New Features for Cisco IOS XE 17.11.1a

This chapter contains the following sections:

Async Serial Port for Console

The IR1101 console port is a USB port. Some installations require that the console port be an RS232 port. This release provides a workaround that allows the Async 0/2/0 port to be used as a console port.

This change requires to ROMMON variables as well as IOS XE. You will need to setup both Mini-USB console and Async 0/2/0 with the same baudrate and 8-N-1.

To change the ROMMON variable, perform the following:

1. Access ROMMON by following the procedure in the IR1101 Software configuration Guide.
2. Set the ROMMON variable CONSOLE_SERIAL with value as 1 using the following command in ROMMON: set CONSOLE_SERIAL=1
3. sync

When ROMMON detects CONSOLE_SERIAL=1, it should start to use the new variable. It will also pass console=ttyS1 as boot parameter instead of console=ttyS0.

After setting the ROMMON variable, then boot up the Cisco IOS XE 17.11.1a image. It will read the new variable and use console=ttyS1 as boot parameter instead of console=ttyS0. Cisco IOS XE 17.11.1a should update the new ROMMON image. Then, reboot the device again and setup auto boot if needed.

Note Async 0/2/0 pinout is EIA-TIA-561 DTE. When CONSOLE_SERIAL=1 is setup, Async 0/2/0 won't exist. Do NOT perform a factory reset or downgrade the software below 17.11.

Change to Smart Licensing Packaging

This release brings the IoT routing products inline with other Integrated Service Routers (ISR).

Smart Licensing Overview

Cisco Smart Licensing is a flexible licensing model that provides users with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across their organization. And it's secure. With Smart Licensing users get:

- Easy Activation: Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more Product Activation Keys (PAKs).
- Unified Management: My Cisco Entitlements (MCE) provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- License Flexibility: Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

Smart Licensing Using Policy (SLP), was previously referred to as Smart Licensing Enhanced (SLE), and is the default mode starting with Cisco IOS-XE release 17.3.2. SLE replaced Smart Software Licensing. This feature change for Cisco IOS XE release 17.11.1a focuses on the licensing packaging.

License Levels

The following are the license levels available for all Cisco IR devices.

Base Licenses

- Network Essentials
- Network Advantage (includes Network Essentials)

Note These licenses are ordered through Cisco Commerce Workspace (CCW), and are permanent.

Add-on Licenses — These can be subscribed for a fixed term of three, five, or seven years.

- Digital Networking Architecture (DNA) Essentials
- DNA Advantage (includes DNA Essentials)

Note These licenses are ordered through Cisco Commerce Workspace (CCW), and relate to DNA-C and SDWAN. For further information, see the Cisco SD-WAN and Cisco DNA Center web pages.

The following tables provide details on the licensing levels:

Table 1: Network Essentials (Perpetual License)

Essential Switch Capabilities	Layer 2, Routed Access(RIP, EIGRP Stub, OSPF (1000 routes)), PBR, PIM Stub Multicast (1000 routes) PVLAN, VRRP, PBR, CDP, QoS, FHS, 802.1x, Macsec-128, CoPP, SXP, IP SLA Responder SSO **Note** For the device to be compliant with the DNA Essential License it must not exceed 1000 routes in the routing table regardless of how the routes were learned.
DevOps Integration	• Netconf, Restconf, gRPC • Yang Data Models • GuestShell (On-Box Python) • PnP Agent, ZTP

Table 2: Network Advantage (Perpetual License) Contains all of the Network Essentials plus the following:

IoT & Mobility	CoAP
Full Routing Functionality	BGP, HSRP, OSPF, ISIS,GLBP
Flexible Network Segmentation	VRF, VXLAN, LISP, SGT, MPLS
High Availability & Resiliency	NSF, GIR, Stackwise Virtual*, ISSU/eFSU, Patching (CLI)
Optimize Bandwidth Utilization with Multicast	MSDP, mVPN, AutoRP, PIM-BIDIR

Table 3: DNA Essentials (3,5,7 year terms)

Basic Automation	• PnP Application • LAN Automation • Embedded Event Manager
Basic Assurance	• Health Dashboards – Network and Client • Basic Device & Wired Client Health Monitoring

Table 4: DNA Advantage (3,5,7 year terms) Contains all of the DNA Essentials plus the following:

Advanced Automation	• Encrypted Traffic Analytics • DNA Service for Bonjour
Assurance & Analytics	• Compliance, Custom Reports • Switch 360 & Wired Client 360

Licensing Throughput Levels

In addition to configuring the license level, it is also possible to configure the throughput level on the device. The throughput level determines the bandwidth limit which is applied to encrypted traffic. There is no limit applied to the non-encrypted (clear) traffic going through a device.

