

*CISCO (COMPUTER INFORMATION TECHNOLOGY)
CERTIFIED NETWORK ASSOCIATE*

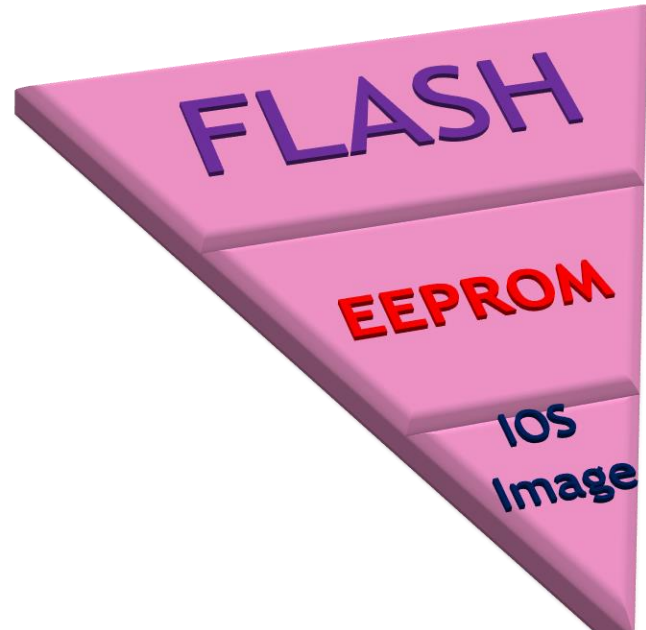
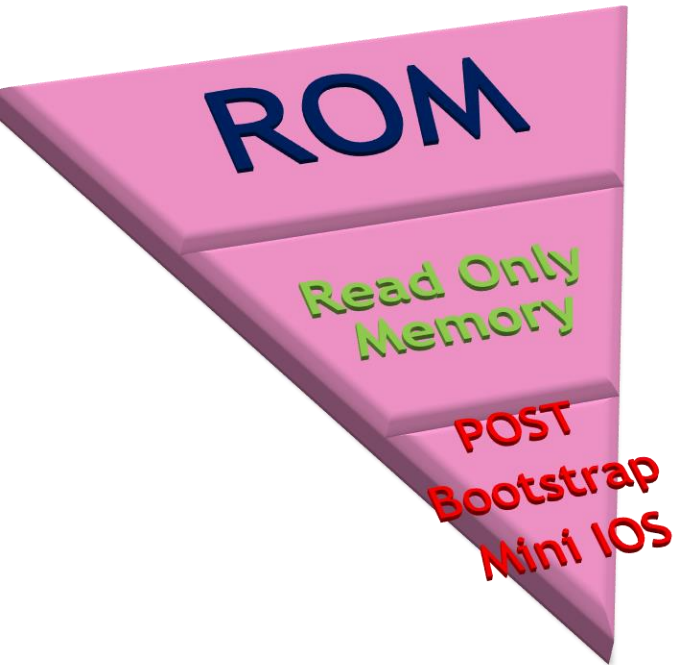
▶ **ROUTING**

▶ **SECURITY**

▶ **SWITCHING**

ROUTER COMPONENTS

- ▶ **Processor-** CPU executes the instructions of the operating system. They also perform functions such as system initialization, routing functions, and network interface control.
- ▶ **ROM** - This maintains the instructions for POST (Power on Self Test) for diagnosis and also stores the **bootstrap** program and basic OS software.
- ▶ **RAM-** It stores the **routing tables** and the configuration file while the router is powered on. The “**running-config**” is stored here. The contents of the RAM are lost when the router is restarted or powered down.
- ▶ **NVRAM** - It stores the “**startup-config**” file which contain ‘**Configuration Register**’. The contents in the NVRAM remain even after the router is shutdown or rebooted.
- ▶ **Flash-** This is the location where the “**Cisco IOS image file**” is stored which is the operating system of the router itself. The contents in the flash memory remain even after reboot or shutdown. This is a type of EEPROM.
- ▶ **Interfaces-** They are physical connectors that connect the router to the network for packet entry and exit.
- ▶ **Power supply**

