

15 Cisco Device Management

- Answer Key

In this lab you will perform a factory reset, password recovery, configuration backup, and system image backup and recovery on a Cisco router. You will also perform an IOS upgrade on a Cisco switch.

Factory Reset

- 1) View the running configuration on R1. Note that the hostname and interface have been configured.

```
R1#sh run
Building configuration...

Current configuration : 696 bytes
!
hostname R1
!
interface GigabitEthernet0/0
ip address 10.10.10.1 255.255.255.0
duplex auto
speed auto
```

- 2) Factory reset R1 and reboot.

```
R1#write erase
Erasing the nvram filesystem will remove all configuration
files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
R1#reload
Proceed with reload? [confirm]
```

- 3) Watch the boot up process as the router boots.

```
System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
```

```
Readonly ROMMON initialized
```

```
IOS Image Load Test
```

Digitally Signed Release Software

Self decompressing the image :

```
#####  
##### [OK]
```

- 4) The router should boot into the Setup Wizard. Exit out of the wizard and then confirm the startup and running configurations are empty.

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: **no**

```
Router>enable  
Router#show run  
Building configuration...  
hostname Router  
!  
interface GigabitEthernet0/0  
no ip address  
duplex auto  
speed auto  
shutdown
```

```
Router#show start  
startup-config is not present
```

- 5) Paste the configuration for R1 from the '15 Cisco Device Management Configs.zip' file back into the configuration and save.

```
Router#configure terminal  
Router(config)#hostname R1  
R1(config)#!  
R1(config)#interface GigabitEthernet0/0  
R1(config-if)# ip address 10.10.10.1 255.255.255.0  
R1(config-if)# duplex auto  
R1(config-if)# speed auto  
R1(config-if)# no shutdown  
R1(config-if)#!  
R1(config-if)#line con 0  
R1(config-line)# exec-timeout 30 0  
R1(config-line)#end  
  
R1#copy run start  
Destination filename [startup-config]?  
Building configuration...  
[OK]
```

Password Recovery

- 6) Set the enable secret 'Flackbox1' on R1 and save the running-configuration.

```
R1(config)#enable secret Flackbox1
R1(config)# do copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R1(config)#
```

- 7) Configure the router to boot into the rommon prompt on next reload with an appropriate command and reboot the router.

```
R1(config)#config-register 0x2120
R1(config)#end
R1#reload
Proceed with reload? [confirm]
```

- 8) In rommon mode, configure the router to ignore the startup-config when booting up, and reload the router.

```
rommon 1 > confreg 0x2142
rommon 2 > reset
```

- 9) The router should boot into the Setup Wizard. Exit out of the wizard.

```
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: no
```

- 10) What do you expect to see if you view the running and startup configurations? Confirm this.

The running configuration should be empty because the router bypassed loading the startup config on boot up. The startup config should remain unchanged and all previous configuration should still be there.

```
Router#sh run
Building configuration...
```

```
hostname Router
!
interface GigabitEthernet0/0
no ip address
duplex auto
speed auto
```

```
Router#sh start
!
hostname R1
!
enable secret 5 $1$mERr$J2XZHM0gpVVXdLjC9lYtE1
!
interface GigabitEthernet0/0
ip address 10.10.10.1 255.255.255.0
duplex auto
speed auto
```

11) Copy the startup config to the running config. Do not miss this step or you will factory reset the router!

```
Router#copy start run
Destination filename [running-config]?
```

12) Verify the status of interface GigabitEthernet0/0. Why is it down?

```
R1#show ip interface brief
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 10.10.10.1 YES NVRAM administratively down down
GigabitEthernet0/1 unassigned YES NVRAM administratively down down
GigabitEthernet0/2 unassigned YES NVRAM administratively down down
Vlan1 unassigned YES NVRAM administratively down down
```

```
R1#show run
! truncated
interface GigabitEthernet0/0
ip address 10.10.10.1 255.255.255.0
duplex auto
speed auto
shutdown
```

Router interfaces are shut down by default. Because 'no shutdown' does not explicitly appear in the startup-configuration for the interface, when the startup-configuration is copied to the running-configuration the default value is applied and the interface is in the shutdown state.

13) Bring interface GigabitEthernet0/0 up.

```
R1(config)#interface g0/0
R1(config-if)#no shutdown
```

14) Remove the enable secret.

```
R1(config)#no enable secret
```

15) Ensure the router will reboot normally on the next reload and that you will be able to access the router.

```
R1(config)#config-register 0x2102
R1(config)#end
R1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

16) Reboot the router and confirm it has the expected configuration.

