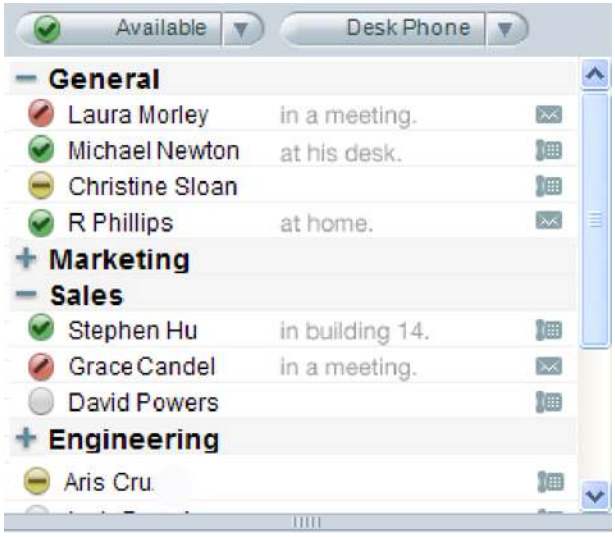
Cisco Context-Aware Mobility Solution: Presence Applications

Increase Collaboration and Efficiency by Integrating Context Awareness with Presence Applications

Executive Summary

By integrating the Cisco® Context-Aware Mobility Solution with unified communication applications such as presence and instant messaging, you can help enable today's mobile workers to greatly increase their business productivity and operational efficiency. The Cisco Context-Aware Mobility Solution extends the value of traditional location-based services by capturing location and contextual information, such as the status and availability of staff members, decision makers, or other key resources critical to the business process.



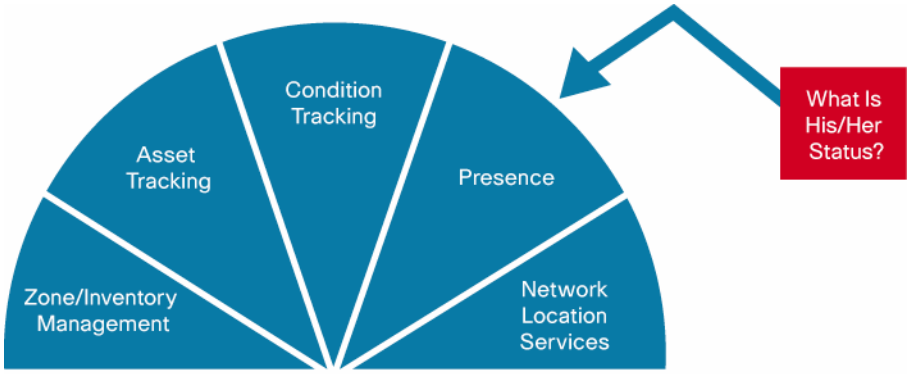
With open API integration, the Context-Aware solution provides new opportunities to enhance unified communication applications with contextual intelligence that facilitates dynamic updates and event triggers. The solution provides a platform to help streamline mobile workflow efficiency and business collaboration by orchestrating information such as:

- Where is it?
- Is it here?
- What is its condition?
- What is its status?
- Where in my network is it?

This solution overview will focus on how the Cisco Context-Aware Mobility solution can be used to potentially interact with an Enterprise unified communications system to provide mobile workers with intelligent, real-time information about the availability and location status of other staff members or critical resources. The overview will introduce the technologies and components that

the solution comprises, and it will provide examples that demonstrate how mobile workers can benefit from having the right information at the right time, based on the network intelligence and visibility that integrated context-aware and presence solutions deliver.

Figure 1. Context Awareness for Presence Applications: What Is His/Her Status?



Challenges

As today's workforce becomes more mobile and business processes more complex, it has become an increasing challenge for businesses to improve collaboration and workflow efficiency.

The inability to locate and determine the availability of a key asset or resource when and where it is needed is a primary source of business inefficiency. It leads to delayed collaboration and decision-making, reduced productivity and responsiveness, and potentially lost opportunities for revenue generation.

