

# Release Notes for the Cisco LoRaWAN Gateway, Release 2.0.11

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## Release Notes for the Cisco LoRaWAN Gateway, Release 2.0.11

These release notes include important information about Cisco LoRaWAN Gateway Software Release 2.0.11 and the limitations, restrictions, and caveats, if any, that apply to this release.



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**Note** The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. Exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation, or language that is used by a referenced third-party product.

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## Introduction

The Cisco LoRaWAN Gateway is one of the Cisco Internet of Things (IoT) extension module series. It can be connected to the Cisco 809 and 829 Industrial Integrated Services Routers (IR800 series) for virtual mode or standalone for low-power wide-area (LPWA) access and is positioned as a carrier-grade gateway for outdoor deployment, including harsh environments. It adds a ruggedized remote LoRaWAN radio modem interface to create a gateway between the Cisco Field Network Director and a partner's LoRa network server.



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**Note** The Cisco LoRaWAN Gateway was previously named Cisco LoRaWAN Interface Module.

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There are two LoRaWAN gateway modes as below:

- Virtual interface mode – IR800 series including the LoRaWAN module as a virtual interface
- Standalone mode – The LoRaWAN module working alone as an Ethernet backhaul gateway

You can configure the LoRaWAN IXM running on virtual interface mode or standalone mode through CLI or IoT FND. For more information, see the [Cisco Wireless Gateway for LoRaWAN Software Configuration Guide](#).

## System Requirements

### Hardware Supported

Model No.	Description
IXM-LPWA-800-16-K9	Cisco LoRaWAN Gateway, IoT extension module series, radio spectrum from 863–870 MHz, 16 LoRa channels, IP67
IXM-LPWA-900-16-K9	Cisco LoRaWAN Gateway, IoT extension module series, radio spectrum from 902–928 MHz, 16 LoRa channels, IP67

### Software Images

Filename	Description	LoRa Forwarder Package (LRR) Version
ixm_mdm_i_k9-2.0.11.tar.gz	Cisco LoRaWAN Gateway OS Image Version 2.0.11 with Semtech Release Version 2.2.0, FPGA Version 58, and HAL Version 5.0.0	LRR 2.2.39



**Note** The LRR version has dependencies with the IXM LoRaWAN firmware/FPGA/HAL release. Contact your Cisco representative if you are using different versions.

## Installation of a New Software Release

To upgrade to Release2.0.x, any older versions must first be upgraded to Release 1.0.20.



**Note** Make sure that FPGA v58 has been upgraded correctly before moving to the next step. FPGA upgrade will be triggered once the IXM boots up with the image version 1.0.20. After 10 - 15 minutes, you can use the following command to check the FPGA version.

```
IR829#show virtual-lpwa 1 modem info
Name : Virtual-LPWA 1
ModemImageVer : 2.0.11
BootloaderVer : 20160830_cisco
ModemAgentVer : 1.02
SerialNumber : FOC21028RBH
PID : IXM-LPWA-900-16-K9
UTCtime : 19:14:14.465 UTC Tue Aug 29 2017
IPv4Address : 192.168.1.2
IPv6Address : none
FPGAVersion : 58
TimeZone : UTC
```

```

LocalTime : Tue Aug 29 19:14:14 UTC 2017
ACT2 Authentication : PASS
ModemVersionID : V01
ProtocolVersion : 2
ChipID : LSB = 0x28750305 MSB = 0x00f1400e
LoRaSerialNumber : FOC21028R05
LoRaCalc :
<NA,NA,NA,55,37,110,101,93,84,76,68,58,49,39,30,21-NA,NA,NA,50,31,106,97,88
,80,71,63,53,44,34,25,16>
CalTempCelsius : 35
CalTempCodeAD9361 : 92
RSSIOffset : -204.00,-204.00
-203.00,-203.00
AESKey : Unknown

```

Then follow this procedure to upgrade to Release2.0.11:

## Procedure

**Step 1** Upgrade the firmware to Release 2.0.11 using the following factory install CLI:

```

IR829#virtual-lpwa 1 modem install firmware factory
flash:ixm_mdm_i_k9-2.0.11.tar.gz

```

**Step 2** Upgrade the firmware to Release 2.0.11 using the same CLI with uboot or uboot-only option:

```

IR829#virtual-lpwa 1 modem install firmware factory flash:ixm_mdm_i_k9-2.0.11.K1.tar.gz ?
only-uboot  install uboot only
uboot      install uboot together
<cr>

```

**Note** Step 2 is to upgrade the uboot options if the device is upgraded to Release 2.0.x for the first time, because the uboot options are not available for Release 1.0.20. Additionally, to use these uboot options in IR8x9, you must upgrade the IOS image of IR8x9 to Release 15.7.3M or later (such as **ir800-universalk9-bundle.SPA.157-3.M.bin**).

**Note** If certificates for IPSec have been persistently stored in the module in any image before 2.0, follow this procedure during an upgrade to image 2.0 and later. This applies to both factory and normal upgrades and must be done for proper behavior of the module.

