

Catalyst 3850 Series Switch Upgrade, Management, and Recovery Techniques



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Introduction

This document describes how to streamline the upgrade process for Cisco Catalyst 3850 Series Switches and offers disaster recovery techniques in the case of a software or boot failure. The upgrade process is simple, but it can seem difficult if you do not have experience with Cisco IOS® XE software upgrades.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- TFTP
- FTP

Components Used

The information in this document is based on the Cisco Catalyst 3850 Series Switch that runs Cisco IOS-XE

Versions 03.03.00 and later. The examples in this document use a stacked solution; however, the same commands can be run on a standalone switch.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Note: In order to download Cisco IOS–XE images from the Cisco website, you must have a valid Cisco Connection Online (CCO) account with entitled credentials. Also, Cisco does not offer a free TFTP/FTP solution, so you must install and configure the TFTP/FTP before you begin.

Install Versus Bundle Mode

When you deploy the Cisco Catalyst 3850 Series Switch, you have two modes of operation to choose from: **INSTALL** and **BUNDLE**. There are minor differences between the two modes. Review the configuration guide for more details.

Cisco recommends that the **INSTALL** mode is used during operation because it allows for a more complete set of features and requires fewer resources upon boot. This document provides a brief overview of each mode for reference.

Install Mode

This is the default mode for the switch. The **INSTALL** mode uses a package–provisioning file named **packages.conf** in order to boot the switch. In addition, there are a number of **.pkg** files in the flash. Cisco recommends that you do not alter these files unless directed by a Cisco Technical Assistance Center (TAC) engineer.

Bundle Mode

If you are comfortable with the use of traditional monolithic IOS images in order to boot the switch, then the **BUNDLE** mode should be familiar. The **BUNDLE** mode consumes more memory than the **INSTALL** mode because the packages are extracted from the Bundle and copied to the RAM.

Verify the Mode

In order to verify the mode, enter the **show version** command:

```
3850-stack#show version
```

```
Cisco IOS Software, IOS-XE Software, Catalyst L3 Switch Software  
(CAT3K_CAA-UNIVERSALK9-M), Version 03.03.00SE RELEASE SOFTWARE (fc1)
```

Switch	Ports	Model	SW Version	SW Image	Mode
	1 32	WS-C3850-24P	03.03.00SE	cat3k_caa-universalk9	INSTALL
*	2 56	WS-C3850-48T	03.03.00SE	cat3k_caa-universalk9	INSTALL

Upgrade

In order to begin the upgrade process, you must download the IOS–XE **.bin** file from the Cisco web site and place it in the flash of your active switch. The process that is used in order to copy the file to the switch is not covered in this document.

When you copy the *.bin* file to a single switch, the install process replicates the file to the other switches in the stack. Once the file is present, enter this command:

```
3850-stack#
software install file flash:cat3k_caa-universalk9.SPA.03.03.01.SE.150-1.EZ1.bin
switch 1-2
```

Note: There are many options available after each command; however, in this example a basic upgrade is run.

Once you begin the upgrade process, the switch pushes the *.bin* file to the stack member peers.

```
Preparing install operation ...
[2]: Copying software from active switch 1 to switch 2
```

After all of the members receive the *.bin* file, it is automatically expanded to the flash.

```
[1 2]: Starting install operation
[1 2]: Expanding bundle flash:
cat3k_caa-universalk9.SPA.03.03.01.SE.150-1.EZ1.bin
[1 2]: Copying package files
[1 2]: Package files copied
[1 2]: Finished expanding bundle flash:
cat3k_caa-universalk9.SPA.03.03.01.SE.150-1.EZ1.bin
[1 2]: Verifying and copying expanded package files to flash:
[1 2]: Verified and copied expanded package files to flash:
[1 2]: Starting compatibility checks
[1 2]: Finished compatibility checks
[1 2]: Starting application pre-installation processing
[1 2]: Finished application pre-installation processing
```