There has been a proliferation of devices, services, and applications designed to address this challenge for mobile workers. Presence applications help you determine who is connected to the network and how they prefer to be contacted (by phone, instant message, or email, etc.). But what if that person's status changes? Presence information must be accurate and updated in a timely manner if we are to make the most of its value. Today, users have to manually update their presence status. If they are not committed to keeping their status updated or they simply forget to do so, the process can become more unreliable than useful. Location information indicates that a resource or a contact is in a specified area; it may even indicate if it is operational, but not necessarily if it is available. For example, you may be in your building but presenting in an online meeting and not available to accept a call or respond to an instant message (IM). Unless you have manually changed your status to "Do Not Disturb," others may try to reach you, disturbing your presentation with phone calls or IM pop-ups. Similarly if you do change your presence indicator to "Away" or "Do Not Disturb" while in a meeting but forget to remove that indication when your meeting is over, others may think that you are still unavailable for collaboration.

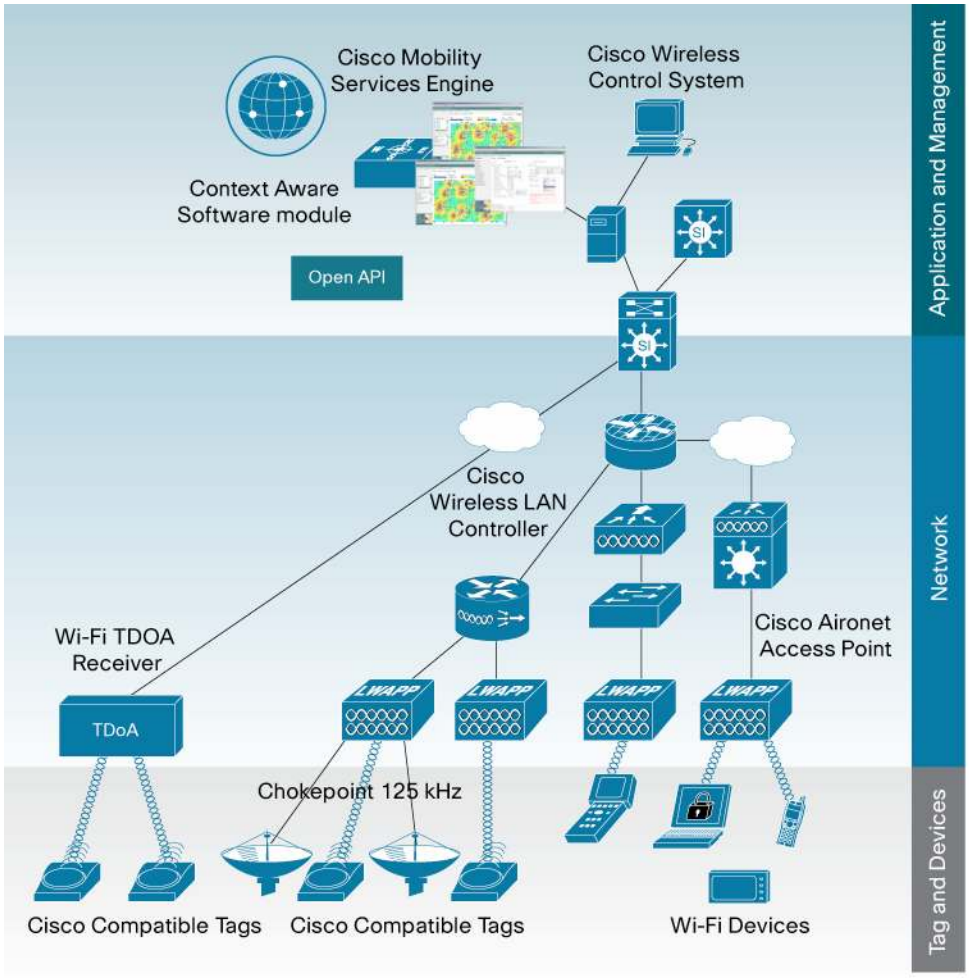
Consider another scenario: A colleague from another building—building 1—schedules a meeting with you in your office to accommodate you. Suddenly you learn that you must attend a presentation in building 1 and you set your status to "Busy." If your presence application could reflect more specific information, rather than just "Busy" or "Available," then it might be able to change automatically to "In building 1" as you entered the building. Both parties could be alerted through context-aware information and unified communication features and could arrange a more efficient meeting without having to return to your building.