```
R1#reload
Proceed with reload? [confirm]
```

```
R1>en
R1#show run
Building configuration...
hostname R1
!
interface GigabitEthernet0/0
ip address 10.10.10.1 255.255.255.0
duplex auto
speed auto
```

```
R1#sh ip int brief
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 10.10.10.1 YES NVRAM up up
GigabitEthernet0/1 unassigned YES NVRAM administratively down down
GigabitEthernet0/2 unassigned YES NVRAM administratively down down
Vlan1 unassigned YES NVRAM administratively down down
```

Configuration Backup

Important: Filenames are case sensitive – you must enter them *exactly* as shown (c2900 is different to C2900).

- 17) Backup the running configuration to Flash on R1. Use a suitable name for the backup file. Verify the configuration has been backed up.

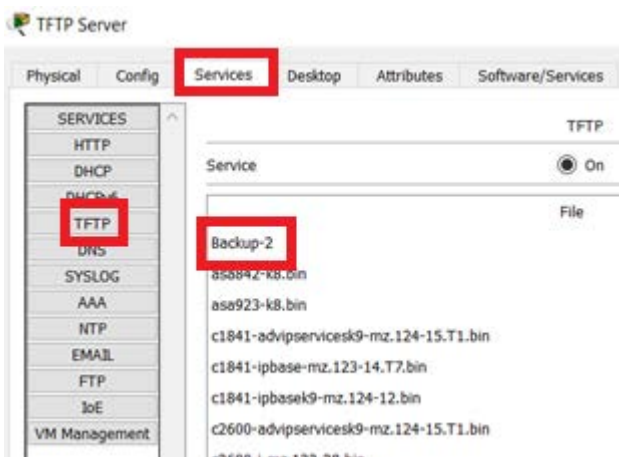
```
R1#copy run flash
Destination filename [running-config]? Backup-1
Building configuration...
[OK]

R1#show flash

System flash directory:
File Length Name/status
5 728 Backup-1
3 33591768 c2900-universalk9-mz.SPA.151-4.M4.bin
2 28282 sigdef-category.xml
1 227537 sigdef-default.xml
[33848315 bytes used, 221895685 available, 255744000 total]
249856K bytes of processor board System flash (Read/Write)
```

- 18) Backup the R1 startup configuration to the TFTP server. Use a suitable name for the backup file. Verify the configuration has been backed up.

```
R1#copy start tftp
Address or name of remote host []? 10.10.10.10
Destination filename [R1-config]? Backup-2
Writing startup-config....!!
[OK - 698 bytes]
698 bytes copied in 3.007 secs (242 bytes/sec)
```



IOS System Image Backup and Recovery

- 19) Backup the IOS system image on R1 to the TFTP server. Verify the configuration has been backed up.

```
R1#show flash
```

```
System flash directory:
File Length Name/status
5 728 Backup-1
3 33591768 c2900-universalk9-mz.SPA.151-4.M4.bin
2 28282 sigdef-category.xml
1 227537 sigdef-default.xml
[33848315 bytes used, 221895685 available, 255744000 total]
249856K bytes of processor board System flash (Read/Write)
```

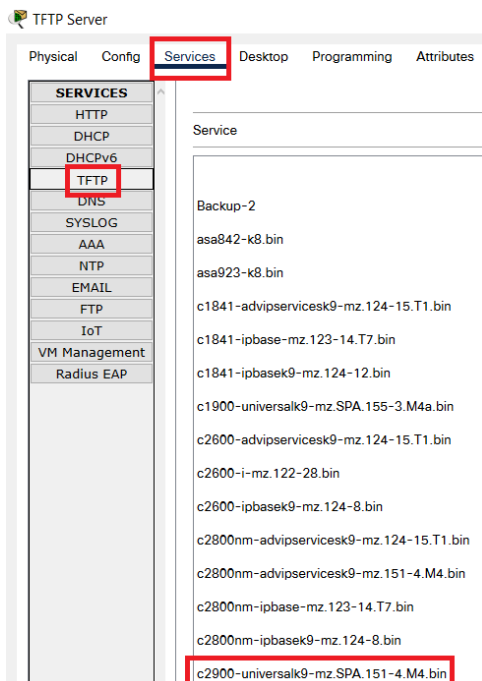
```
R1#copy flash tftp
```

```
Source filename []? c2900-universalk9-mz.SPA.151-4.M4.bin
```

```
Address or name of remote host []? 10.10.10.10
```

```
Destination filename [c2900-universalk9-mz.SPA.151-4.M4.bin]?
```

```
Writing c2900-universalk9-mz.SPA.151-4.M4.bin...!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 33591768 bytes]
```



20) Delete the system image from Flash and reload.

