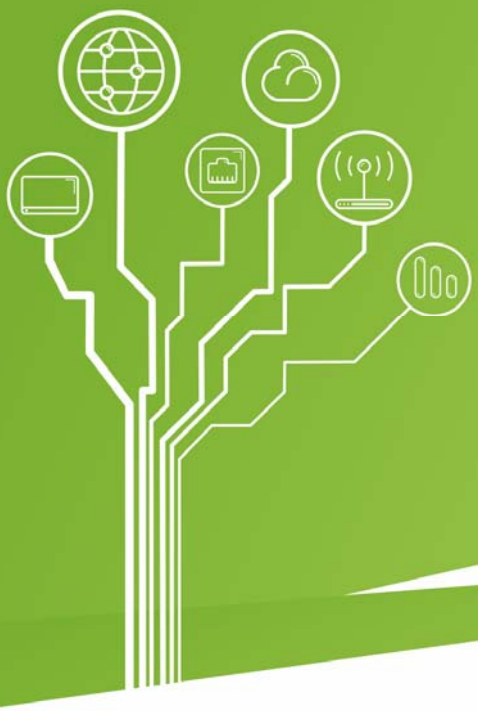
CHAPTER 7



SKILL EXERCISES – PART I

COMPUTER NETWORKS IN PACKET TRACER

FOR BEGINNERS

7 Skill Exercises – Part I

This chapter contains simple exercises designed for novice users, in order to consolidate the acquired theoretical and to check Your skills.

Note – Warning: Remember to periodically save the file state during exercises (keyboard shortcut CTRL+S)

7.1 Device-To-Device Connections

7.1.1 Connection of Devices According to the Scheme

Connect the devices together according to the diagram shown in the figure below. On some devices, you need to install new modules, because by default they are not built-in.

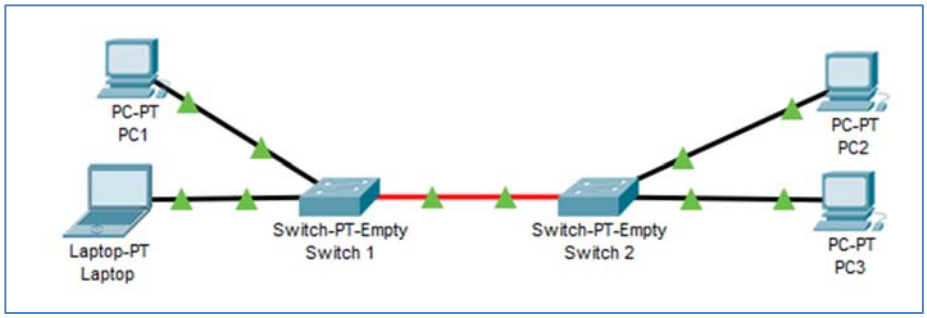


Figure 7.1 Exercise – Scheme Exercise 7.1.1.pkt

Solution:

- Check the installed network hardware on computers and switches.
- After finding that there are no modules on the switches, install two Fast Ethernet cards (1 for each computer) and one Fiber Fast Ethernet module for the connection between the switches.
- Make calls.
- Address computers (e.g. PC1:192.168.0.1/24, PC2:192.168.0.2/24)
- Perform a connection test with any tool (PING, simulation, etc.)

7.1.2 Connecting Devices to the Wi-Fi Router and Access Point

Connect laptops to a Wi-Fi router using a wireless medium and connect computers to Access-Point. There is to be a physical connection between the Access-Point and the Wi-Fi router. In Access Point for SSID is to be set on **PC**, and in router on **Laptop**.