Today's presence applications require manual administration to deliver information about the type of connection users have to the network and the status of a user's availability. The status information however is limited to predefined categories such as "Busy," "Available," or "Away." The Cisco Context-Aware Mobility Solution could provide a rich automated presence experience by integrating presence information with updates based on location metrics that calculate your location—such as "At home," "In a meeting," or "In building 4"—and coordinate that with location-specific contact preferences, such as IM when you're in a meeting, desktop phone when you're at your desk, or mobile phone when you're at another building.

Solution Overview

The Cisco Context-Aware Mobility Solution captures real-time contextual information such as the location, availability, or identity of a mobile user from a pervasively deployed Cisco Unified Wireless Network and integrates that information with an open ecosystem of business applications such as presence.

Figure 2. Cisco Context-Aware Mobility Solution Architecture Diagram



The different components of the Cisco Context-Aware Mobility Solution needed to enhance presence and other unified applications include:

- **Client devices:** Any Wi-Fi device that connects to the WLAN—including laptops, dual-mode phones, and wireless IP phones—can have its associated location information captured.
- **Cisco Unified Wireless Network:** As the only unified wired and wireless network solution that cost-effectively addresses the wireless security, deployment, management, and control issues that businesses face, a pervasively deployed Cisco Unified Wireless Network provides the infrastructure to support Context-Aware Mobility.
- **Cisco Mobility Services Engine (MSE):** A central element of the Cisco Unified Wireless Network, the Cisco MSE platform hosts the Cisco Context-Aware Mobility Solution software that captures, stores, and analyzes contextual information from any wired and wireless network connected to the Cisco Unified Wireless Network.
- **Cisco Context-Aware Software for Clients:** Hosted on the Cisco MSE, the Cisco Context-Aware Software makes it possible to capture and integrate information into business processes using data received from Wi-Fi clients and location technology optimized for indoor, outdoor, or high ceiling environments and for the type of business problem being addressed (“Is it here?”, “Where is it?”, etc.).
  - Received Signal Strength Indication (RSSI): This software running on the Cisco MSE can be used for devices and tags that need to be indoors. It is based on the signal received from the mobile asset to the different access points deployed in the facilities.
  - Chokepoint: Chokepoints use a frequency different from Wi-Fi and are deployed along zones of interest for the business applications. They act as exciters for Wi-Fi tags or devices that come within a close range of them. These tags, in turn, send a notification via WLAN to the Cisco MSE along with the contextual data they have captured.
  - Time Difference of Arrival (TDoA): This software running on the Cisco MSE is used in association with tags and TDoA receivers that are placed outdoors or in challenging RF environments where mobile assets have to be located.
- **Cisco Open API:** Once the Cisco MSE has captured, calculated, and stored all the contextual information, it can make that information available to any business application that needs it via the Cisco open API based on SOAP/XML protocols. Access to this API is available to any technology partner and allows a full integration into customers’ business processes.

The Cisco Context-Aware Mobility Solution is built upon an adaptive, agile, and intelligent Cisco Services-Oriented Network Architecture (SONA), which delivers superior end-user experience and facilitates significant efficiency for businesses. The solution offers a broad range of wireless technologies that deliver solutions to variety of business problems and also act as a platform open to any mobile asset and any business applications deployed on our customers’ premises.

As an open platform, the context-aware solution can integrate tightly with enterprise business applications, including unified communication applications, to add contextual intelligence and automation to collaborative interaction and standard business processes. Users can, for example, integrate context awareness with presence and preference information to determine the location, operational status, availability, and best method to access key resources such as decision makers or subject matter experts. Similarly, users can configure context-driven alerts that will notify

employees by voice or text message to perform specific business processes such as powering down equipment before they leave a building or picking up customer service coverage for an unattended area.

