C H A P T E R **7**

Monitoring Location Servers and Site

This chapter describes how to monitor location servers by configuring and viewing alarms, events, and logs. It also describes how to view location server, client and asset tag status. Details for deployment planning are also provided. This chapter contains the following sections:

- "Working with Alarms" on page 7-1
- "Working with Events" on page 7-3
- "Working with Logs" on page 7-4
- "Monitoring Location Server Status" on page 7-5
- "Monitoring Clients" on page 7-6
- "Monitoring Tagged Assets" on page 7-7
- "Inspect Location Readiness and Quality" on page 7-9
- "Deployment Planning for Data, Voice, and Location" on page 7-10

Working with Alarms

This section describes how to view, assign, and clear alarms and events on location servers using Cisco WCS.

Viewing Alarms

To view location server alarms, follow these steps:

Step 1 In Cisco WCS, choose **Location > Location Servers**.

Step 2 In the bottom left of the Cisco WCS window, click one of the three squares next to Location in the Alarms Dashboard (bottom left) to display the Alarms page and search the Cisco WCS database for location server alarms based on severity.

You can also display the alarms by choosing **Monitor > Alarms** and searching for location server alarms.

> ✎
>
> **Note**   The dashboard uses colors to represent alarm categories. The first square in the dashboard displays the number of critical alarms, the second square displays the number of major alarms, and the third square displays the number of minor alarms.

Cisco WCS displays the Alarms page, which lists the alarms found. Moving the cursor over the links in the Failure Object column displays a tool tip containing the alarm's message.

Step 3   Use the navigation buttons (top) to browse the alarm pages if necessary. Use the column headers to sort alarms.

Step 4   To perform another alarm search, use the Severity drop-down menu (left) to choose a different severity and click **Search**.

Assigning and Unassigning Alarms

Follow these steps to assign and unassign an alarm to yourself:

Step 1   Display the Alarms page as described in "Viewing Alarms" on page 7-1.

Step 2   Select the alarms that you want to assign to yourself (or unassign from yourself) by checking their corresponding check boxes.

Step 3   From the drop-down menu (right-hand side), choose **Assign to Me** (or **Unassign**) and click **Go**.

If you choose **Assign to Me**, your username appears in the Owner column. If you choose **Unassign**, the username column becomes empty.

> ✎
>
> **Note**   You cannot unassign other users.

Deleting and Clearing Alarms

Follow these steps to delete or clear an alarm from a location appliance:

Step 1   Display the Alarms page as described in "Viewing Alarms" on page 7-1.

Step 2   Select the alarms that you want to delete or clear by checking their corresponding check boxes.

Step 3   From the drop-down menu (right-hand side), choose **Delete** or **Clear**, and click **Go**.

> ✎
>
> **Note**   If you delete an alarm, Cisco WCS removes it from its database. If you clear an alarm, it remains in the Cisco WCS database, but under the Clear state. You clear an alarm when the condition that caused it no longer exists.

Emailing Alarm Notifications

Cisco WCS lets you send alarm notifications to a specific email address. Sending notifications through email enables you to take prompt action when needed.

To send alarm notifications, follow these steps:

Step 1   Display the Alarms page as described in "Viewing Alarms" on page 7-1.

Step 2   From the drop-down menu (right-hand side), choose **Email Notification**, and click **Go**.

In the Email Notification page, you can follow these steps:

- Click the links of the supported alarm categories and configure the email options (SMTP server to use, email address of sender, and email address of recipient).

- Enable email notifications for the selected alarm categories.

Step 3   To configure the email options for an alarm category, follow these steps:

1. Click the alarm's corresponding link.

2. In the Email Notification section, enter the following information:

- SMTP Server field—Enter the server to use for sending email notifications.

- From field—Enter the email address of the sender.

- To field—Enter the email address of the recipient.

3. Click **OK** to confirm changes and go back to the Email Notification page.

Step 4   To enable email notification for an alarm category, check its corresponding check box, and click **OK**.

