

# **GENI/FIND: Academic And Industrial Perspectives**

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# Outline Of The Talk

- A sample of academic views
- A sample of industry views
- Recommendations

# **Academic Views**

# Reasons To Pursue GENI

- DARPA funding has dried up; we need NSF to fill the gap
- NSF simply doesn't have a big pot of money for networking research (CISE only has about \$40M in discretionary funds), so we need to build a facility to tap the MREFC pot
- If we get all that money, some good will come of it
- In the 1980's we had CER, and many groups were doing experimental research; if money is made available, everyone will be doing experimental research again
- If we don't grab the funding, the money will go to physicists or biologists

# Reasons To Pursue GENI (continued)

- We can't answer all the “what if” questions:
  - What if everything is virtual?
  - What if everything is programmable?
  - What if the absence of a giant testbed is the only thing holding back research that can drive the next round of economic development?
  - What if the academic community dreams up a totally new Internet that is much better than what we have, but no one pays any attention because it has not been demonstrated at full scale?

# Obtaining Community Support

- This project will open the door to many new papers
- GENI is just PlanetLab<sup>++</sup> with much larger clusters, and you know how many publications came out of PlanetLab
- To generate lots of papers, we need to emphasize virtualization
- To get the attention of the National Science Board and Congress, we need a big vision — we *must* tell them that we will completely replace the Internet with something that will drive a new round of economic development
- There's so much money, there will be enough for everyone who supports the proposal

# Obtaining Community Support (continued)

- Members of the community are either with us or against us

# Industry Views

# Reaction To The GENI Plan

- If this is a testbed, what will be tested?
- Shouldn't the experiment be defined before designing the facility needed for experimentation?
- Why does *everything* have to be virtual at the same time
- In terms of underlying technologies, academics are behind the state-of-the-art
- Do they seriously believe that the only way to make an improvement is to replace the entire Internet?
- Academics need a dose of reality

# Reaction To The GENI Plan (continued)


- The academics keep talking about overlays, but the only redeeming quality of overlays is that they allow one to pretend to design and deploy real networks and services
- We shouldn't bother talking to them because it's a waste of our time
- Let's stay out of it until we see whether they produce anything remotely connected to reality

# **When Research Goes Awry**

# The Downside Of Success

- The Internet was a wonderful research project overcome by commercial success
- As we moved into the twenty-first century, Computer Science decided that research should be measured by startup companies and revenue potential

# A Doomed Approach

- Building a research program around a business plan means sacrificing clarity of ideas in favor of economic viability
-  Important note: at the time of the work on the original Internet, economics favored X.25 and technologies from DEC and IBM

# Let's Not Kid Ourselves

# Science Gone Amok

- The worst has happened: Computer Scientists have met marketing and sales people, and have picked up the bad habit of hyperbole
- Research proposals make outrageous claims:
  - The Internet and TCP/IP are so badly broken that they need to be replaced wholesale
  - The proposed research will lead to a new Internet that is: scalable, general-purpose, robust, resilient, manageable, flexible, secure, and supports voice, video, new multimedia applications, and the web N-dot-zero paradigm as well as mobile wireless sensors in an ad-hoc, self-organizing, low-cost, delay-tolerant, power-friendly manner!

# Recommendations

- Drop the hype
- Instead of using the economic impact of the current Internet as a goal, focus on ideas and approaches that have intellectual merit
- Instead of trying to save the world, start with a small, concrete goal of solving a specific problem and explore tradeoffs
- Define the problem being solved and the approaches to be tested before designing an experimental testbed
- Collaborate with industry to
  - Stay grounded and assure technology transfer
  - Understand the current state-of-the-art

# A Final Thought

You've got to be very careful if you don't know where you're going, because you might not get there.

— Yogi Berra



**CISCO**



**Questions?**

*Thank You.*



**STOP**