

Cisco Network Academy

CCNA1 Introduction to Networks

❖ Cisco IOS Command Hierarchy:

https://www.cisco.com/E-Learning/bulk/public/tac/cim/cib/using_cisco_ios_software/02_cisco_ios_hierarchy.htm

❖ In this lab, you will learn how to configure the following tasks:

Let's assume that the following IP addresses are given.

PC0

(IP address) 192.168.4.69

(Subnet Mask) 255.255.255.192

(Default Gateway) 192.168.4.65

(IPv6 Address) 2001:DB8:CCCC:1::A/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

PC1

(IP address) 192.168.4.70

(Subnet Mask) 255.255.255.192

(Default Gateway) 192.168.4.65

(IPv6 Address) 2001:DB8:CCCC:1::B/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

PC2

(IP address) 192.168.4.197

(Subnet Mask) 255.255.255.240

(Default Gateway) 192.168.4.193

(IPv6 Address) 2001:DB8:CCCC:2::A/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

PC3

(IP address) 192.168.4.194

(Subnet Mask) 255.255.255.240

(Default Gateway) 192.168.4.193

(IPv6 Address) 2001:DB8:CCCC:2::F/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

Note: You will need to configure the router and both switches using the console connection and the desktop terminal program

Configuration Tasks

On the end user devices:

1. configure each end user devices with the given IP addresses

On R1:

1. hostnames: R1
2. R1 minimum password length 10 characters
3. user account: admin, encrypted password: leescourses
4. console line: login using local database
5. enable password: class12345 (encrypted)
6. password encryption on all lines
7. banner message of the day: No unauthorized access allowed!
8. domain name: leescourses.com
9. ssh version 2
10. timeout after 5 minutes on all console and vty lines
11. security keys: rsa 1024 modulus
12. R1: vty 0 4,
secure SSH access using local database
13. enable ipv6 routing on R1
14. configure PCs with IPv4 and IPv6 addresses,
network prefix or subnet mask, and default gateway
15. R1 interfaces with IPv4 and IPv6 addressing
16. Copy running-config to startup-config

Lab Guide

First of all, configure IP addresses on each PC as follows:

❖ End user devices

On PC0

Click on the PC0 → select Desktop → select IP configuration

(IP address) 192.168.4.69

(Subnet Mask) 255.255.255.192

(Default Gateway) 192.168.4.65

(IPv6 Address) 2001:DB8:CCCC:1::A/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

On PC1

Click on the PC1 → select Desktop → select IP configuration

(IP address) 192.168.4.70

(Subnet Mask) 255.255.255.192

(Default Gateway) 192.168.4.65

(IPv6 Address) 2001:DB8:CCCC:1::B/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

On PC2

Click on the PC2 → select Desktop → select IP configuration

(IP address) 192.168.4.197

(Subnet Mask) 255.255.255.240

(Default Gateway) 192.168.4.193

(IPv6 Address) 2001:DB8:CCCC:2::A/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

On PC3

Click on the PC3 → select Desktop → select IP configuration

(IP address) 192.168.4.194

(Subnet Mask) 255.255.255.240

(Default Gateway) 192.168.4.193

(IPv6 Address) 2001:DB8:CCCC:2::F/64

(IPv6 Gateway) FE80::1 ← link-local address of the router

Now, we will configure the following tasks on R1:

1. hostnames: R1, S1, S2
2. R1 minimum password length 10 characters
3. user account: admin, encrypted password: leescourses
4. console line: login using local database
5. enable password: class12345 (encrypted)
6. password encryption on all lines
7. banner message of the day: No unauthorized access allowed!
8. domain name: leescourses.com
9. ssh version 2
10. timeout after 5 minutes on all console and vty lines
11. security keys: rsa 1024 modulus
12. R1: vty 0 4,
 secure SSH access using local database
13. enable ipv6 routing on R1
14. configure PCs with IPv4 and IPv6 addresses,
 network prefix or subnet mask, and default gateway
15. R1 interfaces with IPv4 and IPv6 addressing
16. Copy running-config to startup-config

Now, we will configure the router R1.

```
Router>enable
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

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

```
R1(config)#security passwords min-length 10
```

```
R1(config)#username admin secret leescourses
```

```
R1(config)#line console 0
```

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

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

```
R1(config)#enable secret class1234
```

% Password too short - must be at least 10 characters. Password not configured.

