



New Features for Cisco IOS XE 17.9.1

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Install Mode Support

The following table describes the differences between Bundle mode and Install mode:

Cisco IOS XE running on IoT routers has typically made use of the Bundle boot mode. Bundle boot mode is also known as Consolidated boot, and uses a single compressed image. The typical naming convention is <product>-universalk9.<release>.SPA.bin.

This mode provides a consolidated boot process, using local (hard disk, flash) or remote (TFTP) .bin image. Booting via a .bin image means that the router would first have to uncompress the image before booting from it. This led to a longer period of time for the router to boot.

To upgrade the router to a new version of IOS XE, you would point the "boot system" to a new software image. This method is well known and details are available in your products configuration guide.

Starting with IOS XE release 17.9.1, a new boot mode called Install mode has been added to the IoT routers. Install mode uses packages loaded into bootflash, which are read by a packages.conf file. This method provides more control over the software installation process.



Note SMU installation was supported in both bundle boot and install mode. From Cisco IOS XE Release 17.9.x, SMU installation will be stopped if the router is booted up in bundle mode. If the router is booted up in install mode, SMU installation will keep working as it is in previous releases.

Table 1: Bundle Mode vs Install Mode

Bundle Mode	Install Mode
This mode provides a consolidated boot process, using local (hard disk, flash) or remote (TFTP) .bin image.	This mode uses the local (bootflash) packages.conf file for the boot process.
This mode uses a single .bin file.	.bin file is replaced with expanded .pkg files in this mode.
CLI: Router(config)# boot system bootflash: <filename>	CLI: #install add file bootflash: [activate commit]
To upgrade in this mode, point the boot system to the new image.	To upgrade in this mode, use the install commands.
Image Auto-Upgrade: When a new Field-Replaceable Unit (FRU) is inserted in a modular chassis, manual intervention is required to get the new FRU running with the same version as the active FRUs.	Image Auto-Upgrade: When a new FRU is inserted in a modular chassis, the joining FRU is auto-upgraded to the image version in sync with the active FRUs.
Rollback: Rollback to the previous image with multiple Software Maintenance Updates (SMUs) may require multiple reloads.	Rollback: Enables rollback to an earlier version of Cisco IOS XE software, including multiple patches in single reload.

For additional information, please see [Cisco IOS XE Installation Methods](#).

Cellular Boot Time Improvements

Numerous improvements have been made in the Cellular link up-time with IOS-XE release 17.9.1. In previous releases, the cellular interface was taking approximately two and a half minutes to come up and pass traffic after the router booted up. The Cellular link up-time has been improved by approximately 20% in this release.

IOS XE Downgrade Warning

This feature will present a warning when issuing a **boot system flash** command followed by a file name of an image which has a version number lower than the one of the running image. The downgrade operation will still be possible by ignoring the warning message presented to the user. Booting an image with the same or higher version of the running image is allowed without warning. The feature is only intended for images already loaded on the bootflash of the router, this means only for the **boot system flash** <file_name> CLI (excluding other sources/devices like ftp, mop, rpc, tftp, rom).

The following are examples of how the system compares versions:

When comparing two version numbers as follows:

- 17.7.1
- 17.7.1c

The version with the letter (17.7.1c) will be considered the most updated one.

When comparing two version numbers as follows:

- 17.7.3a
- 17.7.3f

The comparison will be made taking into consideration the alphabetical order. In the case above 17.7.3f will be considered the most updated one.

SNMP Polling of Temperature OID

Support has been added for SNMP MIB to be able to return values from temperature sensors. The output should look similar to the **show environment** CLI.

