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CEL 51, DCCN, Monsoon 2020
## Lab 4: Prototyping a Network

Objective:
Prototype a network using Packet Tracer

Background
A client has requested that you set up a simple network with two PCs connected to a switch. Verify that the hardware, along with the given configurations, meet the requirements of the client.

Step 1: Set up the network topology

a) Add two PCs and a Cisco 2950T switch

b) Using straight-through cables, connect **PC0** to interface **Fa0/1** on **Switch0** and **PC1** to interface **Fa0/2** on **Switch0**.
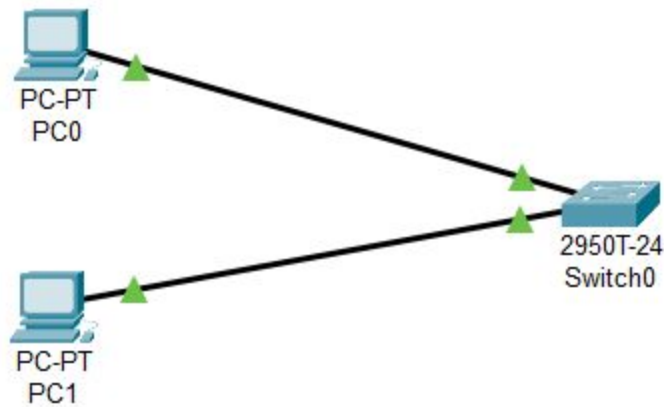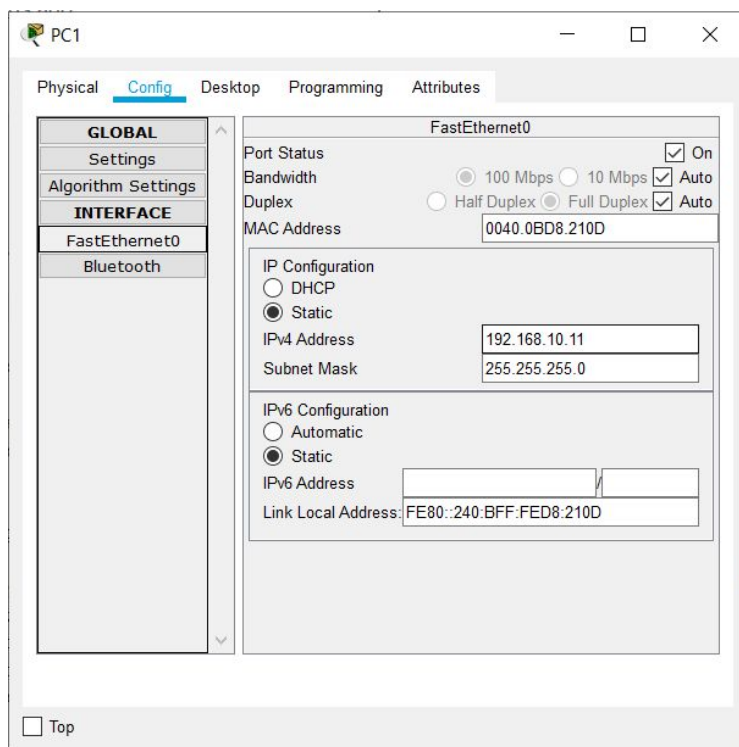

c) Configure PC0 using the **Config** tab in the PC0 configuration window:

    a. IP address: 192.168.10.10
    b. Subnet Mask 255.255.255.0
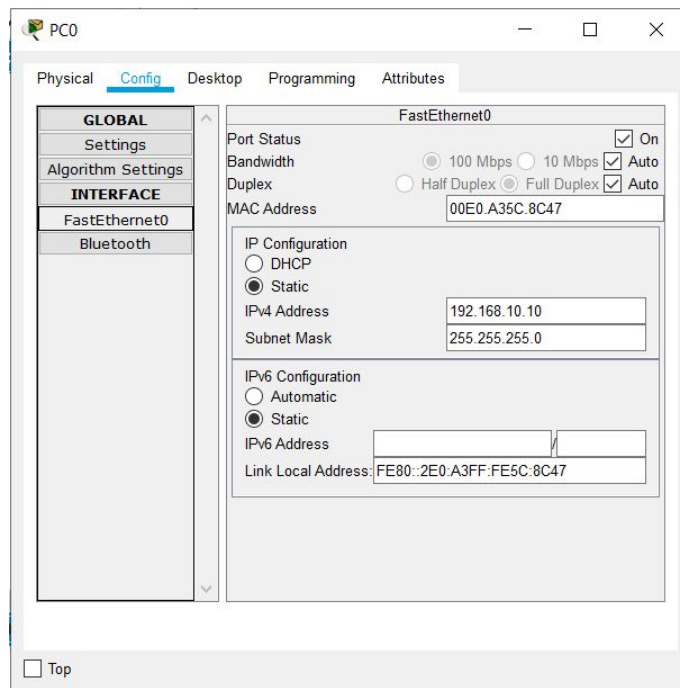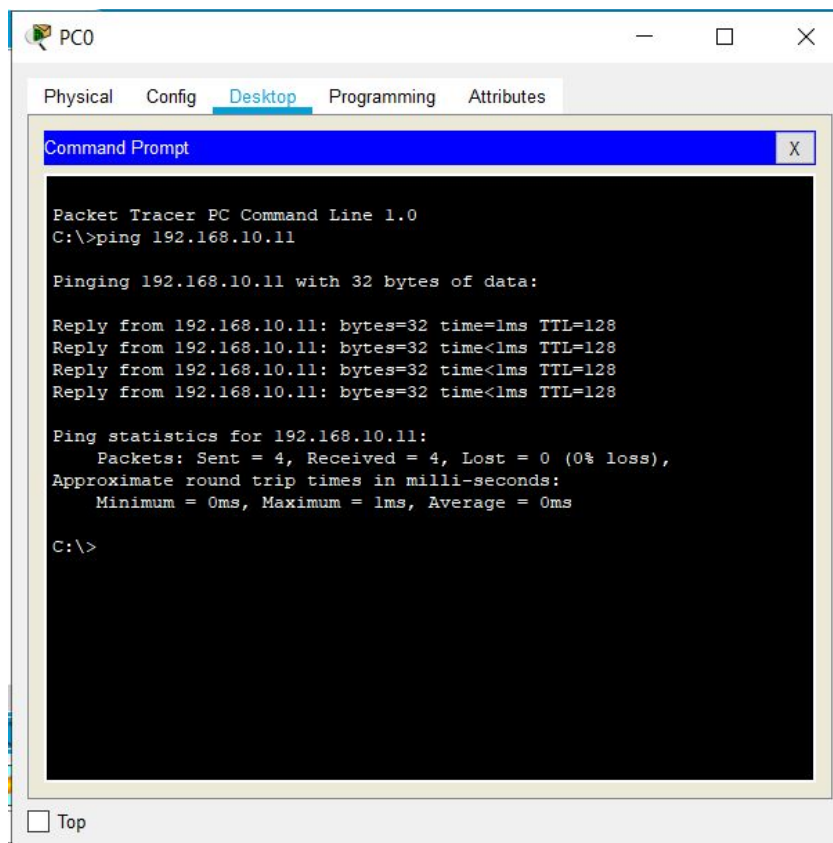
d) Configure PC1 using the **Config** tab in the PC1 configuration window