```
R1(config)#enable secret class12345
```

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

```
R1(config)#banner motd "No unauthorized access allowed!"
```

```
R1(config)#ip domain-name leescourses.com
```

```
R1(config)#ip ssh version 2
```

Please create RSA keys (of at least 768 bits size) to enable SSH v2.

```
R1(config)#crypto key generate rsa
```

The name for the keys will be: R1.leescourses.com

Choose the size of the key modulus in the range of 360 to 2048 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]

*Mar 1 0:55:50.968: %SSH-5-ENABLED: SSH 2 has been enabled

```
R1(config)#ip ssh version 2
```

```
R1(config)#line console 0
```

```
R1(config-line)#exec-timeout 5 0
```

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

```
R1(config)#line vty 0 4  
R1(config-line)#login local  
R1(config-line)#exec-timeout 5 0
```

```
R1(config-line)#transport input ssh  
R1(config-line)#exit
```

```
R1(config)#ipv6 unicast-routing
```

```
R1(config)#interface gigabitEthernet 0/0  
R1(config-if)#ip address 192.168.4.65 255.255.255.192  
R1(config-if)#no shutdown  
R1(config-if)#ipv6 address 2001:DB8:CCCC:1::1/64  
R1(config-if)#ipv6 address FE80::1 link-local
```

```
R1(config-if)#int g0/1  
R1(config-if)#ip address 192.168.4.193 255.255.255.240  
R1(config-if)#no shut  
R1(config-if)#ipv6 address 2001:DB8:CCCC:2::1/64  
R1(config-if)#ipv6 address FE80::1 link-local  
R1(config-if)#exit  
R1(config)#exit
```

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

```
R1#show run  
Building configuration...
```

```
Current configuration : 1098 bytes  
!  
version 15.1  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
service password-encryption  
security passwords min-length 10  
!  
hostname R1  
!  
!  
!  
enable secret 5 $1$mERr$8BPXRaZKXzJUe84Ckfffz.  
!
```

```
!  
!  
!  
ip cef  
ipv6 unicast-routing  
!  
no ipv6 cef  
!  
!  
!  
username admin secret 5 $1$mERr$p3HOT7heFTqvFIYQsDEhe0  
!  
!  
license udi pid CISCO1941/K9 sn FTX1524CPNG  
!  
!  
!  
!  
!  
!  
!  
!  
!  
ip ssh version 2  
ip domain-name leescourses.com  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
!  
!  
interface GigabitEthernet0/0  
ip address 192.168.4.65 255.255.255.192  
duplex auto  
speed auto  
ipv6 address FE80::1 link-local  
ipv6 address 2001:DB8:CCCC:1::1/64  
!  
interface GigabitEthernet0/1  
ip address 192.168.4.193 255.255.255.240  
duplex auto  
speed auto  
ipv6 address FE80::1 link-local
```

```
ipv6 address 2001:DB8:CCCC:2::1/64
!
interface Vlan1
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
!
!
!
banner motd ^CNo unauthorized access allowed!^C
!
!
!
!
line con 0
exec-timeout 5 0
login local
!
line aux 0
!
line vty 0 4
exec-timeout 5 0
login local
transport input ssh
!
!
!
end
```

R1#ping 192.168.4.69

R1#ping 192.168.4.70

R1#exit

At this point, when you try to access the router R1 again by pressing <Enter> key, you will see the following:

No unauthorized access allowed!

User Access Verification

Username: **admin**

Password: ← you need to type the password “leescourses”

R1>**en**

Password: ← you need to type the password “class12345”

R1#

At this point, please close the terminal and open the command prompt on PC0. Then, you can test if the ssh setup works.

PC> **ssh -?**

PC> **ssh -l admin 192.168.4.65**

Open

Password: ← you need to type the password “leescourses”

No unauthorized access allowed!

R1> **en**

Password: ← you need to type the password “class12345”

R1#

Done.