Next, the switch lists a summary of the files that are marked for both removal and addition to the *packages.conf* pointer file.

```
[1]: Old files list:
  Removed cat3k_caa-base.SPA.03.03.00SE.pkg
  Removed cat3k_caa-drivers.SPA.03.03.00SE.pkg
  Removed cat3k_caa-infra.SPA.03.03.00SE.pkg
  Removed cat3k_caa-iosd-universalk9.SPA.150-1.EZ.pkg
  Removed cat3k_caa-platform.SPA.03.03.00SE.pkg
  Removed cat3k_caa-wcm.SPA.10.1.100.0.pkg
[2]: Old files list:
  Removed cat3k_caa-base.SPA.03.03.00SE.pkg
  Removed cat3k_caa-drivers.SPA.03.03.00SE.pkg
  Removed cat3k_caa-infra.SPA.03.03.00SE.pkg
  Removed cat3k_caa-iosd-universalk9.SPA.150-1.EZ.pkg
  Removed cat3k_caa-platform.SPA.03.03.00SE.pkg
  Removed cat3k_caa-wcm.SPA.10.1.100.0.pkg
[1]: New files list:
  Added cat3k_caa-base.SPA.03.03.01SE.pkg
  Added cat3k_caa-drivers.SPA.03.03.01SE.pkg
  Added cat3k_caa-infra.SPA.03.03.01SE.pkg
  Added cat3k_caa-iosd-universalk9.SPA.150-1.EZ1.pkg
  Added cat3k_caa-platform.SPA.03.03.01SE.pkg
  Added cat3k_caa-wcm.SPA.10.1.110.0.pkg
[2]: New files list:
  Added cat3k_caa-base.SPA.03.03.01SE.pkg
  Added cat3k_caa-drivers.SPA.03.03.01SE.pkg
  Added cat3k_caa-infra.SPA.03.03.01SE.pkg
  Added cat3k_caa-iosd-universalk9.SPA.150-1.EZ1.pkg
  Added cat3k_caa-platform.SPA.03.03.01SE.pkg
  Added cat3k_caa-wcm.SPA.10.1.110.0.pkg
```

Lastly, the *packages.conf* file is updated and committed.

```
[1 2]: Creating pending provisioning file
[1 2]: Finished installing software.  New software will load on reboot.
[1 2]: Committing provisioning file
```

```
[1 2]: Do you want to proceed with reload? [yes/no]: yes
```

Verify that the update process is properly completed upon reload.

```
3850-stack#show ver / i INSTALL
  1 32   WS-C3850-24P   03.03.01SE   cat3k_caa-universalk9  INSTALL
*   2 56   WS-C3850-48T   03.03.01SE   cat3k_caa-universalk9  INSTALL
```

Flash Cleanup

Residual files remain in the flash from previous versions. If you want to clean up the residual files, you can enter the *software clean* command instead of a manual deletion of the files. This purges the files that the switch no longer needs in order to operate from the flash of each stack member.

Note: This command also deletes the *.bin* file that is used in order to install the new IOS software. It is important to remember that once it is extracted, you no longer need it.

The next two sections provide examples of how the flash appears before and after the *software clean* command is used.

