

# Experiments and Measurements on the Internet

Two Use-Cases with RIPE Atlas  
and  
Discussion

# Goals and Motivation

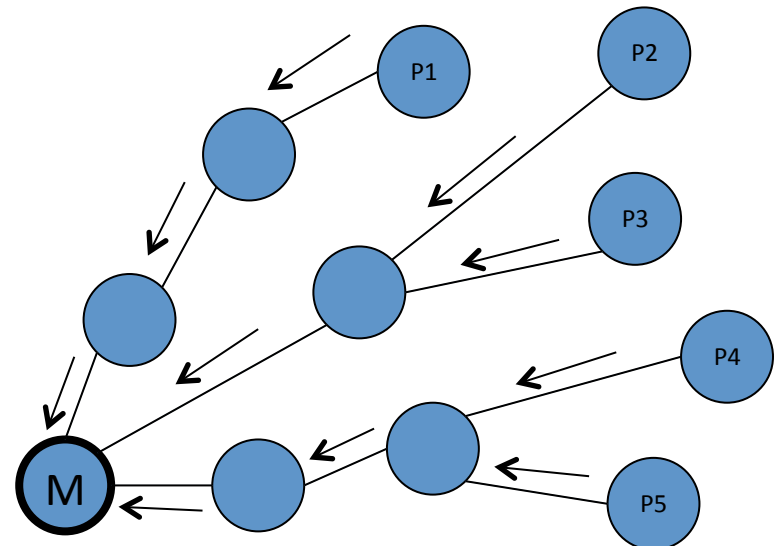
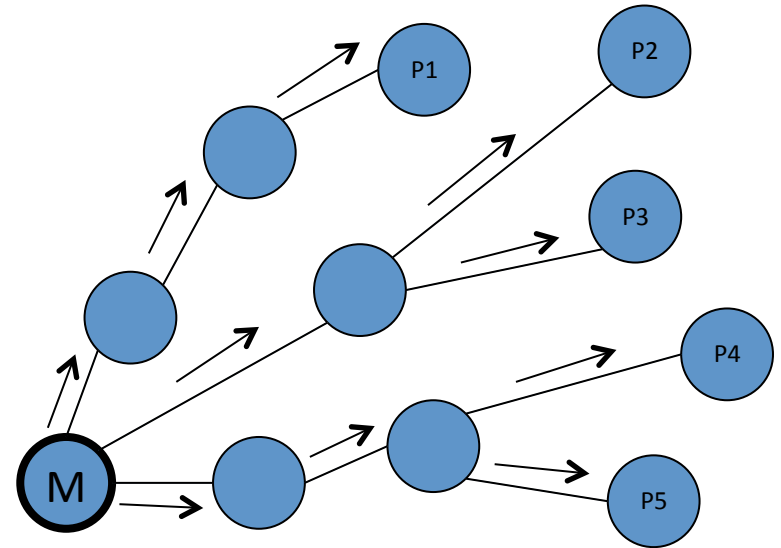
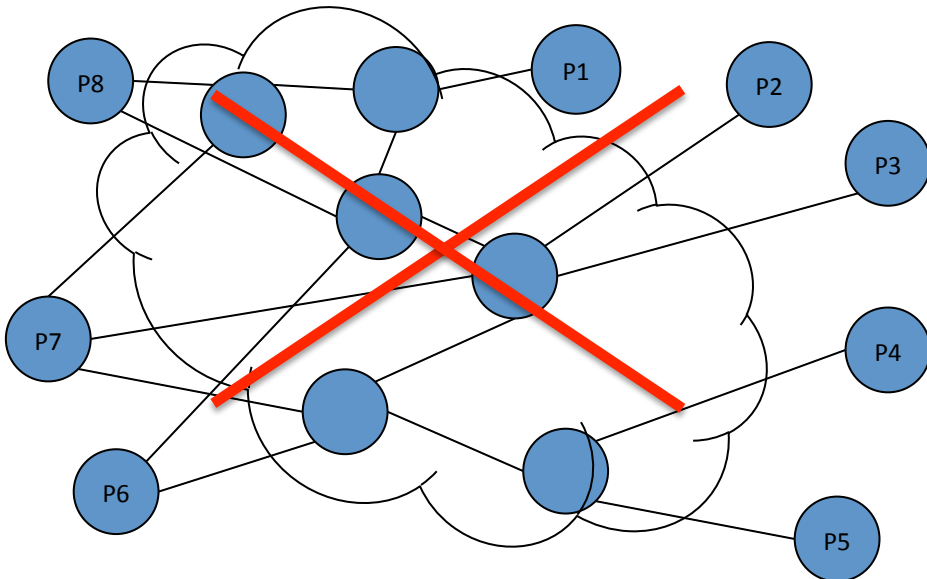
- Show community examples of running large scale measurement experiments
- Give insights in measurement methodology
- Trigger discussion on measurement methodologies
- Create community or involvement in running experiments (measurements, analysis, and tooling)

