



CHAPTER 1

Overview

This chapter describes the role of the Cisco 3300 series mobility services engine (MSE), a component of the Cisco Context-Aware Mobility (CAM) solution, within the overall Cisco Unified Wireless Network (CUWN).

Additionally, Context-Aware Service (CAS) software, a service supported on the mobility services engine and a component of the CAM, is addressed.

This chapter contains the following sections:

- [About the Cisco Context-Aware Mobility Solution, page 1-1](#)
- [Licensing Information for Clients and Tags, page 1-2](#)
- [Guidelines and Limitations, page 1-3](#)
- [Viewing Contextual Information, page 1-3](#)
- [Event Notification, page 1-5](#)
- [Configuration and Administration, page 1-6](#)
- [Synchronizing Mobility Services Engines, page 1-6](#)
- [Context-Aware Planning and Verification, page 1-7](#)
- [Monitoring Capability, page 1-7](#)
- [Maintenance Operations, page 1-8](#)
- [MSE System and Appliance Hardening, page 1-8](#)
- [, page 1-8](#)

About the Cisco Context-Aware Mobility Solution

The foundation of the CAM solution is the controller-based architecture of the CUWN. The CUWN contains the following primary components: access points, wireless LAN controllers, the Cisco Prime Network Control System (NCS) management application, and the Cisco 3300 series mobility services engine.

This section contains the following topics:

- [Cisco 3300 Series Mobility Services Engines, page 1-2](#)
- [CAS, page 1-2](#)
- [ContextAware Tab, page 1-3](#)

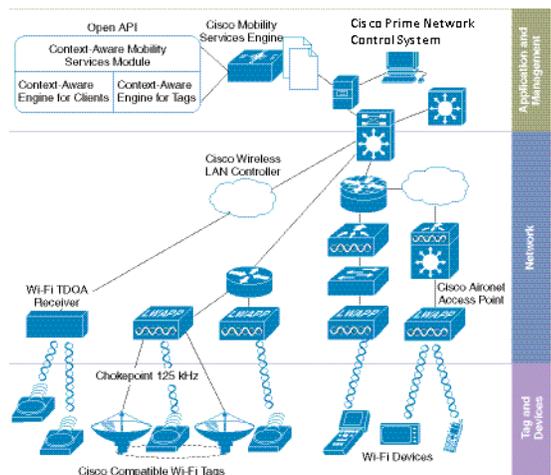
Cisco 3300 Series Mobility Services Engines

The Cisco 3300 series mobility services engine operates with CAS, which is a component of the CAM solution (see [Figure 1-1](#)).

There are three models of the mobility services engine:

- Cisco 3310 Mobility Services Engine
- Cisco 3350 Mobility Services Engine
- Cisco 3355 Mobility Services Engine

Figure 1-1 Context-Aware Mobility Solution



CAS

CAS allows a mobility services engine to simultaneously track thousands of mobile assets and clients by retrieving contextual information such as location, temperature, and availability from Cisco access points.

CAS relies on two engines for processing the contextual information it receives. The *Context-Aware Engine for Clients* processes data received from Wi-Fi clients and the *Context-Aware Engine for Tags* processes data received from Wi-Fi tags; these engines can be deployed together or separately depending on the business need.

Licensing Information for Clients and Tags

You must purchase licenses from Cisco to retrieve contextual information on tags and clients from access points.

- Licenses for tags and clients are offered separately. (The clients license also includes tracking of rogue clients, rogue access points, interferers, and wired clients).
- For more information on tags, clients, rogue clients, and rogue access points, see [Chapter 9](#), “Context-Aware Service Planning and Verification”.

- Licenses for tags and clients are offered in various quantities, ranging from 1,000 to 12,000 units. Up to 18,000 Wi-Fi clients and Wi-Fi tags (combined count) are supported depending on the mobility services engine hardware.
 - The Cisco 3310 mobility services engine supports up to 2,000 clients and tags (combined count).
 - The Cisco 3350 mobility services engine supports up to 18,000 clients and tags (combined count).
- For details on tag and client licenses, see the *Cisco 3300 Series Mobility Services Engine Release Note, Release 6.0* at the following URL:
http://www.cisco.com/en/US/products/ps9742/tsd_products_support_series_home.html
- For details on adding client and tag licenses to the mobility services engine, see [Chapter 2, “Adding and Deleting Mobility Services Engines and Licenses”](#).

Guidelines and Limitations

Username, IP address, and partial MAC address-based troubleshooting is supported only on MSE Release 7.0.200.0 and later.

Viewing Contextual Information

The collected contextual information can be viewed in graphical user interface format in the NCS, the centralized WLAN management platform.



Note

However, before you can use NCS, initial configuration for the mobility services engine is required using a command-line interface console session. See the *Cisco 3350 Mobility Services Engine Getting Started Guide* and the *Cisco 3100 Mobility Services Engine Getting Started Guide* at the following URL:
http://www.cisco.com/en/US/products/ps9742/tsd_products_support_series_home.html

After its installation and initial configuration are complete, the mobility services engine can communicate with multiple Cisco wireless LAN controllers to collect operator-defined contextual information. You can then use the associated NCS to communicate with each mobility services engine to transfer and display selected data.