Before Flash Cleanup

```
3850-stack#show flash
-#- --length-- -----date/time----- -----path-----
  2    2097152 Feb 16 2014 11:38:46.0 +00:00 nvram_config
  4   257016048 Jan 28 2014 17:22:12.0 +00:00 cat3k_caa-universalk9.SPA.03.03.00.SE.150-1.EZ.bin
  5     4096 Jan 28 2014 17:25:50.0 +00:00 mnt
  6     4096 Jan 28 2014 17:25:50.0 +00:00 mnt/images
  7     4096 Jan 28 2014 17:25:52.0 +00:00 mnt/images/ap.bak
  8        40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap1g2.md5
  9   11591680 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap1g2
 10        40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g1.md5
 11  10444800 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g1
 12        40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g2.md5
 13  13568000 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g2
 14        40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/c1140.md5
 15  10291200 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/c1140
 16        11 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/version.info
 17     1214 Jan 28 2014 17:25:10.0 +00:00 packages.conf.00-
 18   79112096 Jan 28 2014 17:25:06.0 +00:00 cat3k_caa-base.SPA.03.03.00SE.pkg
 19   6474428 Jan 28 2014 17:25:06.0 +00:00 cat3k_caa-drivers.SPA.03.03.00SE.pkg
 20  34501468 Jan 28 2014 17:25:06.0 +00:00 cat3k_caa-infra.SPA.03.03.00SE.pkg
 21     1248 Feb 16 2014 11:27:51.0 +00:00 packages.conf
 22  34763952 Jan 28 2014 17:25:06.0 +00:00 cat3k_caa-iosd-universalk9.SPA.150-1.EZ.pkg
 23     796 Feb 19 2014 11:43:13.0 +00:00 vlan.dat
 24  24992476 Jan 28 2014 17:25:06.0 +00:00 cat3k_caa-platform.SPA.03.03.00SE.pkg
 25  77167308 Jan 28 2014 17:25:06.0 +00:00 cat3k_caa-wcm.SPA.10.1.100.0.pkg
 26     1224 Jan 28 2014 16:39:58.0 +00:00 packages.conf.01-
 27     6571 Dec 20 2013 08:56:32.0 +00:00 BLANK_CONFIG.cfg
 28 257193048 Feb 16 2014 11:19:44.0 +00:00 cat3k_caa-universalk9.SPA.03.03.01.SE.150-1.EZ1.bin
 30   79113792 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-base.SPA.03.03.01SE.pkg
 31   74409080 Jan 28 2014 16:39:54.0 +00:00 cat3k_caa-base.SPA.03.02.01.SE.pkg
 32   2775728 Jan 28 2014 16:39:54.0 +00:00 cat3k_caa-drivers.SPA.03.02.01.SE.pkg
 33   6476476 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-drivers.SPA.03.03.01SE.pkg
 34  32478052 Jan 28 2014 16:39:54.0 +00:00 cat3k_caa-infra.SPA.03.02.01.SE.pkg
```

```

35 30389028 Jan 28 2014 16:39:54.0 +00:00 cat3k_caa-iosd-universalk9.SPA.150-1.EX1.pkg
36 18313952 Jan 28 2014 16:39:54.0 +00:00 cat3k_caa-platform.SPA.03.02.01.SE.pkg
37 63402700 Jan 28 2014 16:39:54.0 +00:00 cat3k_caa-wcm.SPA.10.0.101.0.pkg
38 34503664 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-infra.SPA.03.03.01SE.pkg
39 34788684 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-iosd-universalk9.SPA.150-1.EZ1.pkg
40 25009040 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-platform.SPA.03.03.01SE.pkg
41 77296448 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-wcm.SPA.10.1.110.0.pkg
237428736 bytes available (1302147072 bytes used)

```

After Flash Cleanup

```
3850-stack#software clean
```

```
Preparing clean operation ...
```

```
[1 2]: Cleaning up unnecessary package files
```

```
[1 2]: No path specified, will use booted path flash:packages.conf
```

```
[1 2]: Cleaning flash:
```

```
[1]: Preparing packages list to delete ...
```

```
In use files, will not delete:
```

```

cat3k_caa-base.SPA.03.03.01SE.pkg
cat3k_caa-drivers.SPA.03.03.01SE.pkg
cat3k_caa-infra.SPA.03.03.01SE.pkg
cat3k_caa-iosd-universalk9.SPA.150-1.EZ1.pkg
cat3k_caa-platform.SPA.03.03.01SE.pkg
cat3k_caa-wcm.SPA.10.1.110.0.pkg
packages.conf

```

```
[2]: Preparing packages list to delete ...
```

```
In use files, will not delete:
```

```

cat3k_caa-base.SPA.03.03.01SE.pkg
cat3k_caa-drivers.SPA.03.03.01SE.pkg
cat3k_caa-infra.SPA.03.03.01SE.pkg
cat3k_caa-iosd-universalk9.SPA.150-1.EZ1.pkg
cat3k_caa-platform.SPA.03.03.01SE.pkg
cat3k_caa-wcm.SPA.10.1.110.0.pkg
packages.conf

```

```
[1]: Files that will be deleted:
```

```

cat3k_caa-base.SPA.03.02.01.SE.pkg
cat3k_caa-base.SPA.03.03.00SE.pkg
cat3k_caa-drivers.SPA.03.02.01.SE.pkg
cat3k_caa-drivers.SPA.03.03.00SE.pkg
cat3k_caa-infra.SPA.03.02.01.SE.pkg
cat3k_caa-infra.SPA.03.03.00SE.pkg
cat3k_caa-iosd-universalk9.SPA.150-1.EX1.pkg
cat3k_caa-iosd-universalk9.SPA.150-1.EZ.pkg
cat3k_caa-platform.SPA.03.02.01.SE.pkg
cat3k_caa-platform.SPA.03.03.00SE.pkg
cat3k_caa-universalk9.SPA.03.03.00.SE.150-1.EZ.bin
cat3k_caa-universalk9.SPA.03.03.01.SE.150-1.EZ1.bin
cat3k_caa-wcm.SPA.10.0.101.0.pkg
cat3k_caa-wcm.SPA.10.1.100.0.pkg
packages.conf.00-
packages.conf.01-

