Router Basic's

Router Port-Types:

a) Physical Port-types:
- **Console:** Configuration port for command-line access to router management and configuration.
- **Aux port:** This auxiliary port is used to connect a modem to the router, which can then be used to remotely modify the configuration on the router.
- **Serial:** Connects a modem or other serial device to allow a WAN network interface to be used on the router.
- **Ethernet/Fast Ethernet/Gigabit Ethernet:** Network interfaces used to connect different network segments.

b) Logical Port-Types:
- **Loopback Port-types:** Used for testing and defining router-id
- **Tunnel Port-Types:** Used for tunnel configuration in VPN configuration.

Router Memory Types

Cisco routers actually contain different types of memory components that provide the storage and dynamic caching required. The following list provides information about the various memory components found in a Cisco router.

- **ROM**— contains the power-on self test and the bootstrap program for the router. The ROM chips also contain either a subset or the complete router IOS (for example, the ROM on the 2505 router contains only a subset of the IOS, whereas the 7000 series contains the full IOS). The fact that the IOS is available on the ROM enables you to recover from major disasters, such as the wiping out of your Flash RAM (discussed in the following paragraphs). The ROM chips on Cisco routers are removable and can be upgraded or replaced.

- **NVRAM (non-volatile RAM)**—Stores the start-up configuration file for the router. NVRAM can be erased, and you can copy the running configuration on the router to NVRAM. The great thing about NVRAM is that it retains the information it holds even if the router is powered down (which is extremely useful considering you won't want to have to reconfigure the router every time the power goes down).

- **Flash RAM**—Flash is a special kind of ROM that you can actually erase and reprogram. It is used to store the Cisco IOS that runs on your router. You also can store alternative versions of the Cisco IOS on the Flash.

- **RAM**—Similar to the dynamic memory you use on your PC, RAM provides the temporary storage of information and holds information such as the current routing table. RAM also holds the currently running router configuration (changes that you make to the configuration are kept in RAM until you save them to NVRAM)

Types of Cisco OS:

A) Cisco IOS
B) Cisco IOS –XR
C) Cisco IOS – XE
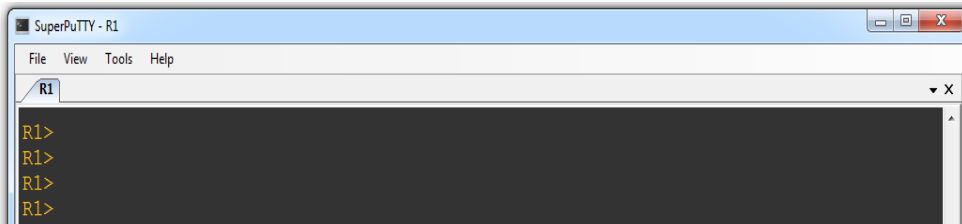D) Cisco NX-OS/ SAN-OS

Basic Commands for router configuration:

Router Modes:

1) Console Mode :
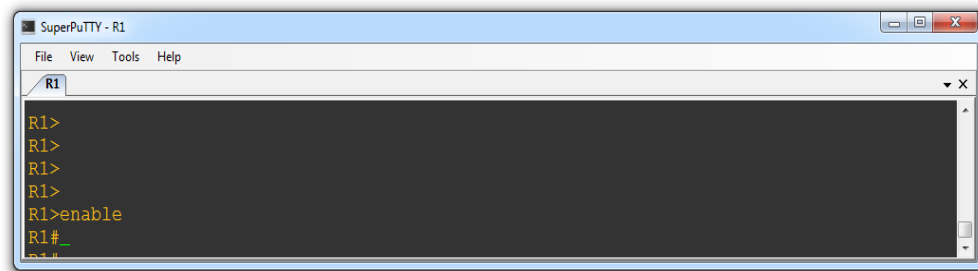   Router>   // whenever you turn on the router you get console mode

2) Privilege Mode
   Router> enable
   Router #
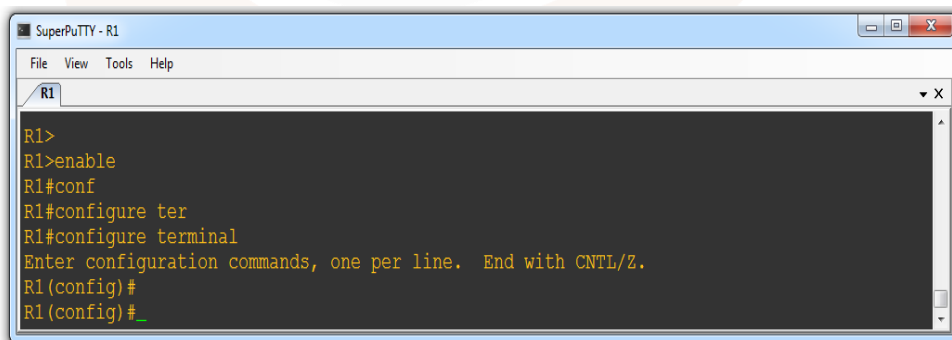
3) Global Configuration mode :
   Router>
   Router> enable
   Router# configure terminal
   Router (config)#

How to configure Router Console Password?

R1>en

R1# configure terminal

R1 (config) # line console 0

R1 (config) # password <abc>

R1 (config) # login

    * verify with show run command

To Remove

R1 (config) # line console 0

R1 (config)# no password <abc>

How to configure enable password?