You can configure the mobility services engine to collect data for clients, rogue access points, rogue clients, mobile stations, and active RFID asset tags.

This section contains the following topics:

- [ContextAware Tab, page 1-3](#)
- [Location Assisted Client Troubleshooting from the ContextAware Dashboard, page 1-4](#)

ContextAware Tab

You can access the ContextAware tab in the NCS home page. This tab provides you with important Context-Aware Service software information.

The following factory default components appear on the ContextAware tab:

- MSE Historical Element Count—Shows the historical trend of tags, clients, rogue APs, rogue clients, interferers, wired clients, and guest client counts in a given period of time.



Note The MSE Historical Element Count information is presented in a time-based graph. For graphs that are time-based, the top of the graph page includes a link bar that displays 6h, 1d, 1w, 2w, 4w, 3m, 6m, 1y, and Custom. When selected, the data for that time frame is retrieved and the corresponding graph is displayed.

- Rogue Element Detected by CAS—Shows the indices of the Rogue APs and Rogue Clients in percentage. It also provides a count of the number of Rogue APs and Rogue Clients detected by each MSE within an hour, 24 hours, and more than 24 hours.

Rogue AP Index is defined as the percentage of total active tracked elements that are detected as Rogue APs across all the MSEs on the NCS.

Rogue Client Index is defined as the percentage of total active tracked elements that are detected as Rogue Clients across all the MSEs on the NCS.

- Location Assisted Client Troubleshooting—You can troubleshoot clients using this option with location assistance. You can provide a MAC address, username or IP address as the criteria for troubleshooting.



Note Username, IP address, and partial MAC address-based troubleshooting is supported only on MSE Release 7.0.200.0 and later.

For more information about Location Assisted Client Troubleshooting, see the [“Location Assisted Client Troubleshooting from the ContextAware Dashboard” section on page 1-4](#).

- MSE Tracking Counts—Represents the tracked and non-tracked count of each of the element types. The element type includes tags, rogue APs, rogue clients, interferers, wired clients, wireless clients, and guest clients.
- Top 5 MSEs—Lists the top five MSEs based on the percentage of license utilization. It also provides the count for each element type for each MSE.
- In the component, click the count link to get a detailed report.
- Use the icons in a component to switch between chart and grid view.
- Use the Enlarge Chart icon to view the grid or chart in full page.

Location Assisted Client Troubleshooting from the ContextAware Dashboard

You can use the ContextAware tab in the NCS home page to troubleshoot a client.

Specify a MAC address, username, or IP address as the search criteria, and click **Troubleshoot**.

The Troubleshoot Client page appears.

You can view the Context Aware History report on the Context Aware History tab.

You can filter this report based on the MSE name. You can further filter the report based on the Timezone, State, or All. The states can be either associated or dissociated.

If you choose Timezone then you can choose any of the following:

- Date and Time

Or

- Any one of these values from the drop-down list:
 - Last 1 Hour
 - Last 6 Hours
 - Last 1 Day
 - Last 2 Days
 - Last 3 Days
 - Last 4 Days
 - Last 5 Days
 - Last 6 Days
 - Last 7 Days
 - Last 2 Weeks
 - Last 4 Weeks

Alternately, you can use the Generate Report link to generate a Client Location History report. You can also opt to export the report to CSV or PDF format, or you can e-mail the report using the icons available in the report page.

For more information on the NCS home page ContextAware tab, see the [“ContextAware Tab” section on page 1-3](#).

Event Notification

A mobility services engine sends event notifications to registered listeners over the following transport mechanisms:

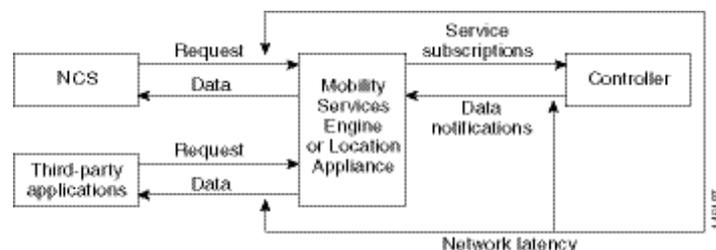
- Simple Object Access Protocol (SOAP)
- Simple Mail Transfer Protocol (SMTP) mail
- Simple Network Management Protocol (SNMP)
- Syslog



Note

The NCS can act as a listener receiving event notifications over SNMP. Without event notification, the NCS and third-party applications need to periodically request location information from location-based services (see [Figure 1-2](#)).

Figure 1-2 Pull Communication Model



The pull communication model, however, is not suitable for applications that require more real-time updates to location information. For these applications, you can configure the mobility services engine push event notifications when certain conditions are met by the registered listeners.

Configuration and Administration

You can use the NCS to perform different configuration and administrative tasks, including adding and removing a mobility services engine, configuring mobility services engine properties, and managing users and groups.

