**Project Name:** Implementation of Static (Standard, Summary, Floating, Default) and Dynamic Routing Using VLSM from 192.168.0.0/24 IP Address.

VLSM Table

Network No	Network Address	1st Usable Address	2nd Usable Address	Last Usable Address	Broadcast Address	Subnet Mask
1	192.168.0.0/25	192.168.0.1	192.168.0.2	192.168.0.126	192.168.0.127	255.255.255.128
2	192.168.0.128/27	192.168.0.129	192.168.0.130	192.168.0.158	192.168.0.159	255.255.255.224
3	192.168.0.160/29	192.168.0.161	192.168.0.162	192.168.0.166	192.168.0.167	255.255.255.248
4	192.168.0.168/30	192.168.0.169		192.168.0.170	192.168.0.171	255.255.255.252
5	192.168.0.172/30	192.168.0.173		192.168.0.174	192.168.0.175	255.255.255.252
6	192.168.0.176/30	192.168.0.177		192.168.0.178	192.168.0.179	255.255.255.252

Connection Diagram of Network
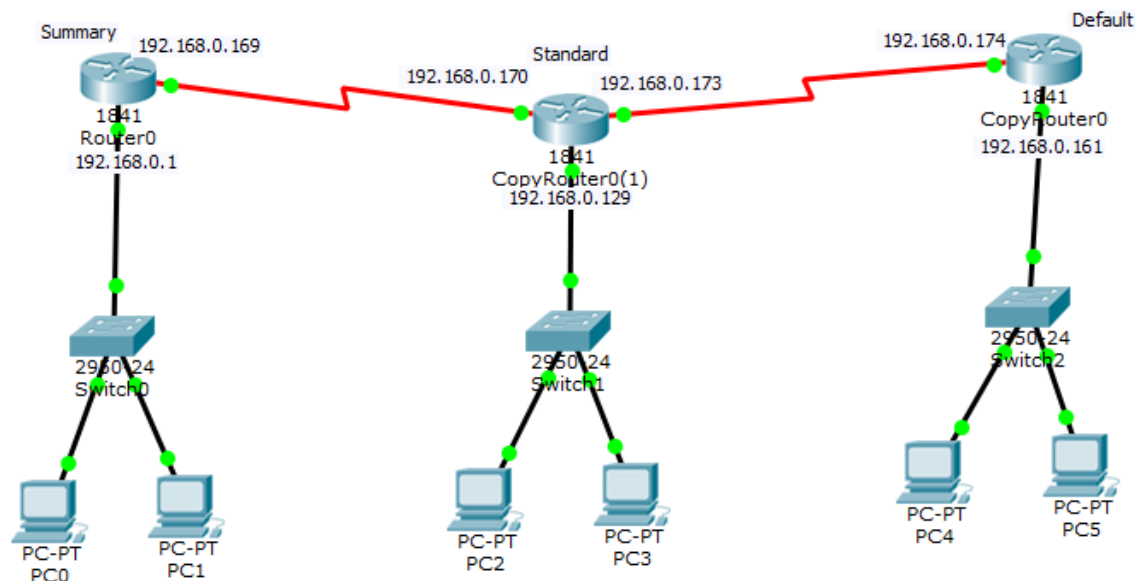
PC Configuration

- 1st usable address is used as default gateway
- 2nd usable address is used for 1st pc IP address
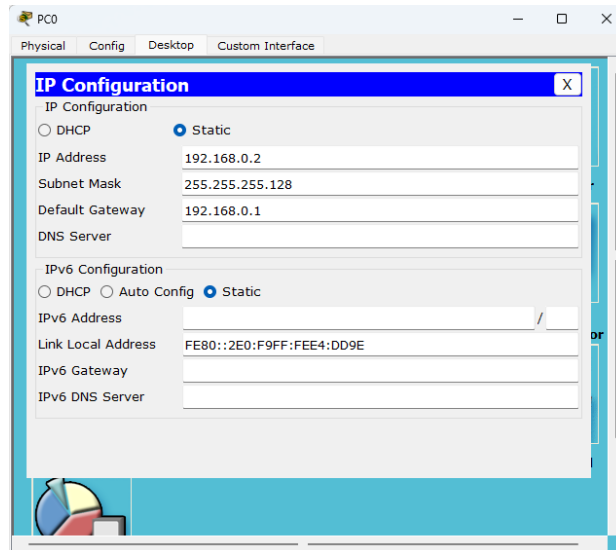- Last usable address is used for 2nd pc IP address

