

Motivating Scenario 1:

Networking 1M interacting people for
1,000 hours using at least 1 Gb/s for
each user

"Tele*, collaborative spaces, and reality
TV on an overlaid Internet"

Technologies stressed

- ❑ QoS
- ❑ overlays (QoS sensitive, multicast)
- ❑ security, privacy
- ❑ mobility (reach people where they are)
- ❑ heterogeneity
 - devices: wearable, handheld, desk, lap
 - networks: telephone, wires, 802.11
- ❑ reliability
- ❑ self-managing
- ❑ scalability
- ❑ measurement
- ❑ opportunities for others: social scientists, end user interface design

Strategic issues

- ❑ can probably see how to do a lot of this
 - (too easy?)
- ❑ leverage: ESM, Planetlab, tele* apps
- ❑ easy to add new capabilities as end user apps
- ❑ demonstrate how this would be difficult over IP only
 - (no QoS, multicast)
- ❑ obvious scalings: 10 people for 10 hours (we're partway there) to 1M people for ?
- ❑ we'll know when we are there
- ❑ sound bite aspects
 - Understandable by all
 - too voyeuristic?
 - "we can do this with webcams"

Challenge 2:

Deploy 1,000 mobile emergency response workers, equipped with comm's over 1,000 m² in 1,000 seconds

Technologies stressed

- ❑ everything ad hoc and mobile
- ❑ QoS
- ❑ group communication
- ❑ self-managability, configurability
- ❑ heterogeneity
 - devices: wearable, handheld, desk, lap
- ❑ distributed services built using overlays
- ❑ dynamic coalitions: integrating groups, individuals with security, privacy concerns

Strategic issues

- ❑ obvious social benefit: homeland security, disaster recovery,
- ❑ national interest
- ❑ leverage: ad hoc, UCSD, Columbia working on this now (many others as well, probably)
- ❑ extensible: add deployed sensors into the mix
- ❑ obvious scalings: 10 people for 10 hours
- ❑ we'll know when we are there
- ❑ sound bite aspects
 - understandable by all

Challenge 3:

Transfer 10 1G files to 1000 users
in 100 seconds
[at any cost? - can buy a GigE switch +
RM for that today]

Technologies stressed, Strategic issues

Technologies stressed:

- optical backbone
- last mile
- making things "go fast"

Strategic issues:

- pure technology push
- speaks to "need for speed" networking researchers

Challenge 4:

Performance prediction:
1M end systems [doing what]?

Technologies stressed, Strategic issues

Technologies stressed:

- modeling, analysis, simulation
- scale

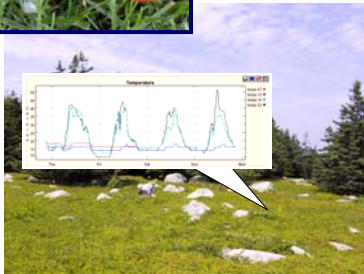
Strategic issues:

- Pose/specify network: access nets, backbone link speed, exogenous user inputs, failure/change modes of network
- challenge: what is the user, network performance
- want to also examine control, response to change
- speaks (partially) to network science

Challenge 5:

Architectures for sensor net systems:
Design, build 3 very different sensor
net systems, identifying common
architectural elements

Architecture: stovepipes or layers?



Duck Island: habitat sensing net



Oklahoma: atmospheric sensing net

Challenge 6:

In a network of networks with 10,000 networks, recover in no more than 0.1 seconds from any failure

Challenge 7:

Have a non-technical user set up a family network in a home, with multimedia conferencing/telephony, email and web, in less than one hour