

# Social Mobility and the 3<sup>rd</sup> Cloud

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12 May 2008

# 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



David MacDonald ©2006

# Living within computing

Vannevar Bush, As we may think, 1945

John McCarthy -> F.J. Corbató, An experimental time-sharing system, 1961

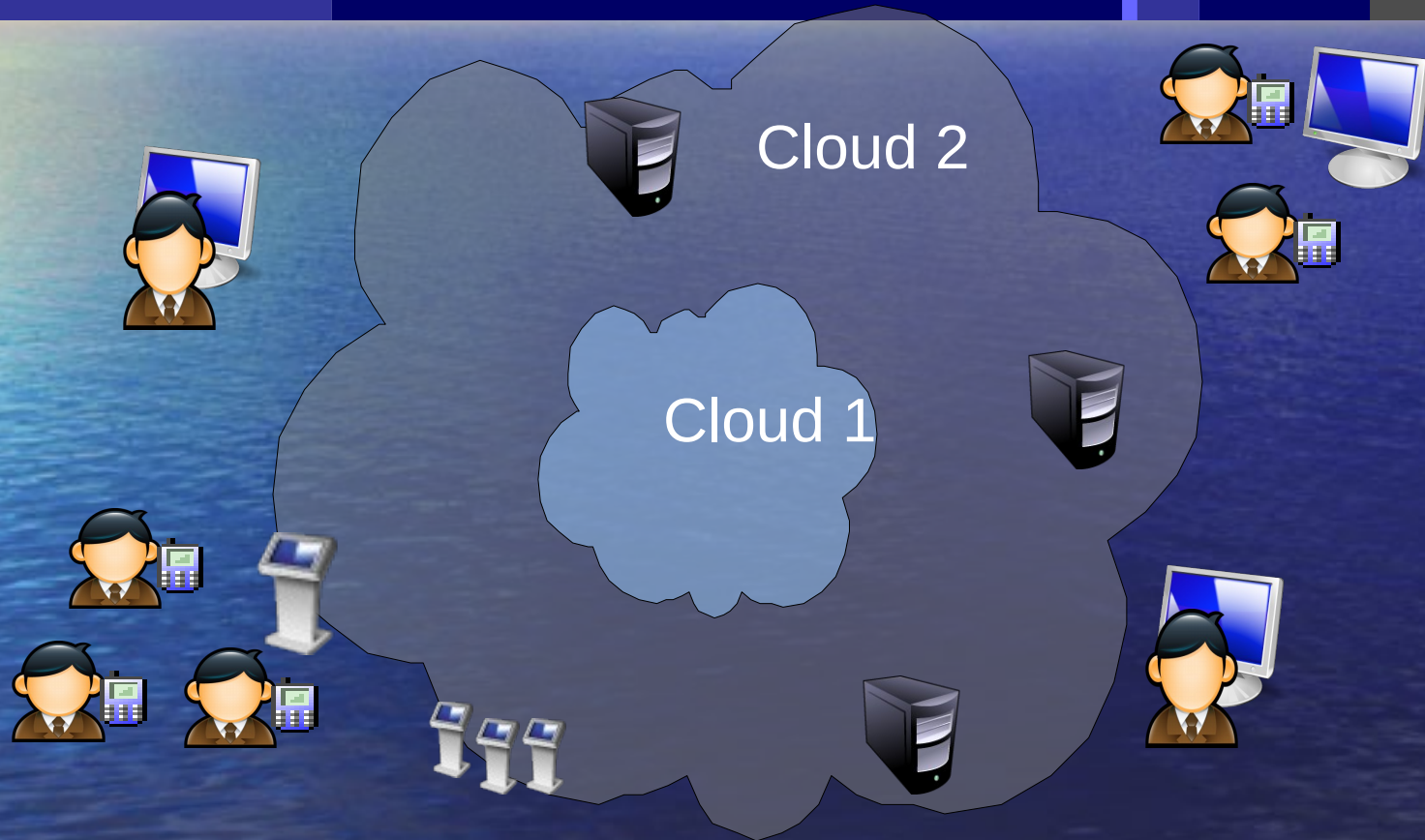
Doug Englebart, A conceptual framework for the augmentation of man's intellect, 1962