Fig. IP Configuration for PC0

Router Configuration


```
Router(config-if)#ip address 192.168.0.1 255.255.255.128
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up
```

Fig. CLI command for configuring router 0
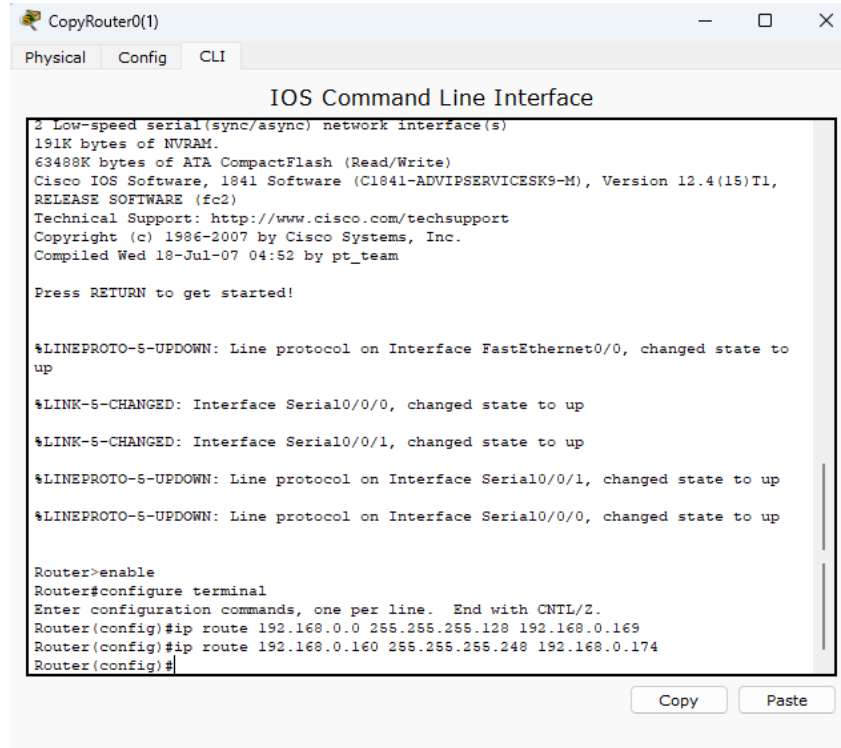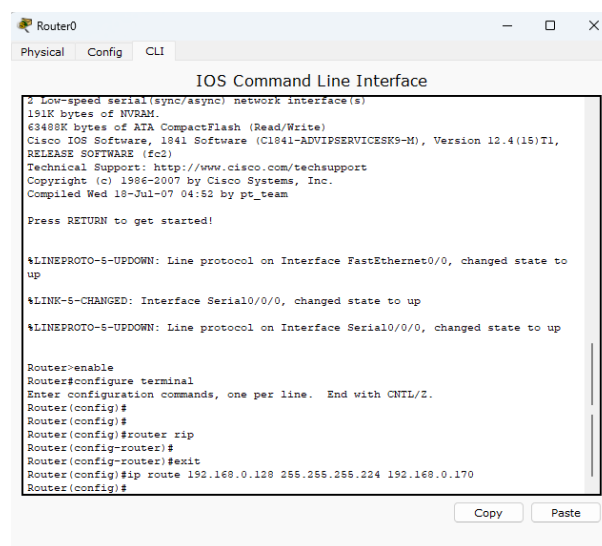
Summary Static Routing in Router 0


```
2 Low-speed serial(sync/async) network interface(s)
191K bytes of NVRAM.
63488K bytes of ATA CompactFlash (Read/Write)
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(15)T1,
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

Press RETURN to get started!


%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up


Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#router rip
Router(config-router)#
Router(config-router)#exit
Router(config)#ip route 192.168.0.128 255.255.255.224 192.168.0.170
Router(config)#
```
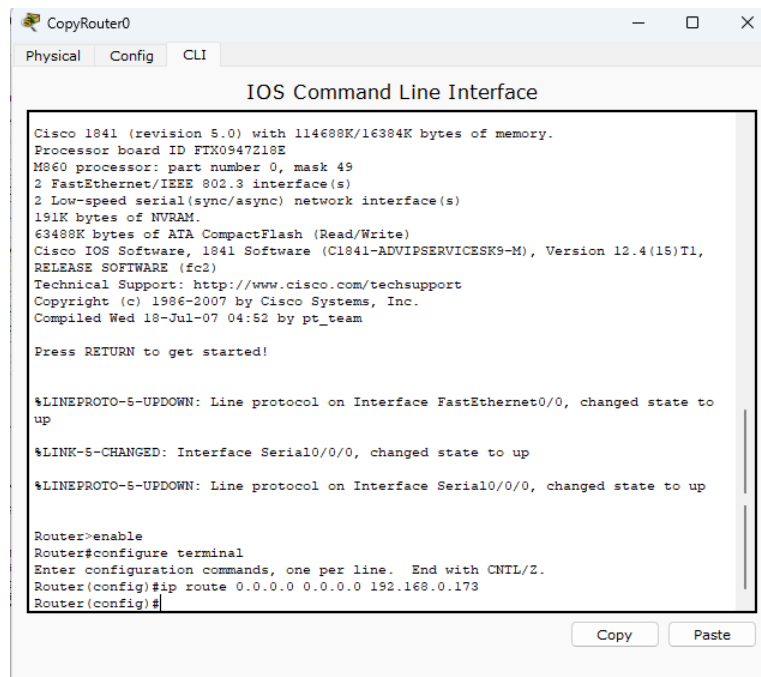
Fig. Summary routing with 192.168.0.128/26 and mask 255.255.255.192

