

# **Longitudinal Internet Measurement: Problems and Possible Paths**

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# **1st Layer of Problems**

- **Generally need more measurements from more vantage points over a longer period of time**

# 2nd Layer of Problems

- Invisibility problems
  - home networks, cloud networks, etc.
- Snapshot problem
  - we tend to measure things once and report without sustaining the measurements

# 2nd Layer of Problems (cont.)

- Moving sands issue
  - measuring the same thing doesn't always mean running the same code
- Vantage point issues
  - we measure where we can, but our individual reach is often limited

# 3rd Layer of Problems

- Incentives
  - publication, promotion, graduation, etc. favor novelty over sustained effort
- Lack of interest in sustaining measurements

# 3rd Layer of Problems (cont.)

- Funding
  - too hard to get small bits of money to sustain small-ish measurement efforts
- Structure of network just naturally hides things now
  - e.g., what happens “in the cloud”?

# Existing (Underused?) Solutions

- FCC's MARS program: Measure Broadband America-Assisted Research Studies
- Possible role for NSF/community in oversight board
- Individual projects can use linode, etc.

# Moving Forward: Easy

- Study what has worked and why
  - e.g., Atlas, DNS DITL, RouteViews/RIS, etc.
    - Dimensions: ease of use, uniqueness of data
    - Many funded from operations community
  - How do other communities (e.g., astronomy) sustain infrastructure and measurement? How do they decide what to support and collect?
  - Also HPC (CICI, C\* programs) and connectivity (going back to NSFnet)



# Moving Forward: Easy

- Could there be a lightweight way to obtain small amounts of money for maintenance?

# Moving Forward: Medium

- Can we evolve incentives towards prizing developing and sustaining things useful to others?
  - infrastructure, data collection, etc.
  - IMC session or paper type for reappraisal
  - awards, promotion guidelines, citable datasets
- Transition measurements and/or infrastructure to some organization to sustain while freeing individual faculty from the task?

# Moving Forward: Hard

- Can we encourage more industry / academic collaboration in some way?
  - e.g., more industry consortiums  
(or better use of existing consortiums ...)
  - e.g., by encouraging joint appointments
  - e.g., by figuring out how to better share industry data
- (See Session 6)

# Moving Forward: Hard

- MBA has been cited as useful, but not scalable in # of experiments and can't name names
- could it provide the starting point for some PlanetLab++ sort of infrastructure?
  - how to arrive at common deployment to meet most needs?
- could we shoehorn in home and mobile networks?