Trust in the mobile family

New approaches and issue definitions

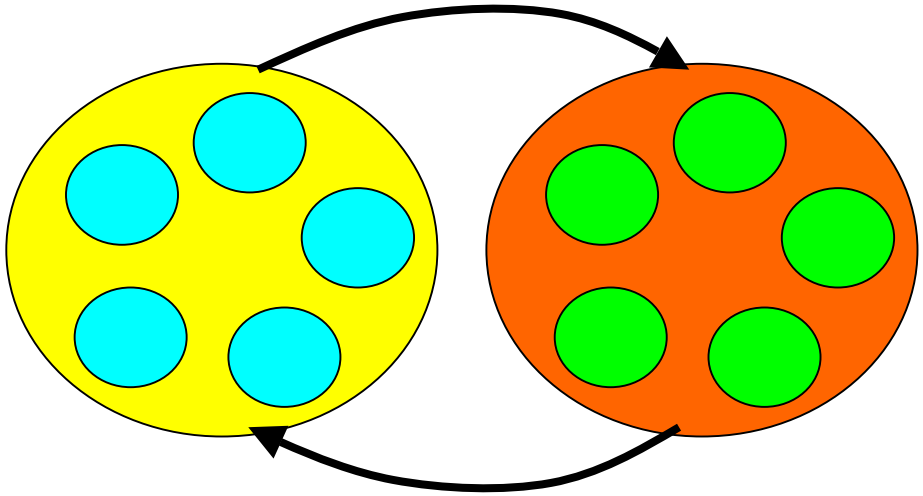
Focus of this presentation: Trust and groups

- WP 3 responsibilities: Trust, Privacy, and Group Management
- Privacy requirements are defined in legislation
  - ⇒ EU directives, national laws
    - Legal requirements have to be applied whatever applications we demonstrate
    - Current research interest is visualization of privacy
      - How do users understand when something is private or not?
  - ⇒ Privacy as such is fuzzily defined, but there is consensus that it is a human right
    - "The right to be left alone"
- Focus of this presentation: Trust and Group management
  - ⇒ Trust is not well-defined
  - ⇒ Interaction with group management is not clear

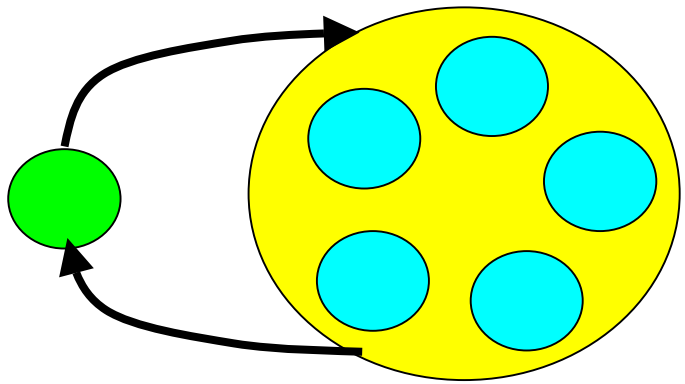
What is trust?

- Trust is a personal belief – trust is a feeling towards someone by a person
- You have to be able to identify (securely and verifiably) both the truster and the trustee
  - ⇒ This implies that the user must trust the mechanisms used to manage trust, as well
- Trust is not transitive
  - ⇒ I do not automatically trust you because someone I know trusts you
- Trust is networkable
  - ⇒ I can trust you because someone I trust trusts you
- Trust is not easily quantifiable
  - ⇒ But there is a span between no trust and full trust, which can be expressed
- Trust is not automatically mutual
  - ⇒ It is perfectly possible to trust someone who distrusts you (or trusts you less)

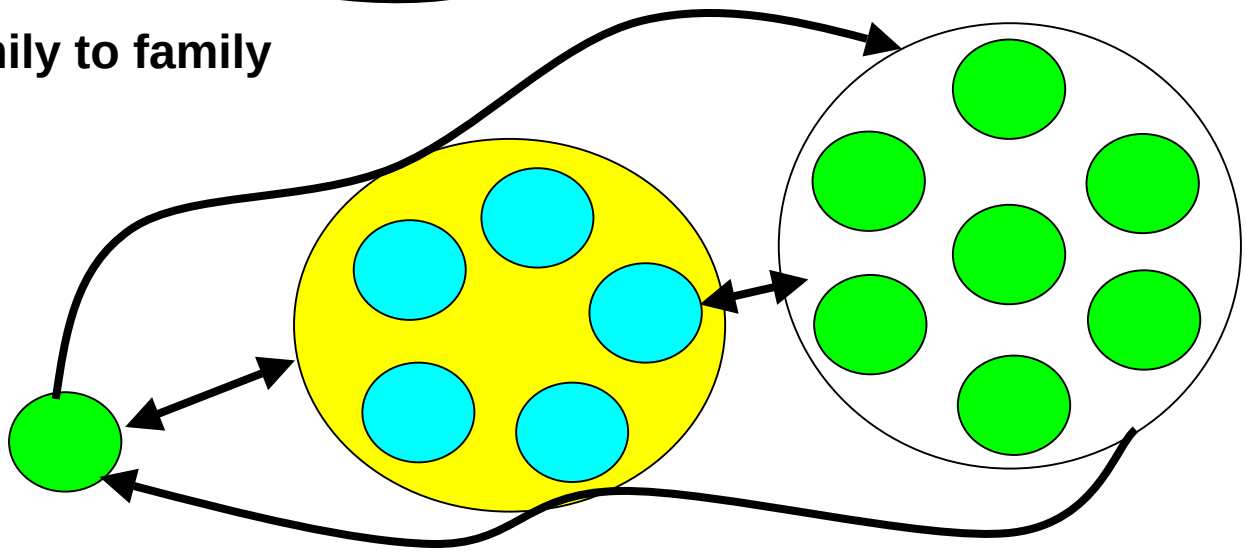
Who trusts whom in our scenarios?



