



CISCO

IP SUBNETTING

BY
VIGNESH M

Configure the Network as Follows

- 1.subnet 192.168.1.0/24 Subnet this into 4 subnet
- 2.subnet 1 for site 1
- 3.subnet 2 for the link between R1 and the internet router
- 4.subnet 3 for site 2
- 5.subnet 4 for the link between R2 and the internet router
- 6.configure the switches with the second last ip address in the subnet
- 7.configure the DHCP servers with the third last ip address in the subnet
- 8.configure the DHCP server to allocate IP addresses to the clients
9. Verify the pc's can access Cisco.com using the browser

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+++initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 385, y: 463

PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4
Server-PT Server1
3650-24PS Switch1
3650-24PS Switch 2

Time: 00:05:03

4331 4321 1941 2901 291

(Select a Device)

R1

Physical Config CLI Attributes

IOS Command Line Interface

compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at: <http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

cisco ISR4321/K9 (1RU) processor with 1687137K/6147K bytes of memory.
Processor board ID FLM2041W2HD
2 Gigabit Ethernet interfaces
2 Serial interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.

Press RETURN to get started!

R1>en
R1#show ip brief
^
% Invalid input detected at '^' marker.

R1#show ip int brief

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0/1	unassigned	YES	unset	administratively down	down
Serial0/1/0	unassigned	YES	unset	administratively down	down
Serial0/1/1	unassigned	YES	unset	administratively down	down
Loopback0	1.1.1.1	YES	manual	up	up
Vlan1	unassigned	YES	unset	administratively down	down

R1#

Copy Paste

Root 02:37:00

Realtime Simulation

Type Color Time(sec) Periodic Num Edit

- configuring Router (R1) with the last ip address in the subnet
- gigabit 0/0/0 is not assigned , so assign the ip address.

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 379, y: 403

PC-PT PC0 Server-PT Server1 192.168.1.62

PC-PT PC1 3650-24PS Switch1

PC-PT PC2

PC-PT PC3 192.168.1.62

PC-PT PC4 3650-24PS Switch2

Time: 00:07:53

4331 4321 1941 2901 2911 8191OX

(Select a Device to Drag)

R1

Physical Config CLI Attributes

IOS Command Line Interface

```

R1#show ip int brief
Interface      IP-Address      OK? Method Status          Protocol
GigabitEthernet0/0/0  unassigned      YES unset  administratively down  down
GigabitEthernet0/0/1  unassigned      YES unset  administratively down  down
Serial0/1/0        unassigned      YES unset  administratively down  down
Serial0/1/1        unassigned      YES unset  administratively down  down
Loopback0         1.1.1.1         YES manual up              up
Vlan1             unassigned      YES unset  administratively down  down
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int g0/0/0
R1(config-if)#no shut

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up

R1(config-if)#ip address 192.168.1.62 255.255.255.192
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show ip interface brief*
^
% Invalid input detected at '^' marker.

R1#show ip interface brief
Interface      IP-Address      OK? Method Status          Protocol
GigabitEthernet0/0/0  192.168.1.62    YES manual up              up
GigabitEthernet0/0/1  unassigned      YES unset  administratively down  down
Serial0/1/0        unassigned      YES unset  administratively down  down
Serial0/1/1        unassigned      YES unset  administratively down  down
Loopback0         1.1.1.1         YES manual up              up
Vlan1             unassigned      YES unset  administratively down  down
R1#

```

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Realtime Simulation

color Time(sec) Periodic Num Edit

- gigabit 0/0/0 is assigned with the ip address 192.168.1.62 and the mask 255.255.255.192(last ip address in the subnet)
- Lets try to ping the local ip address

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 1172, y: 307

PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4
Server-PT Server1
3650-24PS Switch1
3650-24PS Switch2

Time: 00:08:38

4331 4321 1941 2901 2911 8191OX

(Select a Device to Drag)

R1

Physical Config CLI Attributes

IOS Command Line Interface

```
Vlan1 unassigned YES unset administratively down down
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int g0/0/0
R1(config-if)#no shut

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up

R1(config-if)#ip address 192.168.1.62 255.255.255.192
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show ip interface brief*
^
% Invalid input detected at '^' marker.

R1#show ip interface brief
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0/0 192.168.1.62 YES manual up up
GigabitEthernet0/0/1 unassigned YES unset administratively down down
Serial0/1/0 unassigned YES unset administratively down down
Serial0/1/1 unassigned YES unset administratively down down
Loopback0 1.1.1.1 YES manual up up
Vlan1 unassigned YES unset administratively down down
R1#
R1#ping 192.168.1.62
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.62, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/11/24 ms
R1#
```

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Realtime Simulation

Color Time(sec) Periodic Num Edit

- Ping 192.168.1.62
- ping is successful

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 378, y: 403

Time: 00:12:46

Switch1

Physical Config CLI Attributes

IOS Command Line Interface

GigabitEthernet1/0/4	unassigned	YES	unset	up	up
GigabitEthernet1/0/5	unassigned	YES	unset	up	up
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Vlan1	192.168.1.61	YES	manual	up	up

