CS556 - Advanced Netowork LAB Assignment 2 Setting up a basic network as a junior network administrator using Cisco Packet Tracer

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Question 1. You are a junior network administrator tasked with setting up a basic network using
two routers, one switch, and two PCs. The goal is to establish end-to-end communication
between two LANs connected via a WAN link. You will also configure security settings, basic
interface descriptions, and routing to ensure proper network functionality
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Question 1. You are a junior network administrator tasked with setting up a basic network using two routers, one switch, and two PCs. The goal is to establish end-to-end communication between two LANs connected via a WAN link. You will also configure security settings, basic interface descriptions, and routing to ensure proper network functionality.

Task 1: Router Initialization (30 min)

Erase any existing configurations on both routers (R1 & R2)

enable
erase startup-config

Reload routers and ensure a fresh configuration.

reload

Disable auto-setup mode if prompted. type no and press Enter.

Task 2: Basic Router Configuration

1. Set the hostname for both routers (R1 & R2) as Roll Number_RouterNumber

```
enable
configure terminal
hostname T24CS003_R1
enable
configure terminal
hostname T24CS003_R2
```

2. Configure MOTD banner: "Unauthorized access is prohibited!"

banner motd #Unauthorized access is prohibited!#

3. Set password protection:

• Enable secret password: secure123

enable secret secure123

• Console password: cisco

line console 0 password cisco login

• VTY password: cisco123

line vty 0 4 password cisco123 login

4. Ensure console sessions do not time out.

line console 0
exec-timeout 0 0

5. Enable logging synchronous on the console for smooth command execution.

line console 0 logging synchronous exit

Save the configuration:

write memory

Task 3: Interface Configuration

1. Enter global configuration mode:

configure terminal

2. Configure Fa0/0: LAN

interface fa0/0 ip address 192.168.1.1 255.255.255.0 description Connected to SW1 no shutdown

3. Configure Se0/1/0: WAN

```
interface se0/1/0
ip address 10.0.0.1 255.255.255.252
description WAN Link to R2
clock rate 64000
no shutdown
exit
```

Steps for R2:

1. Enter global configuration mode:

```
configure terminal
```

2. Configure Se0/1/0 (WAN interface, DTE end):

```
interface se0/1/0
ip address 10.0.0.2 255.255.255.252
description WAN Link to R1
no shutdown
```

3. Configure Fa0/0 (LAN interface):

```
interface fa0/0
ip address 192.168.2.1 255.255.255.0
description Connected to PC2
no shutdown
exit
```

4. Save configurations on both routers:

```
write memory
```

Similarly, configure the interfaces for Laptop1 and Laptop2.

Task 4: Configure Static Routing

Steps for R1:

1. Add a static route to R2's LAN:

```
configure terminal
ip route 192.168.2.0 255.255.255.0 10.0.0.2
exit
```

Steps for R2:

1. Add a static route to R1's LAN:

```
configure terminal
ip route 192.168.1.0 255.255.255.0 10.0.0.1
exit
```

Task 5: Switch Configuration

Steps for SW1:

 $1. \ \, {\rm Enter \; global \; configuration \; mode:}$

enable
configure terminal

2. Set the hostname:

hostname T24CS003_SW1

3. Configure VLANs:

vlan 10 name PC1_VLAN exit

4. Assign Fa0/1 (to PC1) to VLAN 10:

interface fa0/1
switchport mode access
switchport access vlan 10
description Connected to PC1

5. Configure Fa0/24 (to R1) as a trunk:

interface fa0/24 switchport mode trunk switchport trunk allowed vlan 10 description Trunk to R1

6. Save the configuration:

write memory

Task 6: End-to-End Connectivity Test

Objective: Configure PCs and verify connectivity.

Steps:

- 1. Configure PC1:
 - Click PC1, go to **Desktop** > **IP Configuration**.
 - Set:
 - IP Address: 192.168.1.10
 Subnet Mask: 255.255.255.0
 Default Gateway: 192.168.1.1
- 2. Configure PC2:
 - Click PC2, go to **Desktop** > **IP Configuration**.
 - Set:
 - IP Address: 192.168.2.10
 Subnet Mask: 255.255.255.0
 Default Gateway: 192.168.2.1
- Default Gateway: 192.108.2.1
 3. Similarly, configure Laptop1 and Laptop2.
- 4. Test Local Connectivity:
 - From PC1's command prompt: ping 192.168.1.1.
 - From PC2's command prompt: ping 192.168.2.1.
 - From Laptop1's command prompt: ping 192.168.1.1, .2.1, .3.1....
 - From Laptop2's command prompt: ping 192.168.1.1, .2.1, .3.1....
- 5. Test WAN Connectivity:
 - From R1: ping 10.0.0.2.
- 6. Test End-to-End Connectivity:

• From PC1: ping 192.168.2.10.

