

# One Future, Many Presence

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# Goals of Presentation

- Why We Failed To Make “The” Presence Standard
- Current trends in presence applications
- Presence Redefined
- Requirements for the Next Generation of Presence protocols
- Research Opportunities

# What is Presence?

RFC 3856: Presence, also known as presence information, conveys the ability and willingness of a user to communicate across a set of devices.

- Availability of a user:  
Open or Closed
- Selection from a set of devices at which user might be reachable
- Non-Semantic user status: “I am happy”
- Extended for capability of devices: Prescaps
- Extended for geolocation of devices
- Extended for current actions: IsTyping

# Many Standard Protocols

- IETF SIMPLE
- Jabber and IETF XMPP
- OMA Wireless Village

The nice thing about standards is that there are so many of them to choose from.

-- Andrew S. Tanenbaum, Vrije Universiteit, Amsterdam

# Proprietary Protocols

## “Presence”

- ICQ
- AOL
- Yahoo
- Skype
- MSN Presence

## “Micro-Blogging”

- BrightKite
- Loopt
- Facebook
- LinkedIn
- Twitter

Despite the presence of standards, proprietary approaches seem to dominate in today's market.

# And Plenty of APIs

- JAIN JSR 186 Presence API
- OSA/Parlay Presence API
- Parlay/X Web Service API
- Skype API
- Google Social Graph API
- Windows Live Presence API
- OpenAIM API
- and many more.

# Protocol Assumptions

- Little or no traffic between domains
- Unfiltered access to presence data
- Minimal concept of presence: open/closed plus a short text string
- Scale up by building bigger servers
- Presence information consumed directly by rendering to a user
- Relatively small presentity/watcher sets

