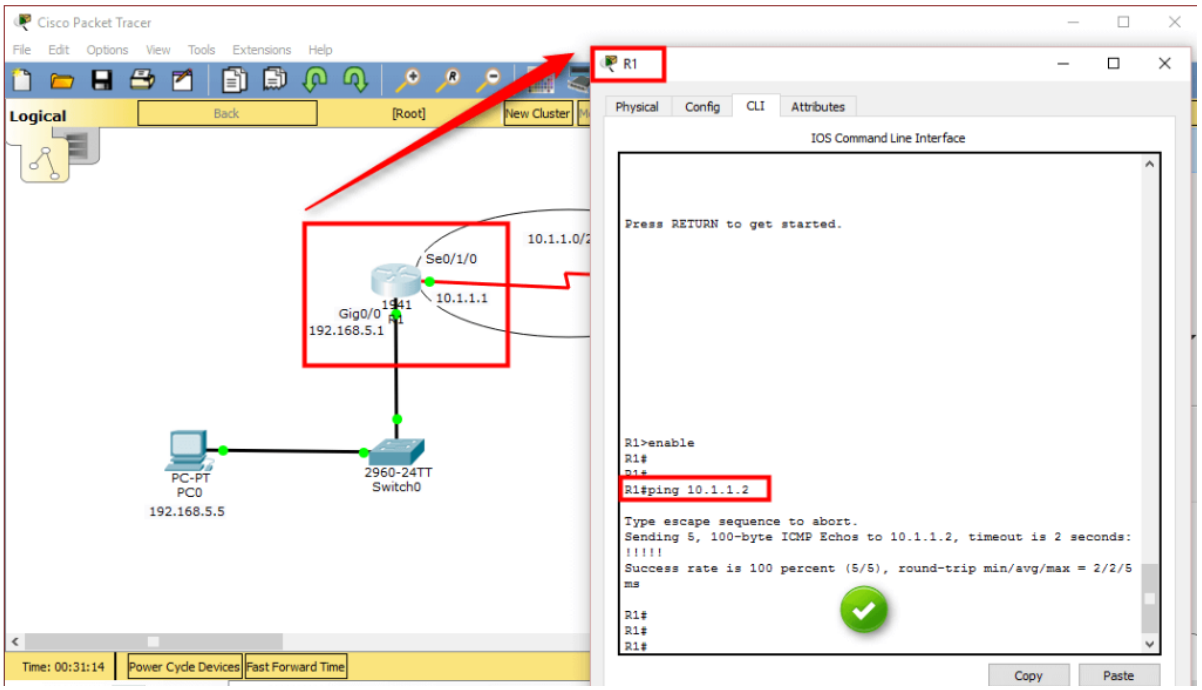

Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical
Back
[Root]
Se0/1/0
10.1.1.1
1941
Gig0/0
192.168.5.1
PC-PT
PC0
192.168.5.5
2960-24TT
Switch0
Time: 00:27:19
Power Cycle Devices
Fast Forward Time
PC0
Physical
Config
Desktop
Attributes
Software/Services
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.5.1
Pinging 192.168.5.1 with 32 bytes of data:
Reply from 192.168.5.1: bytes=32 time=3ms TTL=255
Reply from 192.168.5.1: bytes=32 time<1ms TTL=255
Reply from 192.168.5.1: bytes=32 time<1ms TTL=255
Reply from 192.168.5.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.5.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 3ms, Average = 0ms
C:\>ping 10.1.1.1
Pinging 10.1.1.1 with 32 bytes of data:
Reply from 10.1.1.1: bytes=32 time<1ms TTL=255
Reply from 10.1.1.1: bytes=32 time<1ms TTL=255
Reply from 10.1.1.1: bytes=32 time<1ms TTL=255
Reply from 10.1.1.1: bytes=32 time<1ms TTL=255
Ping statistics for 10.1.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>

