Appendix

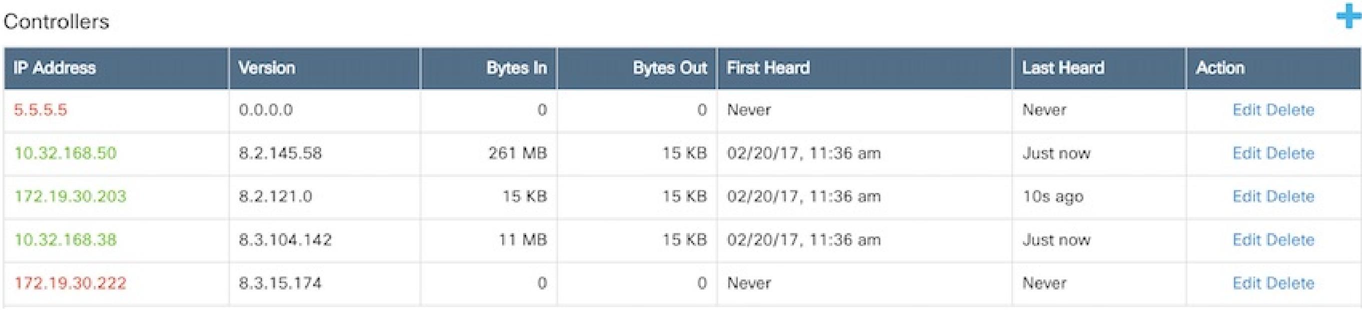
Appendix

Configuring Cisco CMX with wireless controller

Step 1 From the Cisco CMX navigation pane, choose **System>Settings>Controllers and Maps Setup>Advanced**.

Step 2 From the **Controllers** section, select the **IP address** from the drop-down and enter the wireless controller IP address. From the **Controller SNMP Write Community**, select a version and click **Save**.

Step 3 From the main area of the Cisco CMX dashboard, go to the, **Controller** area, and ensure that the wireless controller IP address is green. This indicates a successful connection between the wireless controller and Cisco CMX.



Controllers

IP Address	Version	Bytes In	Bytes Out	First Heard	Last Heard	Action
5.5.5.5	0.0.0.0	0	0	Never	Never	Edit Delete
10.32.168.50	8.2.145.58	261 MB	15 KB	02/20/17, 11:36 am	Just now	Edit Delete
172.19.30.203	8.2.121.0	15 KB	15 KB	02/20/17, 11:36 am	10s ago	Edit Delete
10.32.168.38	8.3.104.142	11 MB	15 KB	02/20/17, 11:36 am	Just now	Edit Delete
172.19.30.222	8.3.15.174	0	0	Never	Never	Edit Delete

Note If the wireless controller IP address is not green, refer to the instructions in the next task.

Configure a Hash Key on wireless controller

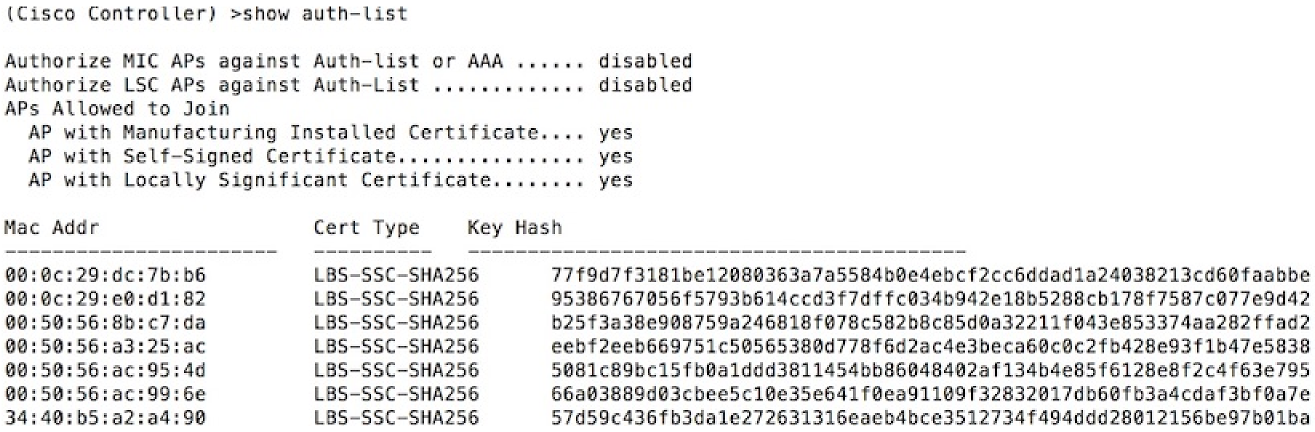
If the status of the wireless controller IP address is red, the wireless controller may have been added on Cisco CMX with a read community string. Perform the following troubleshooting task.

