Measuring IPv6 Network Quality

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background

○ the quality of the IPv6 Internet should be improved
   - for full deployment of IPv6
○ possible causes for poor IPv6 performance
   - low-quality operations, lack of peering, poor tunneling
○ idea: develop techniques specifically designed for dual-stack network
   - take measurements for both IPv4 and IPv6 at the same time
   - compare IPv6 results to IPv4 results
   - extract problems which exist only in IPv6

methodology

- dual-stack node discovery
  - monitor DNS replies for AAAA records
  - create a list of dual-stack nodes in real use
- dual-stack ping
  - run ping/ping6 to target dual-stack nodes
  - select a few representative nodes per site (/48)
    - based on IPv6:IPv4 rtt ratios
- dual-stack traceroute
  - run traceroute/traceroute6 to the selected nodes
    - with Path MTU discovery
  - visualize results for comparative path analysis
    - by juxtaposing IPv4/IPv6 paths to neighbor sites

current status

- 3 measurement points (WIDE, IIJ, Consulintel)
- SIGCOMM NetTs paper
  - Identifying IPv6 Network Problems in the Dual-Stack World
  - K. Cho, M. Luckie and B. Huffaker
- web page
  - http://mawi.wide.ad.jp/mawi/dualstack/
- fund from government (as part of IPv6 promotion)
  - 2004 and probably 2005
- plan for 2005
  - automation of the process
    - more measurement points
  - better visualization of scamper results
  - procedures to report problems to responsible parties