Location-Based Asset Tracking Reduces Costs for Cisco Manufacturing

Cisco Services and JDSU Deploy Cisco Unified Wireless Network and Cisco Location Solution for Production Equipment Management

EXECUTIVE SUMMARY

CISCO GLOBAL SUPPLY CHAIN MANAGEMENT (GCSM) AND CONTRACT MANUFACTURERS (CM)

- Industry: Manufacturing
- Location: Texas (pilot); global

BUSINESS CHALLENGE

- Gain visibility and control of manufacturing equipment owned by Cisco at 13 CM facilities
- Reduce physical inventory and maintenance costs by automating asset location process
- Integrate the solution into existing manufacturing infrastructures and processes (minimize negative effects to help ensure adoption)

NETWORK SOLUTION

- Cisco Unified Wireless Network and Cisco Location solution
- JDSU Services to integrate, install, and support the solution
- AeroScout MobileView software, Aeroscout Wi-Fi active RFID tags, and Aeroscout Exciters
- Cisco Services to design, deploy, and optimize a location-based solution for existing manufacturing networks that meets functional requirements and overcomes security and RF interference concerns

BUSINESS RESULTS

- Deployment test shows that tagged assets can be automatically and remotely located 100 percent of the time. Assets include thermal chambers, traffic generators, test equipment, and calibration equipment.
- Proven results (accuracy within few meters) within a noisy manufacturing environment
- Ability to reduce future inventory losses

Business Challenge

Cisco® products are manufactured at 13 contract manufacturing sites around the world. These manufacturing organizations partner with Cisco to build and ship product to Cisco customers. Tracking and maintaining expensive test equipment located at these sites had posed many challenges for the Cisco manufacturing organization. Each site spans thousands of square feet, and the task of locating the equipment – whether for inventory, calibration, or maintenance purposes – was requiring an increasing amount of time. A disconcerting amount of equipment was also missing. Inventories are carried out once every two years, and in the most recent cycle, in 2006, the technician time required to manually locate equipment exceeded $230,000. At the end of the process approximately $3 million net book value (NBV) of assets was designated as lost and written of the Cisco books.

The GSCM organization turned to a trusted integrator and service provider, JDSU, to help it select and deploy a solution based on real-time radio frequency identification (RFID) technology. JDSU provided the team with needed expertise in the area of asset tracking. The project team identified two major requirements:

- Automation: The customer wanted an asset tracking solution that would leverage existing infrastructure. Passive RFID, although a good solution, wasn't ideal for this scenario so JDSU recommended Active RFID since the Cisco location appliance provides a simple tag-and-go solution. Requiring onsite technicians to operate tag readers in the Passive RFID scenario, would burden site teams and required that multiple readers be conveniently located on each manufacturing floor within a 5- to 6-meter range of the passive tag. Multiple readers would have to be deployed, and the location of each tagged asset would be constrained by reader location. Instead, the team wanted an automated solution so that tag readers could be installed without constraining asset locations, and readings could be done over the network without technician intervention.

- Ease of use: For the solution to be broadly adopted, the manufacturing end users needed an intuitive graphical user interface to make it fast and easy to identify the location of desired assets without knowing anything about the tag readers, location solution components, or any other component of the solution.

Network Solution

Cisco GSCM agreed on the top-level components, composed of JDSU's asset-tracking expertise and the AeroScout Visibility solution. To complete the solution, JDSU relied on Cisco Services' experience with the Cisco Unified Wireless LAN infrastructure as well as the expertise required for integrating the solution within manufacturing sites. The organization preferred an active RFID solution that could automatically provide asset location information in real time, but an always-on tracking system would require a more complex solution architecture so that readers could be transparently integrated with the onsite networks.

"We recognized that the Location-Based Services solution from Cisco and AeroScout was attractive for our project," said David Opsahl, VP of Global Services at JDSU. "It would give us the ability to use the wireless network as a reader infrastructure for Wi-Fi-based active RFID tags and give the users a completely automated solution. The application would make it easy to identify the location of any tagged asset on the manufacturing floor at any point in time." Noisy machinery sites are inherently challenging for wireless networks, and reliable operation requires proper adjustments to the access points to compensate for the radio frequency interference. The team mandated a 12-meter accuracy assurance with the final solution.

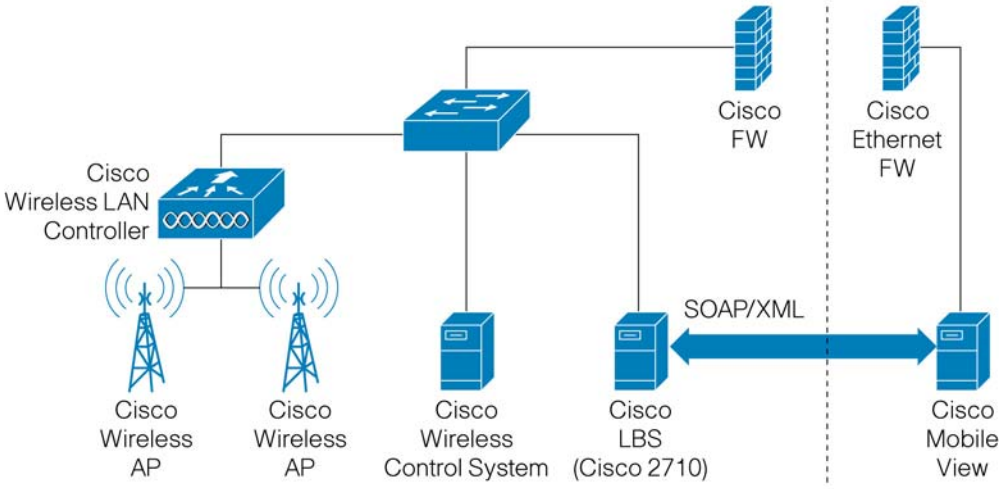
The Cisco Services organization was commissioned to provide the needed product expertise and also solve the integration challenges. "We completed the project team by providing necessary expertise," explained Henry Chou, solution architect, Cisco Services. "By working together with the JDSU project team, we made it possible to very quickly and cost-effectively combine the Location-Based Services solution with Aeroscout middleware and integrate the complete solution into a manufacturing site using the most current Cisco wireless technology – the Cisco Unified Wireless Network solution." The technical resources of Cisco Services contributed to the project during all phases of the lifecycle. Starting with the planning and design phases, Cisco Services experts successfully surveyed the pilot site; defined requirements; and proposed a design, including products and integration. Cisco Services carried through to the deployment and optimization phases. The start-to-finish services included:

- Design and implementation for the Location-Based Services solution
- Architecture and design of the wireless network and location-based solution using active RFID technology
- RF survey
- Pilot definition and management
- Implementation (installation and configuration) and verification
- RF modeling and calibration
- System optimization for Location-Based Services
- Knowledge transfer to JDSU and local CM IT to enable them to support the entire solution

The final design was customized to meet all of the objectives in terms of automation, simplicity, and suitability for diverse manufacturing environments. The main components of the solution (see Figure 1) included:

- Cisco Unified Wireless Network solution
- Location-Based Services solution from Cisco for active Wi-Fi RFID tags
- AeroScout RFID tags, for tracking location information for assets
- AeroScout Exciters, for triggering tags to transmit at critical chokepoints within the facility
- AeroScout MobileView and Aeroscout middleware (software that connects the Location-Based Services solution to the tracking applications and user interface modules)

Figure 1. Cisco Location Solution, Pilot Deployment



Cisco Services designated a logical equipment grouping capability within AeroScout MobileView, which allows the solution to identify ownership for each of the tracked assets. Whether owned by Cisco or by the contract manufacturer, an asset can be grouped with other similar equipment to simplify management of calibration and maintenance schedules. Finance teams can identify and track equipment with the vital ownership information attached to each piece of equipment so that accounting and inventory reports accurately list only relevant assets.

“The pilot project achieved all of our criteria for success,” said Swati Reichmuth, program manager, Cisco GSCM. “The Cisco Unified Wireless Network solution, combined with the Location-Based Services solution, was able to operate within specification and was successfully tuned to overcome radio frequency interference. This deployment proved the technical viability of this solution and showed that it can transparently fit into existing manufacturing networks.”

Security gaps and challenges were also addressed successfully. Initially, manufacturing teams had expressed concern about the wireless network affecting security. Cisco Services was able to work with the IT team at the site to accommodate firewall policies and help ensure that security would not be compromised for the mission-critical infrastructure. The final component of the solution involved service level agreements (SLAs) to outline the roles and responsibilities of the parties that would own and operate the solution.

Business Results

The pilot deployment demonstrated the major benefits of the automated Location Solution. The primary savings have come in the form of eliminated time for both finance and manufacturing groups. For example, whenever calibration or preventive maintenance schedules call for a technician to locate a tagged asset, no searching is required. The system can effectively, and in a timely manner, report on the location of any tagged asset with an accuracy of few meters. Inventories can be carried out in a fraction of the time, and lost equipment will become a problem of the past. Previously, the writeoffs for missing assets totaled millions of dollars for each inventory cycle, and therefore this solution is rapidly paying for itself.

Today, the results from the pilot deployment are being shared with all of the global manufacturing teams. The plan calls for an analysis of deployment options and further study of how the solution can help improve business processes at each manufacturing location. Technical support for the Cisco Location and the Cisco Unified Wireless Network solutions is also being evaluated as part of the requirement definition process for a global deployment. IT teams at each site will be able to recommend the best practices for the ongoing management of the solution.

Next Steps

The proven Cisco Location solution can now be deployed to the other contract manufacturers. In the case of the pilot, Cisco Services teamed with JDSU to deploy the AeroScout Visibility System. JDSU is pursuing Cisco certifications to design and deploy the Cisco Unified Wireless Network solutions for its customers. Businesses looking to deploy similar Location-Based Services solutions might use JDSU, or they can use existing relationships with their wireless solution provider. In either case, Cisco Services can provide the expertise required for a complete project team and a successful deployment.

PRODUCT LIST

Wireless LAN

- Cisco 4400 Series Wireless LAN Controllers
- Cisco Wireless Control System
- Cisco Aironet® access points
- Cisco 2700 Series Wireless Location Appliance
- AeroScout Wi-Fi active RFID tags
- AeroScout Exciters
- AeroScout Mobile View Application

The Cisco Location-Based Services solution is also flexible in terms of technology. The current design provides a foundation for taking advantage of existing and future RFID tagging technology. Today, the tags are suited to tracking high-expense items. As other tag options emerge, the solution can be enhanced to track smaller and lower-cost assets. The solution can also be expanded outside of manufacturing, depending on the needs of each company.

For More Information

To find out more about Cisco Location-Based Services, go to www.cisco.com/go/wirelesslanservices.

To find out more about Cisco wireless technology, go to www.cisco.com/go/wireless.

To find out more information about JDSU, go to www.jdsu.com.

To find out more about AeroScout, go to www.aeroscout.com.

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