Step 1 From the Cisco CMX CLI, execute the **cmxctl config controllers show** command and copy the value of the SHA2 key:

```
[CMXadmin@CMX-jkp103 configuration]$ cmxctl config controllers show

+-------------+------------------------------------------------------------------+

| MAC Address | 00:50:56:ac:99:6e                                                |

+-------------+------------------------------------------------------------------+

| SHA1 Key    | d116d605fd88e72763a03871bc483786e463ae43                         |

+-------------+------------------------------------------------------------------+

| SHA2 Key    | 66a03889d03cbee5c10e35e641f0ea91109f32832017db60fb3a4cdaf3bf0a7e |

+-------------+------------------------------------------------------------------+
```

Step 2 From the wireless controller CLI, issue the **config auth-list add sha256-lbs-ssc** *<CMX-mac><sha2KeyHashString>* command using the SHA2 string from Step 1.

Step 3 At the wireless controller CLI, execute the **show auth-list** command:



```
(Cisco Controller) >show auth-list

Authorize MIC APs against Auth-list or AAA ...... disabled
Authorize LSC APs against Auth-List ............ disabled
APs Allowed to Join
  AP with Manufacturing Installed Certificate.... yes
  AP with Self-Signed Certificate................ yes
  AP with Locally Significant Certificate........ yes

Mac Addr                  Cert Type    Key Hash
-----------------------   ----------   ------------------------------------------
00:0c:29:dc:7b:b6         LBS-SSC-SHA256      77f9d7f3181be12080363a7a5584b0e4ebcf2cc6ddad1a24038213cd60faabbe
00:0c:29:e0:d1:82         LBS-SSC-SHA256      95386767056f5793b614ccd3f7dffc034b942e18b5288cb178f7587c077e9d42
00:50:56:8b:c7:da         LBS-SSC-SHA256      b25f3a38e908759a246818f078c582b8c85d0a32211f043e853374aa282ffad2
00:50:56:a3:25:ac         LBS-SSC-SHA256      eebf2eeb669751c50565380d778f6d2ac4e3beca60c0c2fb428e93f1b47e5838
00:50:56:ac:95:4d         LBS-SSC-SHA256      5081c89bc15fb0a1ddd3811454bb86048402af134b4e85f6128e8f2c4f63e795
00:50:56:ac:99:6e         LBS-SSC-SHA256      66a03889d03cbee5c10e35e641f0ea91109f32832017db60fb3a4cdaf3bf0a7e
34:40:b5:a2:a4:90         LBS-SSC-SHA256      57d59c436fb3da1e272631316eaeb4bce3512734f494ddd28012156be97b01ba
```

Configuring a Proxy on Cisco CMX 10.4 and above

This task shows you how to configure a proxy gateway on Cisco CMX (10.4 and above) to allow communication between a Cisco CMX server installed on a private network and an external cloud setup.

Step 1 **cmxos sysproxy proxy http://** *<proxy-gateway-address> <port>*

This command configures a proxy gateway that allows communication of an internal Cisco CMX with an external Asset Locator server.

Step 2 **cmxos sysproxy no_proxy localhost** *<website-address>*

This command prevents the use of proxy for IP addresses that are within the network.

Step 3 **cmxos sysproxy {enable | clear | disable}**

This command enables proxy.

