C H A P T E R 8

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 use Cisco WCS to view location server, client and asset tag status.

This chapter contains the following sections:

Editing Advanced Parameters

You can use Cisco WCS to modify troubleshooting parameters for a location appliance.

To edit location server advanced parameters, follow these steps:

Step 1 In Cisco WCS, choose **Mobility > Mobility Service Engines**. The All Servers window appears.

Step 2 Click the name of the location server whose properties you want to edit.

Step 3 Click **Advanced** (left-hand side) to expand the advanced menu options.

Step 4 Click **Advanced Parameters** (left-hand side) and scroll to the bottom of that window to see the options that can be modified.

Step 5 Modify the advanced parameters as necessary. Table 8-1 lists each parameter and its description.

Table 8-1   Advanced Parameters

Parameter	Description
Advanced Debug	Check the check box to enable advanced debugging. Uncheck the check box to disable advanced debugging. ⚠ **Caution** Enable advanced debugging only under the guidance of TAC personnel because advanced debugging slows the location server down.
Number of Days to Keep Events	Enter the number of days to keep logs. Change this value as required for monitoring and troubleshooting.
Session Timeout	Enter the number of minutes before a session times out. Change this value as required for monitoring and troubleshooting.
Absent Data cleanup interval	Interval in minutes for data cleanup.

Step 6 Click **Save** to update the Cisco WCS and location server databases.

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Working with Alarms

This section describes how to view, assign, and clear alarms and events on location servers using Cisco WCS. Details on how to have email notifications for alarms sent to you is described as well as how to define those types (all, critical, major, minor, warning) of alarm notifications that are sent to you.

Viewing Alarms

To view location server alarms, follow these steps:

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

Step 2   Click **New Search**. A configurable search panel for alarms appears (Figure 8-1).

Figure 8-1   Search Alarm Panel
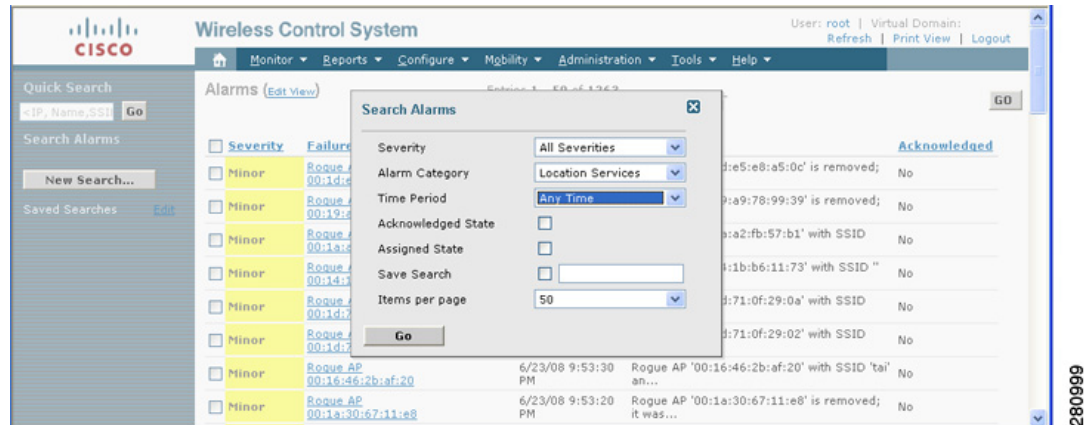
Step 3   Select the Severity of Alarms to display. Options are All Severities, Critical, Major, Minor or Warning.

Step 4   Select **Location Servers** from the Alarm Category.

Options are: All Types, Access Points, Controller, Coverage Holes, Location Notifications, Location Servers, Interference, Mesh Links, Rogue AP, Security and WCS.

Step 5   Select the time frame for which you want to review alarms by selection the appropriate option from the Time Period drop-down menu.

Options range from minutes (5, 15 and 30) to hours (1 and 8) to days (1 and 7). To display all select Any time.

Step 6   Check the **Acknowledged Stat**e check box to exclude the acknowledged alarms and their count from the Alarm Summary window.

Step 7   Check the **Assigned State** check box to exclude the assigned alarms and their count from the Alarm Summary window.

Step 8   To save the search criteria for later use, check the Save Search box and enter a name for the search.

Step 9   Select the number of alarms to display on each window from the Items per Page drop-down menu.