    a. IP address: 192.168.10.11
    b. Subnet Mask 255.255.255.0
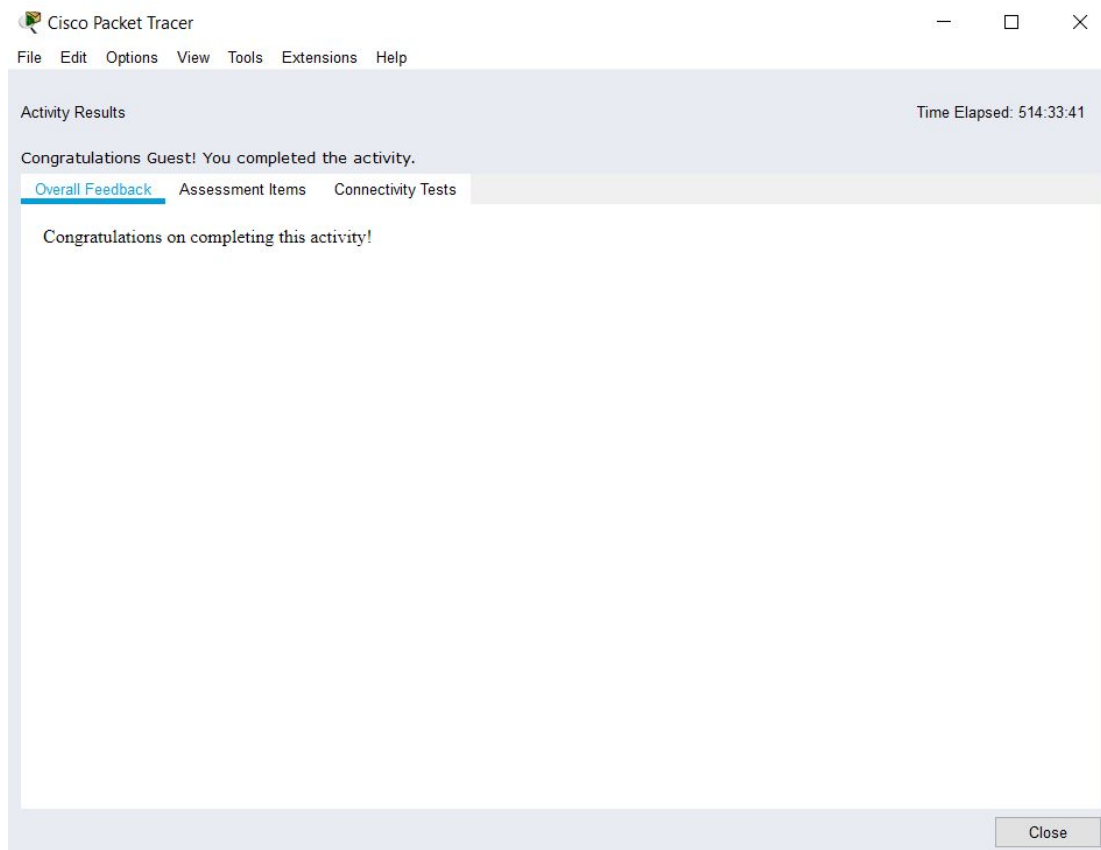

Step 2: Test connectivity from PC0 to PC1

a) Use the **ping** command to test connectivity.
    a. Click PC0.
    b. Choose the **Desktop** tab.
    c. Choose **Command Prompt**.
    d. Type: **ping 192.168.10.11** and press *enter*.

PC0

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.10.11: bytes=32 time=1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

☐ Top

b) A successful **ping** indicates the network was configured correctly and the prototype validates the hardware and software configurations. A successful ping should resemble the below output:

c) Close the configuration window.

d) Click the **Check Results** button at the bottom of the instruction window to check your work..

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Activity Results   Time Elapsed: 514:33:41

Congratulations Guest! You completed the activity.

Overall Feedback   Assessment Items   Connectivity Tests

Congratulations on completing this activity!

Close

Objective:

This lab will test your ability to configure basic settings such as hostname, motd banner, encrypted passwords, and terminal options on a Packet Tracer 6.2 simulated Cisco Catalyst switch.
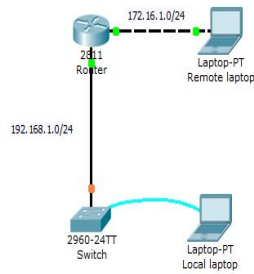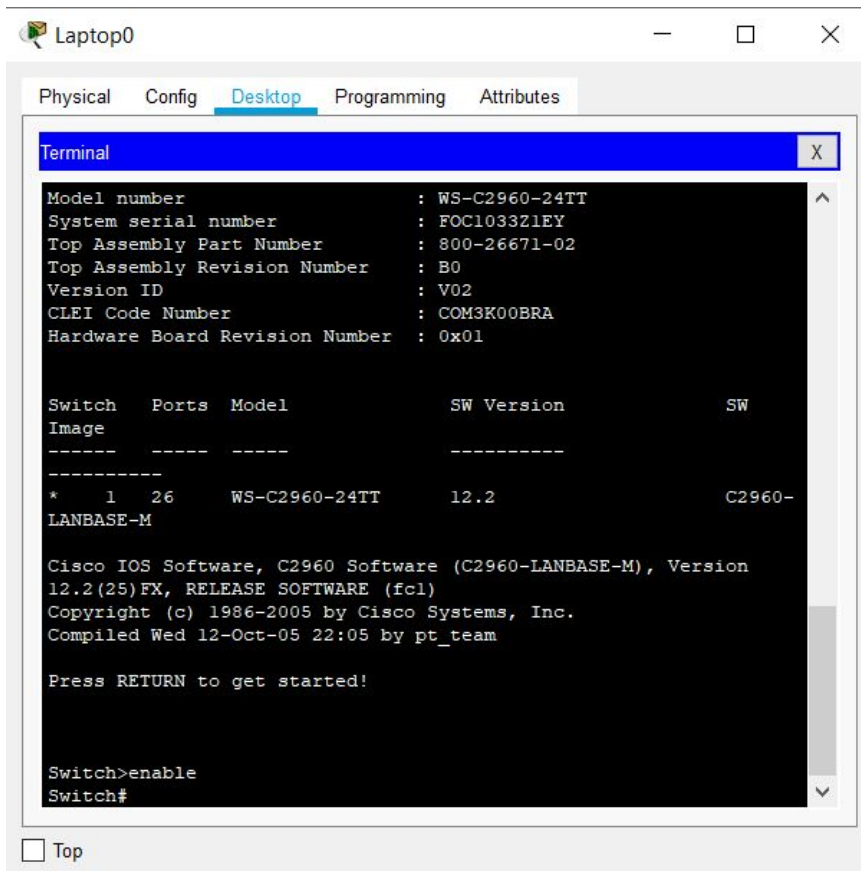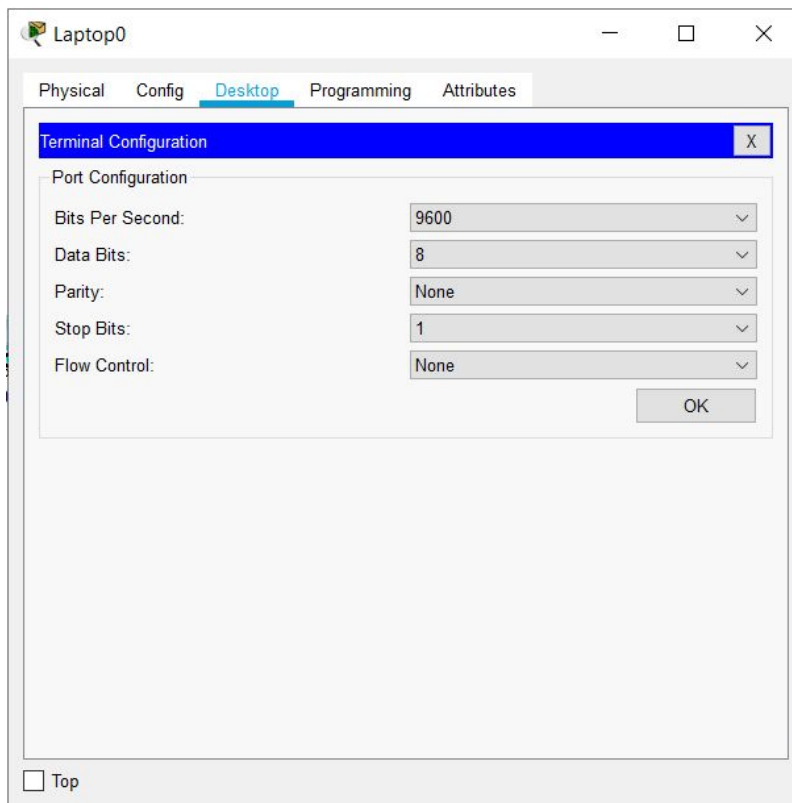