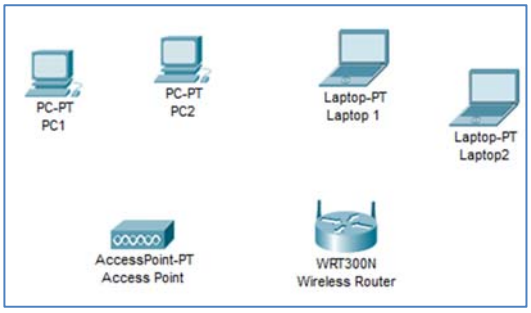


Figure 7.2 Exercise – Assumptions – Scheme Exercise 7.1.2.pkt

Solution:

- Check the type of network adapters installed in your computers.
- Replace the installed network adapters with the Linksys-WPC300N (wireless) adapters.
- Set the **SSID** parameter on the **PC** to the Access-Point and the **Laptop** parameter on the router.
- Set the same settings on computers and laptops respectively.
- Connect the Access-Point to the Wireless Router using a simple cable (to Ethernet port 1).
- On PC1 and PC2, set IP addresses from the same address pool from which laptops got the address dynamically.
- Perform a connection test with any tool (PING, simulation, etc.)

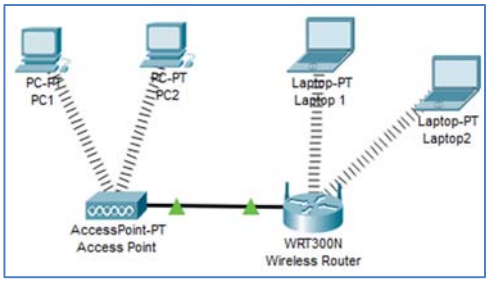


Figure 7.3 Exercise – Solution – Scheme Exercise 7.1.2.pkt

7.1.3 Connecting Computers That Are At Longer Distance Then 100 Meters

Connect computers that are separated from each other at a distance of about **225m - 280m**, in such a way that the signal strength is sufficient to carry out the transmission. Due to the low investment outlays, this should be done in an optimal way. It is also not possible to open the device cases, and thus it is not possible to make changes to the current network adapters.

Figure 7.4 Exercise – Exercise 7.1.3-Assumptions.pkt

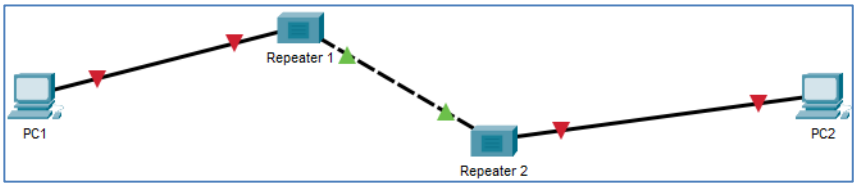


Figure 7.5 Exercise – Exercise 7.1.3-Assumptions.pkt

Solution:

- Check the type of network adapters installed in both computers (Ethernet adapters).
- According to the assumption of network standards in this standard, the maximum cable length is 100 m – so use repeaters.
- Use 2 repeaters.
- Connect the devices with appropriate wires – computers with repeaters using a simple cable, and the connection between repeaters with a patch cable.
- Address computers (e.g. PC1 – 172.16.0.1/24, PC2 – 172.16.0.2/24)
- Perform a connection test with any tool (PING, simulation, etc.)

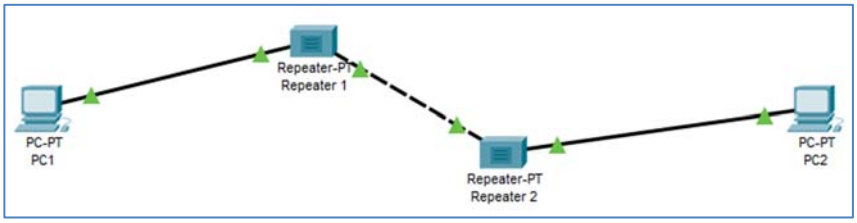


Figure 7.6 Exercise – Exercise 7.1.3-Solution.pkt

7.1.4 Using a HUB to Connect Devices Into a Single Local Network

Connect 5 computers into one LAN in such a way that all devices are in one network segment. Due to technical conditions, hardware changes cannot be made to computers. Be sure to use the simplest solution when doing the exercise.