R1>en

R1# configure terminal

1) R1 (config) #enable password <abc>   /*password is in normal text*/

2) R1 (config) #enable secret <abc>   /*password is in encrypted format*/

For removing

1) R1 (config) # no enable password <abc>

2) R1 (config) #no enable secret <abc>

* verify with show run command.

How to configure Telnet password?

R1>en

R1# configure terminal

R1 (config) # line vty 0 4

R1 (config) # password <abc>

R1 (config) # login

* verify with show run command

How to set the router clock?

R1>en

R1# clock set <hh:mm:ss><days of month (0-31)><month of the year><year>

    hh:mm:ss   hours:minutes:seconds

    Days of month 0-31

    Month of year   JAN,FEB,MAR,APR,MAY……..

    Year: <1993-2035>
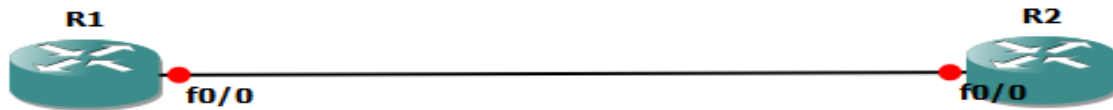
Ex: R1# clock set 11:45:50 JULY 2013

- to verify sh clock.

Points to remember

- where to check router up time – sh ver
- where to check router version – sh ver
- where to check router ios ver- sh ver
- where to check route NVRAM,DRAM,FLASH size – sh ver
- where to check router registry –sh ver

How to change router name?
```
R1>en
R1#configure terminal
R1(configure)# hostname <abc>
abc(configure)#
```


How to configure IP add?
```
R1 (config) # int f0/0
R1 (config-if) # ip add A.B.C.D subnet-mask
            ex: ip address 192.168.12.1 255.255.255.0
R1 (config-if) # no shutdown
   (By default physical interfaces are down to make it up we give no shut command)
R2 (config) # interface f0/0
R2 (config-if)# ip add A.B.C.D subnet-mask
            ex: ip address 192.168.12.2  255.255.255.0
R2 (config-if)# no shut
(by default physical interfaces are down to make it up we give no shut command)
```

Command to check assigned ip address?
```
     R1# sh ip interface brief
```

Command to check routing table?
```
     R1# sh ip route
```

Troubleshoot Commands:
```
     R1# ping <ip add>              * to check connectivity.
     R1#traceroute <ip add>* to check which route is following.
```

Router IOS Backup:
```
     R1#copy flash:   tftp:
         Source filename []? <Source IOS FILE NAME>
         Address or name of remote host []? <tftp SERVER NAME>
         Destination filename [2811.bin]?  <Destination ios file name>
```
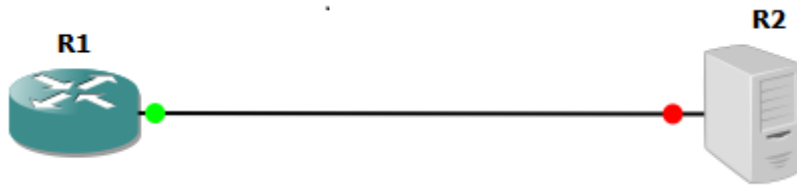
Copy running config to Start-up
```
     R1#copy running-config startup-config
         Destination filename [startup-config]?
```

Copy Start-up to running config
```
     R1#copy startup-config running-config
          Destination filename [running-config]
```

- Router **Running-configuration** is in RAM memory
- Router **Startup-configuration** is in NVRAM memory.
- Router **IOS** is in flash memory.

Installing IOS to Router:

Rommon1 > IP_ADDRESS= 10.1.1.1
Rommon2 > IP_SUBNET_MASK=255.0.0.0
Rommon3 > DEFAULT_GATEWAY=10.1.1.1
Rommon4 > TFTP_SERVER=10.1.1.2
Rommon5 > TFTP_FILE=2811.BIN
Rommon6 > tftpdnld

      IP_ADDRESS= 10.1.1.1
      IP_SUBNET_MASK=255.0.0.0
      DEFAULT_GATEWAY=10.1.1.1
      TFTP_SERVER=10.1.1.2
      TFTP_FILE=2811.BIN
Invoke this command for disaster   recovery only
WARNING: all existing data in all partitions on flash will be lost!

Do you wish to continue? Y/n: [n]: y

Password recovery for a Cisco router

It may happen that you forget the line console password or enable password of a router. So how do you recover the password of the router? The step by step procedure is

1. Power cycle the device and interrupt the boot sequence by using a combination of the keys ctrl+break or ctrl+shift+c. It will take you to the ROMMON mode
   Self-decompressing
   ##
2. Change the configuration register value to 0x2142.
   rommon1 > confreg 0x2142
   rommon2 > reset
   In **show version** commands output previously you can verify that the configuration register value by default is 0x2102. So if this value is at default the router after copying IOS from flash it during booting copies the startup-config from NVRAM if present. By setting the value to 0x2142 we are telling the router to bypass the NVRAM during booting, so the router will start fresh without any config.

3. Power cycle the device. It will boot without any config.
4. Go to privilege mode and do the following
   Router # copy startup-config running-config
5. Change the configuration register value back to 0x2102
   R1(config)# config-register 0x2102
6. Verify its value by using **show version**
7. Reload the router.