# CISCO ROUTER BOOT PROCESS

**Memory Types:** Generally Cisco routers & switches contain four types of memory

**1.Read-Only Memory (ROM):** ROM stores the router's bootstrap startup program,operating system software, and power-on diagnostic test programs (POST).

**2.Flash Memory:** "flash", the IOS images are held here.Flash is erasable and reprogrammable ROM. Flash memory content is retained by the router on reload.

**3.Random-Access Memory (RAM):** Stores operational information such as routing tables and the running configuration file.RAM contents are lost when the router is powered down or reloaded.

**4.Non-volatile RAM (NVRAM):** NVRAM holds the router's startup configuration file.NVRAM contents are not lost when the router is powered down or reloaded.

**Shortcut remember:**

1.ROM contains POST,basic program.

2. Flash contains IOS ( contents do not lost in power off )

3. RAM holds the running configuration file.

4.NVRAM holds the startup configuration file.

**Note :** Cisco IOS (originally **Internetwork Operating System**) is a family of software used on most Cisco Systems routers and current Cisco network switches.

## Router boot process:

1. The router is powered on.

2. The router first runs Power-On Self Test (POST)

3. The bootstrap checks the Configuration Register value to specify where to load the IOS.By default (the default value of Configuration Register is 2102, in hexadecimal).

   A) 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.

   B) 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).

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

5. 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).

# Bringing up a Router

- Boot-up process: