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Batch: C

Date: 04/09/20

CEL 51, DCCN, Monsoon 2020

## Lab 4: Prototyping a Network

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### Objective:

Prototype a network using Packet Tracer

### Background

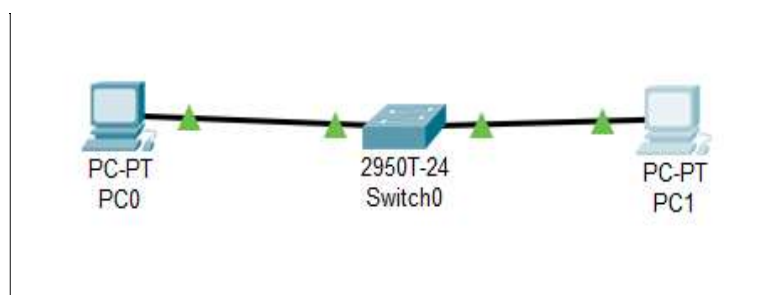
A client has requested that you set up a simple network with two PCs connected to a switch. Verify that the hardware, along with the given configurations, meet the requirements of the client.

### Step 1: Set up the network topology

- a) Add two PCs and a Cisco 2950T switch

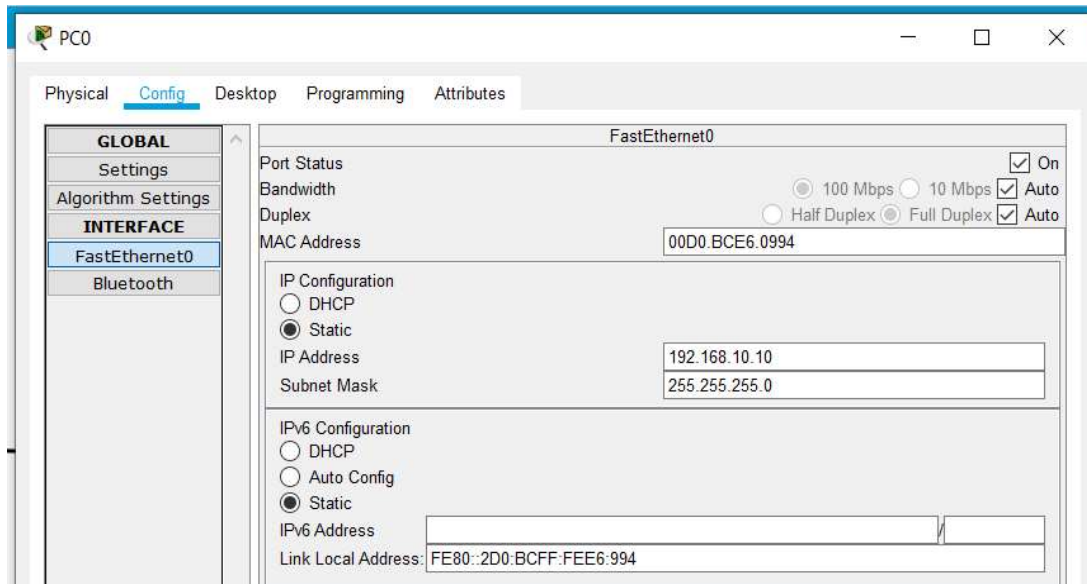


- b) Using straight-through cables, connect **PC0** to interface **Fa0/1** on **Switch0** and **PC1** to interface **Fa0/2** on **Switch0**.



