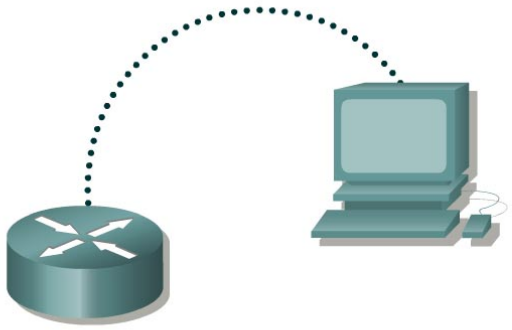
Lab 5.1.5 Troubleshooting Configuration Register Boot Problems – Instructor Version 2500



Router designation	Router name	Enable secret passwor	Enable/VTY/ and Console passwords
Router 1	GAD	class	cisco

Objective

- Check and document the configuration register settings related to boot method.
- Configure the router to boot using the configuration file in NVRAM and reload the router.

Background/Preparation

Setup a network as displayed in the figure. Any router that meets the interface requirements may be used. Possible routers include 800, 1600, 1700, 2500, 2600 routers, or a combination. Refer to the chart at the end of the lab to correctly identify the interface identifiers to be used based on the equipment in the lab. The configuration output used in this lab is produced from 1721 series routers. Any other router used may produce slightly different output. Start a HyperTerminal session as performed in the Establishing a HyperTerminal session lab.

Note: Go to the erase and reload instructions at the end of this lab. Perform those steps on the router in this lab assignment before continuing.

Step 1 Login to the router

a. Connect to the router and login.

Step 2 Configure the router name and configuration register setting

a. Enter the following commands:

```
Router>enable
Router#configure terminal
Router(config)#hostname GAD
GAD(config)#config-register 0x2142
GAD(config)#exit
```

Step 3 Save the existing running-config to the startup-config

a. At the privileged EXEC command prompt enter:

```
GAD#copy running-config startup-config
Destination filename [startup-config]? Enter
```

Step 4 Restart the router

a. At the privileged EXEC command prompt enter:

```
GAD#reload
Proceed with reload? [confirm] Enter
```

After the reload the router will respond with:

```
        --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:n
```

Type **n** and press **Enter**.

Step 5 View the running configuration file

a. Enter **show running-config** at the privileged EXEC mode prompt. The router will display information on the running configuration file stored in RAM.

b. Have the configuration commands from Step 2 loaded into RAM? No

Step 6 Reload the saved configuration

a. At the privileged EXEC command prompt enter:

```
Router#copy startup-config running-config
Destination filename [running-config]? Enter
```

b. Notice that the router name that was configured in Step 2 (GAD), is now displayed. Why did the Startup config file not load when we reloaded the router?
The startup-config in NVRAM was ignored.

Step 7 Display IOS version and other important information

a. Enter the **show version** command at the router prompt.

The router will display information about the IOS that is running in RAM.

b. Notice that at the end of the output shows a configuration register setting of 0x2142 that we configured in Step 2. This is the problem. The setting configures the router to ignore the Startup configuration file on bootup. The setting will be useful to boot up in the password recovery mode.

Step 8 Change the config-register to boot from NVRAM, save, and reload the router

a. Enter global configuration mode and enter the following commands:

```
GAD>enable
GAD#configure terminal
GAD(config)#config-register 0x2102
GAD(config)#exit
GAD#copy running-config startup-config
Destination filename [startup-config]? Enter
GAD#reload
Proceed with reload? [confirm] Enter
```

Step 9 Verify the configuration register setting

a. Once the router has rebooted, it should look to NVRAM for bootup configuration. Verify this by issuing the command, **show version**.

```
GAD#show version
```

The results will be shown. You should be able to see the config-register 0x2102.

Upon completion of the previous steps, logoff by typing **exit**. Turn the router off.

Erasing and reloading the router

Enter into the privileged EXEC mode by typing **enable**.

```
Router>enable
```

If prompted for a password, enter **class**. If “class” does not work, ask the instructor for assistance.

At the privileged EXEC mode, enter the command **erase startup-config**.

```
Router#erase startup-config
```

The responding line prompt will be:

```
Erasing the nvram filesystem will remove all files! Continue?
[confirm]
```

Press **Enter** to confirm.

The response should be:

```
Erase of nvram: complete
```

Now at the privileged EXEC mode, enter the command **reload**.

```
Router#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm]
```

Press **Enter** to confirm.

