Mobile Business Research Group

- Joint project of 7 research groups at the University of Mannheim (since September 2004)
- Aim ⇒ A generic framework for context-aware and especially location-aware mobile business applications
- Web: www.m-business.uni-mannheim.de

Security
- Secure implementations of security protocols (LaCodA compiler)
- Dynamic mobile anonymity with mixing
- Integration of efficient cryptography libraries within Java mobile platform
- Context privacy
- Security and usability

Outline

1. Motivation
   - Mobile Business Research Group
   - Context-aware applications

2. Context Data Model

3. Context Data Model for Privacy
   - Privacy Concerns
   - Privacy Data Model
   - Context Interaction

4. Conclusion
   - Future Work

Context

- Context-aware applications consider context when providing their services.

Context

Any Information that can be used to characterize the situation of an entity

Dynamic Context

Information used to deliver a service which is not explicitly input by the service requestor, but becomes visible during the course of the service delivery
Context-aware Applications


Context Data Model

Schmidt, Beigl, Gellersen (2000): “There is more to Context than Location”

Context Privacy

• Context privacy requires that a user is in the position of controlling his/her context.
• But, what is a context of a user beyond location?
  • Context Data Model is needed.
• What are the privacy concerns in the data model?
  • Privacy-aware context data model is required.
• What is the privacy relation among the context in the privacy-aware data model?
  • Context2Context privacy relation should be explicitly specified.
Privacy Concerns

1. protected context should be specified explicitly as protected context
2. a context can affect another context's privacy sensitivity
3. context blurring/lying can enhance privacy

Protected Context

| 1. User Identity | personal data like name, address, phone number, birth date, credit card number, etc. |
| 2. User Profile   | user interests, habits, schedule, etc. |
| 3. Physical Conditions | the context around the physical surroundings like temperature, light, pressure, etc. |
| 4. Location       | the absolute or relative location of a user |

Evaluated Context

| 5. User Morale    | user's psychological morale status |
| 6. Infrastructure | the surrounding resources for communication capability |
| 7. Social Environment | user's relatives, neighbors, colleagues and their relationships |
| 8. User Tasks     | the user's assigned tasks and aims |
| 9. Time           | date, time and day of week |
Context Interaction Examples

- **Protected** context relation:
  - "Reveal my location only to people who are at a certain location"
  - "Reveal my location only to people who have a certain identity"
  - "Except for certain people, hide my real identity"

- **Evaluated** context relation:
  - "Hide my schedule at certain dates (e.g. at the weekends)"
  - "Reveal my blurring location for indoor application, i.e. communication infrastructure is WLAN"
  - "Do not send my profile, location, identity, etc. if my status is set away"
  - "Never share the physical condition context with outdoor applications"

- **Mixed** context relation:
  - "Blur my location for certain people at certain dates/times"

Future Work

- specification of concrete elements in the new data model
- study of P3P to extend it for context-aware applications
context privacy is required in context-aware applications
context to protect should be concretely specified
a privacy-aware context data model has been proposed