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

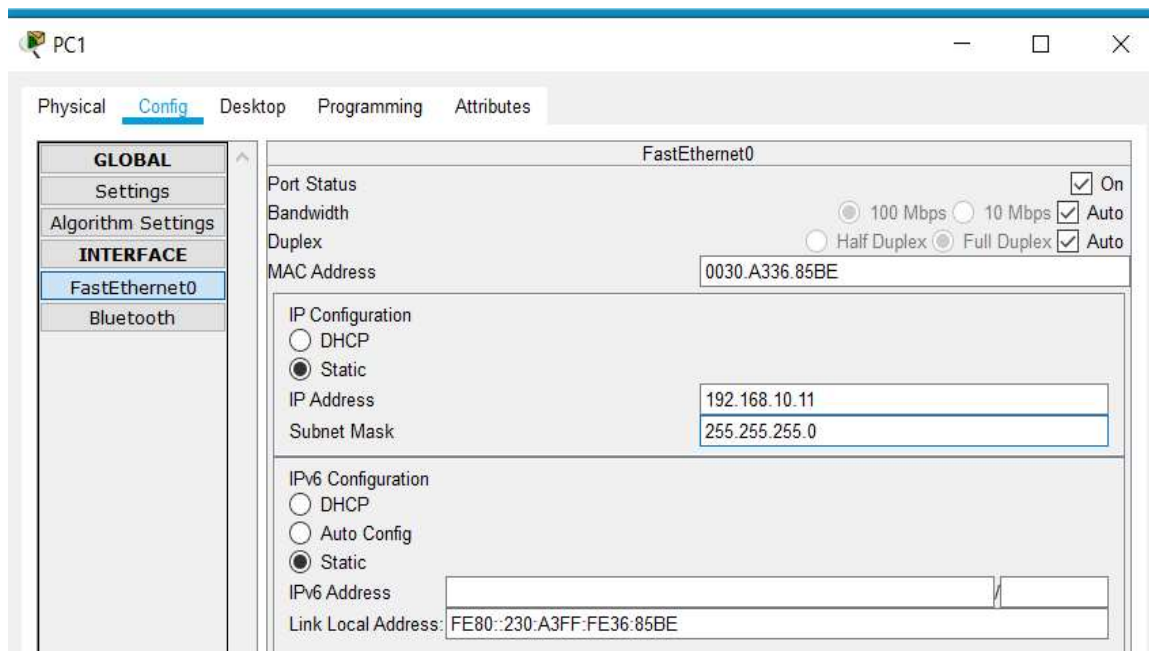


The screenshot shows the PC0 configuration window with the 'Config' tab selected. The left sidebar has a tree view with 'GLOBAL' (Settings, Algorithm Settings) and 'INTERFACE' (FastEthernet0, Bluetooth). The 'FastEthernet0' interface is selected. The configuration fields are as follows:

FastEthernet0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	00D0.BCE6.0994
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IP Address	192.168.10.10
Subnet Mask	255.255.255.0
IPv6 Configuration	
<input type="radio"/> DHCP <input type="radio"/> Auto Config <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::2D0:BCFF:FEE6:994

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

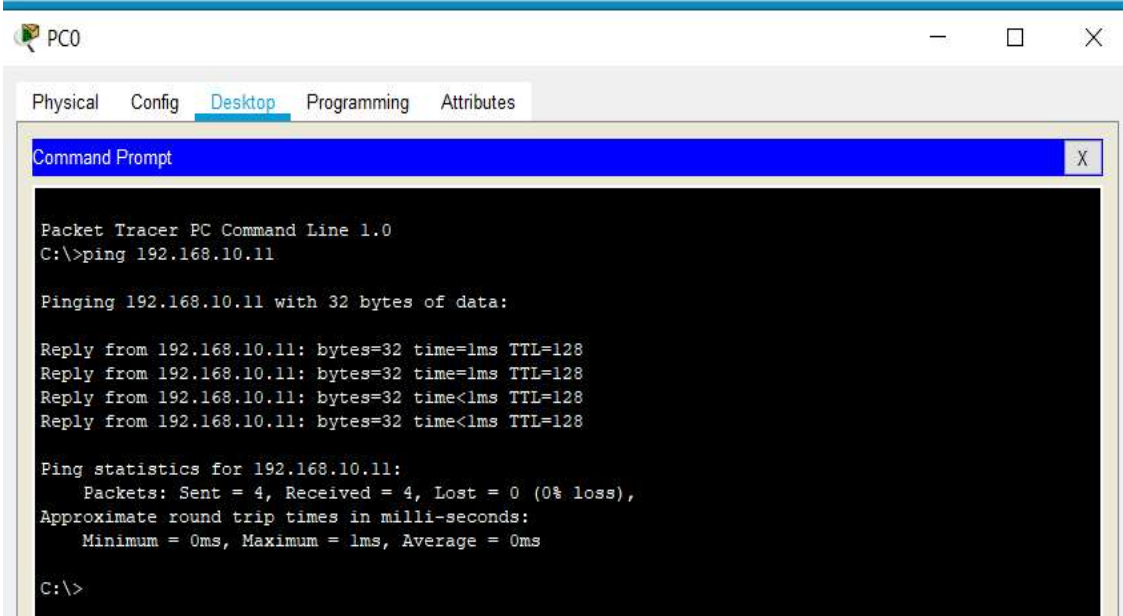


The screenshot shows the PC1 configuration window with the 'Config' tab selected. The left sidebar has a tree view with 'GLOBAL' (Settings, Algorithm Settings) and 'INTERFACE' (FastEthernet0, Bluetooth). The 'FastEthernet0' interface is selected. The configuration fields are as follows:

FastEthernet0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0030.A336.85BE
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IP Address	192.168.10.11
Subnet Mask	255.255.255.0
IPv6 Configuration	
<input type="radio"/> DHCP <input type="radio"/> Auto Config <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::230:A3FF:FE36:85BE

## 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*.
- 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:



The screenshot shows a Packet Tracer PC configuration window for PC0. The 'Desktop' tab is selected, and the 'Command Prompt' application is open. The command prompt displays the output of the 'ping 192.168.10.11' command, showing four successful replies with 32 bytes of data, a time of 1ms, and a TTL of 128. The ping statistics show 4 packets sent, 4 received, and 0% loss.

