



SLIIT

Discover Your Future

Lecture 01

Introduction to Routers



SLIIT
FACULTY OF COMPUTING

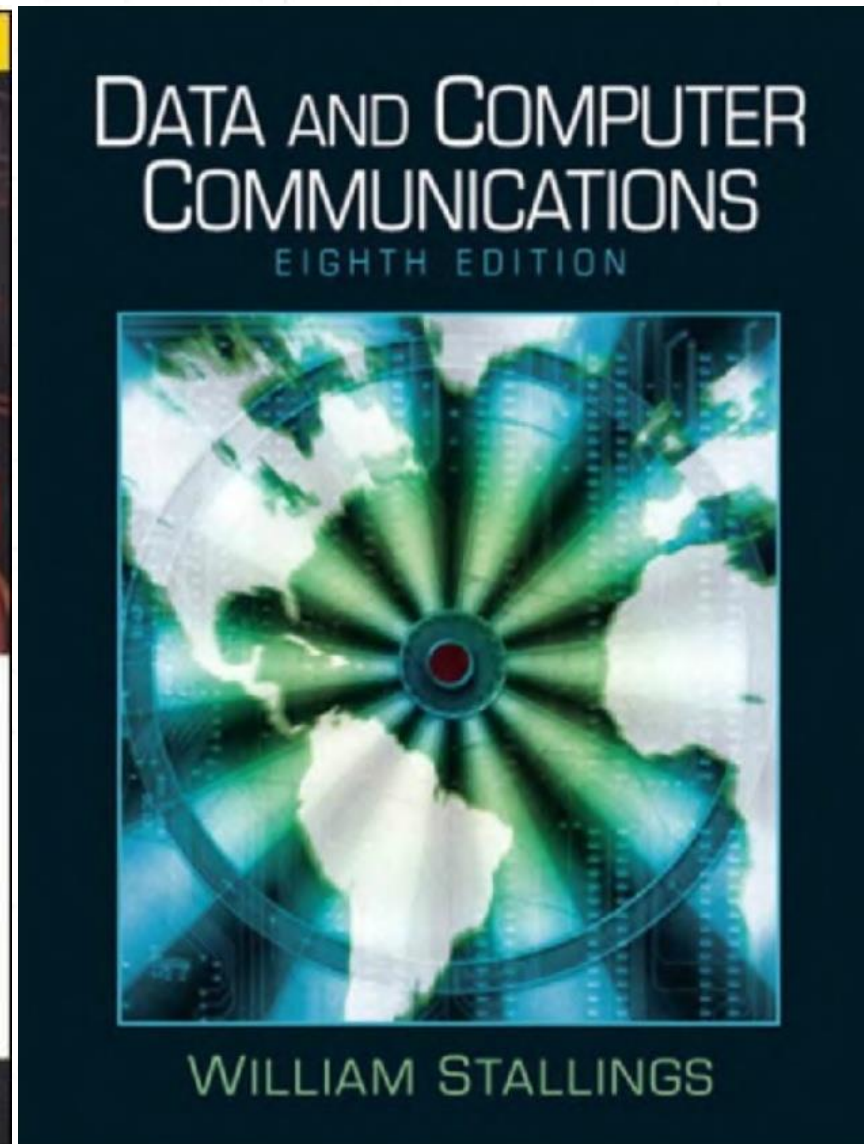
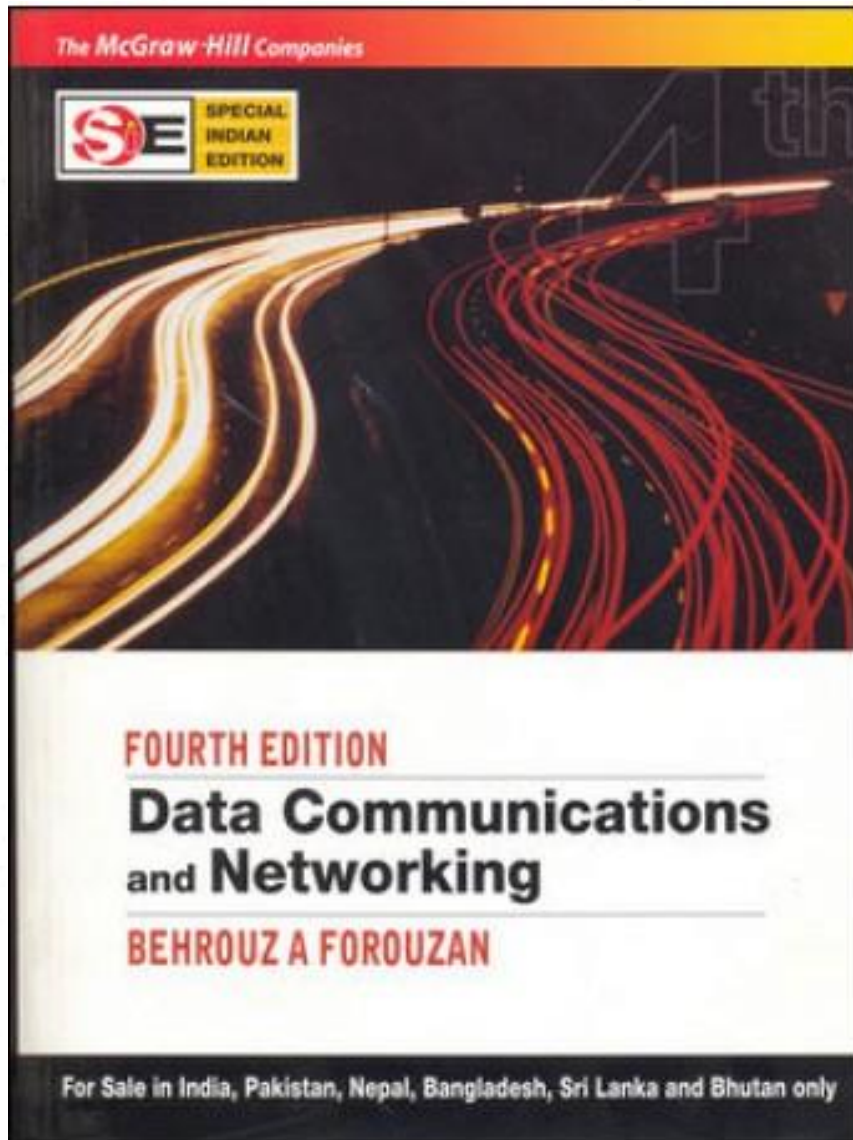
Module Delivery

