

Release Notes for Cisco Connected Mobile Experiences (CMX) Release 11.1.0

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Introduction

Cisco Connected Mobile Experiences (Cisco CMX) Release 11.1.0 is a high-performing scalable software solution that addresses the mobility services requirements of high-density Wi-Fi deployments. Unless otherwise noted, Cisco Connected Mobile Experiences is referred to as Cisco CMX in this document.

What's New in Cisco CMX Release 11.1.0

Cisco CMX Release 11.1.0 includes an AlmaLinux operating system upgrade and addresses multiple vulnerabilities reported in Cisco CMX Release 11.0.0 and Cisco CMX Release 11.0.1.

You can upgrade from the previous releases of Cisco CMX Release 11.0.0 and Cisco CMX Release 11.0.1. If the upgrade is from Cisco CMX Release 11.0.0 and Cisco CMX Release 11.0.1, you must reboot the Cisco CMX servers to upgrade Linux Kernel.

Cisco CMX Release 11.1.0 supports migration of your data from Cisco CMX Release 10.6.3-146 to the latest Cisco CMX Release 11.0.1. Use the **cmxos upgrade** command to migrate data from Cisco CMX Release CMX 11.0.0-154 and Cisco CMX Release 11.0.1-129.



Note

- You must disable the root password in Cisco CMX Release 11.0.0 and Cisco CMX Release 11.0.1 before
 upgrading to Cisco CMX Release 11.1.0.
- Data migration or inline upgrade is not supported for releases earlier than Cisco CMX Release 10.6.3-146.
- Cisco CMX Release 11.1.0 is supported on Cisco Mobility Services Engine (MSE) 3375 Appliance.
- Cisco CMX Release 11.1.0 is not supported on Cisco Mobility Services Engine (MSE) 3365 Appliance.

To install Cisco CMX OVA, follow these steps:

- 1. Download the CISCO CMX-11.1.0-21.ova file available on the Software Download page.
- 2. Install the Cisco CMX Release 11.1.0-21 OVA build on the primary and secondary servers.
- 3. Migrate data from appilcable Cisco CMX Releases. For detailed instructions, see Data Migration.

Table 1: What's New in Cisco CMX Release 11.1.0

Feature	Description	
AlmaLinux Upgrade	This release supports the upgrade from AlmaLinux 8.7 to AlmaLinux 8.10 along with vulnerabilities fixes to various components. For more information, see CSL AlmaLinux Upgrade.	
Customer Success Management Software (CSM) Toolkit support and Cassandra upgrades		
Transport Layer Security (TLS) protocol version Support	This release supports the update or override of the default TLS setting. This feature enables you to support previous releases of Catalyst Center which supports only TLSv1.2. For more information, see Cisco CMX Command Reference Guide, Release 11.1.0.	
Self-signed Certificate Update	This release supports adding IP address in the Subject Alternate Name (SAN) field of self-signed certificate. For more information, see Cisco CMX Command Reference Guide, Release 11.1.0.	
New Supported Access	Cisco Wireless 9176 Series Access Points	
Points	Cisco Wireless 9178 Series Access Points	
	Cisco Wireless 9172 Series Access Points	
NTP Authentication	This release supports NTP authentication using chronyd service. For more information, see Configuring Authenticated NTP Server.	
Cisco Catalyst 9800 Series Wireless Controller Cisco IOS XE 17.15.2 Software and Wi-Fi 7 Clients with Multi-link	This release supports new message identification along with old format (for backward compatibility). For more information, see Wireless Controller and Wi-Fi Client Support.	
Call Home endpoint for Cisco Smart Licensing	This release supports the configuration updates to the Call Home endpoint used in Cisco Smart Licensing.	
Data migration	Data migration from earlier Cisco CMX Releases to Cisco CMX Release 11.1.0 is supported. For more information, see Data Migration.	
Cisco CMX Root Login	This release supports generating the root challenge and enabling or disabling the root login, even if all Cisco CMX services are down.	
Bouncy Castle Cryptography Library Upgrade	This release introduces the Bouncy Castle Cryptography Library version bc-fips-2.0.0 support. This upgrade is for FIPS mode, allows FIPS approved encryption algorithms, ciphers and blocks RSA ciphers in the NMSP connections.	
	This version upgrade impacts only the Cisco CMX core java processes such as nmsplb, Configuration, Location, Hyperlocation and so on.	
Critical issue fixes	Includes critical issue fixes.	