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

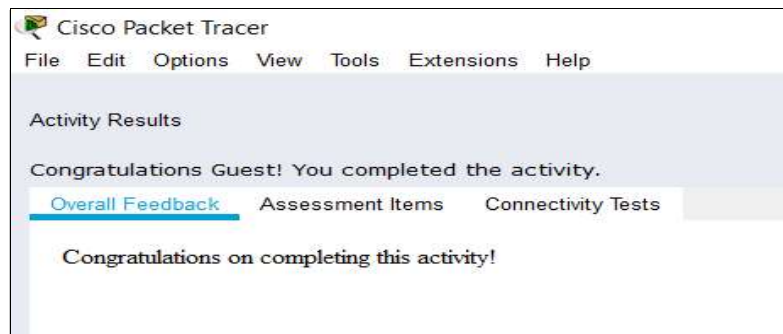
Pinging 192.168.10.11 with 32 bytes of data:

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:\>
```

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

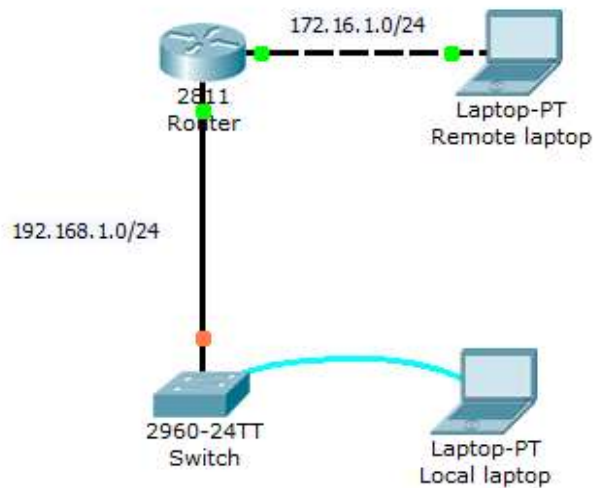


## Lab 4.1: Basic configuration - hostname, motd banner, passwd etc

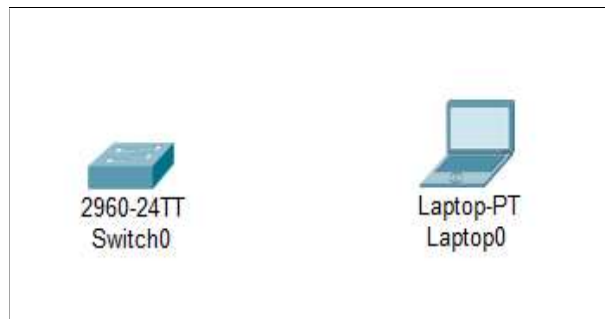
---

### 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.



- Changed the name of laptop:

Local Laptop