- Per Week
 - 2hr Lecture
 - 1hr Tutorial
 - 2hr Practical session (once in 2 weeks)
- Module delivery clarifications
Within the lecture, tutorial and lab sessions
- Panel of Lecturers
 - Mr.Dhammika De Silva - Metro
 - Ms.Akshi De Silva – Malabe
 - Ms. Kaushika Kahatapitiya - Malabe

Module Assessment Criteria

- Continues Assessments – 40 %
 - Online practical Exam - 1 hr - (week 12) – 20 %
 - Mid Online - 1 hr - (week 8) - 20 %
- Final Examination – 60%

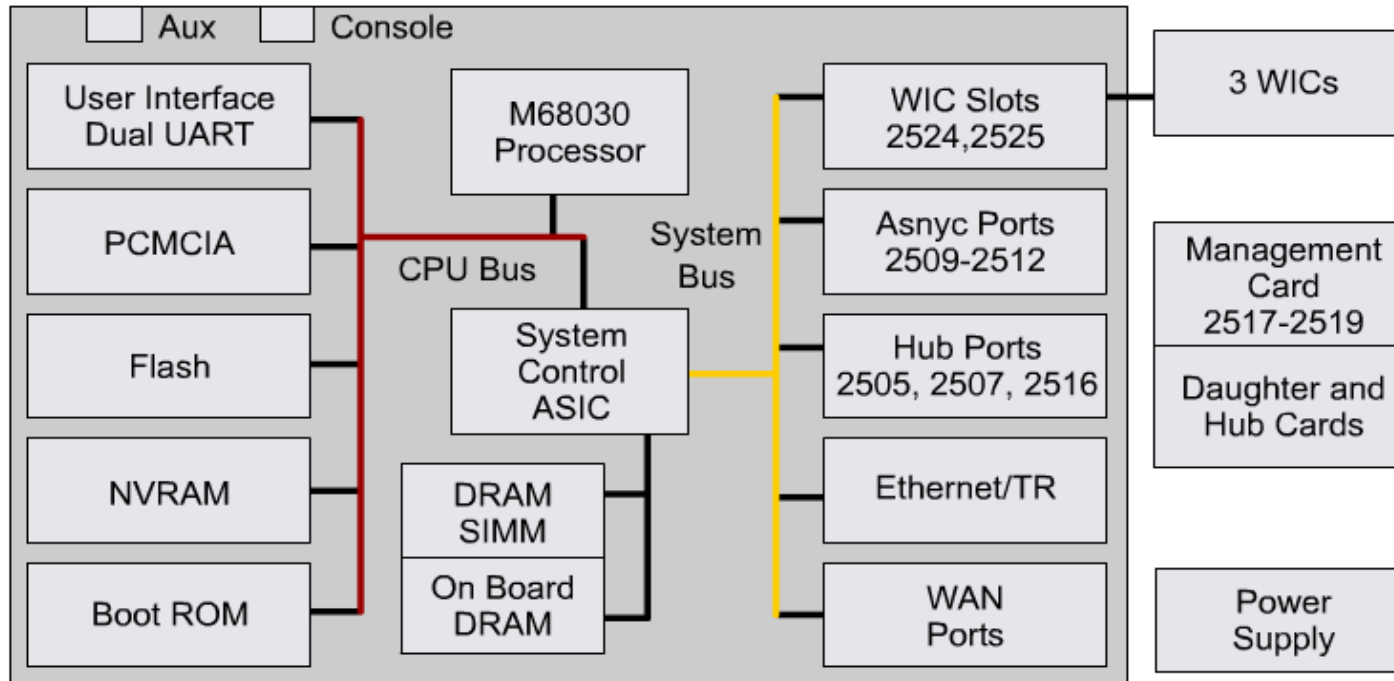