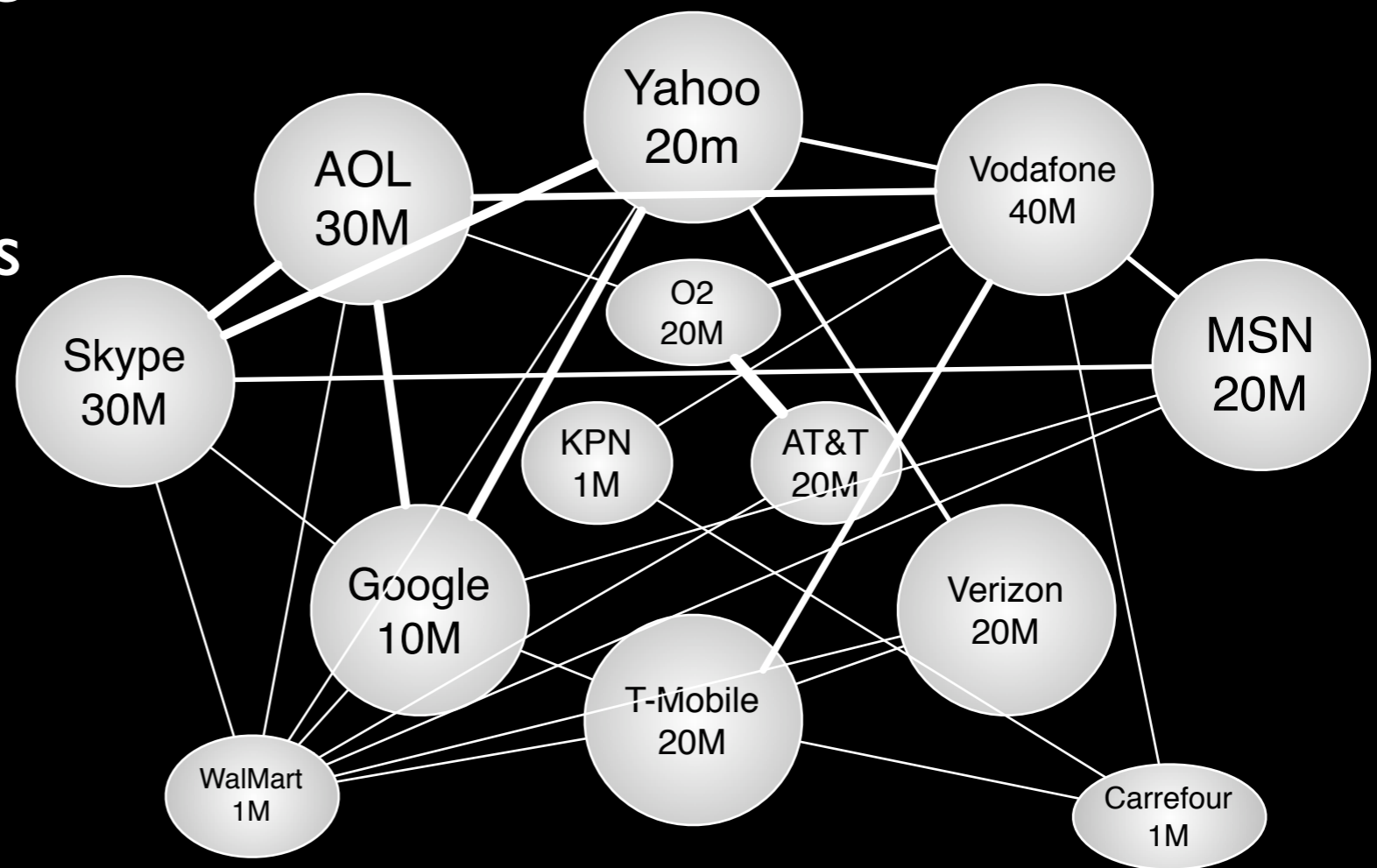
# Current Trends in Applications

- Massive interdomain traffic
- Presence data consumed by applications
- Filtered subset of data delivered to applications, with different selection modes
- Applications mash-up presence and other data, becoming more web-centric
- Huge data sets



# Massive Interdomain Traffic

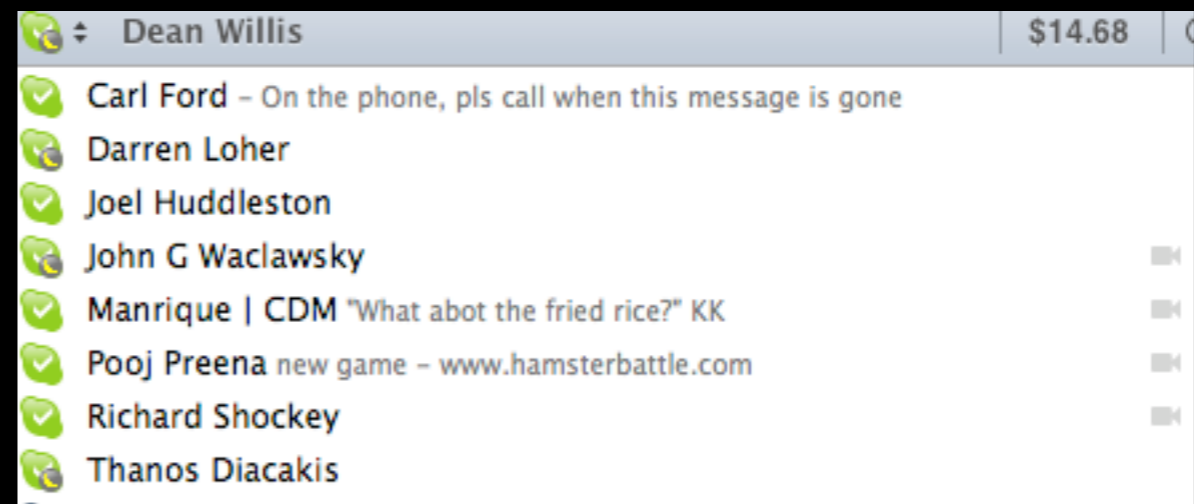
- Millions of presence subscriptions between large carriers, enterprises
- Many redundant: How many AOL users watch [billg@msn.com](mailto:billg@msn.com)?
- Trillions of notifications per hour



