Cisco Wireless Location Appliance

The Cisco® Wireless Location Appliance is the industry's first location solution that simultaneously tracks thousands of devices from directly within the WLAN infrastructure—bringing the power of a cost effective, high-resolution location solution to critical applications such as high-value asset tracking, network location services such as RF capacity management, troubleshooting, and location based security, and business policy enforcement. By providing the ability to integrate tightly with a spectrum of technology and application partners through a rich and open application programming interface (API), this innovative appliance facilitates the deployment of new and important business applications.

The Cisco Wireless Location Appliance is built on an architecture that expands customer choice and advances application functionality with Cisco Compatible Extensions Wi-Fi tags. Customers can mix and match Wi-Fi tags and applications from a variety of vendors who are Cisco Compatible certified. Cisco Compatible tags deliver rich application functionality by supporting telemetry and sensor information; panic, tampering, and motion sensor notifications; tag battery notifications; and high fidelity deterministic location utilizing multi-vendor chokepoints.

Keeping future extensibility of the platform in mind, Cisco Compatible tags also provide the ability to later upgrade the system to include EPC Global and GPS information. These capabilities make the Cisco Wireless Location Appliance the right choice for enterprise class WLANs today.

Product Overview

The Cisco Wireless Location Appliance is an innovative, easy-to-deploy solution that uses advanced RF fingerprinting technology to simultaneously track thousands of 802.11 wireless devices from directly within a WLAN infrastructure, increasing asset visibility and control of the RF environment. Additionally, the appliance provides location-based alerts for business policy enforcement and records rich historical location information that can be used for location trending, rapid problem resolution and RF capacity management. By enabling the deployment of powerful location-based applications such as Enhanced 911 (E911) services, asset management and workflow automation through integration with the Cisco Wireless Location Appliance API, the appliance becomes a critical solution for customers ranging from enterprises to vertical industries such as healthcare, finance, retail, manufacturing and federal organizations.

By design, the Cisco Wireless Location Appliance provides native location services in the WLAN infrastructure to lower customers' total cost of ownership and extend the value and security of the existing WLAN infrastructure by making it "location ready". As a component of the Cisco Unified Wireless Network, the Cisco Wireless Location Appliance uses Cisco wireless LAN controllers and Cisco Aironet® lightweight access points to track the physical location of wireless devices to within a few meters. For areas requiring very high fidelity, deterministic location, Cisco Compatible Extensions Wi-Fi tags support chokepoint-based notifications. The centralized WLAN management capabilities and intuitive GUI of the Cisco Wireless Control System (WCS) with location are extended for managing and configuring the Cisco Wireless Location Appliance, making setup fast and intuitive.

Product Architecture

The Cisco Wireless Location Appliance uses the same Cisco lightweight access points that deliver traffic as location "readers" for 802.11 wireless clients and Wi-Fi tags. These access points collect received-signal-strength-indication (RSSI) information from all Wi-Fi devices, including Wi-Fi enabled laptops, voice handsets, Wi-Fi tags, rogue (unauthorized) devices and rogue access points. The collected RSSI information is then sent through the Lightweight Access Point Protocol (LWAPP) to the Cisco wireless LAN controllers or certain wireless integrated switches or routers. The Cisco wireless LAN controllers then aggregate the RSSI information and send it to the Cisco Wireless Location Appliance through Simple Network Management Protocol (SNMP).

The Cisco Wireless Location Appliance performs location computations based on the RSSI information received from the Cisco wireless LAN controllers. The Cisco Aironet access point antenna height and azimuth is accounted for during these RSSI-based location calculations to provide more accurate location assessment in warehouses or other locations with extended ceiling heights. The Cisco wireless LAN controllers that gather the RSSI information must be associated with the Cisco Wireless Location Appliance (Figure 1).

Figure 1. Location Services Architecture
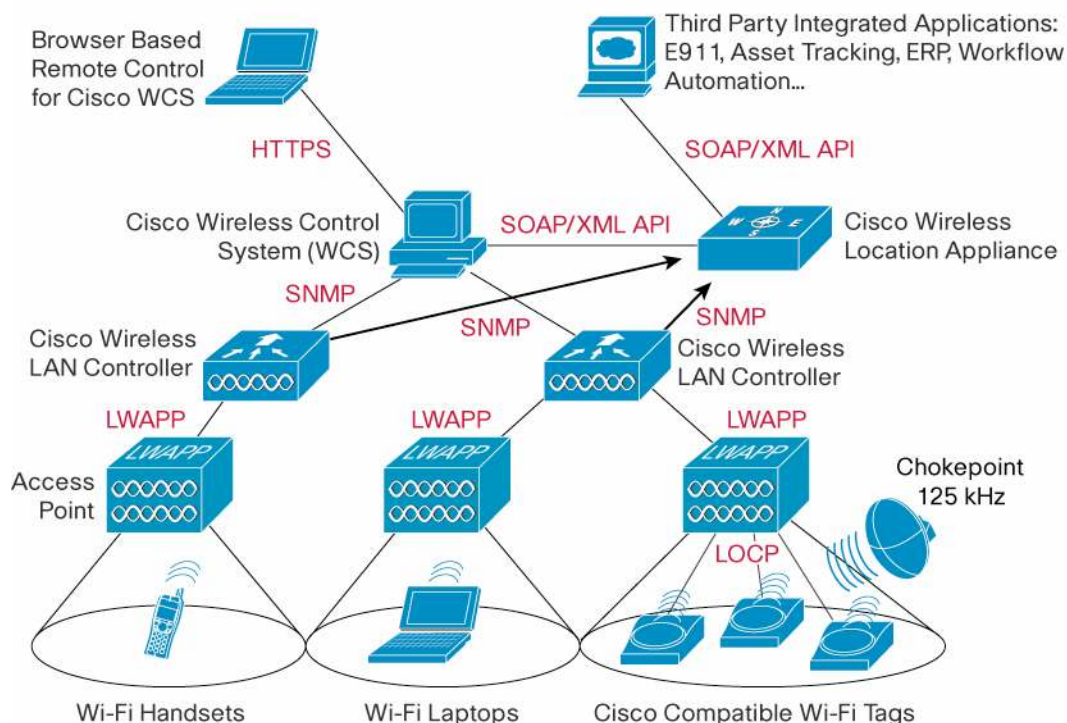
Chokepoint Support

The Cisco Wireless Location Appliance supports applications and areas requiring very high fidelity and deterministic location to within a few feet or several centimeters with third party chokepoints. Third party chokepoints, triggered by Cisco Compatible Wi-Fi tags, can be used for a variety of use cases including theft prevention and entry or exit area notifications. Chokepoint based notifications are triggered by Cisco Compatible Wi-Fi tags as they come within range of a chokepoint that is mounted in the area requiring monitoring. Notifications can be triggered for entry or exit of a tag from a specified zone, doorway, or gate. Applications for chokepoints vary from general purpose uses such as theft prevention of high value assets to industry specific process control events such as those used in manufacturing plants (Figure 2)

A chokepoint can trigger a Wi-Fi tag to send the Cisco Aironet lightweight access point up to 10 bytes of data, transmit one of 10 prestored messages, send and store up to 10 bytes of data or make specific tags blink to enable easy visual identification of high-value assets.

