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Reinventing the Internet for Mobility

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(with contributions from the GENI Wireless Working Group)

Where does the Internet fall down?

- Mobility
- Security[↓]
- Performance
- Economic Incentives
- Wireless, Optical Technologies

Glimpses of a Wireless Future

- Mobile Network Access
- Mobile P2P
- Ad-Hoc Nets
- Cognitive Radio
- Sensor Nets & Pervasive Systems

What is Required to Make Wireless Support 1st Class?

- Naming & Addressing Flexibility
- Mobility Support
- Location Services
- Self-organization & Discovery
- Security & Privacy
- Decentralized Management
- Cross-layer protocol support
- Economic Incentives for Sharing

Band-aids on the Architecture

- None of these requirements were significant in the original Internet architecture
- Years of effort has resulted in a series of incremental patches
- The resulting network is more fragile and is losing many of the properties that made the Internet successful

Let's create a network that will supercede the Internet

- NSF Future Internet Network Design (FIND) supports research looking 10-15 years out
- NSF Global Environment for Networking Innovations (GENI) is facility to conduct research

What is GENI?

- GENI allows exploration of new architectures at large scale, in a systematic way
- Resources are shared through virtualization
- New architectures are created through composition of modularized functions

Going from Research to Deployment

- Thinking about a new Internet will free architects to include important “new” requirements (e.g., mobility, security)
- Good ideas from this effort will find their way into the deployed Internet

More info

- GENI: <http://geni.net>
- FIND: <http://www.nsf.gov>