



New Features for Cisco IOS XE 17.12.1a

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Access Accelerometer and Gyro Sensor Data from IRM-GNSS

This feature allows accelerometer and gyro sensor data from IRM-GNSS (GPS DR) module to be streamed to the IOX via a TTY in IR1800. Prior to this release, the IRM-GNSS module pushed the sensor data to the host in NMEA via port /dev/ttyS2. Previous IOS XE releases already parsed and cached the data.

The feature will forward the sensor data to IOX via the TTY whenever the data is received from the NMEA. Currently, there is no control on the frequency the data is sent from the module, which totally relies on the module itself.

There are no new commands for this feature. It is enabled by default once dead reckoning is enabled. Existing CLIs can be used to view the sensor data, for example:

```
Router# show platform hardware gps dead-reckoning

DR Vehicle interface mode: OBDDII
GPS/DR Vendor Info: TELIT
GPS/DR module FW Version: V33-1.0.5-CLDR-4.7.10-N115R115-003291-3
...
Raw Accel Data in X: -542
Raw Accel Data in Y: 538
Raw Accel Data in Z: 16964
Raw Gyro Data in X: 153
Raw Gyro Data in Y: -80
Raw Gyro Data in Z: 99
```

The existing **debug platform hardware gps dead-reckoning** command has been enhanced to provide additional debug messages for better serviceability. The debug messages will cover the following:

- How frequent the sensor data are pushed from the module to IOS, it must at least once per second.
- The latest sensor data received from the module.

5G Standalone Mode (SA) Support

This feature provides 5G Standalone mode (SA) support on the P-5GS6-GL pluggable module. The 5G SA mode support will enable 5G cellular configuration display using Cisco IOS-XE CLI commands.

This feature provides a mechanism in the CLI to select a set of bands for SA mode, as opposed to a single band in previous software releases. The following IOS-XE CLIs have been modified for 5G SA mode support:

- show cellular radio
- show cellular radio details (without carrier aggregation)
- show cellular network

There is also a band selection CLI to select cellular bands.

Show Command Examples

```
Router#show cellular 0/2/0 radio
Radio power mode = Online
5G Rx Channel Number = 632544
5G Tx Channel Number = 632544
5G-SA Band = 78
Bandwidth = 20 MHz
Current 5G RSSI = -60 dBm
Current 5G RSRP = -71 dBm
Current 5G RSRQ = -11 dB
Current 5G SNR = 34.5 dB
Physical Cell Id = 500
Radio Access Technology(RAT) Preference = AUTO
Radio Access Technology(RAT) Selected = 5G NR-SA
```

```
Router#show cellular 0/4/0 radio detail
Modem Radio is Online
Main 0 Antenna details:
RSSI = -38 dBm
RSRP = -48 dBm
Diversity 0 Antenna details:
RSSI = -47 dBm
RSRP = -58 dBm
```

```
Router#show cellular 0/4/0 network
Current System Time = Sun Jan 6 0:4:36 1980
Current Service Status = Normal
Current Service = Packet switched
Current Roaming Status = Home
Network Selection Mode = Automatic
Network = Test PLMN 1-1
Mobile Country Code (MCC) = 1
Mobile Network Code (MNC) = 1
Packet switch domain(PS) state = Attached
Tracking Area Code (TAC) = 1
Cell ID = 1024
Negotiated network MTU = 1500
```

Band Selection Command Example

The **lte modem band-select** CLI can be used to enable bands that the user wishes to use and subscribe to. By default SA bands are not available.



Important If you wish to use SA bands, the **lte modem band-select** command **MUST** be used as part of the configuration.

The following is an example of the command:

```
conf t
controller cellular 0/2/0
lte modem band-select indices umts3g all lte4g all nr5g-NSA all nr5g-SA 78 slot 0
exit
```

The following shows an example of using nr5g-sa band 48:

```
lte modem band-select indices umts3g "23" lte4g "7" nr5g-nsa "12" nr5g-sa "48" slot 0
```



Note In the above example, umts3g band 23, lte4g band 7, and nr5g-nsa band 12 are not available in the area, which means the modem will only attach to nr5g-nsa band 48.

The following shows an example of using nr5g-sa band 78:

```
lte modem band-select indices umts3g "23" lte4g "7" nr5g-nsa "78" nr5g-sa "none" slot 0
```



Note In the above example, umts3g band 23 and lte4g band 7 are not available in the area, and nr5g-sa bands are turned off which means the modem will only attach to nr5g-nsa band 78.

Limitations

none is an invalid option for umts3g, lte4g, and nr5g-nsa.

Uncapped License Implementation

The Cisco IOS XE 17.11.1 release introduced a new throughput level called "uncapped". This release extends the new throughput level to all of the Cisco IoT routing platforms. The following is a recap of the uncapped license implementation:

Licensing Throughput Levels

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 250Mbps 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 17.12.1a 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 Cisco IOS XE release 17.12.1a 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.

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	Supported starting with 17.12.1a
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	Supported starting with 17.12.1a
IR8100	N/A	Yes	Yes	Yes	Yes	Supported starting with 17.12.1a
IR8300	Yes	N/A	Yes	N/A	N/A	No