The Cisco Wireless Location Appliance currently supports 125 kHz-based chokepoints using AeroScout Exciters or WhereNet WherePorts. Support for other third-party chokepoint products is planned in the future. To ensure interoperability between Wi-Fi tags and chokepoints, it is best to purchase these items from the same vendor.

- AeroScout Exciters support configurable ranges of accuracy from several centimeters to up to 19 feet. For exact accuracy specifications, please read the Aeroscout Exciter data sheets at: http://www.aeroscout.com/content.asp?page=exciter.
- WhereNet WherePorts support configurable ranges of accuracy from 3 feet to 25 feet. For exact accuracy specifications, please read the WhereNet WherePort data sheet at: http://www.wherenet.com/products_whereport.shtml

Note: All chokepoints must be configured and brought online with the vendor's chokepoint management software in order to ensure proper network connectivity and set device ranges. Chokepoints should be added to Cisco WCS only after they have been configured by the vendor's chokepoint management software. Chokepoints that are added to Cisco WCS without configuration by the vendor's chokepoint management software will not operate. Upgrades and detailed configuration of chokepoints are also completed in the vendor's chokepoint management software. For more detailed information, please reference each vendor's chokepoint management software documentation.

Figure 2.   Integrated Location Services Architecture
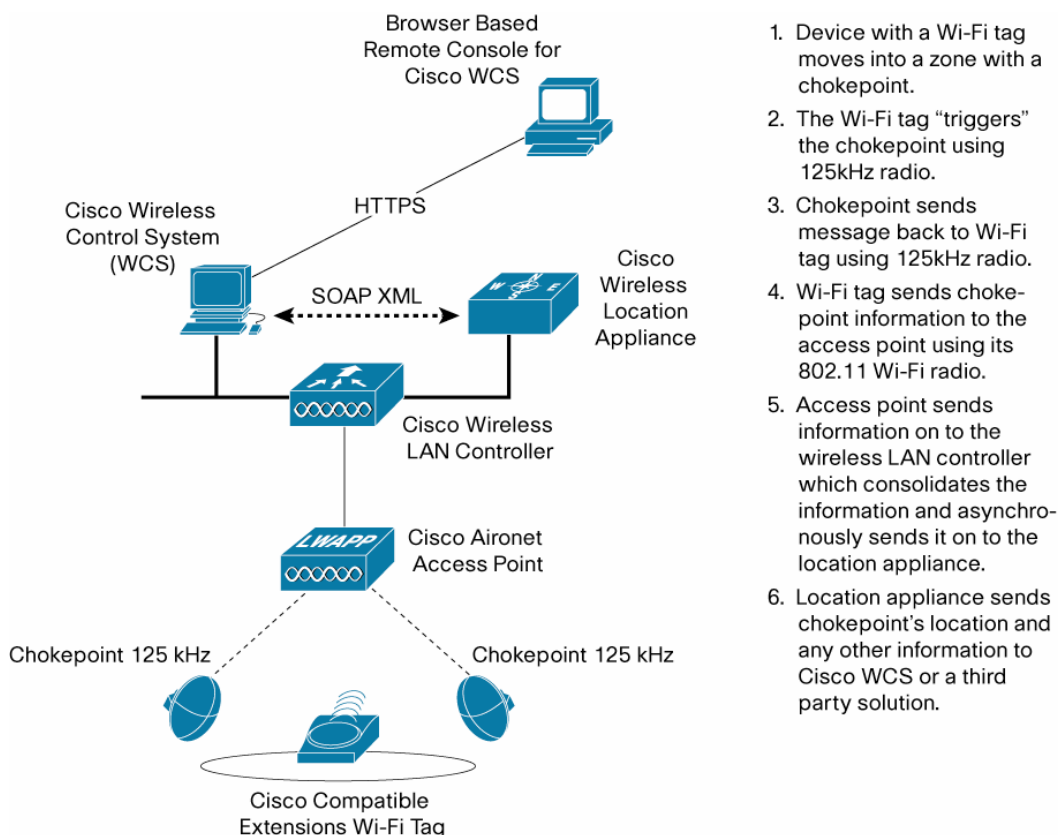
Location Tracking

Once network maps and access points are added to the appliance, RF predictions and heatmaps can be generated to graphically display

the location of thousands of devices on the site's floor plans. Cisco WCS displays this location information visually (Figure 3), providing an immediate location application for customers who want to enhance their RF capacity management, utilize location based security and have asset visibility for WLAN devices. This location information is also available to third-party applications through a Simple Object Access Protocol/Extensible Markup Language (SOAP/XML) API on the appliance, creating an extensible foundation for a host of rich location based applications.

Figure 3. Cisco Wireless Location Appliance: Simultaneous Location Tracking for Thousands of Users, Devices, and Access Points
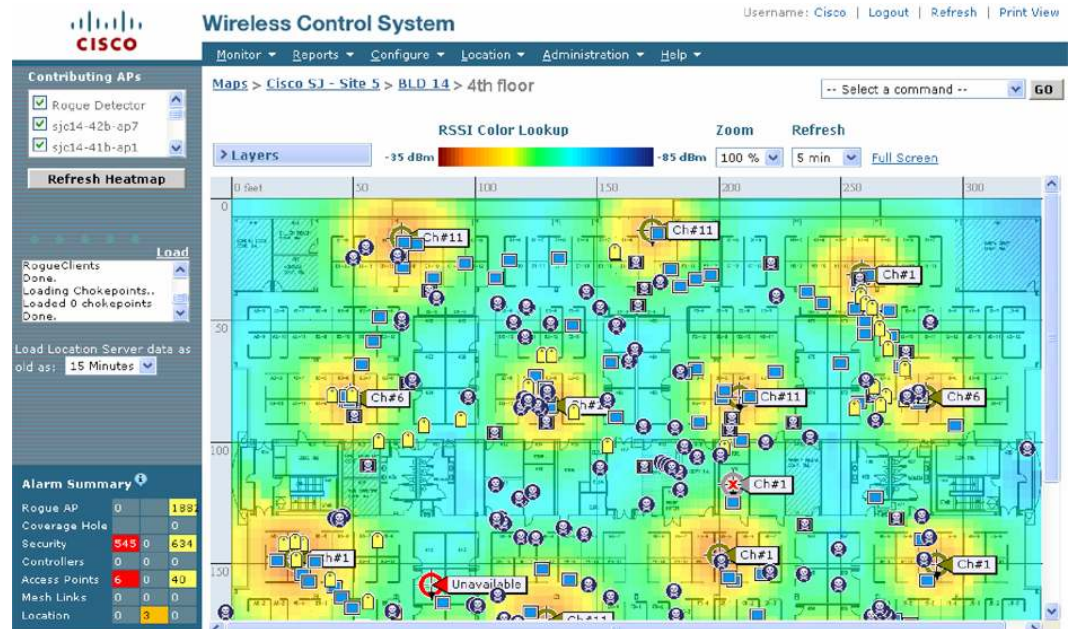

Figure 4 shows a targeted view for rogue access points and devices. Targeted views can be created for a variety of selections including device categories, logical names, time detected and physical location such as floor area. For example, in a hospital, a targeted view of the category "all infusion pumps on floor 3" could be created.

