Mobile, Wireless, and Location-Aware Privacy and Security Issues

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Mobile, Wireless, and Location-Aware Privacy and Security

Wireless Networks

Mobile Devices

Wireless Networks

Destination Network (wired or wireless)

Access Point

Wire Transmission Path

Radio Transmission Path

Cell Phone

Palm Pilot

Laptop

Network

Mobile, Wireless, and Location-Aware Privacy and Security
Mobile Devices - New Security Risks

- Risk of Theft or Loss
- Limited Computing Power
- Multiple Access Points
- Mobility
- Lack of User Awareness
Consumer Products

• X10 Cameras
• Advertised for Security
• But no security
• Unexpected consequences
Video and Camera Phones

- Accountability
- Privacy
- Mercedes-Benz and Honda have banned the phones to ensure the technology in their factories won't fall into a competitor's hands
- Health Club Ban
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- Republican Convention in New York
- TXTMob members who share TXT messages via cellphone
- SMS Text and VideoPhone Cheating in Classroom
Bluetooth

- Bluejacking

- Cabir/Caribe Virus - Long-standing virus writer group 29A

- Emptying the battery in the phone quicker as it tries to beam itself out to other Bluetooth devices.

- Cell phones running SymbianOS, requires users to accept and execute the downloaded package.
Cell Phone Jammers

- Quiet Cars
- Hotels
- Restaurants
- Theaters
- Classrooms
Disposable Cell Phone

- PrePaid Cell Phone
- Disposable
- Anonymity
- Inexpensive

- Prepaid reduces risk of Telecom fraud, but introduces other security issues.
P2P VOIP

- Microsoft Pocket PC 2003 Operating System
- WiFi and 400 MHz processor
- AES (Advanced Encryption Standard)
- 256-bit encryption
• Voice over IP
• Vonage, Lingo
• 911 Calls
• Special emergency circuit links the call to the Automatic Number Identification/Automatic Location Identification database of phone numbers, names, and addresses.
New Mobile Applications

- Opt-in
- “The idea is simple: tell us where you are and we'll tell you who and what is around you. We'll ping your friends with your whereabouts, let you know when friends-of-friends are within 10 blocks, allow you to broadcast content to anyone within 10 blocks of you or blast messages to your groups of friends.” – dodgeball.com
WMATA Smart Trip

- Short Range
- Tracks time of entry and exit to metro stations
  - Registered
    - $5
  - Unregistered
    - Anonymous
TAG USE

• a) Use of your E-ZPassettag binds you to the Terms and Conditions of this agreement.

• b) Your E-ZPassettag(s) may be used on the vehicle(s) specifically listed on this account.

• c) Your E-ZPassettag is good wherever you see the E-ZPass logo.

• d) You must approach and pass through an E-ZPass lane at the posted speed and obey
  • other traffic signs.
• Supply Chain Management
• Industrial Espionage
• Consumer Privacy
• RFID Constellation
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- Rental Car Companies
- Commercial Fleet Management
- Military
- Consumer Electronics
GPS Child Finder

Atomic Clock Synchronized
The watch sets itself accurately, no matter what time zone you're in.

Built-in Pager
Receives and stores up to 10 numeric pages.

Request 911
Wearer presses two outer buttons for 3 seconds to initiate a 911 emergency response; Subscriber may deactivate this feature.

Kid-tested. Kid-tough
Rugged, lightweight and adjustable locator is water-resistant and cut-resistant.

Adjust the Fit
Use inserts included to customize size to child’s wrist.

Lock Button
Press to automatically lock locator.

Key Fob
Manually locks and unlocks locator.

GPS Technology
Integrated GPS and digital wireless technologies pinpoint the wearer’s location.

Patented SafetyLock™
Prevents unwanted removal; activate manually or remotely.

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National ID Cards

- British Government Identity Cards Bill

- Passed its second reading with a vote of 385 to 93 on Dec. 20

- The creation of a national database to contain 51 categories of detailed information on every British citizen and resident, including fingerprints and an iris scan.

- The bill calls for a 2,500-pound ($4,760) fine for refusing to register for the card, and a 1,000-pound ($1,904) fine for failing to inform the government of changes in personal information.
National ID Cards

- Personal Identity Verification (PIV) of Federal employees and contractors
- Grant access to Federally-controlled facilities and logical access to Federally-controlled information systems
- Personal identity can be rapidly verified electronically
- Smart Card, Biometrics
- For more information: http://csrc.nist.gov/piv-project/
Mobile Payment Systems

- Near Field Communication technology, developed by Sony and Royal Philips Electronics, lets wireless devices connect to other devices nearby and transfer data, from payment information to digital pictures.