Working with Events

You can use Cisco WCS to view location server and location notification events. You can display events based on their severity.

To display events, follow these steps:

Step 1   In Cisco WCS, choose **Monitor > Events**.

Step 2   In the Events page, choose **Location Servers** or **Location Notifications** from the Event Category drop-down menu (left).

Step 3   Choose an event severity from the Severity drop-down menu.

You can choose one of the following categories:

- **Location Server** —Reports events such as location server unreachable or elements are not synchronized

- **Location Notifications**—Reports events representing asynchronous notifications sent by the location server

Step 4   Click **Search**. If Cisco WCS finds events that match the search criteria, it displays a list of these events.

Step 5   For more information about an event, click the event's failure object's name.

Working with Logs

This section describes how to configure logging options and how to download log files.

Configuring Logging Options

You can use Cisco WCS to specify the logging level and types of messages to log.

To configure logging options, follow these steps:

Step 1 In Cisco WCS, choose **Location > Location Servers**.

Step 2 Click the name of the server that you want to configure.

Step 3 Click **Administration** (left) to display the administrative configuration options.

Step 4 Click **Advanced Parameters**.

Step 5 In the Logging Options section, choose a logging level from the Logging Level drop-down menu or **Off** to disable logging.

There are four logging options: **Off**, **Error**, **Information**, and **Trace**. Use **Error** and **Trace** only when directed to do so by Cisco Technical Assistance Center (TAC) personnel.

Step 6 Enable logging categories as required by checking the appropriate **Enabled** check boxes.

Step 7 Click **Save** to apply your changes.

Downloading Location Server Log Files

If you need to analyze location server log files, you can use Cisco WCS to download them into your system. Cisco WCS downloads a zip file containing the log files.

To download a zip file containing the log files, follow these steps:

Step 1 In Cisco WCS, choose **Location > Location Servers**.

Step 2 Click the name of the location server to view its status.

Step 3 Click **Logs** (left).

Step 4 Click **Download Logs**.

Step 5 Follow the instructions in the File Download dialog box to save the zip file on your system.

Monitoring Location Server Status

This section describes how to view location server status and how to enable status information polling.

Viewing Location Server Current Information

Follow these steps to view the current status of a location server:

Step 1   In Cisco WCS, choose **Location > Location Servers**.

Step 2   Click the name of a location server to view its status.

Step 3   Click **Administration** (left-hand side of screen) to display the administrative configuration options.

Step 4   Click **Advanced Parameters**.

You can find the following information for the selected location server in the Advanced Parameters page:

Page Heading	Description
General Information	Product name, version, time server started operation, time zone, hardware restarts, active sessions, number of tracked elements and tracked element limit. **Note** A major alert appears on the Advanced Parameter page if the tracked elements limit of 2,500 for the location server is reached.
Cisco UDI	Product identifier, version identifier, and serial number.
Logging Options	Types of occurrences and activity levels being logged.
Memory Information	Memory allocation and usage. Database memory levels. Command: Run Java GC.
Advanced Parameters	Number of days to keep events, Session Time out, Interval between data cleanup and enabled/disable status of Advanced Bug operation.
Advanced Commands	Commands: Reboot Hardware, Clear Configuration and Defragment Database.

Enabling Automatic Location Server Status Polling

You can configure Cisco WCS to automatically poll location servers on a regular basis for status information to keep the location server records in the Cisco WCS database current.

To enable automatic location server status polling, follow these steps:

Step 1   In Cisco WCS, choose **Administration > Scheduled Tasks**.

Step 2   Click **Location Server Status**.

Step 3   Enable automatic location server status polling by checking the **Enabled** check box.

Step 4   In the **Interval** field, enter the interval (in minutes) for performing automatic server status polling.

By default, the location server performs automatic server polling every 5 minutes.

Step 5   Click **Submit**.

