

Going Underground: Cisco Location-Based Services Solutions in the Mining Industry

The Cisco Location-Based Services solution for the mining industry delivers powerful asset-management capabilities from the mining office headquarters to two miles below ground, providing protection for personnel and equipment in some of the world's harshest environments.

In its Location-Based Services solutions Cisco Systems® offers a family of mission-critical technologies that help mining companies increase visibility into assets and personnel to minimize losses due to theft, management inefficiencies, damage, and injury. These solutions are part of the Cisco® Intelligent Networked Manufacturing platform.

Built on the foundation of powerful Cisco networks, end to end, Wi-Fi asset tracking helps mining companies achieve secure, real-time visibility between the mining shaft and corporate supply chain management systems. Mining companies take advantage of:

- The fact that Cisco solutions can integrate with existing WLANs, promoting fast, cost-effective deployment
- Wi-Fi's ability to broadcast clearly underground, even through solid rock and native ores
- A technology that is intrinsically safe for explosion-sensitive environments
- Secure, accurate inventory-management systems capable of locating and monitoring thousands of tagged items on the factory floor and in the yard
- An open-standards asset-tracking system that integrates with corporate systems to facilitate companywide sharing and management of information

Challenges

Mining companies today are under intense pressure to increase production as metal prices increase dramatically, new mergers and acquisitions take place, and public concern grows over failures in mine safety. Throughout the mining supply chain, companies involved in exploration and development confront the need to streamline operations and improve internal processes. Mining administrators strive to reduce costs while managing large workgroups and a wide range of equipment assets.

In particular, mining companies need to increase the productivity of their ore extraction through the efficient tracking and management of mine personnel and assets used in the extraction process. Many managers find that traditional methodologies and supply chain practices are no longer able to accomplish this critical task. As a result, these companies experience:

- A lack of visibility into the location of valuable assets and personnel
- Inefficient allocation and use of people and equipment
- Poor safety standards and tracking of mine personnel

- Excessive costs of leased and purchased equipment to offset losses and theft
- Security issues that stem from the lack of insight into the location and movement of people and assets

Solution

In its Location-Based Services solutions Cisco offers a family of mission-critical technologies that help manufacturers increase visibility and minimize losses resulting from theft, management inefficiencies, damage, and injury. These solutions track the presence and real-time location of high-value manufacturing assets through the use of 802.11 WLANs and real-time location service (RTLS) technologies.

Assets are tagged with Wi-Fi-enabled active RFID tags that operate at 2.4 GHz (with an inside range of 180 feet and an outside range of 600 feet). Protected from exposure to shock, moisture, and dirt, the tags can be mounted on a plate that is screwed to an object, mounted on a wristband, or attached to Velcro. To improve personnel safety, similar tags are embedded in the lamp apparatus of miners' caps; this means that miners can be located in real time without increasing their equipment load. Each tag holds up to 100 bytes of data. A tag can also operate solely as a transponder, broadcasting its MAC address to the mine's network of Cisco Wi-Fi access points.

These access points route the MAC addresses from the tags to powerful system management software, which calculates the location of the asset by measuring the strength of the signal. The software also associates the address with the asset. Managers may view tagged assets on a map of the monitored areas in the mine. With Cisco zone monitoring and event-based alerts capabilities, the system can monitor day-to-day operations of the mine. It can also help locate people and equipment in the event of a collapse or help ensure that specific zones are evacuated prior to a scheduled blast.

Cisco asset-tracking solutions also support the detailed management of rail and truck yards, helping to enable prompt, accurate storage and shipping of ore and coal to processing plants. Real-time visibility of data can improve logistics, distribution information, and fleet management, decreasing a company's costs and increasing worker and driver productivity through to delivery.

By using these advanced technologies offered by Cisco and its partners, mining companies can increase operational efficiency, maximize miner safety, and utilize assets more effectively throughout the supply chain.

Business Benefits

There has been a rapid increase in the adoption of Wi-Fi asset tracking across the manufacturing industries. The Yankee Group predicts that the market for RTLS systems will grow from less than \$20 million in 2005 to more than \$1.6 billion in 2010. Because Cisco solutions are based on open Wi-Fi standards, they can make use of existing access points and hardware, eliminating the need to purchase a new network infrastructure and dramatically decreasing deployment times. Mining companies also benefit from:

- Improved control of expensive equipment assets, including both general monitoring and 24-hour tracking
- Improved efficiencies in ore production, due to faster, more accurate, automated exchanges of information, which helps enable better planning and management
- Better asset management due to the improved visibility into the location of valuable assets and people

- Safer working environments through improved security and monitoring, as well as decreased costs for injuries, rescue searches, health/family benefits, and worker turnover and training
- Better yard management to assure rapid and accurate distribution of product
- Reduced shrinkage/theft and decreased costs from leasing and replacing equipment

Supporting Solutions and Partners

Cisco and its partners work with mining industry leaders to install their asset-tracking solutions from planning to deployment, and can even manage the network as required. In addition to a global network of qualified resellers, Cisco provides comprehensive design and support through CCIE® professionals and the award-winning Cisco Technical Assistance Center, both recognized as industry leaders.

The Cisco Leadership Advantage

Cisco Systems is the worldwide leader in networking technologies, with a 20-year track record in working with manufacturers of all sizes, around the globe. Cisco Location-Based Services solutions for the mining industry form part of the Cisco Intelligent Networked Manufacturing platform, a suite of collaborative solutions that integrate information and processes, spanning the entire manufacturing workflow and giving companies a secure, customer-centered view of their organizations. These powerful solutions are founded on the Cisco Service-Oriented Network Architecture, a conceptual framework that outlines how service-integrated enterprises can accelerate applications, processes, and resources to maximize business opportunities.



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