System Requirements

Supported Hardware

• Cisco CMX can be installed as a virtual Cisco MSE appliance, that requires a version VMware ESXi 7.0. The OVA deployment using a VMware vCenter is supported on VMware ESXi 7.0 and above. The VMware vCenter version must be 7.x or above and earlier versions are not supported.



Note

The vSphere Hypervisor ESXi 6.0 is End of General Support.

For information about installing a virtual Cisco MSE appliance, see the *Cisco MSE Virtual Appliance Installation Guide* for this release at:

https://www.cisco.com/c/en/us/support/wireless/mobility-services-engine/products-installation-guides-list.html.



Note

- Data migration support is only available from Cisco CMX Release 10.6.3-146 to Cisco CMX Release 11.1.0.
- Cisco CMX releases earlier than Cisco CMX Release 10.6.3-146 are not supported for data migration or inline upgrade.
- If you are on Cisco CMX releases earlier than Release 10.6.3-146, you need to upgrade to Cisco CMX Release 10.6.3-146 and then install the cmx-11-migration-readiness-patch patch release, and then migrate the data.
- Cisco CMX does not support VMware tools.

The following table lists the Cisco CMX hardware guidelines for a virtual Cisco MSE appliance on VMware. For complete requirements, see the *Cisco Connected Mobile Experiences Data Sheet* at:

https://www.cisco.com/c/en/us/products/wireless/mobility-services-engine/datasheet-listing.html.

Table 2: Hardware Guidelines

Hardware Platform	Low-End Appliance	Standard Appliance	High-End Appliance
CPU	8 vCPU	16 vCPU	20 vCPU
	4 physical cores	8 physical cores	10 physical cores
RAM	24 GB RAM	48-GB RAM	64-GB RAM
HDD ¹	550 GB	550 GB	1 TB

¹ For Cisco CMX OVA installation, 250 GB is the default hard disk drive (HDD) on all virtual machines. We strongly recommend that immediately after deploying the OVA file and before powering on the VM, you should increase the disk space to the recommended amount specified in this table, so that the HDD resource does not run low while using Cisco CMX. If you do not know

how to increase the disk space before powering on the VM, see the VMWare guidelines on how to increase disk space.

If you do not select the recommended disk space, the basic installation defaults to 160 GB of the disk space.



Note

Cisco Hyperlocation is only supported on the High-End Cisco CMX appliances for Cisco Connected Mobile Experiences. By default, Cisco Hyperlocation is disabled on Low-End appliances.

- Cisco CMX Release 11.1.0 is not supported on Cisco Mobility Services Engine (MSE) 3365 Appliance.
- For compatibility information, see the "Cisco Connected Mobile Experiences (CMX) Compatibility Matrix" section in the Cisco Wireless Solutions Software Compatibility Matrix at:

https://www.cisco.com/c/en/us/td/docs/wireless/compatibility/matrix/compatibility-matrix.html.

Cisco Access Points Support

Cisco CMX Release 11.1.0 supports

- Cisco Wireless 9176 Series Access Points
- Cisco Wireless 9178 Series Access Points, and
- Cisco Wireless 9172 Series Access Points.

Software Requirements

Before you deploy Cisco CMX, we strongly recommend that you see the following documents:

- For scaling information, see the Cisco Connected Mobile Experiences Data Sheet at: https://www.cisco.com/c/en/us/products/collateral/wireless/mobility-services-engine/datasheet-c78-734648.html
- Cisco CMX Release 10.6.0 and later is required to support Cisco Spaces.
- Cisco CMX (which includes Cisco CMX Location and Configuration APIs) has been tested using Google Chrome up to Version 63.



Note

If you are using Google Chrome Version 72 or later, we recommend that you use Mozilla Firefox as your browser, or downgrade to Google Chrome Version 63.

- Cisco CMX supports only English input and output.
- Cisco Prime Infrastructure, when paired with Cisco CMX, displays client information and location, but not client history.

For more information about Cisco CMX feature parity with Cisco Prime Infrastructure and Cisco MSE appliance, see the "Cisco CMX Feature Parity" section in the Chapter "Getting Started" in the *Cisco CMX Configuration Guide* for this release at:

https://www.cisco.com/c/en/us/support/wireless/connected-mobile-experiences/products-installation-and-configuration-guides-list.html.