Monitoring Clients

You can configure Cisco WCS to display the name of the access point that generated the signal for a client, its strength of signal and how often the location information for the client is updated. Pass the mouse over the relevant access point icon on the map page to reveal all of this information.

To provide this functionality, you must first enable location status for the client. Polling frequency can then be configured.

Enabling Client Location Status

You can configure Cisco WCS to display the access point that generated a client location on both the client detail page and map. The access point name, signal strength and last located information are displayed.

To enable client location status, follow these steps:

Step 1   In Cisco WCS, choose **Monitor > Devices > Clients**

The Clients Summary page displays.

Step 2   Click on the **Map Location** link that corresponds to the client to be configured.

A map for the selected client location appears.

Step 3   Click on the appropriate client icon on the map to display the Client Properties page.

Step 4   Enable client location status by checking the **Location Debug** box found under Asset Info (top-right). Click **Update** and close the window.

The map appears.

Step 5   Click on **Refresh Heatmap** after the next polling period to activate the feature on the map.

Step 6   To view the access point signal details for the client from the map, pass the mouse over the client icon. The information is also seen on the Client Properties page.

✎

Note   You can configure how often the location server updates its client location information. Please see the next section in this chapter entitled, "Configuring Client Status Polling" for more details.

Configuring Client Status Polling

You can set how often the location server updates its client location information. Information updates can occur up to every 2 minutes. By default, the location server performs automatic polling every 15 minutes.

You can also modify those clients polled by filtering on a specific client state. Options are All States, Idle, Authenticated, Associated, Probing, and Excluding.

To configure the frequency of client status polling, follow these steps:

Step 1   In Cisco WCS, choose **Monitor > Devices > Clients.**

The Clients Summary page appears.

Step 2   To filter by client state, select the appropriate option from the **Client State** menu (left side).

✎

Note   Select the filter before you select the client location that is to be polled. All States is the default filter.

Step 3   Click the **Map Location** link of the relevant client location.

A map for the selected client location appears.

Step 4   To configure how often client locations are polled, select the desired polling rate from the **Load Location Server data as old as** menu. The default is 15 minutes.

Step 5   You are prompted to click the **Load** link (left side) to immediately accept the new polling period and to load new client location information.

The number of clients location updates received (loaded) appear in the window beneath the Load link.

.

Monitoring Tagged Assets

You can configure WCS to display the name of the access point that generated the signal for a tagged asset, its strength of signal and when the location information was last updated for the asset. All of this information is accessible on location maps by passing the mouse over the relevant access point.

To provide this functionality, you must first enable location status for the tagged asset. You can then configure the last detected parameter to modify the polling frequency.

Enabling Tagged Asset Location Status

You can configure Cisco WCS to display the access point that generated the tag location. The access point name, signal strength, signal type and last located information is displayed and accessible from maps.

To enable tag location status, follow these steps:

Step 1 In Cisco WCS, choose **Monitor > Devices > Tags.**

The Tags Summary page appears.

Step 2 Check the **Tag Vendor** box and select the appropriate vendor from the menu that appears. Click the **Total Tags** link for the appropriate location server.

A summary of all tags for the chosen location server displays noting MAC address, Asset Name, Asset Category, Asset Group, Vendor, Location, Controller, Battery Status, and Map location for each of the tags.

Step 3 Click the appropriate tag.

Note As the mouse passes over the MAC addresses a map showing the location of the tag appears.

Step 4 At the Tag Properties page that appears, check the **Location Debug** box (top-right) to enable tag location status. Click **Update** and close the window.

Step 5 Enlarge the map to see the access point(s) that generated the location signal.

Step 6 To view the access point signal details for the tag, pass the mouse over the appropriate access point icon.

Note You can configure how often the location server updates its tag location information. Please see the next section in this chapter entitled, Configuring Tagged Asset Status Polling for more details.

Configuring Tagged Asset Status Polling

You can set how often the location server updates its tag location information. Information updates can be as often as every 5 minutes. To configure the frequency of tag status polling, follow these steps:

Step 1 In Cisco WCS, choose **Monitor > Devices > Tags**

The Tags Summary page appears.