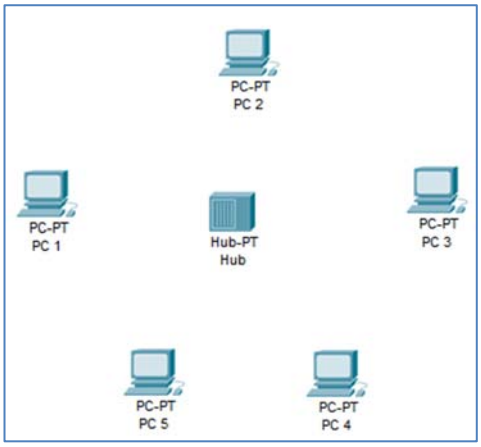


Figure 7.7 Exercise - The technical objectives - Scheme 7.1.4

Solution:

- Check the type of network adapters installed on all computers (a Fiber Gigabit Ethernet network adapter should be installed on PC4 and PC5 to make the task more difficult).
- Install the appropriate ports in the hub that are compatible with the network adapters of the computers.
- Connect devices to each other with cables.
- Address the devices so that they are all on the 10.0.0.0/8 network.
- Perform a connection test with any tool (PING, simulation, etc.)

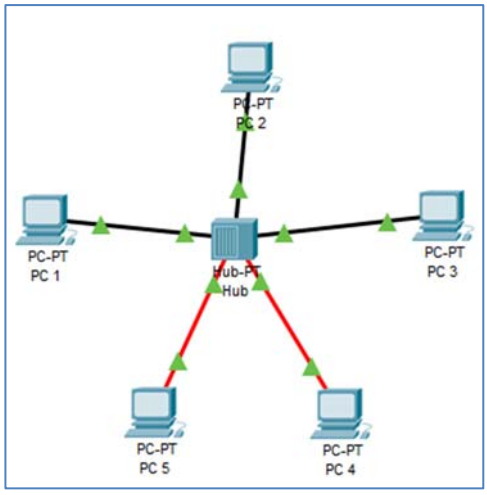


Figure 7.8 Exercise – Solution – Scheme Exercise 7.1.4.pkt

7.1.5 Using a Bridge to Limit Packet Collisions on a Local Network

In the local network shown in the figure, there are often packet collisions that we definitely do not want. To fix this, use a device called a **bridge** that divides the network into two collision domains.

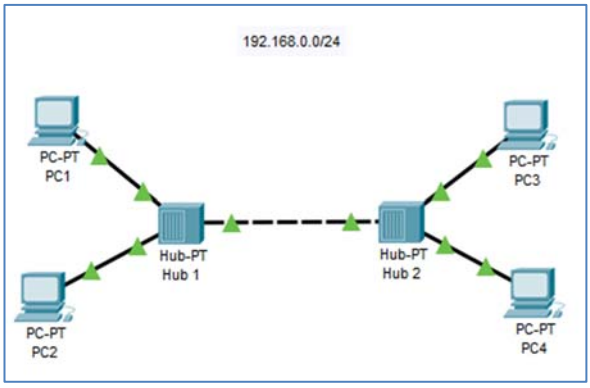


Figure 7.9 Exercise - The technical objectives

Solution:

- Search for a bridge in the device bar and insert it in the middle of the network – between two HUBs.
- Wait for the network to synchronize.
- Address devices so that they are on the 192.168.0.0/24 network

- Perform a connection test so that two devices simultaneously try to communicate with each other from two different parts of the network.