Recommended Books



Lecture 1

Overview of Configuration of Network Devices

Network Devices – Internal Components



- CPU
- RAM
- Flash
- NVRAM

- Buses
- ROM
- Interfaces
- Power Supply

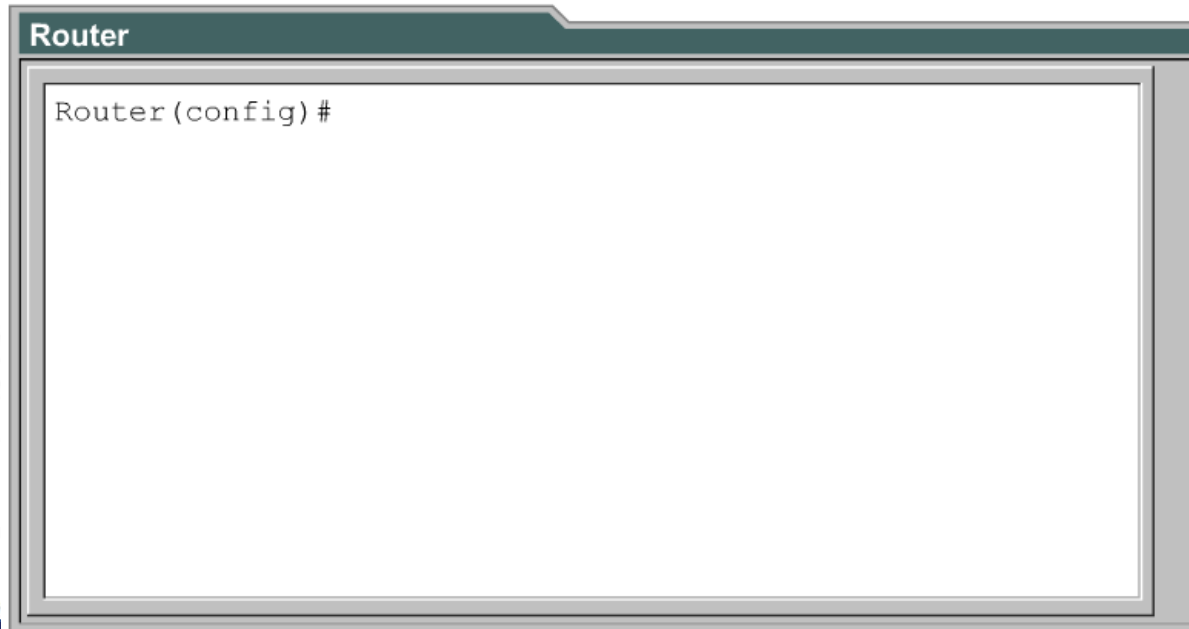
Cisco IOS Software

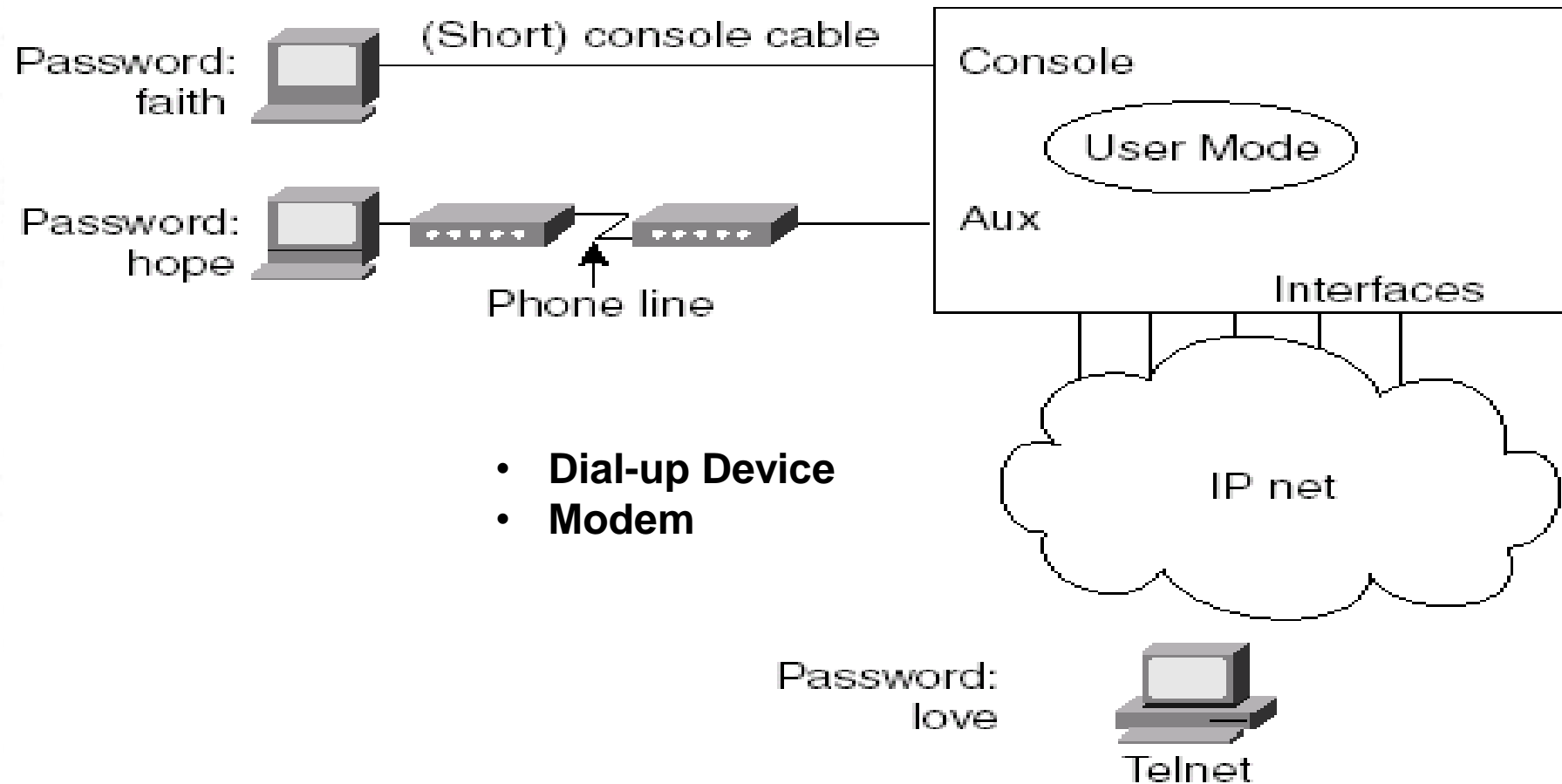


- As with a computer, a network device cannot function without an operating system.
- Cisco calls its OS as the **Cisco Internetwork Operating System** or **Cisco IOS**.