Screenshots/Terminal Outputs:

1. On R1 and R2: show running-config, show ip route, show ip interface brief.

```
T24CS003_R1#show running-config | section interface
 description LAN to PC1
 no ip address
duplex auto
speed auto
interface FastEthernet0/0.10
encapsulation dot10 10
ip address 192.108.1.1 255.255.255.0
 interface FastEthernet0/0.20
 encapsulation dot1Q 20
ip address 192.168.2.1 255.255.255.0
interface FastEthernet0/1
no ip address
duplex auto
 speed auto
shutdown
interface Serial0/1/0
description WAN to R2
 ip address 10.0.0.1 255.255.255.252
 clock rate 64000
interface Serial0/1/1
 no ip address
T24CS003_R1#show running-config | include ip address
 no ip address
ip address 192.168.1.1 255.255.255.0
 ip address 192.168.2.1 255.255.255.0 no ip address
 ip address 10.0.0.1 255.255.255.252
 no ip address
no ip address
T24CS003_R1#
                                                                                                                                                              Сору
                                                                                                                                                                                Paste
```

Figure 1: R1 Running Configuration

```
Physical Config CLI Attributes
                                                                                                IOS Command Line Interface
   T24CS003_R1#
    T24CS003 R1#
   T24CS003_R1#
   T24CS003_R1#
T24CS003_R1#
    T24CS003_R1#
   T24CS003 R1#
   T24CS003_R1#
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   T24CS003_R1#
T24CS003_R1#
    T24CS003_R1#
   T24CS003_R1#
   T24CS003_R1#
   T24CS003_R1#
    T24CS003_R1#
   T24CS003_R1#
   T24CS993_RI#

T24CS993_RI#Show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

NI - 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
          10.0.0.0/30 is subnetted, 1 subnets
10.0.0.0 is directly connected, Serial0/1/0
192.168.1.0/24 is directly connected, FastEthernet0/0.10
192.168.2.0/24 is directly connected, FastEthernet0/0.20
           192.168.3.0/24 [1/0] via 10.0.0.2
          192.168.4.0/24 [1/0] via 10.0.0.2
192.168.30.0/24 [1/0] via 10.0.0.2
           192.168.40.0/24 [1/0] via 10.0.0.2
   T24CS003_R1#show ip interface brief
   Interface
                                                                  OK? Method Status
                                        IP-Address
                                                                                                                       Protocol
    FastEthernet0/0
                                        unassigned
                                                                  YES manual up
   FastEthernet0/0.10
                                        192.168.1.1
                                                                  YES manual up
                                                                                                                        up
   FastEthernet0/0.20
                                        192.168.2.1
                                                                  YES manual up
   FastEthernet0/1
                                        unassigned
                                                                  YES unset administratively down down YES manual up up
   Serial0/1/0
                                        10.0.0.1
   Serial0/1/1
                                        unassigned
                                                                 YES unset administratively down down
YES unset administratively down down
   Vlan1
                                        unassigned
   T24CS003_R1#
                                                                                                                                                                                                Сору
Тор
```

Figure 2: R1 IP Route and R1 IP Interface Brief

```
T24CS003_R2#show running-config | section interface
 description LAN to PC2
 no ip address
duplex auto
speed auto
interface FastEthernet0/0.30
encapsulation dot1Q 30
ip address 192.168.3.1 255.255.255.0
interface FastEthernet0/0.40
encapsulation dot10 40
ip address 192.168.4.1 255.255.255.0
interface FastEthernet0/1
 no ip address
duplex auto
speed auto
shutdown
interface Serial0/1/0
Interface Serial0/1/0
description WAN to R1
ip address 10.0.0.2 255.255.252
interface Serial0/1/1
no ip address
clock rate 2000000
shutdown
interface Vlan1
po ip address
 no ip address
shutdown
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#show running-config | include ip address
 no ip address
ip address 192.168.3.1 255.255.255.0
ip address 192.168.4.1 255.255.255.0
no ip address
ip address 10.0.0.2 255.255.255.252
 no ip address
no ip address
T24CS003_R2#
                                                                                                                                                                                                                                                    Paste
                                                                                                                                                                                                                            Сору
```

Figure 3: R2 Running Configuration

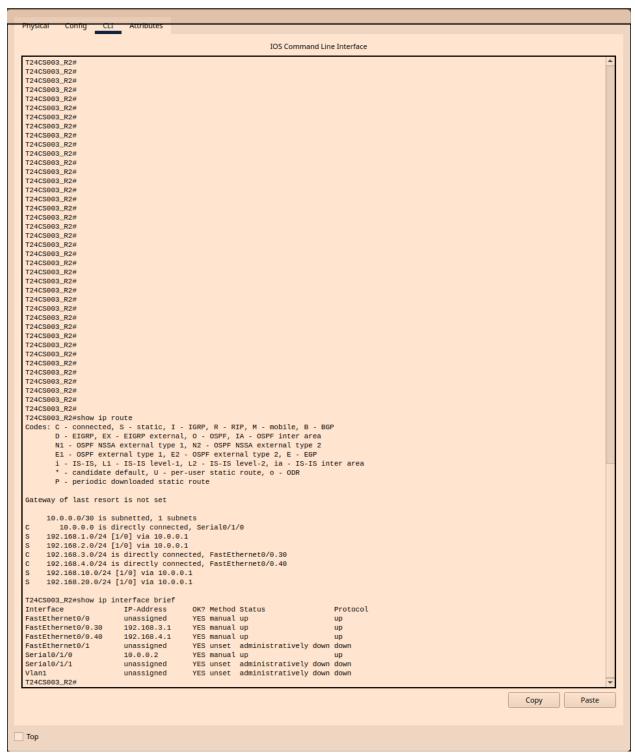


Figure 4: R2 IP Route and R2 IP Interface Brief

2. On SW1: show running-config, show vlan brief.

```
T24CS003_SW1#
T24CS003_SW1#show running-config | exclude interface FastEthernet0/[4-9]|interface FastEthernet0/1[0-9]|interface
Building configuration...
Current configuration : 1450 bytes
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname T24CS003_SW1
spanning-tree mode pvst
spanning-tree extend system-id
interface FastEthernet0/1
switchport access vlan 10
 switchport mode access
interface FastEthernet0/2
switchport access vlan 20
switchport mode access
interface FastEthernet0/3
description Connected to R1
switchport mode trunk
interface GigabitEthernet0/1
interface GigabitEthernet0/2
interface Vlan1
no ip address
line con 0
line vty 0 4
login
line vty 5 15
login
```

Figure 5: SW1 Running Configuration



Figure 6: SW1 VLAN Brief

```
\label{thm:condition} $$ T24CS003\_SW2\#show\ running-config\ |\ exclude\ interface\ FastEthernet0/[4-9]|interface\ FastEthernet0/2[0-4]|\ shutdown|^!$
Building configuration...
Current configuration : 1421 bytes
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname T24CS003_SW2
spanning-tree mode pvst
spanning-tree extend system-id
interface FastEthernet0/1
switchport access vlan 30
switchport mode access
interface FastEthernet0/2
switchport mode trunk
interface FastEthernet0/3
switchport access vlan 40
switchport mode access
interface GigabitEthernet0/1
interface GigabitEthernet0/2
interface Vlan1
no ip address
line con 0
line vty 0 4
login
line vty 5 15
login
end
```

Figure 7: SW2 Running Configuration



Figure 8: SW2 VLAN Brief

3. Ping results from PC1, PC2, Laptop1 and Laptop2.

```
Physical Config Desktop Programming Attributes
                                                                                                                                                                                       Х
  Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
   FastEthernet0 Connection:(default port)
     Bluetooth Connection:
      0.0.0.0
  C:\>ping 192.168.2.1
  Pinging 192.168.2.1 with 32 bytes of data:
  Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
  Ping statistics for 192.168.2.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
   C:\>
Тор
```