```
R1#delete flash:c2900-universalk9-mz.SPA.151-4.M4.bin
Delete filename [c2900-universalk9-mz.SPA.151-4.M4.bin]?
Delete flash:/c2900-universalk9-mz.SPA.151-4.M4.bin?
[confirm]
```

```
R1#reload
Proceed with reload? [confirm]
Boot process failed...
The system is unable to boot automatically. The BOOT
environment variable needs to be set to a bootable
image.
rommon 1 >
```

21) Use Internet search to find system recovery instructions for your model of router. Recover the system image using the TFTP server.

http://www.cisco.com/c/en/us/td/docs/routers/access/1900/software/configuration/guide/Software_Configuration/appendixCrommon.html is the first hit when searching for 'Cisco 2900 rommon recovery'.

Go to the ["Recovering the System Image \(tftpdnld\)" section](#).

The 'tftpdnld' command has built-in help which is displayed when entering the command in rommon mode:

```
rommon 1 > tftpdnld
```

```
Missing or illegal ip address for variable IP_ADDRESS
Illegal IP address.
```

```
usage: tftpdnld
Use this command for disaster recovery only to recover an image via
TFTP.
Monitor variables are used to set up parameters for the transfer.
(Syntax: "VARIABLE_NAME=value" and use "set" to show current
variables.)
"ctrl-c" or "break" stops the transfer before flash erase begins.
```

The following variables are REQUIRED to be set for tftpdnld:

```
IP_ADDRESS: The IP address for this unit
IP_SUBNET_MASK: The subnet mask for this unit
DEFAULT_GATEWAY: The default gateway for this unit
TFTP_SERVER: The IP address of the server to fetch from
TFTP_FILE: The filename to fetch
```

The following variables are OPTIONAL:

```
TFTP_VERBOSE: Print setting. 0=quiet, 1=progress(default), 2=verbose
TFTP_RETRY_COUNT: Retry count for ARP and TFTP (default=7)
TFTP_TIMEOUT: Overall timeout of operation in seconds (default=7200)
```


Use **ALL CAPITAL LETTERS** for this configuration:

```
rommon 2 > IP_ADDRESS=10.10.10.1
rommon 3 > IP_SUBNET_MASK=255.255.255.0
rommon 4 > DEFAULT_GATEWAY=10.10.10.1
rommon 5 > TFTP_SERVER=10.10.10.10
rommon 6 > TFTP_FILE=c2900-universalk9-mz.SPA.151-4.M4.bin
rommon 7 > tftpdnld
```

```
IP_ADDRESS: 10.10.10.1
IP_SUBNET_MASK: 255.255.255.0
DEFAULT_GATEWAY: 10.10.10.1
TFTP_SERVER: 10.10.10.10
TFTP_FILE: c2900-universalk9-mz.SPA.151-4.M4.bin
Invoke this command for disaster recovery only.
WARNING: all existing data in all partitions on flash will
be lost!
```

Do you wish to continue? y/n: [n]: y

```
.
Receiving c2900-universalk9-mz.SPA.151-4.M4.bin from 10.10.10.10
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!|
```

```
! truncated
program flash location 0x61fe0000
program flash location 0x61ff0000
program flash location 0x62000000
```

You've recovered the system image, the only thing left to do after the download has completed is:

```
rommon 8 > reset
```

IOS Image Upgrade

22) Verify SW1 is running C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX

```
SW1#sh version
Cisco IOS Software, C2960 Software (C2960-LANBASE-M),
Version 12.2(25)FX
```

23) Use the TFTP server to upgrade to c2960-lanbasek9-mz.150-2.SE4.bin

```
SW1#copy tftp flash
Address or name of remote host []? 10.10.10.10
Source filename []? c2960-lanbasek9-mz.150-2.SE4.bin
Destination filename [c2960-lanbasek9-mz.150-2.SE4.bin]?

Accessing tftp://10.10.10.10/c2960-lanbasek9-mz.150-
2.SE4.bin....
Loading c2960-lanbasek9-mz.150-2.SE4.bin from 10.10.10.10:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 4670455 bytes]
```

4670455 bytes copied in 3.086 secs (121674 bytes/sec)

```
SW1#show flash
Directory of flash:/

1 -rw- 4414921 <no date> c2960-lanbase-mz.122-25.FX.bin
3 -rw- 4670455 <no date> c2960-lanbasek9-mz.150-2.SE4.bin
2 -rw- 1054 <no date> config.text
```

64016384 bytes total (54929954 bytes free)

```
SW1#config t
SW1(config)#boot system c2960-lanbasek9-mz.150-2.SE4.bin
SW1(config)#end
SW1#copy run start
```

24) Reboot and verify the switch is running the new software version.

```
SW1#reload
```

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

```
SW1#show version
```

```
Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M),  
Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)
```