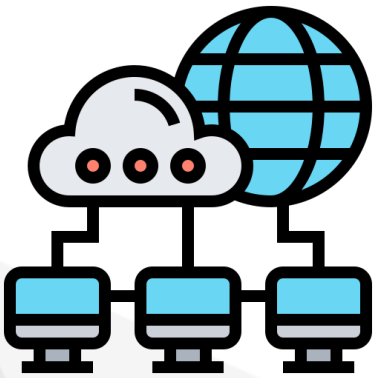
Practical Work: Routing & Switching



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January 2024

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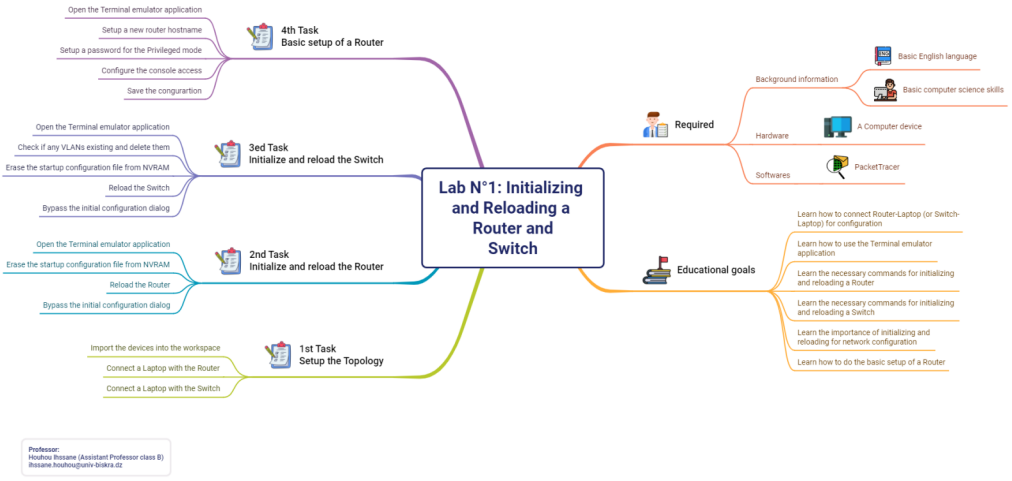
I Lab N°1: Initializing and Reloading a Router and Switch

1. Introduction

Welcome to ***Lab N°1***! During this session, we will delve into the fundamental skills of ***initializing*** and ***reloading*** network devices using the ***terminal*** directly from your laptop. In particular, we'll concentrate on ***routers*** and ***switches*** and explore the vital commands necessary to initiate these procedures. Then, we will learn how to do the ***basic setup*** of a ***Router.***

Please check out the Mind-map presented below to have a general idea about today's Lab :



The Mind-Map of Lab N°1 : Initializing and Reloading a Router and Switch

You can download the Mind map with higher quality by clicking *Here*

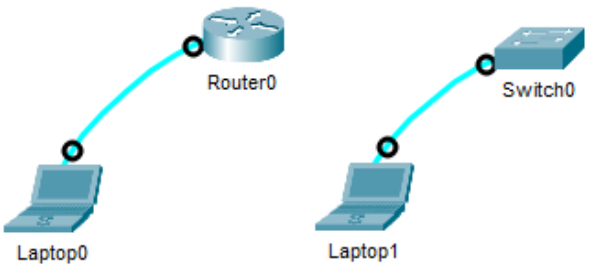
[cf. Mind map Lab 1]

2. Setup the Topology

Setup the topology as illustrated in the figure below, taking into consideration this list of devices :

- 1 Router (Cisco 1941 model)
- 1 Switch (Cisco 2960 model)

- 2 Laptops
- 2 cables (Console cables)



Topology

3. Initialize and reload the Router

Open the Terminal emulator application :

Click on Laptop0 → Desktop → Terminal → Click OK

You may receive this question :

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Write "no" (or "n") then click "Enter"

You will receive this message :

```
Press RETURN to get started!
```

Click "Enter" to pass, then you will see this :

```
Router>
```

The symbol ">" means that you entred the User mode.

Erase the startup configuration file from NVRAM :

To erase the startup configuration we have to enter the ***Privileged exec*** mode by typing "enable" or "en":

```
Router>enable
```

Click "Enter", then you will see this :

```
Router#
```

The symbol "#" means that you entred the Privileged exec mode.

Now write this command ***erase startup-config*** and click "Enter" to remove the startup configuration from nonvolatile random-access memory (NVRAM).

```
Router# erase startup-config
```

You will receive this messege :

```
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
```

Click "Enter" to confirm.

This messege confirms the process is done :

```
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
```

Reload the Router :

To reload or reboot the router, stay at the privileged exec mode and type:

```
Router# reload
```

Click "Enter" and you will see this messege:

```
Proceed with reload? [confirm]
```

Click "Enter" to confirm and wait the process to be done.