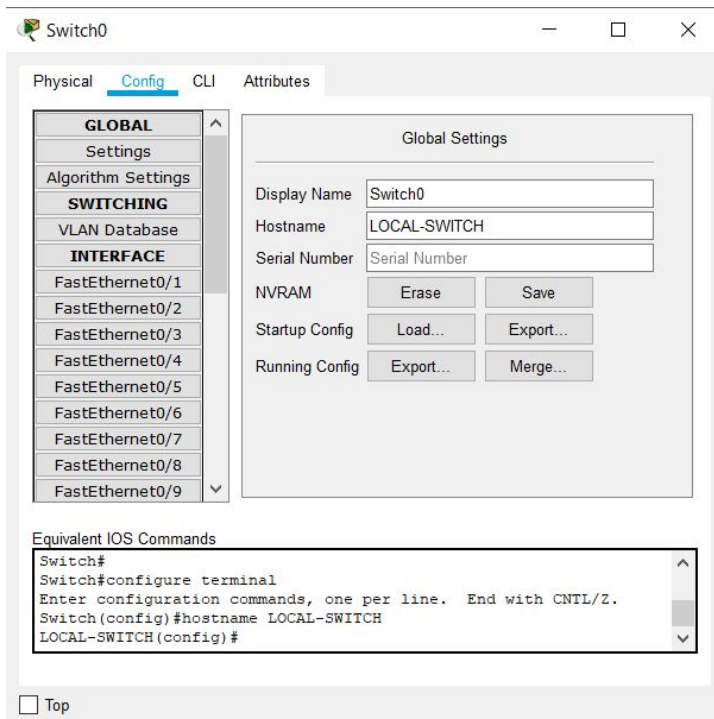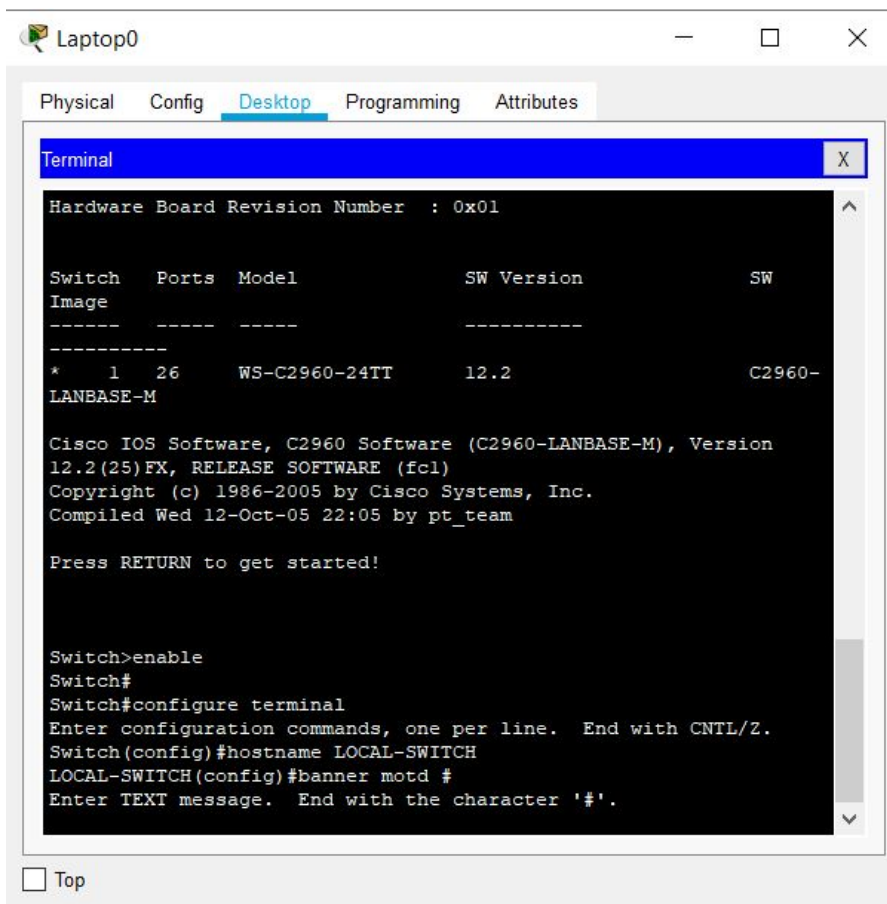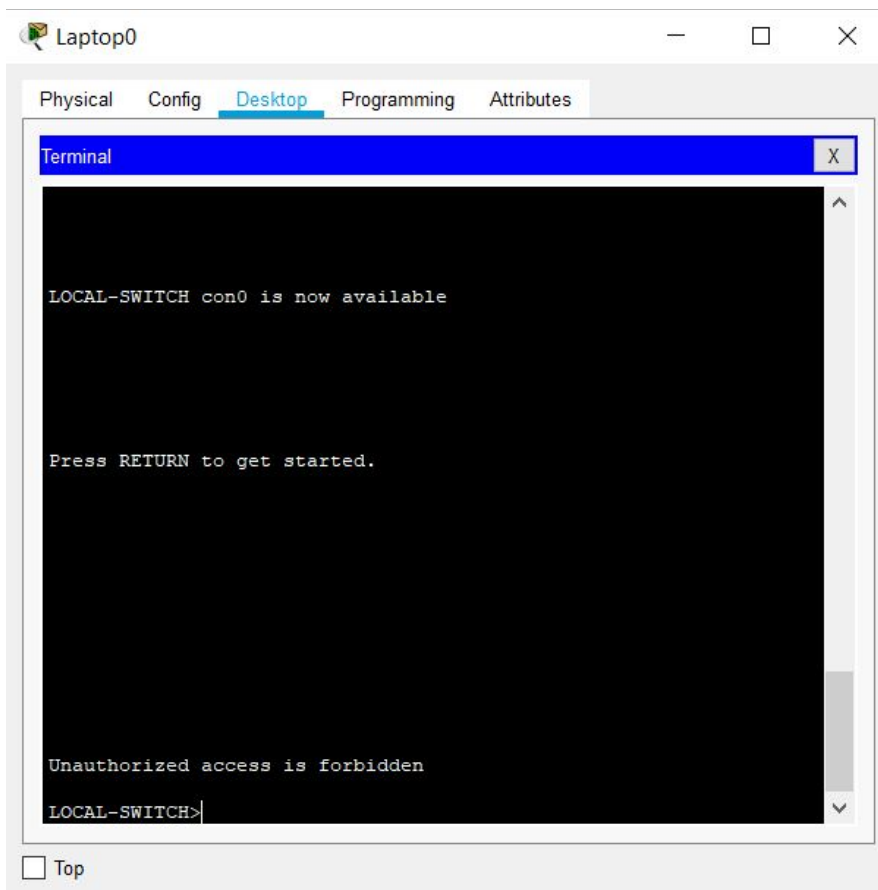1. Use the local laptop connect to the switch console.

