

## Packet Tracer - Design and Build a Small Network - Physical Mode

**Addressing Table**

Device	Interface	IP Address / Prefix	Default Gateway
R1	G0/0	10.0.4.1/28	N/A
		2001:db8:acad::1/64	
		fe80::1	
R2	G0/1	10.0.0.1/22	N/A
		2001:db8:acad:1::1/64	
		Fe80::1	
S1	VLAN 1	10.0.0.2/22	10.0.0.1/22
S2	VLAN 1	10.0.4.2/28	10.0.4.1/28
PC0	NIC	10.0.3.254/22	10.0.0.1/22
		2001:db8:acad:1::a/64	fe80::1
PC1	NIC	10.0.4.14/28	10.0.4.1/28
		2001:db8:acad:0::b/64	fe80::1

LAN	NETWORK ADDRESS	FIRST IP ADDRESS	LAST IP ADDRESS	BROADCAST ADDRESS
S1	10.0.0.0/22	10.0.0.1/22	10.0.3.254/22	10.0.3.255/22
S2	10.0.4.0/28	10.0.4.1/28	10.0.4.14/28	10.0.4.15/2

## Objectives

Explain how a small network of directly connected segments is created, configured, and verified.

## Background /Scenario

In this Packet Tracer Physical Mode (PTPM) activity, you will design and build a network from scratch. Your design must include a minimum of one Cisco 4321 router, two Cisco 2960 switches, and two PCs. Fully configure the network and use IPv4 or IPv6 (subnetting must be included as a part of your addressing scheme). Verify the network using at least five show commands. Secure the network using SSH, secure passwords, and console passwords (minimum).

## Reflection Questions

1. What was the most difficult portion of this activity?

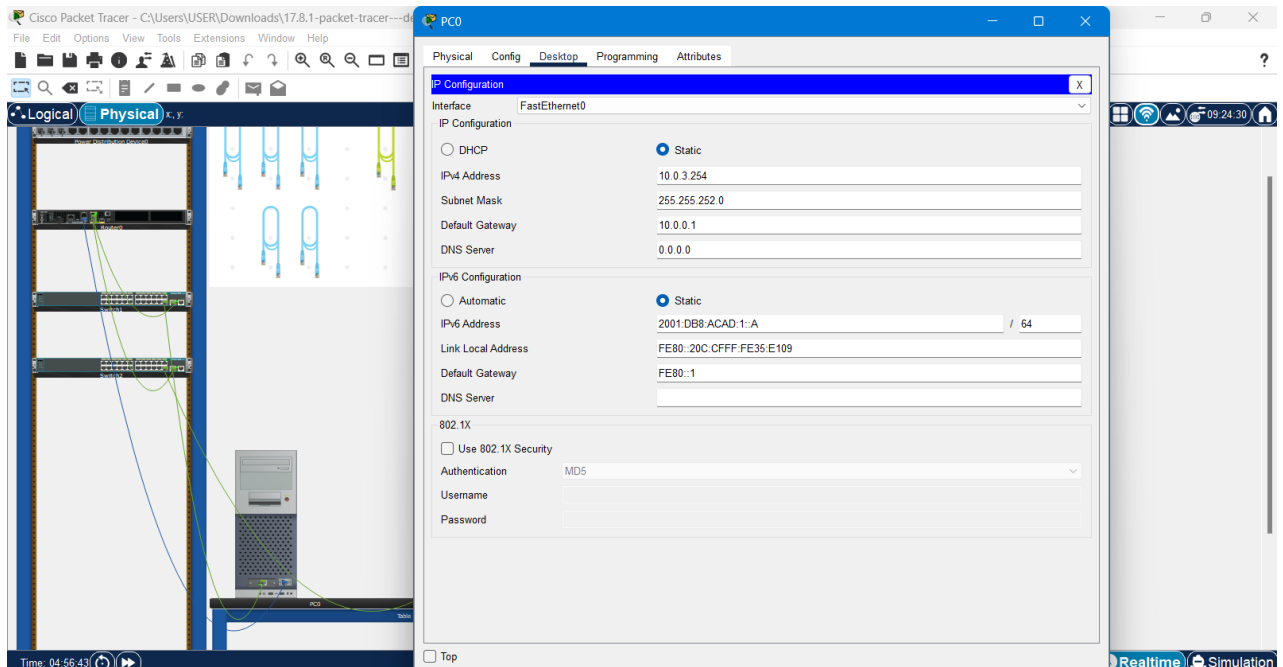
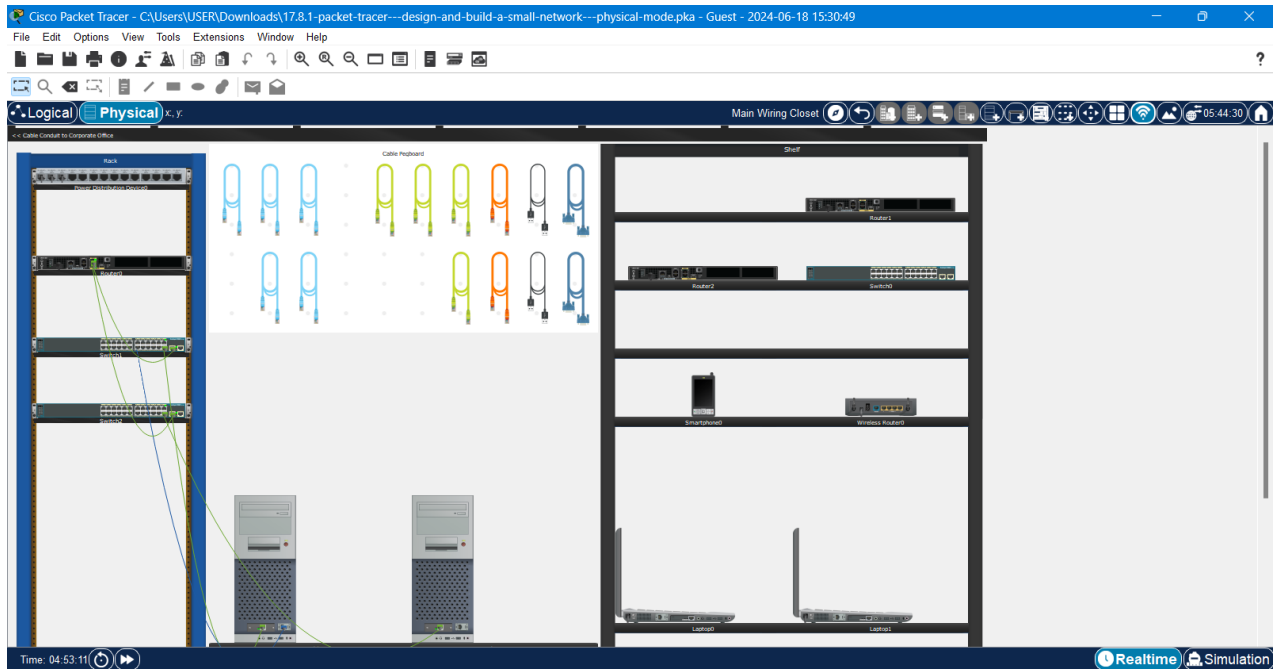
I consider the most difficult part is IPv4 subnetting by using VLSM.