Step 10   Click **GO**. Alarms summary panel appears with search results.

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Note   Click the column headings (Severity, Failure Object, Owner, Date/Time and Message) to sort alarms.

Assigning and Unassigning Alarms

To assign and unassign an alarm to yourself, follow these steps:

Step 1   Display the Alarms window as described in the "Viewing Alarms" section on page 8-3.

Step 2   Select the alarms that you want to assign to yourself by checking their corresponding check boxes.

> **Note**   To unassign an alarm assigned to you, uncheck the box next to the appropriate alarm. You cannot unassign alarms assigned to others.

Step 3   From the Select a command drop-down menu, 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.

Deleting and Clearing Alarms

To delete or clear an alarm from a location appliance, follow these steps:

Step 1   Display the Alarms window as described in the "Viewing Alarms" section on page 8-3.

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

> **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 in the Clear state. You clear an alarm when the condition that caused it no longer exists.

Step 3   From the Select a command drop-down menu, choose **Delete** or **Clear**, and click **Go**.

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.

You can select the alarm severity types (critical, major, minor and warning) that are emailed to you.

To send alarm notifications, follow these steps:

Step 1   Display the Alarms window as described in the .

Step 2   From the Select a commands drop-down menu, choose **Email Notification**, and click **GO**. The Email Notification window appears.

Figure 8-2   All Alarms > Email Notification Window
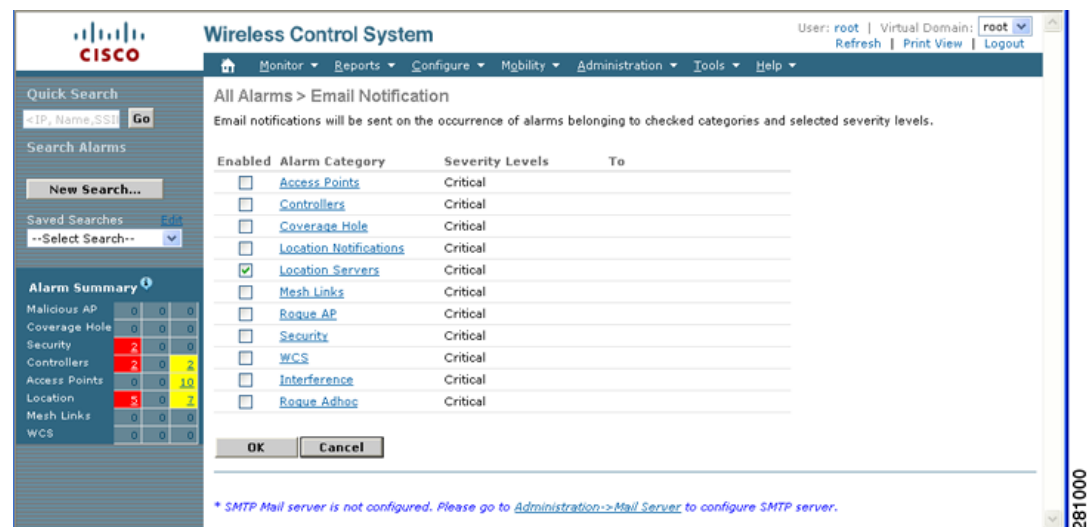
Note   A SMTP Mail Server must be defined prior to entry of target email addresses for email notification. Choose **Administrator > Settings > Mail Server** to enter the appropriate information. You can also select the Administration > Mail Server link, if displayed, on the Email Notification window noted above.

Step 3   Click the **Enabled** box next to the **Location Servers**.

Step 4   Click the **Location Servers** link. The panel for configuring the alarm severity types (critical, major, minor and warning) that are reported for the location servers appears.

Step 5   Check box(es) next to all the alarm severity types for which you want email notifications sent.

Step 6   In the To field, enter the email address or addresses to which you want the email notifications sent. Each email address should be separated by commas.

Step 7   Click **OK**.

You are returned to the Alarms > Notification window. The changes to the reported alarm severity levels and the recipient email address for email notifications are displayed.

Working with Events

You can use Cisco WCS to view location server and location notification events. You can search and display events based on their severity (critical, major, minor, warning, clear, info) and event category.

