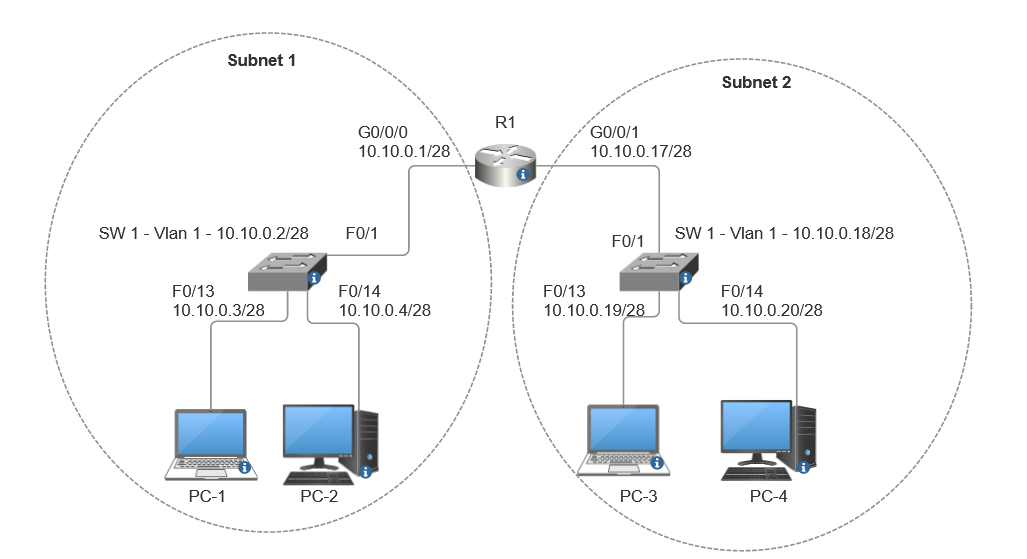
Packet Tracer - Design and Build a Small Network - Physical Mode

# Objectives

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

# Background /Scenario

You will design and build a network from scratch in this Packet Tracer Physical Mode (PTPM) activity. 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).



**Subnet 1**

**Network address: 10.10.0.0 / 28**

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Ipv4 address** | **Subnet Mask** | **Default gateway** |
| R-1 – G0/0/0 | 10.10.0.1 | 255.255.255.240 | - |
| SW-1 (Vlan 1) | 10.10.0.2 | 255.255.255.240 | 10.10.0.1 |
| PC-1 | 10.10.0.3 | 255.255.255.240 | 10.10.0.1 |
| PC-2 | 10.10.0.4 | 255.255.255.240 | 10.10.0.1 |

**Subnet 2**

**Network address: 10.10.0.16 / 28**

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Ipv4 address** | **Subnet Mask** | **Default gateway** |
| R-1 – G0/0/1 | 10.10.0.17 | 255.255.255.240 | - |
| SW-2 (Vlan 1) | 10.10.0.18 | 255.255.255.240 | 10.10.0.17 |
| PC-3 | 10.10.0.19 | 255.255.255.240 | 10.10.0.17 |
| PC-4 | 10.10.0.20 | 255.255.255.240 | 10.10.0.17 |

**Subnet 1 and 2 maximum number of usable hosts information.**

|  |  |  |
| --- | --- | --- |
| **Description** | **Subnet 1** | **Subnet 2** |
| First Usable IP Address | 10.10.0.1 | 10.10.0.17 |
| Last Usable IP Address | 10.10.0.14 | 10.10.0.30 |
| Broadcast address | 10.10.0.15 | 10.10.0.31 |
| Maximum number of hosts | 14 usable hosts | 14 usable hosts |

**R1 Configuration:**

|  |  |
| --- | --- |
| **Task** | **Specification** |
| DNS lookup | DNS lookup was disabled |
| Router name | R1 |
| Domain name | itna-yuri.com |
| Encrypted privileged EXEC password | cisco |
| Console access password | class |
| Administrative user in the local database | Username: **admin** **Password: ciscoclass** |
| Login on all vty lines use local database | Vty password: cisco |
| vty lines accept SSH connections only | RTR-1(config-line)#transport input ssh |
| Clear text passwords encrypted |  |
| MOTD Banner configured |  |
| Interfaces configured |  |
| RSA crypto key (1024-bit) generated | RTR-1(config)#crypto key generate rsa general-keys modulus 1024 |