Command Line Interface (CLI)

- The Cisco IOS software uses a command-line interface (CLI) as the traditional console environment.
- This environment is accessible through several connection methods:
 - Console
 - AUX port
 - Telnet



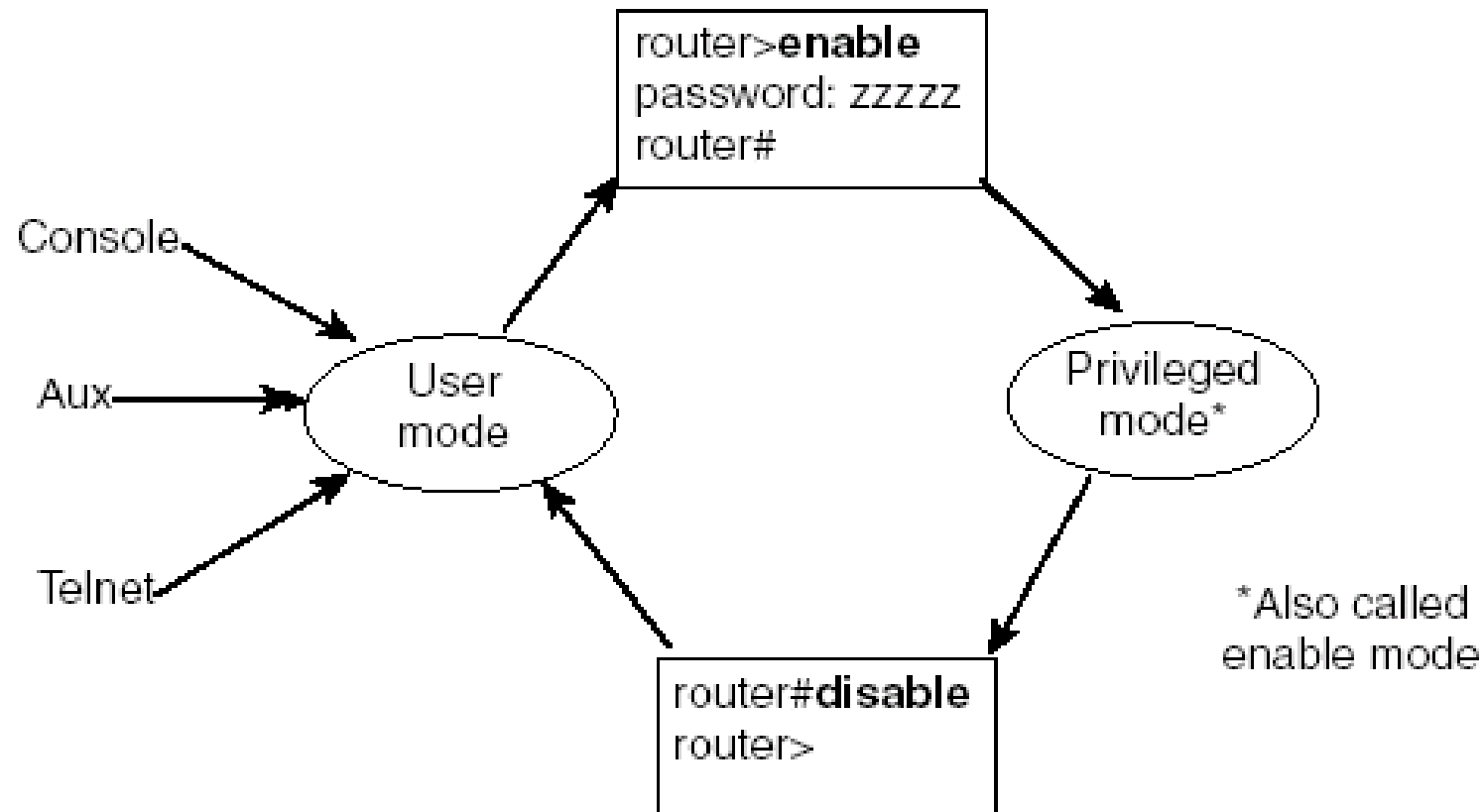


User Level Passwords

Access from . . .	Password Type	Configuration
Console	Console password	line console 0 login password <i>faith</i>
Auxiliary	Auxiliary password	line aux 0 login password <i>hope</i>
Telnet	vty password	line vty 0 4 login password <i>love</i>