You can search by the following event categories:

- By network coverage: coverage holes and interference
- By link: mesh links
- By notifications: location notifications
- By product type: access points (rogue and non-rogue), clients, controllers, and location servers
- By security

A successful event search displays the event severity, failure object, date and time of the event, and any messages for each event.

To display events, follow these steps:

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

Step 2   In the Events window:

To display events by severity and category, select the appropriate options from the Severity and Event Category drop-down menus. Click **Search**.

If Cisco WCS finds events that match the search criteria, it displays a list of these events.

Note   For more information about an event, click the failure object associated with the event. Additionally, you can sort the events summary by each of the column headings.

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 location server that you want to configure.

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

Step 4   Click **Advanced Parameters**. the advanced parameters for the selected location server appears.

Step 5   Scroll down to the Logging Options section and choose the appropriate option from the Logging Level drop-down menu.

There are four logging options: **Off**, **Error**, **Information**, and **Trace**.

⚠️
Caution   Use **Error** and **Trace** only when directed to do so by Cisco Technical Assistance Center (TAC) personnel.

Step 6   Check the **Enabled** check box next to each element listed in that section to begin logging of its events.

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.

Generating Reports

In Cisco WCS, you can generate a utilization report for a location server. By default, reports are stored on the Cisco WCS server.

The location utilization report summarizes and charts the following information in two separate charts for a prescribed period of time:

- Chart 1 summarizes and graphs CPU and memory utilization
- Chart 2 summarizes and graphs client count, tag count, rouge client count, rogue access point count, and ad hoc rogue count

You can generate a utilization report for the location server. Once defined, the report can be saved for future diagnostic use and run on either an ad hoc or scheduled basis.

You can define the following in a utilization report:

- What location server or servers are monitored
- How often the report is generated
- How the data is graphed on the charts
- Whether the report is emailed or exported to a file

Creating a Location Server Utilization Report

Step 1   In Cisco WCS, choose **Reports > Performance Reports.**

Step 2   Select **Location Server Utilization** from the listing under the Performance Reports heading.

The Location Server Utilization summary window appears.

Step 3   Select **New** from the Select a command drop-down menu. Click **GO**.

A tabbed panel appears (see Figure 8-3).

Figure 8-3   ***Reports > Performance Reports > Location Server Utilization***
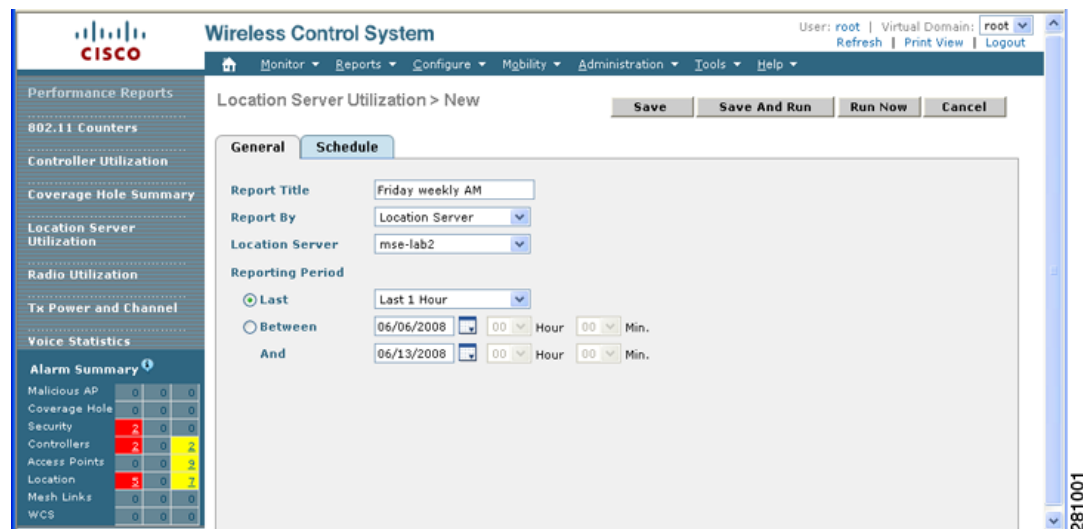
Step 4   Enter a report title.

Step 5   The Report By selection is always location server.

Step 6   Select either a specific location server or **All Location Servers** from the drop-down location server menu.

Step 7   Enter the reporting period for the report. You can define the report to collect data on either an hourly or weekly basis or at a specific date and time.

