

### Internal memory components of a cisco router

**ROM** : Memory containing micro-code for basic functions to start and maintain the router.  
**RAM/DRAM** : Stores the running configuration, routing tables, and packet buffers.  
**NVRAM** : Memory that does not lose information when power is lost. Stores the system's configuration file and the configuration register.  
**Flash Memory** : Stores the compressed IOS image.

### Router Default Boot Sequence for Cisco IOS

1. NVRAM
2. Flash (sequential)
3. TFTP server
4. ROM

The router first looks at Startup Config file in NV RAM, if not available, it falls back to Flash, then to TFTP and then to ROM.

### Router boot configuration commands

**boot system ROM** : boots from system ROM  
**boot system flash <IOS file name>** : boots IOS from flash memory  
**boot system tftp <IOS file name>**  
**<tftp\_addr>** : boots IOS from a tftp server

### Router Cursor Commands

**<ctrl> A**: Move to the beginning of the command line  
**<ctrl> E**: Move to the end of the command line  
**<ctrl> F**: Move forward one character, same as using "Right Arrow"  
**<ctrl> B**: Move backward one character, same as using "Left Arrow".  
**<ctrl> P**: Repeat Previous command, same as using "Up Arrow"  
**<ctrl> N**: Repeat Next (more recent) command, same as using "Down Arrow"  
**<esc> B**: Moves to beginning of previous word.  
**<esc> F**: Moves to beginning of next word.  
**<ctrl>R**: Creates new command prompt, followed by all the characters typed at the last one.

### Configuration Register Command

**Router(config)# config-register 0x10x** (where that last x is 0-F in hex), when the last x is: **0** = boot into ROM Monitor mode; **1** = boot the ROM IOS; **2 - 15** = look in startup-config file in NVRAM.

### Cisco router configurable locations

Console port, Virtual Terminals (vty), Auxiliary port, TFTP server and Network management station

### Router modes of operation include

|                        |                    |
|------------------------|--------------------|
| <b>Mode</b> ----->     | <b>Prompt</b>      |
| user exec----->        | Router>            |
| Privileged----->       | Router #           |
| global config----->    | Router(config)#    |
| Interface config-----> | Router(config-if)# |

### Router passwords

Enable password  
 Console password  
 Enable Secret  
 Virtual terminal password (vty)  
 Auxiliary password

### Three ways router learns to forward packets

- 1. Static routes** : Configured by the administrator manually. Syntax : ip route <ip-addr><mask-addr><ip-addr>  
**Ex:** R1(config)#ip route 192.168.200.0 255.255.255.0 192.168.1.2
- 2. Default routes** : This is used when a route is not known or is infeasible. Syntax : ip route 0.0.0.0 0.0.0.0 <ip-addr>  
**Ex:** R1(config)#ip route 0.0.0.0 0.0.0.0 192.168.1.2
- 3. Dynamic routes** : In dynamic routing, the routing tables are automatically updated. Dynamic routing uses broadcasts and multicasts to communicate with other routers.

### More info

To enable the Cisco IOS to forward packets destined for obscure subnets of directly connected networks onto the best route, use "ip classless" command.

By default, Cisco routers support 5 simultaneous telnet sessions. This number can be configured using IOS commands.