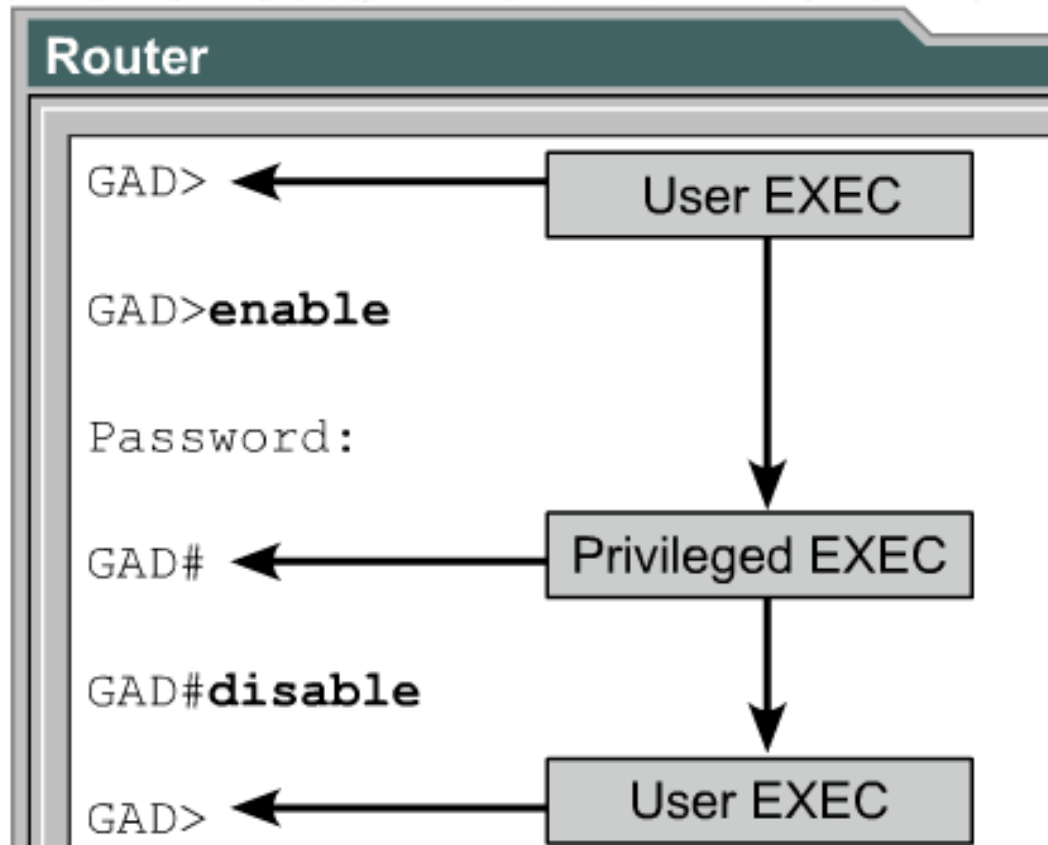


Router Modes

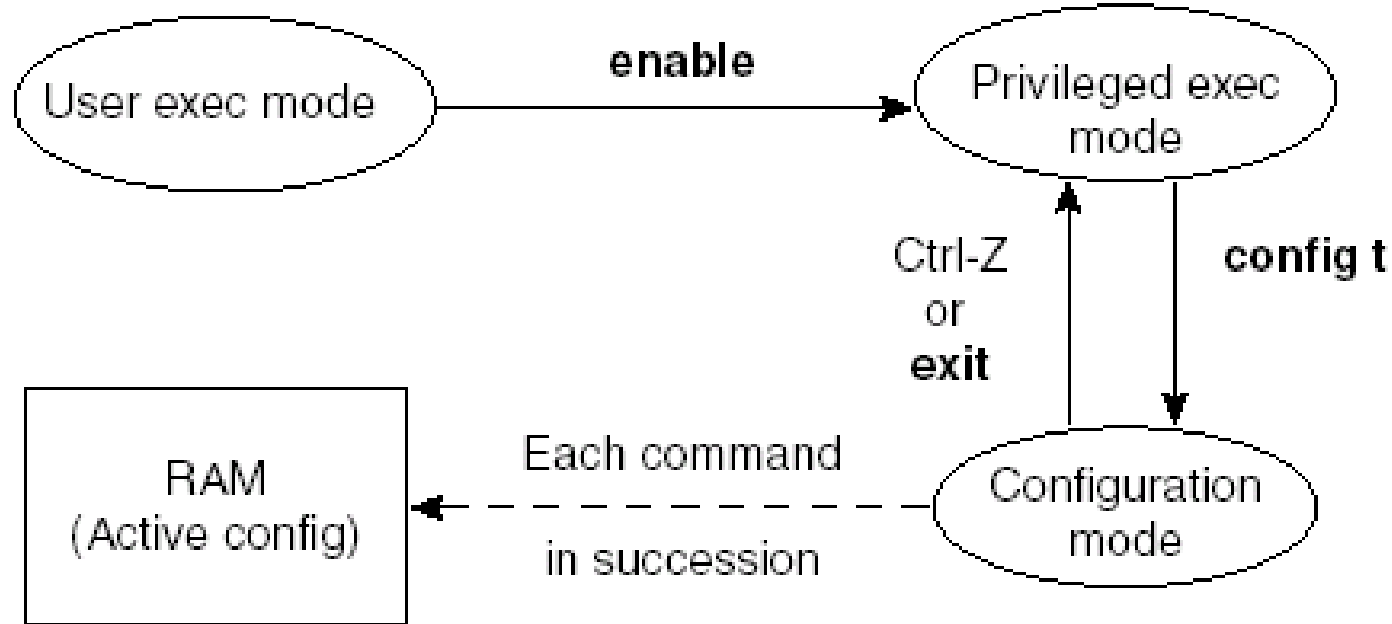


Router Modes

EXEC Mode	Prompt	Typical Use
User	GAD>	check the router status
Privileged	GAD#	accessing the router configuration modes



