

Standardizing EPC Data-Sharing

MIT's Auto-ID Lab has formed a special interest group to develop a standard architecture for sharing real-time EPC event and sensor data over the Internet.

By Mark Roberti

Apr. 16, 2004—The vision for Electronic Product Code technology has always been to share real-time data about products over the Internet. But very little research and development has gone into specifying the nonproprietary network protocols and architecture needed to share this information among supply chain partners. The Auto-ID Lab of the Massachusetts Institute of Technology wants to remedy the situation. It has formed the Web Services WAN Special Interest Group (SIG) to come up with a prototype for a standard architecture for sharing real-time EPC data over wide-area networks (WANs) using Web services standards. "The Auto-ID Center's work was focused primarily on tags and readers and the software to manage them, and no one had gotten around to pinning down the specifics of how you share data over a WAN," says Stephen Miles, the organizer of the SIG. "It's not a problem until you start looking at sharing real-time data with multiple partners, but then it immediately becomes an issue."

Manufacturers working with retail partners to share EPC data as part of a pilot or an early-stage implementation are finding that each pilot has different requirements for exchanging EPC data. To avoid having to build different systems for different customers, several of these companies approached MIT's Auto-ID Lab, which is based in Cambridge, Mass., about specifying a basic asynchronous messaging infrastructure, based on Web services standards, for communicating real-time EPC data.

The overall challenge is to create a WAN architecture that can eventually be used to share EPC event and sensor data among hundreds of thousands of simultaneous users. Today, most retailers and suppliers are using Electronic Data Interchange (EDI) in their pilots, but even Internet-based protocols such as AS2 won't scale effectively for highly distributed EPC and ad-hoc sensor networks, where data about a single product might reside on secure servers hosted by the manufacturer, distributor, third-party logistics provider and retailer.

If companies use EDI and other point-to-point protocols, only the two connected parties can see the information and the data is not available to, say, their third-party logistics providers. So for instance, if Procter & Gamble sends Wal-Mart an advance shipping notice over an EDI network, there would be no way for a logistics manager at a cross-docking facility to have access to that information. The SIG's goal is to develop an architecture that would make that information available to as many players in the supply chain as needed and authorized to view it.

The new network architecture will require the ability to process EPC event data—information about the movement of products carrying an EPC tag—written in the Product Markup Language (PML), an XML variant developed by the Auto-ID Center. The event data, which may be encrypted or compressed, will need to be efficiently parsed and routed to different locations based on the content type or substance of these messages.

On top of the network applications, there will also be business process rules (written in XML), which will add

value to the network by automating routine functions. For instance, companies might set up business rules to alert a trading partner whenever a shipment of goods with EPC tags arrives at a distribution center. The protocols to allow the sharing of information and the XML business rules need to be fleshed out and standardized before the EPC Network can take off as a fully collaborative environment.

"Supply chain participants need a scaleable messaging network that companies can access without it being a big integration project, whether they are in the United States or China or anywhere else," says Miles. "We fully expect [software and network services] vendors to offer sophisticated services on top of this basic Web services infrastructure."

The goal of the Web Services WAN Special Interest Group is to leverage established Internet standards, including Simple Object Access Protocol (SOAP) and Web Services Description Language (WSDL), to create an asynchronous messaging architecture for transmitting EPC event information and associated sensor data. The SIG then hopes to test the system by organizing pilots that will be held by select end user SIG members in the third quarter. By October, the group wants to have a meeting with EPCglobal members to demonstrate benefits of sharing real-time EPC event data, including track and trace and automated reconciliation.

The specification will then be submitted to the appropriate standards organization, such as EPCglobal's Software Action Group, for further refinement. After that, it would go through EPCglobal's process for turning the specification into a standard.

Research within the SIG will follow two separate tracks. One group will focus on the development of the Web services specifications and architecture for integrating sensor data into a prototype network. Those participating in the development will collaborate over the Web, hold teleconferences and frequently meet face-to-face. A second group will focus on planning for significant pilots with SIG sponsors and senior IT architects within user companies to demonstrate the business value from RFID and sensor data.

The group is open to end users, technology vendors, network providers and others (including companies that are not EPCglobal members) who are committed to sharing real-time EPC data over the Internet. Annual fees for SIG membership range from \$25,000 to \$150,000 per year, based on company size. SIG members not only participate in the development of the specifications, but also get to participate in field trials. Vendors pay higher fees than end users because they are expected to derive business opportunities from participating with early adopters in establishing collaborative supply chain networks.

Among the companies represented at the group's first meeting in March were 7-Eleven, Altria, Cyclone Communications, Coca-Cola, EPiC, Hewlett Packard, Qwest, Sun Microsystems, Semantic Web Services Initiative, the WS-I Consortium and the World Wide Web Consortium. Other companies interested in joining the SIG should contact Toni-Marie Pommet (tmpommet@mit.edu), program manager for special interest groups at MIT's Auto-ID Lab.

"We're looking for companies that are interested in sharing real-time data over the WAN," says Miles. "We don't have all the answers. We are saying to platform vendors, retailers, suppliers, common carriers or data-pool companies, we all have an interest in sharing the data when pallets come in and we have to reconcile event data with business processes. We have an opportunity today to get on top of problem before the industry becomes balkanized. We look forward to joining with first movers to specify and pilot a network where supply chain participants can collaborate based on real-time EPC data."

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