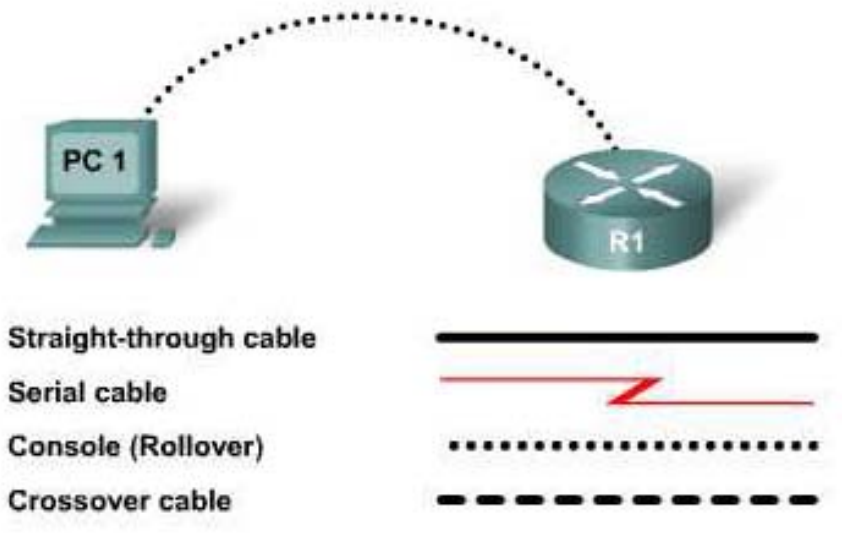
Lab 3.2.5 Observing the Router Startup Process



Objective

- Identify and explain the stages of the router startup process.

640-802 CCNA Exam Objective

This lab contains skills that relate to the following CCNA exam objective:

- Describe the operation of Cisco routers, including the router boot process, POST, and router components.

Expected Results and Success Criteria

Before starting this lab, read through the tasks that you are expected to perform. What do you expect the result of performing these tasks will be?

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How is an understanding of the router startup process useful in network administration?

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How will a network administrator know if the router started correctly?

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Background / Preparation

During this lab, you will observe the startup process of a Cisco router while logged into a console terminal session.

Information about the state of the router startup process, platform, and IOS details is displayed on the terminal screen as the router starts up.

This information can be recorded for future use to help troubleshoot startup problems.

The sample output used in this lab matches that of a particular 1841 series router and IOS platform. Other Cisco routers and IOS versions may produce slightly different output.

Task 1: Observe and Examine the Router Startup Process

Step 1: Connect and set up the router

NOTE: If the PC used in this lab is also connected to your Academy LAN or to the Internet, ensure that you record the cable connections and TCP/IP settings so that these can be restored at the conclusion of the lab.

a. Referring to the topology diagram, connect the console (or rollover) cable to the console port on the router and the other cable end to the host computer with a DB-9 or DB-25 adapter to the COM 1 port. Ensure that power has been applied to both the host computer and router.

b. Establish a HyperTerminal or other terminal emulation program connection to the router.

Step 2: Restart the router and observe the output

a. From the privileged EXEC prompt, issue the **reload** command. Confirm the reload when prompted.

b. Observe the output as the router restarts.

Output similar to this will be displayed.

```
POST information:
System Bootstrap, Version 12.4(13r)T, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2006 by cisco Systems, Inc.
PLD version 0x10
GIO ASIC version 0x127
c1841 platform with 131072 Kbytes of main memory
Main memory is configured to 64 bit mode with parity disabled

Locating and Loading information:
Readonly ROMMON initialized
program load complete, entry point: 0x8000f000, size: 0xcb80
program load complete, entry point: 0x8000f000, size: 0xcb80

program load complete, entry point: 0x8000f000, size: 0xd4a9a0
Self decompressing the image :
################################################
################################################################################
################## [OK]

Smart Init is enabled
smart init is sizing iomem
  ID            MEMORY_REQ         TYPE
                0X003AA110 public buffer pools
                0X00211000 public particle pools
0X0013          0X00035000 Card in slot 0
                0X000021B8 Onboard USB
```

```
If any of the above Memory Requirements are
"UNKNOWN", you may be using an unsupported
configuration or there is a software problem and
system operation may be compromised.

Allocating additional 7692243 bytes to IO Memory.
PMem allocated: 117440512 bytes; IOMem allocated: 16777216 bytes

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(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

           cisco Systems, Inc.
           170 West Tasman Drive
           San Jose, California 95134-1706


Cisco IOS Software, 1841 Software (C1841-IPBASE-M), Version 12.4(1c),
RELEASE SO
FTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Tue 25-Oct-05 17:10 by evmiller
Image text-base: 0x6007ECA0, data-base: 0x61480000

Port Statistics for unclassified packets is not turned on.
Cisco 1841 (revision 7.0) with 114688K/16384K bytes of memory.
Processor board ID FTX1118X0BN
2 FastEthernet interfaces
2 Low-speed serial(sync/async) interfaces
DRAM configuration is 64 bits wide with parity disabled.
191K bytes of NVRAM.
31360K bytes of ATA CompactFlash (Read/Write)
```

Step 3: Examine the router startup output

The startup process has three stages:

a. Performing the POST and loading the bootstrap program

Examine the output displayed. Look at the highlighted section in the sample output in this lab that relates to the POST. Mark any differences between your observed output and this sample.

What are possible reasons for these differences?

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What does the POST test in the router?

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If the POST is successful, what is loaded into RAM?

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What is the purpose of what is loaded into RAM?

_____

What would happen if the POST is unsuccessful, and what could this mean?

_____

_____

b. Locating and loading the IOS software

Examine the displayed output. Look at the sample output in this lab that relates to the IOS loading. Mark any differences between your observed output and this sample.

What are possible reasons for these differences?

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_____

What are the three possible locations of the IOS?

_____

_____

_____

How is the IOS location to be used specified?

_____

What will be the result if an IOS image cannot be located and loaded?

_____

c. Locating and executing the startup configuration file or entering setup mode

Examine the displayed output. Look at the sample output in this lab that relates to the startup configuration loading. Mark any differences between your observed output and this sample.

What are possible reasons for these differences?

_____

_____

What is the output if the router does not have a configuration to load?

_____

What is displayed if a startup configuration is loaded?

_____

Step 4: Clean up

Erase the configurations and reload the router. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), delete the IOS image file from the TFTP directory, reconnect the appropriate cabling, and restore the TCP/IP settings.

Task 2: Reflection / Challenge

Prepare a troubleshooting checklist based on the router startup stages and the hardware and software features associated with each stage. Format the checklist so that if it is noted that a stage was unsuccessful, the possible problems can be readily identified. For example, for “IOS not loaded” enter “ROMON prompt displayed.”

Prepare a second checklist listing possible router faults or problems. For example, “no cooling fan sound,” “LEDs not illuminated or showing unusual behavior,” or “unexpected ROMON prompt displayed.” For each problem listed, enter the stage of the router startup process that failed.