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

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Contents

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. 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
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`.

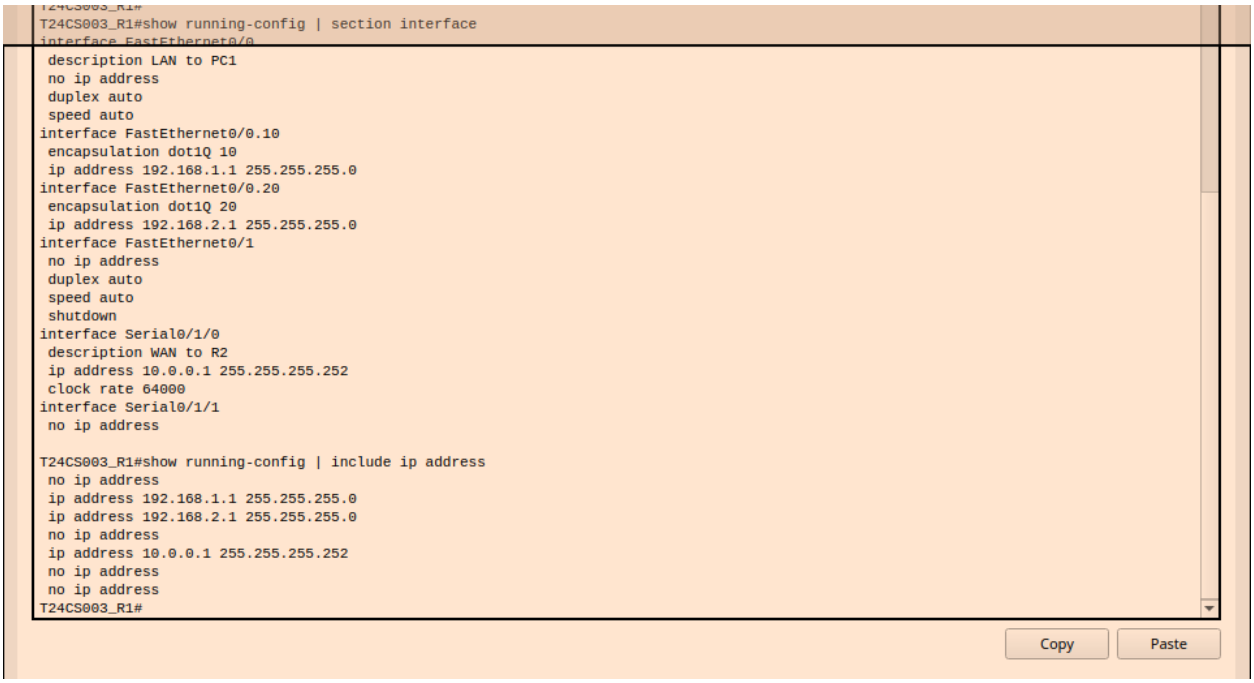


Figure 1: R1 Running Configuration