In the first line of the response will be:

```
Reload requested by console.
```

After the router has reloaded the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Press RETURN to get started!
```

Press **Enter**.

The router is ready for the assigned lab to be performed.

Router Interface Summary					
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2	Interface #5
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)			
1600	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)	
1700	FastEthernet 0 (FA0)	FastEthernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)	
2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)	
2600	FastEthernet 0/0 (FA0/0)	FastEthernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)	
In order to find out exactly how the router is configured, look at the interfaces. This will identify the type of router as well as how many interfaces the router has. There is no way to effectively list all of the combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart does not include any other type of interface even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in IOS command to represent the interface.					


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

Current configuration : 599 bytes
!
version 12.1
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname GAD
!
enable secret 5 $1$C5ZS$ASh31M2FyWGIZL4P2Ba.c/
enable password cisco
!
!
!
ip subnet-zero
!
!
!
!
interface Ethernet0
 no ip address
 shutdown
!
interface Serial0
 no ip address
 shutdown
 no fair-queue
!
interface Serial1
 no ip address
 shutdown
!
interface BRI0
 no ip address
 shutdown
!
ip classless
ip http server
!
!
line con 0
 password cisco
 logging synchronous
 login
line aux 0
line vty 0 4
 password cisco
 login
!
end
```

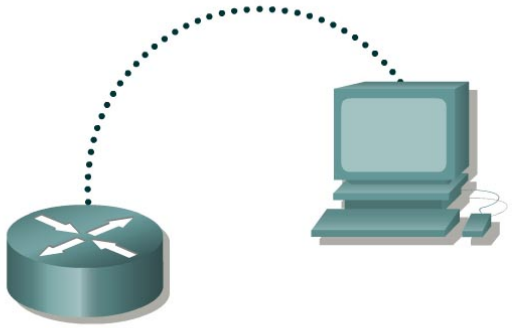


```
GAD#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-I-L), Version 12.1(18), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 02-Dec-02 23:45 by kellythw
Image text-base: 0x03041E94, data-base: 0x00001000

ROM: System Bootstrap, Version 11.0(10c), SOFTWARE
BOOTLDR: 3000 Bootstrap Software (IGS-BOOT-R), Version 11.0(10c), RELEASE
SOFTWARE (fc1)

GAD uptime is 43 minutes
System returned to ROM by reload
System image file is "flash:c2500-i-l.121-18.bin"

cisco 2500 (68030) processor (revision N) with 14336K/2048K bytes of memory.
Processor board ID 08026577, with hardware revision 00000001
Bridging software.
X.25 software, Version 3.0.0.
Basic Rate ISDN software, Version 1.1.
1 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
1 ISDN Basic Rate interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read ONLY)

Configuration register is 0x2102


GAD#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
GAD(config)#config-register 0x2142
GAD(config)#exit
GAD#
00:44:53: %SYS-5-CONFIG_I: Configured from console by console
GAD#


GAD#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-I-L), Version 12.1(18), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 02-Dec-02 23:45 by kellythw
Image text-base: 0x03041E94, data-base: 0x00001000

ROM: System Bootstrap, Version 11.0(10c), SOFTWARE
BOOTLDR: 3000 Bootstrap Software (IGS-BOOT-R), Version 11.0(10c), RELEASE
SOFTWARE (fc1)

GAD uptime is 44 minutes
System returned to ROM by reload
System image file is "flash:c2500-i-l.121-18.bin"

cisco 2500 (68030) processor (revision N) with 14336K/2048K bytes of memory.
Processor board ID 08026577, with hardware revision 00000001
Bridging software.
X.25 software, Version 3.0.0.
Basic Rate ISDN software, Version 1.1.
```



```
1 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
1 ISDN Basic Rate interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read ONLY)

Configuration register is 0x2102 (will be 0x2142 at next reload)


Router#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-I-L), Version 12.1(18), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 02-Dec-02 23:45 by kellythw
Image text-base: 0x03041E94, data-base: 0x00001000

ROM: System Bootstrap, Version 11.0(10c), SOFTWARE
BOOTLDR: 3000 Bootstrap Software (IGS-BOOT-R), Version 11.0(10c), RELEASE
SOFTWARE (fc1)

GAD uptime is 43 minutes
System returned to ROM by reload
System image file is "flash:c2500-i-l.121-18.bin"

cisco 2500 (68030) processor (revision N) with 14336K/2048K bytes of memory.
Processor board ID 08026577, with hardware revision 00000001
Bridging software.
X.25 software, Version 3.0.0.
Basic Rate ISDN software, Version 1.1.
1 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
1 ISDN Basic Rate interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read ONLY)

Configuration register is 0x2142
```


Lab 5.1.5 Troubleshooting Configuration Register Boot Problems – Instructor Version 2600



Router designation	Router name	Enable secret passwor	Enable/VTY/ and Console passwords
Router 1	GAD	class	cisco

Objective

- Check and document the configuration register settings related to boot method.
- Configure the router to boot using the configuration file in NVRAM and reload the router.

Background/Preparation

Setup a network as displayed in the figure. Any router that meets the interface requirements may be used. Possible routers include 800, 1600, 1700, 2500, 2600 routers, or a combination. Refer to the chart at the end of the lab to correctly identify the interface identifiers to be used based on the equipment in the lab. The configuration output used in this lab is produced from 1721 series routers. Any other router used may produce slightly different output. Start a HyperTerminal session as performed in the Establishing a HyperTerminal session lab.

Note: Go to the erase and reload instructions at the end of this lab. Perform those steps on the router in this lab assignment before continuing.

Step 1 Login to the router

a. Connect to the router and login.

