

# Application level measurements: Trends and directions

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NeXtworking'03 June 23-25,2003, Chania, Crete, Greece

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## Measurements research

- Characterization (traffic picture, trends)
- Active/passive measurements
- Protocol-specific (DNS, BGP, HTTP, P2P, ...)
- Modeling issues, routing, topology (big picture)
- Statistical properties, reverse engineering from without, tomography
- Anomalies

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## Application level measurements

- Should be easy, no?
- No grubby details, easy to obtain/parse
- Simpler, better understood code, easy to generalize
- Not!
- Interaction with network layer often causes problems

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## Steps in measurement process

- Infrastructure: packet monitors, tcpdump, combinations
- Storing/moving data (early filtering/aggregation tension)
- Processing/analysis (Perl is not an option)
- Validation/sharing (almost never done)

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## Measurement infrastructure

### Hardware

- Expensive, hard to genericize/replicate, move around, install
- Rarely communicate (work in progress)
- No defined interface for communication

### Software

- tcpdump, tcpdump, tcpdump, tcpdump, and did i mention tcpdump?
- \*ing (bing, ping, sting, ding?)
- netflow! (What an uncontrollable mess)
- low/no expectations in the community

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## Storing/moving data

- Assuming data is obtained, can't always move from measurement point to analysis point quickly
- Data has to be moved to not clutter collection point but takes bandwidth
- Can't always store cleverly
- data warehouse! store once, query never (use my db, my sql, my my)

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## Processing/analysis

- Perl! Semi-precious
- Python! Anaconda
- Write C/C++ from scratch
- Change log format, change code!
- Willing to wait days, not minutes

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## Validation/sharing

- Validation? Er, why?
- My data - won't give it out (ATT)
- Legitimately speaking: customer privacy
- Anonymization (and anonymization code)

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## Software's role

- We deal in volume and good software is indispensable
- Good means portable, scalable, configurable, fast
- New techniques are of interest (Gigascop, graphs, generic scanners)
- Place in PlanetLab?

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