Faculté des Sciences et de la Technologie
Master en Réseaux et Télécommunication
TP administration des services réseaux

Lab5 : SMTP protocol using Cisco Packet Tracer

1 Background

Simple Mail Transfer Protocol (SMTP) is an Internet standard for electronic mail (e-mail) transmission. By default, the SMTP protocol works on three ports:

- **Port 25** - this is the default SMTP non-encrypted port.
- **Port 465** - this is the port used if you want to send messages using SMTP securely.

While electronic mail servers and other mail transfer agents use SMTP to send and receive mail messages, user-level client mail applications (Thunderbird for example) typically use SMTP only for sending messages to a mail server for relaying.

For receiving messages, client applications usually use either POP3 (Post Office Protocol version 3) or IMAP (Internet Message Access Protocol).
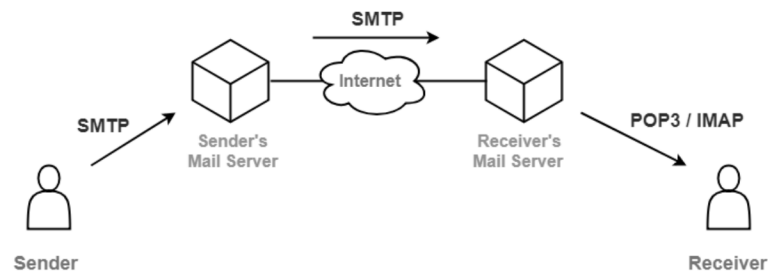
2 Working Principle

- SMTP server is always on a listening mode.
- Client initiates a TCP connection with the SMTP server.
- SMTP server listens for a connection and initiates a connection on that port.
- The connection is established.
- Client informs the SMTP server that it would like to send a mail.
- Assuming the server is OK, client sends the mail to its mail server.
- Client's mail server use DNS to get the IP Address of receiver's mail server.
- Then, SMTP transfers the mail from sender's mail server to the receiver's mail server.

While sending the mail, SMTP is used two times:

1. Between the sender and the sender's mail server
2. Between the sender's mail server and the receiver's mail server
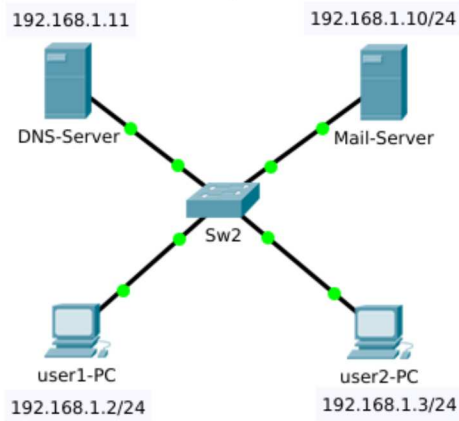
3 SMTP Lab

Figure 1.

Figure 2.

Steps:

- Construct the topology in Fig.1 Configure the static IP addresses for the hosts and servers,

- In the Mail-Server, go to Email service, enable SMTP and POP3, set the domain-name as:**univ-djelfa.com** then configure two users:

    User: user1, Password:123

    User: user2, Password:456

- In the DNS-Server, go to DNS service and enable it, then configure new entry:

    Name:univ-djelfa.com

    Address: 192.168.1.10

- Go to one of the host and test that the DNS server is resolving the hostname univ-djelfa.com by running the command: "ping univ-djelfa.com".

- On the two hosts, go to Desktop and configure the Email users like in Fig. 2.

- Now, go to user1-pc and compose an Email the user2, then go the user2-pc and try to rereive that email.

- Disable, SMTP service in the Mail-Server and repeat the last operation.

- Disable, the POP3 service in the Mail-Server and repeat the same operation.

Homework:

- Add a router (2811) to the topology and configure it as a DHCP server to assign the host's IP addresses,

- Check the ports used by SMTP and POP3 using the simulation mode of Packet Tracer.

Annex: Configure Cisco router as DHCP server

A Cisco router can be configured as a DHCP server. Here are the main steps:

1. Exclude IP addresses from being assigned by DHCP by using the `ip dhcp excluded-address FIRST_IP LAST_IP`
2. Create a new DHCP pool with the `ip dhcp pool NAME` command.
3. Define a subnet that will be used to assign IP addresses to hosts with the `network SUBNET SUBNET_MASK` command.
4. Define the default gateway with the `default-router IP` command.
5. Define the DNS server with the `dns-server IP` address command.

Here is an example configuration:

```
R1(config)#ip dhcp excluded-address 192.168.0.1 192.168.0.50
R1(config)#ip dhcp pool R1_DHCP
R1(dhcp-config)#network 192.168.0.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.0.1
R1(dhcp-config)#dns-server 192.168.0.1
```

In the example above you can see that I've configured the DHCP server with the following parameters:

- the IP addresses from the **192.168.0.1 – 192.168.0.50** range will not be assigned to hosts
- the DHCP pool was created and named **R1_DHCP**
- the IP addresses assigned to the hosts will be from the **192.168.0.0/24** range
- the default gateway's IP address is **192.168.0.1**
- the DNS server's IP address is **192.168.0.1**

To view information about the currently leased addresses, you can use the *show ip dhcp binding* command:

```
R1#show ip dhcp binding
IP address Client-ID/ Lease expiration Type
Hardware address
1   92.168.0.51 0060.5C2B.3DCC -- Automatic
```

In the output above you can see that there is a single DHCP client that was assigned the IP address of **192.168.0.51**. Since we've excluded the IP addresses from the **192.168.0.1 – 192.168.0.50** range, the device got the first address available – **192.168.0.51**.

To display information about the configured DHCP pools, you can use the `show ip dhcp pool` command. This command displays some important information about the DHCP pool(s) configured on the device – the pool name, total number of IP addresses, the number of leased and excluded addresses, subnet's IP range, etc.