This section contains the following topics:

- [Adding and Deleting a Mobility Services Engine, page 1-6](#)
- [Synchronizing Mobility Services Engines, page 1-6](#)
- [Configuring High Availability, page 1-6](#)
- [Configuring the Virtual Appliance, page 1-7](#)
- [Editing Mobility Services Engine Properties, page 1-7](#)
- [Managing Users and Groups, page 1-7](#)
- [Synchronizing Mobility Services Engines, page 1-6](#)
- [Monitoring Capability, page 1-7](#)
- [Provisioning MSAP Requirements, page 1-8](#)
- [Maintenance Operations, page 1-8](#)
- [MSE System and Appliance Hardening, page 1-8](#)

Adding and Deleting a Mobility Services Engine

You can use the NCS to add and delete a mobility services engine within the network. You can also define the service supported on the mobility services engine. See [Chapter 2, “Adding and Deleting Mobility Services Engines and Licenses,”](#) for configuration details.

Synchronizing Mobility Services Engines

You can use the NCS to synchronize Cisco wireless LAN controllers and the NCS with mobility services engines. See [Chapter 3, “Synchronizing Mobility Services Engines,”](#) for more information.

Configuring High Availability

You can use the NCS to configure high availability on the MSE. The mobility services engine is a platform for hosting multiple mobility applications. Every active MSE is backed up by another inactive instance. The active MSE is called the primary MSE and the inactive MSE is called the secondary MSE. See [Chapter 4, “Configuring High Availability,”](#) for more information.

Configuring the Virtual Appliance

The MSE comes preinstalled on a physical appliance with various performance characters. The MSE is delivered in two modes, the physical appliance and the virtual appliance. See [Chapter 5, “MSE Delivery Modes,”](#) for more information.

Editing Mobility Services Engine Properties

You can use the NCS to configure the following parameters on the mobility services engine. See [Chapter 6, “Configuring and Viewing System Properties,”](#) for configuration details.

- **General Properties**—Enables you to assign a contact name, username, password, and HTTP for the mobility services engine.
- **Active Sessions**—Enables you to view active user sessions on the mobility services engine.
- **Trap Destinations**—Enables you to specify which NCS or Cisco Security Monitoring, Analysis and Response System (CS-MARS) network management platform is the recipient of SNMP traps generated by the mobility services engine.
- **Advanced Parameters**—Enables you to set the number of days to keep events, reboot hardware, shut down hardware, or clear the database.

Managing Users and Groups

You can use the NCS to manage users, groups, and host access on the mobility services engine. See [Chapter 7, “Managing Users and Groups,”](#) for configuration details.

Configuring Event Notifications

You can use the NCS to define conditions that cause the mobility services engine to send notifications to specific listeners. This chapter describes how to define events and event groups and how to view event notification summaries. See [Chapter 8, “Configuring Event Notifications,”](#) for configuration event notifications.

Context-Aware Planning and Verification

To plan and optimize access point deployment, you can use the NCS to perform point or line calibration. Additionally, you can analyze the location accuracy of non-rogue clients, asset tags and interferers using the accuracy tool. See [Chapter 9, “Context-Aware Service Planning and Verification,”](#) for specifics.

Monitoring Capability

You can use the NCS to monitor alarms, events, and logs generated by mobility services engine. You can also monitor the status of mobility services engines, clients, interferers, and tagged assets. Additionally, you can generate a utilization report for the mobility services engine to determine CPU and memory utilization as well as counts for clients, tags and rogue access points and clients. See [Chapter 9, “Context-Aware Service Planning and Verification”](#) and [Chapter 10, “Monitoring the System and Services,”](#) for more information.

Provisioning MSAP Requirements

Cisco Mobility Services Advertisement Protocol (MSAP) provides requirements for MSAP client and server and describes the message exchanges between them. Mobile devices can retrieve service advertisements from MSAP server over Wi-Fi infrastructure using MSAP. MSAP is introduced in this release in the Mobility Services Engine (MSE) and provides server functionality. See [Chapter 11, “MSAP,”](#) for more information.

Maintenance Operations

You can back up mobility services engine data to a predefined FTP folder on the NCS at defined intervals, and restore the mobility services engine data from that NCS. Other mobility services engine maintenance operations that you can perform include downloading new software images to all associated mobility services engines from any NCS station, and clearing mobility services engine configurations. See [Chapter 12, “Performing Maintenance Operations,”](#) for more information.

**Note**

Details on recovering GRUB and root passwords for the mobility services engine using the command-line interface (rather than the NCS) are also addressed in [Chapter 12, “Performing Maintenance Operations”](#).

MSE System and Appliance Hardening

System and Appliance Hardening requires some services and processes to be exposed to function properly. Hardening of MSE involves disabling unnecessary services, upgrading to the latest server versions, and applying appropriate restrictive permissions to files, services, and end points. See [Appendix A, “MSE System and Appliance Hardening Guidelines”](#) for more information.

System Compatibility

See the Cisco 3300 Mobility Services Engine Release Note for the latest system (controller, NCS, mobility services engine) compatibility information, feature support, and operational notes for your current release at the following URL:

http://www.cisco.com/en/US/products/ps9742/tsd_products_support_series_home.html