

Cisco Catalyst 4500 Supervisor Engine 8-E Wireless Mode Quick-Start Guide

Introduction

The new Cisco Catalyst® 4500 Supervisor Engine 8-E helps to enable the Cisco® Converged Access solution on the world's most widely deployed modular access switches: the Cisco Catalyst 4500E Series Switches. These switches bring the best of wired and wireless technologies together while preserving your investment on existing wired infrastructure. Cisco Catalyst 4500 Supervisor Engine 8-E supports a built-in wireless controller with a single software image for wired and wireless infrastructure. Cisco Catalyst Supervisor Engine 8-E supports up to 20 Gbps wireless throughput, 50 access points, and 2000 wireless clients on a single system.

For detail on converged access and wireless modes, see the following white paper on converged access.

[Cisco Unified Access Technology Overview - Converged Access White Paper](#)

This document describes the requirements and procedure required to start a Cisco Catalyst 4500E Series Switch with Supervisor Engine 8-E in wireless mode.

Prerequisite for Wireless on a Cisco Catalyst 4500 Series Switch

Hardware: Cisco Catalyst 4500 Supervisor Engine 8-E

Cisco Catalyst 4500 Supervisor Engine 8-E has a daughter card with Cisco Unified Access™ Data Plane application-specific integrated circuit (ASIC), which enable the capability of wireless in the Cisco Catalyst 4500 Supervisor Engine 8-E.

Software requirement: Wireless mode is supported only in Cisco Catalyst 4500 Supervisor Engine 8-E cat4500es8-universalk9* (Crypto) images.

Cisco IOS® XE 3.7.0E and Cisco IOS ROMMON Software Version 15.1(1r)SG4, or later. Make sure that you have the Cisco Catalyst 4500 Supervisor Engine 8-E started with Cisco IOS ROMMON Software Version 15.1(1r)SG4, or later. The updated IOS ROMMON Software is available for download at Cisco.com. For the detailed steps to upgrade the Cisco Catalyst 4500 Supervisor Engine 8-E, see

http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/release/note/OL_30306-01.html.

License Requirement: Supported only in IP Base, and EntServices licenses.

Note :

- Wireless mode is not supported in virtual switching system (VSS) mode.
- In wireless mode no line card is supported in the 10th slot of the Cisco Catalyst 4510R-E chassis.

Starting Cisco Catalyst 4500 Supervisor Engine 8-E in Wired and Wireless Mode.

Traditionally the Cisco Catalyst 4500 Supervisor Engine 8-E is started with a .bin image, which is called a “bundle boot.”

To start wireless mode, additional steps are required, which is called the “install boot.” Both of these startup methods are explained in the following.

Bundle Boot

Wired customers always use the bundle boot method, which is basically starting the Cisco IOS XE 3.07.0E image file. The daughter card is disabled in the bundle boot method, and daughter-card-related packages are not copied to the running system.

Install Boot

Wireless customers use the install boot method, in which the bundle image is installed first. Then the packages.conf file is installed in bootflash. The install boot is supported only from bootflash, as per installer design. The daughter card is enabled by default in the install boot method.

Note: The startup time in wired mode (bundle boot) is comparable to the startup time of Cisco IOS XE 3.6.0E (approximately 6 to 7 minutes), and wireless mode takes approximately 9 to 10 minutes to start.

Following are the steps to perform a bundle boot and install boot. To perform the install boot for the first time, you must perform a bundle boot first.

Step 1. (bundle boot): Start system with the copied image from bootflash:

```
Sup8E# boot system flash bootflash:cat4500es8-universalk9.SSA.03.17.51.PI4.152-3.1.51.PI4.bin
```

Step 2. Reload the switch to start the switch in Cisco IOS XE 3.7.0E wired mode.

To complete the install boot for a wireless mode setup, follow these additional steps:

Step 1. Expand and install the target image from bootflash. (This step copies the necessary packages file in bootflash.)

```
Sup8E# software expand file bootflash:cat4500es8-universalk9.SSA.03.17.51.PI4.152-3.1.51.PI4.bin
```

```
Sup8E#dir bootflash:
```