Step 4 **cmxctl stop -a**

Step 5 **cmxcl agent start**

Step 6 **cmxctl start**

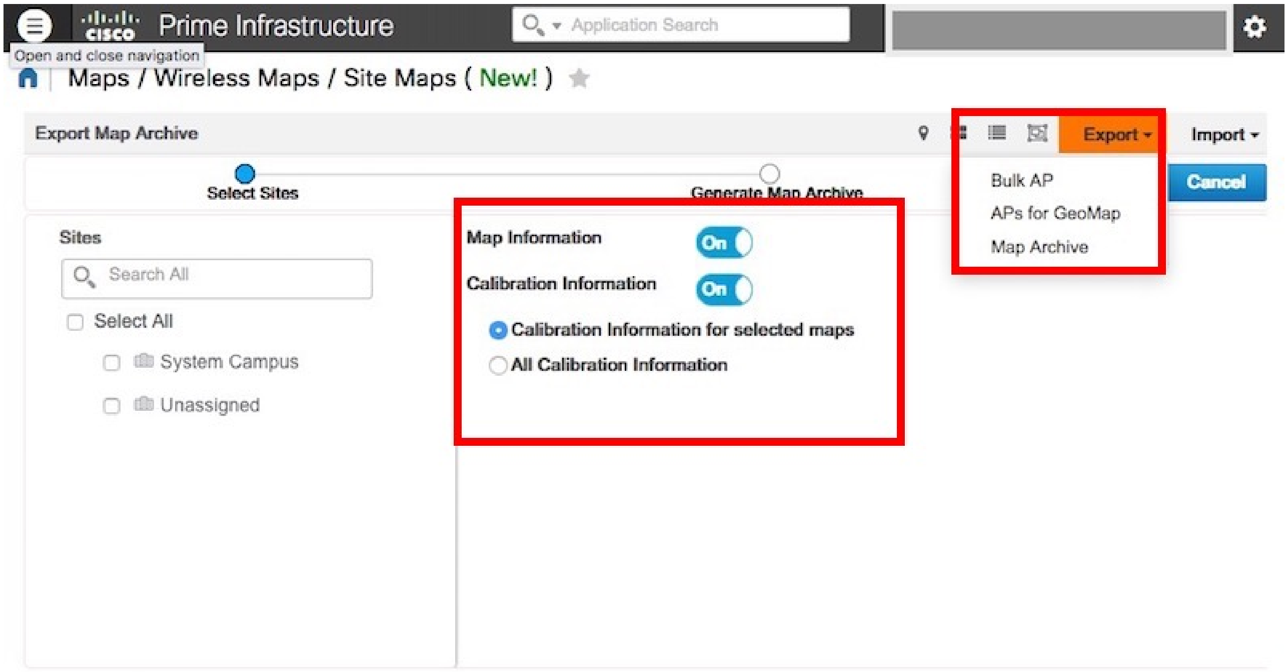
Step 7 Restart Cisco CMX to see the changes in effect.

Import Maps from Cisco PI to Cisco CMX

Step 1 Log in to Cisco PI using the URL *https://<PrimeInfrastructure_IP_address>*.

a) Choose **Maps>Wireless Maps>Site Maps**.

b) From the right navigation pane, choose **Export > Map Archive**. Ensure that all the default checks are retained, as shown in the figure.



Map Information On
Calibration Information On
● Calibration Information for selected maps
○ All Calibration Information

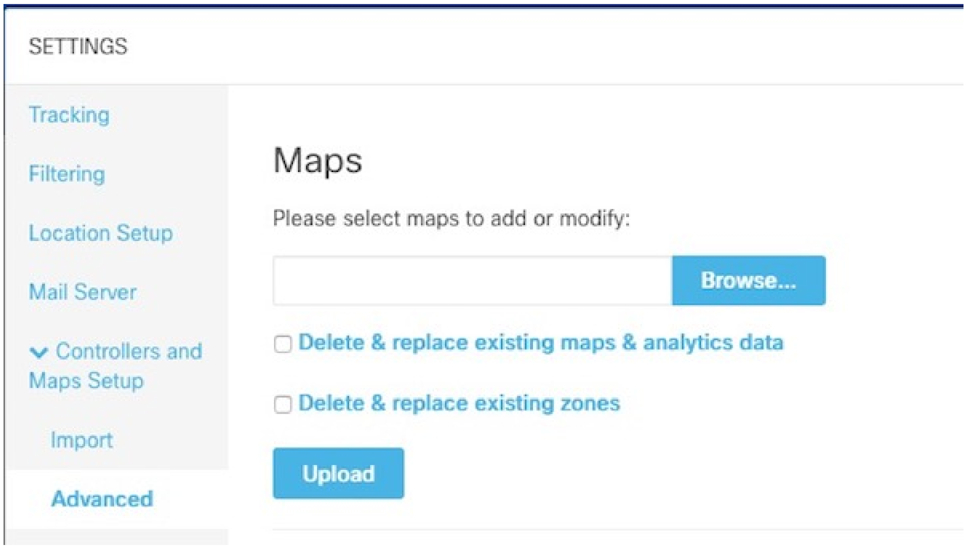
c) Select the map to be exported and click **Export**.

The selected map is downloaded to a compressed .tar file named `ImportExport_xxxx .tar.gz`, for example, `ImportExport_4575dcc9014d3d88.tar.gz`, in your browser's download directory.

Step 2 Log in to Cisco CMX dashboard using the URL *https://<CMX_IP_address>*.

a) Choose **System>Settings>Controllers and Map Setup>Advanced**.

b) Under **Maps**, click **Browse**, select the maps exported from Cisco PI (Step 1), and click **Upload**.