Physical **Config** Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Bluetooth

Global Settings

Display Name: Local Laptop

Interfaces: FastEthernet0

Gateway/DNS IPv4

☐ DHCP

☒ Static

Gateway:

DNS Server:

Gateway/DNS IPv6

☐ DHCP

☐ Auto Config

☒ Static

IPv6 Gateway:

IPv6 DNS Server:

☐ Top

Local Laptop

Physical **Config** Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Bluetooth

Global Settings

Display Name: Local Laptop

Interfaces: FastEthernet0

Gateway/DNS IPv4

☐ DHCP

☒ Static

Gateway: 192.168.1.2

DNS Server:

Gateway/DNS IPv6

☐ DHCP

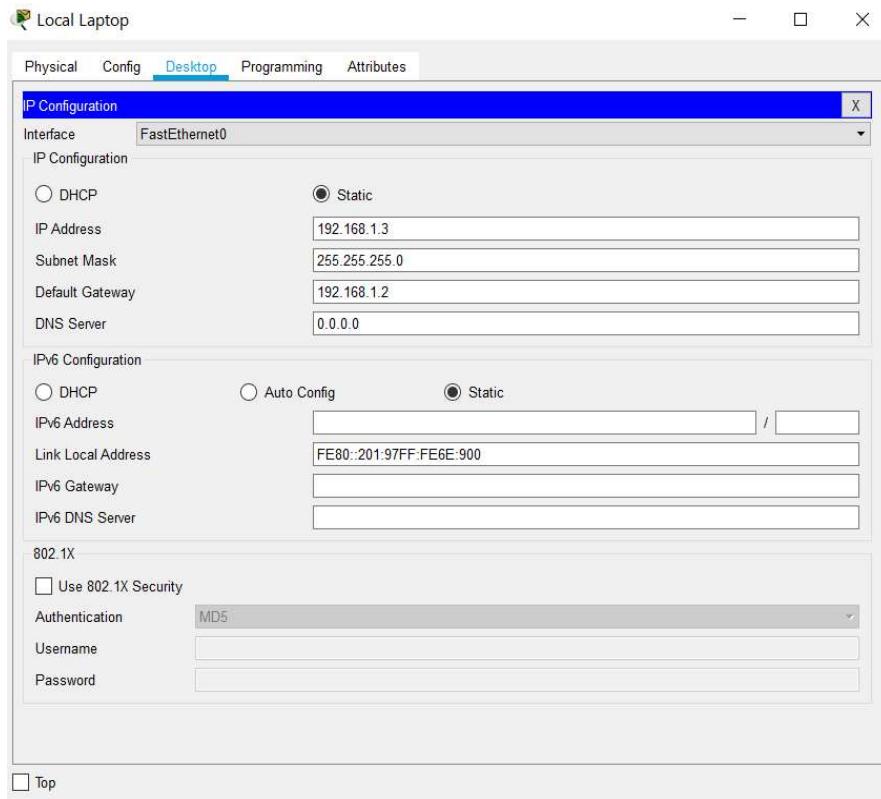