• For compatibility information, see the "Cisco Connected Mobile Experiences (CMX) Compatibility Matrix" section in the Cisco Wireless Solutions Software Compatibility Matrix at:

https://www.cisco.com/c/en/us/td/docs/wireless/compatibility/matrix/compatibility-matrix.html.

• See the following table for system memory details:

Table 3: System Memory for Cisco MSE

Cisco MSE Appliance Model	RAM Allocated
Standard vMSE	48 GB
High-end vMSE	64 GB



Note

High Availability pairing checks are done for software versions and hardware specifications. High Availability pairs should have matching CPU count, memory size, and hard drive size. They should also have the same software versions for Cisco CMX, Redis, Cassandra, and Postgres databases.

Licensing Information

Table 4: Cisco CMX License

Cisco CMX License	Features
Cisco Spaces EXTEND (Cisco CMX Base)	Cisco CMX RSSI-based location calculation of clients, interferers, and rogues for Cisco products such as Cisco Catalyst Center, Cisco Prime Infrastructure, and Cisco
	Identity Services Engine Use of Cisco CMX location data in Catalyst Center
	 Use of Cisco CMX location data in Cisco Prime Infrastructur Tethering of Cisco CMX to Cisco Spaces
	• Use of Business Insights and other capabilities of Cisco Spaces as and when available
	• Use of Basic Detect and Locate capabilities of Cisco Space as and when available
	Use of Basic Location Analytics capabilities of Cisco Space as and when available
	 Access to the DETECT, MANAGE, and SYSTEMS tabs is the Cisco CMX or Cisco Spaces user interface

Cisco CMX License	Features
Cisco Spaces ACT (Cisco CMX Advanced)	Cisco CMX advanced location calculation capabilities, including Cisco FastPath and Cisco Hyperlocation
(Cisco Cimilianumoca)	• Use of Captive Portal capability of Cisco Spaces as and when available
	• Use of Profile and Engagement capability of Cisco Spaces as and when available
	 Use of Advanced Location Analytics capability of Cisco Spaces as and when available
	• Use of Operational Insights capability of Cisco Spaces as and when available
	• Use of Advanced Detect and Locate capability of Cisco Spaces as and when available

• The Cisco CMX Evaluation License provides full functionality for a period of 120 days. The countdown starts when you start Cisco CMX and enable a service.

Two weeks before the evaluation license expires, you will receive a daily alert for obtaining a permanent license. If the evaluation license expires, you will not be able to access the Cisco CMX GUI or APIs. Cisco CMX will continue to run in the background and collect data until you add a permanent license and regain access to it.

- A Cisco Spaces license (ACT/EXTEND) is required to connect Cisco CMX to a cloud. The cloud license includes the Cisco CMX license required to enable Cisco CMX.
- Cisco CMX now includes license changes that warn that the use of Cisco Hyperlocation capabilities requires the Cisco CMX Advanced License. If you have any questions about licensing, contact your Cisco account team.
- The High-Availability feature on Cisco CMX is part of the Cisco CMX Base license, which you should install on the primary HA server. The secondary HA server automatically receives a copy of the Cisco CMX license during synchronization. There is no HA-specific license to install.
- When a third-party certificate is installed in an HA setup, the certificate must be installed separately on both the primary and secondary Cisco CMX servers. For additional information and procedures, see the "Installing a CA-Signed Certificate for High Availability in Cisco CMX" section in the Cisco CMX Configuration Guide at:

https://www.cisco.com/c/en/us/td/docs/wireless/mse/10-6/cmx_config/b_cg_cmx106/getting_started_with cisco cmx.html#id 122557.

For information about procuring Cisco CMX licenses, see the *Cisco Connected Mobile Experiences (CMX) Version 10 Ordering and Licensing Guide* for this release at:

https://www.cisco.com/c/en/us/solutions/collateral/enterprise-networks/connected-mobile-experiences/guide-c07-734430.html.

For information about adding and deleting licenses, see the "Managing Licenses" section in the *Cisco CMX Configuration Guide* for this release at:

https://www.cisco.com/c/en/us/support/wireless/connected-mobile-experiences/products-installation-and-configuration-guides-list.html.

Installation and Upgrade Information

- Cisco CMX Release 11.1.0 is a new OVA installation for Cisco CMX.
- Inline upgrade from Cisco CMX Release 11.0.0 and Cisco CMX Release 11.0.1 to Cisco CMX Release 11.1.0 is supported.
- Inline upgrade and data migration from releases earlier than Cisco CMX Release 10.6.3-146 to Cisco CMX Release 11.1.0 is not supported.
- Data migration is supported only from Cisco CMX Release 10.6.3-146 and later releases to Cisco CMX Release 11.1.0.
- Downgrading from any Cisco CMX release is not supported.