# Social Proprioception

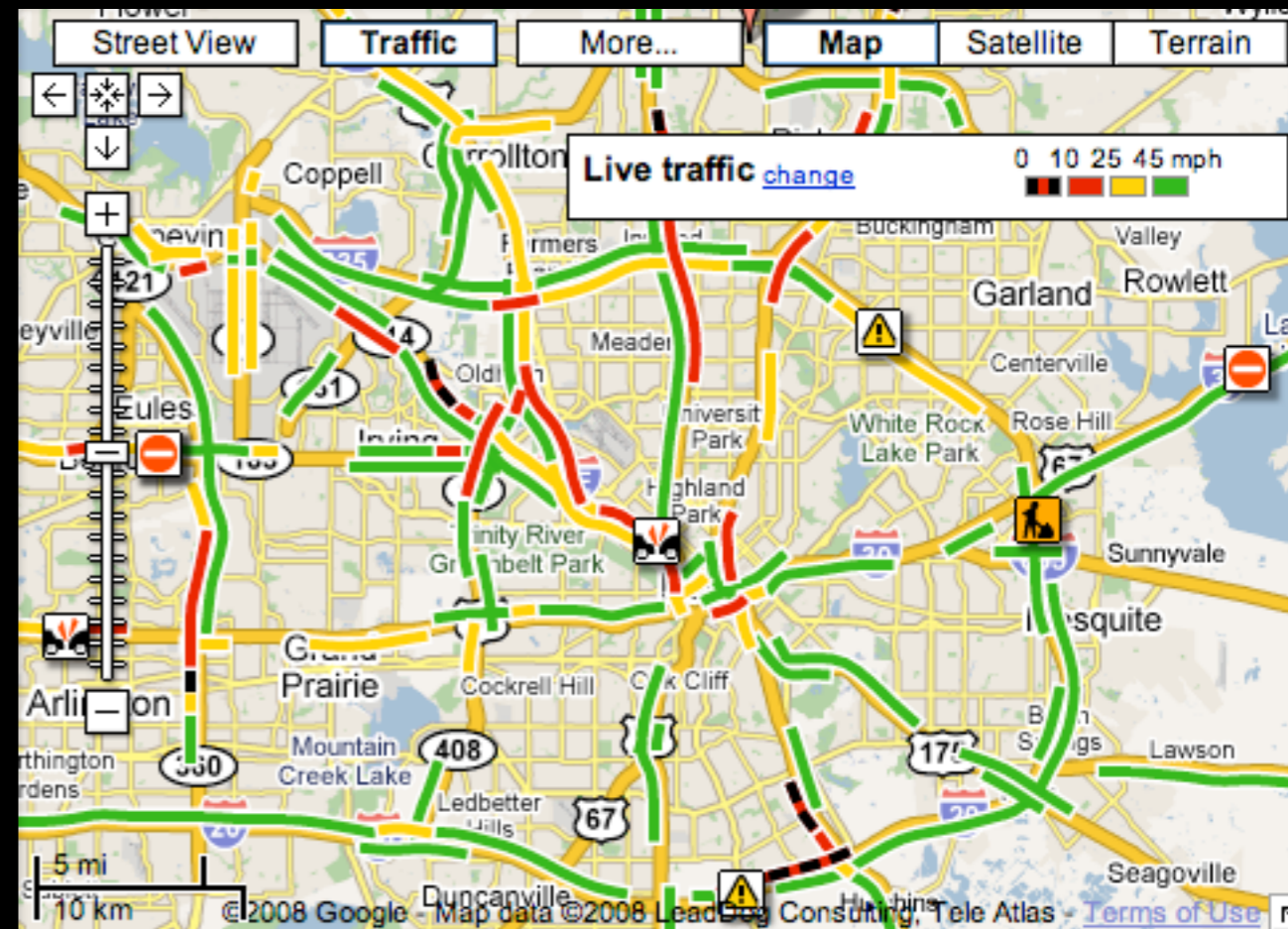
- Primary use of current presence applications is NOT to determine the availability of a user for a call.
- Presence extends the user's awareness of the state of the social network. Friends online? Busy? Location? Current thoughts?

I have not talked with these people in several months. But I still like to see their presence.



# Applications as Data Consumers

- Target presentity set may be dynamic.
- User may not know watcher.
- Limited subset of presence tuples needed.
- Complex consent and privacy issues.



Would you let Google Maps see your vector and nothing else if you were on a freeway?

# Richer Presence Concepts

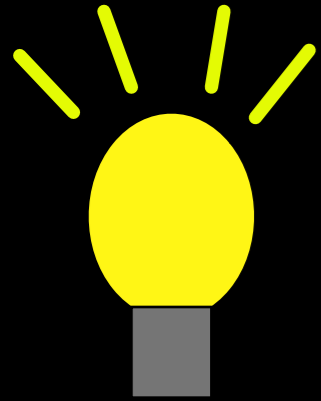
- Location
- Velocity
- Group membership
- Physical Proximity to Others
- Resource Capacities (Fuel, Memory, Screen space, etc.)
- Selection of dynamic subsets: Show all Arsenal fans currently within 1km of me
- Selective notification: Notify when user-entered state changes, not when 'busy' changes
- Semantics meaningful to automata

# Peta-Scale Computing

What would it be like to hear the murmurs and feel the mood of a billion people at the same time?