> ✎
> **Note**   The reporting period uses a 24-hour rather than 12-hour clock. For example, select hour 13 for 1:00 PM.

Step 8   To define how collected data is grouped and displayed (hourly, daily, weekly) on the report (x-axis), select an option from the Aggregation Frequency drop-down menu. Select the **Schedule** tab when complete.

For example, if you want to graph data daily on your report, you select **daily**. Additionally, you must select daily as the Recurrence value in the schedule tab.

> ✎
> **Note**   The Recurrence parameter defines how often a report is generated.

Step 9   At the Schedule window, check the **Enable Schedule** check box to enable the report.

Figure 8-4   Location Server Utilization > New > Schedule Tab

Step 10   Select the export format from the drop-down menu.

Step 11   Select either the **Save To File** or the **Email To** option.

- If you select the Save To File option, a destination path must first be defined at the **Administration > Settings >** *Report* window. Enter the destination path for the files in the Repository Path field.

- If you select the Email To option, an SMTP Mail Server must be defined prior to entry of target email address. Choose **Administrator > Settings >** *Mail Server* to enter the appropriate information.

Step 12   Enter a start date (MM:DD:YYYY) or click the calendar icon to select a date.

Step 13   Specify a start time using the hour and minute drop-down menus.

Step 14   Click one of Recurrence buttons to select how often the report is run.

> **Note**   The days of the week only appear on the screen when the weekly option is chosen.

Step 15   When complete with all of the above steps, do one of the following:

- Click **Save** to save edits.

- Click **Save and Run** to save the changes and run the report now. The report is run and the results are either emailed or saved to a designated file as defined in the Schedule tab. The report runs again at the scheduled time.

- Click **Run Now** if you want to run the report immediately and review the results in the WCS window. The report runs regardless of any scheduled time associated with the report. If the report is too large to display in the WCS window, you are referred to the history tab to download the file for viewing. Click **Save** if you want to save the report scenario you entered.

> **Note**   You can also click **Run Now** to check a report scenario before saving it or to run reports as necessary.

Viewing a Location Server Utilization Chart

To view results of a defined report, do the following:

Step 1   In Cisco WCS, choose **Reports > Performance Reports**.

Step 2   Select **Location Server Utilization** from the listing under the Performance Reports heading.

The Location Server Utilization summary window appears. Any pre-defined reports, previously created and saved, are listed.

> **Note**   You can select one of the listed reports or you can define a new report. For details on creating a new report, see the "Creating a Location Server Utilization Report" section on page 8-8.

Step 3   Select a listed report.

Step 4   Review or modify the report parameters on the General tab window. When finished, select the Schedule tab.

Step 5   Check the **Enable Schedule** check box to enable the report.

Step 6   Review and edit other parameters, as necessary. When finished with your review or edit, do one of the following:

- Click **Save** to save edits.

- Click **Save and Run** to save the changes and run the report now. The report is run and the results are either mailed or saved to a designated file as defined in the Schedule tab. The report runs again at the scheduled time.

- Click **Run Now** if you want to run the report immediately and review the results in the WCS window. The report runs regardless of any scheduled time associated with the report. If the report is too large to display in the WCS window, you are referred to the history tab to download the file for viewing. Click **Save** if you want to save the report scenario you entered.

> **Note**   You can click **Run Now** to check a report scenario before saving it or to run reports as necessary.

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

To view the current status of a location server, follow these steps:

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 **Advanced** to display the administrative configuration options.

Step 4   Click **Advanced Parameters**.

Information for the selected location server found on the Advanced Parameters window is summarized in Table 8-2.

Table 8-2   Advanced Parameters for Location Servers:

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 window 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 level (off, information, error, trace) being logged.
	Note Use **Error** and **Trace** only when directed to do so by Cisco Technical Assistance Center (TAC) personnel.

Page Heading	Description
Advanced Parameters	Number of days to keep events, Session Time out, Interval between data cleanup and enabled/disable status of Advanced Bug operation. **Note** To modify these values, refer to the "Editing Advanced Parameters" section on page 8-2.
Advanced Commands	Commands: Reboot Hardware, Shutdown Hardware, Clear Configuration and Defragment Database.

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 that client is updated. This information is display by simply passing the cursor over the client icon on the map. Additionally, you can click on the icon to open the Client Properties window.

