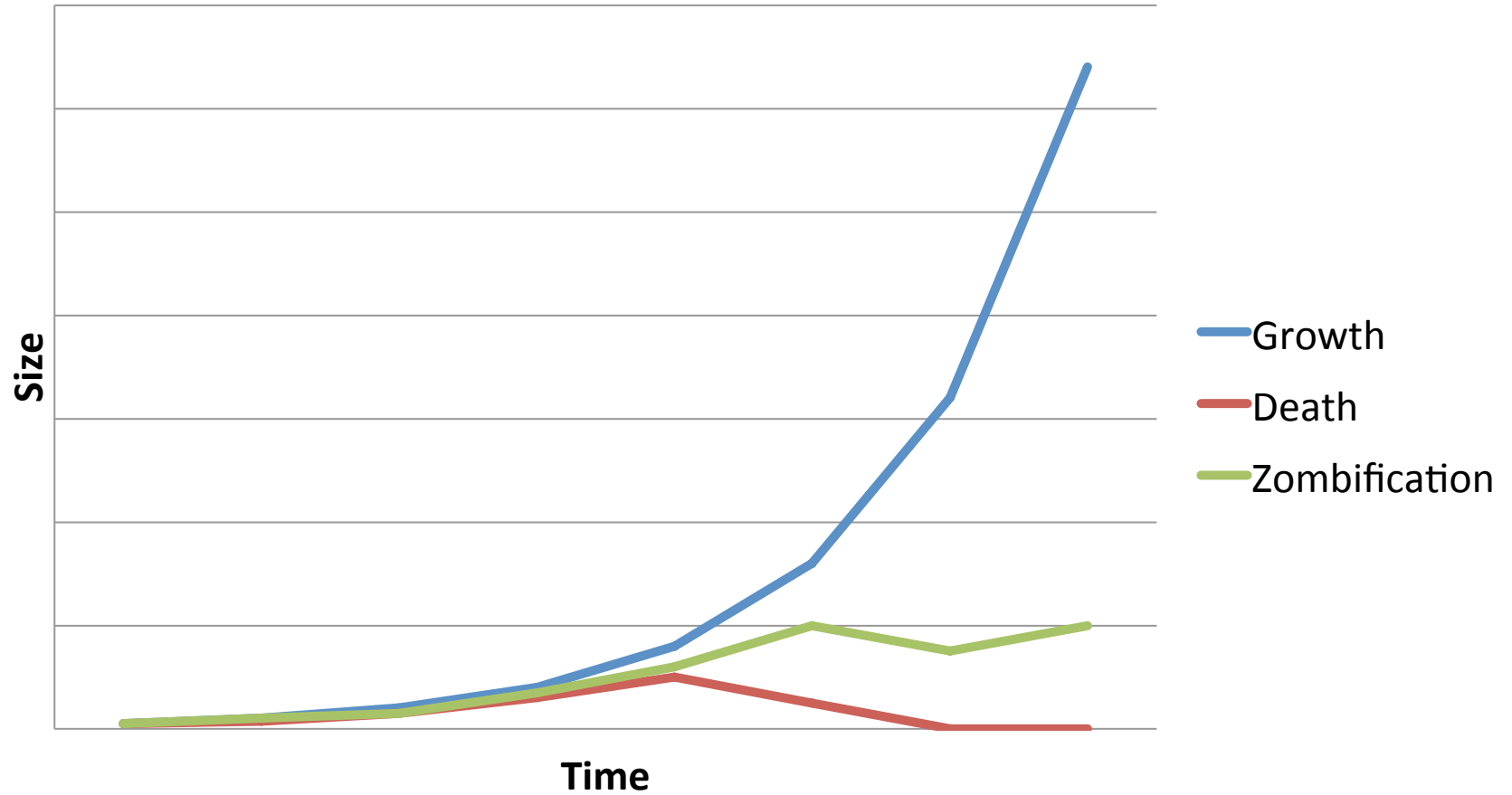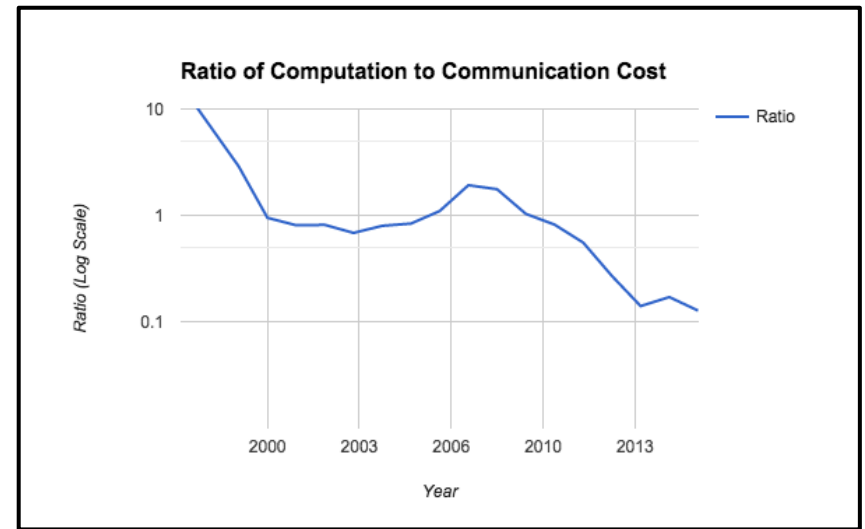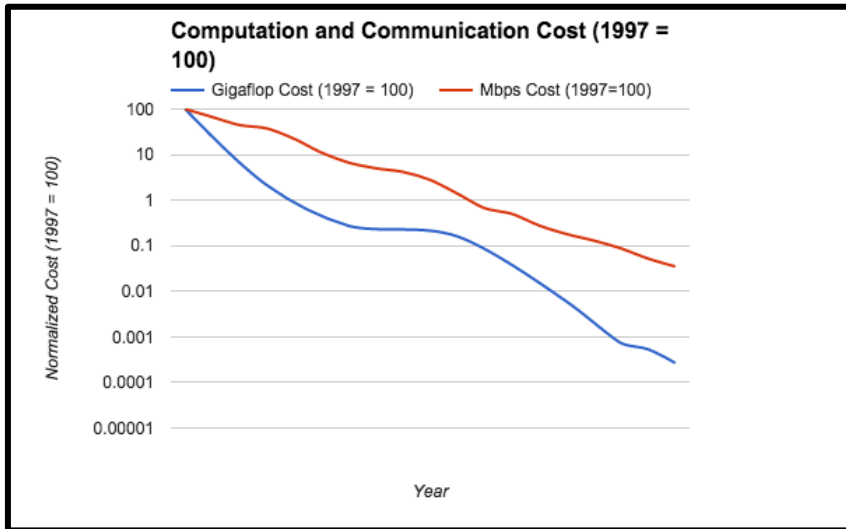# The Future of GENI: Go Big Or Go Home