☐ Auto Config

☒ Static

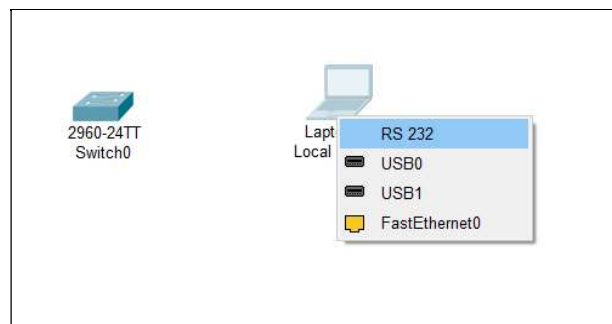
IPv6 Gateway:

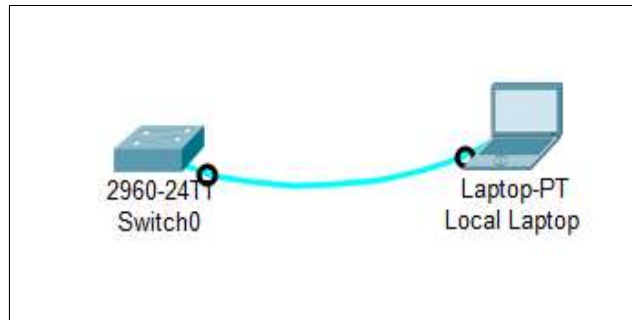
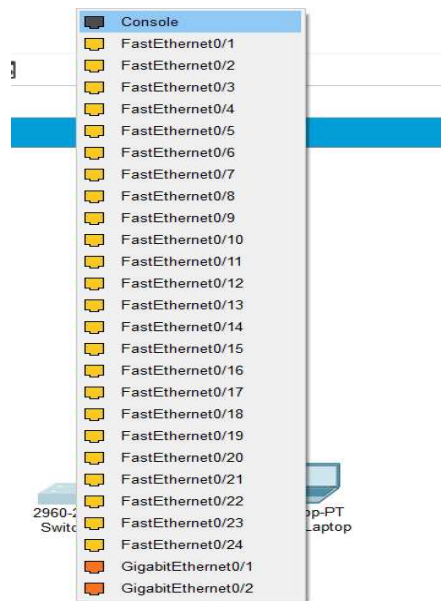
IPv6 DNS Server:

☐ Top



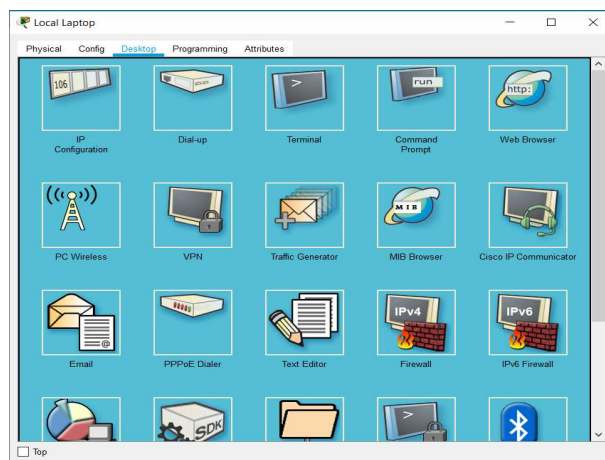
- Connect Local laptops RS232 with Switch 0 console using console:



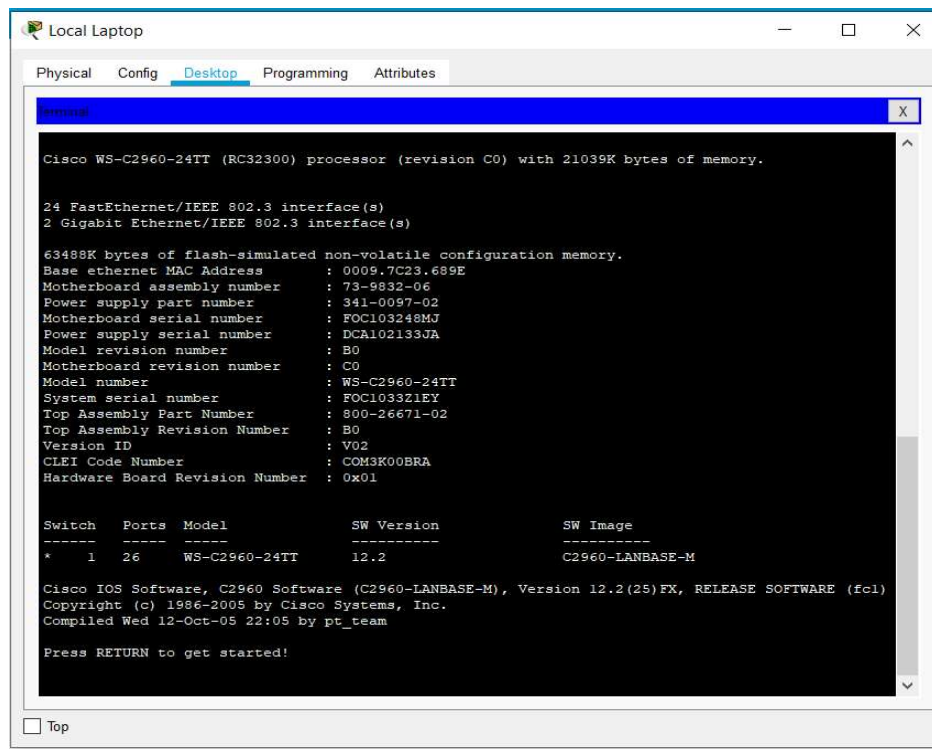
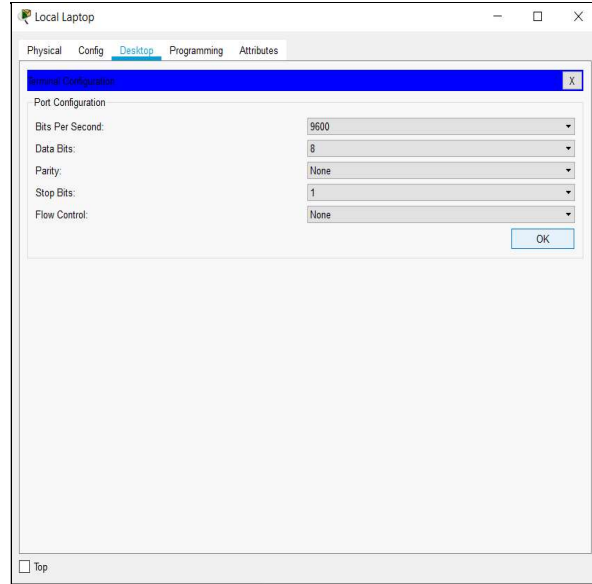


## 2. Configure Switch hostname as LOCAL-SWITCH

- Click on Local Laptop and go to Desktop:



- Select Terminal and click ok:





- Press Enter and write enable:

```

Local Laptop
Physical Config Desktop Programming Attributes

24 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

63488K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address      : 0009.7C23.689E
Motherboard assembly number    : 73-9832-06
Power supply part number       : 341-0097-02
Motherboard serial number      : FOC103248MJ
Power supply serial number     : DCA102133JA
Model revision number          : B0
Motherboard revision number    : C0
Model number                   : WS-C2960-24TT
System serial number           : FOC103321EY
Top Assembly Part Number       : 800-26671-02
Top Assembly Revision Number   : B0
Version ID                     : V02
CLEI Code Number               : COM3K00BRA
Hardware Board Revision Number : 0x01

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#

```

☐ Top

- Write configure terminal and give command hostname LOCAL\_SWITCH

```

Local Laptop
Physical Config Desktop Programming Attributes

24 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

63488K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address      : 0009.7C23.689E
Motherboard assembly number    : 73-9832-06
Power supply part number       : 341-0097-02
Motherboard serial number      : FOC103248MJ
Power supply serial number     : DCA102133JA
Model revision number          : B0
Motherboard revision number    : C0
Model number                   : WS-C2960-24TT
System serial number           : FOC103321EY
Top Assembly Part Number       : 800-26671-02
Top Assembly Revision Number   : B0
Version ID                     : V02
CLEI Code Number               : COM3K00BRA
Hardware Board Revision Number : 0x01

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

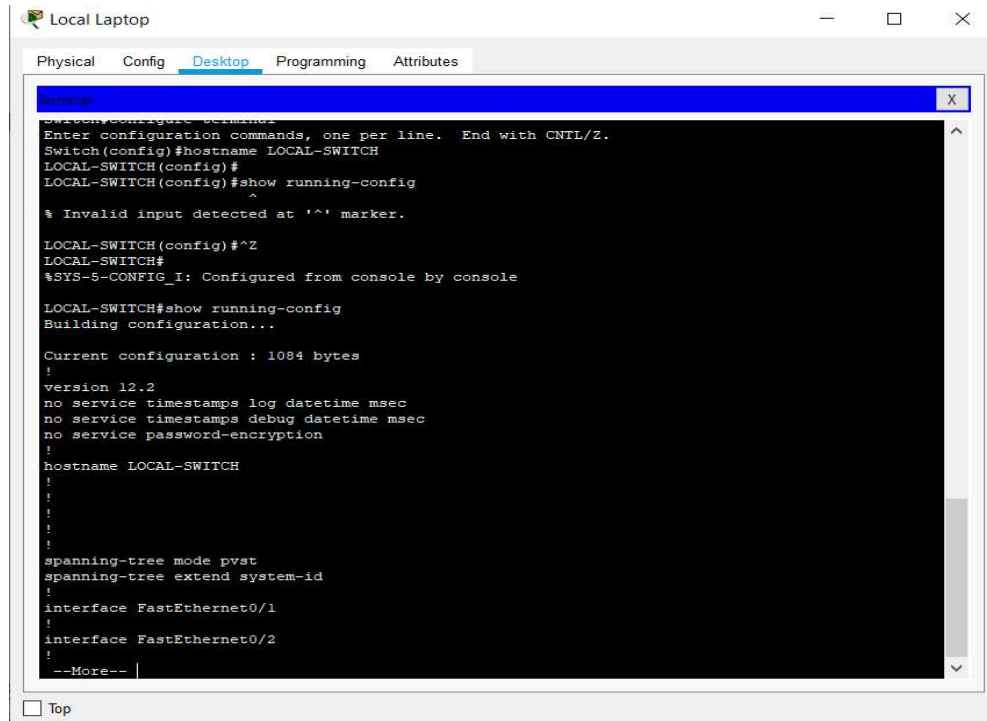
Press RETURN to get started!

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname LOCAL-SWITCH
LOCAL-SWITCH(config)#

```

☐ Top

- Exit configuration with CTRL+Z, and run show running-config command to check the new hostname:



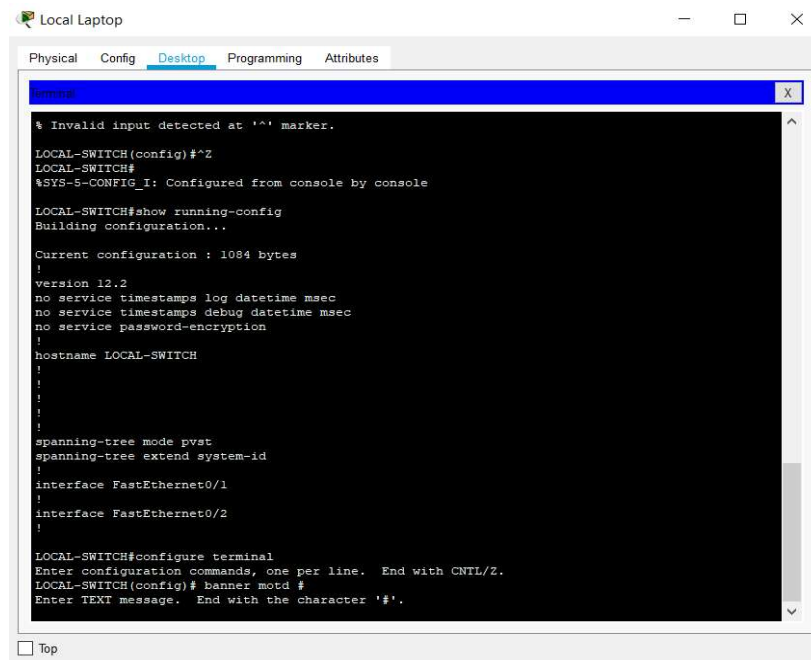
```