**SW-1**

|  |  |
| --- | --- |
| **Task** | **Specification** |
| DNS lookup | DNS lookup was disabled |
| Switch name | SW-1 |
| Domain name | itna-yuri.com |
| Encrypted privileged EXEC password | cisco |
| Console access password | class |
| All unused interfaces were shutdown |  |
| Administrative user in the local database | Username: **admin** **Password: ciscoclass** |
| Login on all vty lines use local database | Vty password: cisco |
| vty lines accept SSH connections only | SW-1(config-line)#transport input ssh |
| Clear text passwords encrypted |  |
| MOTD Banner configured |  |
| RSA crypto key (1024-bit) generated | SW-1(config)#crypto key generate rsa general-keys modulus 1024 |
| Configure Management Interface (SVI) on VLAN 1 | Set the description Set the Layer 3 IPv4 Address |

**SW-2**

|  |  |
| --- | --- |
| **Task** | **Specification** |
| DNS lookup | DNS lookup was disabled |
| Switch name | SW-2 |
| Domain name | itna-yuri.com |
| Encrypted privileged EXEC password | cisco |
| Console access password | class |
| Shutdown all unused interfaces |  |
| Administrative user in the local database | Username: **admin** **Password: ciscoclass** |
| Login on all vty lines use local database | Vty password: cisco |
| vty lines accept SSH connections only | SW-1(config-line)#transport input ssh |
| Clear text passwords encrypted |  |
| MOTD Banner configured |  |
| RSA crypto key (1024-bit) generated | SW-1(config)#crypto key generate rsa general-keys modulus 1024 |
| Configure Management Interface (SVI) on VLAN 1 | Set the description Set the Layer 3 IPv4 Address |

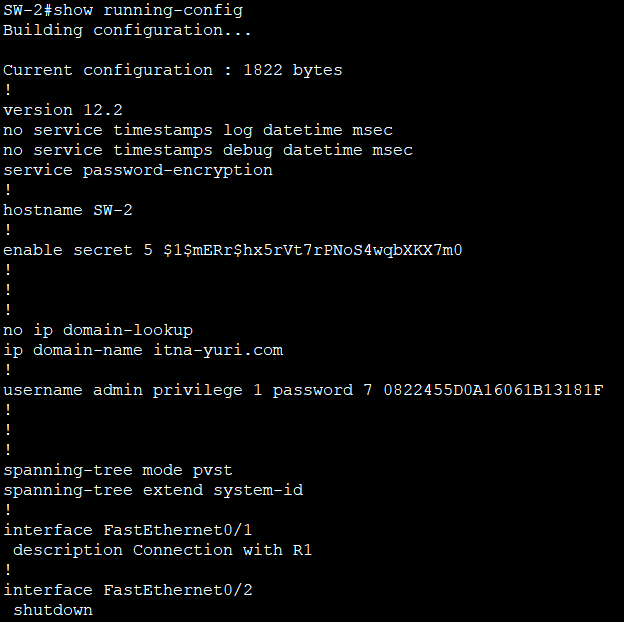
**Ping table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **From:** | | **To:** | | **Ping Result** |
| PC-1 | 10.10.0.3 | R1 g0/0/0 | 10.10.0.1 | 0ms |
| SW-1 (Vlan 1) | 10.10.0.2 | 0ms |
| PC-2 | 10.10.0.4 | 0ms |
| R1 g0/0/1 | 10.10.0.17 | 0ms |
| SW-2 (Vlan 1) | 10.10.0.18 | 0ms |
| PC-3 | 10.10.0.19 | 0ms |
| PC-4 | 10.10.0.20 | 0ms |
| PC-2 | 10.10.0.4 | R1 g0/0/0 | 10.10.0.1 | 0ms |
| SW-1 (Vlan 1) | 10.10.0.2 | 0ms |
| PC-1 | 10.10.0.3 | 0ms |
| R1 g0/0/1 | 10.10.0.17 | 0ms |
| SW-2 (Vlan 1) | 10.10.0.18 | 0ms |
| PC-3 | 10.10.0.19 | 0ms |
| PC-4 | 10.10.0.20 | 0ms |
| PC-3 | 10.10.0.19 | R1 g0/0/0 | 10.10.0.1 | 0ms |
| SW-1 (Vlan 1) | 10.10.0.2 | 0ms |
| PC-1 | 10.10.0.3 | 0ms |
| PC-2 | 10.10.0.4 | 0ms |
| R1 g0/0/1 | 10.10.0.17 | 0ms |
| SW-2 (Vlan 1) | 10.10.0.18 | 0ms |
| PC-4 | 10.10.0.20 | 0ms |
| PC-4 | 10.10.0.20 | R1 g0/0/0 | 10.10.0.1 | 0ms |
| SW-1 (Vlan 1) | 10.10.0.2 | 0ms |
| PC-1 | 10.10.0.3 | 0ms |
| PC-2 | 10.10.0.4 | 0ms |
| R1 g0/0/1 | 10.10.0.17 | 0ms |
| SW-2 (Vlan 1) | 10.10.0.18 | 0ms |
| PC-3 | 10.10.0.19 | 0ms |