```

```
[2]: Files that will be deleted:
```

```

cat3k_caa-base.SPA.03.02.01.SE.pkg
cat3k_caa-base.SPA.03.03.00SE.pkg
cat3k_caa-drivers.SPA.03.02.01.SE.pkg
cat3k_caa-drivers.SPA.03.03.00SE.pkg
cat3k_caa-infra.SPA.03.02.01.SE.pkg
cat3k_caa-infra.SPA.03.03.00SE.pkg
cat3k_caa-iosd-universalk9.SPA.150-1.EX1.pkg
cat3k_caa-iosd-universalk9.SPA.150-1.EZ.pkg
cat3k_caa-platform.SPA.03.02.01.SE.pkg
cat3k_caa-platform.SPA.03.03.00SE.pkg
cat3k_caa-universalk9.SPA.03.03.00.SE.150-1.EZ.bin
cat3k_caa-universalk9.SPA.03.03.01.SE.150-1.EZ1.bin
cat3k_caa-wcm.SPA.10.0.101.0.pkg

```

```
cat3k_caa-wcm.SPA.10.1.100.0.pkg
packages.conf.00-
packages.conf.01-
```

```
[1 2]: Do you want to proceed with the deletion? [yes/no]: yes
```

```
[1 2]: Clean up completed
```

Here is the output from the *show flash* command after the flash cleanup:

```
3850-stack#show flash
-#- --length-- -----date/time----- -----path-----
 2    2097152 Feb 16 2014 11:38:46.0 +00:00 nvram_config
 4      4096 Jan 28 2014 17:25:50.0 +00:00 mnt
 5      4096 Jan 28 2014 17:25:50.0 +00:00 mnt/images
 6      4096 Jan 28 2014 17:25:52.0 +00:00 mnt/images/ap.bak
 7         40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap1g2.md5
 8   11591680 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap1g2
 9         40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g1.md5
10  10444800 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g1
11         40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g2.md5
12  13568000 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/ap3g2
13         40 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/c1140.md5
14  10291200 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/c1140
15         11 Oct 03 2013 05:02:21.0 +00:00 mnt/images/ap.bak/version.info
16      1248 Feb 16 2014 11:27:51.0 +00:00 packages.conf
17       796 Feb 19 2014 11:43:13.0 +00:00 vlan.dat
18      6571 Dec 20 2013 08:56:32.0 +00:00 BLANK_CONFIG.cfg
20  79113792 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-base.SPA.03.03.01SE.pkg
21   6476476 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-drivers.SPA.03.03.01SE.pkg
22  34503664 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-infra.SPA.03.03.01SE.pkg
23  34788684 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-iosd-universalk9.SPA.150-1.EZ1.pkg
24  25009040 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-platform.SPA.03.03.01SE.pkg
25  77296448 Feb 16 2014 11:27:46.0 +00:00 cat3k_caa-wcm.SPA.10.1.110.0.pkg
1231515648 bytes available (308060160 bytes used)
```

Auto-Upgrade Feature for Catalyst 3850 Series Switches

There are many scenarios where you must introduce a new switch into a current stack of Catalyst 3850 Series Switches, such as when a new switch is purchased in order to expand the number of usable ports in the stack. In order to successfully add a new switch to a stack, you must ensure that the same software version is run on the new switch. Prior to IOS-XE Version 3.3.1, the only way to ensure that the versions match is to stage the new switch prior to introduction into the stack.

The Catalyst 3850 Series Switches include a feature called *Auto-Upgrade* that might be familiar if your migration occurs from the Catalyst 3750 Series platform. The goal of this feature is to ensure that a newly added switch is automatically provisioned by the stack members with the correct IOS-XE version. However, one caveat to note is that prior to Version 3.3.1, this feature does not work (reference Cisco bug ID CSCui69999). Therefore, you must ensure that your current stack runs at least Version 3.3.1 in *INSTALL* mode.