Directory of bootflash:/

```
40802 -rwx 184725808 Jun 12 2013 14:04:56 +00:00 cat4500es8-universalk9.bin
40803 -rw- 1750 Sep 3 2014 22:51:54 +00:00 packages.conf
89765 -rw- 127017144 Sep 4 2014 01:08:44 +00:00 cat4500es8-base.SSA.03.17.84.E.pkg
89766 -rw- 82336068 Sep 4 2014 01:08:50 +00:00 cat4500es8-dc-base.SSA.03.17.84.E.pkg
89767 -rw- 6978508 Sep 4 2014 01:08:53 +00:00 cat4500es8-dc-drivers.SSA.03.17.84.E.pkg
89768 -rw- 35095672 Sep 4 2014 01:08:52 +00:00 cat4500es8-dc-infra.SSA.03.17.84.E.pkg
```

```

89769 -rw- 26778616 Sep 4 2014 01:08:53 +00:00 cat4500es8-dc-platform.SSA.03.17.84.E.pkg
89770 -rw- 4225332 Sep 4 2014 01:08:44 +00:00 cat4500es8-firmware.SSA.03.17.84.E.pkg
89771 -rw- 54192 Sep 4 2014 01:08:44 +00:00 cat4500es8-infra.SSA.03.17.84.E.pkg
89772 -rw- 2087904 Sep 4 2014 01:08:53 +00:00 cat4500es8-platform.SSA.03.17.84.E.pkg
89773 -rw- 88364208 Sep 4 2014 01:08:48 +00:00 cat4500es8-universalk9.SSA.152-3.1.84.E.pkg
89774 -rw- 110072832 Sep 4 2014 01:08:57 +00:00 cat4500es8-wcm.SSA.10.3.0.135.pkg

```

1708220416 bytes total (549847040 bytes free)

Sup8E#

Step 2. Configure system to start from the file packages.conf. (The .bin file is no longer needed.)

```
Sup8E(config)#boot system bootflash:packages.conf
```

Note: Starting the supervisor engine using bootflash:packages.conf enables wireless support on the Cisco Catalyst Supervisor Engine 8-E.

Step 3: Save the configuration and then reload the switch.

```
Sup8E# show module
```

Chassis Type : SW-7507R+E

Power consumed by backplane : 40 Watts

Mod	Ports	Card Type	Model	Serial No.
1	48	10/100/1000BaseT Premium POE E Series	WS-X4648-RJ45V+E	JAE1515058P
2	0	Unsupported module	WS-X4548-GB-RJ45V	JAE1133U8KD
3		Supervisor		
4	12	Sup 8-E 10GE (SFP+), 1000BaseX (SFP)	WS-X45-SUP8-E	CAT1823L0QC

M	MAC addresses	Hw	Fw	Sw	Status
1	c89c.1de0.2a60 to c89c.1de0.2a8f	2.0			Ok
2	0000.0000.0000 to 0000.0000.0000	3.3			Unsupport
3	Unknown	Unknown	Unknown		Other
4	c89c.1d93.1ccc to c89c.1d93.1cd7	1.1	15.1(1r)SG(0	03.07.01.WC.11	Ok

Mod	Redundancy role	Operating mode	Redundancy status
3	Standby Supervisor	SSO	Disabled
4	Active Supervisor	SSO	Active

Mod	Submodule	Model	Serial No.	Hw	Status
4	Daughter Card	WS-UA-SUP8E	CAT1822L517	1.0	Ok

Note: When the switch is started in wired mode, the daughter card is not displayed.

Software Upgrade Procedure for Wireless Mode

To perform a software image upgrade in wireless mode, the switch must be in the install mode:

Software Upgrade for Nonredundant Switch in Wireless Mode

If we need to upgrade the switch when the switch is started in the install mode, we need to use the software to expand the command-line interface (CLI) only. With the CLI the access point image predownload is done with the new image.

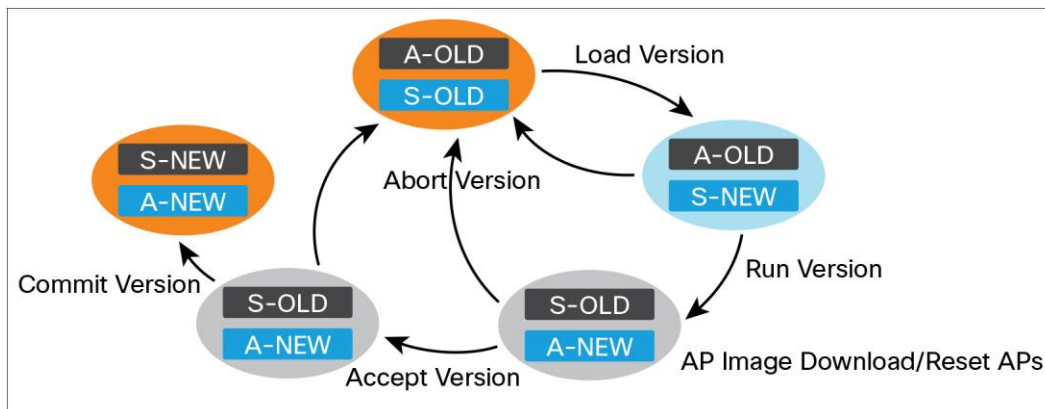
After this command when the Cisco In-Service Software Upgrade (ISSU) is done in the supervisor engine, the access point reloads automatically with the new image, which has already been predownloaded.

```
Sup8E# software install file bootflash:cat4500es8-universalk9.SSA.03.17.51.PI4.152-3.1.51.PI4.bin
```