2. Configure Switch hostname as LOCAL-SWITCH

3. Configure the message of the day as "Unauthorized access is forbidden"

Laptop0

Physical | Config | Desktop | Programming | Attributes

Terminal [X]

```
Switch    Ports  Model              SW Version           SW
Image
------    -----  -----              ----------
----------
*    1    26     WS-C2960-24TT      12.2                 C2960-
LANBASE-M

Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version
12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

Press RETURN to get started!



Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname LOCAL-SWITCH
LOCAL-SWITCH(config)#banner motd #
Enter TEXT message.  End with the character '#'.
Unauthorized access is forbidden#

LOCAL-SWITCH(config)#
```

☐ Top

Laptop0

Physical | Config | Desktop | Programming | Attributes

Terminal [X]

```
LOCAL-SWITCH con0 is now available




Press RETURN to get started.







Unauthorized access is forbidden

LOCAL-SWITCH>
```

☐ Top

4. Configure the password for privileged mode access as "cisco". The password must be md5 encrypted
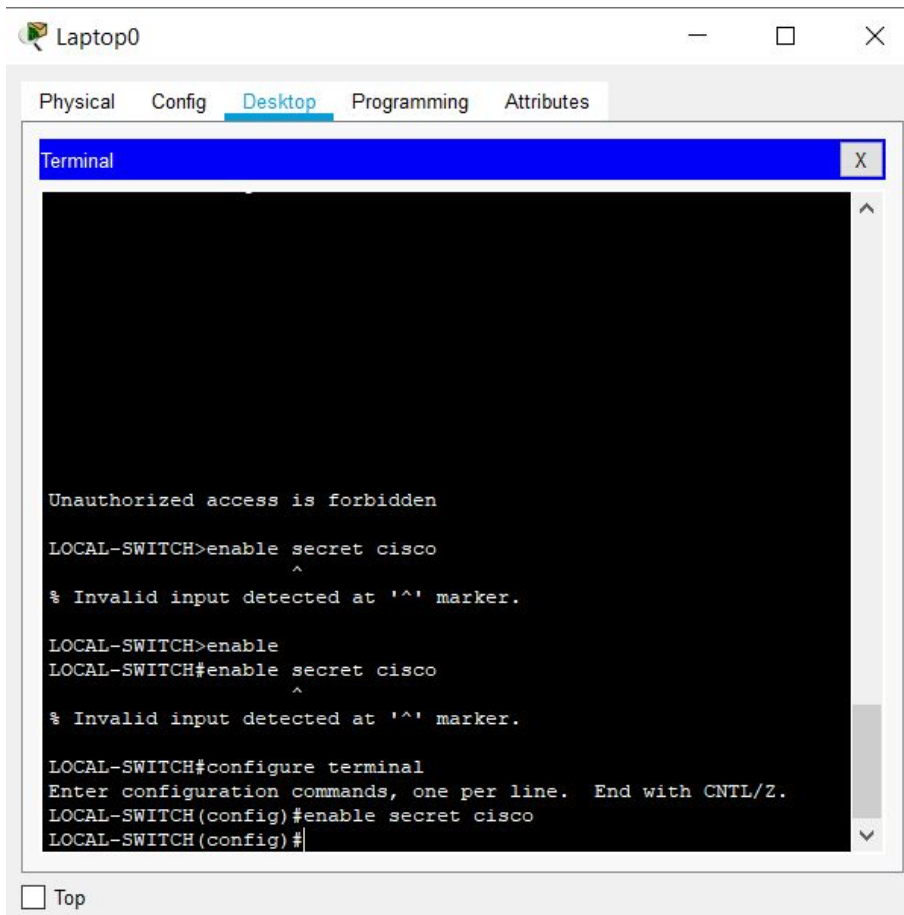
5. Configure password encryption on the switch using the global configuration command

Terminal

```
LOCAL-SWITCH(config)#exit
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console
show running-config
Building configuration...

Current configuration : 1180 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname LOCAL-SWITCH
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 --More--
```
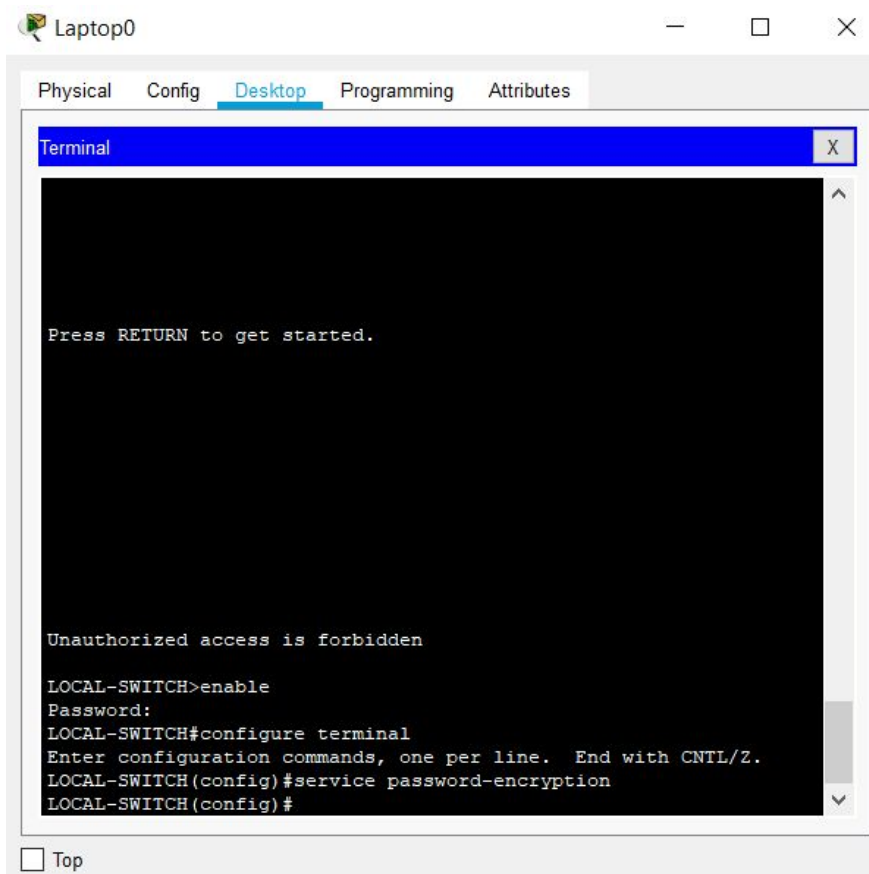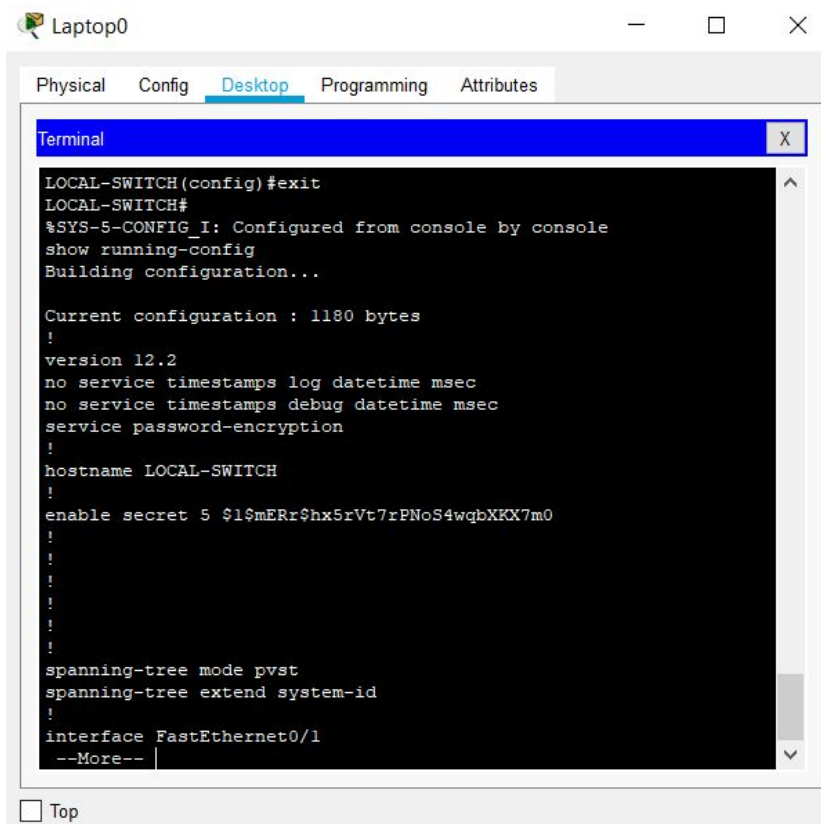
6. Configure CONSOLE access with the following settings :
- Login enabled
- Password : whatever you like
- History size : 15 commands
- Timeout : 6'45"
- Synchronous logging

