

Mobile terminals as smart IDs

Introduction

Imagine that you approach the subway ticket gate and the gates opens without you having to do anything, Science Fiction? No, the technology is here already. Smart tags, or RFID (Radio Frequency Identification) as they are called, are used in security systems, ticket systems, and logistical systems to identify users and to trace goods.

By combining a mobile terminal with a smart tag the terminal can wirelessly identify itself to a reader. The mobile could contain tickets to trains, subways, busses, cinemas etc. When the user approaches a control gate the reader in the gate can identify the terminal even when the terminal remains in the user's pocket or bag.

By having a smart tag in the mobile terminal the user can browse to a cinema web site, order and pay for the ticket. The user not only receives the ticket as an MMS, the terminal has also sent the smart tag ID to the cinema so the ticket gate will recognize the terminal and know how many people are allowed to pass the gate on that ID. In the cinema the user can bring up the MMS to find the row and seat number.

The same would of course apply to subway, bus and train tickets etc. where users could buy tickets for their journey and the gate would identify the terminal and allow passage. The smart tag could then be complemented by an electronic ticket (MMS, SMS, email etc) that can be showed in the display to allow the user to be reminded and informed of his tickets and enable visual ticket controls. The terminal can easily become a wallet of tickets, where the user stores train, airline, cinema and theatre tickets etc.

The terminal could also replace security cards. Instead of handing a security card to each person that needs access, the terminal smart tag ID could be used to identify the user in security systems. By knowing the mobile number of a user the security system could configure access over the air. If the terminal is lost the ID is just blocked in the system.

About Northstream

Northstream provides strategic technology and business advice to the global wireless industry. Northstream has assembled a multinational team with some of the world's best experts and analysts on wireless communication business and technology. Northstream's list of clients includes several of the world's leading operators and system suppliers as well as some of the leading investment banks and financial institutions.

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Old technology

The technology, smart tags, has been around for many years. The tags have however been large and expensive and the usage has been in security systems and large-scale logistic systems to follow containers etc. Lately the tags have become smaller and cheaper and are now used in ticket systems like subways road-tolls and ski passes.

Wal-Mart has recently decided that their 100 largest suppliers have to mark all products with smart tags at the latest from 2005, enabling them to use smart tags instead of barcodes in their stores. Smart tags can be read without the customers having to remove the goods from the trolley. An additional advantage is that it enables the retail chain to follow the goods through out the logistic chain, smart tag readers in trucks and in doorways can report to a central system about type and amount of goods in and out. Wal-Mart is not the only retailer looking at this; in Europe Carrefour, Metro group and Tesco are working on a similar project together with Intel.

Trials with mobile terminals

In Japan NTT DoCoMo has carried out a trial with smart tags and mobile terminals in the new shopping area Roppongi Hills. Users could get more information in their mobile terminal on products and services displayed at signboards in the shopping complex. The user could also receive local area information, either on request or automatically as readers detected their movements in the area.

NTT DoCoMo and its competitor KDDI have also decided to join Sony's FeliCa project (the smart tag system that e.g. is used in Tokyo's subway) to initiate a trials to enable the terminals to work as subway passes, and later on also for e-commerce. In Europe Philips and Visa have made trials with Philips' NFC technology (compatible with FeliCa) and Nokia has also been involved in similar trials.

Several terminals vendors are also using, or performing trials, with RFID in the terminal assembling and/or distribution process. In the future the same tag in the terminal could be used to trace the terminal through the assembling, the distribution chain and later on for consumer services.

Lack of dominating standard

The main challenge with smart tags today is that there are several standards and a lot of proprietary systems out there, and they do not talk to each other. Tags can be active (with own power source) or passive (using emitted energy from the reader to transmit the ID), read-write or read-only, and they use totally different frequencies, from 125kHz to 2.45GHz. The allowed frequency and power varies from continent to continent and country to country. The reading distance between reader and tag varies from a few millimetres to tens of meters.

Tags come in many different shapes and forms. In general a tag consists of a microchip and is connected to an antenna. The microchip includes a memory that carries the data content, usually a code that identifies the tag including security features for authentication. The cheapest and smallest tags are passive and read-only. Such tags can be just a few mm in size and cost as low as 0.3 USD.

Ongoing standardisation

Currently EPC (Electronic Product Code) Global is standardising a smart tag system for consumer goods. The work is backed by the UCC (Uniform Code Council) and EAN (European Article Numbering) International. The system includes radio protocol, IDs and information system. The information system includes and Object Name System (ONS), an automated networking service similar to Internet DNS, which points to sites on the Internet. This gives the possibility to link information to a physical product. The first version of the standard targets the 915MHz band, which cannot be used in Europe and large parts of Asia.

In the future not only tags could be installed and connected to the browser in the mobile terminal. Further on even readers in the terminal could allow the user to scan a product and automatically get more information of the product in the browser. Tags could be fitted not just to goods in stores but on cultural and historical sites, ticket machines, buses etc. enabling users to easy get instant and updated information on the goods, location etc. The information could also be adjusted to the users preferences in terms of language, size etc.

But smart tags don't just provide new opportunities, they also generate new threats. The integrity of the consumer information must be respected and handled. If the shop in an easy way can scan your shopping trolley at the cash register, what stops others from doing the same? So far several trials with RFID in retail has failed, as the involved companies did not manage to convince the general public that the tracing of the product stops as it leaves the shop. The security of smart tags must also be high to enable e-ticketing and e-commerce. It is very important for mobile operators and handset manufactures to make sure that this new technology does not interfere with people's integrity.

Enables new services and revenues

Smart tags are already in use today in security, ticket and road-toll systems around the globe. For mobile operators smart tags enables new convenient services for end-users and potential revenues. But at the moment operators and terminal manufactures are facing a lot of difficult questions; what standards and frequencies should be used? When will the technology be mature enough to be used? And for which services? What power and reading distance are needed? What security issues need to be addressed? And who are the players in this industry?

Contact

Northstream has studied and assisted mobile players in the area of smart tags and is well suited to help mobile operators and terminal vendors on how and when they best can benefit from smart tag technologies.

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