The output of a **show environment** on an IR1101:

```
IR1101#show environment
```

```
Number of Critical alarms: 0
Number of Major alarms: 0
Number of Minor alarms: 0
```

Slot	Sensor	Current State	Reading	Threshold (Minor, Major, Critical, Shutdown)
R0	Temp: TS1	Normal	42 Celsius	(75 ,80 ,90 ,na) (Celsius)
R0	Temp: TS2	Normal	37 Celsius	(75 ,80 ,90 ,na) (Celsius)

The output from an snmpwalk would look similar to this:

```
[root@sg-centos-hv ~]# snmpwalk -v 2c -c public 33.33.33.204 1.3.6.1.4.1.9.9.13.1.3.1
SNMPv2-SMI::enterprises.9.9.13.1.3.1.2.1 = STRING: "Sensor 1"
SNMPv2-SMI::enterprises.9.9.13.1.3.1.3.1 = Gauge32: 48
SNMPv2-SMI::enterprises.9.9.13.1.3.1.4.1 = INTEGER: 93
SNMPv2-SMI::enterprises.9.9.13.1.3.1.5.1 = INTEGER: 0
SNMPv2-SMI::enterprises.9.9.13.1.3.1.6.1 = INTEGER: 1
SNMPv2-SMI::enterprises.9.9.13.1.3.1.7.1 = INTEGER: 0
```

The ciscoEnvMonTemperatureStatusEntry oid is 1.3.6.1.4.1.9.9.13.1.3.1:

- ciscoEnvMonTemperatureStatusIndex (.1)
- ciscoEnvMonTemperatureStatusDescr (.2)
- ciscoEnvMonTemperatureStatusValue (.3)
- ciscoEnvMonTemperatureThreshold (.4)
- ciscoEnvMonTemperatureLastShutdown (.5)
- ciscoEnvMonTemperatureStatus (.6)

GPS Mode Enabled By Default

In IOS XE versions prior to 17.9.1, GPS was enabled by default, however, GPS Mode was disabled by default. This required that the user perform an additional modem power-cycle after the router came up in order to use GPS.

Starting with IOS XE 17.9.1, GPS Mode will be enabled by default, and will be set to standalone mode. This will help reduce the cellular link up time.



Note This only applies to the cellular based GPS. This does not apply to the GPS/GNSS module in IR1800 (DR module), IR8140 (native GPS) and IR8340 (Timing module).

Use the following command to check cellular GPS status:

```
Router# show cellular <slot> gps
auto-reset Enable reset modem automatically after configuring GPS enable or mode
```

Cisco WebUI Access Point Name (APN)

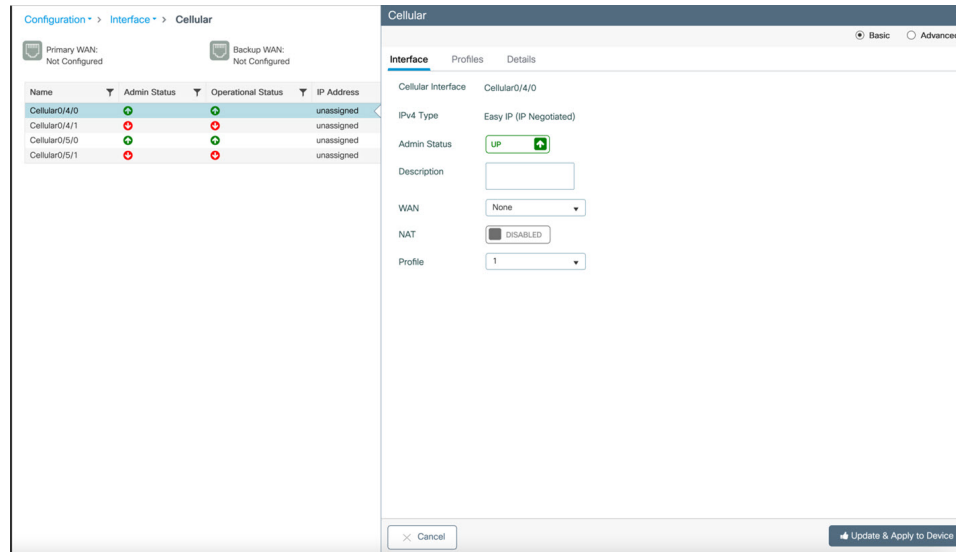
IOS XE 17.9.1 added the ability to add, edit, or delete the APN from the Cisco WebUI Interface. The following provides an overview of how to perform this function.



