



## Q&A

# CISCO RFID READY NETWORKS

### GENERAL

**Q.** What is RFID?

**A.** RFID stands for radio frequency identification. It is a wireless technology that uses radio frequency waves to transfer data between a moveable item and a reader to identify, track, or locate that item.

**Q.** How is RFID being applied?

**A.** Within various industries, companies are making the transition to RFID by moving away from line-of-sight auto identification mechanisms such as bar-code and optical character recognition (OCR) toward radio frequency based methods that do not require line-of-sight. Cisco Systems® sees RFID technology initially impacting three areas:

- Supply Chain: Tracking products and containers through the supply chain (pallets, cases, and eventually individual items)
- Asset Tracking: Efficiently utilizing expensive assets (tractors, medical equipment, manufacturing equipment, etc.)
- Security and Regulatory: Identifying people, vehicles, and other items to ensure regulatory and security compliance

**Q.** Why is this the right time for RFID?

**A.** Although RFID technology has been around for a long time, it is only recently that a combination of cost savings, corporate and government mandates, as well as business-side integration have come together to make RFID solutions viable.

**Q.** What is Cisco® doing in RFID?

**A.** Leveraging industry leading networking expertise, Cisco plans to enable IP Networks for RFID deployments. Cisco RFID Ready Networks will allow customers to roll-out RFID technology over IP networks that are scalable, resilient, manageable, and secure for our customers. Cisco will provide an infrastructure of routers and switches that have been optimized to run RFID applications through testing, device integration, and standards development. Cisco is not delivering RFID tag or reader products.

**Q.** What plans does Cisco have to implement RFID technology in its own business?

**A.** Cisco is committed to leveraging RFID for Cisco internal usage. Cisco is exploring where in the business process Cisco will adopt RFID.

### TECHNOLOGY AND STANDARDS

**Q.** What is EPCglobal?

**A.** EPCglobal is the standards body that leads the development of industry-driven standards for the EPC Network to support the use of RFID.

**Q.** What is an EPC?

**A.** An Electronic Product Code (EPC) is the data construct used as the unique universal identifier for products with RFID tags within supply chains. Like many current numbering schemes used in commerce, the EPC is divided into numbers that identify the manufacturer and product type. The EPC uses an extra set of digits, a serial number, to identify unique items.

**Q.** What is the EPCglobal Network?

**A.** The EPCglobal Network is a “stack” of technologies and components that will enable immediate, automatic identification and sharing of information of items in various supply chains. The technical standards developed through EPCglobal will help to ensure that the “stack” of components and technologies of the EPCglobal Network will work together, on a global scale.

**Q.** What are the components of an EPCglobal Network?

**A.** The components of the EPCglobal Network Architecture include:

- RFID Tags—Hold EPC information
- RFID Readers—May both read information from and write information to RFID tags
- RFID Middleware—Typically implements the Application Level Events (ALE) Layer that provides aggregation, counting, and filtering of tag reads from individual readers
- EPC Information Services (EPCIS) Layer—Makes tag data available to Enterprise Applications (enterprise resource planning [ERP], Warehouse Management System [WMS], etc.) and trading partners enabling track and trace and other higher order functions
- The Object Name Service (ONS)—Provides name resolution services for EPC data, similar to Domain Name System (DNS). In this case, the EPC itself resolves to a location that contains further information about the product specified by the EPC

**Q.** Is Cisco active in developing any RFID-related standards?

**A.** Mohsen Moazami, Vice President of the Internet Business Solutions Group at Cisco, was selected to serve on the Board of Governors for EPCglobal, Inc.; in addition, Cisco has employees participating in various EPCglobal Hardware and Software Action Groups (HAG, SAG).

## **PRODUCT**

**Q.** What is a Cisco RFID Ready Network?

**A.** A Cisco RFID Ready Network is a network that is enabled to support RFID technology that may be deployed by Cisco customers to provide an integrated, secure, manageable end-to-end IP infrastructure optimized for RFID traffic.