Limitations, Restrictions, and Important Notes

• (CSCve28851) The following error message is displayed because MATLAB only counts heavy walls for location calculation, while Java counts all the obstacles on the floor map. Ignore this message because the heat maps are now correctly generated and stored:

```
ERROR com.cisco.mse.matlabengine.heatmap.BaseMatlabHeatmapBuilder - MatlabHeatmapBuilder#createApInterfaceHeatmap Number of heavy walls used by Matlab: <nn> not equal to count reported by Java: <nn> during heatmap calculation for AP Interface: 88:f0:31:08:06:70-5.0-2.
```

• (CSCve37513) Cisco CMX detects the same sources of interferences as the Cisco CleanAir system. For more information, see the "Configuring Cisco CleanAir on the Cisco Wireless LAN Controller (GUI)" section in the Chapter "Wireless Quality of Service" of the Cisco Wireless Controller Configuration Guide, Release 8.4 at:

https://www.cisco.com/c/en/us/td/docs/wireless/controller/8-4/config-guide/b cg84/wireless quality of service.html#ID51.

The sources of interference are:

- Bluetooth Paging Inquiry: A Bluetooth discovery (802.11b/g/n only)
- Bluetooth Sco Acl: A Bluetooth link (802.11b/g/n only)
- Generic DECT: A digital, enhanced cordless communication-compatible phone
- Generic TDD: A time division duplex (TDD) transmitter
- Generic Waveform: A continuous transmitter
- Jammer: A jamming device
- Microwave: A microwave oven (802.11b/g/n only)
- Canopy: A canopy bridge device
- Spectrum 802.11 FH: An 802.11 frequency-hopping device (802.11b/g/n only)
- Spectrum 802.11 inverted: A device using spectrally inverted Wi-Fi signals
- Spectrum 802.11 non std channel: A device using nonstandard Wi-Fi channels

- Spectrum 802.11 SuperG: An 802.11 SuperAG device
- Spectrum 802.15.4vAn 802.15.4 device (802.11b/g/n only)
- Video Camera: An analog video camera
- WiMAX Fixed: A WiMAX fixed device (802.11a/n/ac only)
- WiMAX Mobile: A WiMAX mobile device (802.11a/n/ac only)
- XBox: A Microsoft Xbox (802.11b/g/n only)
- (CSCvg10317) Cisco MSE virtual machine (VM) appliance running Cisco CMX might not function properly after being powered on after a power outage. If this occurs:
- 1. Use the **cmxos date** command to make sure that the Cisco CMX system date matches the current date. If the dates do not match, use the NTP server to synchronize the dates.
- **2.** Enter the **cmxctl stop –a** command to shut down Cisco CMX services.
- **3.** Enter the **cmxctl start** command to restart the services.
- (CSCvg28274) If NMSP tunnel flapping occurs, ping an external address to check if the DNS resolution is slow. If it is slow, delete all the external DNS server entries in the /etc/resolv.conf file, except for the entry that maps to the localhost.
- (CSCvg79749) In Cisco CMX Release 10.4.0, the v3 client API was introduced, and the v2 client API was deprecated. We recommend that you use the v3 API instead of the v2 API. High CPU usage by the Cisco CMX Location service occurs when the v2 API is used for a long duration. Restart the Cisco CMX Location service to correct the condition.
- (CSCvi07385) With VMware vSphere ESXi 6.5 Update 2, you can successfully deploy the Cisco CMX OVA file. Update 2 displays the deployment options (Low-end, Standard, and High-end). Minor erroneous text such as [object Object] is also displayed.

With VMware vSphere ESXi 6.5 and VMware vSphere ESXi 6.5 Update 1, the deployment options are not displayed.

- (CSCvi84935) High CPU usage of the Cisco CMX Analytics and Location services might occur during
 initial HA synchronization, causing incomplete synchronization. If this occurs, remove the Cisco controller
 from the system to decrease the CPU usage of the Cisco CMX Analytics service. This provides enough
 memory for the initial HA synchronization to get completed.
- (CSCvj52515) There is significant overhead in maintaining the compact history, which allows you to
 query the unique clients seen on a floor or zone per day. This does not affect the regular clients history
 that is stored in the Cassandra database.



