ITU-T

International Telecommunication Union

Networking Architecture and Capabilities of RFIDs

Session 5

Session Chairman: Rajiv Kapoor (Cisco Systems, USA)

Objectives for this Session

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- This session will seek to identify architectural models for RFID services from a networking perspective, identifying, for example, the various different network configurations between end-user devices and RFID servers.
- Based on these models, proper networking capabilities and currently used protocols (including relevant identification frames) will be investigated, with a view to supporting RFID communication requirements including QoS and security.

Many Questions

- How do we network the RFID revolution ?
- How does RFID networking fit into the IPNGN Framework ?

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RFID Session 5 Program

- **The EPC global Network Architecture**
  Henri Barthel (EPC global)

- **RFID – An IP Networked Application**
  Monique Morrow & Mallik Tatipamula (Cisco Systems, USA)

- **Networked ID Applications and Standardization Topics**
  Yong Woon Kim (ETRI, Korea)

- **The interferences among passive type UHF-RFID systems in dense environment - Analysis and Proposals**
  Toshihisa Kamemaru (Mitsubishi Electric Corporation, Japan)

- **Self-organizing Sensor and Actuator Networks**
  Martin Glänzer (Siemens, Germany)

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RFID – Revolution or Evolution ?

Radio Frequency Identification (RFID)Technology

- Technology relying on RF transponders to automatically retrieve data remotely using RF signals
  - Active RFID elements use their own power source to send data
  - Passive RFID elements use power from readers to activate

- Presently four main frequency bands used in RFID systems
  - Low Frequency band: 125/134 KHz
  - High Frequecy band: 13.56 MHz
  - Ultra High Frequency band: 800-900 MHz
  - Microwave band: 2.4-5.8 GHz

- RFID typically imbedded in miniscule ASICs attached to objects to be tracked
  - RF readers detect the signals to be processed and networked

Very low cost/complexity systems for mass market "smart cards" and electronic "bar codes" with imbedded intelligence - an evolutionary trend

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RFIDs – A Market Prognosis

- **Cumulative RFID device sales in 2005 topped $ 1.2B ***
  - 600M RFID devices sold in 2005
- **Total RFID system sales (inc. readers, services, etc.) in 2005 was $ 1.85B**
- **Projected 2006 RFID sales up to $ 2.4B**
  - Anticipate sales of 1.3B RFID devices in 06
- **Projected use of RFID tags in 2010 is estimated at 30+B devices**
- **RFID revenues driven primarily by retail business and manufacturing**
  - E.g. auto parts, distribution services, Wal-Mart, etc.
- **Myriad potential applications for RFID tags**
  - supply chain management
  - security services
  - mobile communications

* Note: Projections based on 2005 RFID market study by In-Stat

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RFIDs – Societal Impacts

- **Some consumer backlash against ubiquitous use of RFID tags**
  - consumer groups: "smacks of Big Brother is Watching You !"
  - "Do you want your underwear to tell everyone where you are ?"

- **Are RFIDs simply smart electronic "bar-codes" or something more ?**
  - Privacy concerns – who polices personal information in RFIDs ?

- **Security implications of RFIDs/smart cards – nothing is infallible**
  - if codes are cracked.. what then ?
  - who monitors what information goes in RFID tags ?

- **Regulatory aspects**
  - privacy protection versus commercial benefits
    - achieving the right balance

Does RFID Networking Architecture approach need to address these negative perceptions for wider acceptance ?

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