- Samsung Electronics and Philips are developing cell phones with embedded NFC chips that could double as debit cards or electronic IDs.
Wireless Protocols

- Wireless Protocols
- Design and Implementation Mistakes
- 802.11b WEP
Dozens of open access points in any neighbourhood
Results of a drive around the block with Netstumbler
Thousands of open wireless access points across U.S.
• 5.9 GHz DSRC (Dedicated Short Range Communications) is a short to medium range communications service.

• Supports both Public Safety and Private operations in roadside to vehicle and vehicle to vehicle communication environments.

• Short to medium range, low latency, high data rate communications.
Configuration

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Other ITS Communications Equipment

- 87.5-107.9 MHz FM sub carrier
- 1575.42 MHz GPS Receiver
- 2322.5-2345 MHz for XM Radio Satellite Radio band
- Multiple Bands Two-way Radio
- 76-77 GHz Collision Avoidance Radar

800 to 900 MHz and 1800 to 1900 MHz Cellular Phone Antenna

909.75-921.75 MHz Toll & Parking OBU (Add-on when needed)

5.850-5.925 GHz Multi-Application OBU/w 360 degree antenna (factory installation) (connected to the IDB)

Interface Devices (Built-in Display, Annunciator, Microphone, Keypad, etc. connected to the Computer, which is connected to the IDB)

1800 to 1900 MHz 2.5/3G PCS Phone (which is connected to the IDB)

Computer (factory installation) (connected to the IDB)

Infrared OBU (Add-on when needed for super high data rates)
• Goal Is To Reduce Traffic Accidents, Resulting In:
  – Fewer Injuries And Fatalities
  – Lower Direct And Indirect Financial Costs
  – Reduced Traffic Congestion

• Typical Examples Are:
  – Forward Obstacle Detection And Avoidance
  – Lane Departure Warning
  – Turn Accident Warnings
  – Intersection Collision Warning
  – Automated, Variable Message Signs
DSRC Applications

- Access Control
- Toll Collection
- Data Transfer / Info Fueling (A)
- Traffic Information (C)
- Drive-thru Payment
- Parking Lot Payment
- Infrastructure Based Probe Data Collection
- Rental Car Processing
DSRC Applications

- Curve Speed Assistance [Rollover Warning]
- Infrastructure Based - Stop Light Assistant
- Intersection Collision Warning/avoidance
- Cooperative Collision Warning [V-v]
- Vehicle Based Probe Data Collection
- Cooperative Adaptive Cruise Control
- Cooperative Vehicle System – Platooning
- Highway/rail [Railroad] Collision Avoidance
- Imminent Collision Warning
- Emergency Vehicle Video Relay
- Road Condition Warning
- Work Zone Warning
Boeing and iPass set up wireless hotspots in the sky by using satellites to deliver the internet to planes and extending these links to passengers' laptops with Wi-Fi.

The companies are betting that business travelers, who already connect their laptop computers wirelessly in hotels, cafes and airports around the world, want to stay connected on the plane.
Mobile Facial Recognition

- Los Angeles Police Department
- Hand-held computer with camera
- Luis Li, chief of the Los Angeles city attorney's criminal branch, said the technology should not present legal problems because it was used only as an initial means of identification.

"If you are standing in the street, you have no expectation of privacy," he said.

- Associated Press, Dec. 26, 2004
Mobile Entertainment

- Betting
- Multiplayer Gaming
- Wallet Phone

Select the desired service at the Cmode Coca-Cola site on your i-mode phone and receive a bar code called a C Ticket. Display the C Ticket on the i-mode screen and pass the mobile phone over the vending machine’s sensor to authenticate and receive the drink or service you want. Points are also earned as you use Cmode. Have more fun and make faster purchases by using the infrared communications function and i-appli of 504i and 504iS series mobile phones.
Brave New World or 1984?

- Orwell feared that the truth would be concealed from us.
- Orwell feared we would become a captive culture.
- Orwell feared those who would ban books.

- Huxley feared the truth would be drowned in a sea of irrelevance.
- Huxley feared we would become a trivial culture.
- Huxley feared that there would be no reason to ban a book, for there would be no one who wanted to read one.
- Civil libertarians and rationalists who are ever on the alert to oppose tyranny "failed to take into account man's almost infinite appetite for distractions".

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