Maps

Please select maps to add or modify:

□ Delete & replace existing maps & analytics data

□ Delete & replace existing zones

Step 3 Log in to App dashboard

Step 4 Select **Maps** from the left menu.

Step 5 Click **Upload**. The map uploads to the App.

Step 6 Verify that the map uploaded to the App correctly.

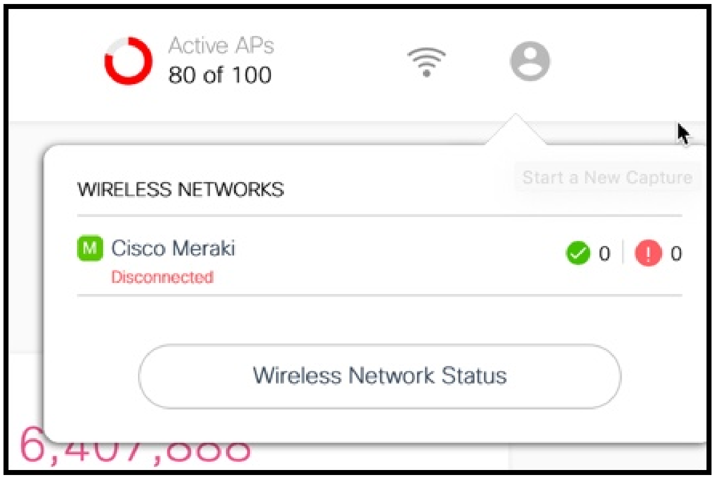
How to obtain a Cisco CMX token from Cisco Spaces

This appendix shows you how to add a Cisco CMX to your Cisco Spaces account and obtain a token for the same. You can configure this token on Cisco CMX. This step is a prerequiste for the proper functioning of Asset Locator.

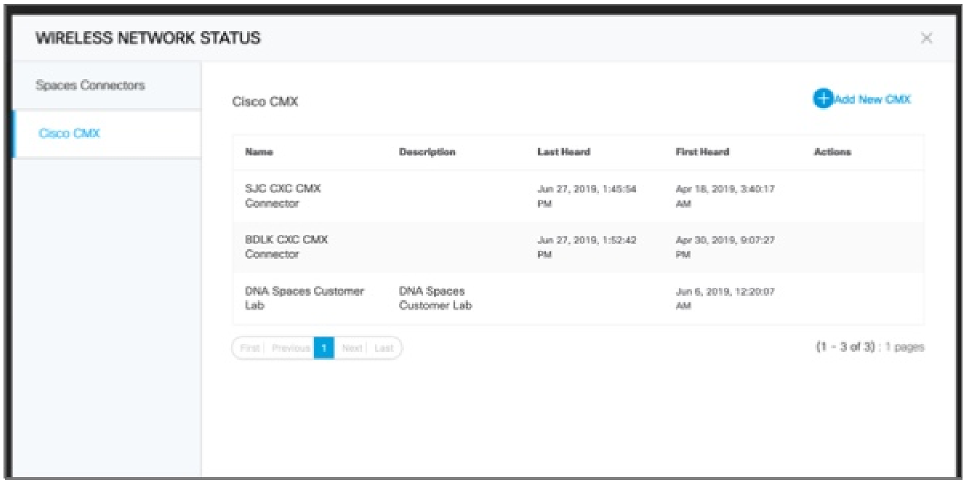
Step 1 Log in to your Cisco Spaces account.

Step 2 Click on the 📶 button in the top-right corner.

Step 3 Click **Wireless Network Status**.



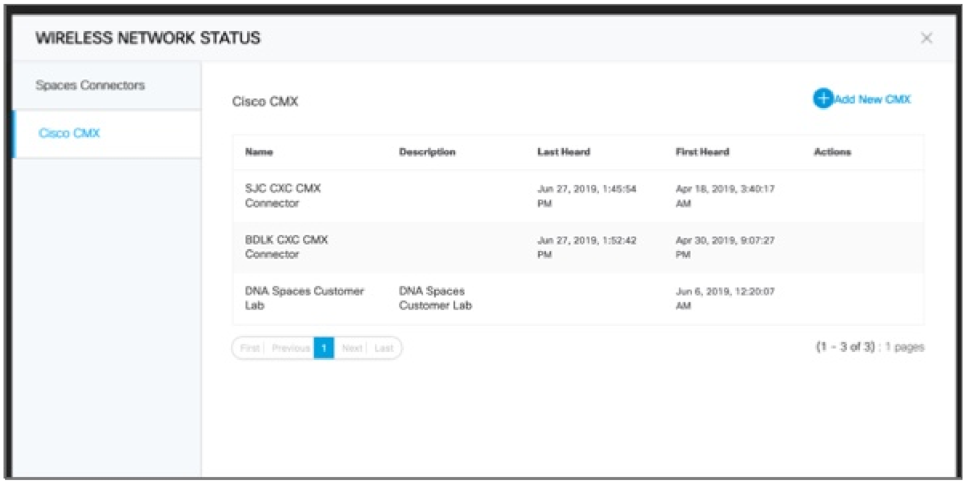
Step 4 From the **Wireless Network Status** page that is displayed, click **Cisco CMX** and **Add New CMX**