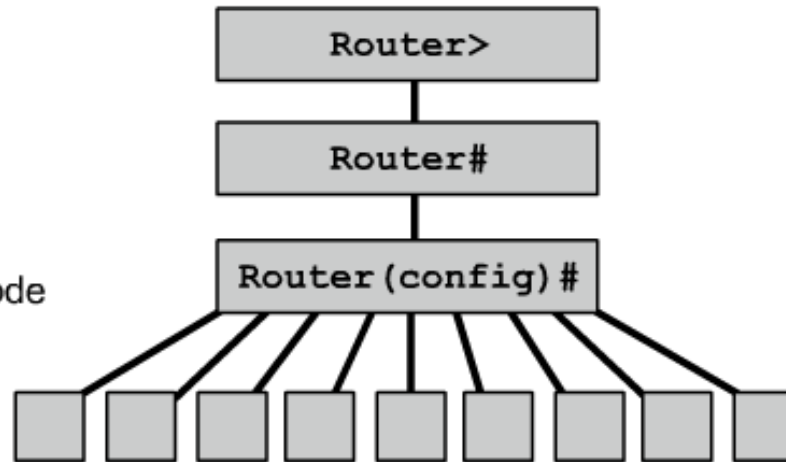
Router Modes



```
Router>
Router>enable
Router#
Router#configure terminal
Router(config)#hostname AtlantaHQ
AtlantaHQ(config)#
```

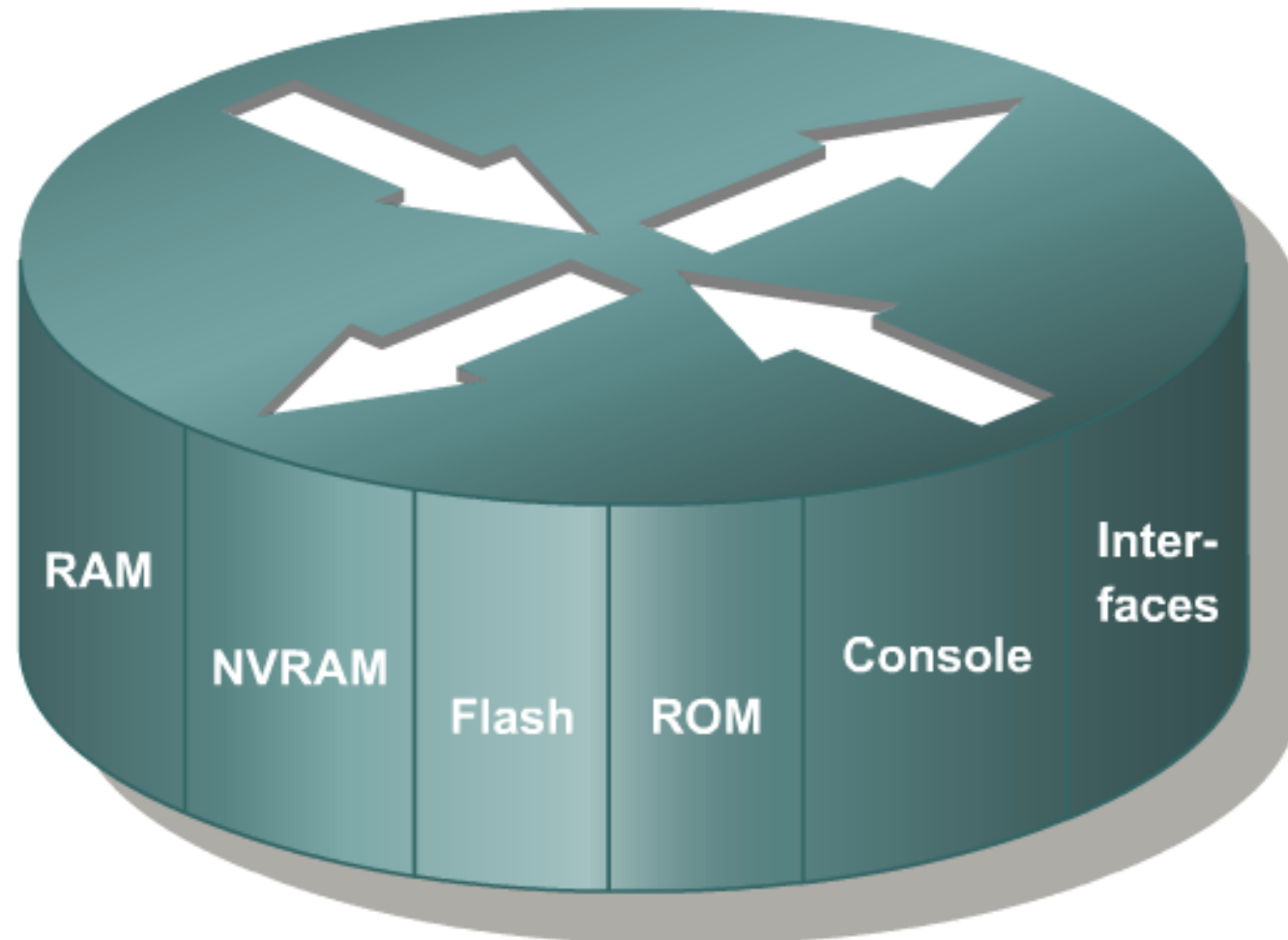
Router Modes

- User EXEC mode
- Privileged EXEC mode
- Global configuration mode
- Specific configuration modes



Configuration Mode	Prompt
Interface	Router (config-if)#
Subinterface	Router (config-subif)#
Controller	Router (config-controller)#
Map-list	Router (config-map-list)#
Map-class	Router (config-map-class)#
Line	Router (config-line)#
Router	Router (config-router)#
IPX-router	Router (config-ipx-router)#
Route-map	Router (config-route-map)#

Router Memory



Router Memory cont.

❖ RAM

- Store *running or active configuration* file
- Loses content when router is powered down
- A working storage

❖ ROM

- Read-Only Memory
- Stores **bootable IOS image** and bootstrap program

Router Memory cont.