J.C.R. Licklider, R. Taylor, The computer as communications device, 1967

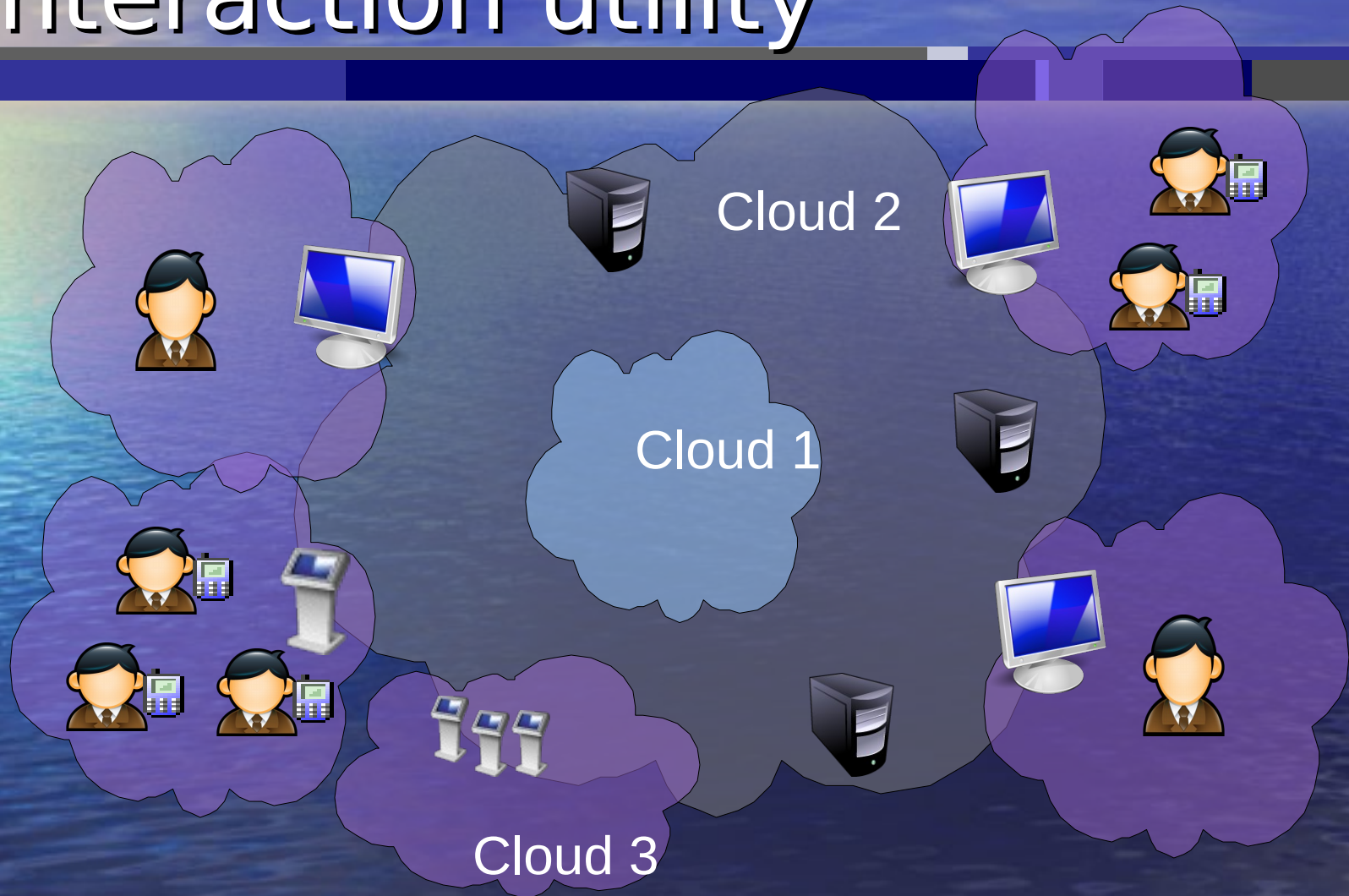
# Internet ... a connectivity utility



# Cloud computing ... a resource utility



# The 3<sup>rd</sup> cloud – mobile, social interaction utility



# 3<sup>rd</sup> cloud: qualities

Context-based

Mobile

Mobility of *people*, not devices

Social

Communications centers on *relationships*  
and *memberships* which define *identity*