To provide this functionality, you must first enable location status for the client.

To enable client location status for a specific client, follow these steps:

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

The Clients Summary window displays.

Step 2   Click the Total Clients link for the appropriate location server listed under Clients Detected by Location Servers.

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

Note   To search for a client by a specific parameter such as by MAC address or controller, click New Search and select the appropriate search criteria. If you searched for the client by its MAC address, only one entry is listed.

Step 3   Click on the appropriate client.

Step 4   Click the **Location** tab.

Step 5   Check the **Enabled** check box for **Location Debug** under Asset Info.

Step 6   Click **Update** and close the window.

Step 7   At the map, click **Refresh Heatmap** to activate the feature on the map.

Note   At the **Monitor > Maps** window, both the Refresh Heatmaps and Clients check boxes must be checked for the RSSI and client icons to display on the map.

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. This information is display by simply passing the cursor over the asset tag icon on the map. Additionally, you can click on the icon to open the Tag Properties window.

To provide this functionality, you must first enable location status for the tagged asset.

Enabling Tagged Asset Location Status

To enable tag location status, follow these steps:

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

The Tags Summary window appears.

Step 2   Click **New Search** to open a search window.

Step 3   Click the **Total Tags** link for the appropriate location server.

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

> **Note**   You can also search for a specific tag by criteria such as MAC address, controller, or Tag Vendor. See the "Querying of Tags" section on page 8-13 for more details.

Step 4   Click the appropriate tag. The Tag Properties window appears.

Step 5   Check the **Enabled** check box for **Location Debug** under Asset Info

Step 6   Click **Update** and close the window.

Step 7   At the map, click **Refresh Heatmap** to activate the feature on the map.

> **Note**   At the **Monitor > Maps** window, both the Refresh Heatmaps and 802.11 Tags check boxes must be checked for the RSSI and tag icons to display on the map.

Querying of Tags

You can query tags by asset type (name, category and group), by MAC address, by system (controller or location appliance), and by area (floor area and outdoor area).

You can further refine your search by tag vendor and type (telemetry) and save the search criteria for future use. Saved search criteria can be retrieved from the Saved Searches drop-down menu on the Tag Summary window (Monitor > Tags).

The following details are displayed on the Tag Properties window for each tag:

- Tag vendor
- Controller to which tag is associated
- Battery Life

- Asset Information (Name, Category, Group)
- Statistics (bytes and packets received)
- Location (Floor, Last Located, Location Server)
- Location Notifications
- Telemetry Data (CCX v1 compliant tags only)

✎

Note   Telemetry data displayed is vendor-specific; however, some commonly reported details are GPS location, battery extended information, pressure, temperature, humidity, motion, status, and emergency code.

- Emergency Data (CCX v1 compliant tags only)

To query tags, follow these steps:

Step 1   Choose **Monitor > Tags**. The Tag Summary window appears.

Step 2   To initiate a search for tags, click **New Search** (side panel) to open the tag search window (Figure 8-5).

Figure 8-5   *Search Tags Panel*
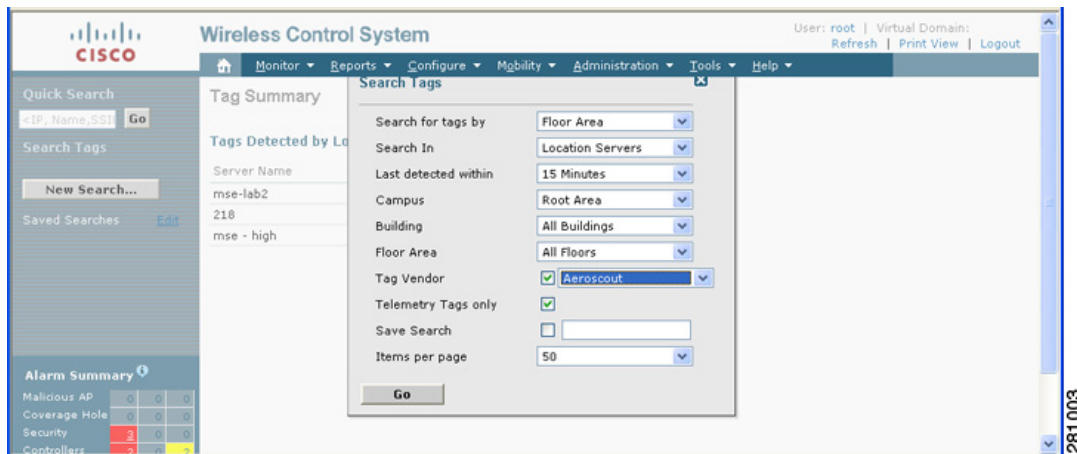
Step 3   Select the appropriate search criteria. Table 8-3 lists search criteria and their possible values.