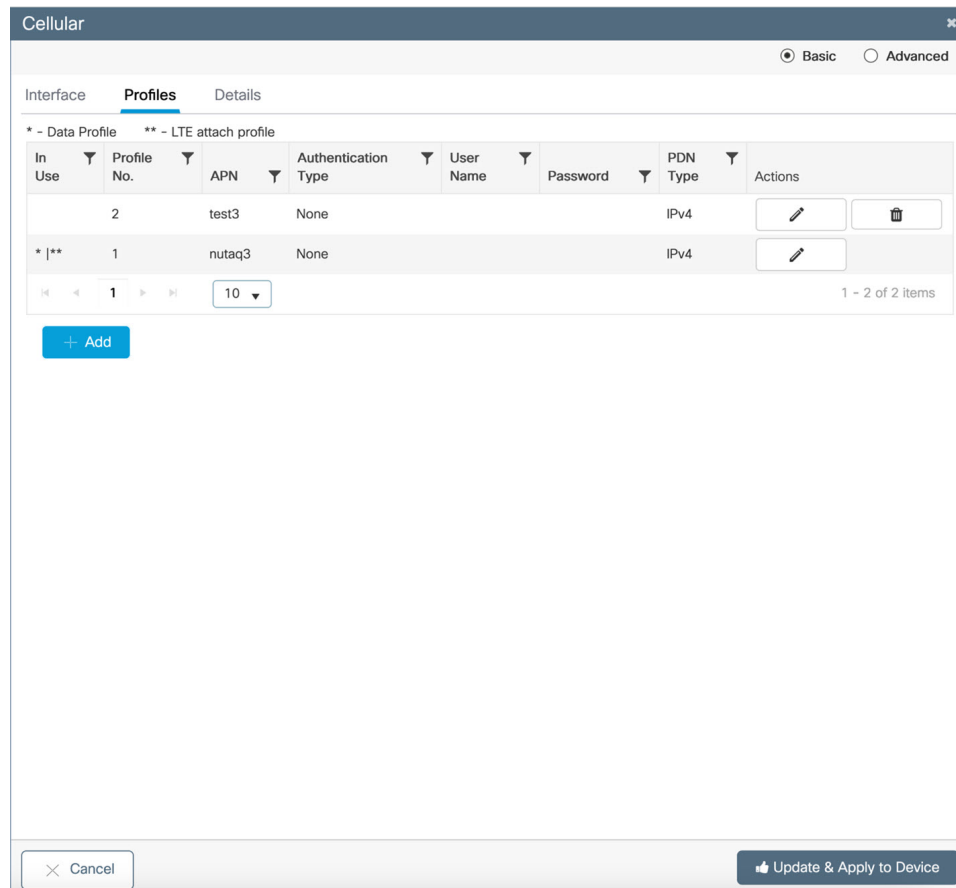
Note This section only describes new functionality and is not a complete overview of the WebUI.

Adding the APN

From the WebUI, navigate to **Configuration > Interface > Cellular**. Double click on the cellular interface based upon your platform.



On the Cellular window, click on the **Profiles** tab.



From the **Profiles** tab, you can Add, Delete, or Edit the APN. Once the profile is modified, click on **Update & Apply to Device** at the bottom of the window.

Changing the SIM Slot

By default, the APN is attached to SIM slot 0. You can change the APN to SIM slot 1 by using the WebUI.

From the WebUI, navigate to **Configuration > Interface > Cellular**. Click on the **Advanced** radio button on the top of the window.

