The Third Cloud
New social contexts for safety

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Agenda

Reed/Lippman: Social, Mobile Communications in Public Spaces

The Third Cloud

Architecting Social Safety
In the Public Spaces of the Future...

People will be:

more aware of their context
well connected, directly with each other

People will need:

To feel safe
to establish trust with familiar strangers
To share and collaborate with their neighbors
Communications value chain redefined by hypermediation

Communications platforms provide and enhance group context

Transactions, Awareness, Search, Persistence, Resilience become essential platform elements

Value chain embodied in the cloud via mediated business arrangements

Resources become liquid, public, shared
Structural Components

Ad-hoc communication

Adaptive & Nomadic software

Mobile Devices

Public infrastructure

Public infrastructure
Primary Communications
Functions:
Awareness and Coordination

We are social, cooperative spiders, building our own webs

We don't send or receive

We coordinate through awareness

There is no “I”, there are many “we's”
New relationships emerge

Interaction is core to the public space:
  Transactions, marketing, services

Public/shared resources, private goals

New relationships, new rules: safety, ethics, ...
Opportunity

Create a public infrastructure for mobile citizens and customers
Understand the mechanisms of local cooperation, sharing, and commerce
Transform the local village in the same way that the Internet transformed the global village
Sharing the transport: Internet

- Tele- is the problem to solve
- Resources are fixed – servers, people, content
- Transporting bits faster, farther, cheaper
Sharing computing services: Cloud computing

- Web 2.0
  - Mashups, YouTube
- Social networking
  - Facebook
- MMORPG
  - Blizzard Games
- Online Collaboration and Simulation
  - Second Life
Sharing interaction services

- Location
- Identity/Relation
- Privacy/safety
- Resiliency
- Sensing/capture
- Interaction/expression
- Computing
- Glue (comms)
The Third Cloud

• Cloud 1: The Internet – a universal communications “utility”

• Cloud 2: A universal computing service “utility”: “Cloud Computing”, Web 2.0, Software as a Service, Everything as a Service

• Cloud 3: A universal local human interaction and sharing “utility”
Creating a common platform

• Communications embedded in context
• Enabled by identity
• Centered around awareness and discovery
• Cooperative use of common resources
• Negotiation
• Standard programming interfaces (APIs)
• Standard protocols for negotiation
Technical challenges: radio

• “universal radio” - interoperability with everything at the physical layer.

• Radio-based awareness – use every observable signal to build context and connectivity

• Radio secrecy – limit what can be discovered without permission

• Approach: multi-radio, asymmetric SDR
Technical challenges: safety and privacy

- Intimate information spanning multiple devices and owners – provide virtualization and multiplexing solutions
- Information accountability – ensure that devices we use are accountable for what they do to the users and groups affected
- Approach: auditable, secure virtual elements, mathematically secure protocols
Technical challenges: easy to use, understand, control

- Applications span devices and architectures
- Users depend on elements and systems that they did not build or buy
- Developers create applications that must work on combinations of platforms
- Approach: common high level expressive “language”, UI that represents that language directly
Approach

- The Amulet
- The Crowd
- The Neighborhood
- Social Dashboards
- Open collaborative community outside MIT that builds on this (Open Source?)
The Amulet

- In-pocket computing and wireless communications device
- Secure mediation of identity
- Organizes and establishes personal context
- Composes ambient computing systems
- Multiple radio -> software adaptive radio
- Parasitic on environment for interaction, computing power, storage, resiliency
The Crowd

- Each person at the center of his/her own networks of relationships
- Relationships are “real-time” and “persistent”
- Cooperation based in, requires instantiation of relationship
The Neighborhood

- Devices that support “amulet-based” interaction (screens, controls, cameras, ...)
- Multiplexed, virtual, context-creating
Architecting social safety

Key problems:
Action is not information
Assistance creates dependency
Freedom implies responsibility
Service implies accountability

Beyond *information* accountability:
action accountability
Social Safety, Neighborhood Safety

What makes a city feel “safe”? Be “safe”?

Trust is a verb

Trust is collective

Norms are important
Some candidate principles?

Publicity beats privacy
   If an act can be public, do it in public
Privacy is respected
   Avert your eyes, don't record, don't rat on friends
Support others, and reward support
Reveal your intentions and signal honestly
Punish dishonesty
Evolving “common carriage”?

Providing service to others (especially essential ones) -> tort rules against exploitation

Safety = not being exploited by one's neighborhood

Joint interest in “safety” (not national, not local, but collective).
Low level assistance easier to regulate/structure

Carry my bits vs. carry out my intentions
Run this program vs. answer my question

Why? Difficulty of interpreting intention
The “Social Dashboard”

Show user what's happening
Allow user to manipulate meaningfully
Multiple Dashboards
Elements of “virtualization” and “multiplexing” interactions

Helping vs. being helped - duality

Does “deep packet inspection” lead to “deep VM inspection”?  

When does a neighbor “impose” too much in asking for help? 

What is the business model of a flowerbox? 

Can monetary exchange capture local cooperation?
New “common carriage” units

Virtual Machine – Run on behalf
Virtual Content – Store in cloud
Virtual Network – Establish configuration
Virtual Display – instantiate
Virtual Sensor – observe through

These are the “units of behavior” - creating an aura for individuals and groups
Conclusions: safety in clouds

Structure the interactions
Establish norms and principles
Ensure observability