Name	Description	Last Heard	First Heard	Actions
SJC CXC CMX Connector		Jun 27, 2019, 1:45:54 PM	Apr 18, 2019, 3:40:17 AM	
BDLK CXC CMX Connector		Jun 27, 2019, 1:52:42 PM	Apr 30, 2019, 9:07:27 PM	
DNA Spaces Customer Lab	DNA Spaces Customer Lab		Jun 6, 2019, 12:20:07 AM	

(1 - 3 of 3) : 1 pages

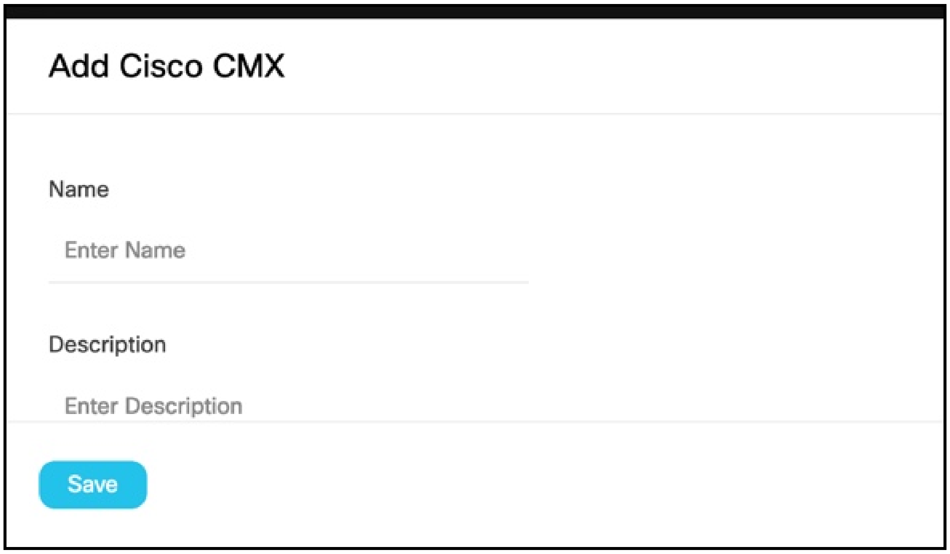
Step 5 From the **Wireless Network Status** page that is displayed, click **Cisco CMX** and **Add New CMX**



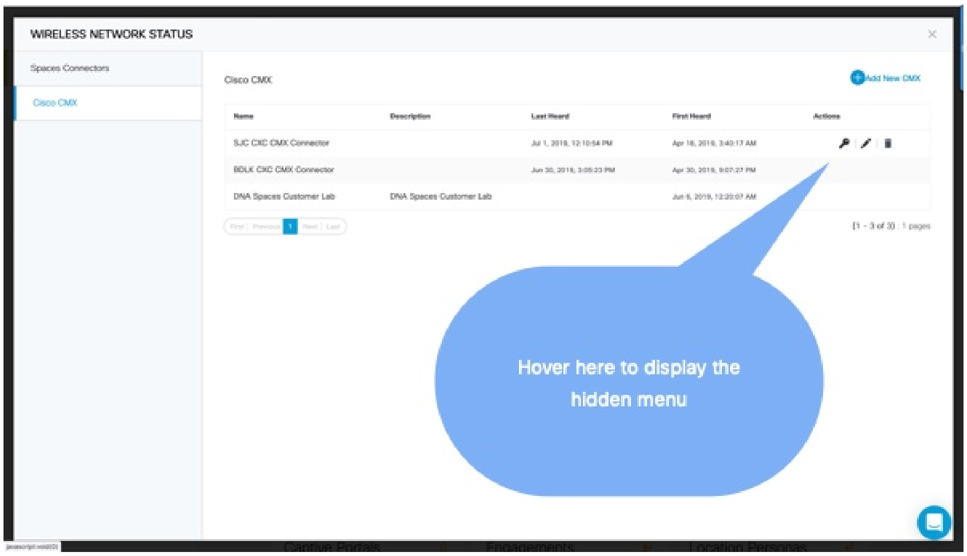
Name	Description	Last Heard	First Heard	Actions
SJC CXC CMX Connector		Jun 27, 2019, 1:45:54 PM	Apr 18, 2019, 3:40:17 AM	
BDLK CXC CMX Connector		Jun 27, 2019, 1:52:42 PM	Apr 30, 2019, 9:07:27 PM	
DNA Spaces Customer Lab	DNA Spaces Customer Lab		Jun 6, 2019, 12:20:07 AM	

