# Radio Frequency Identification (RFID) April 6, 2005

**Opportunities and Challenges in Implementation**

Today the Department of Commerce has released an information paper on Radio Frequency Identification (RFID). The paper can be accessed at: www.technology.gov/reports/.

**Table of Contents**


**Summary**

**Chapter 1: Introduction**

**Chapter 2: The Fundamentals of RFID**

- RFID Technology
- RFID Applications
- Economic Implications of RFID

**Chapter 3: Enabling Global Use of RFID**

- International Trade Aspects
- RFID Spectrum Use
- Standards Development Activities

**Chapter 4: Other Issues Relating to RFID**

- Patents
- Small and Medium Enterprise Implementation of RFID
- Privacy and Security


The following is a brief summary of the key points in the paper.

**Technology**

- RFID in the United States is poised for growth as businesses and governments explore applications implementing RFID. The large-scale adoption of RFID in commerce and security applications is likely to have important implications for businesses, government, and consumers in the United States.

- Unlike the barcode where identification is limited by line-of-sight, RFID technology and its reliance on radio waves does not require a line-of-sight for identification or a straight-line alignment between the tags and readers.
- As new applications develop, the technology will continue to evolve. Growth beyond today's user-specific systems will occur as RFID is deployed across the marketplace and the related hardware and software achieve a high degree of harmonization.

## Opportunities

- As the technology matures and applications proliferate, RFID will facilitate global commerce and spur innovation and competitiveness.
- RFID technology increases visibility and accountability in the supply chain. RFID will allow manufacturers, retailers, and suppliers to efficiently collect, manage, distribute, and store information on inventory, business processes, and security controls.

## Challenges

- As is common with emerging technologies, several challenges must be overcome for the technology to mature to its full potential. In the case of RFID, these challenges include: maturation of RFID technology, harmonization of standards for hardware/software and wireless spectrum operations, privacy and security concerns, and implementation cost barriers. As these technical and policy challenges are mitigated, RFID will likely become the system of choice for global commerce.
- Interoperability across various RFID systems, companies, and countries is critical to achieving wide-scale deployment of RFID technology. Development of technical standards for tags, readers, and interface systems; and allocation of operational limits for frequency and transmission power will determine global interoperability.
- Initial system and implementation costs are still being refined; in the near-term this could prove to be an impediment to large-scale adoption. Within small and medium-sized enterprises, although RFID provides them with new opportunities to compete in the global market, limited budgets, lack of in-house expertise, and a lack of access to new technologies could be an impediment for adoption.
- The collection and use of personally identifiable information through RFID technologies represents a key public policy challenge to the deployment and use of RFID technologies. Much of this concern is with the collection, use, and storage of the data rather than the technology itself. Industry-driven solutions are beginning to include a combination of operational guidelines, technical solutions, and educational campaigns.

###