

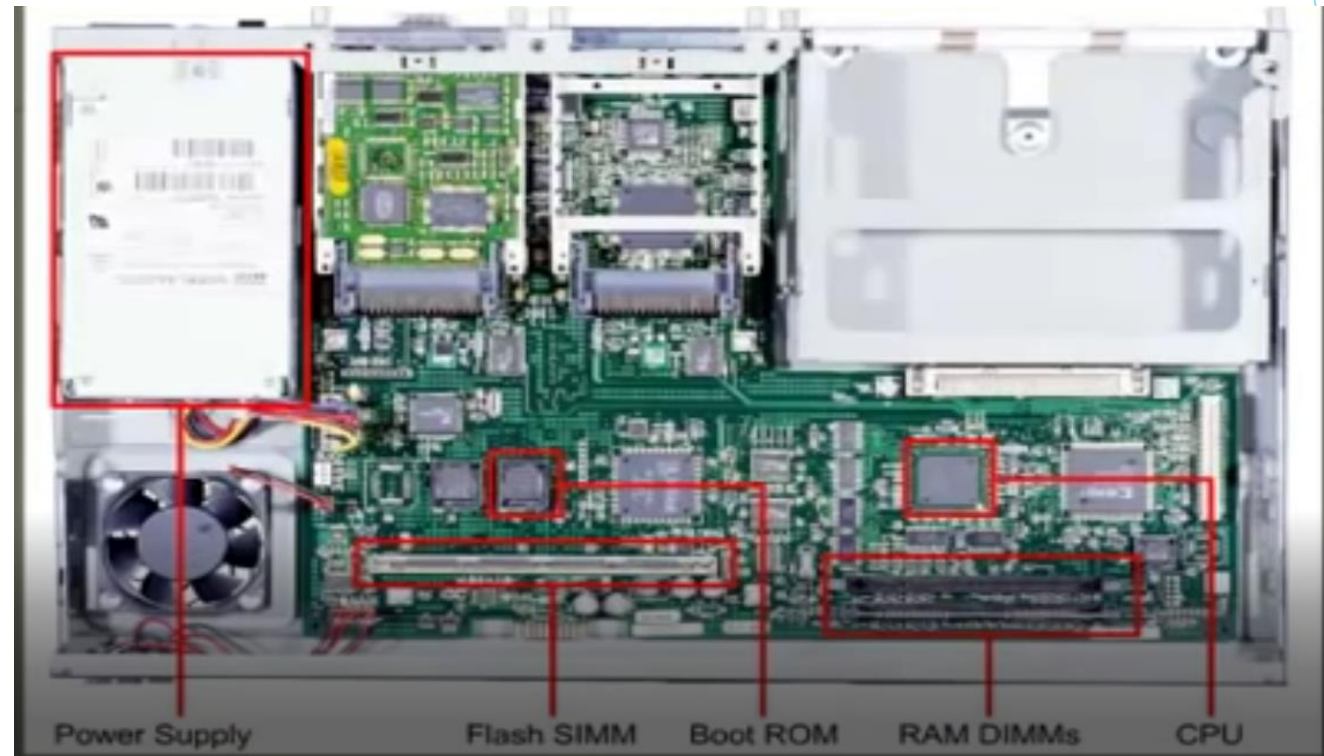
Router configuration

What is Router??

- ▶ A router is a device that connects two or more packet-switched networks or subnetworks.
- ▶ It serves two primary functions:
 1. managing traffic between these networks by forwarding data packets to their intended IP addresses,
 2. allowing multiple devices to use the same Internet connection.