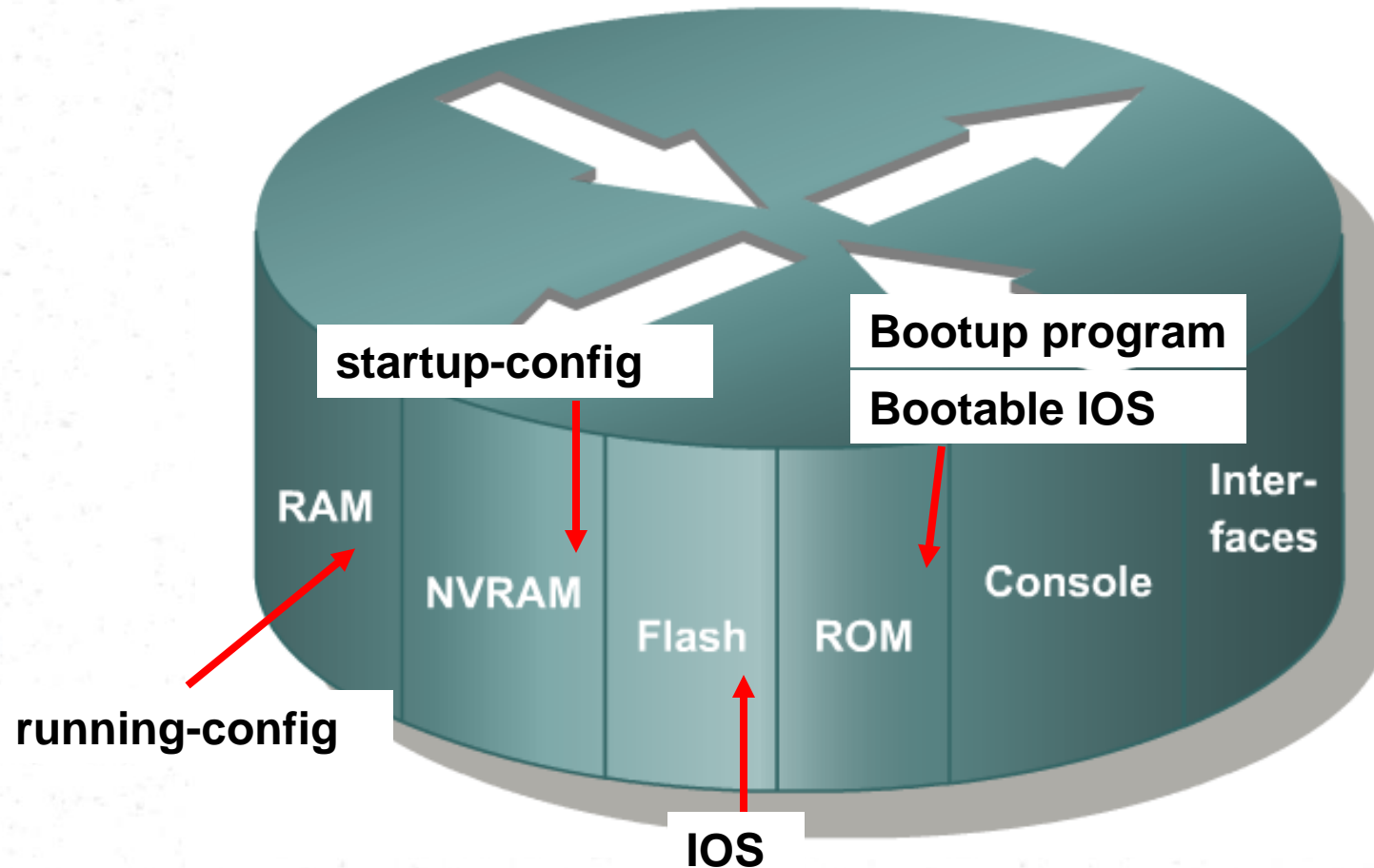
❖ NVRAM

- Provides storage for the **startup configuration file**
- Retains content when router is powered down

❖ Flash memory

- Holds the **fully functional IOS image**
- Retains content when router is powered down
- Is a type of electronically erasable, programmable ROM (EEPROM)

Router Memory cont.