Note: Auto-Upgrade is disabled by default and is not available in *BUNDLE* mode.

In order to use the Auto-Upgrade feature, add the *software auto-upgrade enable* command into the configuration of the current stack. This ensures that any newly added stack members are automatically upgraded.

Configure

Once the switch is stacked and boots up, you see a clear indication that there is a mismatch in versions, and the new member does not fully join the stack. If you watch the `SYSLOG` as the switch attempts to join, you notice that the Auto-Advise feature alerts you that the newly added switch runs a different software version and mode.

Note: For this example, the new switch runs IOS-XE Version 3.2.2 in **BUNDLE** mode.

```
%STACKMGR-1-STACK_LINK_CHANGE: STANDBY: 1 stack-mgr:
  Stack port 2 on switch 1 is up (3850-Stack-1)
%STACKMGR-1-STACK_LINK_CHANGE: 2 stack-mgr:
  Stack port 1 on switch 2 is up
%STACKMGR-6-SWITCH_ADDED: 2 stack-mgr:
  Switch 3 has been added to the stack.
%STACKMGR-6-SWITCH_ADDED: STANDBY:1 stack-mgr:
  Switch 3 has been added to the stack. (3850-Stack-1)
%INSTALLER-6-AUTO_ADVISE_SW_INITIATED: 2 installer:
  Auto advise initiated for switch 3
%INSTALLER-6-AUTO_ADVISE_SW: 2 installer:
  Switch 3 running bundled software has been added
%INSTALLER-6-AUTO_ADVISE_SW: 2 installer:
  to the stack that is running installed software.
%INSTALLER-6-AUTO_ADVISE_SW: 2 installer:
  The 'software auto-upgrade' command can be used to
%INSTALLER-6-AUTO_ADVISE_SW: 2 installer:
  convert switch 3 to the installed running mode by
%INSTALLER-6-AUTO_ADVISE_SW: 2 installer:
  installing its running software.
```

Once the newly joined member is fully booted, you see that a mismatch is detected:

```
3850-Stack#show switch
```

```
Switch/Stack Mac Address : 0c27.24cf.ab80 - Local Mac Address
Mac persistency wait time: Indefinite
```

Switch#	Role	Mac Address	Priority	H/W Version	Current State
*1	Active	0c27.24cf.ab80	14	B0	Ready
2	Standby	f41f.c238.a800	13	B0	Ready
3	Member	b4e9.b0d3.6600	12	0	V-Mismatch

Enable Auto-Upgrade Feature

In *Global Configuration* mode, enter the `software auto-upgrade enable` command. This enables the feature for any new switches that join the stack.

```
3850-Stack(config)#software auto-upgrade enable
```

```
3850-Stack(config)#end
```

You must reload the newly added switch only; a full stack reload is not necessary. In this case, the newly added switch is *switch 3*, so the `reload slot 3` command is entered.

Tip: The *slot* mentioned in these commands designates the switch in the stack (*slot 1 = switch 1*).

```
3850-Stack#reload slot 3
```

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

```
%STACKMGR-1-RELOAD_REQUEST: 1 stack-mgr:
```

```
Received reload request for switch 3, reason Reload Slot Command
```

```

%STACKMGR-1-STACK_LINK_CHANGE: 1 stack-mgr:
  Stack port 2 on switch 1 is down
%STACKMGR-6-SWITCH_REMOVED: 1 stack-mgr:
  Switch 3 has been removed from the stack.
%STACKMGR-1-STACK_LINK_CHANGE: STANDBY:
  2 stack-mgr: Stack port 1 on switch 2 is down (3850-Stack-2)
Starting SWITCH-DELETE sequence, switch 3
SWITCH-DELETE sequence complete, switch 3
%STACKMGR-6-SWITCH_REMOVED: STANDBY:2 stack-mgr:
  Switch 3 has been removed from the stack. (3850-Stack-2)
Starting SWITCH-DELETE sequence, switch 3 (3850-Stack-2)
SWITCH-DELETE sequence complete, switch 3 (3850-Stack-2)