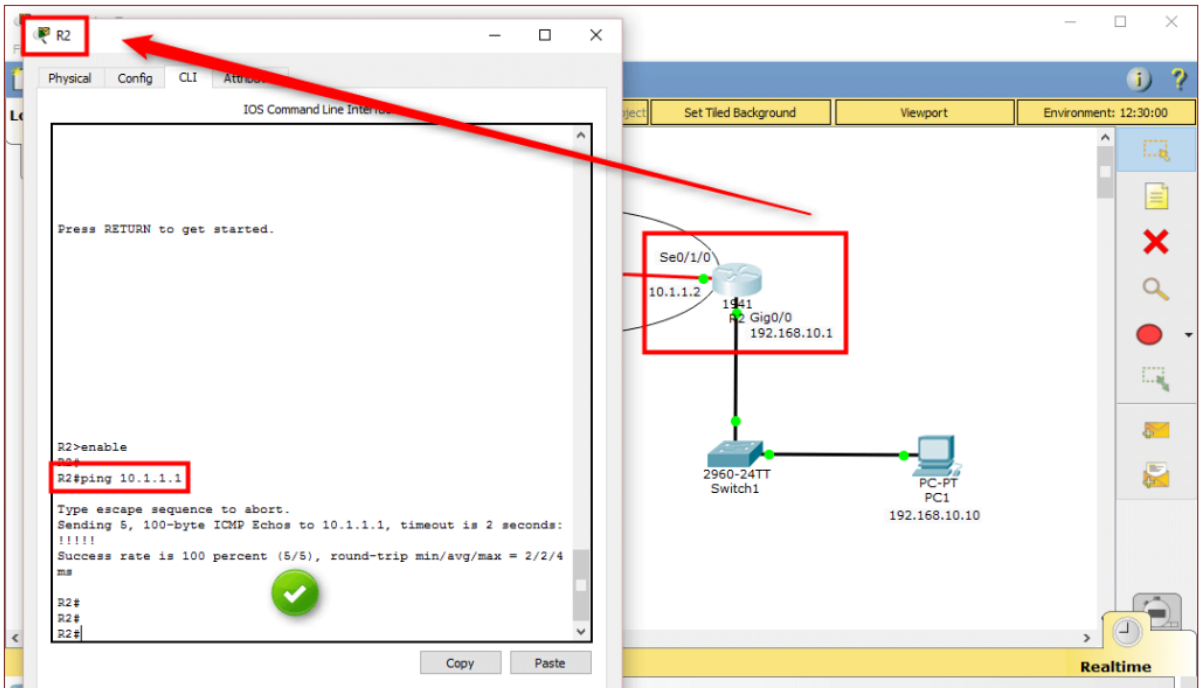
pc1

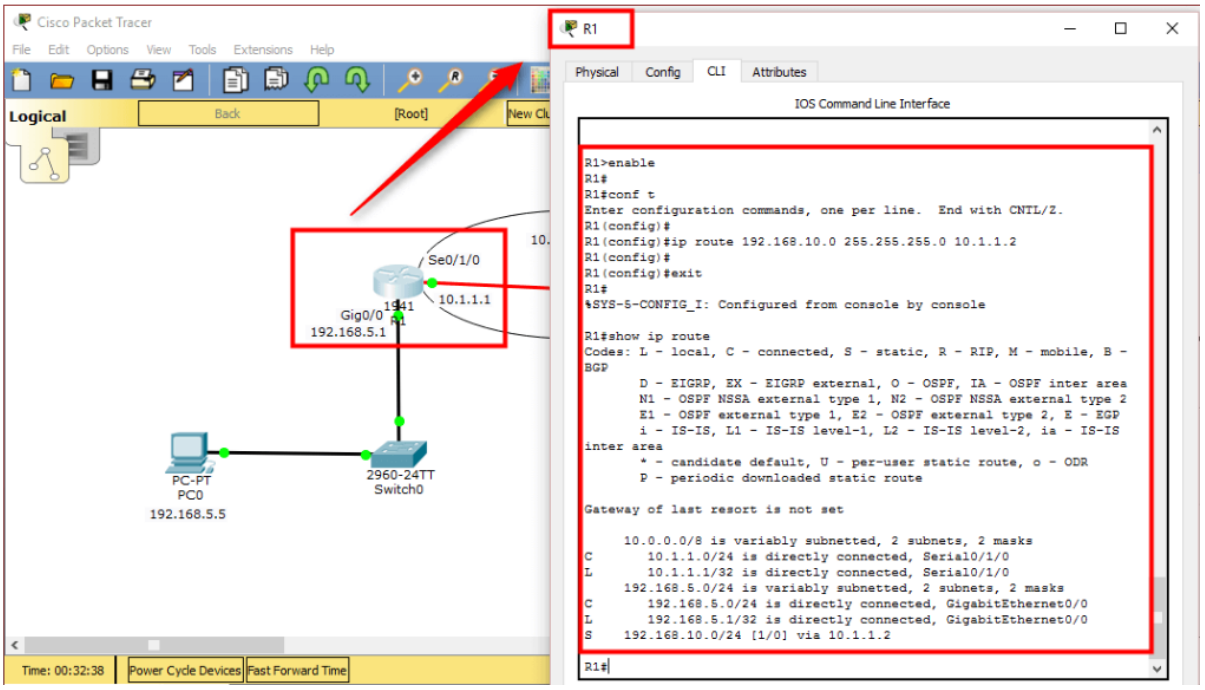

PC1
Physical
Config
Desktop
Attributes
Software/Services
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1
Pinging 192.168.10.1 with 32 bytes of data:
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.10.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 10.1.1.2
Pinging 10.1.1.2 with 32 bytes of data:
Reply from 10.1.1.2: bytes=32 time<1ms TTL=255
Reply from 10.1.1.2: bytes=32 time<1ms TTL=255
Reply from 10.1.1.2: bytes=32 time<1ms TTL=255
Reply from 10.1.1.2: bytes=32 time<1ms TTL=255
Ping statistics for 10.1.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Set Tiled Background
Viewport
Environment: 17:00:00
10.1.1.2
1941
Gig0/0
192.168.10.1
2960-24TT
Switch1
PC-PT
PC1
192.168.10.10
Realtime