Step 2 Configure the router name and configuration register setting

a. Enter the following commands:

```
Router>enable
Router#configure terminal
Router(config)#hostname GAD
GAD(config)#config-register 0x2142
GAD(config)#exit
```

Step 3 Save the existing running-config to the startup-config

a. At the privileged EXEC command prompt enter:

```
GAD#copy running-config startup-config
Destination filename [startup-config]? Enter
```

Step 4 Restart the router

a. At the privileged EXEC command prompt enter:

```
GAD#reload
Proceed with reload? [confirm] Enter
```

After the reload the router will respond with:

```
        --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:n
```

Type **n** and press **Enter**.

Step 5 View the running configuration file

a. Enter **show running-config** at the privileged EXEC mode prompt. The router will display information on the running configuration file stored in RAM.

b. Have the configuration commands from Step 2 loaded into RAM? No

Step 6 Reload the saved configuration

a. At the privileged EXEC command prompt enter:

```
Router#copy startup-config running-config
Destination filename [running-config]? Enter
```

b. Notice that the router name that was configured in Step 2 (GAD), is now displayed. Why did the Startup config file not load when we reloaded the router?
The startup-config in NVRAM was ignored.

Step 7 Display IOS version and other important information

a. Enter the **show version** command at the router prompt.

The router will display information about the IOS that is running in RAM.

b. Notice that at the end of the output shows a configuration register setting of 0x2142 that we configured in Step 2. This is the problem. The setting configures the router to ignore the Startup configuration file on bootup. The setting will be useful to boot up in the password recovery mode.

Step 8 Change the config-register to boot from NVRAM, save, and reload the router

a. Enter global configuration mode and enter the following commands:

```
GAD>enable
GAD#configure terminal
GAD(config)#config-register 0x2102
GAD(config)#exit
GAD#copy running-config startup-config
Destination filename [startup-config]? Enter
GAD#reload
Proceed with reload? [confirm] Enter
```

Step 9 Verify the configuration register setting

a. Once the router has rebooted, it should look to NVRAM for bootup configuration. Verify this by issuing the command, **show version**.

```
GAD#show version
```

The results will be shown. You should be able to see the config-register 0x2102.

Upon completion of the previous steps, logoff by typing **exit**. Turn the router off.

Erasing and reloading the router

Enter into the privileged EXEC mode by typing **enable**.

```
Router>enable
```

If prompted for a password, enter **class**. If “class” does not work, ask the instructor for assistance.

At the privileged EXEC mode, enter the command **erase startup-config**.

```
Router#erase startup-config
```

The responding line prompt will be:

```
Erasing the nvram filesystem will remove all files! Continue?
[confirm]
```

Press **Enter** to confirm.

The response should be:

```
Erase of nvram: complete
```

Now at the privileged EXEC mode, enter the command **reload**.

```
Router#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm]
```

Press **Enter** to confirm.

In the first line of the response will be:

```
Reload requested by console.
```

After the router has reloaded the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Press RETURN to get started!
```

Press **Enter**.

The router is ready for the assigned lab to be performed.

Router Interface Summary					
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2	Interface #5
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)			
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2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)	
2600	FastEthernet 0/0 (FA0/0)	FastEthernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)	
In order to find out exactly how the router is configured, look at the interfaces. This will identify the type of router as well as how many interfaces the router has. There is no way to effectively list all of the combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart does not include any other type of interface even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in IOS command to represent the interface.					


```
Router#copy startup-config runnig-config
Destination filename [running-config]?

532 bytes copied in 0.832 secs (639 bytes/sec)


GAD#show version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-IS-M), Version 12.2(12), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Wed 21-Aug-02 03:01 by pwade
Image text-base: 0x8000808C, data-base: 0x810CE168

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)

GAD uptime is 3 minutes
System returned to ROM by reload
System image file is "flash:c2600-is-mz.122-12.bin"

cisco 2621 (MPC860) processor (revision 0x600) with 60416K/5120K bytes of
memory.
Processor board ID JAD054304U6 (196842265)
M860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
2 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102


GAD#show version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-IS-M), Version 12.2(12), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Wed 21-Aug-02 03:01 by pwade
Image text-base: 0x8000808C, data-base: 0x810CE168

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)

GAD uptime is 3 minutes
System returned to ROM by reload
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M860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
2 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102 (will be 0x2142 at next reload)
```



```
GAD#show version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-IS-M), Version 12.2(12), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
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System returned to ROM by reload
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2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2142



GAD#show running-config
Building configuration...

Current configuration : 539 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname GAD
!
!
ip subnet-zero
!
!
!
call rsvp-sync
!
!
interface FastEthernet0/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial0/0
 no ip address
 shutdown
!
interface FastEthernet0/1
 no ip address
```



```
 shutdown
 duplex auto
 speed auto
!
interface Serial0/1
 no ip address
 shutdown
!
ip classless
ip http server
!
!
dial-peer cor custom
!
!
!
!
line con 0
line aux 0
line vty 0 4
 login
!
end

GAD#
```