Terminal

```
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
banner motd ^C
Unauthorized access is forbidden^C
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end

LOCAL-SWITCH#
LOCAL-SWITCH#
```

Physical   Config   Desktop   Programming   Attributes

Terminal   X

```
Unauthorized access is forbidden^C
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end


LOCAL-SWITCH#
LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
LOCAL-SWITCH(config)#line con 0
LOCAL-SWITCH(config-line)#password neha
LOCAL-SWITCH(config-line)#logging synchronous
LOCAL-SWITCH(config-line)#login
LOCAL-SWITCH(config-line)#history size 15
LOCAL-SWITCH(config-line)#exec-timeout 6 45
LOCAL-SWITCH(config-line)#
```

☐ Top

Physical   Config   Desktop   Programming   Attributes

Terminal   X

```
 no ip address
 shutdown
!
banner motd ^C
Unauthorized access is forbidden^C
!
!
!
line con 0
 password 7 082F494608
 logging synchronous
 login
 history size 15
 exec-timeout 6 45
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end

LOCAL-SWITCH#
```

☐ Top
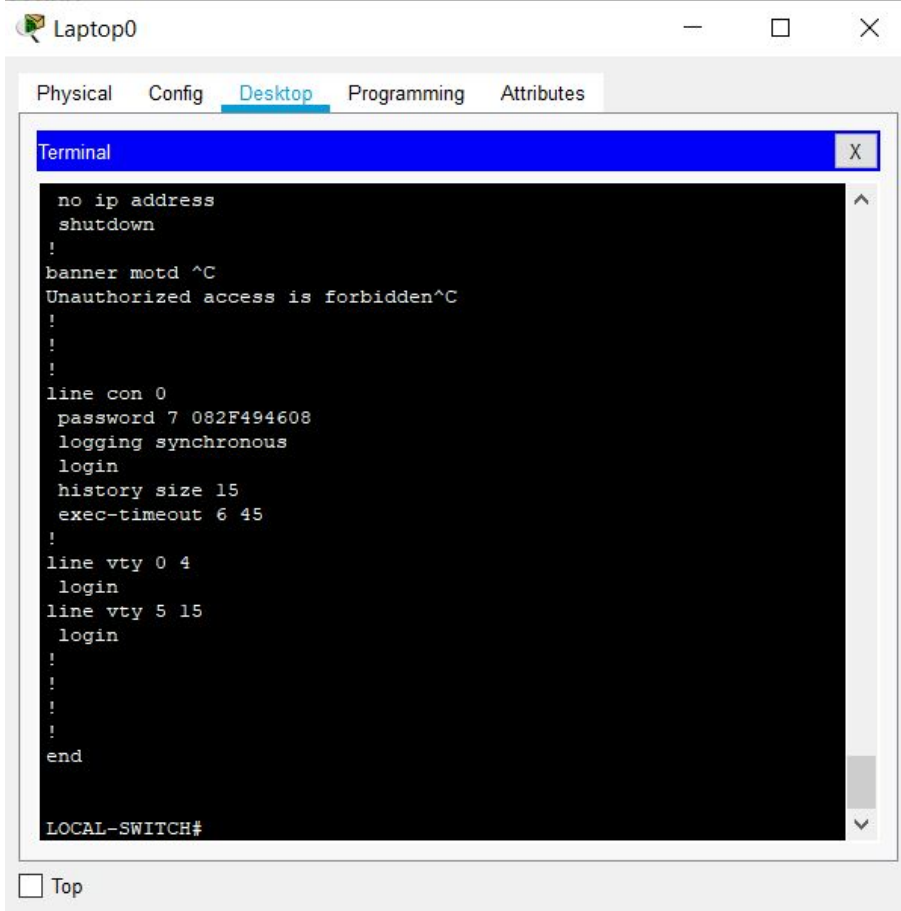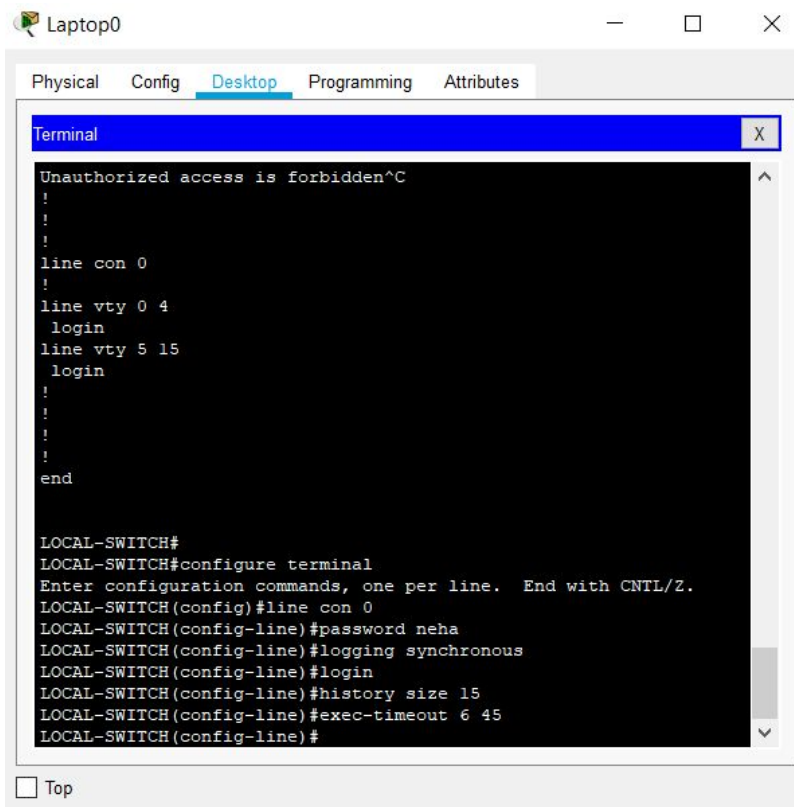
6. Configure TELNET access with the following settings :
- Login enabled
- Password : whatever you like
- History size : 15 commands
- Timeout : 8'20"
- Synchronous logging

```
Laptop0                                              —   □   X

Physical    Config    Desktop    Programming    Attributes

Terminal                                                   X

LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
LOCAL-SWITCH(config)#line vty 0 15
LOCAL-SWITCH(config-line)#exec-timeout 8 20
LOCAL-SWITCH(config-line)#history size 15
LOCAL-SWITCH(config-line)#login
% Login disabled on line 1, until 'password' is set
% Login disabled on line 2, until 'password' is set
% Login disabled on line 3, until 'password' is set
% Login disabled on line 4, until 'password' is set
% Login disabled on line 5, until 'password' is set
% Login disabled on line 6, until 'password' is set
% Login disabled on line 7, until 'password' is set
% Login disabled on line 8, until 'password' is set
% Login disabled on line 9, until 'password' is set
% Login disabled on line 10, until 'password' is set
% Login disabled on line 11, until 'password' is set
% Login disabled on line 12, until 'password' is set
% Login disabled on line 13, until 'password' is set
% Login disabled on line 14, until 'password' is set
% Login disabled on line 15, until 'password' is set
% Login disabled on line 16, until 'password' is set
LOCAL-SWITCH(config-line)#password neha
LOCAL-SWITCH(config-line)#logging synchronous
LOCAL-SWITCH(config-line)#login
LOCAL-SWITCH(config-line)#

□ Top
```

```
Laptop0                                              —   □   X

Physical    Config    Desktop    Programming    Attributes

Terminal                                                   X

line con 0
 password 7 082F494608
 logging synchronous
 login
 history size 15
 exec-timeout 6 45
!
line vty 0 4
 exec-timeout 8 20
 password 7 082F494608
 logging synchronous
 login
 history size 15
line vty 5 15
 exec-timeout 8 20
 password 7 082F494608
 logging synchronous
 login
 history size 15
!
!
!
!
end

LOCAL-SWITCH#

□ Top
```