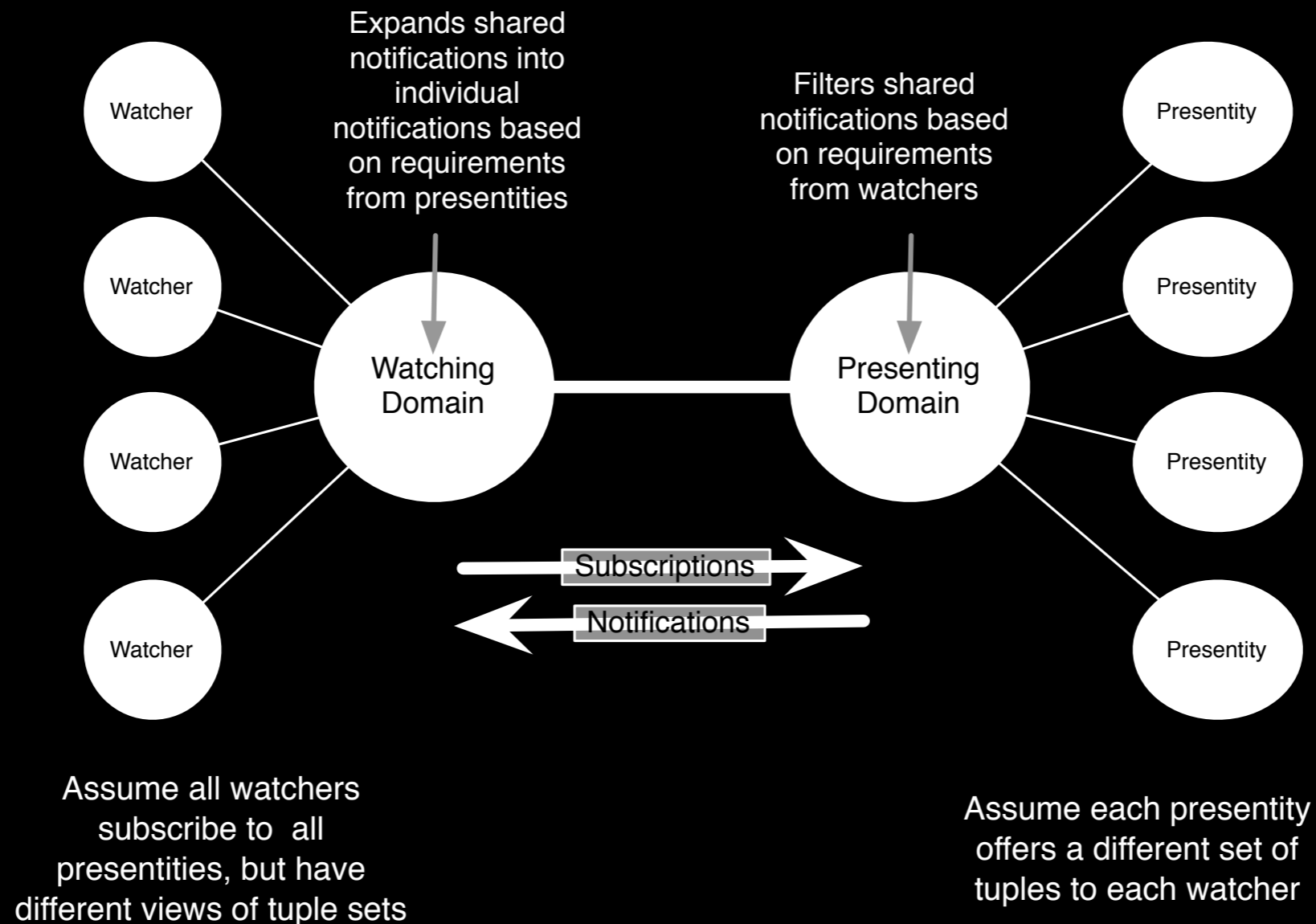
- Real-time Stock Market Projection
- Dynamic adaptation of State-of-Union address or live theater scripting
- Logistics: Product distribution, power management, etc.

# Presence Isn't Just for People Anymore



- Automata may consume presence information, either acting it on directly or turning it into some other kind of dynamic data
- Anything with a unique “identity” has associated presence information: Shipments, inventory, vehicles, pets, livestock, houses, control systems
- Presence and network management systems have much in common
- This increases the scale of the presence problem

# Interdomain Model



# Presence Redefined

- Dynamically updated information about the state of selected entities, where the information, states, selection, and dynamicity of update are variable and appropriate for the application.



# Further Requirements

- Eliminate interdomain redundancy
  - “Filtering” of data close to sources
  - “Expansion” of data close to end users
- Express dynamic selection and filtering
- Extend redistribution policy across domains
- Increase semantic range and specificity of presence data for processing by automata

# Filtering Close to Source

- Watcher(s) may not be interested in every tuple in a presence document. Why send them all?
- Watcher(s) may be interested in the value of some tuple(s) but may not wish to receive a new presence document when that tuple changes, only when some other tuple changes
- View sharing requires determining the minimum subset of data for the cross factor of a set of presences and a set of watchers

# Research Opportunities

- Reconcile petascale consumption with p2p. Can a watcher really support a billion subscriptions to presentities, or are aggregation layers needed?
- Efficient dialect for selecting presentities and tuples dynamically, esp. with geospatial bounding.
- Implications for privacy, especially legal implications. Is revealing an anonymized velocity and location a violation?