Switch(configure terminal)
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname LOCAL-SWITCH
LOCAL-SWITCH(config)#
LOCAL-SWITCH(config)#show running-config
% Invalid input detected at '^' marker.
LOCAL-SWITCH(config)#^Z
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console

LOCAL-SWITCH#show running-config
Building configuration...

Current configuration : 1084 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname LOCAL-SWITCH
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
--More--
  
```

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



```

% Invalid input detected at '^' marker.
LOCAL-SWITCH(config)#^Z
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console

LOCAL-SWITCH#show running-config
Building configuration...

Current configuration : 1084 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname LOCAL-SWITCH
!
!
!
!
!
!
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)# banner motd #
Enter TEXT message. End with the character '#'.
  
```

- Run banner motd # command and enter the message :

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

☐ Top

- The message of the day is set

Local Laptop

Physical Config **Desktop** Programming Attributes

```
LOCAL-SWITCH#
%SYS-S-CONFIG_I: Configured from console by console
^Z
LOCAL-SWITCH#

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

- Run enable secret cisco and check if set using show running-config command. The password is md5 encrypted.

```

LOCAL-SWITCH(config)#enable secret cisco
LOCAL-SWITCH(config)#^Z
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console

LOCAL-SWITCH#show running-config
Building configuration...

Current configuration : 1181 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname LOCAL-SWITCH
!
enable secret 5 $1$mERr$hX5rVt7rPNoS4wqbXKX7m0
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!

```

5. Configure password encryption on the switch using the global configuration command

- Run service password-encryption command:

```

LOCAL-SWITCH#
LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
LOCAL-SWITCH(config)#service password-encryption
LOCAL-SWITCH(config)#^Z
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console

LOCAL-SWITCH#show running-config
Building configuration...

Current configuration : 1178 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

```
!
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#
```

```
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 ciscoconsole
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)#^Z
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console

LOCAL-SWITCH#show running-config
Building configuration...
```

```

terminal
!
!
!
line con 0
  password 7 0822455D0A1606181C1803082F
  logging synchronous
  login
  history size 15
  exec-timeout 6 45
!
line vty 0 4
  login
line vty 5 15
  login
!
!
!
!
end

LOCAL-SWITCH#
LOCAL-SWITCH#

```

6. Configure TELNET access with the following settings:

- Login enabled
- Password : whatever you like
- History size : 15 commands
- Timeout : 8'20"
- Synchronous logging

```

LOCAL-SWITCH#
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)#password ciscotelnet
LOCAL-SWITCH(config-line)#logging synchronous
LOCAL-SWITCH(config-line)#login
LOCAL-SWITCH(config-line)#history size 15
LOCAL-SWITCH(config-line)#

```

```

terminal
login
history size 15
exec-timeout 6 45
!
line vty 0 4
exec-timeout 8 20
password 7 0822455D0A1611121E050910
logging synchronous
login
history size 15
line vty 5 15
exec-timeout 8 20
password 7 0822455D0A1611121E050910
logging synchronous
login
history size 15
!
!
!
!
end
--More--

```

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

```

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)#

```

```

!
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
--More--

```



```

terminal
!
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

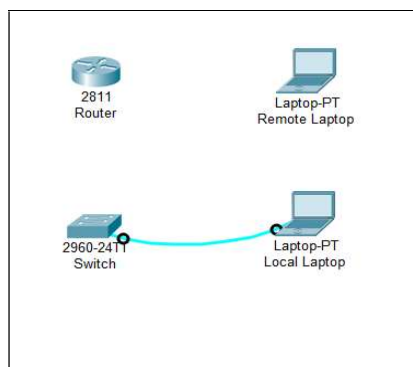
LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
LOCAL-SWITCH(config)#interface vlan1
LOCAL-SWITCH(config-if)#no shutdown