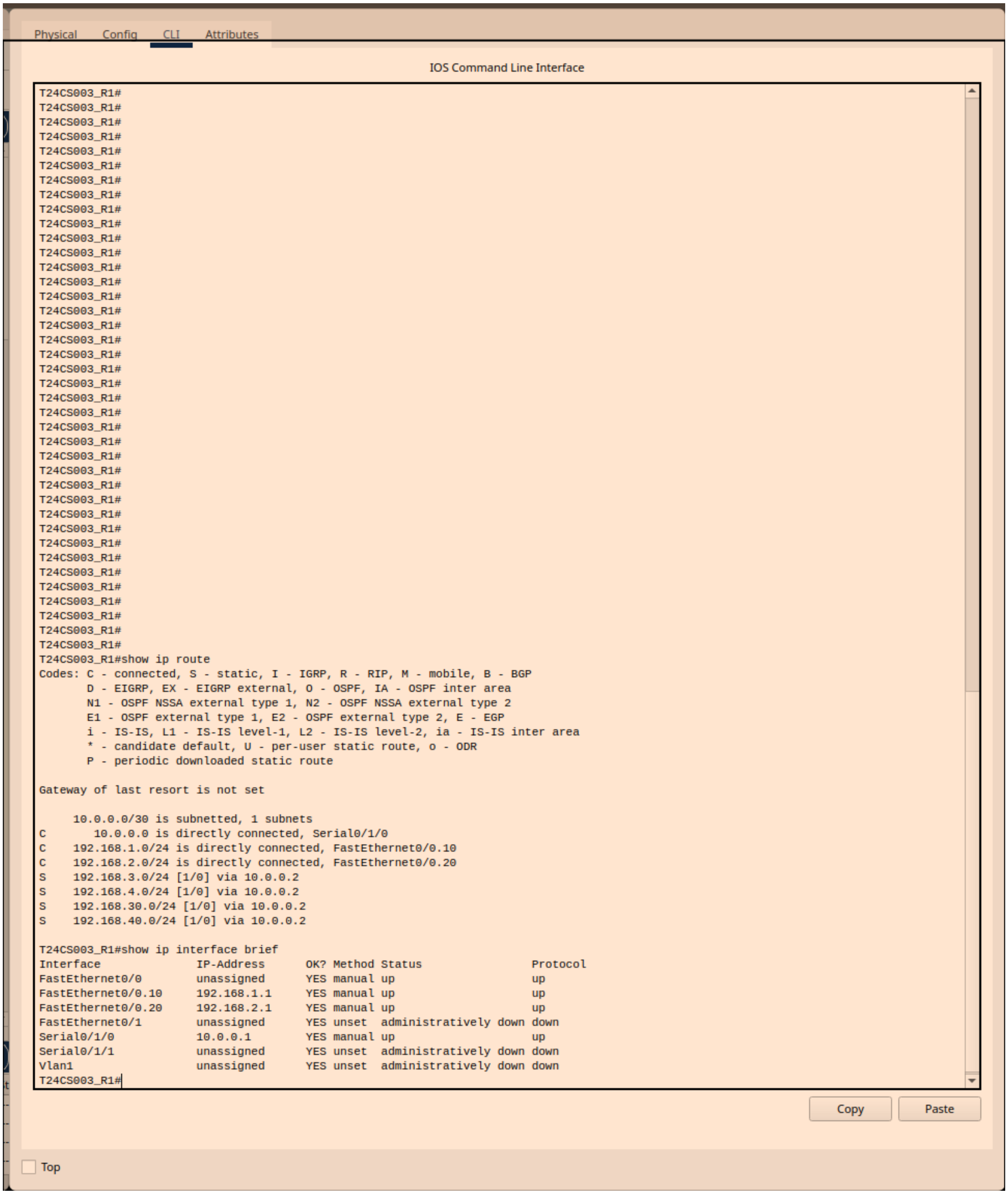


Figure 2: R1 IP Route and R1 IP Interface Brief

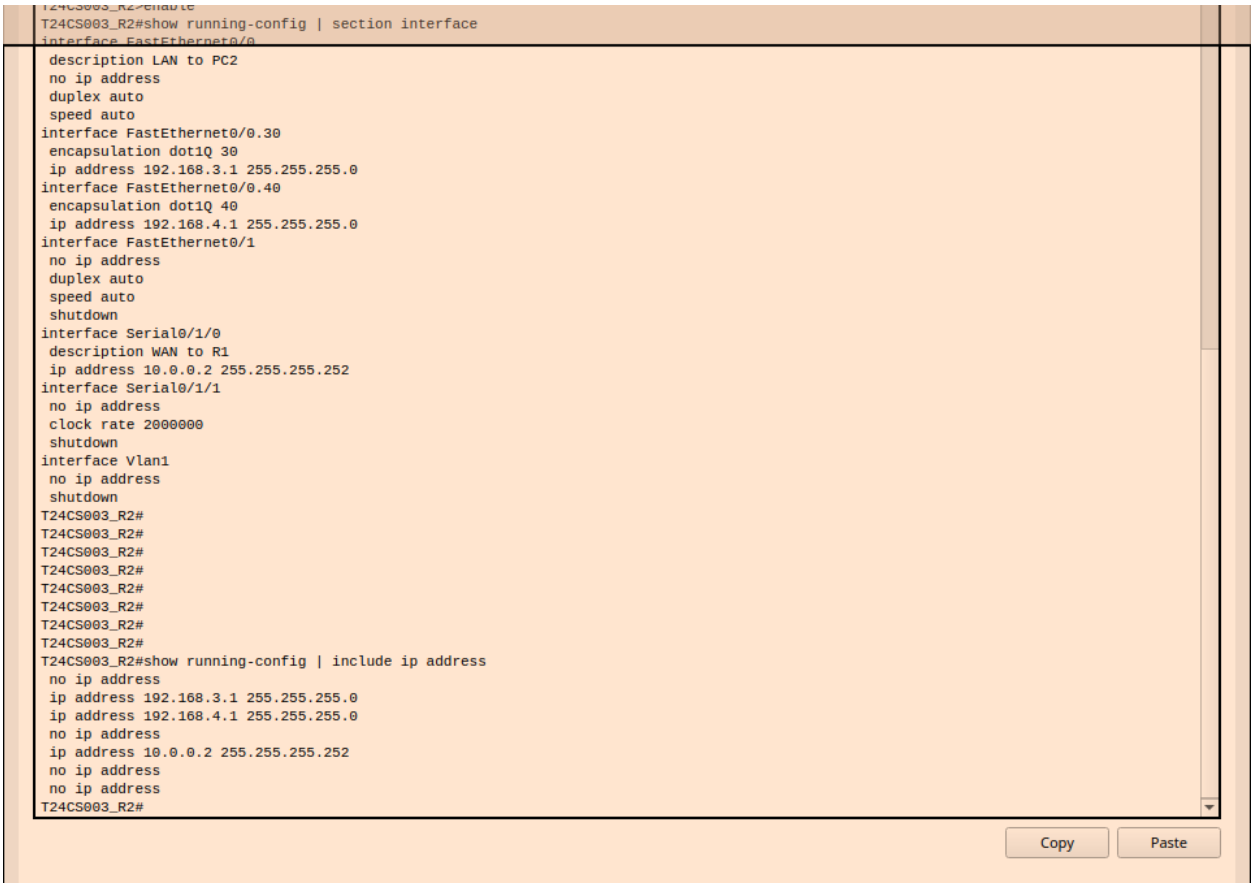
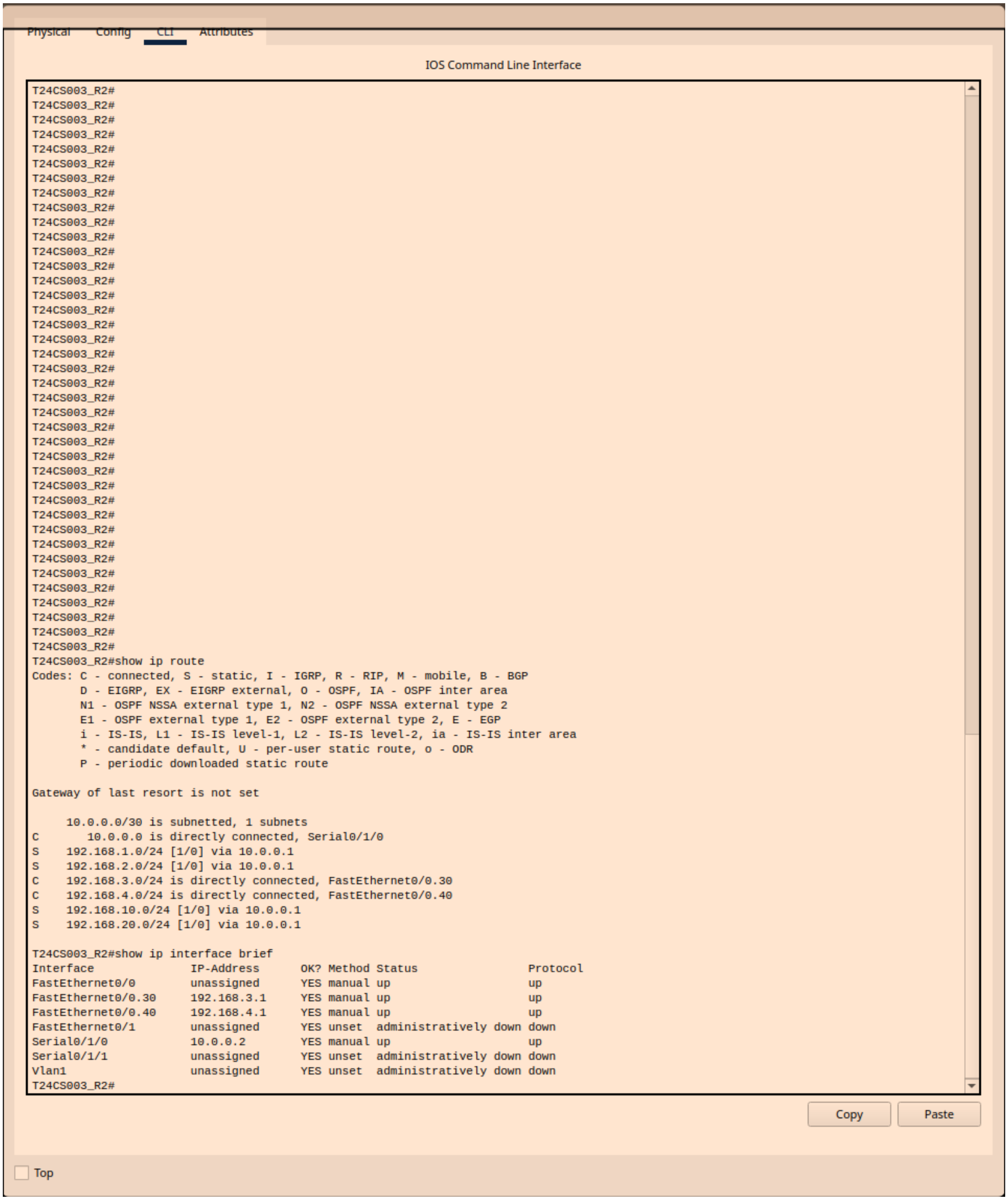