The integration of context-aware solutions with unified communications is made simpler by the Cisco Unified Application Environment, a rich, end-to-end platform that streamlines the development and deployment of converged applications by abstracting implementation differences across products and technology types to help ensure reliable, seamless interoperability.

Presence Applications with Context Awareness: Improving Business Collaboration and Efficiency

Healthcare

Business Problem: Efficient communication among hospital staff is a key element to delivering high-quality patient care. However in a Forrester Consulting survey, more than 65 percent of nurses reported that they spent as much as 60 minutes a day is spent trying to reach other staff members. This lost time can ultimately affect patient care. Hospitals frequently rely on communication applications such as presence and instant messaging to keep highly mobile physicians, nurses, and other healthcare staff connected and aware of information, such as staff availability for clinical collaboration. But if caregivers have to manually update the status of applications to keep them accurate and relevant, that decreases productivity. When time is imperative and caregivers are constantly on the move around the hospital, locating and engaging with resources that are critical to patient care should be instant and intelligent. Having to manually update the status of applications to make them accurate and relevant detracts from the level of productivity they are capable of delivering.

For instance, if a cardiologist enters the emergency room to perform a surgery, he becomes unavailable for general collaboration and would only want to be contacted with urgent information relevant to that patient—say, an inaccurate lab result. With presence indication alone, the clinician must manually change his status from “Available” to ”Unavailable.” If he forgets, others may interrupt him with non-urgent issues. If he does make the change, he will still need to rely on other means of communication to receive urgent patient information.

Solution: Healthcare organizations can support their mobile caregivers by using the Cisco Context-Aware Mobility Solution, which will deliver automated real-time insight into the location and availability of key resources. Hosted on the Cisco MSE, the context-aware software uses RSSI technology to detect the location of a mobile healthcare worker’s Wi-Fi device (notebook computers, dual-mode phones, or Wi-Fi PDAs) or RFID badge as the worker roams through the healthcare facility. Through the open API of the Cisco MSE, the solution can interface with an enterprise unified communications system to deliver automated presence status for more accurate visibility of critical resources.

Context awareness can also use chokepoint technology to determine when a caregiver has entered a certain area such as the emergency room, and to deliver context-specific information for that user in that location using a communications format that has been predefined by the user’s profile rules. For example, when a cardiologist wearing an RFID badge enters the emergency room, a chokepoint is triggered, which could signal the context-aware software to automatically update that clinician’s presence status to “In Surgery.” The clinician’s context-aware profile rules could indicate that when presence is set to “In Surgery,” only communications about the patient in

that surgical theater should be sent to a hands-free speakerphone in the theater. All other communications would be directed to a mailbox.

Benefits: Mobile clinicians and caregivers need accurate, instantaneous access to the right people, the right information, and the right equipment. Integration of the Cisco Context-Aware Mobility Solution with unified communication applications provides mobile users with accurate real-time visibility to the resources and information they need, based on automatic updates to their location and availability. If caregivers must update this information manually, it decreases the time they could spend with patients. Whether caregivers are in a patient's room, in surgery, in transit down a hall, or outside on a break, these solutions can dynamically deliver the information needed to help create a collaborative, synergistic environment where knowledge can be shared seamlessly and workflow processes can be optimized.

Office Environment

Business Problem: In order to protect customer relationships from competitive threat, businesses must deliver superior customer service and competitive advantage. For instance, you can help achieve customer satisfaction by identifying a technology expert with the right skill set to address a customer's request or concern. However, as the workforce becomes more mobile, it becomes more difficult to determine the availability of a subject matter expert, particularly when people don't keep their presence indicator up-to-date. To optimize joint expertise and add a new dimension of competitive advantage, you really need the ability to add automatic, rules-driven context awareness to collaborative business processes.

Consider the situation of a sales team presenting a new product demonstration to a customer. If the customer has a specific technical question the sales team cannot address, it's critical to be able to determine accurately the real-time availability of the nearest technical expert to join the meeting. The sales manager could use a presence application from his laptop or mobile phone to determine if a technical engineer is available. But without the network intelligence of a context-aware solution, the presence information might not be up–to-date, and it likely will not provide the engineer's proximity to the meeting room. These information gaps could delay the meeting and lead to customer dissatisfaction.

