Some GENI thoughts

Nicholas Weaver

International Computer Science Institute

All opinions are my own
GENI’s Vision Appears to be Separate Testbeds

- GENI appears to be a group of separate facilities:
  - The *Emulab*-style component:
    - Centralized cluster
      - Interconnect is as critical as processing
    - Commercial equivalent: *EC2* with VLANs
  - The *Planelab*-style component:
    - Many distributed endpoints over commodity Internet
      - Diversity of locations is the greatest asset
    - Commercial equivalent: *Akamai*
The Emulab Component: Federation Considered Dangerous

- For small experiments, federation doesn’t help
  - It will fit in a single sub-testbed
- For large experiments, federation is dangerous
  - Unless the experimental topology’s bottlenecks match those in the federation’s arrangement, the experiment can’t be mapped
- Focus on federation distracts from the proper structure: All emulab-style components should be in a single, centralized facility
  - Bandwidth bottlenecks can not be economically removed
    - Compare the price of 10 Gbps national links to the price of 10-Gig Ethernet cables
  - Latency bottlenecks can never be removed
The PlanetLab Component: Needs Many More Endpoints

- Goal should be 2000+ end-points, worldwide, as close to the end-users as possible.
  - This requires that ISPs want to deploy Geni-PlanetNodes
- Develop an application which saves everybody money
  - P2P without caches is very bad for ISPs and customers
  - P2P with caches is very good for ISPs, customers, and content providers
- EG. A BitTorrent cache architecture
  - Troll for torrents
  - Connect only with isp local clients and trade cache data
  - Handle the DMCA complaints automatically
    - If the infrastructure is missing, applications still work unchanged
  - Calculate bandwidth savings on the nodes
    - A fraction of the saved bandwidth is now available for Geni-Planetlab style experiments