Displaying configuration files

`show running-config`

Command Output

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

Current configuration:
!
version 11.1
!
    -- More --
```

`show startup-config`

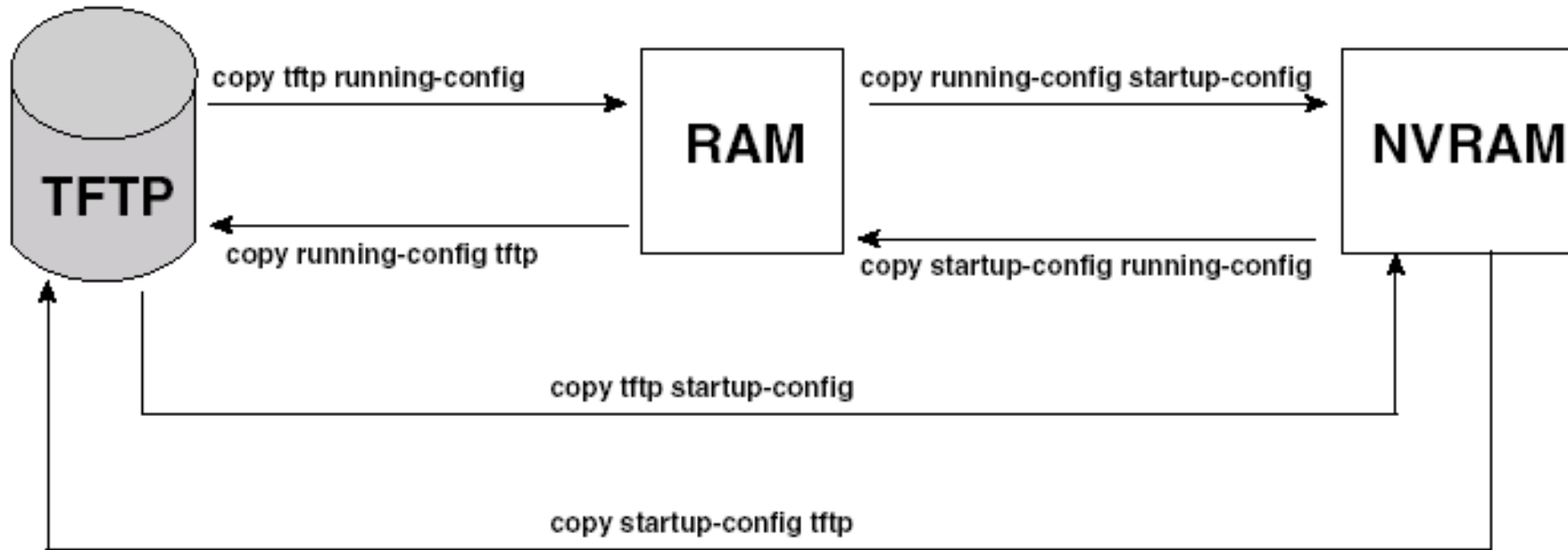
Command Output

```
Router#show startup-config
Using 1108 out of 130048 bytes
!
version 11.2
!
hostname router

    -- More --
```



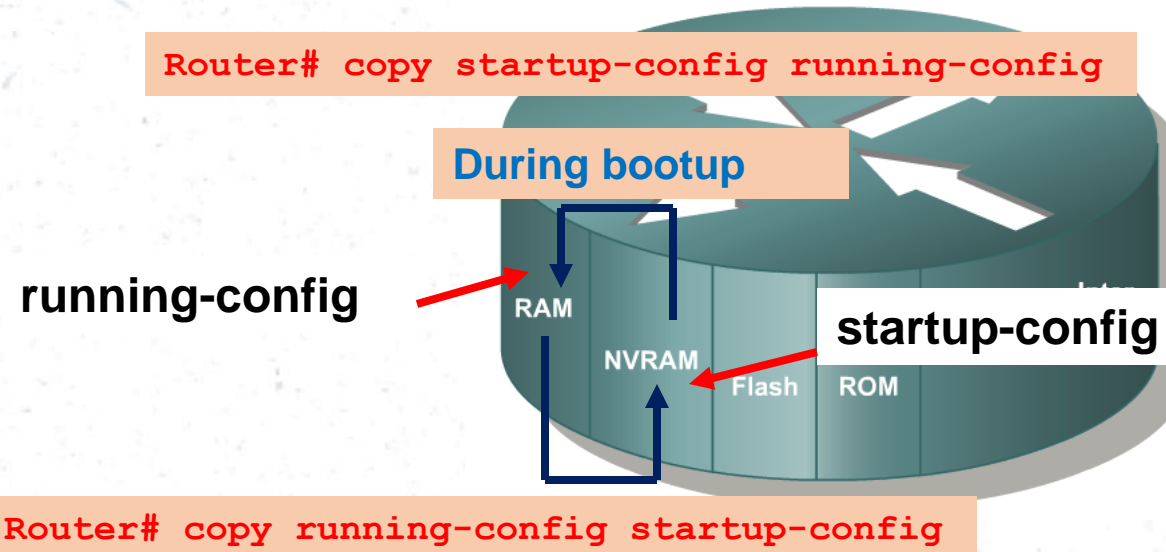
Managing configuration files



Copy Command

- copy files in a router (configuration file, new version of the IOS Software)
- Move configuration files among RAM, NVRAM, and TFTP server

copy running-config startup-config



- Changes to the router are put in the running-config file.
- If the router loses power or reboots, everything in RAM is lost including the running-config file.
- To make sure the changes to the router's configuration remain saved, you must copy the running-config from RAM into the startup-config into NVRAM:

```
Router# copy running-config startup-config
```

copy running-config startup-config cont.

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

```
Router#show startup-config
```

```
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router
!
!
ip subnet-zero
!
interface Ethernet0
  no ip address
  no ip directed-broadcast
  shutdown
!
```

The startup-config file now identical to running-config and the router will also have these changes if the router reboots.

running-config

startup-config

RAM

NVRAM

Flash

ROM

IOS

Console

Inter-
faces

copy tftp running-config

copy tftp startup-config

copy tftp flash

copy flash tftp

copy startup-config tftp

copy running-config tftp

TFTP Host



Router

```
Router#copy running-config tftp  
  
Remote host []? 131.108.2.155  
  
Name of configuration file to write[tokyo-config]?tokyo.2  
  
Write file tokyo.2 to 131.108.2.155? [confirm] y  
  
Writing tokyo.2 !!!!!!! [OK]
```

Router

```
Router#copy tftp running-config  
  
Host or network configuration file [host]?  
  
IP address of remote host [255.255.255.255]? 131.108.2.155  
  
Name of configuration file [Router-config]? tokyo.2  
  
Configure using tokyo.2 from 131.108.2.155? [confirm] y  
  
Booting tokyo.2 from 131.108.2.155:!! [OK-874/16000 bytes]
```