# Identifying IPv6 Fragmentation Problems

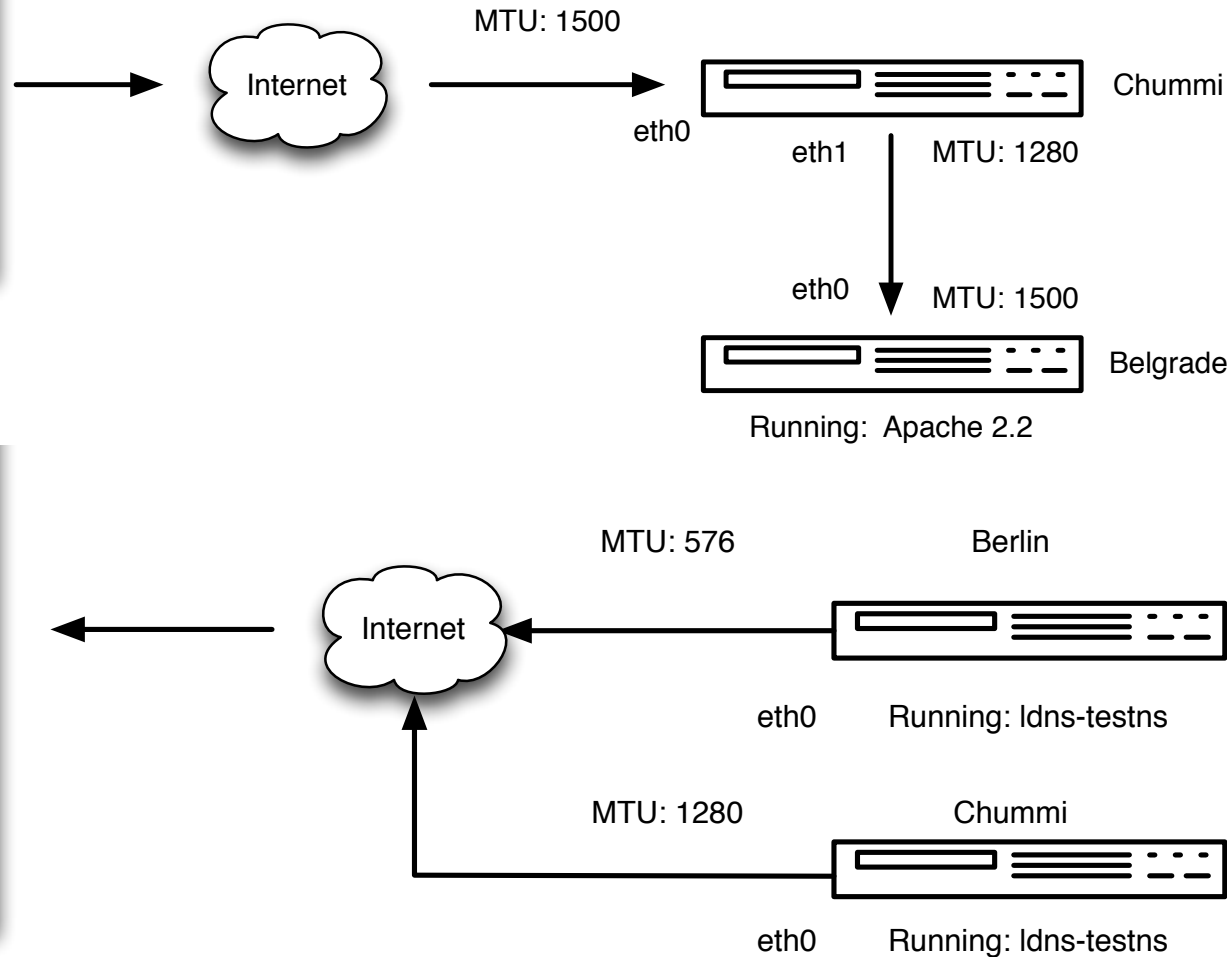
- Measuring IPv6 Fragmentation
  - Baseline is correct ICMP PTB and fragment handling
  - Problems either with ICMP PTB filtering, or fragment dropping
- With IPv6 measurements, compare with IPv4 fragmentation problems
  - IPv4 is operational baseline, IPv6 should (or strive to) be at least as good as IPv4