```

Wait a few minutes while the switch reloads in the background. Then, you see this:

```

%STACKMGR-1-STACK_LINK_CHANGE: 1 stack-mgr:
  Stack port 2 on switch 1 is up
3850-Stack#
%STACKMGR-1-STACK_LINK_CHANGE: STANDBY:2 stack-mgr:
  Stack port 1 on switch 2 is up (3850-Stack-2)
3850-Stack#
%STACKMGR-6-SWITCH_ADDED: 1 stack-mgr:
  Switch 3 has been added to the stack.
%STACKMGR-6-SWITCH_ADDED: STANDBY:2 stack-mgr:
  Switch 3 has been added to the stack. (3850-Stack-2)

```

You now see that the conversion from **BUNDLE** to **INSTALL** mode occurs, followed by a reload:

```

%INSTALLER-6-AUTO_UPGRADE_SW_INITIATED: 1 installer:
  Auto upgrade initiated for switch 3
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
  Converting switch 3 to installed mode by
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
  installing its running software
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
  Setting the boot var on switch 3
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
  Finished installing the running software on switch 3
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
  Reloading switch 3 to boot in installed mode
%STACKMGR-1-RELOAD_REQUEST: 1 stack-mgr:
  Received reload request for switch 3, reason Auto upgrade
%STACKMGR-1-STACK_LINK_CHANGE: 1 stack-mgr:
  Stack port 2 on switch 1 is down
%STACKMGR-6-SWITCH_REMOVED: 1 stack-mgr:
  Switch 3 has been r
3850-Stack#removed from the stack.
%STACKMGR-1-STACK_LINK_CHANGE: STANDBY:2 stack-mgr:
  Stack port 1 on switch 2 is down (3850-Stack-2)
Starting SWITCH-DELETE sequence, switch 3
SWITCH-DELETE sequence complete, switch 3
%STACKMGR-6-SWITCH_REMOVED: STANDBY:2 stack-mgr:
  Switch 3 has been removed from the stack. (3850-Stack-2)
3850-Stack#
Starting SWITCH-DELETE sequence, switch 3 (3850-Stack-2)
SWITCH-DELETE sequence complete, switch 3 (3850-Stack-2)

```

After the reboot, the upgrade continues:

```

%INSTALLER-6-AUTO_UPGRADE_SW_INITIATED: 1 installer:
  Auto upgrade initiated for switch 3
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
  Searching stack for software to upgrade switch 3
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:

```



```

Found donor switch 1 to auto upgrade switch 3
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
Upgrading switch 3 with software from switch 1
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
Finished installing software on switch 3
%INSTALLER-6-AUTO_UPGRADE_SW: 1 installer:
Reloading switch 3 to complete the auto upgrade
%STACKMGR-1-RELOAD_REQUEST: 1 stack-mgr:
Received reload request for switch 3, reason Auto upgrade
%STACKMGR-1-STACK_LINK_CHANGE: 1 stack-mgr:
Stack port 2 on switch 1 is down
%STACKMGR-6-SWITCH_REMOVED: 1 stack-mgr:
Switch 3 has been removed from the stack.
%STACKMGR-1-STACK_LINK_CHANGE: STANDBY:2 stack-mgr:
Stack port
3850-Stack#t 1 on switch 2 is down (3850-Stack-2)
Starting SWITCH-DELETE sequence, switch 3
SWITCH-DELETE sequence complete, switch 3
%STACKMGR-6-SWITCH_REMOVED: STANDBY:2 stack-mgr:
Switch 3 has been removed from the stack. (3850-Stack-2)

```

Another reload is performed automatically. Once the switch boots up, it successfully joins the stack with the correct IOS-XE version and software mode.

```

%STACKMGR-6-SWITCH_ADDED: 1 stack-mgr:
Switch 3 has been added to the stack.
%STACKMGR-6-SWITCH_ADDED: STANDBY:2 stack-mgr:
Switch 3 has been added to the stack. (3850-Stack-2)
%STACKMGR-6-SWITCH_READY: STANDBY:2 stack-mgr:
Switch 3 is ready. (3850-Stack-2)
%STACKMGR-6-SWITCH_READY: 1 stack-mgr: Switch 3 is ready.
Starting SWITCH-ADD sequence, switch 3
%NGWC_USB_CONSOLE-6-CONFIG_ENABLE: Switch 3:
Console media-type changed to default
Starting SWITCH-ADD sequence, switch 3 (3850-Stack-2)
SWITCH-ADD sequence complete, switch 3 (3850-Stack-2)
SWITCH-ADD sequence complete, switch 3