(1 - 3 of 3) : 1 pages

Step 6 Enter a **Name** and **Description** for your Cisco CMX and click **Save**.



Step 7 Hover around the right extreme area of the Cisco CMX you added to display the respective hidden menu. Click on the Key button.



Cisco CMX

Name	Description	Last Heard	First Heard	Actions
SJC CXC CMX Connector		Jul 1, 2019, 12:10:54 PM	Apr 18, 2019, 3:40:17 AM	
BDLK CXC CMX Connector		Jun 30, 2019, 3:05:23 PM	Apr 30, 2019, 9:07:27 PM	
DNA Spaces Customer Lab	DNA Spaces Customer Lab		Jun 6, 2019, 12:20:07 AM	

[1 - 3 of 3] : 1 pages

Step 8 Authenticate using your Cisco Spaces credentials when prompted and click **Submit**.

Step 9 When the Token is displayed, click **Copy**.

What to do next

You can now add this token on your Cisco CMX.

Location Services Using Cisco CMX

Configuring Cisco CMX 10.6 and Above

Configuring Notifications on Cisco CMX 10.6 and above

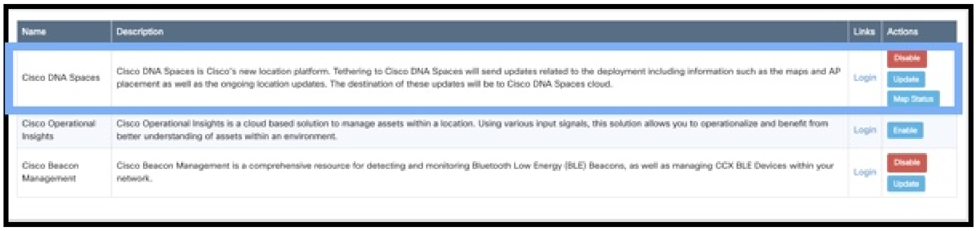
This step demonstrates how to configure HTTPS notifications in Cisco CMX to notify Application when a location update occurs for a tag.

Before you begin

Get the Application token. Refer to *How to Obtain a token from Cisco Spaces* of the Appendix.

Step 1 From the Cisco Spaces: Asset Locator dashboard, choose **Manage> Cloud Apps**.

Step 2 In the **Cloud Applications> Cisco Spaces** section, click **Enable**.

