Ubiquitous Computing

Security

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Why Security?

Security is PAIN...

- Privacy (confidentiality)
- Authentication
- Integrity
- Non-repudiation

(No Pain, no Gain...)

Security is Needed for...

Privacy Reasons:
- People want to hide certain (culturally specific) things

Economic Reasons:
- People (and enterprises) want to protect their property
Pervasive e-commerce

1. Business to Consumer
   B2C Transactions are high in volume, but very cost sensitive.

2. Business to Employee
   B2E Transactions are low in volume, but transaction cost is less of an issue.

3. Business to Business
   (e.g. machine-to-machine transactions)
   The next wave...
Mobile Security

Mobile Security Specifics:
- Dynamic connections over multiple access networks (partly untrusted)
- Restrictions in communication protocols (bandwidth, latency,...)
- Restrictions in devices (power, performance)

State of affairs:
- Client-side technology is still very immature
- Security management of wireless networks and devices is inherently complicated
- But: Enterprise borders disappear, protection against intruders, espionage,... is a must
Manage Sustainability - Reduce Complexity

Grown System Landscape

Portal
Exchange
Execution Systems
Manage Sustainability - Reduce Complexity

Grown System Landscape

Security?

Portal

Exchange

Execution Systems
Ubiquitous Computing Security

There is no such thing as Ubiquitous Computing Security per se.

Since...
- digital artefacts
- tags/labels/sensors
- “Things that Think”, etc.

...do not have any security requirements.

Security comes in iff something is carried out on behalf of a someone

Thesis: **Ubiquitous Computing Security is a Story About Applications and Users of Applications**
Security for Ubiquitous Computing...

Security is today largely centered around networks and devices

- Ubiquitous computing needs application-oriented security: it matters what you do, not how or where you do it

Research Questions:

- Security primitives matching the specifics of UbiComp
- Security Management at large
- Transfer of Credentials/Policies/... to UbiComp devices
- „Spontaneous Security Federations“: minimizing the burden for users (e.g. expressing and reasoning about policies)
- „Macro-security“ vs. Micro-insecurity
- How does a „UbiComp Identity Module“ and a Security Infrastructure look like?

UbiComp simply won’t happen without security....