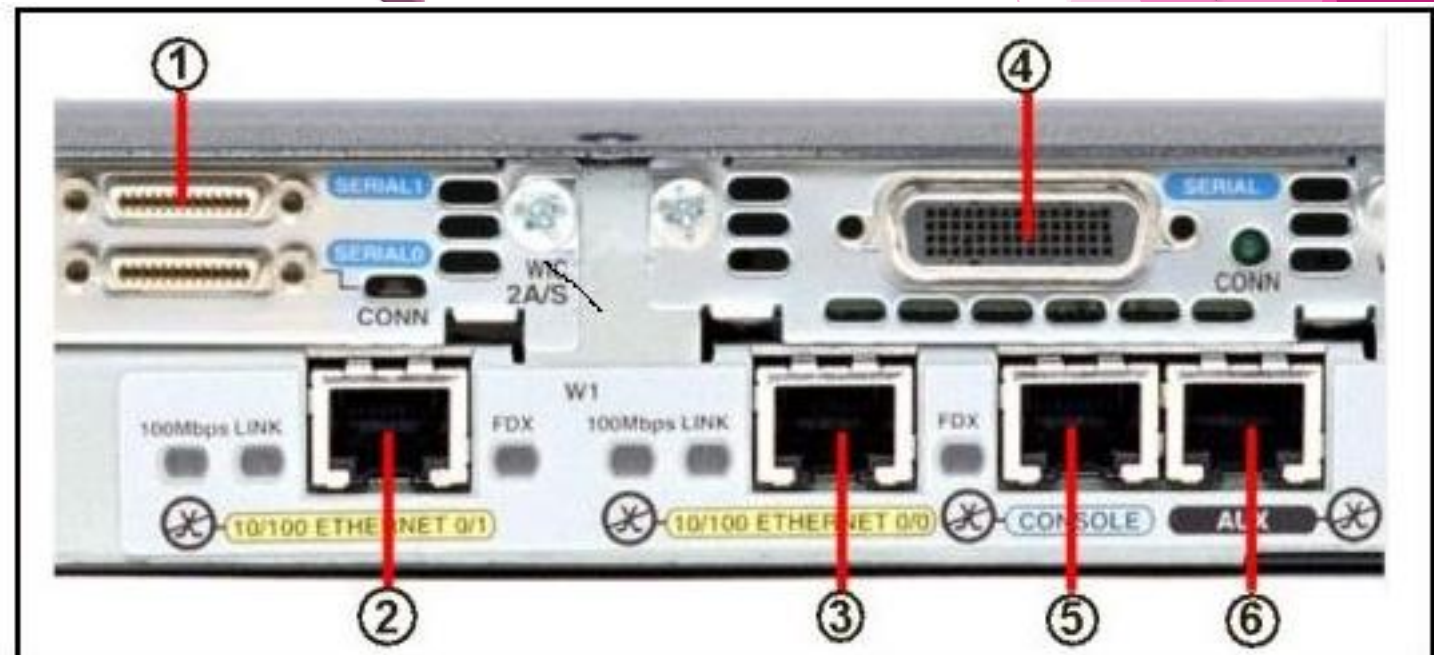


NVRAM

Non-Volatile RAM

Startup Configuration

Configuration Register



Router boot process

```
cisco 2811 (MPC860) processor (revision 0x200) with 60416K/5120K bytes of memory
```

Router model

RAM

```
Processor board ID JAD05190MTZ (4292891495)
```

```
M860 processor: part number 0, mask 49
```

```
2 FastEthernet/IEEE 802.3 interface(s)
```

```
239K bytes of non-volatile configuration memory.
```

NVRAM

```
62720K bytes of ATA CompactFlash (Read/Write)
```

Flash memory

```
Cisco IOS Software, 2800 Software (C2800NM-ADVIPSERVICESK9-M), Version 12.4(15)T
```

```
1, RELEASE SOFTWARE (fc2)
```

IOS version

```
Technical Support: http://www.cisco.com/techsupport
```

```
Copyright (c) 1986-2007 by Cisco Systems, Inc.
```

```
Compiled Wed 18-Jul-07 06:21 by pt_rel_team
```


POST

The router is powered on-
The router first runs Power-On Self Test.

LOAD AND RUN BOOTSTRAP CODE

IOS can store in three following locations.

1- FLASH MEMORY

2- TFTP SERVER

3- ROM

The bootstrap (It is a mini program) checks the Configuration Register value to specify where to load the IOS. By default (the default value of Configuration Register is 2102, in hexadecimal), the router first looks for “boot system” commands in startup-config file. If it finds these commands, it will run boot system commands in order they appear in startup-config to locate the IOS. If not, the IOS image is loaded from Flash . If the IOS is not found in Flash, the bootstrap can try to load the IOS from TFTP server or from ROM (mini-IOS- it have minimum configurations).



After the IOS is found, it is loaded into RAM.

The IOS attempts to load the configuration file (startup-config) from NVRAM to RAM. If the startup-config is not found in NVRAM, the IOS attempts to load a configuration file from TFTP. If no TFTP server responds, the router enters Setup Mode (Initial Configuration Mode).