Figure 5 shows event-based chokepoint information displayed in Cisco WCS.

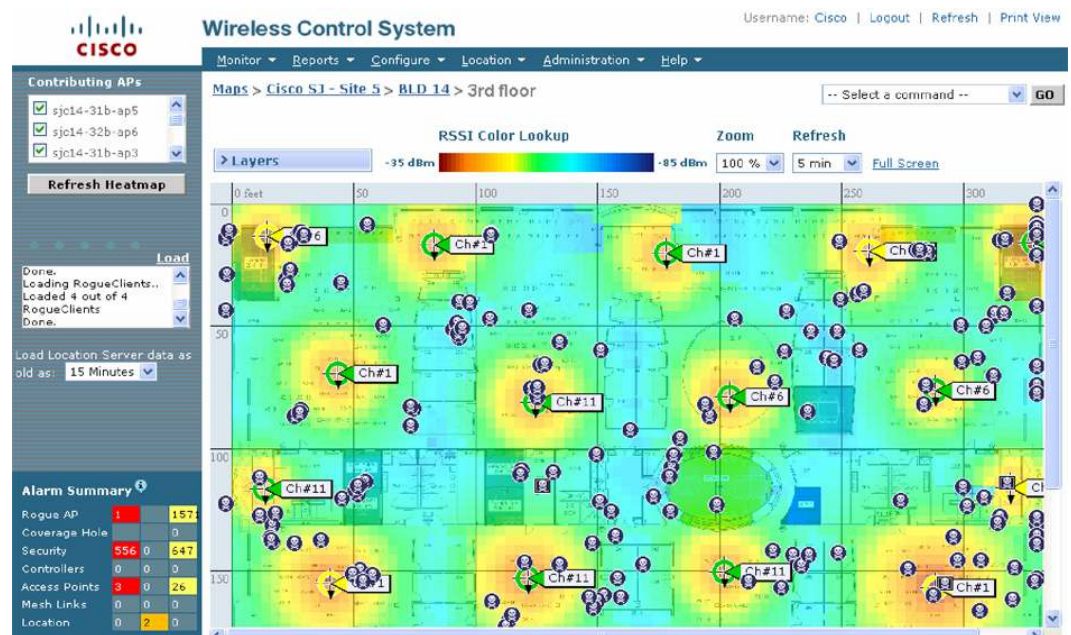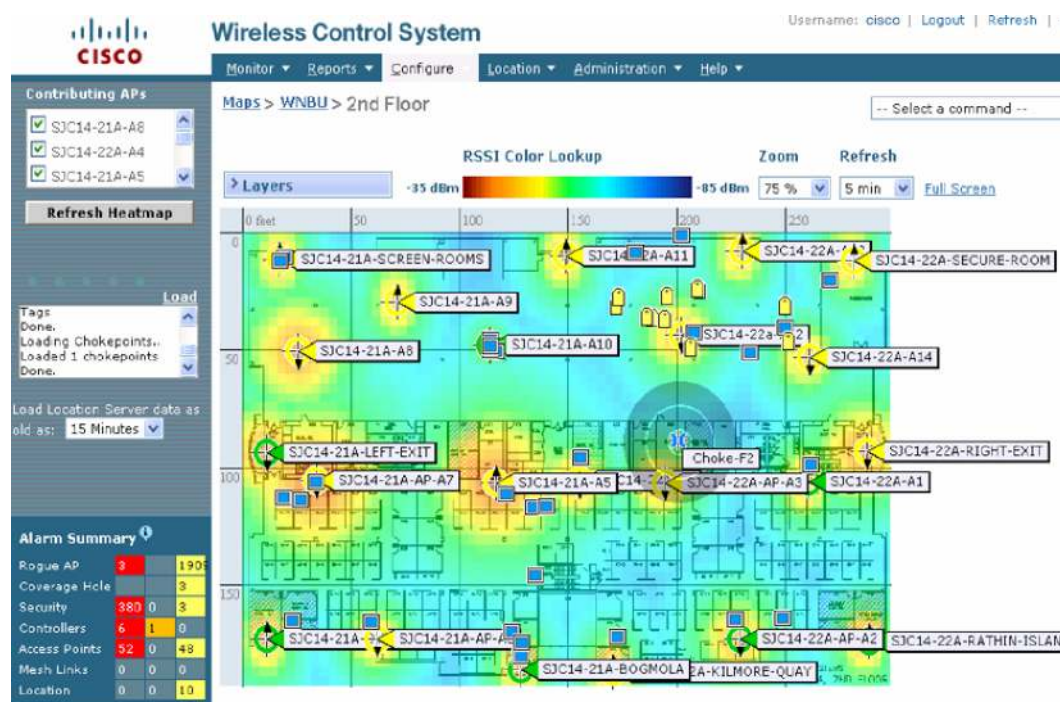**Figure 4.** Cisco Wireless Location Appliance: Targeted Views for Rogue Access Points and Devices

Figure 5.   Cisco WCS Chokepoint Display

Intuitive Appliance Management

Cisco WCS manages the Cisco Wireless Location Appliance through an intuitive and visually rich GUI providing centralized management and configuration. For greater scalability, Cisco WCS can manage one or more Cisco Wireless Location Appliances. Cisco WCS view filters and flexible search criteria make targeted viewing of location data easy and adaptive to user needs. A Cisco WCS license with location services must be installed in order to interface with the Cisco Wireless Location Appliance and display location services information.

Wireless Security and Rapid Troubleshooting

The Cisco Wireless Location Appliance allows IT managers to quickly and accurately locate security threats such as rogue access points and devices (Figure 6). Rogue access points create potential security breaches and unsecured WLAN connections that put the entire network at risk. Rogue devices are installed by employees or intruders. The ability to locate these devices more accurately helps IT managers rapidly isolate security threats and unauthorized attempts to access the network. Accurate detection of these rogue devices provides enhanced WLAN security by helping ensure that legitimate client stations associate only with trusted access points. Additionally, IT managers can also use features such as location-based alerting and high-resolution rogue tracking to establish a framework for location-based security—further elevating WLAN security.

