IOS Mode Hierarchical Structure

User EXEC Command-Router>
ping
show (limited)
enable
etc.

Privileged EXEC Commands-Router#
all User EXEC commands
debug commands
reload
configure
etc.

Global Configuration Commands-Router(config)#
hostname
enable secrect
ip route

interface ethernet
         serial
         dsl
         etc.

Interface Commands-Router(config-if)#
ip address
ipv6 address
encapsulation
shutdown/ no shutdown
etc.

router   rip
         ospf
         eigrp
         etc.

Routing Engine Commands-Router(config-router)#
network
version
auto summary
etc.

line   vty
         console
         etc.

Line Commands-Router(config-line)#
password
login
modem commands
etc.

Modes on Cisco Routers

Setup Mode :-
- If NVRAM is Blank

User Mode:-
- Only some basic monitoring

Privileged Mode:-
- monitoring and some troubleshooting

Global Configuration mode:-
- All Configurations that effect the router globally

Interface mode:-
- Configurations done on the specific interface

Rommon Mode:-
- Reverting Password

Setup Mode

- If NVRAM is blank (router without configurations)
- new router or erase startup-configurations
- Skip setup mode using No option

```
Cisco 1841 (revision 5.0) with 114688K/16384K bytes of memory.
Processor board ID FTX0947Z18E
M860 processor: part number 0, mask 49
2 FastEthernet/IEEE 802.3 interface(s)
191K bytes of NVRAM.
63488K bytes of ATA CompactFlash (Read/Write)
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Vers
 RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team


         --- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]:
% Please answer 'yes' or 'no'.
Continue with configuration dialog? [yes/no]:
```

User Mode: Only some basic monitoring

Router>show flash
System flash directory:
File Length   Name/status
  3   5571584 c2600-i-mz.122-28.bin
  [5827403 bytes used, 58188981 available, 64016384 total]
63488K bytes of processor board System flash (Read/Write)

Router>sh ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	unassigned	YES	unset	administratively down	down
FastEthernet0/1	unassigned	YES	unset	administratively down	down'

Router>show version

Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
Image text-base: 0x8000808C, data-base: 0x80A1FECC

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
ROM: C2600 Software (C2600-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)

System returned to ROM by reload
System image file is "flash:c2600-i-mz.122-28.bin"

cisco 2621 (MPC860) processor (revision 0x200) with 60416K/5120K bytes of memory
.

Processor board ID JAD05190MTZ (4292891495)
M860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
2 FastEthernet/IEEE 802.3 interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)
Configuration register is 0x2102

Router>ping 1.1.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:

.....

Success rate is 0 percent (0/3)

Router>traceroute 1.1.1.1

Type escape sequence to abort.

Tracing the route to 1.1.1.1

Privilege Mode

- Complete monitoring
- All show commands, Copy , erase commands

```
Router>  enable
Router #
Router # show flash
Router # show version
Router #show ip interface brief
Router#  ping 1.1.1.1
Router # traceroute 50.1.1.1


Router # show running-config          (configs in RAM)
Router # show startup-config           (configs in NVRAM)
Router # Copy                          (save configurations)
Router # erase                          (erase configurations)
```
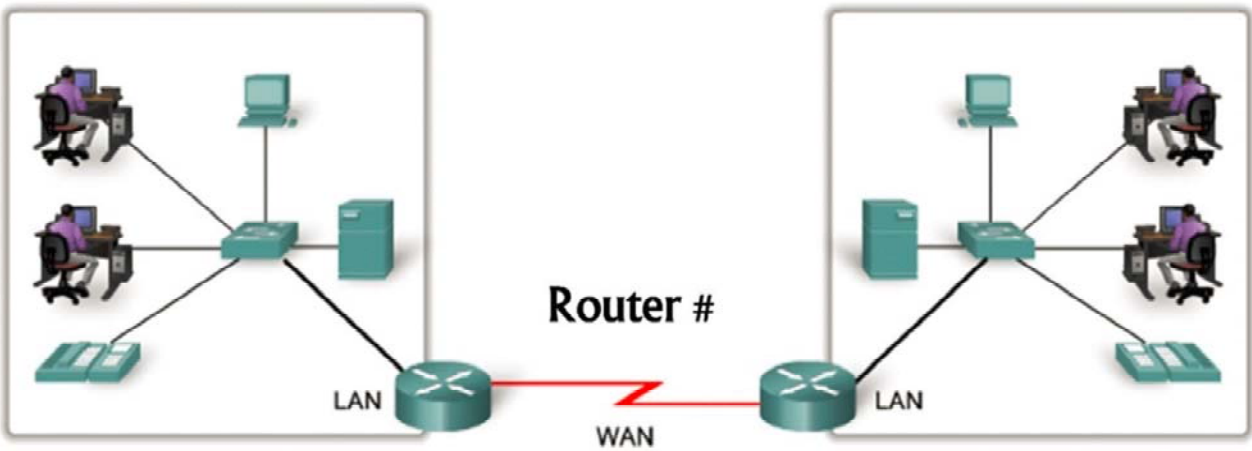
Global configuration mode