7. Configure the IP address of the switch as 192.168.1.2/24 and it's default gateway IP (192.168.1.1).

Laptop0

Physical | Config | **Desktop** | Programming | Attributes

Terminal

```
Unauthorized access is forbidden

User Access Verification

Password:

LOCAL-SWITCH>enable
Password:
Password:
LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
LOCAL-SWITCH(config)#interface Vlan1
LOCAL-SWITCH(config-if)#ip address 192.168.1.2 255.255.255.0
LOCAL-SWITCH(config-if)#ip default-gateway 192.168.1.1
LOCAL-SWITCH(config)#
```

☐ Top

Laptop0

Physical | Config | **Desktop** | Programming | Attributes

Terminal

```
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 ip address 192.168.1.2 255.255.255.0
 shutdown
!
ip default-gateway 192.168.1.1
!
banner motd ^C
Unauthorized access is forbidden^C
!
!
!
line con 0
 password 7 082F494608
 logging synchronous
 login
 history size 15
 exec-timeout 6 45
!
 --More--
```
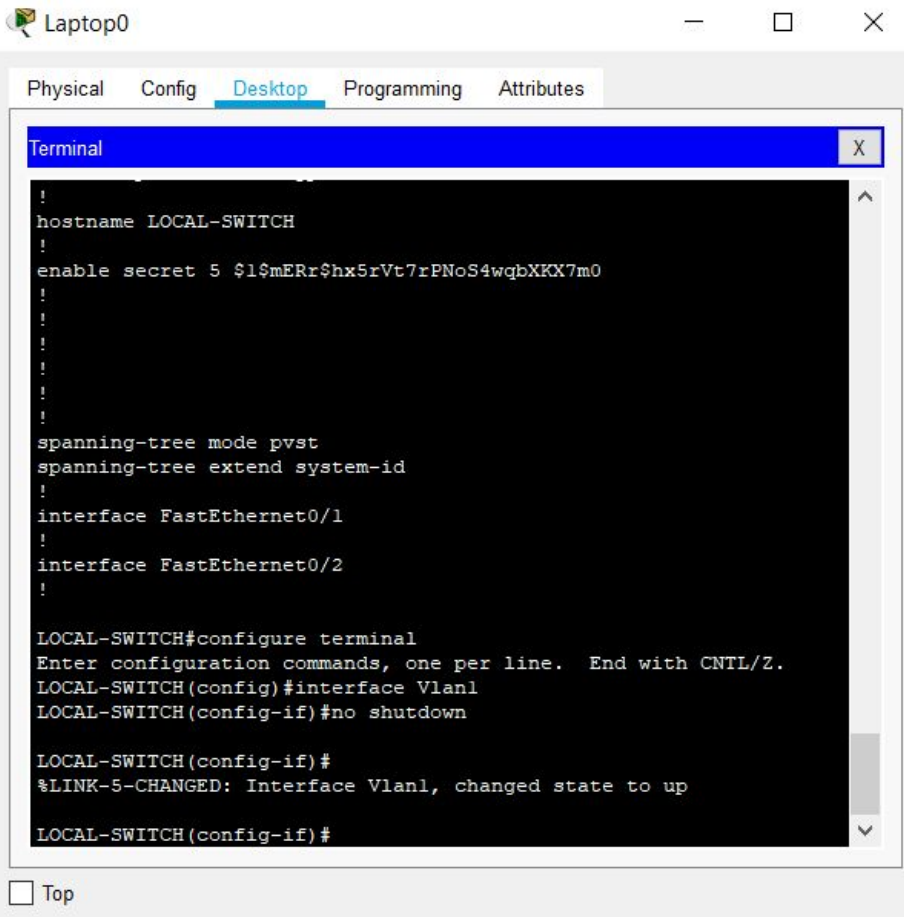
☐ Top

Laptop0 — □ ✕

Physical   Config   Desktop   Programming   Attributes

Terminal   X

```
!
hostname LOCAL-SWITCH
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!

LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
LOCAL-SWITCH(config)#interface Vlan1
LOCAL-SWITCH(config-if)#no shutdown

LOCAL-SWITCH(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

LOCAL-SWITCH(config-if)#
```

☐ Top

8. Test telnet connectivity from the Remote Laptop using the telnet client.

Laptop-PT
Local Laptop

2960-24TT
Switch0

Laptop-PT
Remote Laptop

2811
Router0
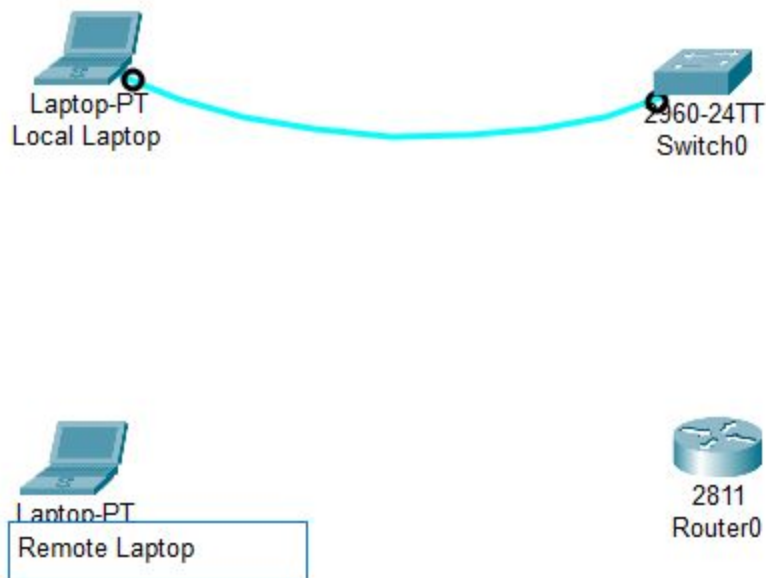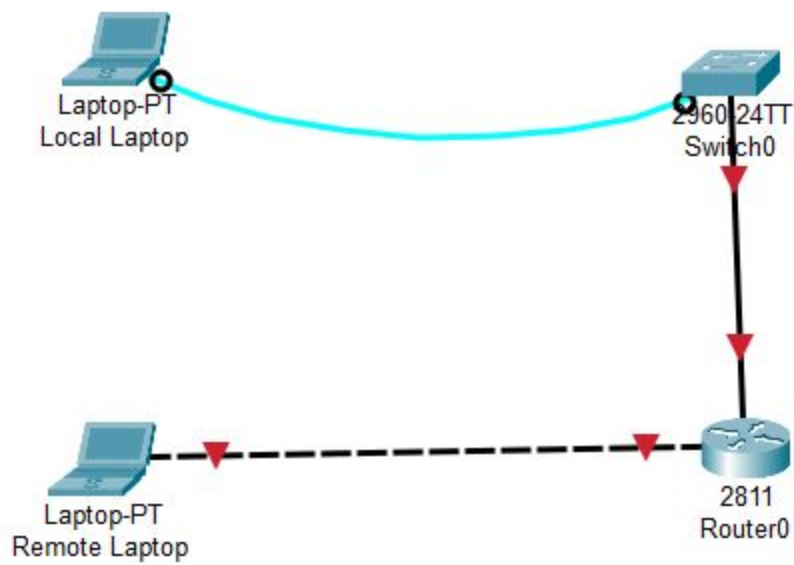
Remote Laptop — □ ×

| Physical | Config | **Desktop** | Programming | Attributes |

IP Configuration   X

Interface   FastEthernet0   ∨

IP Configuration

○ DHCP   ● Static

IPv4 Address   172.16.1.2

Subnet Mask   255.255.0.0

Default Gateway 172.16.1.1

DNS Server   0.0.0.0

IPv6 Configuration

○ Automatic   ● Static

IPv6 Address   [   ] / [   ]