# Experiments Cross-Table

	ICMP PTB	fragments
IPv4	✓	✓
IPv6	✓	✓

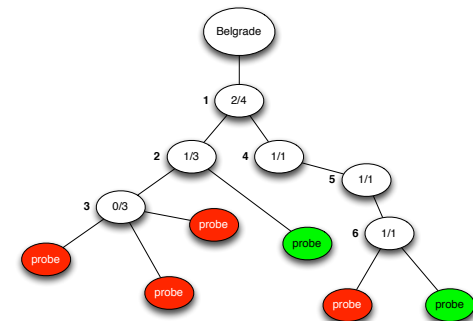


# Experimental Setup



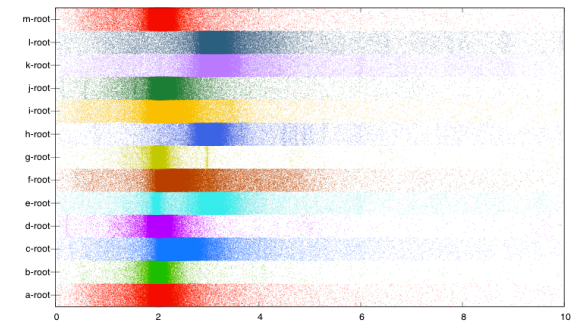
# Data Gathering and Scripting

- Data gathering
  - Atlas probes: measurement data is made available in JSON format via RESTful interface
  - On-site servers: tcpdump to capture network traffic
- Scripts
  - Filter and correlate “events” from Atlas probes and servers
  - Running statistics (histograms) on filtered and correlated data
  - Analyse results: core vs. edge



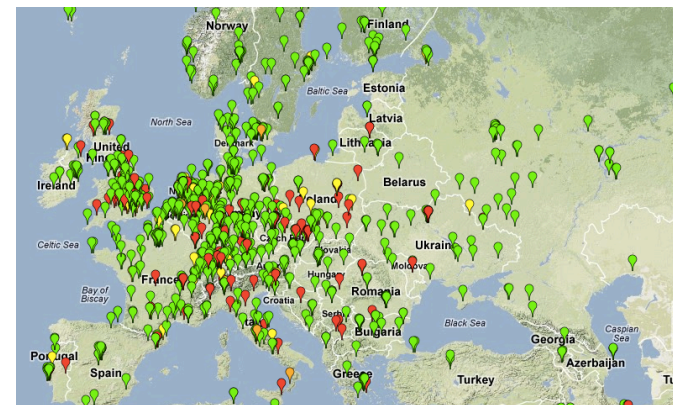
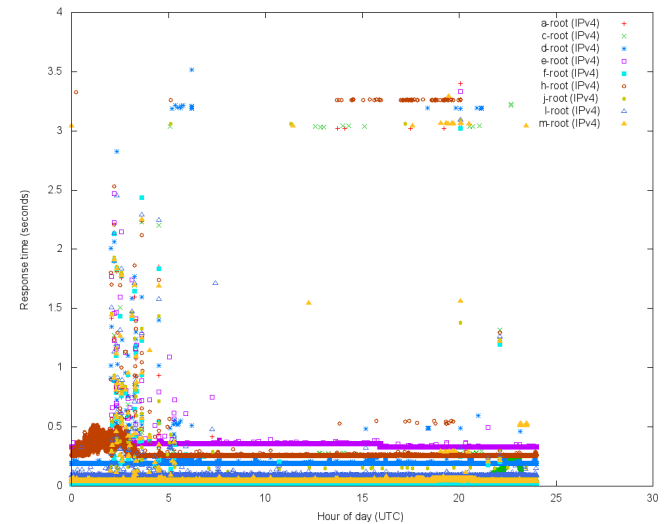
# TCP vs. UDP Performance of DNS Root Servers

- TCP DNS map of k-root
  - ‘last table’ contains per probe/measurement the last result reported
  - Sensitive to transient errors
- TCP DNS graph of k-root
  - Script gets data from hadoop/hbase
  - One day worth of day



# One-off measurements

- Is Atlas broken?
  - Quickly written script using dig
  - Single vantage point
- DNS result modification
  - Regular UDM
  - Results processed by Peter Koch. Viz. RIPE NCC





# Some Steps in Creating a Community

- All for discussion...
- Make available results, methodology, tools, and analysis scripts, e.g.
  - Publish at RIPE Labs (results and methodology)
  - Create index to tools and analysis scripts
    - Index website (at ripe.net) with pointers to individual contributions
    - Git repository (github or git repository run by a RIPE member)
- Exchange ideas, experiences, questions, etc., on mat-wg mailing list

# Open Floor for Discussion

- Kind of measurements
  - Error/anomaly debugging
  - Performance monitoring
  - ...
- Available tools and methodology
  - RIPE Atlas
  - NLNOG RING
  - ...
- Platform to exchange code & data
  - Toolbox for data collection, analysis, and visualisation
  - ...