2. Why do you think network documentation is so important to this activity and in the real world?

Documentation is imperative to good network management. Without it, network administrators have to recreate topologies, physically check addressing, etc. This takes time, which could be used elsewhere.

Create a small network of directly connected segments, at a minimum 1 router, 2 switches and 2 PCs, and include a screenshot of the network in your final documentation.

## Packet Tracer - Skills Integration Challenge



## Packet Tracer - Skills Integration Challenge

The screenshot shows the Cisco Packet Tracer interface. On the left, a network diagram displays a rack of three switches and a PC connected to the bottom switch. The top switch is labeled 'R1', the middle 'R2', and the bottom 'R3'. The PC is labeled 'PC0'. On the right, a 'Command Prompt' window for PC0 is open, showing the results of several ping commands. The first ping is to 10.0.0.1, which succeeds. The second ping is to 10.0.4.1, which also succeeds. The third ping is to 10.0.4.14, which fails with 'Destination host unreachable'.

```
C:\>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time=1ms TTL=255
Reply from 10.0.0.1: bytes=32 time=1ms TTL=255
Reply from 10.0.0.1: bytes=32 time=1ms TTL=255
Reply from 10.0.0.1: bytes=32 time=1ms TTL=255

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.0.4.1

Pinging 10.0.4.1 with 32 bytes of data:

Reply from 10.0.4.1: bytes=32 time=1ms TTL=255
Reply from 10.0.4.1: bytes=32 time=1ms TTL=255
Reply from 10.0.4.1: bytes=32 time=1ms TTL=255
Reply from 10.0.4.1: bytes=32 time=1ms TTL=255

Ping statistics for 10.0.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.0.4.14

Pinging 10.0.4.14 with 32 bytes of data:

Reply from 10.0.4.14: bytes=32 time=1ms TTL=127
Reply from 10.0.4.14: bytes=32 time=1ms TTL=127
Reply from 10.0.4.14: bytes=32 time=1ms TTL=127
Reply from 10.0.4.14: bytes=32 time=1ms TTL=127

Ping statistics for 10.0.4.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

The screenshot shows the Cisco Packet Tracer interface. On the left, a network diagram displays a rack of three switches and a PC connected to the bottom switch. The top switch is labeled 'R1', the middle 'R2', and the bottom 'R3'. The PC is labeled 'PC1'. On the right, a 'Command Prompt' window for PC1 is open, showing the results of several ping commands. The first ping is to 10.0.4.1, which succeeds. The second ping is to 10.0.3.254, which fails with 'Destination host unreachable'.