**Figure 6.**   Cisco Wireless Location Appliance Rogue Device Detection
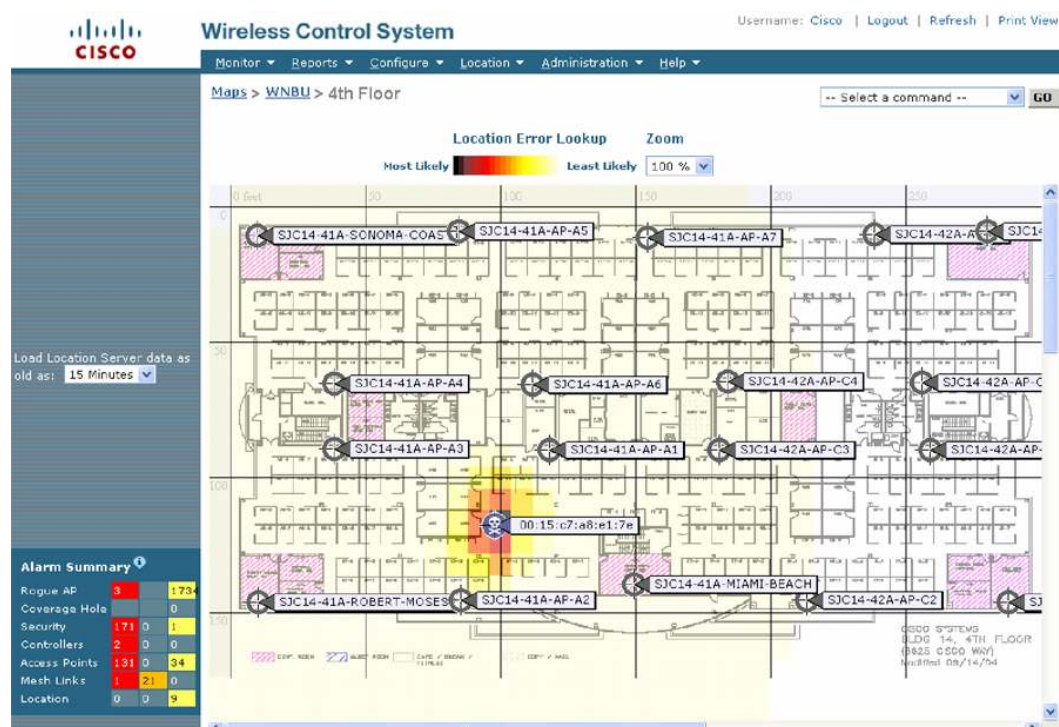
IT staff can easily review security alarms or movement alarms by drilling down into detailed location and statistical information about devices for isolation and containment of wireless intruders as well as for rapid troubleshooting and simplified device management (Figure 7). For example, actionable data can be mined on clients, including recent and historical physical location information about where users have been when, and client traffic analysis, as well as IP address, username, MAC Address, Service Set Identifier (SSID), and access point association details. This feature also provides a rich audit trail of information that IT staff can archive and replay for up to 30 days or longer with easily exported log files.

Figure 7. Cisco Wireless Location Appliance Client Details
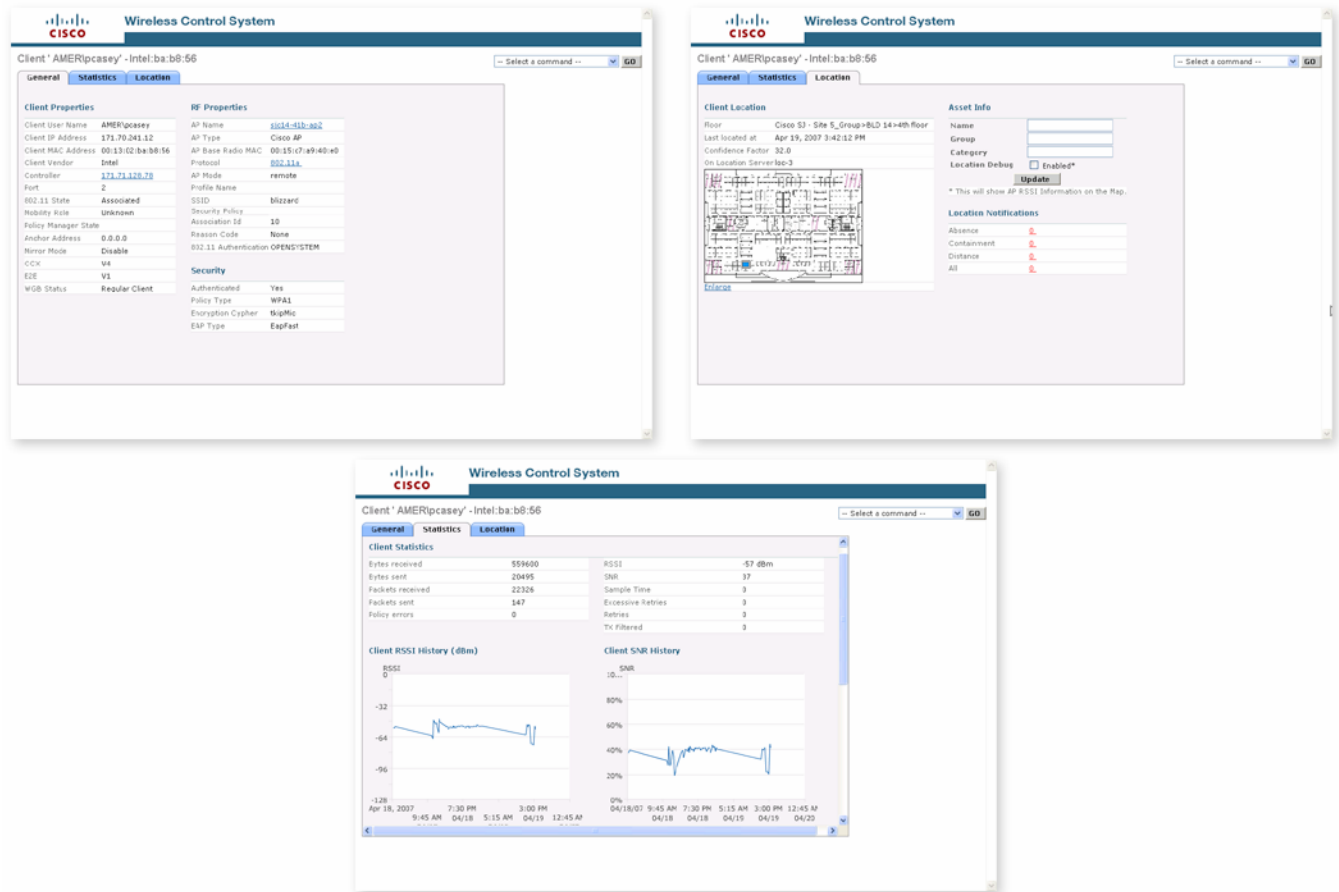
Location Trending for RF Capacity Management and Visibility

A variety of useful information for enhanced RF capacity management can be generated. This information can be based on location trends—where people have been and when, for example client/tag distribution across a floor; statistical location information—where people have been and associated traffic analysis; and coverage areas—where hotspots are based on volume of people and traffic to determine how concentrated RF resources are and how WLAN is handling the number of clients (Figure 8).