Software Upgrade for Dual-Supervisor SSO Mode Switch in Wireless Mode

If the switch has a redundant supervisor, then we use the normal Cisco ISSU procedure. The ISSU commands listed in Figure 1 automatically execute the install mode (wireless mode) of the setup upgrade.

Figure 1. ISSU Steps



High Availability in Wired and Wireless Mode

Following is information about wired stateful switchover (SSO) and Cisco ISSU and wireless access point SSO and ISSU.

Wired SSO and ISSU

For the wired setup, the SSO is supported between active and standby supervisor in the standalone chassis as well as across the chassis in a VSS setup.

The Cisco ISSU is supported between Cisco IOS XE 3.6.0E release and Cisco IOS XE 3.7.0E release. The Cisco ISSU between a release before Cisco IOS XE 3.6.0E and Cisco IOS XE 3.7.0E release is not supported. Please see the following document For more details, see [Upgrade Steps for Cisco Catalyst 4500-E Switch to Cisco IOS XE Software Release 3.6.0E - 15.2\(2\)E](#).

Wireless AP SSO and ISSU

For the wireless setup, the SSO is supported between active and standby supervisor in the standalone chassis. The access points also performs SSO and remains connected. The wireless client traffic is not be affected.

At the time of ISSU, the access point predownloads the access point image as shown in the Figure 1. When the switchover happens from active to standby supervisor, the access point is reloaded and starts with the new version (predownloaded image). This predownloaded image helps keep high uptime of the access point at the time of the switchover.

Following are the high availability startup scenarios:

Active (bundle boot) and standby (bundle boot)

- Result in -> bundle boot (SSO)

Active (bundle boot) and standby (install boot)

- Result in -> Standby keeps reloading and after three attempts , the standby drops to ROMMON mode.

Active (install boot) and standby (install boot)

- Result in -> install boot (SSO)

Active (install boot) and standby (bundle boot)

- Result in -> Auto Upgrade -> install boot (SSO)

Auto Upgrade Standby

Active supervisor detects boot mode mismatch and triggers an automatic upgrade of the standby supervisor. Active supervisor pushes the installed bundle from active to the standby supervisor followed by the reloading of the standby supervisor.

Standby comes up with same image as active and reaches SSO (hot standby)

Migration Scenarios

There can be multiple scenarios possible for moving to Cisco IOS XE 3.7.0E release.

1. Cisco IOS XE 3.6.0E wired to Cisco IOS XE 3.7.0E-wired
 - The usual ISSU commands of load version, run version, and commit version can be used for ISSU migration from Cisco IOS XE 3.6.0E to Cisco IOS XE 3.7.0E release for wired mode.
2. Cisco IOS XE 3.6.0E wired to Cisco IOS XE 3.7.0E wireless
 - Perform traditional way of ISSU to Cisco IOS XE 3.6.0E-rebuild image or Cisco IOS XE 3.7.0E release.
 - Run install startup commands to enable daughter card (wireless).
3. Cisco IOS XE 3.6.0E-rebuild to Cisco IOS XE 3.7.0E wireless mode.
 - Copy Cisco IOS XE 3.7.0E release image to Cisco Catalyst 4500 Supervisor Engine 8-E.
 - Run install startup commands to enable daughter card (wireless).
4. 3.3.0XO to Cisco IOS XE 3.7.0E-Wired
 - Upgrade the Cisco Catalyst Supervisor Engine 8-E ROMMON to Version 15.1(1r)SG4, or later.
 - Perform traditional startup (bundle boot) to Cisco IOS XE 3.7.0E release.

Cisco Catalyst Supervisor Engine 8-E Uplink Modes

Table 1 displays the default uplink configuration for Cisco Catalyst Supervisor Engine 8-E:

Table 1. Uplink Modes

Mode	Uplink Bandwidth	Daughter Card Bandwidth	Supported in Chassis	Line Card Slot Restrictions
1	8 x 10G	None	3-, 6-, 7-, 10-Slot Chassis	Slot 10 - 47xx Series Line Cards only
2	4 x 10G Supervisor Engine 7-E Mode, DC disabled	None	10-Slot Chassis	None
3	8 x 10G	20G Wireless Mode	3-, 6-, 7-, Slot Chassis	None
4	4 x 10G	20G Wireless Mode	10-Slot Chassis	Slot 10 - 47xx Series Line Cards only

Note: The 4510R-E chassis does not support any line cards in the tenth slot, when the daughter card is enabled.

