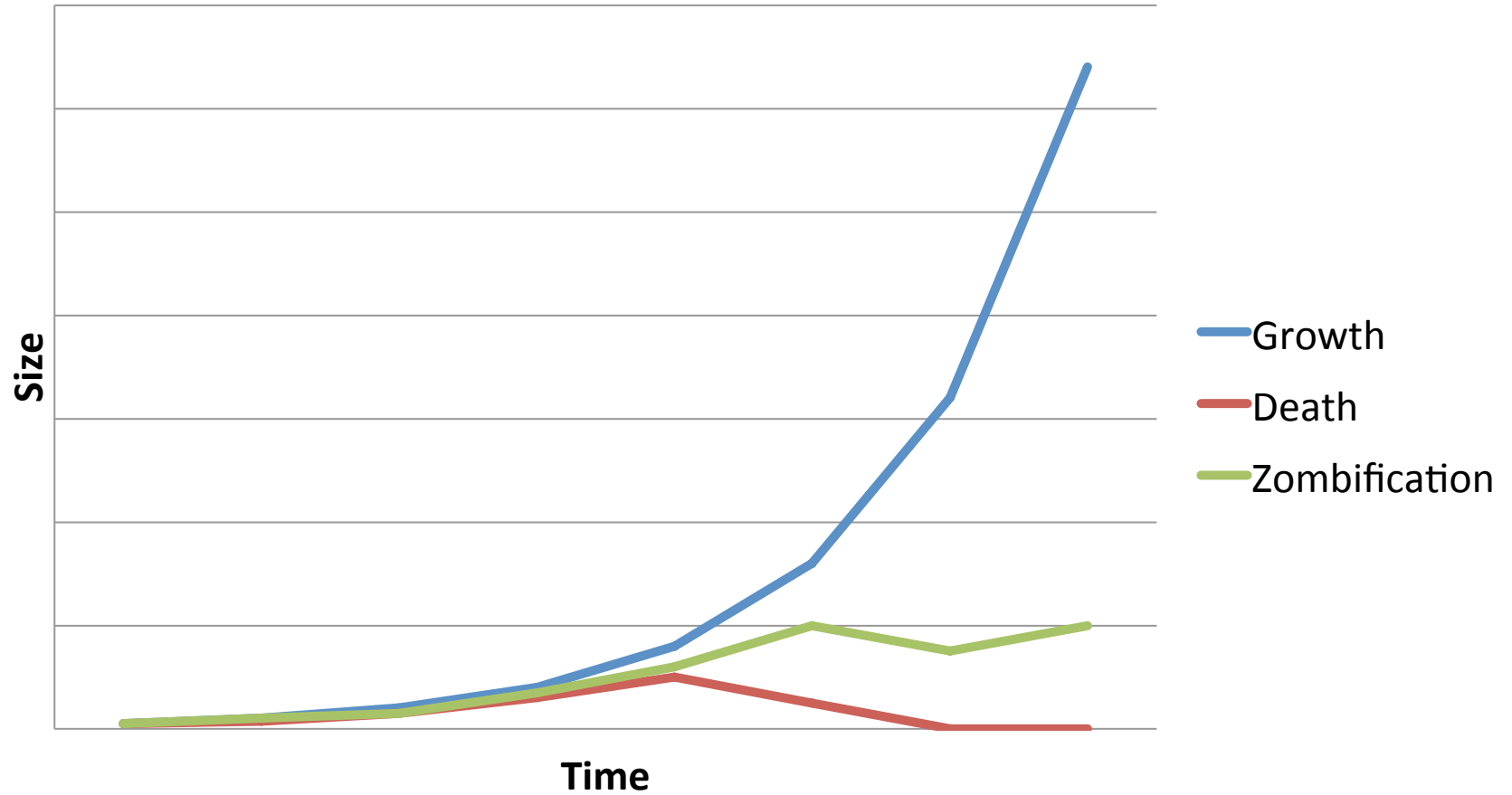


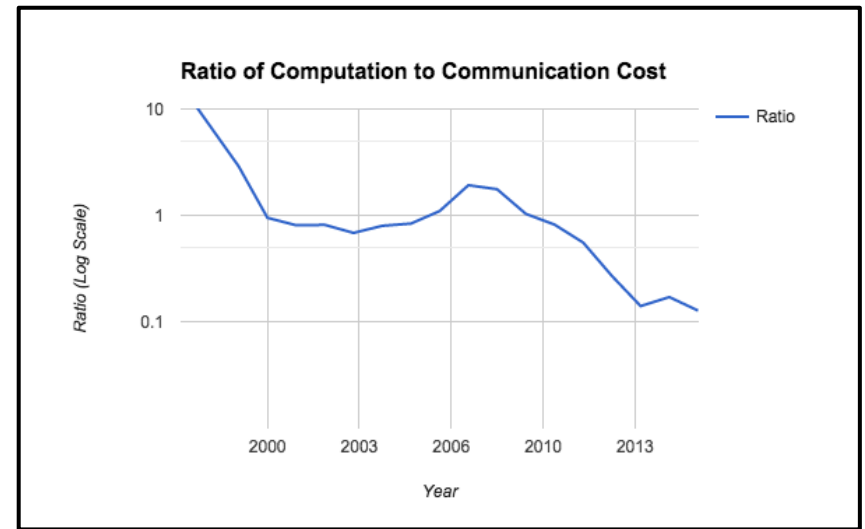
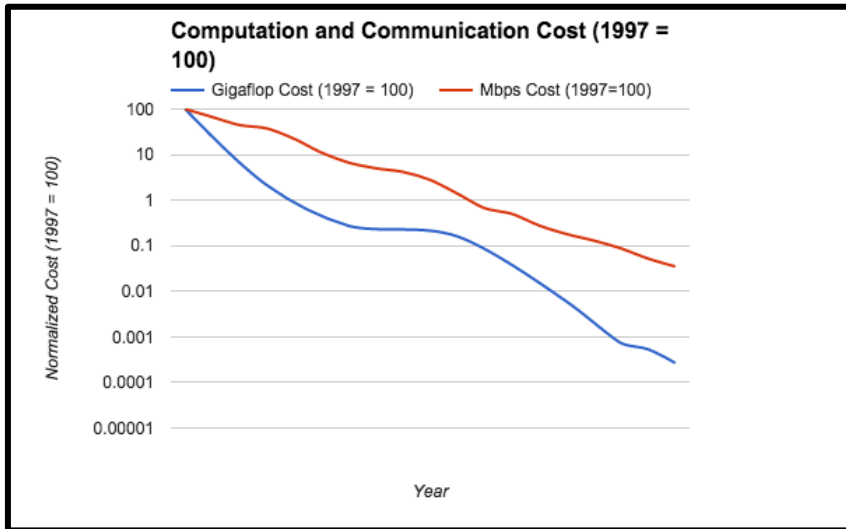
# The Future of GENI: Go Big Or Go Home

Rick McGeer  
US Ignite/CDG

# The Fates of Infrastructures



# The Future Is Ours...



- 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

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? It's much better, it's free, and all you need is permission from your Department Chair, Dean, CIO, Research VP, the GENI Project Office, and have them all electronically sign these certs. In triplicate. Make sure you keep copies and remember, access is only by password-protected keys!

It's a lot easier to give them my credit card than to do your paperwork!

# 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)

I'd like to join  
GENI!

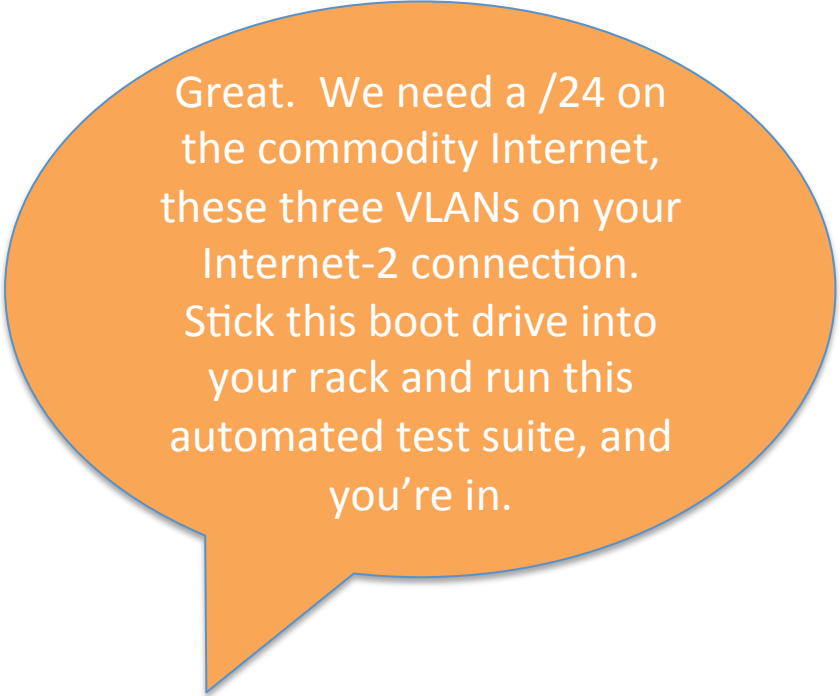
All of the paperwork to use  
GENI PLUS a two-week  
people-intensive  
installation procedure PLUS  
eight weeks of acceptance  
tests

Never mind....

# How We Can Win (II)



I'd like to join  
GENI!



Great. We need a /24 on  
the commodity Internet,  
these three VLANs on your  
Internet-2 connection.  
Stick this boot drive into  
your rack and run this  
automated test suite, and  
you're in.




Done!



# How We Can Blow It (III)



I need a  
nonstandard  
resource in my  
slice



Blah policy blah resource  
allocation blah permissions  
blah...




Never mind....

# How We Can Win (III)



I need a  
nonstandard  
resource in my  
slice



Won't break anything.  
Done. Go nuts.



Cool. Thanks.

# How We Can Blow It (IV)

Half of the racks  
are obsolete or  
down

Oops. We never put in  
place a refresh plan

I'll go find a Cloud  
that runs the  
current Ubuntu  
release

# How We Can Win (IV)

What's this new hardware for?

Your rack is obsolete.  
Please boot the GENI image  
on the new one and feel  
free to use the old one for  
w/e

Thanks!

That's what you pay your  
dues for...

# 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!*