Figure 3: R2 Running Configuration




```
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T24CS003_R2#
T24CS003_R2#
T24CS003_R2#
T24CS003_R2#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
       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

     10.0.0.0/30 is subnetted, 1 subnets
C       10.0.0.0 is directly connected, Serial0/1/0
S    192.168.1.0/24 [1/0] via 10.0.0.1
S    192.168.2.0/24 [1/0] via 10.0.0.1
C    192.168.3.0/24 is directly connected, FastEthernet0/0.30
C    192.168.4.0/24 is directly connected, FastEthernet0/0.40
S    192.168.10.0/24 [1/0] via 10.0.0.1
S    192.168.20.0/24 [1/0] via 10.0.0.1

T24CS003_R2#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        unassigned      YES manual up                    up
FastEthernet0/0.30     192.168.3.1     YES manual up                    up
FastEthernet0/0.40     192.168.4.1     YES manual up                    up
FastEthernet0/1        unassigned      YES unset  administratively down down
Serial0/1/0            10.0.0.2        YES manual up                    up
Serial0/1/1            unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
T24CS003_R2#
```


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
FastEthernet0/2[0-4]| shutdown|^!$
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
end
```

Figure 5: SW1 Running Configuration

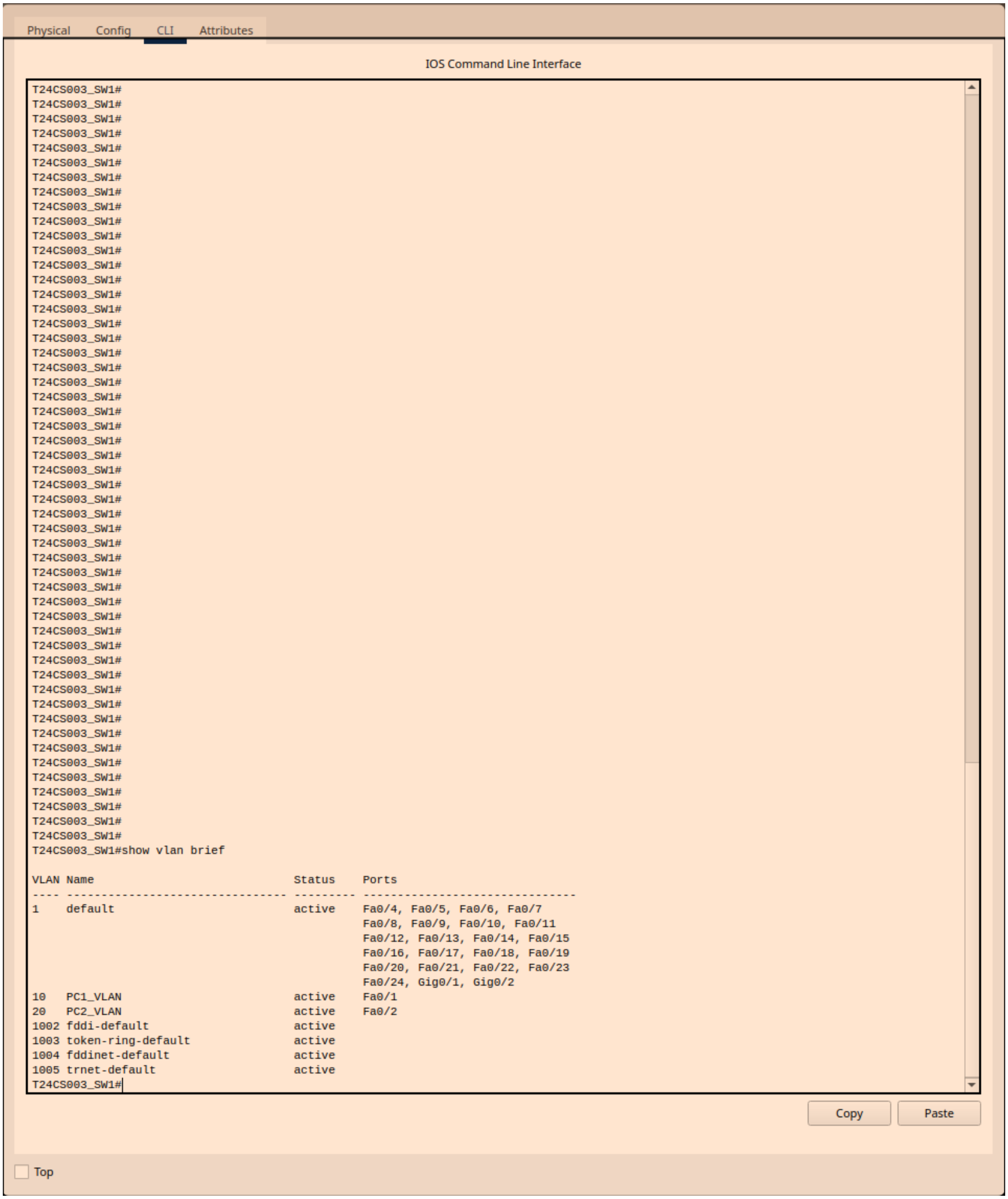
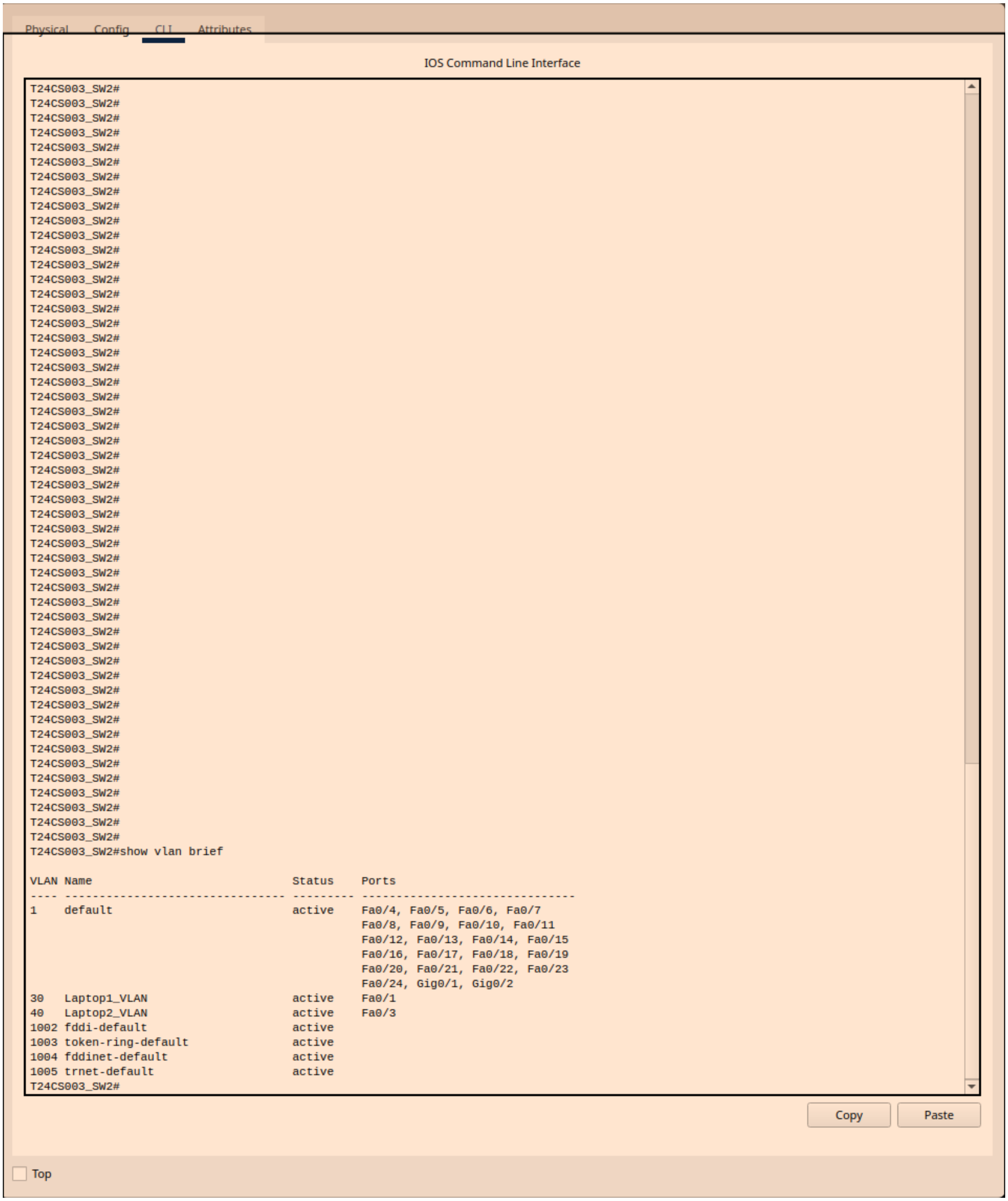


Figure 6: SW1 VLAN Brief