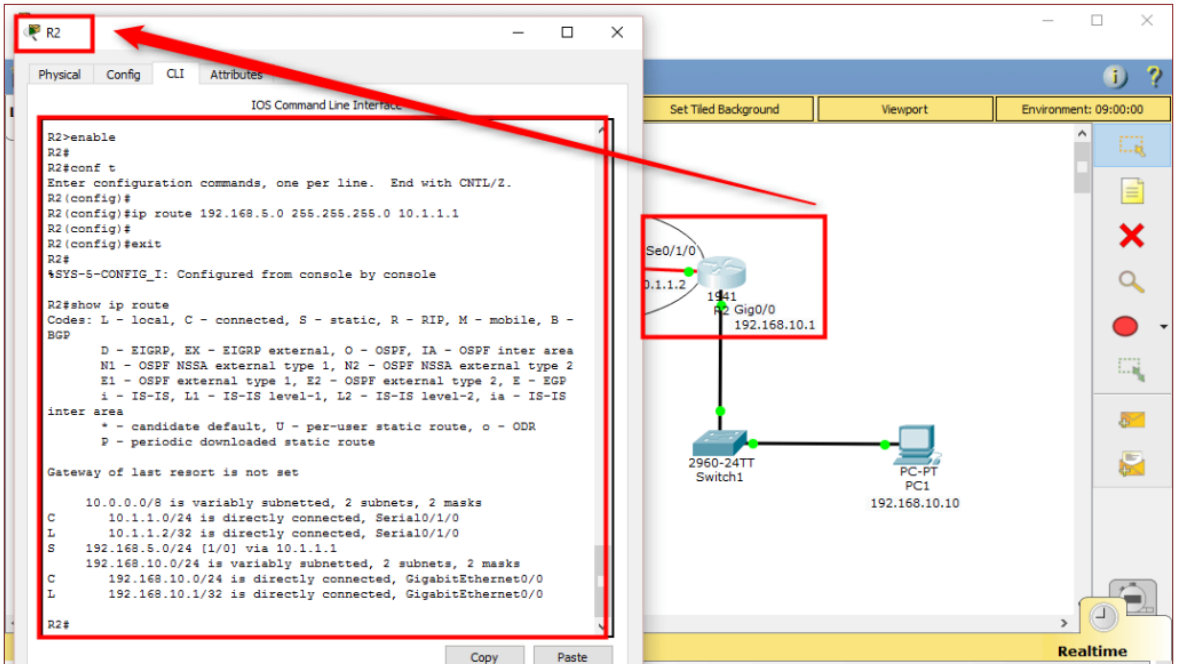

Cisco Packet Tracer
File
Edit
Options
View
Tools
Extensions
Help
Logical
Back
Se0/1/0
10.1.1.1
1941
Gig0/0
192.168.5.1
PC-PT
PC0
192.168.5.5
2960-24TT
Switch0
Time: 00:28:46
Power Cycle Devices
Fast Forward Time
PC0
Physical
Config
Desktop
Attributes
Software/Services
Command Prompt
C:\>ping 10.1.1.2
Pinging 10.1.1.2 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.1.1.2:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 192.168.10.10
Pinging 192.168.10.10 with 32 bytes of data:
Reply from 192.168.5.1: Destination host unreachable.
Reply from 192.168.5.1: Destination host unreachable.
Reply from 192.168.5.1: Destination host unreachable.
Reply from 192.168.5.1: Destination host unreachable.
Ping statistics for 192.168.10.10:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