Table 8-3   Tag Search Criteria and Values

Search Criteria	Variable Search Criteria	Possible Values
Search for tags by (Tier 1 search criteria)	—	All Tags; Asset Name, Asset Category or Asset Group; MAC Address; Controller or Location Server; Floor Area or Outdoor Area.
Search In (Tier 2 search criteria)	—	WCS Controllers or Location Server. **Note** WCS Controller option indicates that the search for controllers is done within WCS.
Last detected within	—	Options are from 5 minutes to 24 hours.
Variable search criteria. (Tier 3 search criteria) **Note** Possible search criteria determined by the **Search for tabs by** (Tier 1 search) value.	If **Search for tags by** value is: 1. Asset Name, then enter Tag Asset Name. 2. Asset Category, then enter Tag Asset Category. 3. Asset Group, then enter Tag Asset Group. 4. MAC Address, then enter Tag MAC Address. 5. Controller, then select Controller IP address from drop-down menu. 6. Location Server, then choose a Location Server IP address from drop-down menu. 7. Floor Area, then choose Campus, Building and Floor Area. 8. Outdoor Area, then choose Campus and Outdoor Area.	
Show Telemetry Tags only	—	Check box to display telemetry tags. Leaving option unchecked displays all tags. **Note** Option only seen when Location Server, Floor Area or Outdoor Area are selected as the Search for tags by option. **Note** Only those vendor tags that support telemetry appear.
Tag Vendor	—	Check box to select tag vendor from drop-down menu. **Note** Option does not display when Asset Name, Asset Category, Asset Group or MAC Address are the search criteria for tags.
Save Search	—	Check box to name and save search criteria. Once saved, entry appears under Saved Searches heading (left-panel).
Items Per Page	—	Select the number of tags to display per search request. Values range from 10 to 500.

Step 4   Click **Go** when all search criteria are selected. A listing of all tags that match the search criteria appears.

> ✎
> **Note**   If no tags are found based on the selected search criteria, a message appears noting this as well as the reason why the search was unsuccessful and possible actions.

Step 5   Select a MAC Address link to display details for a specific tag. The Tag Properties window appears (Figure 8-6).

Figure 8-6   Tag Properties Window (top)

> ✎
> **Note**   Scroll down to the bottom of the window to see Telemetry and Emergency details for the tag (Figure 8-7).

Figure 8-7   Tag Properties Window (bottom)
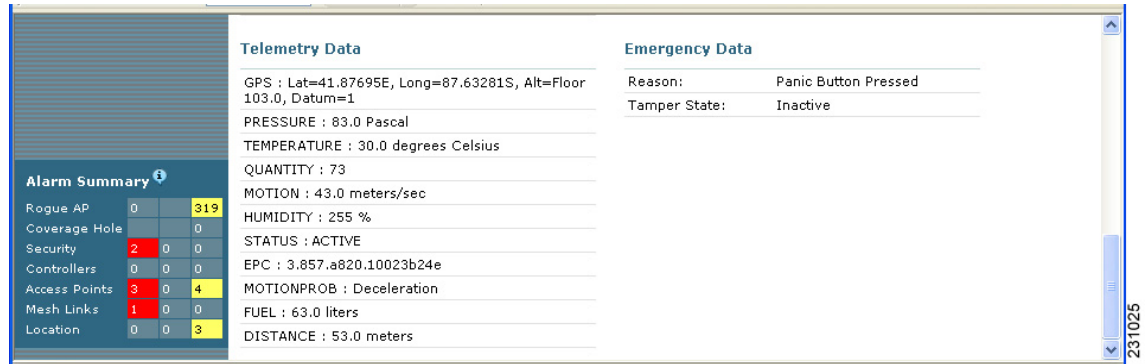
Overlapping Tags

When multiple tags are within close proximity of one another a summary tag is used to represent their location on a WCS map (**Monitor > Maps**). The summary tag is labeled with the number of tags at that location.