Link Local Address   FE80::2D0:BCFF:FE33:1295

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication   MD5

☐ Top

Router0 — □ ✕

Physical　**Config**　**CLI**　**Attributes**

GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1

FastEthernet0/0

Port Status　　　　　　　　　　　　　　　　□ On

Bandwidth　　　　　　⦿ 100 Mbps　○ 10 Mbps　☑ Auto

Duplex　　　　　　　⦿ Half Duplex　○ Full Duplex　☑ Auto

MAC Address　　　　　0004.9AAB.E701

IP Configuration

IPv4 Address　　　　192.168.1.1

Subnet Mask　　　　255.255.255.0

Tx Ring Limit　　　　10

Equivalent IOS Commands

```
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#
```
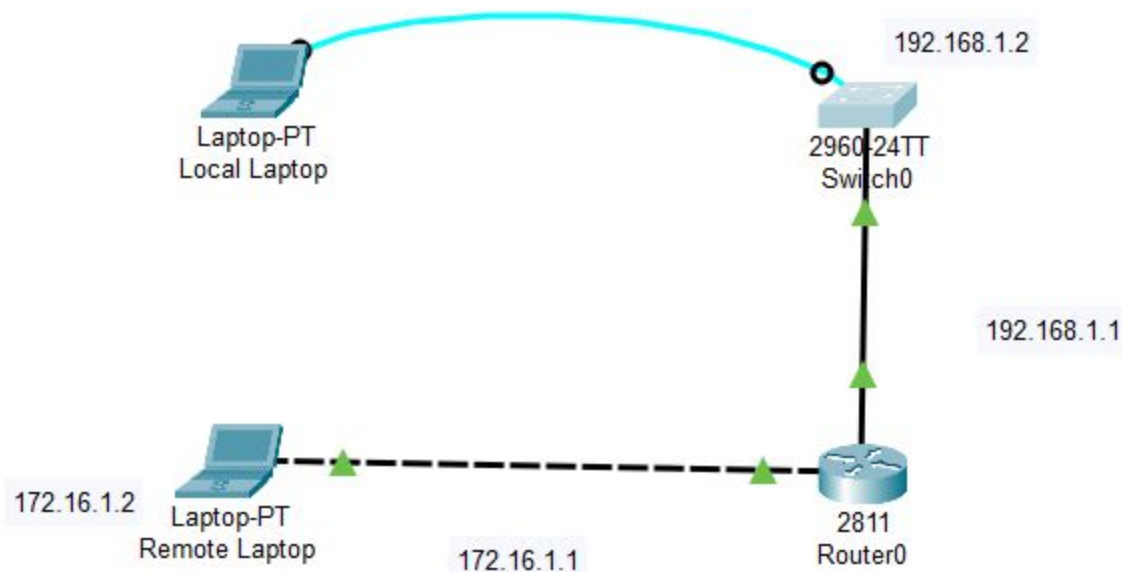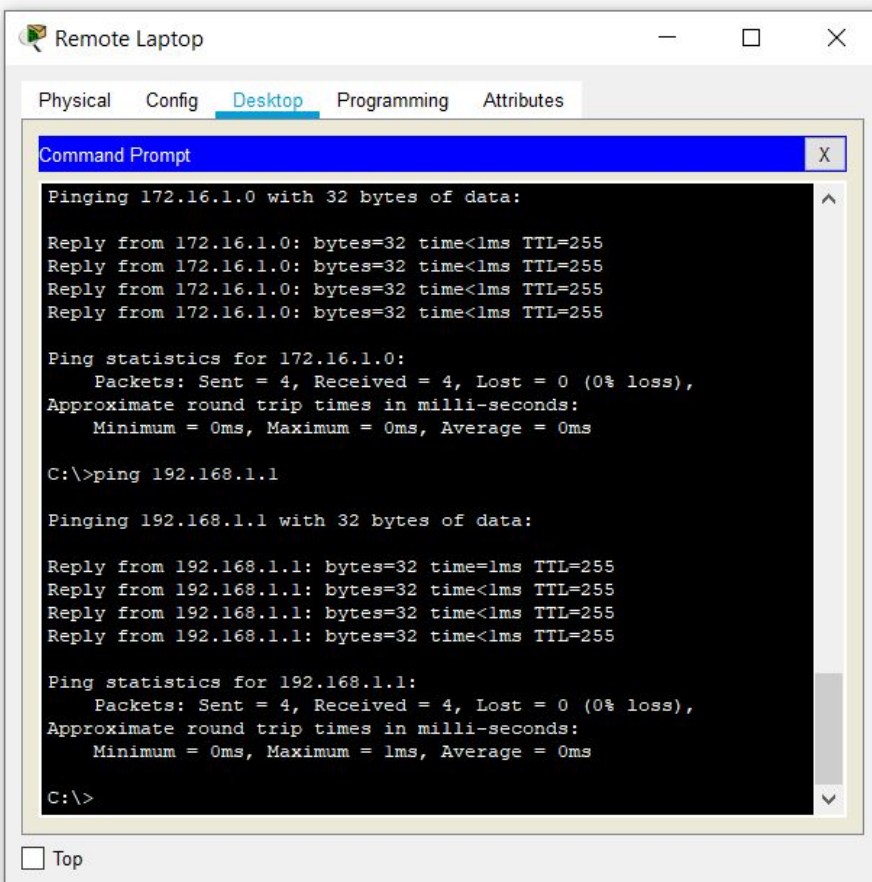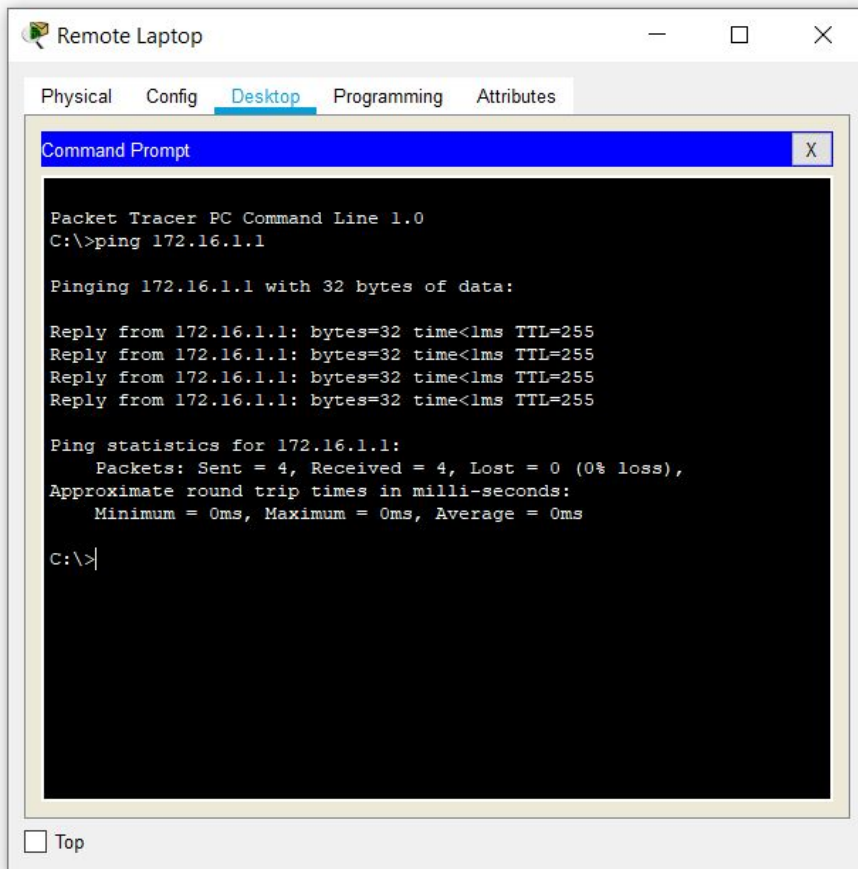
□ Top