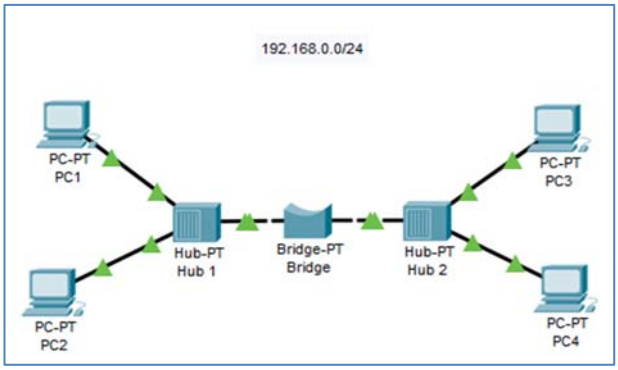


Figure 7.10 Exercise – Solution – Scheme Exercise 7.1.5.pkt

7.2 Configure Services on Servers

7.2.1 DNS and HTTP Configuration

You have to create a LAN working with two desktop computers and two servers connected to the switch. One server will serve as a DNS server with a **www.lan.xyz** entry that corresponds to the IP address of the other HTTP server. The addressing of this network is based on the address 20.0.0.0/24.

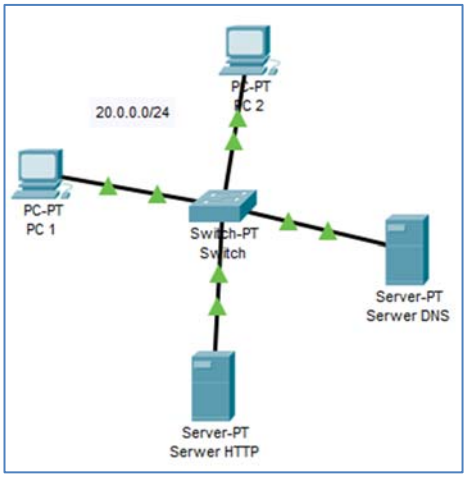


Figure 7.11 Exercise – The technical objectives – Scheme Exercise 7.2.1.pkt

Solution:

- Address the devices so that they are all on the 20.0.0.0/24 network.
- Configure the HTTP server by removing unnecessary files from the HTTP service and leaving index.html. In the finished index, change the HTML code so that your name and surname are displayed.
- Configure the DNS server so that dns contains an HTTP server entry under the name **www.lan.xyz.**
- Perform a DNS and HTTP test from one of the computers by typing the **www.lan.xyz** address in the browser.

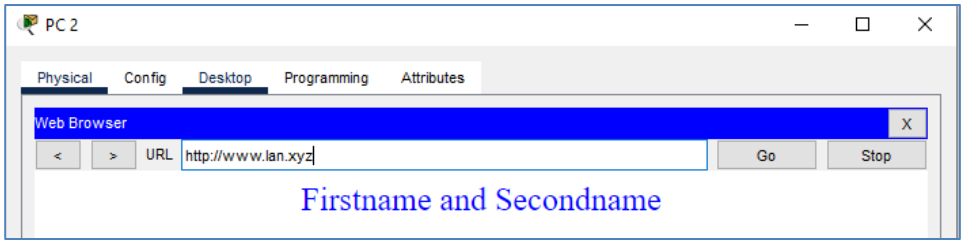


Figure 7.12 Exercise – Solution – www.lan.xyz - Exercise 7.2.1.pkt

7.2.2 Configuring DHCP and FTP

In this case, you have to create a network in which all end devices get addresses dynamically from the pool on the DHCP server (the address pool starts with 172.16.0.10, in the network 172.16.0.0/24) and have access to FTP server resources (address 172.16.0.1) by authorizing themselves as **user1** with the password **zaq1@WSX** .

