Fragments of Identity

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"Pure" systems issues are not conceptually new

- just another distributed system
- scalability tools are the usual ones
  - replication
  - hierarchy
  - offload work to clients
  - etc.

New systems issues are driven by social requirements
TWIST '99:

- "Pure" systems issues are not conceptually new
  - just another distributed system
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    - replication
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    - etc.
- New systems issues are driven by social requirements
Two parts to "internet-scale names"

- Assigning everything a unique address, somehow
- Mapping a user-friendly name to the right address
  - I'm only concerned with characterizing the latter problem
  - I'm not even going to tell you anything about the mapping -- just about the names.
Who Needs Names, Anyway?

- **People**
  - That's why this isn't a pure systems issue.
  - Machines can do just fine with entities like
    - 132.22.45.23
    - 0x84162B17
    - (Did you notice that those are the same value?)
  - Tough constraints:
    - Moore's Law doesn't apply to text on business cards
    - Or to hearing and remembering over a phone
My Special Concerns

- Presence and instant messaging
  - IMPP standards work in the IETF
  - by now, probably everyone on the planet knows about the AOL/Microsoft dispute...

- Handheld devices
  - especially interaction with presence
Three Kinds of Names

- People
- Devices
- States
Names for People

- You don't get to name people
  - they name themselves
  - and they change their name when they want!
  - no guarantee of uniqueness
    - lookup can't return 0/1 values
    - capability of "query refinement" required
      - there are 2 Mark Days in IBM
      - Mark Days on the net: physicist, health insurer, urologist, closing agent, filmmaker...
State of the Art?

- Same person:
  - mday@lcs.mit.edu
  - Mark Day
  - Mark_Day@lotus.com
  - Mark Day/CAM/Lotus@lotus
Three Kinds of Names

- People
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Handheld and other Devices

- Assuming I know who you are...
- ... how do I reach your
  - cell phone
  - pager
  - email
  - answering machine or voicemail
  - instant message inbox
Ownership and naming

- My ring
- My glasses
- My watch
- My laptop
- My cell phone
- My office desk
- My office phone
- My car
- My house

more likely to be shared by others
Big Devices

- How do you name a person's house?
  - apartment?
  - dorm room?
- How do you name a person's office?
  - cubicle?
  - meeting area?
- How do you name a person's car?
The upcoming nightmare

- You're in a room filled with other people
  - each with one or more devices
- Your device can establish communication with one or more others
- How do you pick the ones you want to talk to?
- This is already an issue in Bluetooth
  - "conferencing" scenarios assume pairwise introductions of devices
Three Kinds of Names

- People
- Devices
- States
What states do you want to expose?

- Available / unavailable
- Available / busy / idle
- Active / do not disturb / away
- Available to my team / available to all / disturb in emergency / really unavailable
- you get the idea...
Are these really names?

- Yes
  - Assuming that you register the machine-readable meanings somewhere,
  - and if you don't, it's hard to get your client to do the right thing on a new markup.
  - The challenge is to have a good shorthand for those.
  - URLs don't really cut it as shorthand for states.
    - might work OK to identify namespaces
Conclusion

- Naming people, devices, states
  - biggest challenges are human and social
    - short intelligible names
      - for a huge and dynamic universe
    - unambiguous identifiers
      - for ambiguous entities and relationships
  - build the systems for the people
    - not vice-versa