Standard Static Routing in Router 1

Fig. Standard routing in router1

Default Static Routing in Router 2

Fig. Default routing in router 2

Verifying the network by pinging the IP address

```
PC>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:

Reply from 192.168.0.2: bytes=32 time=3ms TTL=125
Reply from 192.168.0.2: bytes=32 time=24ms TTL=125
Reply from 192.168.0.2: bytes=32 time=3ms TTL=125
Reply from 192.168.0.2: bytes=32 time=3ms TTL=125

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 24ms, Average = 8ms

PC>
```
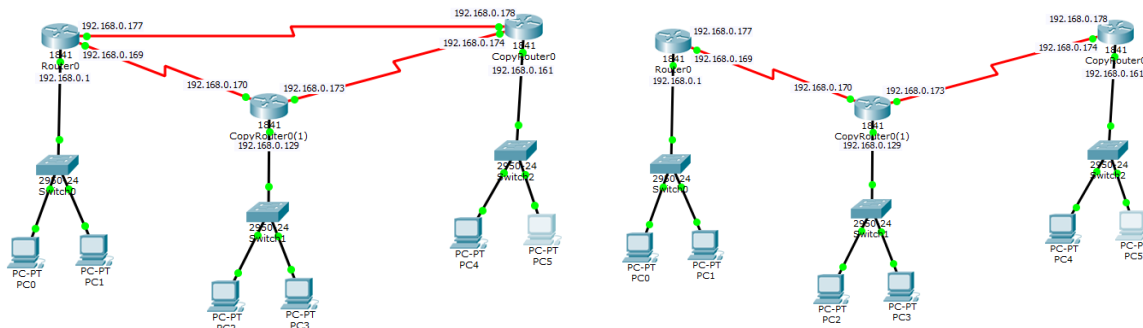
Fig. Pinging from PC4 to PC0