Figure 8. Cisco Wireless Location Appliance Client Device - Location Trending
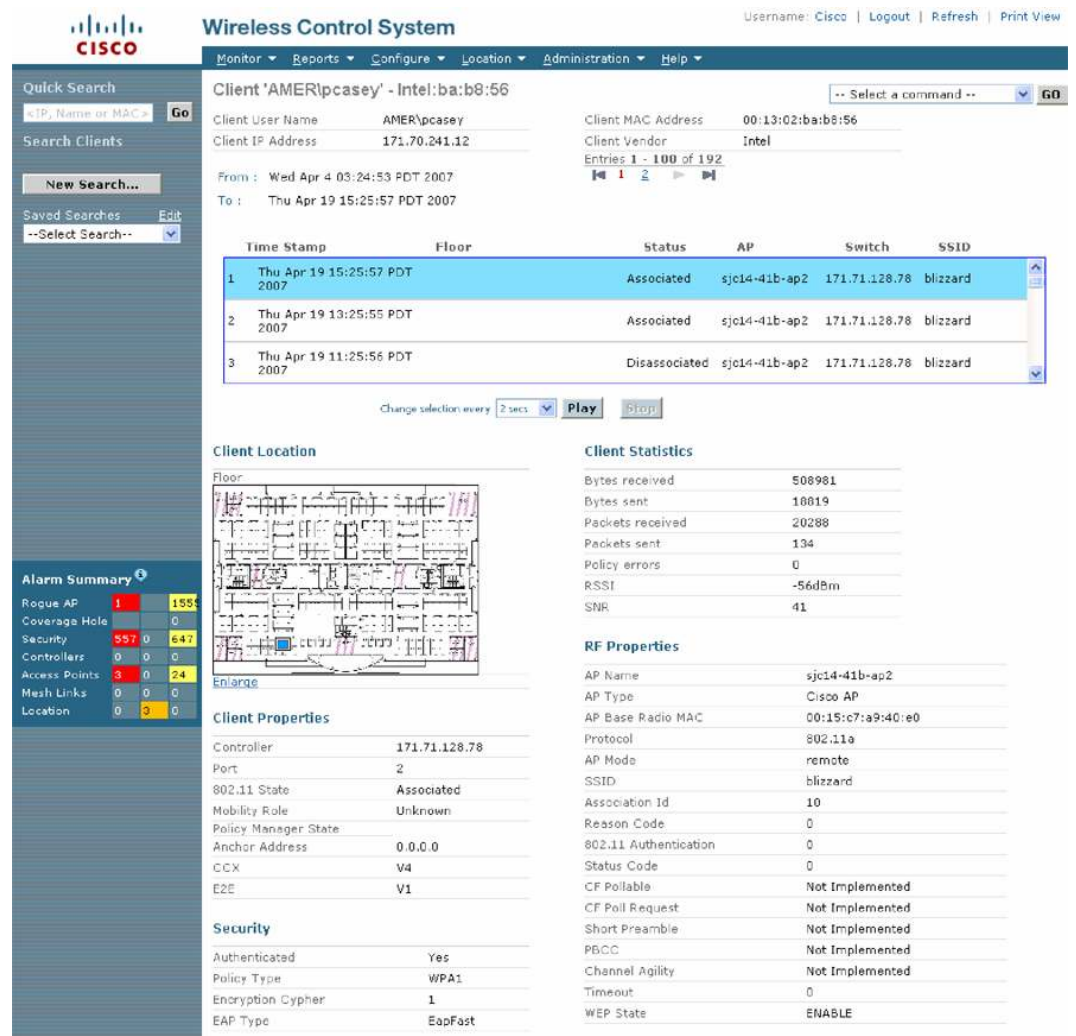
Targeted Location Searches

Targeted searches can be easily conducted across a variety of flexible parameters that can be adapted to specific user interests. These search criteria include but are not limited to asset categories such as tags, clients, rogues as well as customized and logical asset names; physical location parameters such as floors, campuses, buildings, associated access points; detection times; protocols, SSIDs, IP and MAC addresses, and usernames. For instance, Figure 9 shows a search in process to list all tags in a particular asset group, but this could just as easily be all rogues on a particular floor.

Figure 9. Cisco Wireless Location Appliance Tag Search Parameters

Deploying Wireless Location Services

The Cisco Wireless Location Appliance includes a variety of pre and post deployment tools that simplify the deployment and management of location services.

Pre-Deployment Tools

- **Planning Mode Tool:** This tool provides recommendations for access point placement and density to create a WLAN deployment that supports location accuracy within the specifications of the location appliance. Drawing of irregularly shaped buildings using polygons is supported to help organizations easily design and support WLAN deployments in such buildings (Figure 10)
- **Location Readiness Assessment Tool:** This tool helps customers determine if their current WLAN deployment is sufficient to support location accuracy within the specifications of the location appliance. (Figure 11)
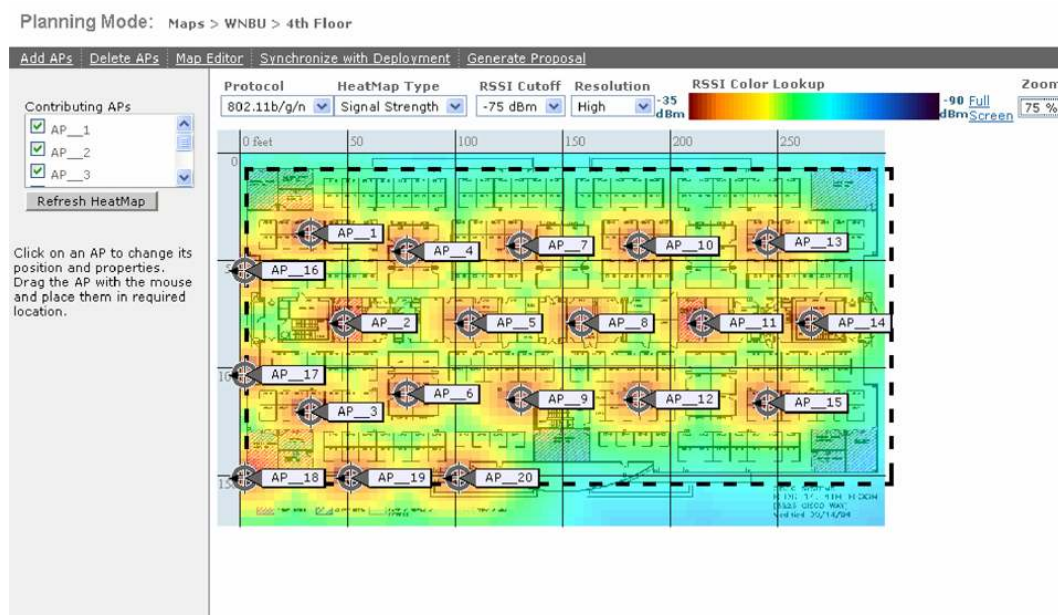
Figure 10. Planning Mode Tool

Figure 11. Location Readiness Assessment Tool

Post Deployment Tools

- **Calibration Tool**: Customers can choose to perform a post-deployment calibration of their network if the network's location accuracy becomes out of specification. During this calibration, an 802.11 wireless client device is used to take RSSI measurements in the environment. The measured RSSI is then used by the location appliance to fine tune the location accuracy of the location device. Improvements in location accuracy can be visualized using the Location Inspector Tool.