Interoperability, Open participation

Clouds grow via standardization of  
interfaces & evolving protocols

# Public Interactive Surfaces

Wall displays that serve visitors (and perhaps their owners, too)

Sensors and computing support interaction

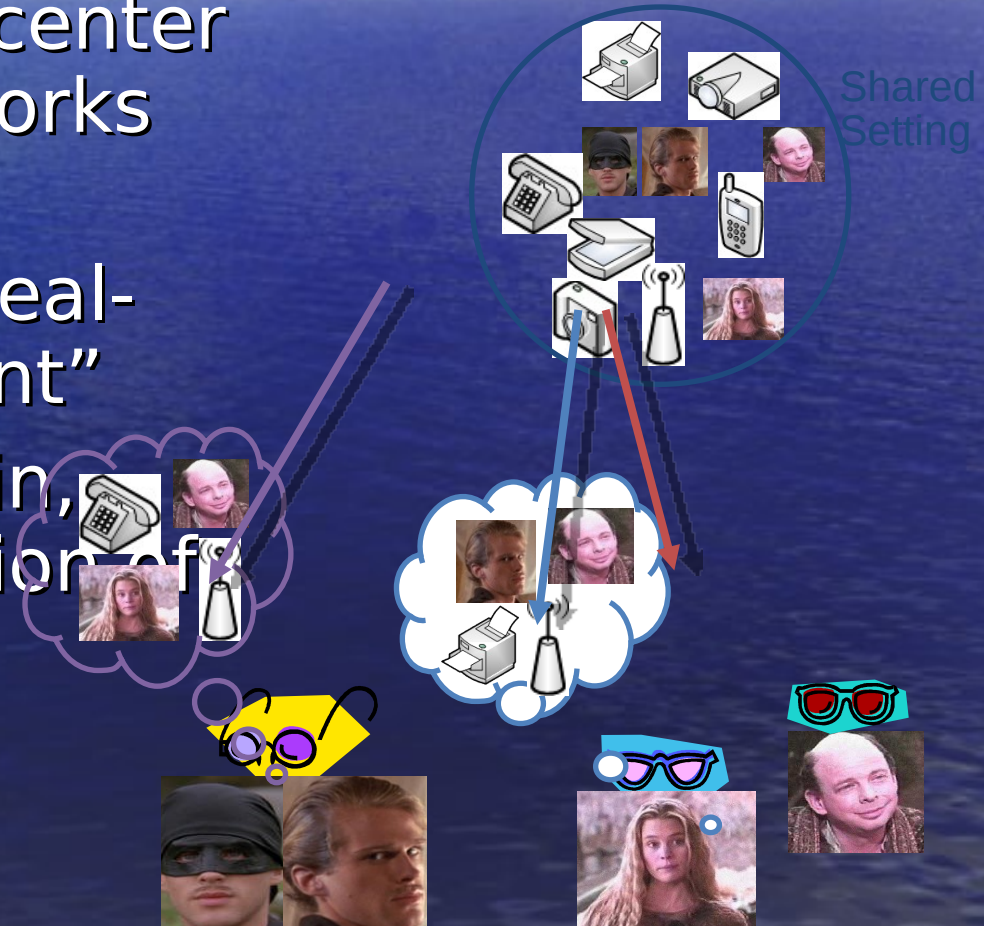
Amulet provides identity and context





# Among 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



# Clouds Invite *Virality*

Consider:

Answering Machines, Texting, Skype, Facebook

Sudden emergence of a new global-scale phenomenon

3 defining properties of a viral system

Can scale without bound, and does

Very small incremental cost to scale

Disproportionate returns to scale

# The Viral Process

Virality exploits resources of a ubiquitous host

Contributory participation

Peer-to-peer (edge-based) architectures: Skype

Contribute to join: Early Internet, PlanetLab

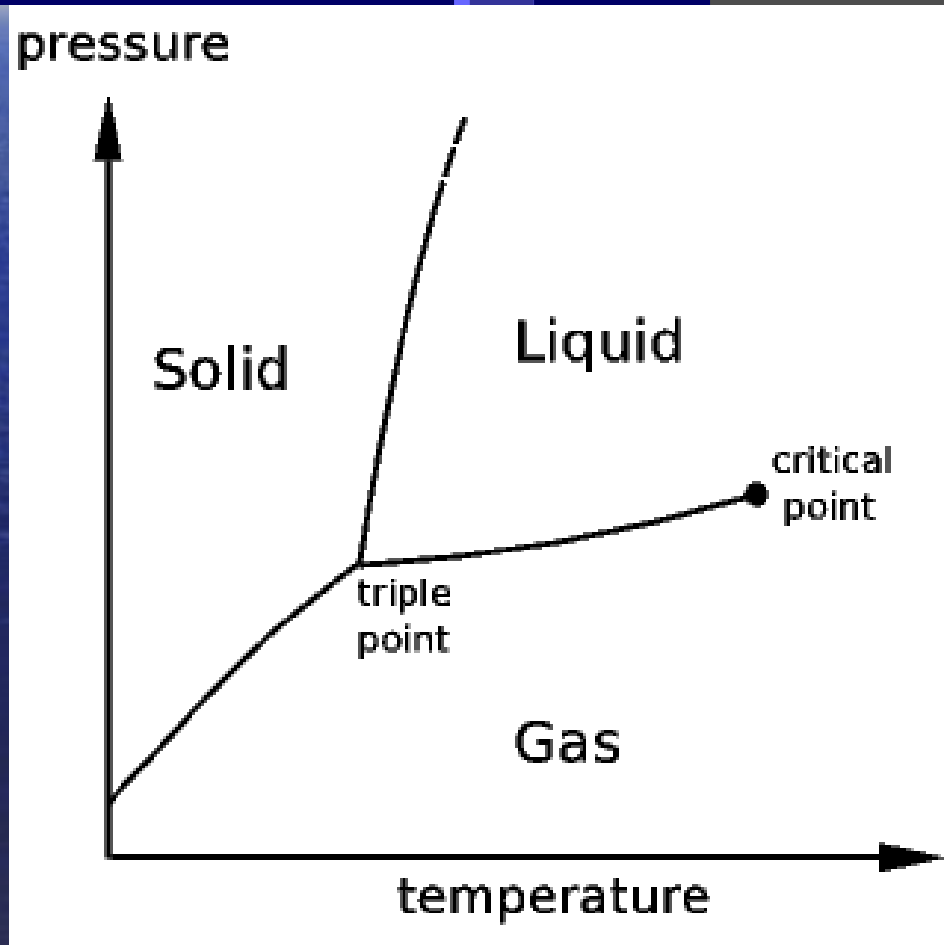
Value shared with users, who then repay host

Minimal cost, high payoff to creator shared with host

# Liquidity - phase change

From Wikipedia, the free encyclopedia.

In the physical sciences, a **phase** is a set of states of a macroscopic physical system that have relatively uniform ... physical properties.



# Let users lead

Eric von Hippel – Lead Users create breakthrough innovations

Create platforms to enable invention

# Structural Elements

Adaptive & Nomadic software

Ad-hoc communication



Mobile  
Devices



Public infrastructure



Public infrastructure



# Examples

- Use surveillance camera to create mobile video conferencing, room microphone to capture private version of meeting
- Use mesh broadcast among existing group for audio conferencing at project site
- Use wall display to provide better UI for smart-phone application (picture sharing)

# 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





# A “Social Dashboard”

Show user 's social context

Express and manipulate relationships

Multiple Perspectives based on context



# Creating a common platform

- Communications embedded in **context**
- Enabled by **identity**
- *Centered around awareness and discovery*
- *Cooperative use of common resources*
- *Negotiation*
- Open interfaces (APIs)
- Open negotiation protocols

# Awareness and Discovery

- Sensing:
  - presence/activity in neighborhood
- Signaling:
  - intent/interest/disinterest to neighbors
- Neighborhood:
  - Physical neighborhood (user centered)
  - Social neighborhood (user centered)
- Search:
  - Cooperative exploration using neighbors