When you move the mouse over the overlapping tag on the map, a panel appears with summary information for the overlapping tags (see Figure 8-8).

Select the Prev and Next links to move between the individual tag summary panels. To see detailed information on a specific tag, select the Details link while viewing the tag's summary information.

Note
- Summary information for tags includes: Tag MAC address, Asset Name, Asset Group, Asset Category, Vendor (Type), Battery life and Last Located data (date and time). If the tag is Cisco CX v.1 compliant, telemetry information also appears.

- Detailed information for tags includes this additional information: IP address of associated controller, statistics, location notifications, location history and whether the location debug feature is enabled.

  – To view location history for a tag, select that option from the Select a command drop-down menu and click **GO**.

  – To return to the details screen from the location history window, select the Tag Detail option and click **GO**.

Figure 8-8   Overlapping Tags Window
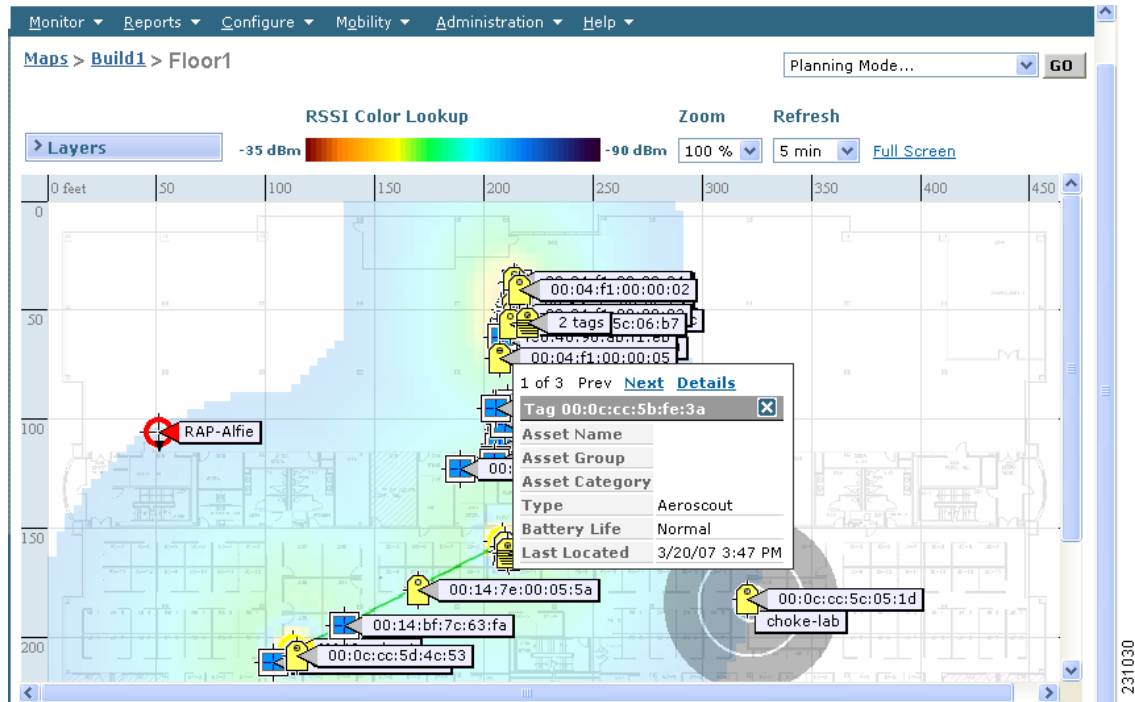
Monitoring Chokepoints

To monitor chokepoints, follow these steps:

Step 1 Click **Monitor > Chokepoints**. The Chokepoint > Search Results summary window appears showing all mapped chokepoints.

Step 2 To refine the search criteria when an extensive lists appears, you can search by MAC address or chokepoint name.

   a. To initiate a search for a chokepoint by its MAC address, select **MAC address** from the Search for Chokepoints by drop-down menu and enter the MAC address of the chokepoint in the field below. Click **Search**.

   b. To initiate a search for a chokepoint by its name, select **Chokepoint Name** from the Search for Chokepoints by drop-down menu and enter the chokepoint name in the field below. Click **Search**.

If no match exists, then a message indicating that appears in the window. Otherwise the search result displays.