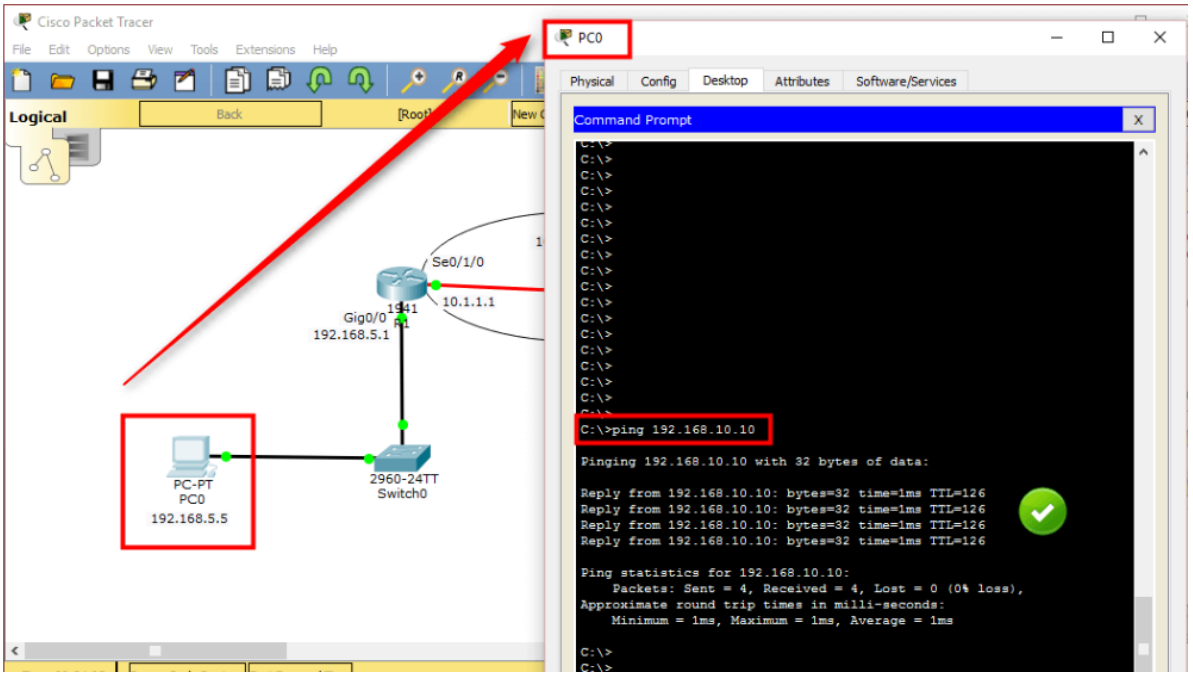

PC1
Physical
Config
Desktop
Software/Services
Command Prompt
C:\>ping 10.1.1.1
Pinging 10.1.1.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.1.1.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 192.168.5.5
Pinging 192.168.5.5 with 32 bytes of data:
Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.
Ping statistics for 192.168.5.5:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
Set Tiled Background
Viewport
Environment: 05:30:00
10.1.1.2
1941
R2 Gig0/0
192.168.10.1
2960-24TT
Switch1
PC-PT
PC1
192.168.10.10
Realtime