- **Location Inspector Tool:** This tool is used post-deployment to determine the location accuracy throughout the WLAN. It provides a visual representation of the quality of location accuracy. It can also be used for on-going performance tuning of the network. (Figure 12)

- **Location Troubleshooting:** When location accuracy does not conform to specifications, the location debug feature can be enabled. This feature displays the access points that contributed to the location calculations, the signal strength of these devices and a time stamp of when the signal strength measurement was last received. Screenshots of this display can be sent to the Cisco Technical Assistance Center (TAC) to help with location services troubleshooting.

Figure 12. Location Inspector Tool
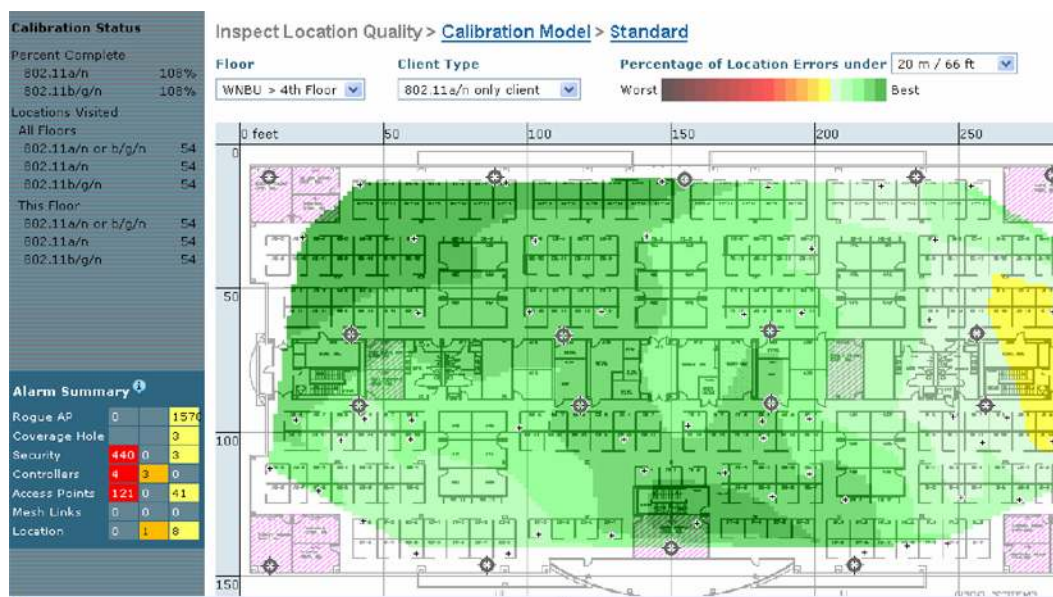
Integration with Location Based Applications

To facilitate the deployment of location-based applications in the enterprise, the Cisco Wireless Location Appliance is equipped with a rich and open SOAP/XML-based API. Applications can rapidly make use of location information by importing components that impact the RF environment such as entire network maps including buildings, floors, access points, coverage areas and device lists from the location appliance. Rich and actionable data can also be imported such as recent and historical location and statistical device information. Location based alarms and notifications can be triggered in applications through area boundary definitions, allowed areas and distances.

Receipt of the following information from properly enabled Cisco Compatible Extensions Wi-Fi Tags is supported by the Cisco Wireless Location Appliance:

- **Telemetry:** Notifications for temperature, pressure, humidity, device status, fuel, quantity, distance, and motion probability.
- **Battery:** Information on percentage of power remaining, days remaining, and battery age.
- **Emergency Group:** Notifications for panic, device tampering, and device detachment from its carrier.

Each Wi-Fi tag manufacturer determines the information that is supported by its Wi-Fi tag offerings. The Cisco Unified Wireless Network can receive and display information or notifications through third-party specialized applications that are receiving information from the Cisco Wireless Location Appliance API or in some instances, information can be displayed on the Cisco WCS Location Notifications Summary

All of these capabilities allow the Cisco Wireless Location Appliance API to be used for tight and transparent integration with external software applications such as E911, asset management, enterprise-resource-planning (ERP) tools, and workflow automation systems that can use location information. This makes the Cisco Wireless Location Appliance an ideal part of any end-to-end enterprise solution.

Features and Benefits

The Cisco Wireless Location Appliance delivers a host of tangible benefits to enterprises running business-critical wireless LANs, including:

- **Increased accuracy**: The Cisco Wireless Location Appliance uses the Cisco patent-pending RF fingerprinting technology to determine the location of wireless devices. Cisco has the only WLAN infrastructure that correlates known RF characteristics of a building (for example, multipath or attenuation) with user information to track mobile devices to within a few meters. The solution also supports the reduction of position jitter for a stable Wi-Fi device.

- **Location-based alerts**: This feature provides the ability to proactively send location notifications based on device movement, device absence, zone entry and exit of tracked devices, Wi-Fi tag battery level Wi-Fi device position change, emergency groups and chokepoint information. The Wi-Fi tag battery level notification indicates the Wi-Fi tag's power level. The Wi-Fi device position change notification sends an alert when the position of a device changes. The emergency groups notifications indicate panic and device tampering. The chokepoint notifications indicates alerts about temperature, pressure, humidity, device status, fuel, quantity, distance, and motion probability. All of these notifications can be delivered over multiple transport types: syslog, Simple Network Management Protocol (SNMP) traps, e-mail, and Simple Object Access Protocol (SOAP) XML API. (Figure 13).

- **Expedited alert notifications:** The Cisco location protocol (LOCP) supports expedited notifications for emergency and chokepoint trigged events such as when an item passes through a security check point or when a doctor needs to be located quickly during a hospital emergency.

- **Scalability**: With the Cisco Wireless Location Appliance, thousands of wireless clients and Wi-Fi tags can be tracked simultaneously, helping ensure that location services can be applied to an entire enterprise environment.

- **Lowered total cost of ownership**: The Cisco solution reduces operating expenses by using the existing Cisco WLAN network infrastructure in conjunction with the location appliance. This approach is more cost-effective than proprietary or single-purpose location tracking solutions because it uses standard 802.11 components and does not require dedicated access points for location tracking.

- **Transparent integration**: Cisco is the only vendor to integrate location tracking directly into the existing WLAN infrastructure. The same Cisco access points that deliver data traffic also are used to locate wireless devices. This minimizes capital expenditures, helps ensure better visibility, and helps enable the WLAN to act upon location information for better security and capacity management.

- **Flexibility**: Cisco offers the only WLAN system that can track 802.11 clients, such as a laptop or PDA, alongside other, non-Wi-Fi mobile devices equipped with active radio frequency identification (RFID) tags (tags supplied by Cisco partners). This helps IT staff track any mobile item.

- **Easy deployment of business applications**: Asset tracking, inventory management, location-based security, automated workflow management, and other new business applications can be easily deployed with the Cisco Wireless Location Appliance.

- **Cisco Compatible Extensions Wi-Fi Tag Specification:** Cisco has been working with a variety of Wi-Fi tag vendors, including PanGo, WhereNet, AeroScout, and G2, to create an extensible specification for 802.11 Wi-Fi based tags. The Cisco Compatible Extensions Wi-Fi Tag specification defines a common format across a variety of manufacturers' Wi-Fi tags for interoperability with a baseline set of Wi-Fi tag features that include basic telemetry; location fields (received signal strength indication [RSSI] and fields for future Global Positioning System [GPS] and electronic product code [EPC] global enhancements); battery information; and advanced fields for emergency groups and chokepoints.

