

Lab to Build EPC Network Simulation

The Auto-ID Lab at MIT is creating a simulation of the EPCglobal Network to study how data will flow within and among supply chain partners.

By Mark Roberti

Aug. 29, 2005—The Auto-ID Lab at the Massachusetts Institute of Technology (MIT) has launched a new initiative to build a software simulation platform of the EPCglobal Network to study how data will flow within a single company and among supply chain partners.

"EPCglobal has requested us to build this," says John Williams, director of the MIT Auto-ID Lab. "So MIT will do the first draft of the system and then coordinate with the other Auto-ID Labs from around the world to build a distributed version that will span country boundaries. One of the challenges is to build software that meets the requirements of what I call 'CLEMSS'—customizable, localizable, extensible, maintainable, secure and scalable."

The system will have simulated RFID readers (interrogators) that generate data and events (the movement of goods, for instance) and transmit those events to interested supply chain parties. The readers will mimic those that would be found in manufacturing facilities, warehouses, distribution centers, retail stores and so on. Each virtual facility will have a simulated EPC Information Service (EPCIS)--a suite of Web services companies are expected to use in managing their EPC data.

The lab will use the system to predict the flow of data, and to test various strategies for data protection and privacy. This information will guide the design of the EPCglobal Network, which EPCglobal is creating to allow companies to manage and share EPC data.

"We want to explore the implications of various architectures and strategies for managing the data," says Williams. "Are you going to have chokepoints where you will be overwhelmed by data? What business events will be escalated to a higher level? How will you handle security?"

A postdoctoral student has been working to program the individual elements that will make up the simulation, including readers, EPCIS servers, databases and so on. Williams expects to finalize the first version by October, after which the other Auto-ID labs will join the full-scale project.

When the project is completed, by October 2006, it could be part of a reference implementation for software vendors that want to develop EPCglobal Network applications, and for end user companies that want to model their own systems before deploying EPC technologies. Williams hopes RFID vendors, end users and EPCglobal will provide funding to develop a more robust version.

Williams has been working in the software simulation field for nearly 30 years. He has worked with Shell Oil to simulate events in natural gas fields to predict how small, seemingly independent problems can cascade into more significant issues. And he recently did work for the U.S. Department of Homeland Security (DHS) to build simulation models of critical U.S. infrastructure, such as the electric power grid in the United States,

to help the DHS understand where the national infrastructure might be vulnerable to attack.

Williams took over as director of the MIT Auto-ID Lab last April. He is also director of MIT's Intelligent Engineering Systems Laboratory, which has a research budget of \$2 million, five professors and 50 masters and doctoral students. Much of his previous work creating large-scale information systems for the petroleum industry, he says, is relevant to RFID networks.

"DHS needed to understand messaging systems and event systems that would take data from different sources and integrate them," Williams says. "So the grid companies had different types of systems that needed to talk to one another. That's very similar to what companies are trying to achieve in their supply chains with RFID."

Copyright ©2005 RFID Journal, Inc. All Rights Reserved