S1#
S1#
S1#
S1#
S1#
S1#
S1#
S1#
S1#
S1#

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Top

Root 06:37:00

Realtime Simulation

Type Color Time(sec) Periodic Num Edit

- Switch needs to be configured with the 2nd last Ip address in the subnet
- configure it with the ip address 192.168.1.61 with the subnet 255.255.255.192
- Ip address of the switch is successfully configured

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 378, y: 403

Time: 00:13:25

Switch1

Physical Config CLI Attributes

IOS Command Line Interface

Interface	IP Address	Subnet Mask	Administrative State	Operational State	Line Protocol State
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Vlan1	192.168.1.61	YES	manual	up	up

```
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#
Sl#ping 192.168.1.62
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.62, timeout is 2 seconds:
!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms
Sl#
```

Copy Paste

Root 06:57:30

Realtime Simulation

Type Color Time(sec) Periodic Num Edit

- Lets check the switch can ping the router
- yes it can .. switch successfully pings the router

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 1123, y: 63

PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3

Server-PT Server1

3650-24PS Switch1

Time: 00:15:08

4331 4321 1941 2901 291

(Select a De

Server1

Physical Config Services Desktop Programming Attributes

GLOBAL

INTERFACE

FastEthernet0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00E0.F994.753A

IP Configuration

☐ DHCP

☒ Static

IPv4 Address 192.168.1.60

Subnet Mask 255.255.255.192

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local Address: FE80::2E0:F9FF:FE94:753A

Root

07:51:30

Realtime Simulation

Type Color Time(sec) Periodic Num Edit

- Lets configure the DHCP server
- configure static Ip address as 192.168.1.60
- Default gateway will be the router 192.168.1.62

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 304, y: 327

PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
Server-PT Server1
3650-24PS Switch1

Time: 00:17:08

4331 4321 1941 2901 2911

(Select a Device)

Server1

Physical Config **Services** Desktop Programming Attributes

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS**
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type A Record

Address

Add Save Remove

No.	Name	Type	Detail
0	cisco.com	A Record	8.8.8.9

DNS Cache

Root

08:54:30

Realtime Simulation

Type Color Time(sec) Periodic Num Edit

- DNS Server will be 8.8.8.9
- server has been configured
- Let's check can we ping the switch

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 1102, y: 19

Time: 00:20:44

4331 4321 1941 2901 291

(Select a De

Server1

Physical Config Services Desktop Programming Attributes

Command Prompt

```
C:\>exit

C:\>ping 192.168.1.61

Pinging 192.168.1.61 with 32 bytes of data:

Reply from 192.168.1.61: bytes=32 time<1ms TTL=255
Reply from 192.168.1.61: bytes=32 time<1ms TTL=255
Reply from 192.168.1.61: bytes=32 time<1ms TTL=255
Reply from 192.168.1.61: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.61:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.62

Pinging 192.168.1.62 with 32 bytes of data:

Reply from 192.168.1.62: bytes=32 time<1ms TTL=255
Reply from 192.168.1.62: bytes=32 time<1ms TTL=255
Reply from 192.168.1.62: bytes=32 time<1ms TTL=255
Reply from 192.168.1.62: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.62:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
```

Root

10:47:30

Realtime Simulation

Type	Color	Time(sec)	Periodic	Num	Edit
------	-------	-----------	----------	-----	------

- ping is successful.
- we can ping both switch and the router

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 775, y: 325

PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4

3650-24PS Switch1
3650-24PS Switch 2

Time: 00:33:10

4331 4321 1941 2901 291

(Select a De

IntRouter

Physical Config CLI Attributes

IOS Command Line Interface

to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to
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cisco ISR4321/K9 (1RU) processor with 1687137K/6147K bytes of memory.
Processor board ID FLM2041W2HD
2 Gigabit Ethernet interfaces
2 Serial interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.

Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up

%DHCP-6-ADDRESS_ASSIGN: Interface GigabitEthernet0/0/1 assigned DHCP address 8.8.8.100, mask 255.255.255.0, hostname IntRouter

IntRouter>en
IntRouter#sh ip int brief

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0/1	8.8.8.100	YES	DHCP	up	up
Serial0/1/0	unassigned	YES	unset	down	down
Serial0/1/1	unassigned	YES	unset	down	down
Loopback0	3.3.3.3	YES	manual	up	up
Vlan1	unassigned	YES	unset	administratively down	down

IntRouter#

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Root 17:16:30

server-PT 8.8.8.8
server-PT co.com
server-PT book.com

Realtime Simulation

Type Color Time(sec) Periodic Num Edit

- serial interface 0/1/0 is not set
- let's configure the interface with the 1st ip address 192.168.1.65
255.255.255.192

Cisco Packet Tracer - C:\Users\vigne\Downloads\Subnetting+lab+1+--+initial\Subnetting lab 1 - initial.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 383, y: 407

PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
Server-PT Server1
3650-24PS Switch1