Solution: The Cisco Context-Aware Mobility Solution eliminates the need to look up an engineer's availability with a presence application and then check his proximity with a location application. After all, you might do that only to find out, when you call or IM, that he isn't really available because he has not manually updated his status. The Cisco solution streamlines and automates real-time presence and context-aware location information based on user-defined rules. As a user moves throughout the enterprise, the context of his environment is used to automatically update his presence and communication preferences.

Suppose that the technical engineer the sales manager is looking for has just left his office and is on his way to the cafeteria in another building. Chokepoint technology can detect when he has left one building and entered another. While he's outside, TDoA technology can calculate his exact location and proximity to the meeting room. That real-time information is then integrated with a presence application to automatically update his presence status. Based on the policy definitions for the user, it could indicate that his service calls are to be automatically transferred to the next available engineer when he leaves his building or is outside, so that there is service coverage at all times.

Benefits: The solution uses multiple technologies to provide the most up-to-date information about the status and location of a mobile employee. When that information is dynamically and intelligently integrated with other collaborative business applications, users can make faster, more informed decisions and increase productivity based on timely collaboration with nearby experts. The sales manager in the example above can avoid wasting time coordinating communications and efficiently resolve the issue at hand by relying on the Cisco Context-Aware Mobility solution to deliver automated integration of real-time location and presence information.

Education

Business Problem: Young people today are highly familiar with consumer social networking applications that allow them to use Wi-Fi mobile devices to communicate with a “buddy list” of frequent contacts. These users expect to benefit from the same mobile experience when they are students on a college campus.

Many colleges and universities are using their investment in a wireless LAN to offer advanced technologies such as presence applications for social networking to attract the latest generation of students. While these solutions must offer the depth and range of features that appeal to students, they must also deliver value to the underlying operational processes of the institution.

Solution: The Cisco Context-Aware Mobility Solution offers open integration with a wide variety of mobile communication and collaboration applications that students find appealing. While it’s convenient to be able to coordinate an impromptu break for pizza using a presence-based buddy list, it’s far more valuable when final exams approach to be able to locate and collaborate with other students who are working on the same study problems or to arrange an impromptu study session with other available students in your proximity. When integrated with unified communications applications, the context-aware solution can provide students with real-time location, presence, and messaging capabilities. Members of a study group meeting in a library or study hall could receive text message alerts when other members of the group enter the same building. Chokepoint technology could be used to indicate when a group member has entered the building, automatically changing their presence status and triggering a text message to other identified members of the group to determine if the team would like to meet.

During natural disasters or emergency situations, context-aware presence capabilities can also assist campus staff and emergency teams by facilitating integrated collaboration and context-aware services that can keep these teams informed about events in their area, such as a weather-related power outage or a safety lockdown of buildings due to an intruder.

Benefits: Presence applications give mobile users the ability to coordinate information and activities based on the real-time contextual data available about the environment and resources around them. Higher education institutions can integrate this solution with popular social networking applications that appeal to students. By combining location and application information over the campus wireless network, institutions can deliver increased value to a variety of users by offering the sophisticated policy definitions, event triggers, alerts, and rules that drive context-aware services. The solution can locate and identify defined groups of people more quickly and provide instant notification of proximity and availability to better coordinate collaboration among students and staff.

In addition, since safety and emergency event coordination are always primary concerns, educational institutions can integrate presence capabilities with context awareness to provide

network visibility and accurate, reliable communications to facilitate efficient operations in emergency situations.

For More Information

For more information about the Cisco Context-Aware Mobility Solution, visit: http://www.cisco.com/go/contextaware

To learn more about Cisco customers who have deployed the Cisco Context-Aware Mobility Solution, visit: http://www.cisco.com/en/US/products/ps6386/prod_case_studies_list.html

As a Cisco partner, find more information on the Cisco open API at: http://www.cisco.com/cgi-bin/dev_support/access_level/product_support

For more information about the Cisco Mobility Services Engine, visit: http://www.cisco.com/go/mse

For more information about the Cisco Unified Wireless Network, visit: http://www.cisco.com/go/wireless

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