Figure 9: PC1 Ping

```
<u>Physical Config Desktop Programming Attributes</u>
  Command Prompt
   Cisco Packet Tracer PC Command Line 1.0
   C:\>ipconfig
   FastEthernet0 Connection:(default port)
     Bluetooth Connection:
       Connection-specific DNS Suffix..:
     C:\>ping 192.168.1.1
   Pinging 192.168.1.1 with 32 bytes of data:
  Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
  Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
   C:\>
Тор
```

Figure 10: PC2 Ping

```
Config
                                                    Programming
  ommand Prompt
                                                                                                                                                                                                                                                         Х
 Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
 FastEthernet0 Connection:(default port)
       Connection-specific DNS Suffix..:
      192.168.3.1
 Bluetooth Connection:
      Connection-specific DNS Suffix..:
Link-local IPv6 Address.....:::

      IPv6 Address
      :

      IPv4 Address
      0.0.0.0

      Subnet Mask
      0.0.0.0

      Default Gateway....:::
                                                                     0.0.0.0
 C:\>ping 192.168.1.1
 Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=1ms TTL=254
Reply from 192.168.1.1: bytes=32 time=10ms TTL=254
Reply from 192.168.1.1: bytes=32 time=15ms TTL=254
Reply from 192.168.1.1: bytes=32 time=15ms TTL=254
Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 19ms, Average = 12ms
 C:\>ping 192.168.2.1
 Pinging 192.168.2.1 with 32 bytes of data:
Reply from 192.168.2.1: bytes=32 time=27ms TTL=254
Reply from 192.168.2.1: bytes=32 time=14ms TTL=254
Reply from 192.168.2.1: bytes=32 time=16ms TTL=254
Reply from 192.168.2.1: bytes=32 time=1ms TTL=254
Ping statistics for 192.168.2.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 27ms, Average = 14ms
 C:\>ping 192.168.4.1
 Pinging 192.168.4.1 with 32 bytes of data:
Reply from 192.168.4.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.4.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
         Minimum = 0ms, Maximum = 0ms, Average = 0ms
 C:\>
Top
```

Figure 11: Laptop1 Ping

```
Physical
                  Config Desktop Programming Attributes
   Command Prompt
                                                                                                                                                                                                                                                           Х
   Cisco Packet Tracer PC Command Line 1.0
   C:\>ipconfig
   FastEthernet0 Connection:(default port)
         Connection-specific DNS Suffix..:
Link-local IPv6 Address...... FE80::290:CFF:FE87:E973

      IPv6 Address
      ::

      IPv4 Address
      : 192.168.4.10

      Subnet Mask
      : 255.255.255.0

         Subnet Mask.....::

Default Gateway...::

192.168.4.1
   Bluetooth Connection:
         Connection-specific DNS Suffix..:
         Link-local IPv6 Address :: ::
IPv6 Address :: ::
IPv4 Address :: 0.0.0.0
        Subnet Mask...... 0.0.0.0
Default Gateway.....: ::
                                                                       0.0.0.0
   C:\>ping 192.168.1.1
   Pinging 192.168.1.1 with 32 bytes of data:
   Reply from 192.168.1.1: bytes=32 time=1ms TTL=254
Reply from 192.168.1.1: bytes=32 time=17ms TTL=254
Reply from 192.168.1.1: bytes=32 time=1ms TTL=254
Reply from 192.168.1.1: bytes=32 time=16ms TTL=254
   Ping statistics for 192.168.1.1:
   Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 17ms, Average = 8ms
   C:\>ping 192.168.2.1
   Pinging 192.168.2.1 with 32 bytes of data:
   Reply from 192.168.2.1: bytes=32 time=34ms TTL=254
Reply from 192.168.2.1: bytes=32 time=1ms TTL=254
Reply from 192.168.2.1: bytes=32 time=15ms TTL=254
Reply from 192.168.2.1: bytes=32 time=16ms TTL=254
   Ping statistics for 192.168.2.1:
   Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 34ms, Average = 17ms
   C:\>ping 192.168.3.1
   Pinging 192.168.3.1 with 32 bytes of data:
   Reply from 192.168.3.1: bytes=32 time<1ms TTL=255 Reply from 192.168.3.1: bytes=32 time<1ms TTL=255 Reply from 192.168.3.1: bytes=32 time<1ms TTL=255 Reply from 192.168.3.1: bytes=32 time<1ms TTL=255
   Ping statistics for 192.168.3.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms
   C:\>
Тор
```

Figure 12: Laptop2 Ping