```

Verify

Use the *show switch* and *show version* commands in order to verify that the upgrade process is completed properly:

```

3850-Stack#show switch
Switch/Stack Mac Address : 0c27.24cf.ab80 - Local Mac Address
Mac persistency wait time: Indefinite

```

Switch#	Role	Mac Address	Priority	H/W Version	Current State
*1	Active	0c27.24cf.ab80	14	B0	Ready
2	Standby	f41f.c238.a800	13	B0	Ready
3	Member	b4e9.b0d3.6600	12	B0	Ready

```

3850-Stack#show version
Switch Ports Model          SW Version  SW Image                Mode
-----
*   1 56   WS-C3850-48P   03.03.01SE  cat3k_caa-universalk9  INSTALL
   2 56   WS-C3850-48P   03.03.01SE  cat3k_caa-universalk9  INSTALL
   3 56   WS-C3850-48P   03.03.01SE  cat3k_caa-universalk9  INSTALL

```

Recover from a 3850 Series Switch Boot Failure

There are multiple reasons for a 3850 Series Switch boot failure, such as a corrupt boot image, a corrupt *packages.conf* file, or missing files. This section describes possible recovery methods.

Note: Ensure that you have knowledge of the two possible boot modes, *INSTALL* and *BUNDLE*, before you continue.

Standard Recovery Methods

This section describes the two standard methods that are used in order to recover from a Catalyst 3850 Series Switch boot failure.

USB Recovery

The 3850 Series Switches have a USB port on the front that is used for console access. This USB port is also used with flash drives for image backup and recovery.

If you become stuck at the *switch:* prompt with a corrupt image or *.conf* file, you can easily boot to a file that is stored on the USB drive or copy an image from the USB to internal flash. Complete these steps in order to recover from the boot failure:

1. Verify that the flash drive is recognized and the *.bin* file exists:

```
switch: dir usbflash0:  
Directory of usbflash0:/  
74 -rw- 223734376 cat3k_caa-universalk9.SPA.03.03.00.SE.150-1.EZ.bin
```

2. Boot to the USB image:

```
switch: boot usbflash0:cat3k_caa-universalk9.SPA.03.03.00.SE.150-1.EZ.bin
```

Note: This process boots the switch into *BUNDLE* mode.

Tip: You can also copy the *.bin* file from *usbflash0:* to *flash:*, and point the boot statement towards internal flash.

Corrupt File Recovery

There are instances when the *packages.conf* calls files that no longer exist in flash. You can manually boot an image from the *switch:* prompt file; however, upon reload it calls the *packages.conf* file again and fails to boot. If this occurs, Cisco recommends that you back up the current *packages.conf* file and rename it or delete it. This process is mandatory, as the next step fails if a *.conf* file already exists. Once you extract the *.bin* file, a new *packages.conf* file is created. Complete these steps in order to recover from a corrupt *packages.conf* file:

1. Once booted (in *BUNDLE* mode), verify the files in the flash:

```
Switch#dir flash:  
Directory of flash:/  
15500 -rwx 1243 Aug 1 2013 07:04:02 +00:00 packages.conf
```

2. Copy or rename the current *packages.conf* file:

```

Switch#cp flash:packages.conf flash:packages.conf.badop
Destination filename [packages.conf.bad]?
Copy in progress...C
1243 bytes copied in 0.140 secs (8879 bytes/sec)

Switch#dir flash:
Directory of flash:/
15500 -rwx          1243   Aug 1 2013 07:04:02 +00:00  packages.conf
15502 -rw-          1243   Aug 1 2013 11:53:51 +00:00  packages.conf.bad
Switch#del flash:packages.conf
Delete filename [packages.conf]?
Delete flash:/packages.conf? [confirm]

```

3. Expand the bundle in order to create a new *packages.conf* file:

```

Switch#software expand running switch 1 to flash:
Preparing expand operation ...
[1]: Expanding the running bundle
[1]: Copying package files
[1]: Package files copied
[1]: Finished expanding the running bundle

```

4. Verify the boot:

```

Switch#show boot
-----
Switch 1
-----
Current Boot Variables:
BOOT variable does not exist

Boot Variables on next reload:
BOOT variable = flash:packages.conf;
Manual Boot = no
Enable Break = no

```

5. Reload the switch:

```

Switch#reload
Reload command is being issued on Active unit, this will reload the whole stack
Proceed with reload? [confirm]

```

Emergency Recovery

If the previous recovery methods fail, the 3850 Series Switches have a *trap door* method that you can use in order to recover the system. You must have a terminal that is connected to the management port of the switch that runs a TFTP server. Download a valid image file from CCO and store it in the root of the TFTP server.