# Structuring awareness and discovery

Configuration
Tracking
Event Routing
Authentication
Recognition Protocols
Wireless, Optical, Audio

Instantiate VMs (Gauthier)

Cerebro, SMOCS

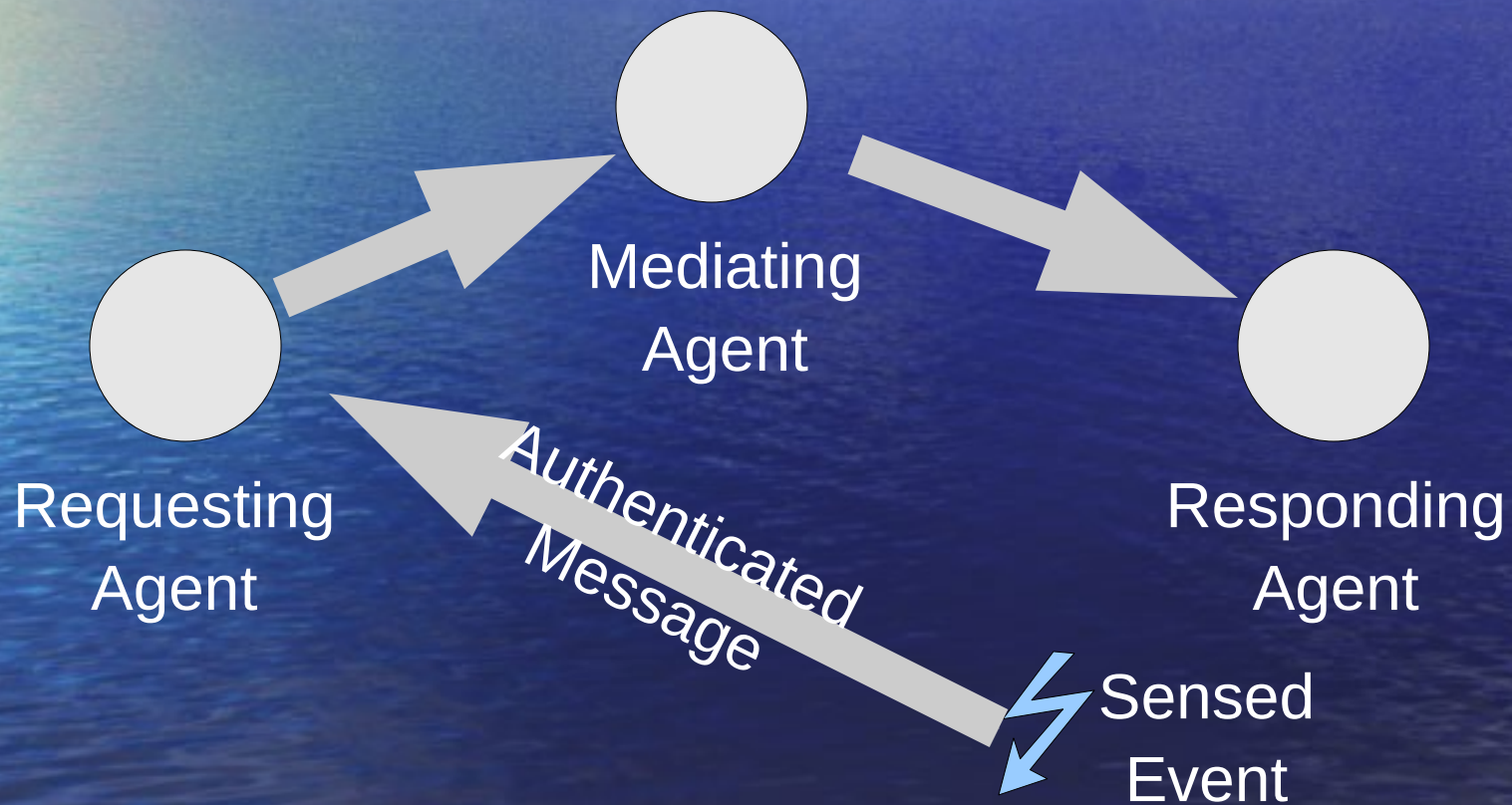
Multicast, Pub/Sub, overlay

PKI? Amulet?