```
T24CS003_SW2#show running-config | exclude interface FastEthernet0/[4-9]|interface FastEthernet0/1[0-9]|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




```
T24CS003_SW2#
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T24CS003_SW2#
T24CS003_SW2#
T24CS003_SW2#
T24CS003_SW2#
T24CS003_SW2#
T24CS003_SW2#
T24CS003_SW2#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/4, Fa0/5, Fa0/6, Fa0/7
                                                Fa0/8, Fa0/9, Fa0/10, Fa0/11
                                                Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                                Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                                Fa0/20, Fa0/21, Fa0/22, Fa0/23
                                                Fa0/24, Gig0/1, Gig0/2
30   Laptop1_VLAN                     active    Fa0/1
40   Laptop2_VLAN                     active    Fa0/3
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
T24CS003_SW2#
```

Figure 8: SW2 VLAN Brief

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

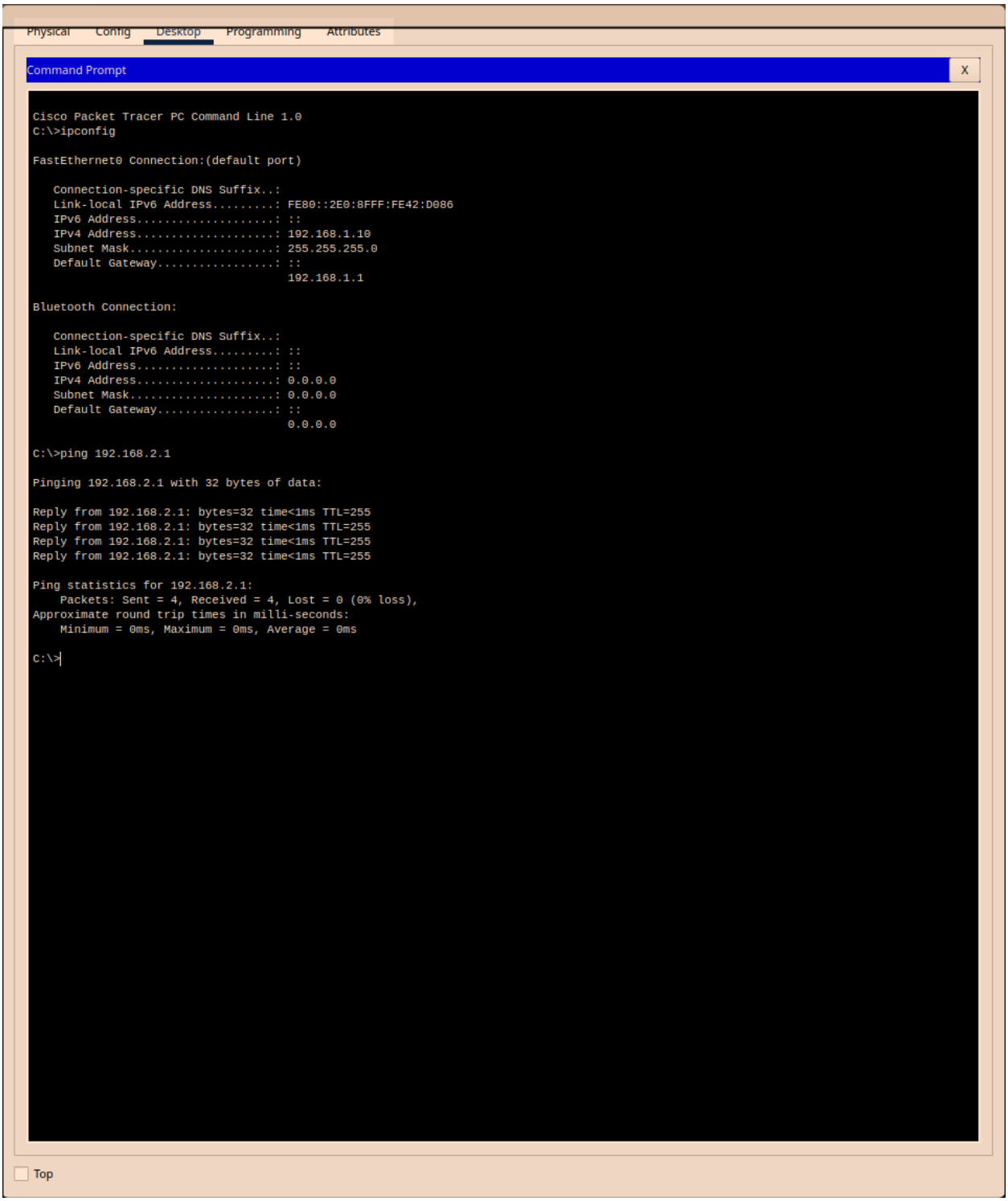

Figure 9: PC1 Ping

Figure 10: PC2 Ping

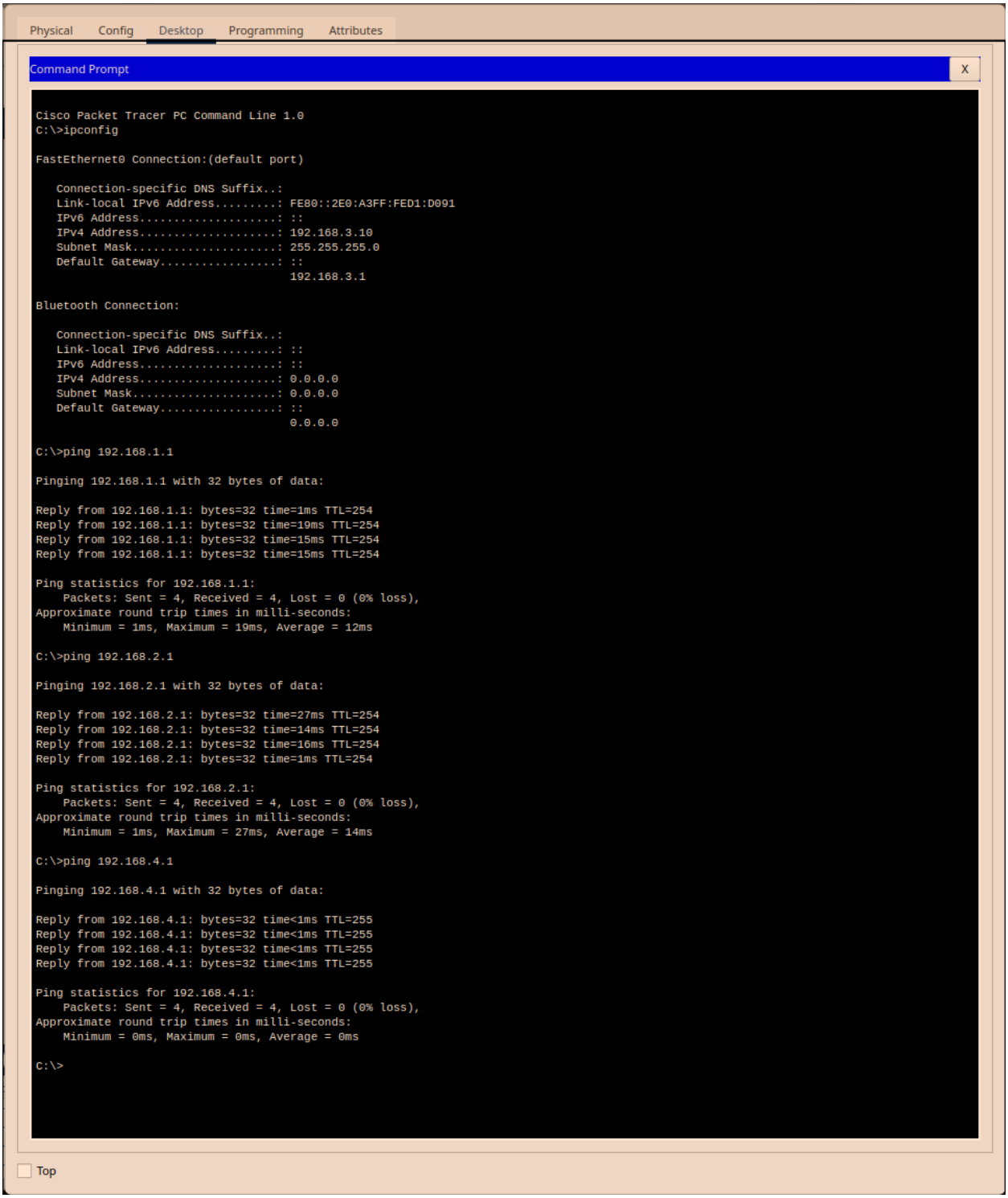

Figure 11: Laptop1 Ping

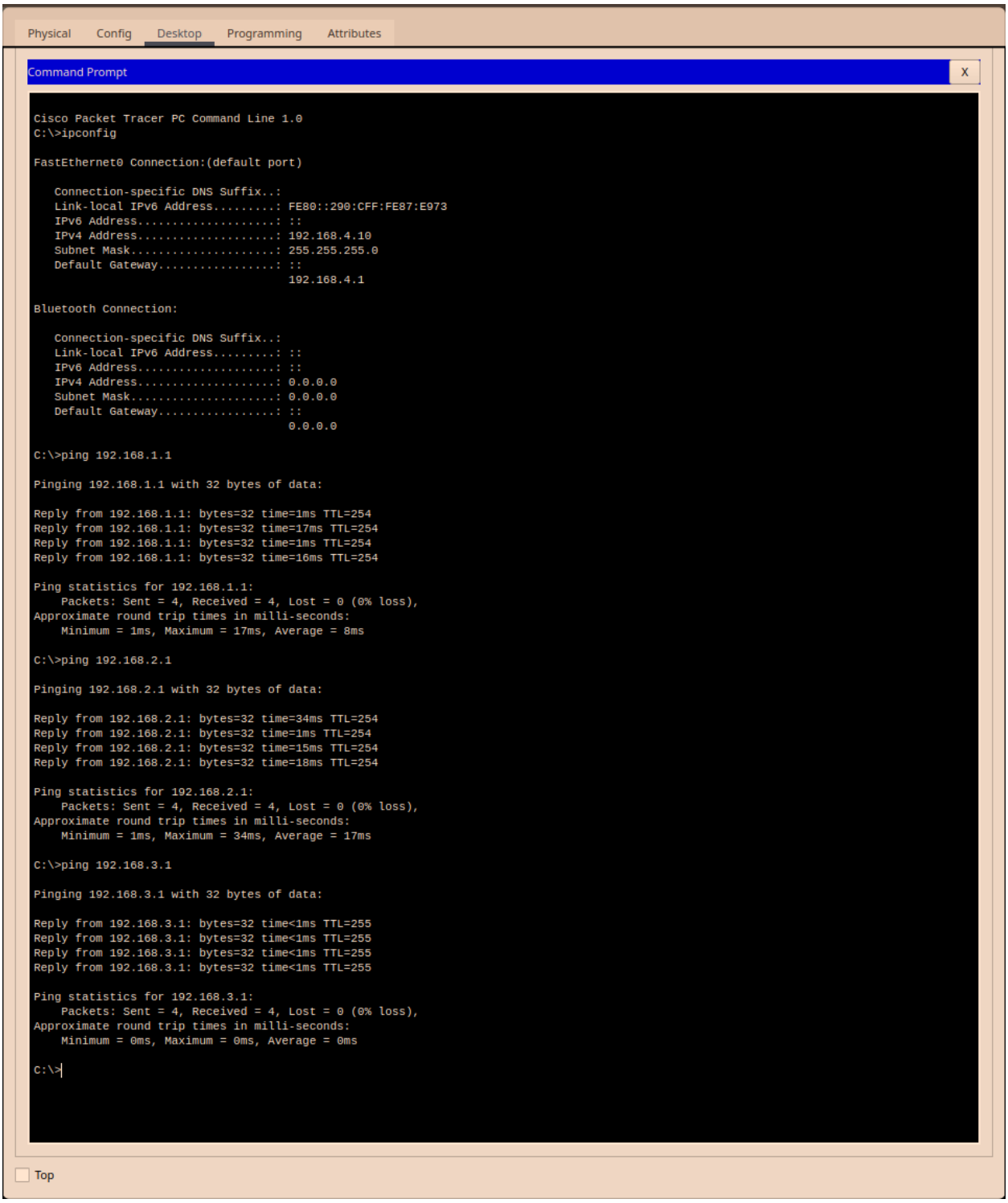

Figure 12: Laptop2 Ping