  Having a standardized Wi-Fi tag specification will give customers more choices by giving them the ability to mix and match Wi-Fi tags from different vendors as well as implement mixed-vendor applications that integrate with the Cisco Wireless Location Appliance application programming interface (API). The Cisco Wireless Location Appliance API makes the information received from the Wi-Fi tag available to any application that uses its API. Wi-Fi tag manufacturers can add vendor-specific advanced Wi-Fi tag functions to the base specification to meet specific customer needs or environments.
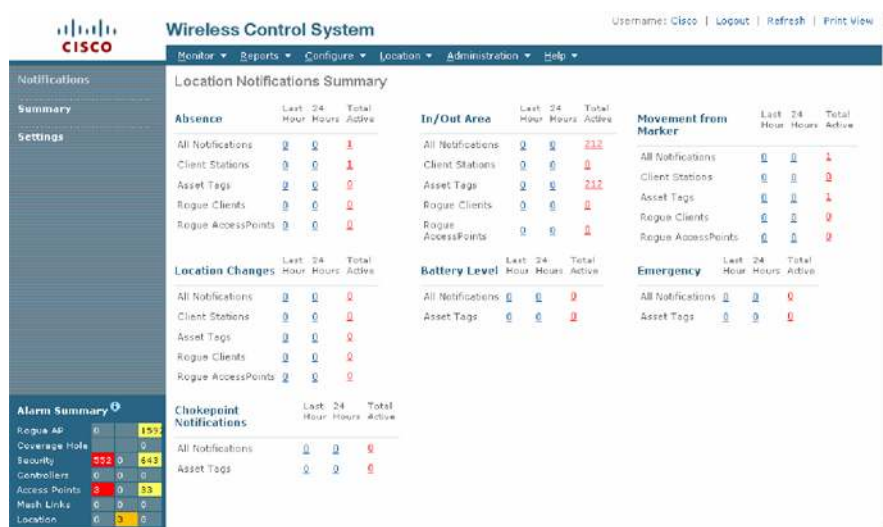
Figure 13. Location-Based Alerts

Table 1. Summary of Features and Benefits of the Cisco Wireless Location Appliance

Feature	Benefit
Scalable Location Tracking and Asset Management	Simultaneously track thousands of wireless users and devices to within a few meters of their physical location using advanced RF printing technology and easy visualization on network maps. Efficiently access both updated and historical location information from the location appliance. The built-in asset template allows quick definition of Wi Fi device categories, groups and names. These definitions can be distributed simultaneously to multiple devices and imported into or exported out of the location appliance.
Native Network Location Services and Cost-Effective Asset Tracking	The same Cisco lightweight access points that are delivering Wi-Fi traffic can also locate wireless devices and send location related alerts for these devices. This minimizes total cost of ownership, and helps ensure better visibility by helping enable the WLAN to act upon location information for better security and capacity management.
Chokepoint-based notifications	High-accuracy deterministic location-based notifications are triggered by Cisco Compatible Extensions Wi-Fi tags as they come within range of a chokepoint. Notifications can be triggered by a variety of Wi-Fi tag actions, including entry or exit of a tag from a specified zone, doorway, or gate; and process control events such as those used in manufacturing environments.
Enhanced WLAN Security	Rogue devices and rogue access points are quickly and accurately located, allowing IT managers to rapidly respond to security threats and unauthorized attempts to access the network. Location-based alerts also notify IT managers of rogue movement, rogue device appearance/disappearance, and rogue zone association. This allows the IT manager to establish a solid framework for increased WLAN security through location-based security.
Intuitive Centralized Management	IT staff can utilize the intuitive Cisco WCS Location GUI to centrally and easily add, configure, manage, and upgrade a single or multiple location appliances from Cisco WCS with minimal training. Centralized and scalable deployments are made easy through WLAN templates and out of the box RF calibration models. Cisco WCS Location also supports access control setup; definition of content and frequency of polls; and configuration of archive parameters as well as logging and viewing server events and severity levels for Cisco Wireless Location Appliance.
Hierarchical Maps	Import network designs, maps, and placement of access points from Cisco WCS into Cisco Wireless Location Appliance for quick and easy explorer-like browsing of devices across different geographies, campuses, buildings, floors, and areas.
Transparent Resilience to Network Changes	Cisco WCS periodically polls the location appliance for its status and changes to maintain synchronized control data such as network maps between Cisco WCS and the Cisco Wireless Location Appliance. A two-way intelligent synchronization mechanism exists between the Cisco WCS and the Cisco Wireless Location Appliance to help ensure each has the most recent information.
Targeted View Lists	Customizable and targeted views using filters and flexible search parameters make viewing thousands of devices easy. Support for logical and friendly name definitions for asset categories enhances intuitive viewing.
Enhanced RF Capacity Management	Easily drill down into detailed client location and statistical information and generate trends for rapid troubleshooting and enhanced RF capacity and device management.
Flexible and Easy Deployment	Rapid deployment is facilitated with "out-of-the-box" RF models and predictive technology that correlates known RF characteristics of buildings with user information for accurate tracking. Increased deployment flexibility is provided through template-based RF models that can be edited to fit specific RF environments, as well as support for reusable, custom RF calibration models.
Audit Trails and Database Maintenance	Up to 30 days of location and statistical wireless device information can be archived and replayed. Easy exports of log files are supported for archiving information older than 30 days. To maintain optimal location database performance, configurable intervals for automated pruning and de-fragmentation are built in.
Support for a Rich and Customizable Set of Location Based Applications	The deployment of applications that can take advantage of location-based information such as E911, asset management, ERP tools, and workflow and automation systems is facilitated through tight and transparent integration with the rich and open API of the Cisco Wireless Location Appliance. Receipt of specialized telemetry, emergency group and battery notifications from properly enabled Cisco Compatible Extensions Wi-Fi Tags allows organizations to implement specialized location-based applications.
Expanded Customer Choice and Advanced Functionality Through Solutions using Cisco Compatible Extensions Wi-Fi Tags	The Cisco Compatible Extensions Wi-Fi tag specification defines a common network interface across a variety of manufacturers' Wi-Fi tags for expanded customer choice, enhanced interoperability and advanced functionality. This provides customers with the ability to mix and match Wi-Fi tags from different vendors as well as implement mixed-vendor applications that integrate with the Cisco Wireless Location Appliance API.
Cisco Location Appliance API Program	The Cisco Location Appliance API Program allows Cisco customers and partners to interface with the Cisco Wireless Location Appliance API to create customized location applications and solutions. Organizations can join this program by accepting the Web-based license agreement. The API is available for free. Optional integration and development support is available on a fee-basis.