Router internal component

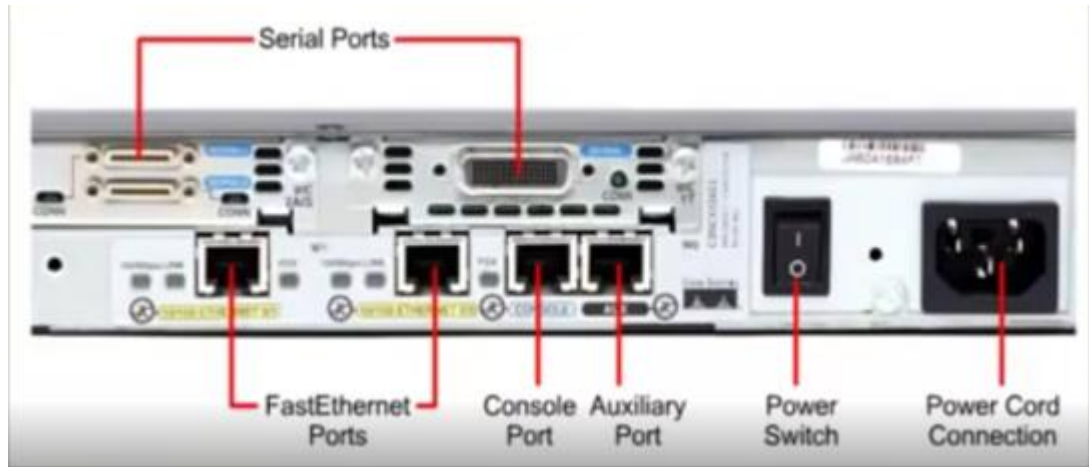
- ▶ Processor
- ▶ Interface
- ▶ Memory



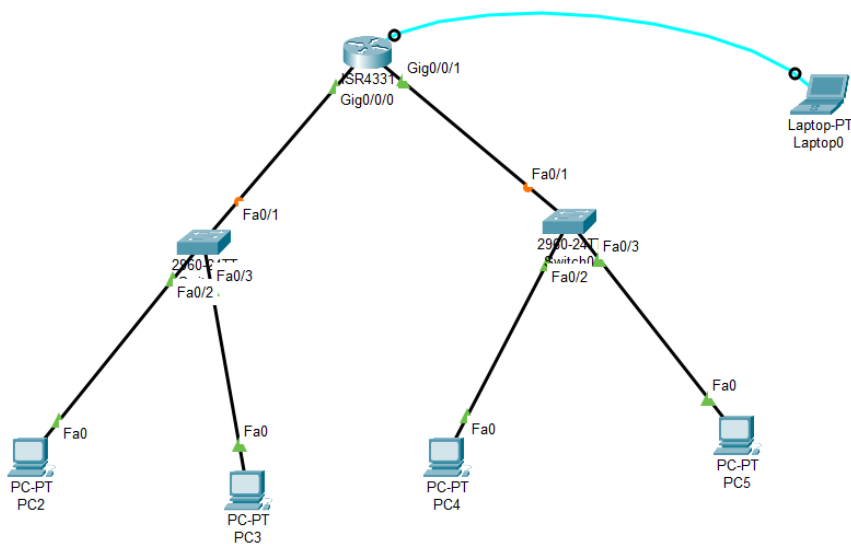
Memory

- ▶ RAM
- ▶ ROM:
 - ▶ POST ,
 - ▶ Bootstrap find the IOS and load it in RAM , find the configuration file and load it in the RAM
- ▶ Flash contain IOS of router
- ▶ NVRAM contain configuration file