Step 2 Choose the search criteria for the tag from the **Search for tags by** menu (left side).

Step 3 Choose the desired polling frequency from the **Last Detected within** menu. The default is 15 minutes.

Step 4 Select the appropriate location server from the **Choose a Location Server** menu.

Step 5 Check the **Tag Vendor** box and select the appropriate vendor from the menu that appears.

Step 6 Click **Search**.

A listing of tags displays corresponding to the selected polling frequency. For example, if you chose 5 minutes from the **Last Detected within** menu, all tags last found within the past 5 minutes are listed.

Inspect Location Readiness and Quality

You can configure Cisco WCS toverify the ability of the existing access point deployment to estimate the true location of an element within 10 meters at least 90% of the time. The location readiness calculation is based on the number and placement of access points.

You can also check the location quality and the ability of a given location to meet the location specification (10 m, 90%) based on data points gathered during a physical inspection and calibration.

Inspect Location Readiness Using Access Point Data

To inspect location readiness using access point data, follow these steps:

Step 1   In Cisco WCS, choose **Monitor > Maps.**

Step 2   Click on the appropriate location link from the list that displays.

A map displays showing placement of all installed elements (access points, clients, tags) and their relative signal strength.

Step 3   Select **Inspect Location Readiness** from the menu found at the top-right of the page. Click **GO.**

A color-coded map appears showing those areas that do (Yes) and do not (No) meet the 10 meter, 90% location specification.

Inspect Location Quality Using Calibration Data

After completing a calibration model based on data points generated during a physical tour of the area, you can inspect the location quality of the access points. To inspect location quality based on calibration, follow these steps:

Step 1   In Cisco WCS, choose **Monitor > Maps.**

Step 2   Choose **RF Calibration Mode**l from the menu found at the top-right of the page. Click **GO.**

A list of calibration models appears.

Step 3   Click the appropriate calibration model.

Details on the calibration including date of last calibration, number of data points by signal type (802.11a, 802.11 b/g) used in the calibration, location, and coverage are displayed.

Step 4   On the same page, click the **Inspect Location Quality** link found under the Calibration Floors heading.

A color-coded map noting percentage of location errors appears.

Note   You can modify the distance selected to see the effect on the location errors.

Deployment Planning for Data, Voice, and Location

You can calculate the recommended number and location of access points based on whether data and/or voice traffic and/or location will be active.

To calculate recommended number and placement of access points for a given deployment, follow these steps:

Step 1 In Cisco WCS, choose **Monitor > Maps.**

Step 2 **Click** on the appropriate location link from the list that displays.

A map appears showing placement of all installed elements (access points, clients, tags) and their relative signal strength.

Step 3 Select **Planning Mode** from the menu found at the top-right of the page. Click **GO.**

A color-coded map summarizing contributing access points appears.

Step 4 Click **Add APs** to open a page to enter data necessary to calculate the recommended number of access points.

Step 5 In the page that appears, drag the dashed rectangle over the map location for which you want to calculate the recommended access points.

> **Note** Adjust the size or placement of the rectangle by selecting the edge of the rectangle and holding down the **Ctrl** key. Move the mouse as necessary to outline the targeted location.

Step 6 **Check** the box next to the service that will be used on the floor. Options are Data/Coverage (default), Voice and Location. Click **Calculate**.

The recommended number of access points given the services requested appears.

> **Note** Each service option is inclusive of all services that are listed above it. For example, if you check the Location box, the calculation will consider data/coverage, voice and location in determining the optimum number of access points required.

> **Note** Recommended calculations assume the need for consistently strong signals. In some cases, fewer access points may be required than recommended.

Step 7 Click **Apply** to generate a map based on the recommendations to see recommended placement of the access points in the selected area.

> **Note** Check the Location services option to ensure that the recommended access points will provide the true location of an element within 10 meters at least 90% of the time.