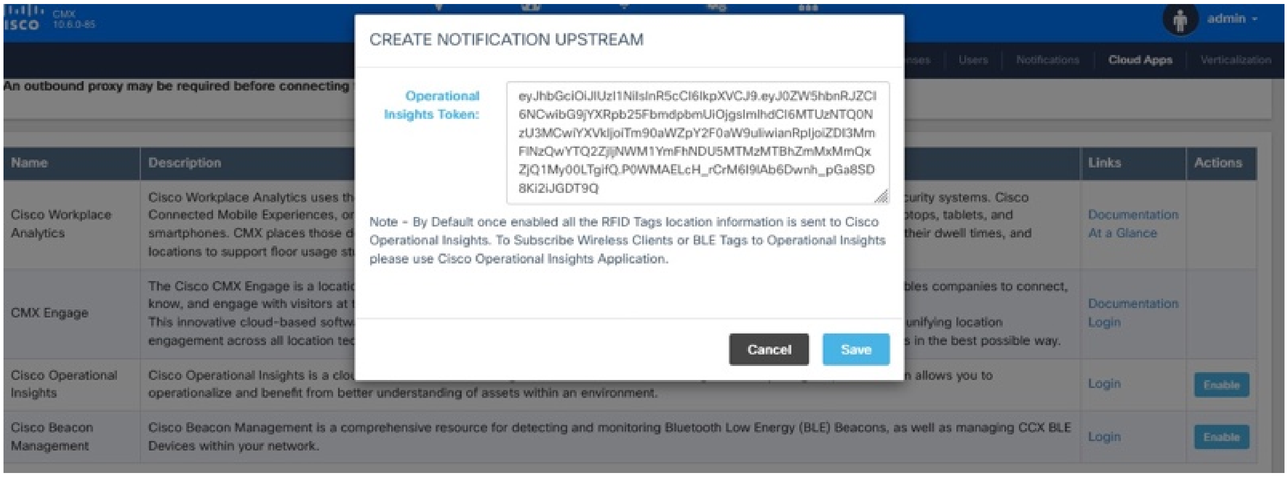


Name	Description	Links	Actions
Cisco DNA Spaces	Cisco DNA Spaces is Cisco's new location platform. Tethering to Cisco DNA Spaces will send updates related to the deployment including information such as the maps and AP placement as well as the ongoing location updates. The destination of these updates will be to Cisco DNA Spaces cloud.	Login	Disable Update Map Status
Cisco Operational Insights	Cisco Operational Insights is a cloud based solution to manage assets within a location. Using various input signals, this solution allows you to operationalize and benefit from better understanding of assets within an environment.	Login	Enable
Cisco Beacon Management	Cisco Beacon Management is a comprehensive resource for detecting and monitoring Bluetooth Low Energy (BLE) Beacons, as well as managing CCX BLE Devices within your network.	Login	Disable Update

Note **WARNING**

Do not enable Asset Locator if it is present. This is deprecated.

Step 3 In the **Create Notification Upstream** dialog box, enter the value of token obtained from Cisco Spaces.



An outbound proxy may be required before connecting

CREATE NOTIFICATION UPSTREAM

Operational Insights Token: eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0ZW5hbnRJZCI6NCwibG9jYXRpb25FbmdpbmUiOjgsImlhdCI6MTUzNTQ0NzU3MCwiYXVkIjoiTm90aWZpY2F0aW9uIiwianRpIjoiZDI3MmFlNzQwYTQ2ZjljNWM1YmFhNDU5MTMzMTBhZmMxMmQxZjQ1My00LTgifQ.P0WMAELcH_rCrM6I9IAb6Dwnh_pGa8SD8Ki2iJGDT9Q

Note - By Default once enabled all the RFID Tags location information is sent to Cisco Operational Insights. To Subscribe Wireless Clients or BLE Tags to Operational Insights please use Cisco Operational Insights Application.

Name	Description	Links	Actions
Cisco Workplace Analytics	Cisco Workplace Analytics uses th … curity systems. Cisco Connected Mobile Experiences, or … ptops, tablets, and smartphones. CMX places those d … their dwell times, and locations to support floor usage st	Documentation At a Glance	
CMX Engage	The Cisco CMX Engage is a locatic … bles companies to connect, know, and engage with visitors at t … This innovative cloud-based softw … unifying location engagement across all location tec … s in the best possible way.	Documentation Login	
Cisco Operational Insights	Cisco Operational Insights is a clou … n allows you to operationalize and benefit from better understanding of assets within an environment.	Login	Enable
Cisco Beacon Management	Cisco Beacon Management is a comprehensive resource for detecting and monitoring Bluetooth Low Energy (BLE) Beacons, as well as managing CCX BLE Devices within your network.	Login	Enable

Configuring Cisco CMX 10.5 and Before

Configuring Notifications on Cisco CMX (Prior to Cisco CMX 10.6)

This procedure demonstrates how to configure HTTPS notifications in Cisco CMX to notify Application when a location update occurs for a tag.