**Verification of the network using 5 commands.**

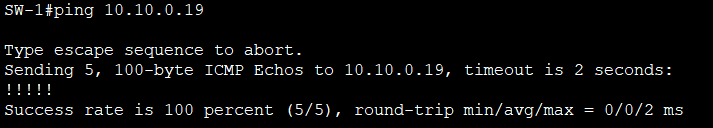
1. Show running-config: I chose this command because it gives all the configuration that is running on the cisco device. It is possible to see if passwords, secrets were enabled. I used this command on R1, SW-1 and SW-2

Example: show running-config performed on SW-2.



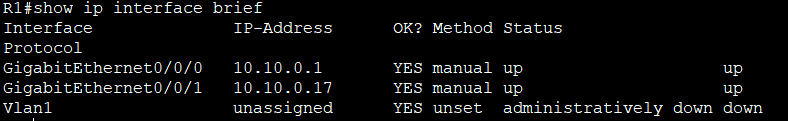
1. Ping: I chose this command to test the connection of each device to make sure there was communication between all devices. I used this command on all cisco devices and on each PC.

Example: ping performed on SW-1 to PC3.



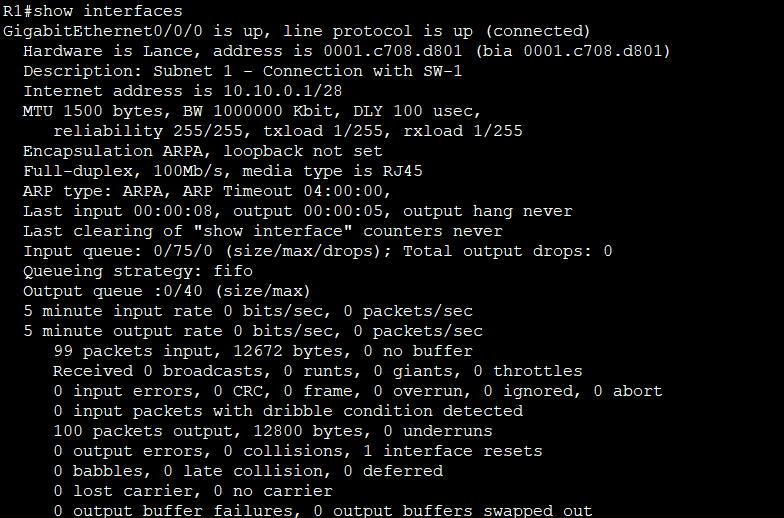
1. Show ip interface brief: I chose this command on all switches and the router because it shows the IP address of each port and if the port is “up” or “down” or “administratively down”.

Example: show ip interface brief performed on R1.



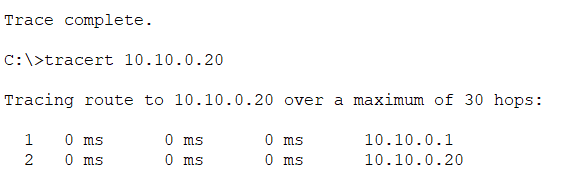
1. Show interfaces: I used this to check all details of each port of each cisco device. This command is very useful because it shows all details of each port. Including description and IP address.

Example: show interfaces performed on R1.



1. tracert: I used this command on the Windows computers. This command was very helpful to check if the package was first going to the default gateway in case it needed to reach a different subnet. It shows each hop with each ping. So for example, tracert from PC1 to PC4. It shows:

The packet goes to the default gateway (R1) than it goes to the destination (PC4).



# Reflection Questions

What was the most difficult portion of this activity?

1. It was not the most difficult but the one I needed to spend more time was to make sure all cisco devices were properly configured. I needed to make sure there were passwords, descriptions and ip configurations properly done. Pinging each device was time consuming as well because I needed to make sure every device was able to properly communicate with each other.
2. Another challenge was also to define what kind of network I would create, how many devices I would add and how I was going to do subneting. I tried to do in a simple way that would be easier to troubleshoot. So, I created detailed documentation so I could easily see which physical ports were connected to which devices.

Type you answers here

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

I think it is critical to have adequate documentation of all parts of the network. A network diagram, Ip addressing, also adding description to the ports on the cisco devices (Router and switches). If the documentation was properly done, a person from outside would be able to understand how the network was set up and would also be able to troubleshoot if necessary. Without proper documentation troubleshooting would be very time-consuming and very hard to fix the problems. The network administrator would spend a lot of time trying to figure out where each device is connected and what IP scheme was used by the person who created the network.

End of document