Important To comply with global export regulations, if more than 250Mbs of encrypted traffic is required, then an "uncapped" – platform dependent – selection must be done on CCW, as well as an HSEC license.

This limit is imposed bidirectionally. This means that if the throughput limit is set to 250Mbps then up to 250Mbps of encrypted traffic can flow through the device in either direction. For example, the device can both receive and transmit up to 250Mbps of encrypted traffic. There is no limit applied on unencrypted traffic.

When the throughput level on the device is set to 'uncapped' there are no limits imposed on both encrypted and unencrypted traffic flowing through it.

Note To avoid confusion on throughput limits and IOS XE software releases, please note the following:

Cisco IOS XE release 17.11.1a and earlier running on the ESR6300, IR1800, and IR8140 platforms support boost, uncapped, and unlimited licenses. These are configured using the **platform hardware throughput level 2G** CLI.

Future Cisco IOS XE release 17.12.1 and later running on the ESR6300, IR1800, and IR8140 support the same licenses, but will be configured using the **platform hardware throughput level uncapped** CLI.

With future Cisco IOS XE release 17.12.1 and later, the **platform hardware throughput level 2G** and the **platform hardware throughput level uncapped** CLIs will both provide the same throughput as the uncapped license.

The following table shows the throughput limits (also referred to as Tier license) supported on IoT devices as of Cisco IOS XE 17.11.1a release.

Platform	25 Mbps bidirectional (Tier 0)	50 Mbps bidirectional	Up to 200 Mbps bidirectional (Tier 1)	250 Mbps bidirectional	2 Gbps	Uncapped (Tier 2)
ESR 6300	N/A	Yes	N/A	Yes	Yes	To be supported starting with 17.12.1
ESR-6300-LIC-K9	N/A	Yes	N/A	N/A	N/A	Yes
IR1101	N/A	N/A	N/A	Yes	N/A	Supported starting with 17.10.1.
IR1800	N/A	Yes	N/A	Yes	Yes	To be supported starting with 17.12.1

Platform	25 Mbps bidirectional (Tier 0)	50 Mbps bidirectional	Up to 200 Mbps bidirectional (Tier 1)	250 Mbps bidirectional	2 Gbps	Uncapped (Tier 2)
IR8100	N/A	Yes	Yes	Yes	Yes	To be supported starting with 17.12.1
IR8300	Yes	N/A	Yes	N/A	N/A	Yes

Command Line Interface

The following commands are available:

license boot level *<network-essentials/network-advantage>*

The throughput level can be configured using the following CLI on all IR devices except IR8300:

platform hardware throughput level *<limit>*

On the IR8300, the throughput level can be configured using the following CLI:

platform hardware throughput crypto *<limit>*

To see the throughput configured on the device, use the following CLI:

```
show version | include throughput
The current crypto throughput level is: 50000 kbps
```

Galileo Support on the LTE Pluggable Modules

With Cisco IOS XE 17.11.1a and earlier, the only GNSS constellation supported was GPS. This release introduces support for Galileo.

Note Only ONE constellation can be enabled at a time.

There are new CLI options available to support the new constellation:

Configuration Commands

```
config# controller cellular <slot/port>
(config-controller)# <no> lte gps constellation <gps | galileo | gnss >
```

Example:

```
(config-controller)#lte gps constellation ?
  galileo  select Galileo as active constellation
  gps      select GPS as active constellation
  gnss      select multiple GNSS as active constellation
```

Note The default setting is gps mode.

The new galileo and gnss options in the above CLI are used to configure Galileo and Multiple/Simultaneous GNSS (GPS + Galileo etc) respectively.

If you disable the GPS configuration, ensure there is no constellation configured, consistent with GPS mode configuration. For example:

```
config# controller Cellular 0/1/0
(config-controller)# no lte gps constellation gps
```

Show Commands

The following example shows the current GNSS constellation as Galileo:

```
#show cellular 0/1/0 gps detail
GPS Feature =  enabled
GPS Mode Configured =  standalone
Current Constellation Configured =  galileo | gps | gnss
GPS Port Selected =  Dedicated GPS port
GPS Status =  GPS acquiring
```

Any changes made to the configuration will require the router to be rebooted.

More information is available in the Cellular Pluggable Interface Module Configuration Guide.