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

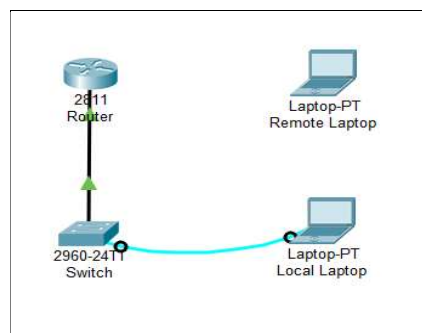
```

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

- Take 2811 Router and Laptop and change their name to Router and Remote Laptop:

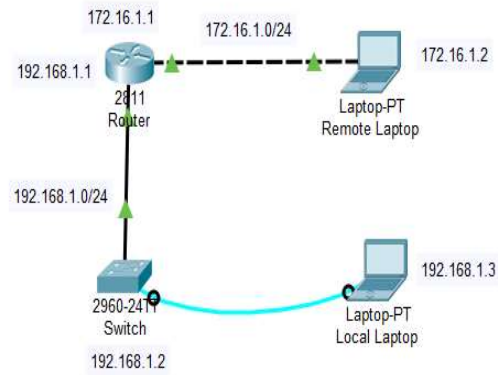


- Connect Switch and Router using Copper straight through cable at FastEthernet0/1 for both of them:





- Connect Remote Laptop and Router using Copper cross-over cable at FastEthernet0/0 for both of them:



- Setup the IP configurations of Remote laptop and Router:

Remote Laptop

Physical Config **Desktop** Programming Attributes

**IP Configuration**

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP 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

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address:

Link Local Address: FE80::201:43FF:FE53:8A30

IPv6 Gateway:

IPv6 DNS Server:

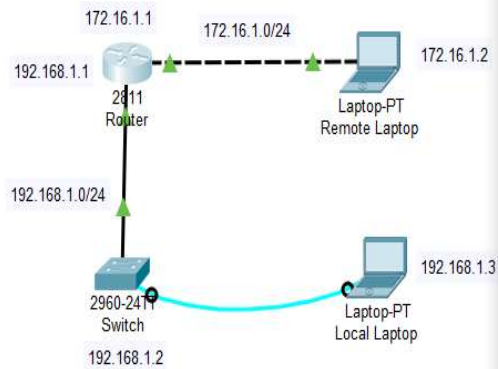
802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:



Router

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 000C.8517.8001  

IP Configuration  
IP Address 172.16.1.1  
Subnet Mask 255.255.0.0

Tx Ring Limit 10

Equivalent IOS Commands

```

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#

```

☐ Top

Router

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 000C.8517.8002  

IP Configuration  
IP 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 FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#

```

☐ Top



```
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:\>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:\>|
```

- Checking connectivity using telnet:

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

User Access Verification

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

```

password
LOCAL-SWITCH#show running-config
Building configuration...

Current configuration : 1515 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--

```

```

!
line con 0
password 7 0822455D0A1606181C1803082F
logging synchronous
login
history size 15
exec-timeout 6 45
!
line vty 0 4
exec-timeout 8 20
password 7 0822455D0A1611121E050910
logging synchronous
login
history size 15
line vty 5 15
exec-timeout 8 20
password 7 0822455D0A1611121E050910
logging synchronous
login
history size 15
!
!
!
!
end

LOCAL-SWITCH#
LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
LOCAL-SWITCH(config)#banner motd #
Enter TEXT message. End with the character '#'.
Telnet Successful!!#
LOCAL-SWITCH(config)#

```

```
Command Prompt
logging synchronous
login
history size 15
exec-timeout 6 45
!
line vty 0 4
exec-timeout 8 20
password 7 0822455D0A1611121E050910
logging synchronous
login
history size 15
line vty 5 15
exec-timeout 8 20
password 7 0822455D0A1611121E050910
logging synchronous
login
history size 15
!
!
!
!
end

LOCAL-SWITCH#
LOCAL-SWITCH#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
LOCAL-SWITCH(config)#banner motd #
Enter TEXT message. End with the character '#'.
Telnet Successful!!#

LOCAL-SWITCH(config)#^Z
LOCAL-SWITCH#exit

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

- Checking motd from Local Laptop terminal :

```
Terminal

Press RETURN to get started.

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

%SYS-5-CONFIG_I: Configured from console by console

Telnet Successful!!

User Access Verification

Password:
Password:
Password:

LOCAL-SWITCH>
```

