

The networking and communications equipment company has been exploring how RFID can help it to improve supply chain management, asset tracking and usage, and reverse logistics.

By Mary Catherine O'Connor

Nov. 25, 2008—[Cisco](#) uses contract manufacturers and distributors to produce the networking and communications equipment it sells, and to get them into reseller's hands. By the time a carton containing a Cisco product arrives at its final destination, it might have as many as 16 bar-coded labels on it, says Waseem Sheikh, director and group leader of the company's supply chain management practice. Replacing some, if not all, of those bar-code labels with an RFID label, he states, could greatly improve the speed and accuracy of the shipping and receiving functions.

Cisco also knows its supply chain partners need to play a role in—and be compelled by the benefits of—any RFID application. That's why the firm collaborated with one its distributors, [Ingram Micro](#), on an RFID pilot program, and why it is currently working to collaborate with its contract manufacturers to begin tagging products at the point of manufacture.



Waseem Sheikh

Its supply chain, however, is only one of many areas where Cisco believes radio frequency identification can deliver benefits. In recent years, the company conducted another major RFID pilot, focused on asset tracking. Based on the results of these efforts, which are shared across the corporation's departments through its intranet, there are now 64 different RFID-related initiatives currently being investigated across the company's operations.

"We are trying to reduce the number [of initiatives] by combining similar ones," Sheikh says. "We have to walk the line between encouraging many experiments and combining them. While improved visibility is a major driver, the projects are not always focused solely on product tracking."

Shipping-Receiving Pilot

This project, conducted in 2007, involved three parties: Cisco, [Menlo Worldwide](#), which provides logistics services, and Ingram Micro. During the project, all Cisco shipments transported from a Menlo warehouse in Houston to an Ingram Micro warehouse in Carol Stream, Ill., were tagged.

"We have a service level agreement with Menlo that we amended so Menlo workers would tag" the goods, Sheikh says. Each case or carton of Cisco products was tagged with a passive EPC Gen 2 label and loaded onto a pallet, which was also assigned an EPC tag. In back-end software, the pallet tag's Electronic Product Code (EPC) was associated with all of those encoded to the cases on the pallet.

Because Ingram keeps only 5 percent of Cisco goods in inventory, every other piece of Cisco equipment the company sells is made to order, which means each pallet built up to fulfill an Ingram

order comprises differently sized and shaped cases—making it look nothing like a homogenous pallet carrying only one type of item. The cases' odd shapes also make it difficult to receive and manually (through bar-code scans) verify the shipments, because some small cases are occasionally missed. When Ingram employees must pull cases off the pallet to ensure each is identified, they can take up to a half hour to receive one pallet at its warehouses.

With streamlining this process as its goal, Menlo workers tagged the pallets of goods and sent along advance shipment notices to the Ingram warehouse in Carol Stream. There, the tagged pallets were brought into the warehouse through an RFID reader portal. If the portal interrogator was able to read every case and pallet RFID tag, the pallet would be verified. If the portal reader failed to capture all of the case tag EPCs, workers would break down the pallet and utilize a handheld interrogator to verify the receipt of each case that should be on the pallet, according to the manifest referenced by the pallet tag and the advance shipment notice.

Based on the pilot results, Cisco estimates that if each item were RFID-tagged at the point of manufacture, \$2.2 million could be saved through improved efficiencies in the shipping and receiving processes. Ingram would accrue 60 percent of the benefits from such processes, Sheikh says, while Cisco would earn the balance. According to Sheikh, Cisco hopes to begin working with contract manufacturers to start tagging cases with RFID labels at the point of manufacture, and to work with Ingram and its other distributors to use the labels to track the shipments, all as part of a standard operating procedure. But exactly when this might happen is, as of yet, unknown.

Because Cisco employs a network of contract manufacturers to make its goods, however, as well as resellers and distributors to get them into customers' hands, the only way the firm can effectively deploy RFID in its supply chain is to engage those companies in its use of the technology. Cisco is also active in [EPCglobal](#), and is currently working to develop standards and encourage the use of RFID technology across the supply chain.

"Cisco is basically an engineering company, and a marketing and sales company," Sheikh notes. "One hundred percent of our manufacturing and servicing is done by third parties—some of whom are much larger than us in terms of revenue and size." For that reason, the firm is encouraging these companies to begin using RFID, not just in dealing with Cisco but also in servicing its others customers. That way, Cisco would benefit as well as the other companies with which these third parties work. And if RFID leads to greater efficiencies and accuracy in the supply chain, Sheikh says, the third parties will benefit as well.

Asset Management

In addition, Cisco performed another pilot project to ascertain whether and how RFID could be employed to help its employees better utilize assets within its research and development labs. This, Sheikh explains, would help the company avoid purchasing items identical to those it already owns but merely can't locate, while also ensuring that proper business procedures are followed so computers or other assets not being utilized are stored and powered down, thus helping to prevent the wasting of

electricity.

"Cisco spends \$700 million each year on equipment for our labs, and \$42 million on energy costs [to power them]," Sheikh says. The company has now deployed an RFID-based tracking system for assets, and believes it will help Cisco reduce both expenditures. If an employee can quickly determine a mobile asset's location, he is less likely to request that another be purchased.

Because Cisco labs are metal-rich environments, the company had to test a range of different tags in order to pair the right tag with the correct asset. Depending on an asset's value, the amount of RF interference it would pose and the distance from which it needed to be tracked, Cisco paired active (battery-powered, with a long read range), semi-active (battery-assisted to boost range) and passive (no battery) tags to assets. "We use the technology that makes the most sense [for the asset to be tracked]," Sheikh says.

In addition to attaching RFID tags to assets used on a continual basis, such as testing equipment or microscopes, Cisco also affixed them to prototypes of new products being developed. Because some testing steps involve exposing a prototype to exceedingly harsh environments (extreme heat, for instance), some tags must be extremely ruggedized. But the higher cost of these tags is justified by the competitive advantage Cisco gains by being able to quickly and accurately identify and track each prototype as it moves through the testing steps.

The company uses its intranet, in combination with wikis and blogs, in order to share the location data of tagged assets with employees in various departments or buildings. This has helped Cisco avoid superfluous replacement purchases that previously resulted when an asset could not be readily found.

Cisco has tagged assets and prototypes, and installed RFID reader infrastructures, at six of its labs to date, with plans to roll out the technology to other labs as well. According to Sheikh, the firm believes the system can help it lower capital expenditures by more than \$10 million per year.

Reverse Logistics and Product Repair

Additionally, Cisco is looking to utilize RFID to improve the speed of its returned material authorization process. During this process, the firm works with its contract manufacturers to determine why a particular piece of equipment has failed, and to also determine whether it is linked to a larger manufacturing issue that could lead to additional failures.

Cisco's end customers need to be up and running 100 percent of the time, Sheikh says. "When you pick up a phone, you need to hear a dial tone." So when a piece of equipment does fail, Cisco works with its supply chain partners to quickly replace it, and then to determine the cause of the failure. They accomplish this by first having the broken gear shipped to a Cisco customer service center. From there, it might be sent back to the contract manufacturer that built it. Cisco engineers will also work to determine the problem.

The process can take more than two months, and Cisco is now testing RFID as a means of tracking the items' location as they move from one facility to another for repair. This should not only shorten repair cycle times, but also enable Cisco to provide up-to-date repair status information to its customers, based on where their returned items are located in the repair process.

According to Sheikh, Cisco has identified an end user and a contract manufacturer willing to participate in a pilot to test this application. At present, he says, the project is in its planning stages but should up and running by early January 2009.

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