Note

From Cisco CMX Release 10.4.1-15, the Feature Flags setting for compact location history is disabled by default. If your system is running an earlier release of Cisco CMX, we recommend that you disable the Feature Flags setting.

To disable the Feature Flags setting, enter these commands:

1. cmxctl config featureflags location.compactlocationhistory false

- 2. cmxctl agent restart
- 3. cmxctl location stop
- 4. cmxctl location start
- (CSCvn98927) We recommend that you assign an IP address to a single interface (ens32). Assigning IP addresses to two interfaces allows data to go to both the interfaces, which causes Cisco CMX to drop packets, which in turn, leads to issues related to client tracking.
- (CSCvo14248) Generating scheduled reports in PDF format is not supported on Cisco CMX Release 10.5.0 and later. Use the **PrtSc** option instead. This feature set will be removed from the product.
- (CSCvo60319) On Cisco CMX, using OAuth with Instagram might not always display the Log In portal. If the portal is not displayed, refresh your browser.
- (CSCvp00432) As of Cisco CMX Release 10.6.0, Cisco CMX no longer supports the Historylite (/api/location/v1/historylite) API. The API requires he collection of the compact location history, which causes performance issues.
- (CSCvp11685) If FIPS mode is enabled on Cisco CMX, the Maps online sync (Import from Cisco Prime Infrastructure) fails for Cisco Prime Infrastructure Release 3.5.

To import maps from Cisco Prime Infrastructure Release 3.5 to Cisco CMX with FIPS mode enabled, you must download the tar file of Cisco Prime Infrastructure, and then upload the tar file to Cisco CMX, as described in the "Importing Maps" section in the Cisco CMX Configuration Guide at:

https://www.cisco.com/c/en/us/support/wireless/connected-mobile-experiences/products-installation-and-configuration-guides-list.html

 (CSCvp19413) If you need to use round brackets (such as parentheses) in a Cisco CMX API regex expression, use a backslash (\) to escape the next character. For example, instead of this string:

```
Global->System Campus>1212 Deming Way (TTD)>Floor 1
use this string:
Global->System Campus>1212 Deming Way \((TTD\))>Floor 1
```

• (CSCvp31400) Cisco CMX in FIPS mode does not support the aes128-ctr and aes256-ctr ciphers (while Cisco CMX in non-FIPS mode supports them). If a Cisco Catalyst 9800 wireless controller is using either of these ciphers, it will not be able to communicate with Cisco CMX in FIPS mode.

Cisco CMX in FIPS mode supports only the aes128-cbc, aes256-cbc, aes128-gcm@openssh.com, and aes256-gcm@openssh.com ciphers.

- (CSCvp25049) The Repeat Devices API does not provide all the required information because it requires
 information from history location data, which is managed by the compacthistory feature flag. The feature
 flag causes performance issues and is disabled by default.
- (CSCvp92688) Cisco CMX might not be able to process a large amount of history data from the Cassandra database if the duration between locatedAfterTime and locatedBeforeTime for the **All Client History** API is either 1 hour or 20 minutes. We recommend that you use the Cassandra export tool to extract history data.
- (CSCvq81962) When the Cisco CMX session idle timeout period is reached, users are logged out of their Cisco CMX UI session whether the session is idle or is actively being used. Users must then log in to Cisco CMX again.

Use the **cmxctl config auth settings** command to configure the **Session idle timeout in minutes** setting. The time range is 1 to 720 minutes. The default value is 30 minutes.

This timeout period does not apply to Cisco CMX CLI sessions.

