Subnet Mask

The original network is 10.0.0.0/24, which means it has a subnet mask of 255.255.255.0 (or /24, indicating 24 bits for the network portion).
To divide this network into 4 equal subnets, we need to borrow additional bits from the host portion.
The original /24 network provides 8 bits for hosts (since a classful /24 network uses the first 24 bits for the network and leaves 8 bits for hosts).

With 8 bits for hosts, the total number of IP addresses is 28=2562^8 = 2562^8 = 256,including the network and broadcast addresses.

To create 4 equal subnets, we need to borrow 2 more bits from the host portion (because 2^2= 4)
This increases the subnet mask from /24 to /26 (24 + 2 = 26).

The new subnet mask in dotted decimal is 255.255.255.192 (since the last octet is now 128+64=192128 + 64 = 192128 + 64 = 192).

So, the new subnet mask is /26 or 255.255.255.192.

Subnet Ranges

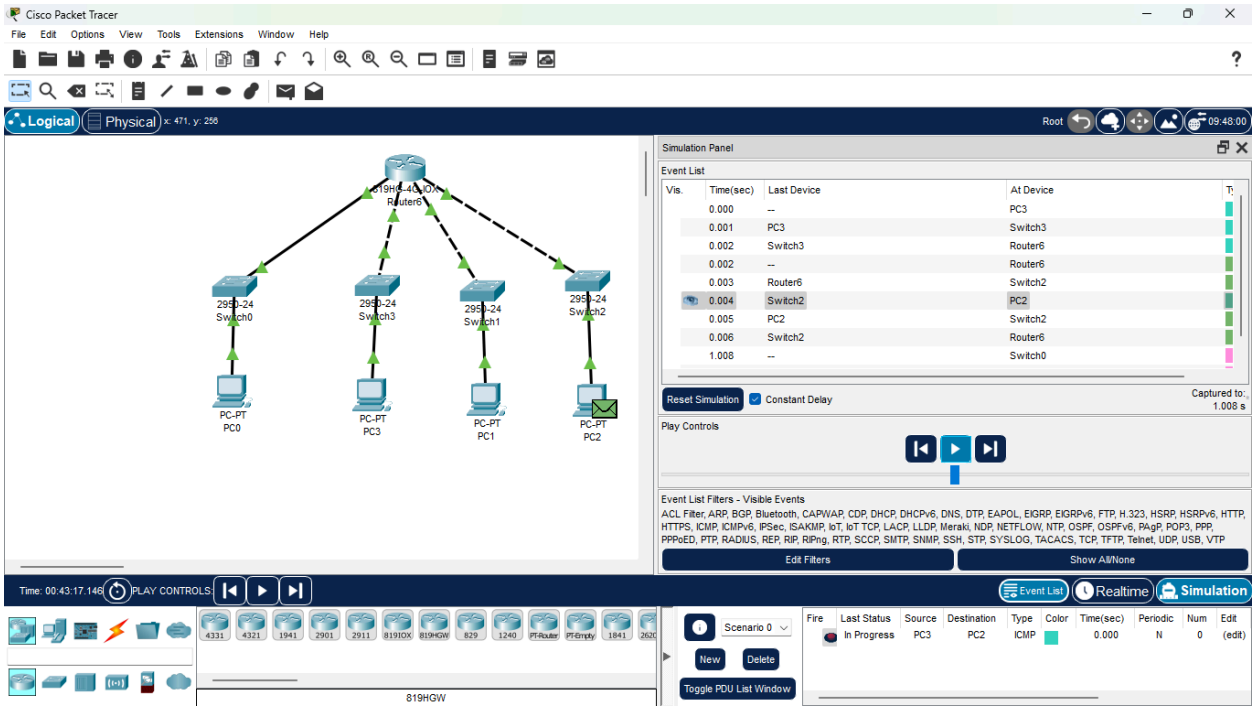
Subnet ranges (based on the fourth octet):

Subnet 1: 10.0.0.0 - 10.0.0.63
Network address: 10.0.0.0
Broadcast address: 10.0.0.63
Valid host range: 10.0.0.1 - 10.0.0.62 (62 usable hosts)

Subnet 2: 10.0.0.64 - 10.0.0.127
Network address: 10.0.0.64
Broadcast address: 10.0.0.127
Valid host range: 10.0.0.65 - 10.0.0.126 (62 usable hosts)

Subnet 3: 10.0.0.128 - 10.0.0.191
Network address: 10.0.0.128
Broadcast address: 10.0.0.191
Valid host range: 10.0.0.129 - 10.0.0.190 (62 usable hosts)

Subnet 4: 10.0.0.192 - 10.0.0.255
Network address: 10.0.0.192
Broadcast address: 10.0.0.255
Valid host range: 10.0.0.193 - 10.0.0.254 (62 usable hosts)


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical x: 471, y: 256
Root 09:48:00
819HGW-4G-IOX
Router6
2950-24
Switch0
2950-24
Switch3
2950-24
Switch1
2950-24
Switch2
PC-PT
PC0
PC-PT
PC3
PC-PT
PC1
PC-PT
PC2
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device
0.000 -- PC3
0.001 PC3 Switch3
0.002 Switch3 Router6
0.002 -- Router6
0.003 Router6 Switch2
0.004 Switch2 PC2
0.005 PC2 Switch2
0.006 Switch2 Router6
1.008 -- Switch0
Reset Simulation
Constant Delay
Captured to: 1.008 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:43:17.146
PLAY CONTROLS:
Event List
Realtime
Simulation
4331 4321 1941 2901 2911 819IOX 819HGW 829 1240 PT-Router PT-Empty 1841
819HGW
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit
In Progress PC3 PC2 ICMP 0.000 N 0 (edit)