- a. Erase the certificates.
- b. Upgrade the image.
- c. Re-download the new certificates.

## Virtual Mode Installation

Follow these steps to install a new software image on the virtual mode LoRaWAN Gateway:

## Procedure

- Step 1** Log in to the IR809 or IR829 system with terminal through SSH or Console.
- Step 2** Use the `scp` command to copy the image file into IR809 or IR829 from your host, and the image will be stored in flash.

### Example:

```
IR829#copy ftp://root:cisco@192.168.0.1/temp/ixm_mdm_i_k9-2.0.tar.gz flash:
Destination filename [ixm_mdm_i_k9-2.0.tar.gz]?
Accessing ftp://*:cisco@192.168.0.1/temp/ixm_mdm_i_k9-2.0.tar.gz...
Loading temp/ixm_mdm_i_k9-2.0.tar.gz
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 70138462/4096 bytes]

70138462 bytes copied in 247.056 secs (283897 bytes/sec)

IR829#dir | include ixm
 68 -rw-      70138462   Jun 2 2017 17:56:22 +00:00  ixm_mdm_i_k9-2.0.tar.gz
IR829#
```

- Step 3** (Optional) If you are upgrading from an older version to Release 1.0.20, the upgrade will result in updating the FPGA to version 58. After upgrading the image, no action should be taken while the FPGA is upgrading. You must wait until you get the upgrade status of Ready, as the following example shows.

### Example:

```
IR829#show virtual-lpwa 1 modem status
Name : Virtual-LPWA 1
Status : Running
Uptime : 0:05:02.130000
Door : DoorClose
Upgrade Status : Ready

IR829#show virtual-lpwa 1 modem info
Name : Virtual-LPWA 1
ModemImageVer : 1.0.20
BootloaderVer : 20160830_cisco
ModemAgentVer : 1.02
SerialNumber : FOC20304ZG8
PID : IXM-LPWA-800-16-K9
UTCTime : 17:30:45.593 UTC Fri Jun 02 2017
IPv4Address : 10.16.16.5
IPv6Address : none
FPGAVersion : 58
TimeZone : CEST
LocalTime : Fri Jun 2 19:30:45 CEST 2017
ACT2 Authentication : PASS
ModemVersionID : V01
ProtocolVersion : 2
ChipID : LSB = 0x28610316 MSB = 0x00f14086
LoRaSerialNumber : FOC203310FV
LoRaCalc :
<153,140,132,124,116,112,108,104,95,87,78,70,61,57,53,49-156,144,136,128,120,116,112,108,99,91,83,74,66,62,58,54>
CalTempCelsius : 41
CalTempCodeAD9361 : 98
```

```
RSSIOffset : -204.35,-205.89

AESKey : 595EB592055421C06895E4D4CE0FE63D
```

**Step 4** From the CLI on IR809 or IR829, install the image. Using factory mode to install will take more than four minutes.

**Example:**

```
IR829#virtual-lpwa 1 modem install firmware factory flash:ixm_mdm_i_k9-2.0.tar.gz
filepath: flash:ixm_mdm_i_k9-2.0.tar.gz sent to modem
Name : Virtual-LPWA 1
Modem image installed successfully
The modem will reboot in 10 s
IR829#
```

**Step 5** After the image is installed successfully, verify the status. As shown in the following output, **ModemImageVer** has been updated, but **BootloaderVer** remains the same.

**Example:**

```
IR829#show virtual-lpwa 1 modem info
Name : Virtual-LPWA 1
ModemImageVer : 2.0
BootloaderVer : 20160830_cisco
ModemAgentVer : 1.02
SerialNumber : FOC20304ZG8
PID : IXM-LPWA-800-16-K9
UTCTime : 18:12:50.141 UTC Fri Jun 02 2017
IPv4Address : 10.16.16.5
IPv6Address : none
FPGAVersion : 58
TimeZone : CEST
LocalTime : Fri Jun 2 20:12:50 CEST 2017
ACT2 Authentication : PASS
ModemVersionID : V01
ProtocolVersion : 2
ChipID : LSB = 0x28610316 MSB = 0x00f14086
LoRaSerialNumber : FOC203310FV
LoRaCalc :
<153,140,132,124,116,112,108,104,95,87,78,70,61,57,53,49-156,144,136,128,120,116,112,108,99,91,83,74,66,62,58,54>
CalTempCelsius : 41
CalTempCodeAD9361 : 98
RSSIOffset : -204.35,-205.89

AESKey : D6E59138224920AA66D99F680CFD9543

IR829#
```

**Step 6** From the CLI on IR809 or IR829, install the image again with the uboot option:

**Example:**

```
IR829#virtual-lpwa 1 modem install firmware factory
flash:ixm_mdm_i_k9-2.0.tar.gz uboot
filepath:flash:ixm_mdm_i_k9-2.0.tar.gz sent to modem
Name : Virtual-LPWA 1
Modem image installed successfully The modem will reboot in 10 s
```

```
IR829#
```

- Step 7** After the image is installed successfully, verify the status. You will find from the output that both **ModemImageVer** and **BootloaderVer** have been upgraded.

