



Large-Scale Manufacturing: The Cisco and AeroScout Context-Aware Mobility Solution in the Aerospace Industry

The Cisco® and AeroScout Context-Aware Mobility solution for aerospace delivers powerful asset-management capabilities to the assembly floor, providing cost-effective, timely inventory administration and controls for work-in-process production in large-scale manufacturing projects. This solution is part of the Cisco Connected Manufacturing platform.

The Cisco and AeroScout Context-Aware Mobility solution helps aerospace companies track assets and personnel in real time to minimize losses due to waste, management inefficiencies, damage, and theft. Built on the powerful Cisco Unified Wireless Network, this technology allows manufacturers to achieve continuous, secure visibility between the assembly floor and corporate management systems, taking advantage of:

- Complete integration with existing Cisco Unified Wireless Network WLANs, enabling fast, cost-effective deployment
- Reliable signal coverage throughout frequently reconfigured assembly floors containing aircraft fuselages and other large metal parts
- Secure, accurate inventory management systems that can locate and monitor mobile and static assets in very large areas
- An open standards-based solution that integrates with existing corporate networks to facilitate companywide sharing and management of information

Challenges

In today's turbulent aerospace industry, manufacturers are under intense pressure to streamline operations and lower costs. Throughout the manufacturing supply chain, companies need to remain profitable at a time when rising fuel prices, tightening government and corporate budgets, and increased military activity are bringing major changes to the industry. Administrators try to find new ways to improve processes while remaining flexible to meet market demands.

As part of this effort, aerospace companies are examining their asset management practices in the assembly of aircraft, from police helicopters and military fighter aircraft to commercial jets. Manufacturers have found that valuable parts can be lost or misplaced inside these vast facilities for hours or even days at a time. This adds up to a significant financial burden: The cost of a single lost part can be as high as US\$1 million. Each incident risks bringing assembly to a halt, creating an immediate negative impact on direct labor costs, capital equipment utilization, and cycle time. In addition, manufacturers must often pay large fines for aircraft delivered past schedule.

In many cases, traditional supply chain practices are simply no longer able to control asset-management processes in this rapidly changing industry. As a result, companies experience:

- A lack of visibility into the location of valuable equipment, parts, and personnel in large-scale facilities
- Inefficient allocation and use of people and equipment
- Scheduling delays, which result in higher costs
- Time wasted on manual searches and inventory checks
- Greater risk of violations of critical safety protocols
- Security issues that stem from lack of insight into the location and movement of people and assets

Solution

The Cisco and AeroScout Context-Aware Mobility solution helps aerospace manufacturers increase visibility and minimize losses using RF identification (RFID) technologies. It makes use of the Cisco Unified Wireless Network to track the presence and real-time location of high-value manufacturing assets, providing the reliable signal coverage needed to manage large assembly areas, even in the presence of large aircraft bodies being moved about the factory floor.

This context-aware solution is made up of a variety of components to help meet the specific needs of aerospace manufacturers. These include:

- **Cisco 3300 Series Mobility Services Engine (MSE):** The Cisco Context-Aware Software resides on the MSE and integrates with the Cisco Unified Wireless Network and Cisco technology-compatible devices to expand the reach and value of the aerospace asset-management system.
- **Cisco open API:** The MSE supports an open API that passes along the contextual information captured from the RFID tags attached to the assets, through the Cisco Unified Wireless Network. Developers can then integrate this information into business applications such as inventory management, and gather more detailed information about assets including availability, status of components, and usage. The Cisco Context-Aware Software supports both the enhanced received signal strength indication (RSSI) and time difference of arrival (TDOA) algorithms, improving location accuracy and performance in challenging RF environments. Access to this API is available to any Cisco technology partner and allows a full integration into the business processes of customers.
- **Cisco Unified Wireless Network:** This multipurpose network is the only unified wired and wireless network solution to cost-effectively address the wireless network security, deployment, management, and control issues that businesses face, in addition to providing context-aware mobility.

- **AeroScout Active RFID tags:** AeroScout Active RFID tags are typically attached to the asset being tracked. When they pass within the range of a mounted access point, contextual information is passed to the MSE. AeroScout is a member of the Cisco Compatible Extensions program for technology partners, which supports tag development by helping to ensure that RFID tags comply to a predefined standard and format. This allows the advanced information they send (such as motion, humidity, and other parameters) to be captured and made available to the rest of the solution, including business applications from other Cisco partners.

This approach to asset tracking helps ensure that before assembly begins, inventory counts and pre-positioning are as accurate as possible for the thousands of items needed. This is accomplished by tagging parts, containers, pieces of equipment, tools, and staff members with an active RFID tag, and taking an automated, real-time inventory at the start of each day's work.

The solution performs the inventory count and sends out alerts if pre-positioned parts or persons have moved, if they leave the staging area, if a station has run out of needed parts, or if an item is absent from the staging area for longer than a predefined time. Workers with handheld devices can easily locate any tagged person or item at any time throughout the shift. Call buttons may also be activated on each RFID tag to change its project status from "in process" to "complete," letting managers know the status of each assembly process.

Business Benefits

Aircraft assembly takes place on a large scale, making it crucial for manufacturers to be able to maintain a secure, accurate, and timely inventory of parts and tools. By keeping complete records of every piece of equipment and material needed for each craft—from cranes and jet engines to tools and containers of bolts and screws—companies minimize downtime and decrease labor costs caused by errors and problems in large, unstructured factory areas. The Cisco and AeroScout Context-Aware Mobility solution for the aerospace industry enables:

- Increased equipment utilization
- Decreased loss and theft
- Improved product quality
- Reduced costs
- Faster production

Integrated with the powerful Cisco Unified Wireless Network, this solution makes asset information fully available to corporate systems, facilitating companywide sharing and management of information. Such technologies provide secure and accurate automated inventory, reduced labor costs, and faster time-to-delivery for aerospace manufacturers.

Supporting Solutions and Partners

Cisco, AeroScout, and their partners work with manufacturers to install Context-Aware solutions from planning to deployment. In addition to a global network of qualified resellers, Cisco provides comprehensive design and support through Cisco CCIE® professionals, the Cisco Advanced Services team, and the award-winning Cisco Technical Assistance Center, all recognized as industry leaders. Cisco Advanced Services also offers services for deploying and managing this solution.

The Leadership Advantage

Cisco is the worldwide leader in industrial networking technologies, with a 20-year track record in working with manufacturers of all sizes worldwide. The Cisco and AeroScout Context-Aware solution forms part of the Cisco Connected Manufacturing platform, a suite of collaborative business solutions that integrate information and processes, spanning the entire manufacturing work flow and giving companies a secure, customer-centered view of their organizations. These scalable solutions are founded on the Cisco Service-Oriented Network Architecture (SONA), a conceptual framework that outlines how service-integrated enterprises can accelerate applications, processes, and resources to maximize business opportunities.

Cisco is committed to the development of open manufacturing industry standards—it is a founding member of the ODVA and participates in ISA standards committees.

AeroScout is the market leader in Wi-Fi-based active RFID, and the winner of several awards and endorsements. AeroScout invented the industry's first Wi-Fi-based tracking tag, and continues to innovate and help customers around the globe solve their critical visibility problems.

Next Steps

Manufacturing organizations all over the world are making widespread use of the solutions in the Cisco Connected Manufacturing portfolio. For more information, visit

<http://www.cisco.com/go/manufacturing>.

You can also contact your Cisco account manager or partner. To locate your Cisco partner, please visit <http://www.cisco.com/go/partnerlocator>.



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