```
C:\>ping 10.0.4.1

Pinging 10.0.4.1 with 32 bytes of data:

Reply from 10.0.4.1: bytes=32 time=1ms TTL=255
Reply from 10.0.4.1: bytes=32 time=1ms TTL=255
Reply from 10.0.4.1: bytes=32 time=1ms TTL=255
Reply from 10.0.4.1: bytes=32 time=1ms TTL=255

Ping statistics for 10.0.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.0.3.254

Pinging 10.0.3.254 with 32 bytes of data:

Reply from 10.0.4.1: Destination host unreachable.
Reply from 10.0.4.1: Destination host unreachable.
Request timed out.
Reply from 10.0.4.1: Destination host unreachable.

Ping statistics for 10.0.3.254:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ssh -l admin 10.0.0.1

Password:
% Login invalid

Password:

R1>en
Password:
R1>conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#
```

## Packet Tracer - Skills Integration Challenge

The screenshot shows the Cisco Packet Tracer interface. On the left, a network diagram displays a rack of switches and a PC connected via cables. The main window is divided into tabs: Physical, Config, Desktop, Programming, and Attributes. The 'Config' tab is active, showing the configuration for PC0. The terminal window displays the following commands and output:

```
PC0>enable
PC0>configure terminal
PC0(config)#interface FastEthernet0/1
PC0(config-if)#ip address 10.0.0.1 255.255.255.0
PC0(config-if)#no shutdown
PC0(config-if)#exit
PC0(config)#end
PC0#show ip interface brief
```

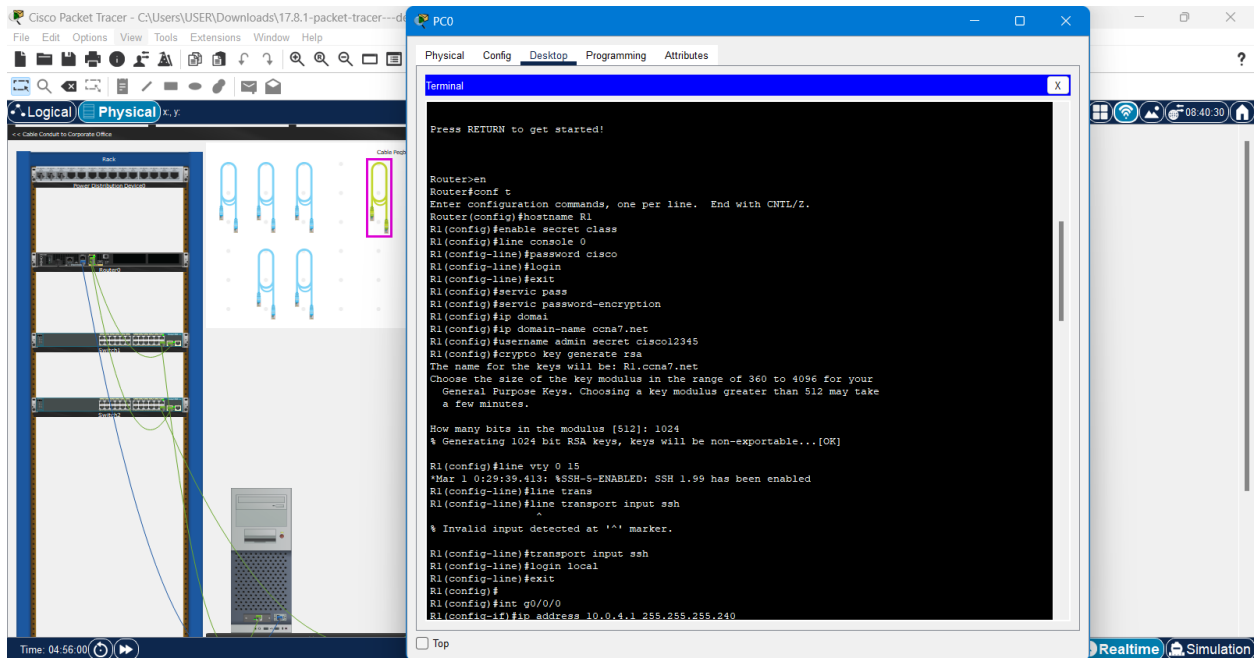
Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	10.0.0.1	YES	manual	down	down
FastEthernet0/2	unassigned	YES	manual	down	down
FastEthernet0/3	unassigned	YES	manual	down	down
FastEthernet0/4	unassigned	YES	manual	down	down
FastEthernet0/5	unassigned	YES	manual	down	down
FastEthernet0/6	unassigned	YES	manual	down	down
FastEthernet0/7	unassigned	YES	manual	down	down
FastEthernet0/8	unassigned	YES	manual	down	down
FastEthernet0/9	unassigned	YES	manual	down	down
FastEthernet0/10	unassigned	YES	manual	down	down
FastEthernet0/11	unassigned	YES	manual	down	down
FastEthernet0/12	unassigned	YES	manual	down	down
FastEthernet0/13	unassigned	YES	manual	down	down
FastEthernet0/14	unassigned	YES	manual	down	down
FastEthernet0/15	unassigned	YES	manual	down	down
FastEthernet0/16	unassigned	YES	manual	down	down
FastEthernet0/17	unassigned	YES	manual	down	down
FastEthernet0/18	unassigned	YES	manual	down	down
FastEthernet0/19	unassigned	YES	manual	down	down
FastEthernet0/20	unassigned	YES	manual	down	down
FastEthernet0/21	unassigned	YES	manual	down	down
FastEthernet0/22	unassigned	YES	manual	down	down
FastEthernet0/23	unassigned	YES	manual	down	down
FastEthernet0/24	unassigned	YES	manual	up	up
GigabitEthernet0/1	unassigned	YES	manual	up	up
GigabitEthernet0/2	unassigned	YES	manual	down	down
Vlan1	10.0.0.2	YES	manual	up	up