Bypass the initial configuration dialog :

You will receive this question:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type "no" (or "n") then click "Enter"

Congrats! You've completed the initialization and reloading of the Router.

4. Initialize and reload the Switch

Open the Terminal emulator application :

Click on Laptop1 → Desktop → Terminal → Click OK

You may receive this question :

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Write "no" (or "n") then click "Enter"

You will receive this message :

```
Press RETURN to get started!
```

Click "Enter" to pass, then you will see this :

```
Switch>
```

The symbol ">" means that you entred the User mode.

Check if any VLANs existing and delete them :

First you have to check if any VLANs are existing, but first, you have to enter the ***Privileged exec*** mode by typing "enable" or "en":

```
Router>enable
```

Click "Enter", then you will see this :

```
Router#
```

The symbol "#" means that you entred the Privileged exec mode.

Now type the "show flash" command and click "Enter" to check if any VLANs already existing on the switch.

```
Switch#show flash
Directory of flash:/

    1  -rw-     4670455          <no date>  2960-lanbasek9-mz.150-2.SE4.bin
    2  -rw-     676              <no date>  vlan.dat

64016384 bytes total (59345929 bytes free)
```

If there is "vlan.dat" file, it means the switch has received a VLAN configuration and it needs to be deleted by applying the "delete" command and hitting "Enter" to confirm the operation, as follows :

```
Switch# delete vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
Switch#
```

Erase the startup configuration file from NVRAM :

Now write this command ***erase startup-config*** and click "Enter" to remove the startup configuration from nonvolatile random-access memory (NVRAM).

```
Switch# erase startup-config
```

You will receive this messege :

```
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
```

Click "Enter" to confirm.

This messege confirms that the operation is done :

```
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
```

Reload the Switch :

To reload or reboot the router, stay at the privileged exec mode and type:

```
Switch# reload
```

Click "Enter" and you will see this messege:

```
Proceed with reload? [confirm]
```

Click "Enter" to confirm and wait the operation to be done.

Bypass the initial configuration dialog :

You will receive this question:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type "no" (or "n") then click "Enter"

Congrats! You've completed the initialization and reloading of the Switch.

5. Basic setup of a Router

In this part, you will set a basic configuration for the router following these points:

- Setup a hostname for the Router (Let it be "R1")
- Setup a password for the Priviliged mode (Let it be "123")
- Apply password encryption to secure stored passwords
- Configure the console access (Login : yes, Password : "456", History : 10 commands, Timeout : 2 minutes 45 seconds)

Setup a new hostname for the Router :

First open the Terminal by Click on Laptop1 → Desktop → Terminal → OK

In order to change the hostname of the Router it is necessary to enter the "Global Configuration mode" passing by the "User Exec mode" and the "Privilaged Exec mode".

To go from the "User mode" to the "Privilaged mode" excute the "enable" command, then excute the "configure terminal" command to go from the "Privilaged mode" to the "Config mode".

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

The "(config)#" means that you entred the Global Configuration mode.

Now use the "hostname" command followed by the new hostname "R1"

```
Router(config)# hostname R1
R1(config)#
```

Notice that the hostname changed from "Router" to "R1"

Setup a password for the Privileged mode :

To set a password for accessing privileged exec mode (also known as enable mode) you should use the "enable secret" command followed by the password.

```
R1(config)#enable secret 123
```

Apply password encryption :

It is important to apply password encryption to ensure that stored passwords are not exposed to unauthorized parties. This can be easly activated by using the "service password-encryption" command.

```
R1(config)#service password-encryption
```

Configure the console access :

To configure the console access you need to enter the "Line mode" through the "Global Configuration mode" using the command "line console" followed by the port number (in our case it is 0)

```
R1(config)#line console
R1(config-line)#
```

The "(config-line)#" indicates that you entred the Line mode.

Now setup a password for this port by typing the "password" command followed by the password (in this case 456)

```
R1(config-line)#password 456
```

Activating the login option by typing the "login" command is necessary. If this option is not activated, the user will not be able to access the router system.

```
R1(config-line)#login
```

Setting a timer for the user to log-out will ensure better security for our system. This can be done by executing the "exec-timeout" command followed by the amount of time (in this case 2min 45sec).

```
R1(config-line)#exec-timeout 2 45
```

It is also possible to controle how much hestory commands can be kept in the memory.

```
R1(config-line)#hestory size 10
R1(config-line)#end
R1#
```

Save the congurartion :

Now let's save the configuration by typing the "copy running-config startup-config" command. You will receive a request of confirmation, by clicking "Enter" the saving will start.

```
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#
```

6. Conclusion

During Lab 1, we gained practical experience in initializing and reloading routers and switches using a terminal emulator application. We also learned how to configure routers and save this configuration on NVRAM to avoid losing it accidentally.

7. Exercice : Do you remember?

Write the command that can be used to clear the NVRAM

8. Exercice : Do you remember?

Mention one of the commands through which you can save network configurations in the NVRAM