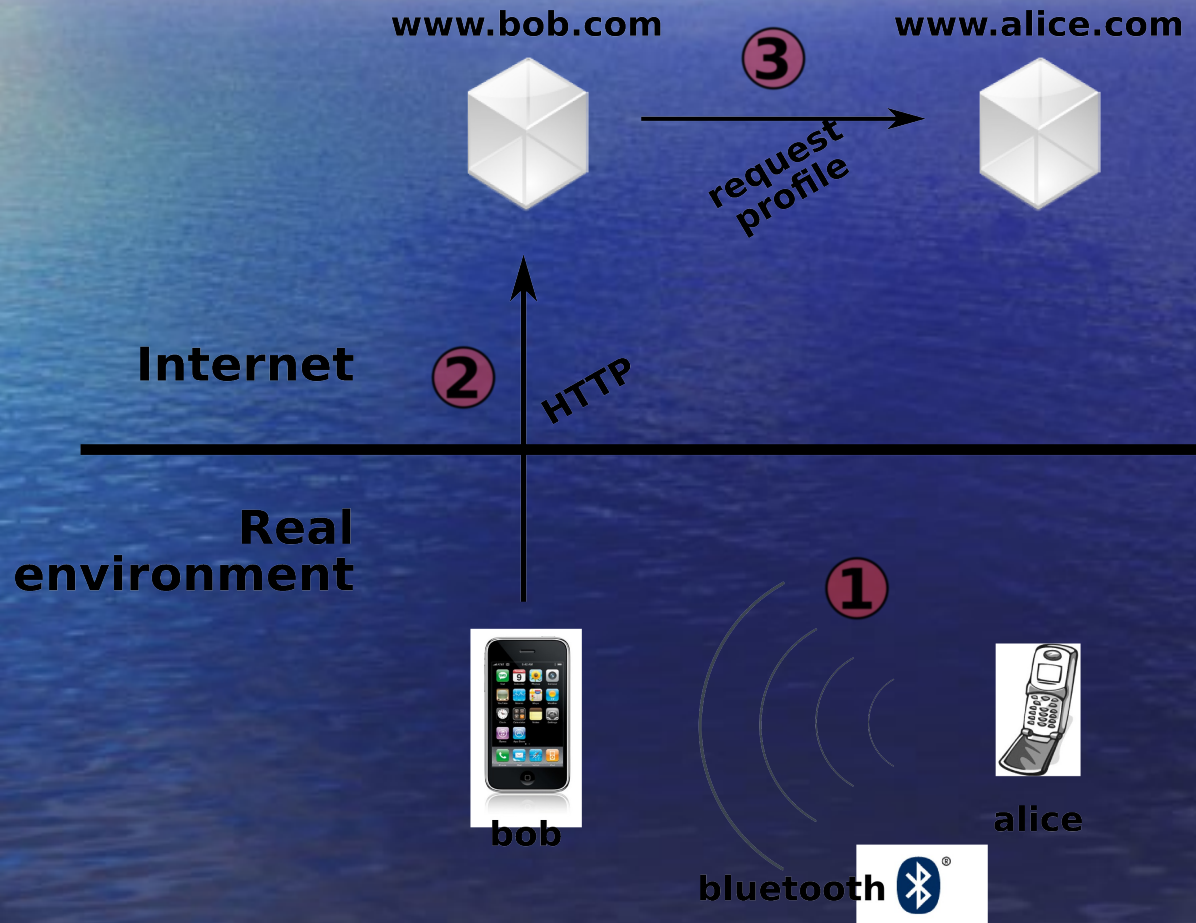
???

802.11/BT/SDR monitoring,  
Infrared scanning,  
Geolocation,  
Visual light scanning  
Microphone, Ultrasound

# Agent-based computing context (Ego)



# Tracking, Event Routing



# Novel expressions of the 3<sup>rd</sup> cloud?

## Experience metaphors

- Cloud 1: Web browser, web site
- Cloud 2: Web 2.0, Mashups, Amazon Web Services
- Cloud 3:
  - Social context in the UI
  - Mobile and local exploit each other
  - Adaptive places
    - Cheers: the place where everyone and everything knows who you are