It is likely that the switch is stuck at the *switch:* prompt. However, if you are in a boot loop, you can use the *Mode* button on the front of the switch in order to break the cycle: hold the button for approximately ten seconds, and the switch breaks the cycle and stops at the *switch:* prompt.

Complete these steps in order to perform an emergency recovery:

1. Set the switch IP address:

```

switch: set IP_ADDR 192.0.2.123/255.255.255.0

```

2. Set the default gateway:

```
switch: set DEFAULT_ROUTER 192.0.2.1
```

3. Ping the terminal that contains the TFTP server in order to test the connectivity:

```
switch: ping 192.0.2.1  
ping 192.0.2.1 with 32 bytes of data ...  
Host 192.0.2.1 is alive.
```

4. Verify that the emergency files exist in the switch file system:

```
switch: dir sda9:  
Directory of sda9:/  
  
   2  drwx  1024      .  
   2  drwx  1024     ..  
  11  -rwx 18958824  cat3k_caa-recovery.bin  
36903936 bytes available (20866048 bytes used)
```

5. Run the emergency install feature:

```
switch: emergency-install tftp://192.0.2.1/cat3k_caa-universalk9.SPA.03.03.00.SE.150-1.EZ.bin  
The bootflash will be erased during install operation, continue (y/n)?Y  
Starting emergency recovery (tftp://192.0.2.1/cat3k_caa-universalk9.SPA.03.02.02.SE.150-1.EX2.bin)...  
Reading full image into memory.....done  
Nova Bundle Image  
-----  
Kernel Address      : 0x6042f5d8  
Kernel Size         : 0x317ccc/3243212  
Initramfs Address   : 0x607472a4  
Initramfs Size      : 0xdc6546/14443846  
Compression Format  : .mzip  
  
Bootable image at @ ram:0x6042f5d8  
Bootable image segment 0 address range [0x81100000, 0x81b80000]  
is in range [0x80180000, 0x90000000].  
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@  
@@@@@@@@@@@@@@@@@@@@@@@@  
File "sda9:cat3k_caa-recovery.bin" uncompressed and installed,  
entry point: 0x811060f0  
Loading Linux kernel with entry point 0x811060f0 ...  
Bootloader: Done loading app on core_mask: 0xf  
  
### Launching Linux Kernel (flags = 0x5)  
  
Initiating Emergency Installation of bundle tftp://192.0.2.1/  
cat3k_caa-universalk9.SPA.03.03.00.SE.150-1.EZ.bin  
  
Downloading bundle tftp://192.0.2.1/ cat3k_caa-universalk9.  
SPA.03.03.00.SE.150-1.EZ.bin...  
  
Validating bundle tftp://192.0.2.1/ cat3k_caa-universalk9.  
SPA.03.03.00.SE.150-1.EZ.bin...  
Installing bundle tftp://192.0.2.1/ cat3k_caa-universalk9.  
SPA.03.03.00.SE.150-1.EZ.bin...  
Verifying bundle tftp://192.0.2.1/ cat3k_caa-universalk9.  
SPA.03.03.00.SE.150-1.EZ.bin...  
Package cat3k_caa-base.SPA.03.03.00.SE.pkg is Digitally Signed  
Package cat3k_caa-drivers.SPA.03.03.00.SE.pkg is Digitally Signed  
Package cat3k_caa-infra.SPA.03.03.00.SE.pkg is Digitally Signed
```

Package cat3k_caa-iosd-universalk9.SPA.150-1.EX2.pkg is Digitally Signed
Package cat3k_caa-platform.SPA.03.03.00.SE.pkg is Digitally Signed
Package cat3k_caa-wcm.SPA.10.0.111.0.pkg is Digitally Signed
Preparing flash...
Syncing device...
Emergency Install successful... Rebooting
Restarting system.

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