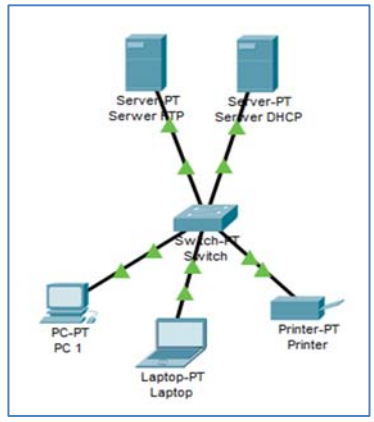


Figure 7.13 Exercise – The technical objectives

Solution:

- Address both servers statically (FTP server – 172.16.0.1/32, DHCP server – 172.16.0.2/32)
- Configure address pools on the DHCP server, which is available to a maximum of three users and starts at 172.16.0.10/24.
- On the FTP server, create **user1** with the password **zaq1@WSX**.
- Enable dynamic IP address on each of the three devices.
- Log in to the FTP server from your **Laptop**.

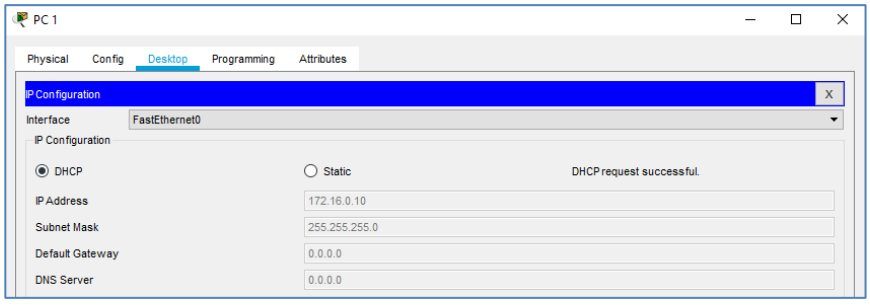


Figure 7.14 Exercise - Solution – part one

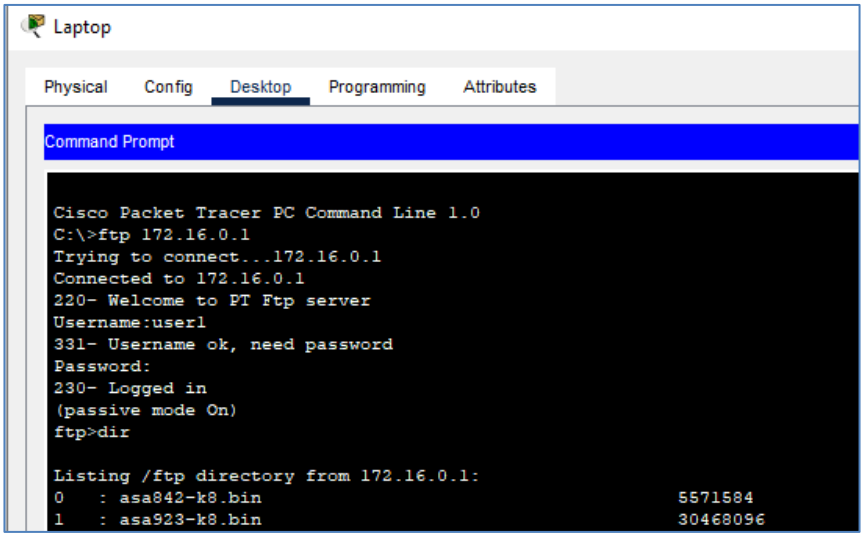


Figure 7.15 Exercise - Solution – part two

7.2.3 Mail Server Configuration (SMTP, POP3)

There are two laptops in the exercise – one is the **Boss** and the other is the **Employee**. They use the **email.com** server as their mail server. The domain name on the server is the same as its name, and the users are the names of the laptops (passwords the same). You have to configure the devices in such a way that both laptops can communicate with each other via mail. Finally, send an email called **TEST** from one to the other.