Applications

The Cisco Wireless Location Appliance can be deployed in a wide variety of environments and situations across multiple industries. Some of the primary usage scenarios include:

- **Visibility and tracking of mobile devices**: Operating and capital expenses can be reduced by preventing loss or theft of valuable mobile assets such as wheelchairs and infusion pumps in a healthcare environment and overhead projectors, laptops, and voice handsets in an enterprise. Individuals and assets can be quickly located anywhere within a wireless environment.

- **Workflow automation and people tracking**: Inventory use and e-workflow and dispatch processes are optimized. In a retail environment, store layout and queue management can be optimized based on tracking customer shopping "patterns." In amusement parks, children can be tracked, allowing parents to know where they are at all times, and security personnel can be tracked in any relevant facility. In healthcare facilities where caregivers are severely short-staffed, hospitals can track caregivers during normal operations or during emergency code blue situations where the "nearest" caregiver on call is most desirable. Other healthcare facilities with special-purpose needs may need to track infants or the elderly sick such as those suffering from Alzheimer's who may accidentally wander off the premises.

- **Telemetry**: Wi-Fi tags with serial interfaces can be attached to a piece of equipment to relay important information about the device directly to business applications. For instance, car rental businesses often want telemetric information relating to mileage and fuel level of returned cars, whereas customers want location information that will help them find vehicles faster. Pharmaceuticals, manufacturing plants, and retailers want information about batch numbers, expiration dates, product or serial numbers, and out-of-specification information about components. Additionally, in healthcare, knowing the location of an infusion pump is valuable, but knowing whether or not it is in use (on or off) is even more valuable.

- **Chokepoints:** Notifications triggered by the entry or exit of a tag from a specified zone, doorway, or gate; and process control events such as those used in manufacturing can be used to deliver a variety of solutions. Logistics yard and manufacturing facility gates can turn tags on and off when they enter or leave a zone to conserve tag power. This facilitates tag communication with no human interaction. Healthcare, manufacturing, retail, and general enterprises can use Wi-Fi tags to reduce theft attempts and issue alerts or page security guards. High-value or custom-produced inventory can be easily tracked as it moves through a manufacturing process, and inventory records can be automatically updated as inventory enters and leaves a warehouse.

- **WLAN security and network control**: IT staff can rapidly locate security threats, such as rogue access points and rogue client devices. IT managers also can use the appliance to establish a framework for location-based security, whereby the physical security in a building is used to control WLAN access: enhancing WLAN security.

- **RF capacity management and visibility**: Integrating location tracking into the WLAN allows IT staff to do more than just track users. With this appliance they can generate location-based trend reports and drill down into usage behavior to accommodate changes in traffic patterns, helping enable better RF capacity management.

- **Voice over WLAN (VoWLAN)**: Many states have a regulatory requirement for E911 calls that require emergency dispatch personnel to identify the location of a distressed caller. E911 services can be enabled through granular location tracking for wireless voice devices.

Location tracking is a critical component of enterprise-class WLANs today. By identifying and tracking the location of wireless users, companies can improve the accuracy of WLAN planning and deployment to optimize ongoing network performance, enhance wireless security, and improve both the usefulness and value of important business applications. Location tracking provides visibility and control of the RF environment, helping IT staff deploy wireless networks that are as easy to manage and as effective to deploy as traditional wireline networks.

Summary

Customers need a cost-effective, easy-to-deploy solution for tracking and managing Wi-Fi devices and tags across a variety of business environments. They also need to deploy advanced services that enhance their business applications and meet regulatory requirements for enhanced security, asset visibility, and E911 calls.

The Cisco Wireless Location Appliance, a component of the Cisco Unified Wireless Network, meets these needs by delivering accurate and scalable location services with device tracking and chokepoint notifications. This easy-to-deploy solution provides asset visibility for Wi-Fi enabled devices and tags, enhanced capacity management, location-based business policy enforcement, and increased WLAN security for the Wi-Fi environment. This innovative appliance also facilitates the deployment of new applications that take advantage of wireless location information.

Product Specifications

A Cisco WCS license with location services must be installed in order to interface with the Cisco Wireless Location Appliance and display location services information.

Table 2.   Product Specifications: 1-Rack-Unit Mountable Appliance

Specification	Description
Memory	1-GB memory
Ports	• Serial: One 9-pin connector • RJ-45: Two RJ-45 connectors for connection to two 10/100/1000 Ethernet controllers • 2 USB ports: One USB connector in front and one in back • 2 PS2 ports: One mouse and one keyboard • 2 VGA ports: One in front and one in back
Connectivity	Network: Two 10/100/1000 (RJ-45) ports
Management	SNMP v1, v2c, and v3
Network Management	Cisco WCS Location v.3.0 or greater running Internet Explorer 6.0/Service Pack 1 or later
Network and Client Devices	Cisco 2000, 2100, 4100 and 4400 Series Wireless LAN Controllers; Cisco Catalyst 6500 Series Wireless Services Module (WiSM), Cisco Catalyst 3750G Integrated Wireless LAN Controller, Cisco Wireless LAN Controller Module (WLCM and WLCM-E) for Integrated Services Routers; Cisco Aironet lightweight access points Wi-Fi enabled laptops, PDAs, voice handsets, Wi-Fi tags, Cisco Compatible client devices, Cisco client devices, and non-Wi-Fi mobile devices equipped with active RFID tags (tags supplied by Cisco partners) 125 kHz-based chokepoints using AeroScout Exciters or WhereNet WherePorts
Programming Interfaces	SOAP/XML APIs
Physical Dimensions	Height: 1.68 in. (4.27cm) Width: 16.8 in. (42.7cm) Depth: 23 in. (58.4cm) Weight: 28.6lbs (13kg) maximum
Power	• AC power supply wattage: 230W • AC power supply voltage: 100-120V at 50-60Hz; 200-240V at 50-60Hz

Specification	Description
Environmental	Operating Temperature: 50 to 95°F (10-35°C) Storage Temperature: 32–104°F (0–40°C)
Approvals and Compliance	• Safety UL 60950 • CAN/CSA -C22.2 No. 60950 • EN60950 • IEC 60950: EMC FCC Part 15 (CFR 47) Class A • ICES-003 Class A • EN 55022 Class A • CISPR22 Class A • AS/NZS 3548 Class A • VCCI Class A • EN 55024 • EN 50082-1

Ordering Information

Table 3 lists ordering information for the Cisco Wireless Location Appliance. To place an order, visit the Cisco Ordering Home Page or http://www.cisco.com/en/US/ordering/index.shtml.

The Cisco Wireless Location Appliance 2710 (AIR-LOC2710-L-K9) model is the successor to the 2700 (AIR-LOC2700-L-K9) model. There is no functional difference between the 2700 and 2710 models. Both models support the same features and functionality.

Table 3. Ordering Information

Part Number	Product Name
AIR-LOC2710-L-K9	Cisco 2700 Series Wireless Location Appliance (May 2006 Model Release)
AIR-LOC2700-L-K9	Cisco 2700 Series Wireless Location Appliance

Service And Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you to protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, refer to Cisco Technical Support Services or Cisco Advanced Services.

For More Information

For more information about the Cisco Wireless Location Appliance, visit http://www.cisco.com/en/US/products/ps6386/index.html or contact your local Cisco account representative.

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