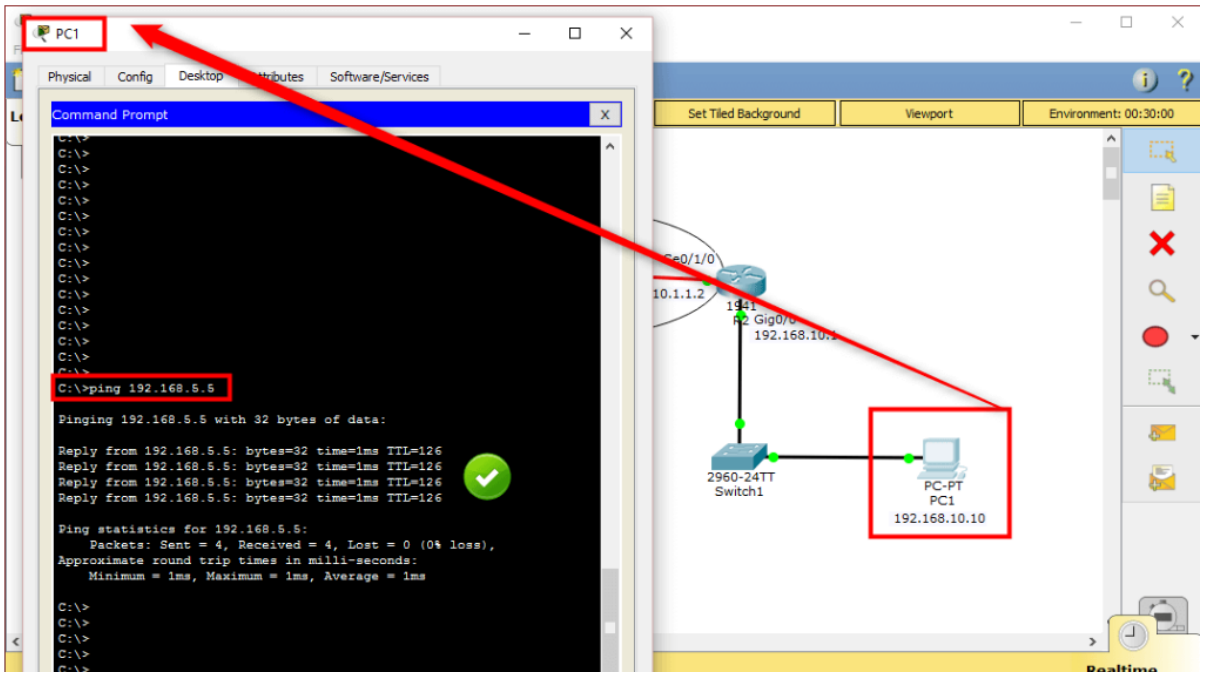

Cisco Packet Tracer
File
Edit
Options
View
Tools
Extensions
Help
Logical
Back
[Root]
New Cluster
Se0/1/0
10.1.1.1
1941
R1
Gig0/0
192.168.5.1
10.1.1.0/2
PC-PT
PC0
192.168.5.5
2960-24TT
Switch0
Time: 00:31:14
Power Cycle Devices
Fast Forward Time
R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
R1>enable
R1#
R1#ping 10.1.1.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/5
ms
R1#
R1#
R1#
Copy
Paste


R2
Physical
Config
CLI
IOS Command Line Interface
Press RETURN to get started.
R2>enable
R2#ping 10.1.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/4
ms
R2#
R2#
R2#
Copy
Paste
Set Tiled Background
Viewport
Environment: 12:30:00
Se0/1/0
10.1.1.2
1941
R2 Gig0/0
192.168.10.1
2960-24TT
Switch1
PC-PT
PC1
192.168.10.10
Realtime


Cisco Packet Tracer
File
Edit
Options
View
Tools
Extensions
Help
Logical
Back
[Root]
Se0/1/0
10.1.1.1
Gig0/0
192.168.5.1
PC-PT
PC0
192.168.5.5
2960-24TT
Switch0
Time: 00:32:38
Power Cycle Devices
Fast Forward Time
R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
R1>enable
R1#
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#
R1(config)#ip route 192.168.10.0 255.255.255.0 10.1.1.2
R1(config)#
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.1.1.0/24 is directly connected, Serial0/1/0
L 10.1.1.1/32 is directly connected, Serial0/1/0
192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.5.0/24 is directly connected, GigabitEthernet0/0
L 192.168.5.1/32 is directly connected, GigabitEthernet0/0
S 192.168.10.0/24 [1/0] via 10.1.1.2
R1#


R2
Physical
Config
CLI
Attributes
IOS Command Line Interface