Router #

Router # configure terminal

Router (config) #

Changing Hostnames

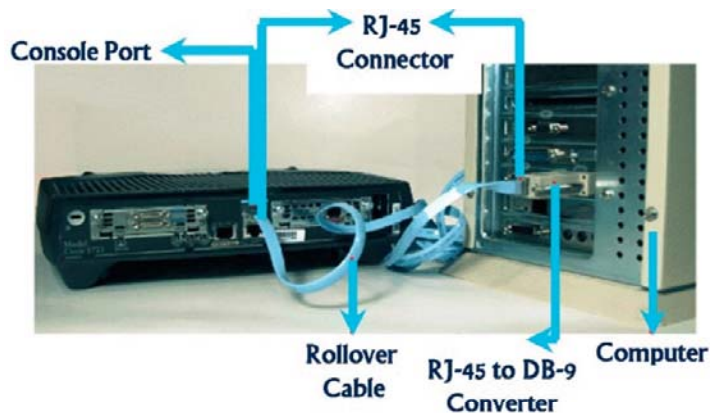| Without names, network devices are difficult to identify for configuration purposes. |
| --- |

Router #

Router #

Router # **configure terminal**
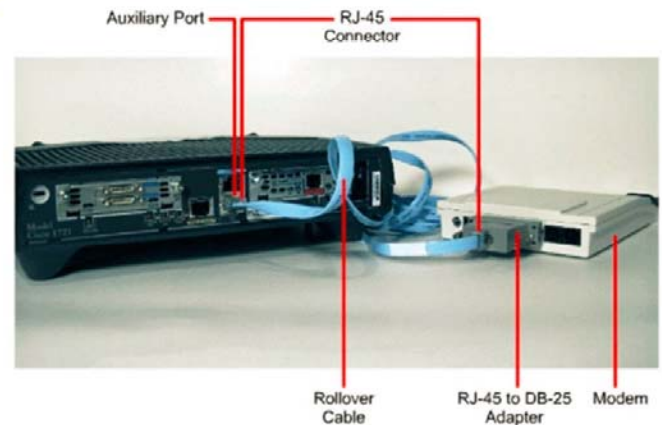
Router (config) #

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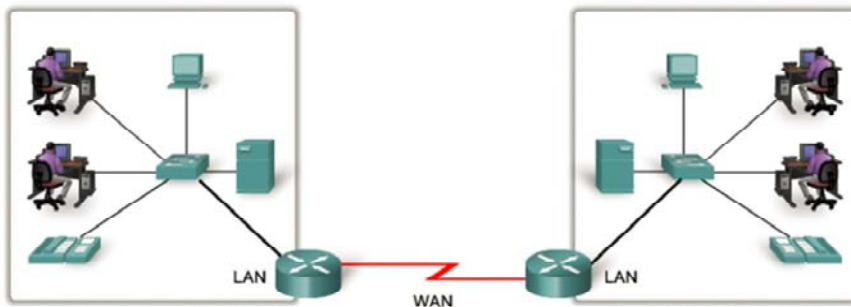
R1 (config) #

Assigning Passwords

- ▸ Console
- ▸ Auxiliary
- ▸ VTY line (telnet)

Using VTY line for Telnet

- Telnet protocol allow you to access remote device .
- Telnet uses VTY line on cisco devices

Prerequisite for Telnet access

- ▸ Connectivity
- ▸ IP address
- ▸ VTY line must be configured with passwords.

Assigning console password:

```
Router(config) # line con 0
Router(config-line) # password <password>          (line mode)
Router(config-line) # login
Router(config-line) # exit
```

Assigning Auxiliary password:

```
Router(config) # line aux 0
Router(config-line) # password <password>
Router(config-line) # login                        (line mode)
Router(config-line) # exit
```

Assigning Telnet password:

```
Router(config) # line vty 0 4
Router(config-line) #password <password>           (line mode)
Router(config-line) #login
Router(config-line) #exit
```

Enable Password

Router> **enable**
Router #

Router> **enable**
Password: ......
Router #

Router(config) # **enable password** **<password>**

The password will be saved in clear text

OR

Router(config) # **enable secret** **<password>**

The password will be saved in encrypted text

Encrypting all Password Display

(config)# **service password-encryption**

Banner Messages

(config)# **banner motd #** ……………………… **#**

Limiting Device Access - MOTD Banner

LAB_A(config)#banner motd # This is a secure system. Authorized Access ONLY!!! #

This configuration results in this message of the day banner.

Delimiting characters are not included in the message.

```
Sw1-Floor-1 con0 is now available

Press RETURN to get started.

This is a secure system. Authorized
Access ONLY!!!

User Access Verification

password:

Sw1-Floor-1>enable

Password:

Sw1-Floor-1#
```

To save the configuration:

Router # **copy running-config   startup-config**

(OR)

Router # **write memory**

(OR)

Router # **write**

Erase all Configurtions

NOA #   **erase startup-config**

NOA #   **reload**