Cellular
✕

Basic
 Advanced

Interface

Controller

Profiles

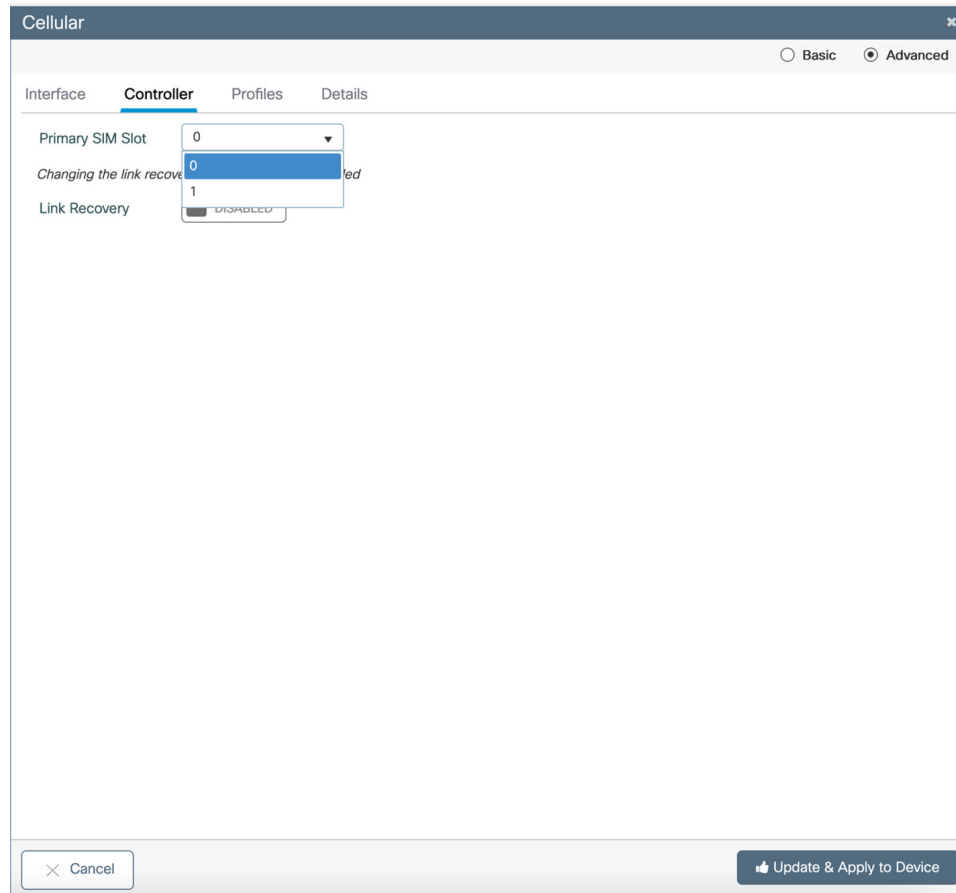
Details

Cellular Interface	Cellular0/4/0	Data Profile	1
IPv4 Type	Easy IP (IP Negotiated)	Attach Profile	1
Admin Status	UP	Dialer In-Band	ENABLED
Description	<input type="text"/>	Dialer Idle Timeout	0
WAN	None	Dialer Group	1
NAT	<input type="checkbox"/> DISABLED	Pulse Time	1
		Load Interval	30

✕ Cancel

Update & Apply to Device

Click on the **Controller** tab at the top of the window.



Click on the Primary SIM Slot pull-down and select slot 1. Click on **Update & Apply to Device** on the bottom of the window.

IPv6 Multicast over PPPoE

This new feature applies to the ESR6300 Router.

PPPoE is a session/connection-oriented protocol, which extends the point-to-point radio frequency (RF) link from an external radio to an IOS router. Router communication with the radio is represented by virtual access interface (connectivity to a radio neighbor).

VMI operates in the Bypass mode where each Virtual Access Interface (VAI) represents a radio neighbor. The VMI layer re-directs unicast routing protocol traffic to the appropriate P2P link (Virtual-Access interface) and replicates any Multicast traffic that needs to flow.

For IPV6 multicast over PPPoE to function properly, the following must be configured:

- PPPoE (Virtual-template, VMI and physical interface)
- IPV6 unicast and multicast routing
- IPv6 PIM BSR
- IPv6 MLD



Note This feature requires the Network Advantage License.

For additional information, see the [IPv6 Multicast over PPPoE](#) chapter.