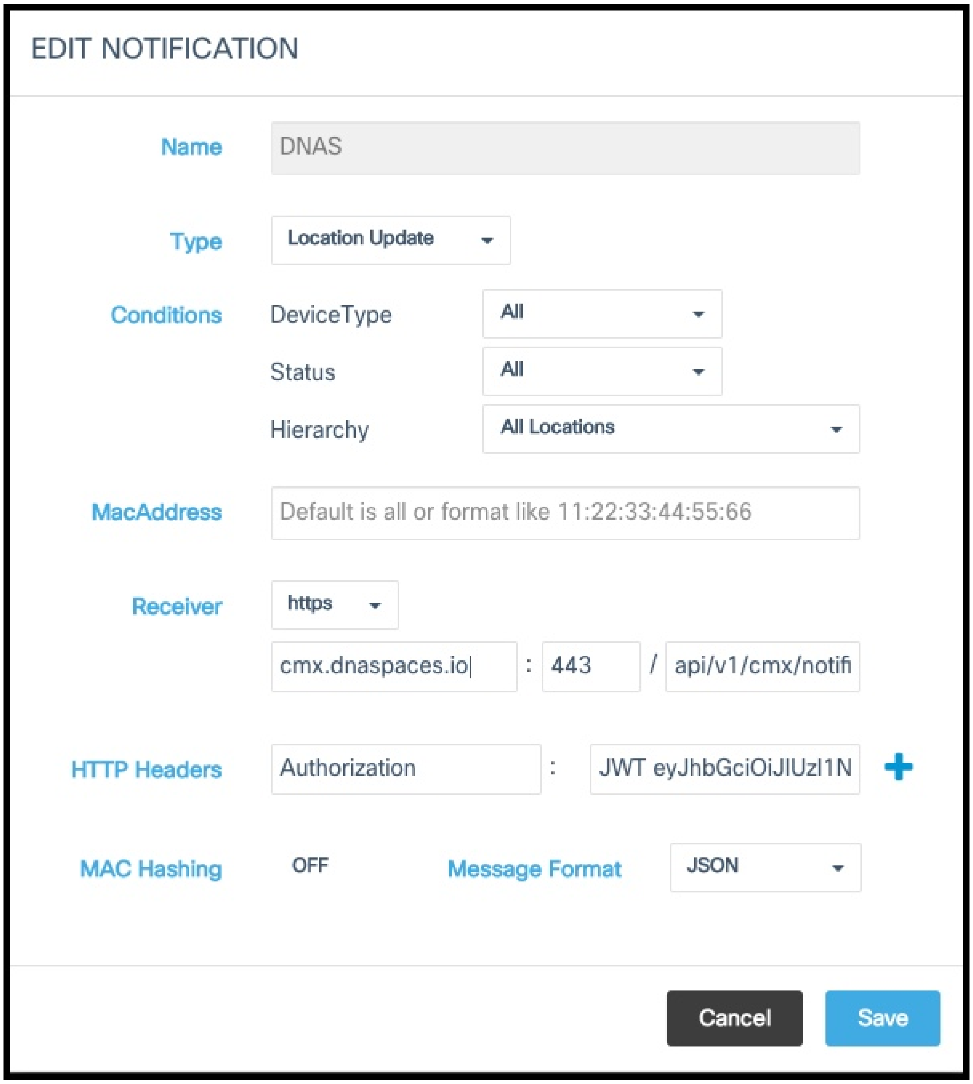
Before you begin

You can retreive a token from the Creating Cisco CMX Connector and Retrieving Token section of the Cisco CMX configuration guide.

Step 1 From the Cisco CMX dashboard, navigate to **Manage** > **Notification** > **+New Notification**.

Step 2 In the **Create New Notification** dialog box, enter a **Name** for your notification.

Figure 1: Create New Notification



EDIT NOTIFICATION

Name	DNAS	
Type	Location Update	
Conditions	DeviceType	All
	Status	All
	Hierarchy	All Locations
MacAddress	Default is all or format like 11:22:33:44:55:66	
Receiver	https	
	cmx.dnaspaces.io : 443 / api/v1/cmx/notifi	
HTTP Headers	Authorization : JWT eyJhbGciOiJIUzI1N	
MAC Hashing	OFF	
Message Format	JSON	

Step 3 Under **Conditions**, choose **All** from the **Device Type** and **Status** drop-down box, and choose **All Locations** from the **Heirarchy** drop-down box.

Step 4 Leave the **MAC address** field empty.

Step 5 From **Receiver** drop-down list, select **https** .

Step 6 From the information in the activation mail, fill the **host address** field with `https://cmx.dnaspaces.io` and port number as *443*.

Step 7 In the **url** field, enter ***`api/v1/cmx/notifications/locationUpdate`***

Step 8 Turn the **MAC hashing** option off.

Step 9 From the **Message Format** drop-down list, select **JSON**.

Step 10 Click **Create**.

Enabling Telemetry on Cisco CMX (Prior to 10.3)

This task enables Cisco CMX to send telemetry data to the Asset Locator. Telemetry data is nonlocation data such as temperature of humidity that is collected by the RFID tags and sent to Asset Locator through the Cisco CMX location engine.

Step 1 In the Cisco CMX CLI, navigate to the `/opt/cmx/etc/node.conf` and insert the following line under **location** section.

```
user_options=-Dpublish-telemetry=true
```

Step 2 Restart Cisco CMX.

```
cmxctl stop -a
cmxctl agent start
cmxctl start
```

Step 3 Ensure that Cisco CMX and all its services and processes are up and running.

```
cmxctl status
```