Floating Static Routing

Verifying the network by trace routing


```
PC>tracert 192.168.0.2

Tracing route to 192.168.0.2 over a maximum of 30 hops:

  1    0 ms      3 ms      0 ms      192.168.0.161
  2    1 ms      1 ms      1 ms      192.168.0.173
  3    1 ms      2 ms      0 ms      192.168.0.177
  4    0 ms     17 ms      2 ms      192.168.0.2

Trace complete.

PC>
```

```
PC>tracert 192.168.0.2

Tracing route to 192.168.0.2 over a maximum of 30 hops:

  1    1 ms      1 ms      0 ms      192.168.0.161
  2    2 ms      0 ms      0 ms      192.168.0.173
  3    5 ms      1 ms      1 ms      192.168.0.169
  4    2 ms      0 ms      1 ms      192.168.0.2

Trace complete.

PC>
```
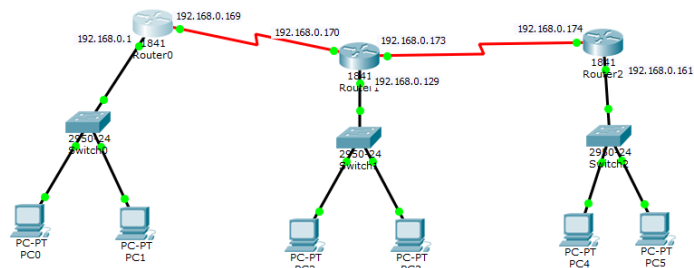
Fig. Showing different route for PC 5 to PC0
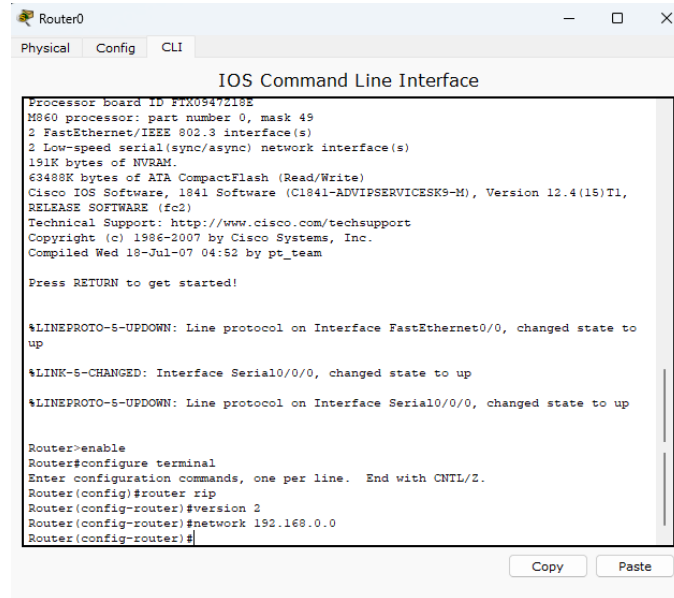
Dynamic Routing

Router Configuration
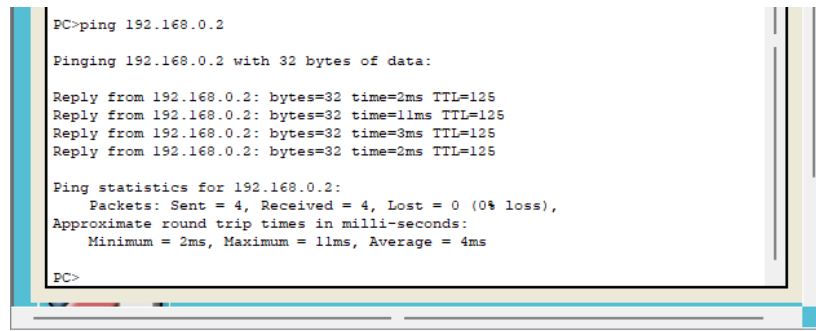

Fig. Router configuration for RIP version 2

Verifying the network by pinging the IP address

Fig. Pinging from PC5 to PC0