Router External connection



Network structure

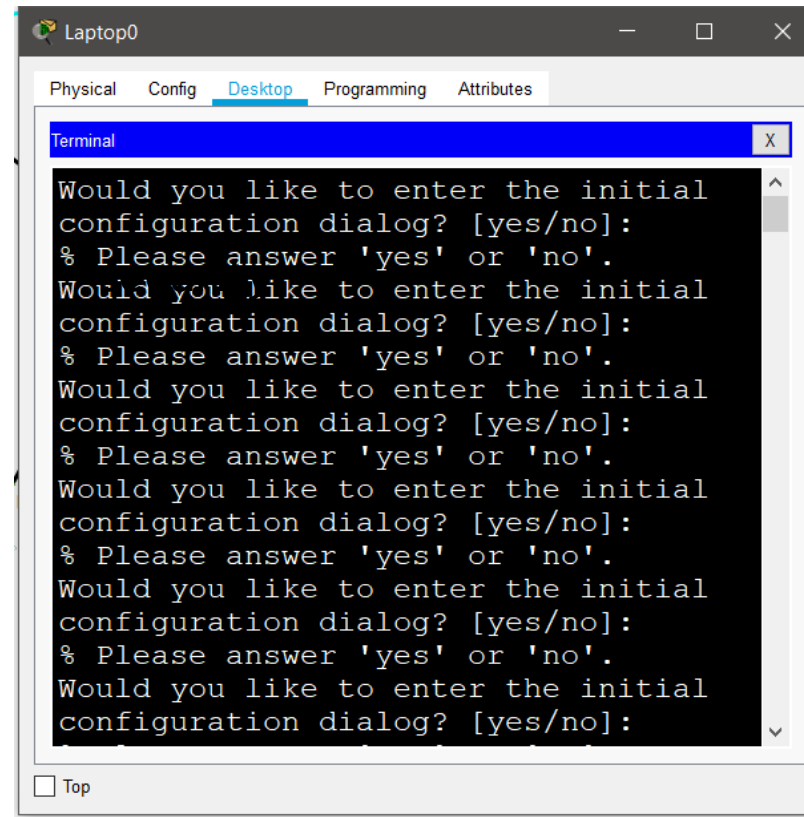


- ▶ We connect router to laptop or pc using console cable to access router
- ▶ Click on the laptop then desktop after that terminal then ok

Router Modes

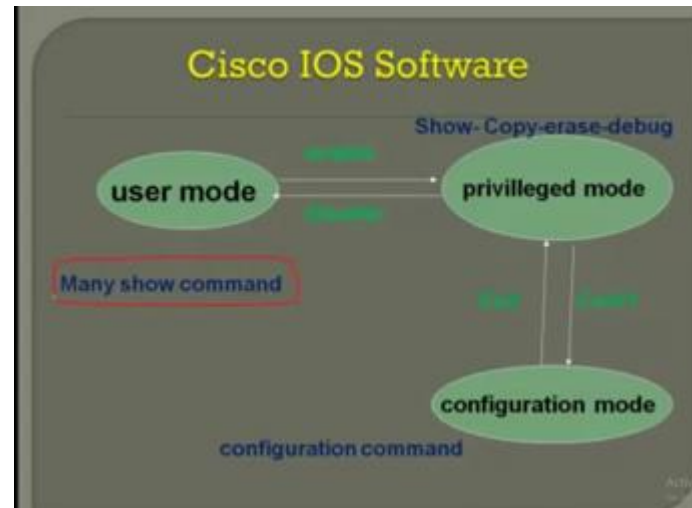
1. Setup mode(initial configuration)

To exit from setup press ctrl+C



Router Modes

2. User mode > **enable**
3. Privileged mode **# config t**
 - ▶ Show , copy, erase, debug
4. Configuration mode



Show Default Router Configuration

- ▶ To get default configuration run **show running-config** command.
- ▶ What is hostname??
- ▶ How many Fast Ethernet interfaces does the Router have?
- ▶ 0
- ▶ How many Gigabit Ethernet interfaces does the Router have?
- ▶ 3
- ▶ What is the range of values shown for the vty lines?
- ▶ line vty 0 4

```
Router#sh running-config
Building configuration...

Current configuration : 648 bytes
!
version 16.6.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
--More-- |
```

Show Default Router Configuration

- ▶ Display the current contents of NVRAM.
 - ▶ `show startup-config`
- ▶ It displays this message because the configuration file was not saved to NVRAM. Currently it is only located in RAM.

```
Router#show startup-config  
startup-config is not present  
Router#
```

Configure and Verify the Initial Router Configuration

▶ Change hostname for the router

- ▶ Router#config t
- ▶ Router(config)#hostname shkh

```
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname shkh
shkh(config)#
```

▶ Change enable password

- ▶ shkh(config)#enable password 123
- ▶ shkh(config)#exit
- ▶ shkh#
- ▶ shkh#exit
- ▶ shkh>enable

```
shkh>enable
Password:
shkh#
```