Family to family



Individual to family; family to individual



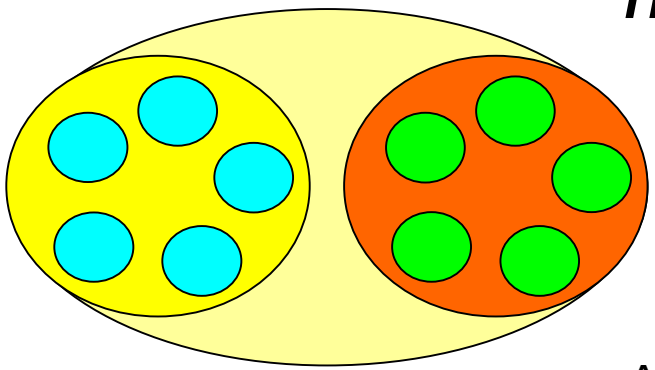
Individual to family to group to individual to family

Use case: The phone as a remote control

- If your phone is your remote control (as NTT DoCoMo in Japan envisions) it will be:
  - ⇒ Your wallet
  - ⇒ The remote key to your car
  - ⇒ The remote controller to your central heating
  - ⇒ Etc.
- Some of these things are already happening
  - ⇒ Mobile phones can be used to control BMW cars
    - In reality, not just in James Bond movies, either!
  - ⇒ Central heating equipment can send SMS to report its status
  - ⇒ FeliCA cards in Japanese phones are electronic wallets

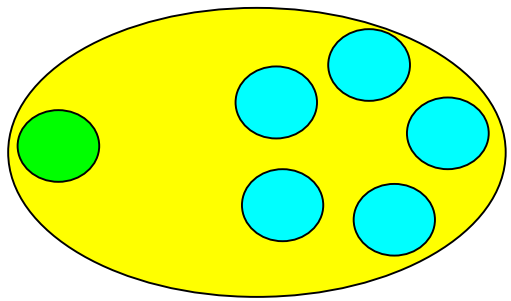
Trust as groups

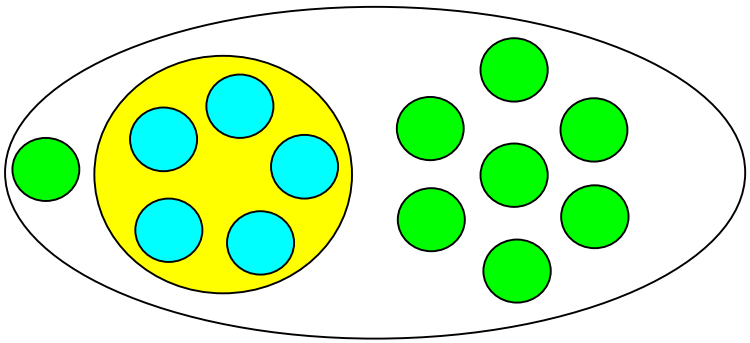
Trust can be modelled as groups



Two groups which trust each other form one virtual group

A trusted individual becomes a member of a group



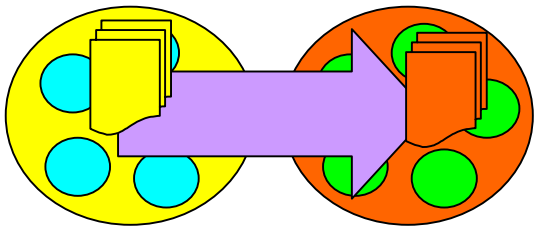


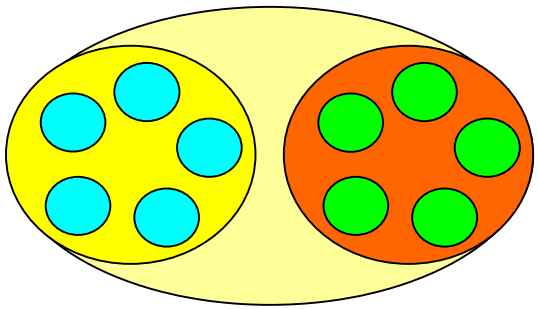
The individual to be trusted becomes a member of the group. The family to be trusted forms a subgroup in the trustgroup.