Time: 00:38:58

4331 4321 1941 2901 291

(Select a De

R1

Physical Config CLI Attributes

IOS Command Line Interface

```
Serial0/1/0      unassigned      YES unset      administratively down down
Serial0/1/1      unassigned      YES unset      administratively down down
Loopback0       1.1.1.1        YES manual    up            up
Vlan1           unassigned      YES unset      administratively down down

R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int s0/1/0
R1(config-if)#ip address 192.168.1.65 255.255.255.192
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#sh ip int brief
Interface          IP-Address      OK? Method Status              Protocol
GigabitEthernet0/0/0 192.168.1.62    YES manual    up                  up
GigabitEthernet0/0/1 unassigned      YES unset      administratively down down
Serial0/1/0         192.168.1.65    YES manual    administratively down down
Serial0/1/1         unassigned      YES unset      administratively down down
Loopback0          1.1.1.1        YES manual    up                  up
Vlan1              unassigned      YES unset      administratively down down

R1#
R1#
R1#ping 192.168.1.126

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.126, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

R1#ping 8.8.8.8

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 8.8.8.8, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

R1#
```

Copy Paste

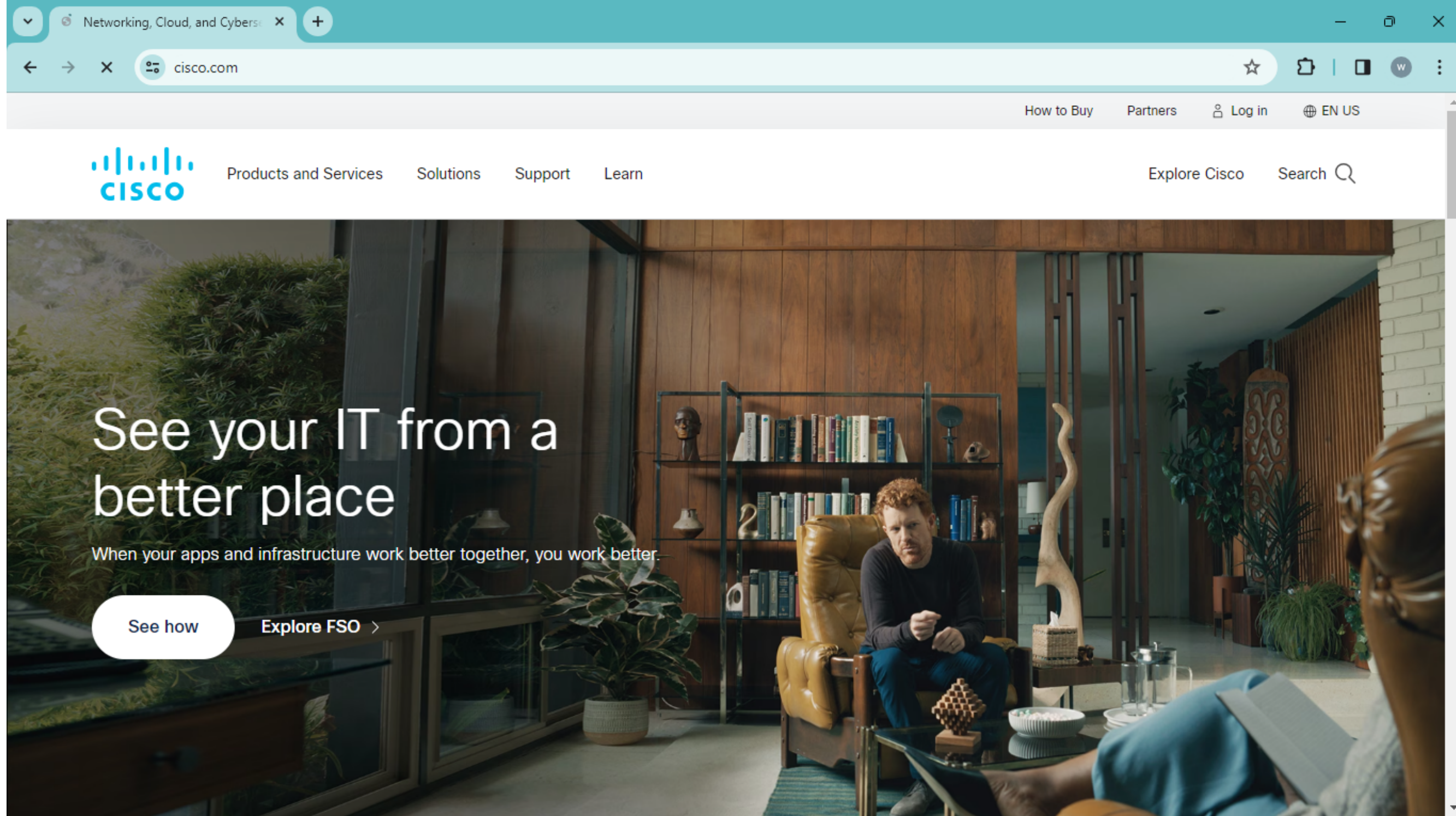
Root 20:18:30

Server-PT 8.8.8.8
Server-PT co.com

Realtime Simulation

Type Color Time(sec) Periodic Num Edit

- lets check the ip connectivity between the router and the internet by pinging
- ping is successful
- router also pings DNS server



Result :

After configuring the ip address with the subnet pc successfully reached the website