Rick McGeer

US Ignite/CDG

The Fates of Infrastructures

The Future Is Ours...

Computation and Communication Cost (1997 = 100)

Ratio of Computation to Communication Cost

- Price:Performance of Computing Dropping Much Faster than Price:Performance of Communication
- ➡ Trade Local Computation for Data Transmission
- ➡ Future of Systems is *Distributed Systems*

…If We Don't Blow It

- GENI is the *Premier* World Distributed System Platform
  - ✓ Many Points of Presence (> 50 across the US)
  - ✓ Developer-programmable network
  - ✓ Federatable with similar platforms
- ➡ Low Latency/High Bandwidth To Anywhere
- ➡ Developer Control of Performance-Critical Component
- ➡ Easy to Join and Grow

How We Can Blow It

How We Can Win

I'm developing my system on a commercial provider. It sort of sucks, but it's cheap and really easy!

Why don't you use GENI? All you need is your eduroam email and password. It's 5 mouse clicks to allocate 50 VMs across the continent. 3 of the 5 clicks are login.

What was I thinking?

How We Can Blow It (II)

How We Can Win (II)
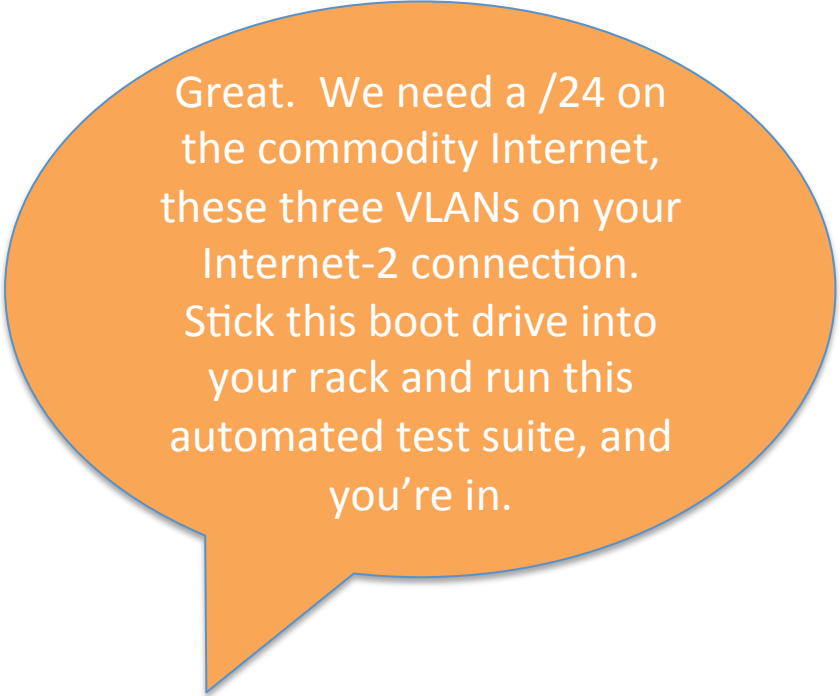
How We Can Blow It (III)

How We Can Win (III)

How We Can Blow It (IV)

How We Can Win (IV)

Other Stuff We Need To Do

- Continue/broaden federation/interoperability
  - Use SAVI Federation Model Externally (ask SAVI to lead this…)
  - Immediate Federation with other NSF infrastructures
    - Chameleon, CloudLab, PlanetLab, APTLab
    - Should be easy
    - Multiple levels (from cross-federate embedded infrastructure to slice exchange)
- Make GENI even easier to use
  - Offer distributed PaaS
  - Better VMaaS tools (expose/embed OpenStack)

Stuff We Need to Do (II)

- Continue and deepen recruitment efforts at other communities
  - eScience (Paul/JoeM/Ilya), SmartCities (Ignite), Education (Ignite/Vic/Niky), others
  - Documentation and tutorials!
- Innovators Run Infrastructure
  - Proven formula for breakthroughs and productivity
  - Innovators know how to make it easy to use (they are the users, after all)
  - Dev/Ops shortens cycles

Agenda and Takeaways

- Sustainment/Refresh Plan
  - NSF funding/fee-based/transition from A to B?
- Principles of Operations Plan that Focuses on Ease-of-Use, Federability, Easy-to-Join
- Governance/operations structure that leverages strengths of researchers (understand user community, develop the software, intuitive feel for user-focused policy) and of operators (process, availability, operational skills)

Thanks!