▶ To remove password run

- ▶ shkh(config)#no enable password

Configure and Verify the Initial Router Configuration

- ▶ Run
 - ▶ shkh#show running-config
- ▶ Create encrypted password
 - ▶ shkh#config t
 - ▶ shkh(config)#enable secret 12345
- ▶ Encrypt all passwords
 - ▶ shkh(config)#service password-encryption
 - ▶ shkh#show running-config

```
shkh#show running-config
Building configuration...

Current configuration : 668 bytes
!
version 16.6.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname shkh
!
!
enable password 123
!
```

```
shkh(config)#do sh run
Building configuration...

Current configuration : 719 bytes
!
version 16.6.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname shkh
!
!
!
enable secret 5 $1$mERr$/Q/mbs3O9oHsKR7rNG4e81
enable password 7 08701E1D
!
!
!
```

Configure and Verify the Initial Router Configuration

▶ Console password

- ▶ shkh(config)#line console 0
- ▶ shkh(config-line)#password 123
- ▶ shkh(config-line)#login
- ▶ shkh(config-line)#exit
- ▶ shkh(config)#exit
- ▶ shkh#
- ▶ %SYS-5-CONFIG_I: Configured from console by console
- ▶
- ▶ shkh#exit

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

```
User Access Verification
```

```
Password: |
```

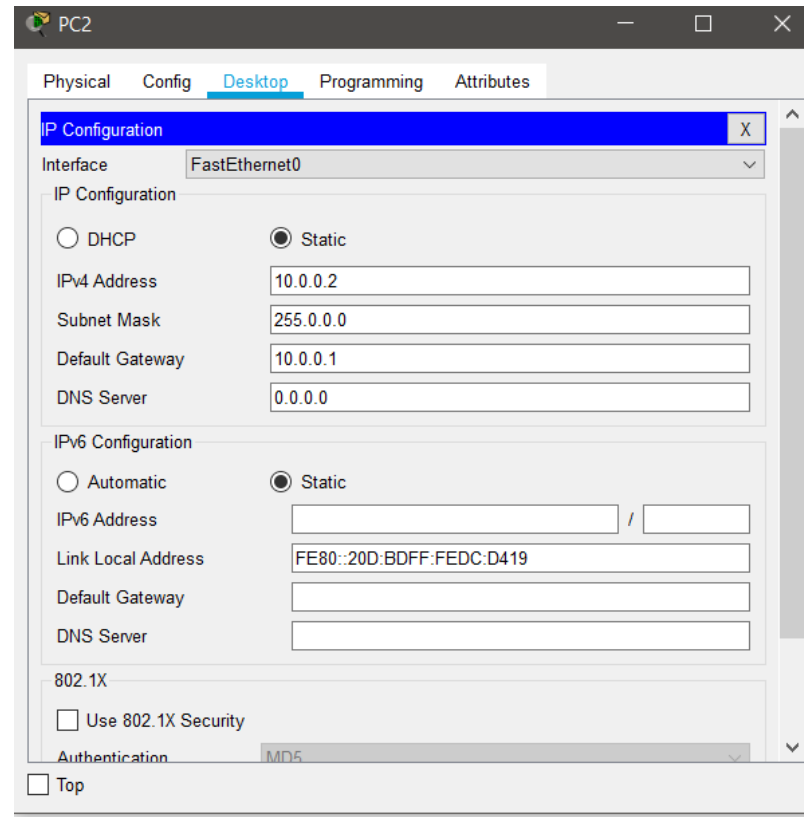
Save the Running Configuration File

- ▶ To save the current configuration run
 - ▶ shkh#copy running-config startup-config
- ▶ Run
 - ▶ shkh#show startup-config

```
shkh#show startup-config
Using 719 bytes
!
version 16.6.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname shkh
!
!
!
enable secret 5 $1$mERr$/Q/mbs3O9oHsKR7rNG4e81
enable password 7 08701E1D
!
```