- (CSCvq82147) Cisco CMX supports VMware Snapshot.
- (CSCvq82305) Location data is poor when too few Angle of Arrival (AoA) measurements are reported in a network, with both hyperlocation and nonhyperlocation access points.
- (CSCvr16016) The issue of the Cisco CMX Analytics Service not processing data is now fixed in Cisco CMX Release 10.6.2-72 but for the fix to come into effect, you must reboot Cisco CMX.
- (CSCvr26395 and CSCvr26398) The Cisco CMX Troubleshooting Tool supports only Cisco Hyperlocation-capable access points.
- (CSCvs57713) With Cisco CMX Release 10.5 and later and Cisco WLC Release 8.7 and later, the Cisco CMX Group Subscription feature allows one Cisco Hyperlocation-enabled wireless controller to connect to multiple Cisco CMX servers.
- (CSCvs68618) When collecting client data from the Cisco CMX v3 Location API, the last seen time stamp is different from the time stamp displayed on the Cisco CMX GUI.
- In Cisco CMX Release 10.6.2-89, the floorRefId component is replaced with floorId.
- (CSCvs89951) If your network has a Cisco Catalyst 9800 wireless controller, do not check the **Exclude Probing Only Clients** check box located in the **Settings** > **Filtering** section on the **System** > **Dashboard** window on Cisco CMX. Checking the **Exclude Probing Only Clients** check box causes all the clients (probing and associated clients) to be excluded from the controller, and hence will not be displayed on Cisco CMX.
- (CSCvt83715) We recommend that you disable the Cisco CMX Analytics service if you are not using the service.
 - If you are running Cisco CMX Release 10.6.2-72 or earlier, install the **cmx-disableanalytics-patch-10.6.2-1.cmxp** patch file. Contact Cisco Customer Support (https://www.cisco.com/c/en/us/support/index.html) for the patch file.
 - If you are running Cisco CMX Release 10.6.2-89 or later, use the **cmxctl disable analytics** command.



Note

The **cmxctl disable analytics** command is supported only on Cisco CMX Release 10.6.2-89 and later.

- (CSCvt83902) Cisco CMX displays an authentication error during SSO login if the SAML response from the IDP does not include the **User.email**, **User.FirstName**, and **User.LastName** attributes.
- (CSCvu18413) Due to FIPS/CC/UCAPL compliance, root access is no longer available as of Cisco CMX Release 10.6.0. Only Cisco Customer Support has access to a root patch for troubleshooting. Contact Cisco Customer Support (https://www.cisco.com/c/en/us/support/index.html) for assistance.

Issues

Issues describe unexpected behavior in the Cisco CMX application. The Open Issues and Resolved Issues sections list the issues in this release.

Open Issues

There are no open issues in this release of Cisco CMX 11.1.0.

Resolved Issues

This section lists the issues that have been resolved in this release of Cisco CMX 11.1.0.

Table 5: Cisco CMX 11.1.0 Resolved Issues

Bug ID	Description
CSCwk62270	Evaluation of cmx for OpenSSH regreSSHion vulnerability.
CSCwk48102	CVE-2023-48795 impacts several CMX images.
CSCwk33188	Issue with the CMX 11.0.1 ApiServer, v3 probing client count
CSCwm55027	Unable to import maps on CMX 11.0.1, displaying a blank image.
CSCwf36900	CMX-11: Hostname change is not sticky as it does not get saved
CSCwf38238	CMX-11: Tracking CDETS for CLI that are deprecated or not working
CSCwf36880	CMX-11: On System dashboard the tab showing Time is missing
CSCwf36890	CMX-11: Authenticated ntp not supported
CSCwj86908	CMX 11.0.1 showing incorrect actual disk size
CSCwf31042	CMX11 on IPv6 most services not shown as running after initial configuration
CSCwj69526	Multiple Vulnerabilities Found By Nessus on CMX 11

Documentation and Support

Related Documentation

- Cisco Spaces product information: https://www.cisco.com/c/en/us/solutions/enterprise-networks/connected-mobile-experiences/index.html
- Cisco Spaces documentation: https://www.cisco.com/c/en/us/support/wireless/dna-spaces/tsd-products-support-series-home.html
- Cisco CMX documentation:

https://www.cisco.com/c/en/us/support/wireless/connected-mobile-experiences/tsd-products-support-series-home.html

- Cisco CMX Cloud documentation:
 https://www.cisco.com/c/en/us/support/wireless/connected-mobile-experiences-cmx-cloud/tsd-products-support-series-home.html
- https://www.cisco.com/c/ci/us/suppor/wileless/confected-fribone-experiences-cmx-cloud/isc-products-support-series-norme.num
- https://www.cisco.com/c/en/us/support/wireless/mobility-services-engine/tsd-products-support-series-home.html

https://www.cisco.com/c/en/us/support/interfaces-modules/aironet-access-point-modules/products-installation-guides-list.html

Cisco Support Community

Cisco Support Community is a forum for you to ask and answer questions, share suggestions, and collaborate with your peers. Join the forum at Cisco Community.

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- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.

• Cisco Mobility Services Engine documentation:

Cisco Aironet Access Point Modules documentation:

- To discover and browse secure, validated enterprise-class apps, products, solutions, and services, visit Cisco DevNet.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a gateway to the Cisco bug-tracking system, which maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. The BST provides you with detailed defect information about your products and software.

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