Router0

Physical   Config   CLI   Attributes

GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1

FastEthernet0/1

Port Status   ☐ On
Bandwidth   ◉ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex   ◉ Half Duplex ○ Full Duplex ☑ Auto
MAC Address   0004.9AAB.E702

IP Configuration
IPv4 Address   172.16.1.1
Subnet Mask   255.255.0.0

Tx Ring Limit   10

Equivalent IOS Commands

```
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#
```

☐ Top

Laptop-PT
Local Laptop

192.168.1.2

2960-24TT
Switch0

192.168.1.1

172.16.1.2

Laptop-PT
Remote Laptop

172.16.1.1

2811
Router0

Remote Laptop — □ ✕

Physical   Config   Desktop   Programming   Attributes

Command Prompt — X

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.16.1.1

Pinging 172.16.1.1 with 32 bytes of data:

Reply from 172.16.1.1: bytes=32 time<1ms TTL=255
Reply from 172.16.1.1: bytes=32 time<1ms TTL=255
Reply from 172.16.1.1: bytes=32 time<1ms TTL=255
Reply from 172.16.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

☐ Top

Remote Laptop — □ ✕

Physical   Config   Desktop   Programming   Attributes

Command Prompt — X

```
Pinging 172.16.1.0 with 32 bytes of data:

Reply from 172.16.1.0: bytes=32 time<1ms TTL=255
Reply from 172.16.1.0: bytes=32 time<1ms TTL=255
Reply from 172.16.1.0: bytes=32 time<1ms TTL=255
Reply from 172.16.1.0: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.1.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
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 = 1ms, Average = 0ms

C:\>
```

☐ Top

Remote Laptop

Physical   Config   Desktop   Programming   Attributes

Command Prompt [X]

```
Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
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 = 1ms, Average = 0ms

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<1ms TTL=254
Reply from 192.168.1.2: bytes=32 time=1ms TTL=254
Reply from 192.168.1.2: bytes=32 time=1ms TTL=254
Reply from 192.168.1.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

[ ] Top

Remote Laptop

Physical   Config   Desktop   Programming   Attributes

Command Prompt [X]

```
Password:
LOCAL-SWITCH#^Z
LOCAL-SWITCH#exit

[Connection to 192.168.1.2 closed by foreign host]
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=254
Reply from 192.168.1.2: bytes=32 time<1ms TTL=254
Reply from 192.168.1.2: bytes=32 time=2ms TTL=254
Reply from 192.168.1.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 1ms

C:\>telnet 192.168.1.2
Trying 192.168.1.2 ...Open
Unauthorized access is forbidden


User Access Verification

Password: |
```

[ ] Top

Remote Laptop — ☐ ✕

Physical   Config   Desktop   Programming   Attributes

Command Prompt   X

```
LOCAL-SWITCH#^Z
LOCAL-SWITCH#exit

[Connection to 192.168.1.2 closed by foreign host]
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=254
Reply from 192.168.1.2: bytes=32 time<1ms TTL=254
Reply from 192.168.1.2: bytes=32 time=2ms TTL=254
Reply from 192.168.1.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 1ms

C:\>telnet 192.168.1.2
Trying 192.168.1.2 ...Open
Unauthorized access is forbidden


User Access Verification

Password:
LOCAL-SWITCH>
```
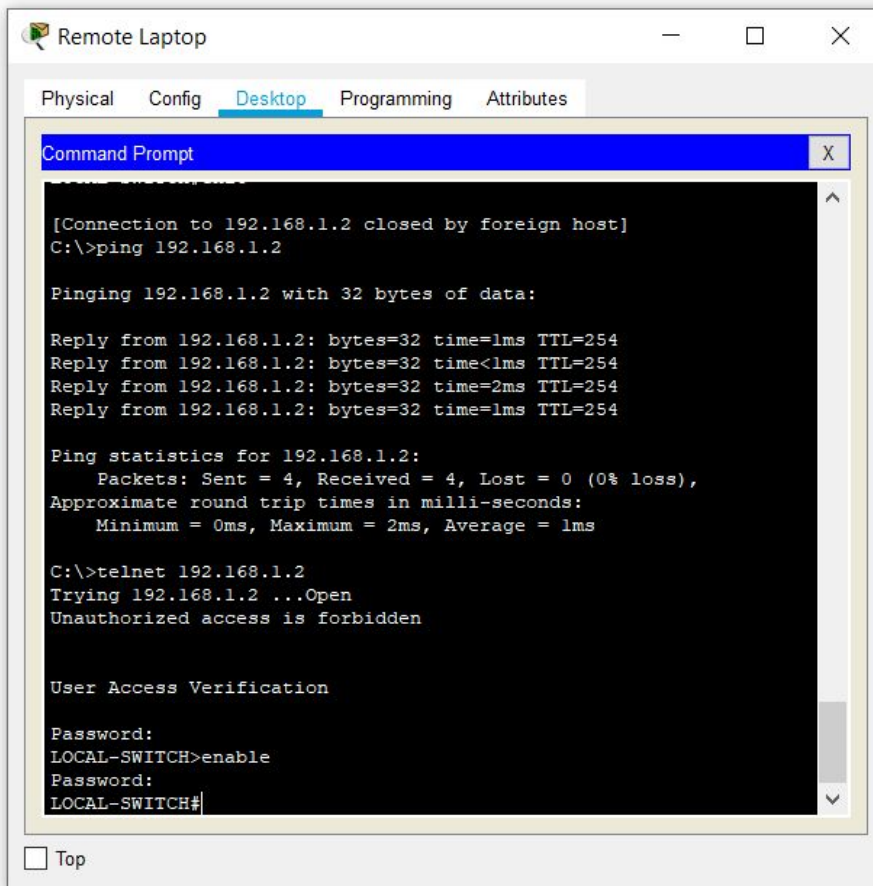
☐ Top

Remote Laptop — ☐ ✕

Physical   Config   Desktop   Programming   Attributes

Command Prompt   X

```
LOCAL-SWITCH#exit

[Connection to 192.168.1.2 closed by foreign host]
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=254
Reply from 192.168.1.2: bytes=32 time<1ms TTL=254
Reply from 192.168.1.2: bytes=32 time=2ms TTL=254
Reply from 192.168.1.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 1ms

C:\>telnet 192.168.1.2
Trying 192.168.1.2 ...Open
Unauthorized access is forbidden


User Access Verification

Password:
LOCAL-SWITCH>enable
Password:
```

☐ Top

Conclusion:
I learnt about routers and switches.
I configured telnet for switch and checked its connectivity from remote laptop.