**Example:**

```
IR829#show virtual-lpwa 1 modem info
Name :Virtual-LPWA 1
ModemImageVer : 2.0
BootloaderVer: 20170515_cisco
.....
```

## Firmware Upgrade From Standalone Mode

Follow these steps to install a new software image on the standalone mode LoRaWAN Gateway:

### Procedure

- Step 1** Log into the Cisco LoRaWAN Gateway through the console port, or SSH if configured.

**Note** The console port is 115.2kbs.

- Step 2** Check the current version before upgrade.

**Example:**

```
IXM-alone#show version

Corsica Software, Version 2.0.02, RELEASE SOFTWARE
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2012-2014, 2017 by Cisco Systems, Inc.
Compiled 15-Jun-2017.16:58:41UTC-04:00 by Corsica Team
```

```
ROM: Bootstrap program is Corsica boot loader
Firmware Version : 2.0.02, RELEASE SOFTWARE
Bootloader Version: 20170515_cisco
```

```
Hostname:IXM-alone uptime is 2 weeks, 6 days, 9 hours, 31 minutes
Using secondary system image
```

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

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If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).



```

Extracting images...
Extracted images successfully
Verifying images...
Verification successful
Installing firmware in normal mode...
System will reload in few seconds...

```

**Step 4** After the image is installed successfully, verify the status.

**Example:**

```

IXM-alone#show version
Corsica Software, Version 2.0.03rc3, RELEASE SOFTWARE
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2012-2014, 2017 by Cisco Systems, Inc.
Compiled 07-Aug-2017.17:41:05UTC-07:00 by Corsica Team

```

```

ROM: Bootstrap program is Corsica boot loader
Firmware Version : 2.0.03rc3, RELEASE SOFTWARE
Bootloader Version: 20170515_cisco

```

```

Hostname:IXM-alone uptime is 2 minutes
Using secondary system image

```

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at: <http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

```

cisco model: IXM-LPWA-800-16-K9
Processor : ARMv7 Processor rev 1 (v7l) with 1027308K bytes of memory.
Last reset from power-on

```

```

Base ethernet MAC Address      : 00:50:43:14:2E:30
Model revision number:         : B0
System serial number:          : FOC20394AA0

```

## Switching Between Standalone Mode and Virtual Mode

When the LoRaWAN gateway is in standalone mode, use the **switchover EXEC** command to switch to the virtual mode.

```
#switchover
```



You can switch the LoRaWAN gateway from virtual mode to standalone mode through IR8x9, using the following command.

```
IR800#virtual-lpwa 1 modem standalone mode enable
```

## Caveats

This section contains the caveats for this release.

- **CSCvi92370**

**Symptom:** Upgrading IXM image via USB and having the USB connected to the unit while upgrading can cause problem and block the upgrade.

**Workaround:** Copy the IXM image to flash and perform archive download via FLASH. Unplug USB while the boot is happening. If the IXM is in error state, simply unplug the USB. The device will recover from the error state after several minutes.

- **CSCvi70922**

**Symptom:** The **virtual-lpwa packet forwarder install/uninstall** exec commands have no effect.

**Workaround:** In IOS, the packet forwarder installation exec commands are not supported and have been removed.

- **CSCvh06187**

**Symptom:** In virtual mode, the XPKI CA server is not supported when SCEP is configured from file instead of profile.

**Workaround:** Configure the XPKI CA server using the **lpwa modem scep profile** command, and make sure that every parameter is configured properly.

- **CSCvh00511**

**Symptom:** FTP server does not accept passwords with special characters like ! or #.

**Workaround:** Avoid using these special characters.

## Resolved Caveats in Release 2.0.11

- CSCvf84848—Fix enable secret error of handling incorrect padding.
- CSCvf80656—IPSec tunnels do not work if DNS service takes longer than a minute.
- CSCvf98774—IPsec enable and disable issue.

## Known Issues

- **CSCvf98764**

**Symptom:** SSH parameters are not honored.

**Workaround:** There is no workaround.

- **CSCvg00838**

**Symptom:** When backup goes down, the primary tunnel is resetting in certain cases.

**Workaround:** There is no workaround.

## Related Documentation

These documents provide detailed information about the Cisco LoRaWAN Gateway and are available at: [www.cisco.com/go/lorawanmodule](http://www.cisco.com/go/lorawanmodule)

- [Getting Started and Product Document of Compliance for the Cisco LoRaWAN Interface Module](#)
- [Cisco LoRaWAN Gateway Hardware Installation Guide](#)
- [Cisco LoRaWAN Gateway Software Configuration Guide](#)
- [Release Notes for IoT Field Network Director](#)
- [Release Notes for Cisco IR800 Industrial Integrated Services Routers and Cisco 1000 Series Connected Grid Routers](#)
- [Cisco IR800 Integrated Services Router Software Configuration Guide](#)
- [Cisco IoT Field Network Director User Guide](#)

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