**Q.** Why is this significant for Cisco?

**A.** Cisco sees RFID as a network-centric technology that represents a very important opportunity for our customers, as well as for Cisco. RFID builds on the Intelligent Information Network (IIN) not unlike other network applications or data types like voice and video.

**Q.** On which Cisco products does this initiative focus?

**A.** The Cisco RFID Ready Network initiative is designed to assist customers with pilots and initial RFID deployments. Initial deployments are projected to be standalone “islands” within Enterprise networks, primarily utilizing wired, Ethernet attached RFID Readers. The Cisco products involved include Cisco Catalyst® desktop switch platforms (Cisco Catalyst 2940, 2950, 2955, 2970, 3550, 3560, and 3750 series) providing access-layer network connectivity for RFID readers, and Cisco Catalyst 4500 and 6500 series platforms providing distribution-layer connectivity for Cisco Catalyst desktop switch platforms to increase scalability and availability of the deployment.

**Q.** What features and functions of Cisco products are important to customers?

**A.** The following existing features are important to Cisco customers:

- Network Connectivity—Support for RFID is a natural evolution of packet networks (wired or wireless), convergence and single network architecture. There is no need to build a separate network for RFID deployments; it can be supported on existing LAN infrastructures based on Cisco switches and routers.

- Scalability and Availability—Basic tiered-network design (Layer 2 access switches connecting to redundant Layer 3 distribution switches) that Cisco has recommended over the years still holds true for providing a scalable and highly available network design for RFID deployments within a location. Services such as Network Time Protocol can be provided by the network infrastructure to assist in time synchronization of RFID devices throughout the network. IEEE 802.3af Power over Ethernet (PoE) can help reduce deployment costs because power does not have to be run to the RFID Reader locations as well as networking cable.
- Provisioning and Management—SmartPorts Macros can be implemented on Cisco Catalyst switches, enabling easy, rapid, and consistent provisioning of LAN switch ports to support RFID devices.
- Network Security—Cisco Catalyst switch features, such as broadcast and multicast Storm Control and Dynamic Host Configuration Protocol (DHCP) Snooping with Rate Limiting, can be used to help mitigate against intentional or unintentional denial or degradation of service attacks within the LAN. Cisco Catalyst switch features such as Port Security can be used to help mitigate against unauthorized access to the RFID network until RFID readers support IEEE 802.1x port-based authentication. Trust exploitation and man-in-the-middle attacks can be mitigated by isolating RFID traffic onto separate VLANs and by implementing Cisco Catalyst switch features such as Dynamic ARP Inspection.
- Quality of service (QoS)—Because the majority of RFID Readers do not support any QoS tagging, RFID traffic can be prioritized by applying QoS features on Cisco Catalyst switches. Cisco Auto-QoS for voice over IP (VoIP) provides a straightforward, easy method of implementing prioritization for voice traffic, which also fits the recommendations for support for RFID traffic. Minimal QoS provisioning (which can be done using SmartPorts macros) is required to enable QoS support for RFID traffic on top of existing Auto-QoS for VoIP.

**Q.** Is Cisco building an RFID reader or tags?

**A.** No. Cisco does not currently plan to manufacture readers or tags. Cisco will partner with industry leaders in these areas to provide a complete solution for our customers.

## **CUSTOMERS**

**Q.** How do customers benefit from RFID?

**A.** RFID will enable trading partners to minimize shrinkage and shortages, accelerate order processing, and increase responsiveness to consumer demand by enabling real-time information about goods in their supply chain. In addition, it will provide increased efficiency in handling physical goods during processes such as receiving, counting, sorting, and shipping.

**Q.** How do customers benefit from a Cisco RFID Ready Network?

**A.** Cisco is the only company to provide an integrated, secure, manageable end-to-end IP network optimized for RFID traffic—thereby providing the lowest total cost of ownership (TCO). Customers can work with Cisco as a trusted partner focused on delivering an intelligent solution that provides enhanced reliability, scalability, and interoperability.

## **FOR MORE INFORMATION**

For more information about Cisco RFID Ready Networks, visit <http://www.cisco.com/go/rfid>

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