

The Cisco® Service-Oriented Network Architecture (SONA) provides a foundation upon which network-based services can enrich business solutions with network-embedded functionality previously not available to applications. When deployed as part of a Cisco network, these services transform reliable transport into a strategic asset that increases efficiencies and enables new business processes. This At-a-Glance provides an overview of the location service, which is part of the mobility domain of the SONA framework and plays an integral part in other architecture domains.

Location is a Business Service

Location services allow an enterprise to locate and track any Wi-Fi device on the premises and are a key capability of the [Cisco Location Solution](#)¹. Deployed over a [Cisco Service-Oriented Network Architecture](#)² design, they can be integrated into multiple applications to form complete business solutions. A rich and open API provides the ability to integrate location services with a spectrum of technologies and applications to facilitate the deployment of new and innovative business processes.

Location Services Enable Innovation

Cisco Location Services allow customers and partners to enhance existing applications or create customized applications that interface with the network for real-time location information for assets and personnel. Business processes can be made more efficient in such areas as:

- Asset tracking
- Physical security
- Supply chain management
- Information or content based on user location
- Personnel tracking
- Operations management

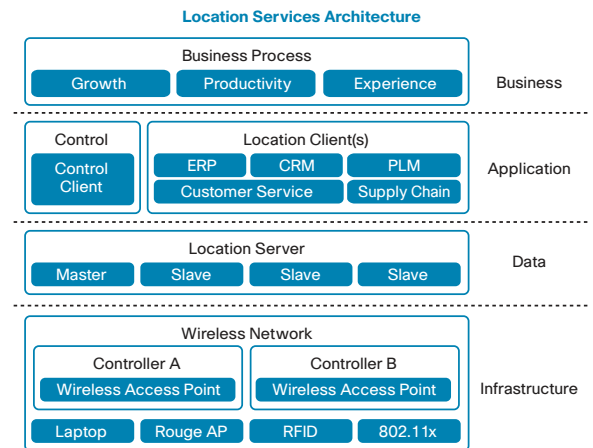
Location Services Architecture

Cisco Location Services has a simple architecture that is designed to scale with your enterprise and enable you to reuse and repurpose a centralized location service to support multiple business processes. The Location Services architecture (Figure 1) is comprised of the following components:

- Location client
 - The location client is the recipient of the data from the location server. The location client may request information (the “pull” model) or request to be a listener for information based on notification criteria (the “push” model).
 - The location client is the interface within an application or system that requires interaction with the location services.
- Control client
 - The control client will administer the location server as well as write/read all data contained in the server.
 - The control client will populate the server with information about the physical environment (network designs, floors, access point locations) and the network elements that should be monitored (such as the network switches or access points).
 - The control client may be combined with the location client to provide a single client entity.
- Location server
 - The location server will provide the location services for a particular area of the network. Multiple location servers can be deployed within a single network. A location server can handle multiple client applications communicating with it.
 - A location server can act as a master of other location servers to enable centralization of the interface to upper-level products.

- A location server can also be designated as a hot-standby backup for another location server.
- WLAN system
 - The embedded software plays the important role of station/tag/rogue-client discovery, tracking, and statistics/information gathering.
 - The tags, mobile stations, rogue clients, and access points are part of the network that the location system will monitor.

Figure 1: Location Services Architecture (with examples)



Summary

Location services are a key capability only the network can provide that can be integrated into multiple applications to form a complete and innovative business solution. Possible applications include: asset tracking in healthcare, retail, manufacturing, and government; personnel location in hospitality, transportation, and the public sector; and security of assets and people in any industry. Cisco has partnered with several companies to form complete business solutions, but in addition provides rich APIs that can be integrated with any business application to drive innovation.

¹ <http://www.cisco.com/go/location>

² <http://www.cisco.com/go/SONA>



Location Services Interface

Location services are a key capability of a Cisco Service-Oriented Network Architecture (SONA) design with a rich and open API that allows the integration of applications in support of business solutions. Cisco has standardized on SOAP/XML over HTTP/S as the interface for managing, querying, and updating location services.

Location Services Message Types

Cisco Location Services use SOAP/XML over HTTP/S as the communication mechanism and contains the following message types:

- Request: sent from the client to the server to set or get information
- Response: sent from the server to the client in response to a request
- Notification: sent from the server to the client asynchronously upon a particular server event occurring. A client application must register for notifications based on a set of criteria defined in the request for notification.

Location Services Message Content

The main message content is contained in the body of the SOAP message; following authentication the message consists of:

- Request
 - Request name: identifies the method/request being made.
 - Session: identifies the authenticated session. If the session ID is not specified or is illegal, the request will be rejected.

- List of requested objects: list of objects that are parameters to the request.
- Optional list of attachments: additional content from the client that is required for completion of the request (for example, an image file).
- Response
 - Response: identifies that this message is a response to a request.
 - List of response objects: list of objects that are the result of the request.

Location Services Methods

The following section provides an overview of the Cisco Location Services methods. Please refer to the complete [API documentation¹](#) for details.

- Server connection: ping the server, log in to the server, and log out of the server.
- Server administration: get server information and get changes to the server.
- Network design interface: get the network design, get and add image maps.
- Station: get station or server information, statistics, location, and history. Stations may also be added, deleted, and modified.
- Tag: get tag information, statistics, location (XYZ format), and history. Tags may also be added, modified, and deleted.
- Rogues: get rogue client information, lists, locations, and history. Get rogue access point information, lists, locations, and history. Rogue access points and clients may also be deleted.

- Notifications: there are different notification options available. Not only are notifications available using SOAP, but also using SNMP, Syslog, and SMTP. The following notifications are available:
 - Containment
 - Movement
 - Absence
 - Battery life
 - Update
 - Emergency
 - Chokepoint
 - Northbound

Summary

Location services are a key capability only the network can provide that can be integrated into multiple applications to enhance existing or develop new, innovative business solutions. A standard and well-known API allows developers to take advantage of location services with any application. Cisco also offers development support through its [Cisco Developer Technology Program²](#).

¹ http://www.cisco.com/cgi-bin/dev_support/access_level/product_support

² <http://www.cisco.com/web/partners/pr46/tdp/index.html>