Add IP for devices

- ▶ For first LAN use
 - ▶ 10.0.0.2 and 10.0.0.3 for IP and 10.0.0.1 for default gateway
- ▶ For second LAN use:
 - ▶ 20.0.0.2 and 20.0.0.3 for IP and 20.0.0.1 for default gateway

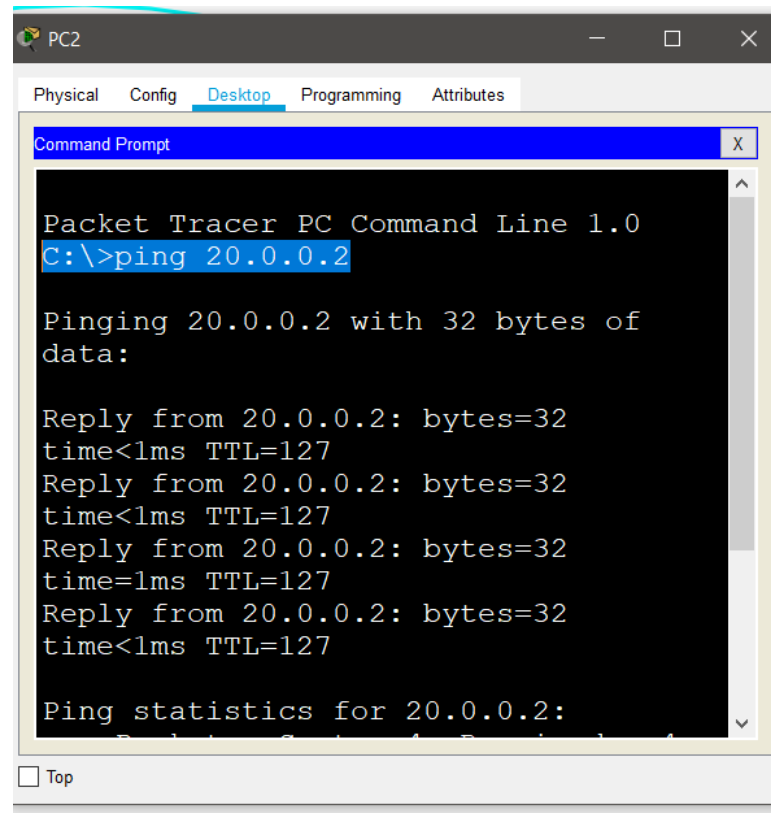


Add router IPs

- ▶ shkh(config)#int g0/0/0
- ▶ shkh(config-if)#no sh
- ▶ shkh(config-if)#no shutdown
- ▶ shkh(config-if)#ip address 10.0.0.1 255.0.0.0
- ▶ shkh(config-if)#int g0/0/1
- ▶ shkh(config-if)#no shutdown
- ▶ shkh(config-if)#ip address 20.0.0.1 255.0.0.0
- ▶ shkh(config-if)#

Test connection

- ▶ Using ping command to test connection
- ▶ From pc2 run C:\>ping 20.0.0.2
- ▶ From pc4 run C:\>ping 10.0.0.3