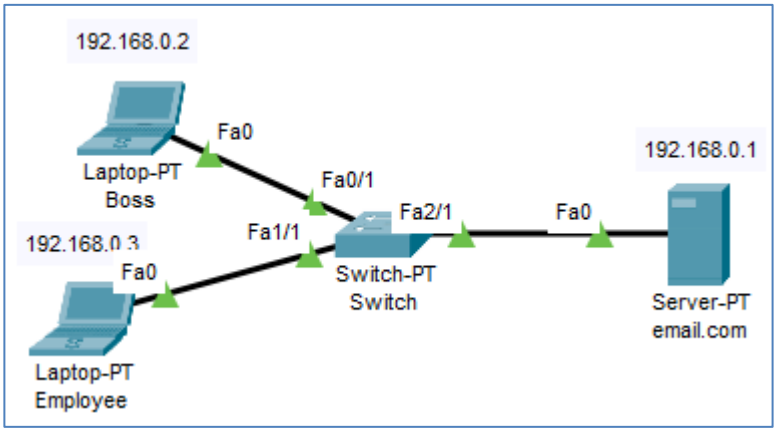


Figure 7.16 Exercise – The technical objectives – Scheme Exercise 7.2.3.pkt

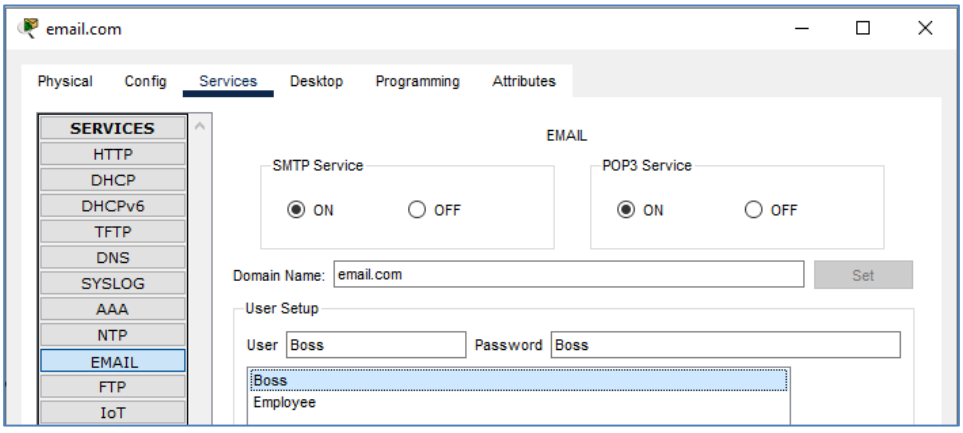


Figure 7.17 Exercise – Email configuration – Scheme Exercise 7.2.3.pkt

Solution:

- Address all devices in the right way.
- On the mail server, configure the domain name and two users.

- On both laptops, set the mail service based on device names and setting 192.168.0.1 as the mail address.
- Send an email with the title TEST from one laptop to another.

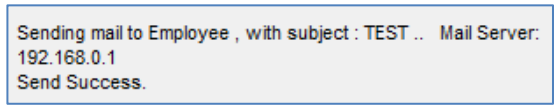


Figure 7.18 Exercise – sending e-mail

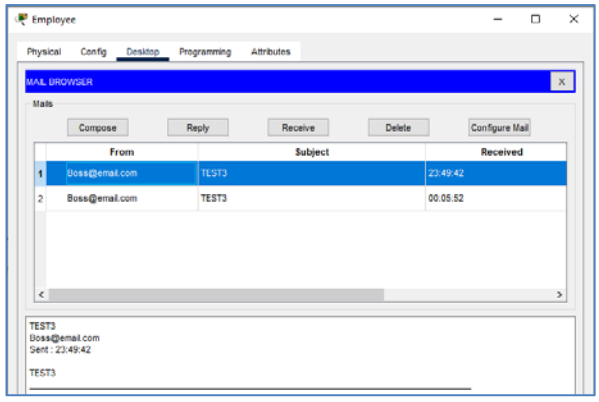


Figure 7.19 Exercise – receiving e-mail