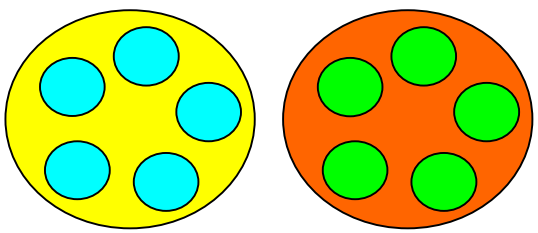
The people you trust form a group. The people others trust also form groups.

If groups are considered sets, there are well-established mathematics for how to manage intersections and unions of groups

Trust relation: Family dinner







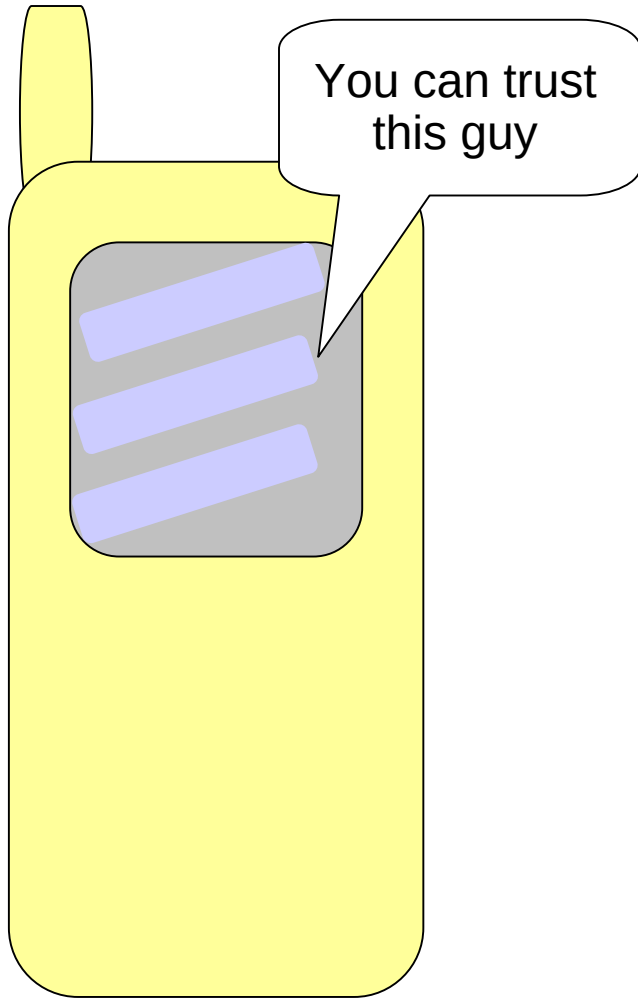
- Family A invites family B for dinner
  - ⇒ Family calendars establish relationship, book time, determine preferences – and form trust group
- Families form a group for the duration of dinner
  - ⇒ Family A extends trust for most things in their home to family B – but not everything (e.g. allowed to take beer from the fridge, but not drive the car)
- Group ceases to exist when dinner is over
  - ⇒ Relationship between families continue, possibly enhanced

Enhancing convenience, not imposing complexity

- Since trust is personal, the mechanisms must be personal
  - ⇒ Or related to the personal device
- However we use technology, it must not be intrusive
  - ⇒ The user must feel that his life is enhanced, not degraded
- There must be trust in the mechanisms themselves
  - ⇒ If the user does not trust the mechanisms, the trust system is broken
- Two possibilities:
  - ⇒ Show when something/someone is not trustworthy
  - ⇒ Show when someone/something is trustworthy
    - Depends on your perception of humanity… and how the system is designed

Relating trust to groups in a convenient way

- The convenient user interface
  - ⇒ Minimally intrusive
  - ⇒ Visualizing trust networks
    - *Research topics*
- Exposing trust mechanisms which are trustworthy
  - ⇒ How do we show that mechanisms are trustworthy
  - ⇒ How do we verify mechanisms automatically, in the background
    - *Research topic*
- Implies mechanisms which are secure and verifiable
  - ⇒ Already lots of litterature exists



Requirements on groups

- Ephemeral
  - ⇒ Not tied to a person, existing on its own
- Time-limited
  - ⇒ Groups must be limited in time (i.e. at some time, they expire – in a few hours, or when you die)
- Ad-hoc formation
  - ⇒ Groups must be possible to form on the spot
- Controlled membership
  - ⇒ The group members have the final say on determining who becomes a member in the group
  - ⇒ The control is mutual – you can not be co-opted into a trust group (but you can in other groups)
- Relations within and between groups must have properties
  - ⇒ You do not necessarily trust someone outside a specific context

Summary

- Trust is a personal belief
- Individuals who trust others become members of groups
  - ⇒ Ad-hoc, automatically formed groups
  - ⇒ We can use the MobiLife group management mechanisms to express this
- User interface needs to be minimally intrusive
  - ⇒ Only show exceptions?
- Trust networks can be modelled as groups
  - ⇒ As long as certain requirements on group functions are fulfilled