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```
PC0>enable
PC0>configure terminal
PC0(config)#interface FastEthernet0/1
PC0(config-if)#ip address 10.0.0.1 255.255.255.0
PC0(config-if)#no shutdown
PC0(config-if)#exit
PC0(config)#end
PC0#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	10.0.0.1	YES	manual	down	down
FastEthernet0/2	unassigned	YES	manual	down	down
FastEthernet0/3	unassigned	YES	manual	down	down
FastEthernet0/4	unassigned	YES	manual	down	down
FastEthernet0/5	unassigned	YES	manual	down	down
FastEthernet0/6	unassigned	YES	manual	down	down
FastEthernet0/7	unassigned	YES	manual	down	down
FastEthernet0/8	unassigned	YES	manual	down	down
FastEthernet0/9	unassigned	YES	manual	down	down
FastEthernet0/10	unassigned	YES	manual	down	down
FastEthernet0/11	unassigned	YES	manual	down	down
FastEthernet0/12	unassigned	YES	manual	down	down
FastEthernet0/13	unassigned	YES	manual	down	down
FastEthernet0/14	unassigned	YES	manual	down	down
FastEthernet0/15	unassigned	YES	manual	down	down
FastEthernet0/16	unassigned	YES	manual	down	down
FastEthernet0/17	unassigned	YES	manual	down	down
FastEthernet0/18	unassigned	YES	manual	down	down
FastEthernet0/19	unassigned	YES	manual	down	down
FastEthernet0/20	unassigned	YES	manual	down	down
FastEthernet0/21	unassigned	YES	manual	down	down
FastEthernet0/22	unassigned	YES	manual	down	down
FastEthernet0/23	unassigned	YES	manual	down	down
FastEthernet0/24	unassigned	YES	manual	up	up
GigabitEthernet0/1	unassigned	YES	manual	up	up
GigabitEthernet0/2	unassigned	YES	manual	down	down
Vlan1	10.0.0.2	YES	manual	up	up

## Packet Tracer - Skills Integration Challenge



The screenshot displays the Cisco Packet Tracer interface. On the left, the 'Physical' tab is active, showing a network diagram with a rack of three routers and a PC connected to the bottom router. On the right, the 'PC0' window is open, showing the 'Terminal' tab with the following configuration commands:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#enable secret class
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#servic pass
R1(config)#servic password-encryption
R1(config)#ip domai
R1(config)#ip domain-name ccna7.net
R1(config)#username admin secret cisco12345
R1(config)#crypto key generate rsa
The name for the keys will be: R1.ccna7.net
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
R1(config)#line vty 0 15
*Mar 1 0:29:39.413: %SSH-5-ENABLED: SSH 1.99 has been enabled
R1(config-line)#line trans
R1(config-line)#line transport input ssh
% Invalid input detected at '^' marker.
R1(config-line)#transport input ssh
R1(config-line)#login local
R1(config-line)#exit
R1(config)#
R1(config)#int g0/0/0
R1(config-if)#ip address 10.0.4.1 255.255.255.240
```

The bottom status bar shows 'Time: 04:56:00' and 'Realtime' simulation mode.