R2>enable
R2#
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#
R2(config)#ip route 192.168.5.0 255.255.255.0 10.1.1.1
R2(config)#
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.1.1.0/24 is directly connected, Serial0/1/0
L 10.1.1.2/32 is directly connected, Serial0/1/0
S 192.168.5.0/24 [1/0] via 10.1.1.1
192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.10.0/24 is directly connected, GigabitEthernet0/0
L 192.168.10.1/32 is directly connected, GigabitEthernet0/0
R2#
Copy
Paste
Set Tiled Background
Viewport
Environment: 09:00:00
Se0/1/0
1941
R2 Gig0/0
192.168.10.1
2960-24TT
Switch1
PC-PT
PC1
192.168.10.10
Realtime


Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical
Back
Se0/1/0
10.1.1.1
1941
Gig0/0
192.168.5.1
PC-PT
PC0
192.168.5.5
2960-24TT
Switch0
PC0
Physical
Config
Desktop
Attributes
Software/Services
Command Prompt
C:\>ping 192.168.10.10
Pinging 192.168.10.10 with 32 bytes of data:
Reply from 192.168.10.10: bytes=32 time=1ms TTL=126
Reply from 192.168.10.10: bytes=32 time=1ms TTL=126
Reply from 192.168.10.10: bytes=32 time=1ms TTL=126
Reply from 192.168.10.10: bytes=32 time=1ms TTL=126
Ping statistics for 192.168.10.10:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms



Conclusion

Static routing is more suitable for small networks where a network administrator manages the routing tables. Static routing uses simple routing algorithms and provides better security than dynamic routing. Dynamic routing is used in extensive networks, as it allows routers to choose the best path based on the changes in the logical network layout in real-time.