Cisco Catalyst 4500 Supervisor Engine 8-E with Daughter Card Enabled

By default, the daughter card is enabled when the supervisor engine is booted in install boot mode, and disabled when the supervisor engine is started in bundle boot mode. When the daughter card is enabled, Cisco Catalyst 4500 Supervisor Engine 8-E base board uplink bandwidth is restricted to 40 GB as the default configuration in a 10-slot chassis. In nonredundancy mode, the supervisor can support the first four active interfaces. In redundancy mode, the first two interfaces on both the active and the standby supervisors become active. Only 47xx series line cards are supported in the 10th slot of the Cisco Catalyst 4510R+E chassis. The 4510R-E chassis does not support any line cards in the tenth slot, when the daughter card is enabled.

Cisco Catalyst 4500 Supervisor Engine 7-E Mode on Supervisor Engine 8-E

The pictorial representation of Cisco Catalyst 4500 Supervisor Engine 7-E Mode in a 10-Slot chassis is shown in Figure 2

Note: You can configure **Cisco Catalyst 4500** Supervisor Engine 7-E mode (Sup7-E mode) on Supervisor Engine 8-E in a 10-slot chassis only.

When **Cisco Catalyst 4500** Supervisor Engine 7-E mode is enabled, the Supervisor Engine 8-E base board uplink bandwidth is restricted to 40 GB as default configuration in a ten-slot chassis. In nonredundancy mode, the supervisor can support four active interfaces. In redundancy mode, this uplink mode supports the first two interfaces on both active and standby supervisors. All line cards are supported in all 10 slots in the chassis with no restriction on the 10th slot. To enable Supervisor Engine 7-E mode, you must disable the daughter card on the switch.

Using the following CLI disables the daughter card in the install boot method as well:

```
Sup-8E (config)#hw-module daughtercard disable
```

A reload of the active supervisor is required to apply the new configuration.

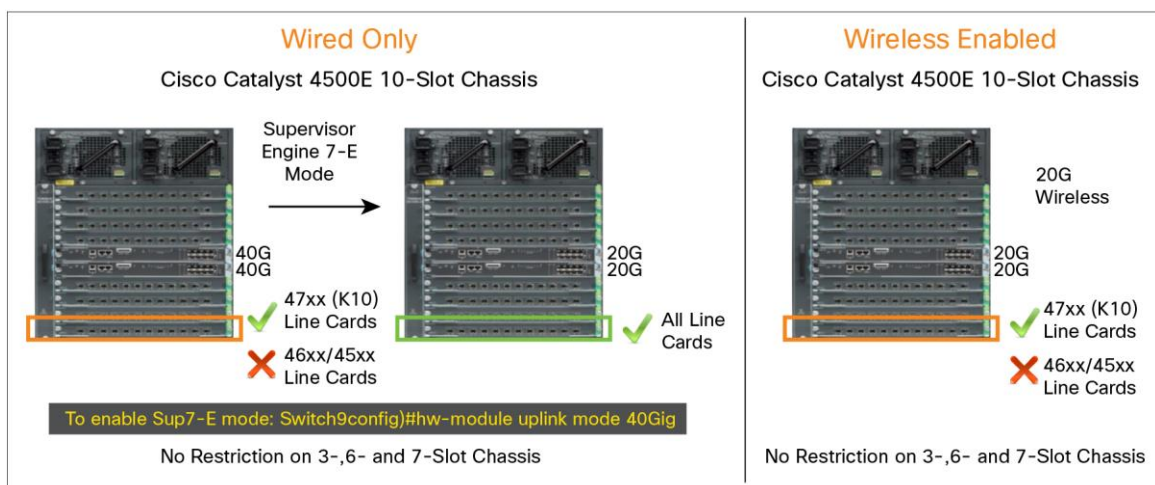
```
Sup-8E(config)#
```

Disabling the daughter card also provides the flexibility of keeping the wireless configuration intact in the switch, even if wireless is not being used in the system.

To enable Supervisor Engine 7-E mode on Supervisor Engine 8-E, when the daughter card is disabled, enter the following commands.

```
Sup-8E (config)# hw-module uplink mode 40Gig
```

Figure 2. Cisco Catalyst 4500E 10-Slot Chassis Support






Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

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