The screenshot shows a Packet Tracer PC Command Line window for PC2. The window has tabs for Physical, Config, Desktop, Programming, and Attributes, with Desktop selected. The Command Prompt shows the command 'C:\>ping 20.0.0.2' being executed. The output indicates a successful ping to 20.0.0.2 with 32 bytes of data, showing four replies with times less than 1ms and TTL=127. The window also displays 'Ping statistics for 20.0.0.2:' at the bottom.

```
PC2
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 20.0.0.2

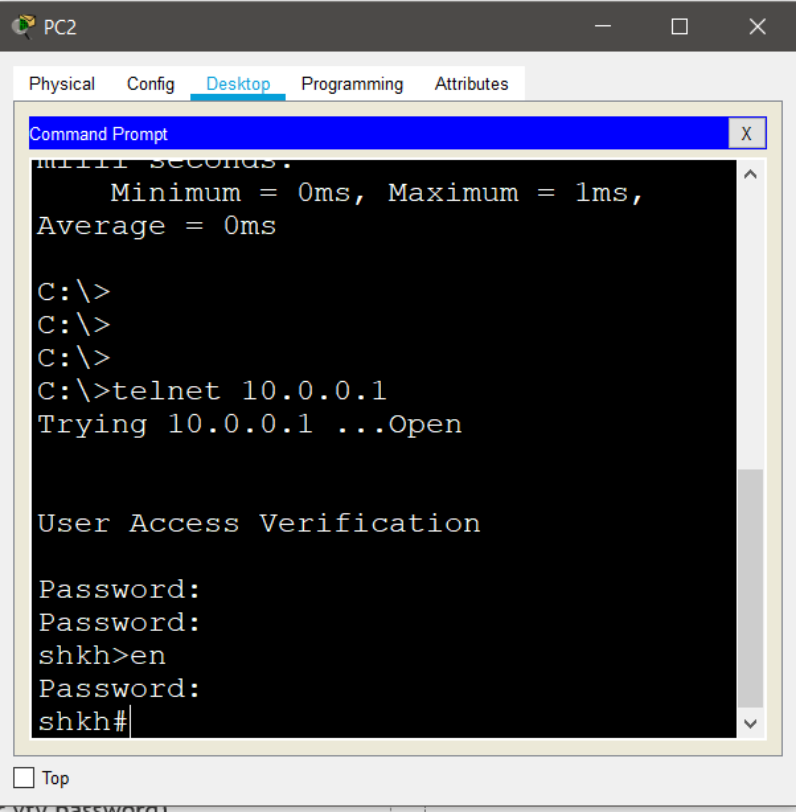
Pinging 20.0.0.2 with 32 bytes of data:

Reply from 20.0.0.2: bytes=32
time<1ms TTL=127
Reply from 20.0.0.2: bytes=32
time<1ms TTL=127
Reply from 20.0.0.2: bytes=32
time=1ms TTL=127
Reply from 20.0.0.2: bytes=32
time<1ms TTL=127

Ping statistics for 20.0.0.2:
```

Access router remotely

- ▶ Add password to virtual terminal
- ▶ shkh(config-if)#line vty 0 4
- ▶ shkh(config-line)#password asd123
- ▶ shkh(config-line)#login
- ▶ shkh(config-line)#
- ▶ From any pc open desktop then terminal run command
- ▶ C:\>telnet 10.0.0.1
- ▶ Trying 10.0.0.1 ...Open
- ▶ User Access Verification
- ▶ Password: (enter vty password)
- ▶ shkh>en
- ▶ Password: (enter enable secret password)



The screenshot shows a PC2 desktop environment with a 'Command Prompt' window open. The window title is 'Command Prompt' and it has a close button. The terminal output is as follows:

```
PC2
Physical Config Desktop Programming Attributes
Command Prompt
m1111 SECONDS.
    Minimum = 0ms, Maximum = 1ms,
    Average = 0ms
C:\>
C:\>
C:\>
C:\>telnet 10.0.0.1
Trying 10.0.0.1 ...Open

User Access Verification

Password:
Password:
shkh>en
Password:
shkh#
```

At the bottom of the window, there is a checkbox labeled 'Top'.

Router Device Security

- ▶ **Password creation for privilege mode**
 - ▶ Router(config)#enable password 246
- ▶ **Create Encrypted password**
 - ▶ Router(config)#enable secret 579
- ▶ **Encrypt all passwords**
 - ▶ Switch(config)#service password-encryption



Router Device Security

- ▶ **Set password Minum length to 10**
 - ▶ Router(config)#security password min-length 10
- ▶ **Create a user with a strong encrypted password.**
- ▶ Router(config)#username shkh secret 1234567890
- ▶ **This user and password will be used we connect remotely**
- ▶ **Configure VTY lines to use the local user profiles for authentication.**
- ▶ Switch(config)#line vty 0 15
- ▶ Switch(config-line)#login local
- ▶ **When use telnet it need username(shkh) and password(1234567890)**

Thank You