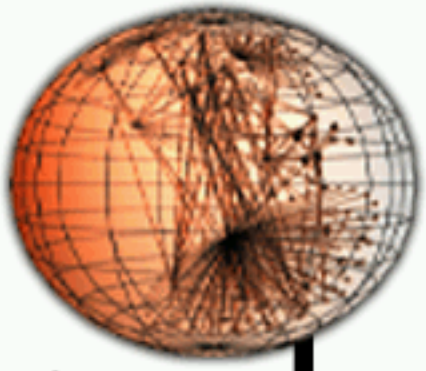

overview of skitter daily summaries

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outline

- skitter project background
- RTT performance data
- topology data
- URLs

skitter project background

- skitter (sources)
  - skitter monitors
  - location of monitors
- target list (destinations)
  - current destination lists
  - geographical distribution
  - country distribution

sources

- skitter
  - http://www.caida.org/tools/measurement/skitter
  - traceroute-like methodology
    - increments Time-To-Live (TTL)
    - ICMP echo requests
    - small (52-bytes)
    - slow-paced
- skitter collects
  - IP forward path information
  - round trip time (RTT) to destination

skitter monitor locations

North America (7), Europe (2), Asia (2), Oceania (1)

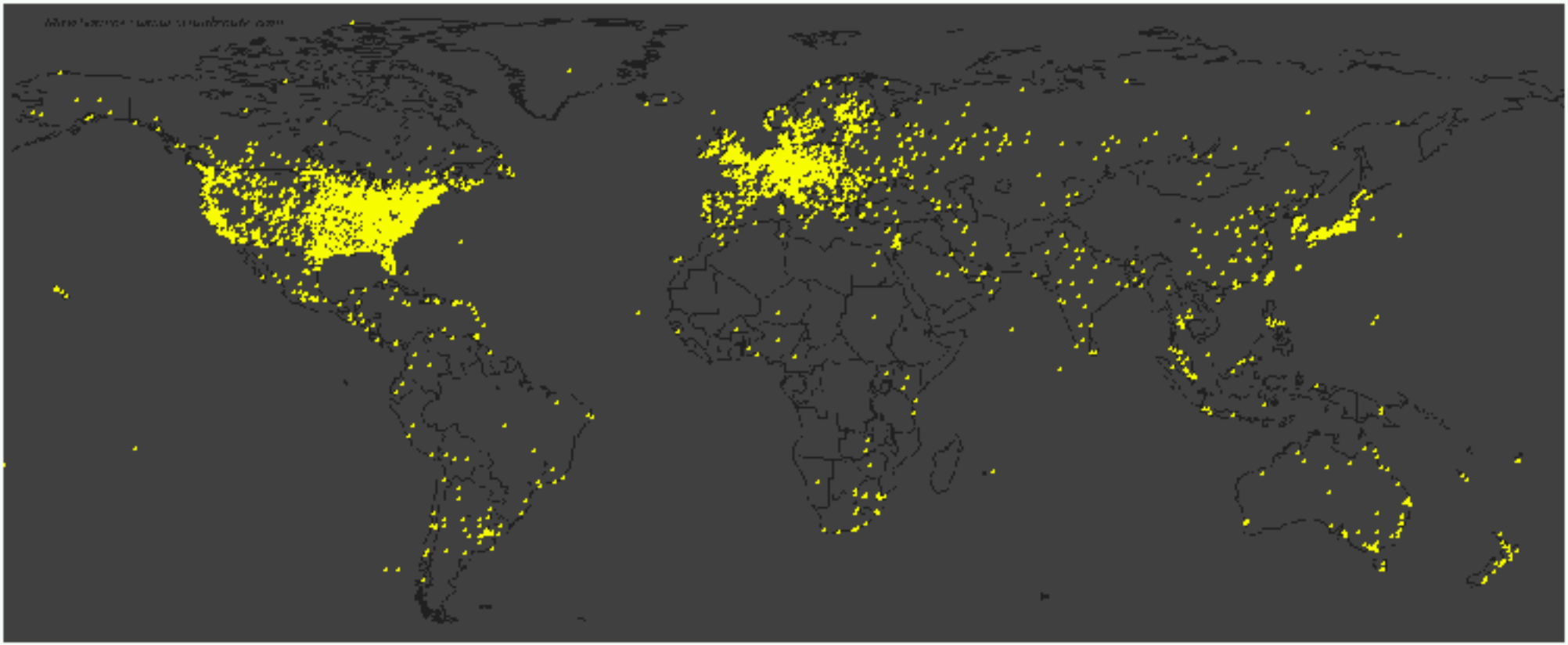
http://www.caida.org/tools/measurement/skitter/monitors.xml

current destination lists

http://www.caida.org/tools/measurement/skitter/lists/

Name	Num.servers	Num.destinations
Web	4	15,493
IPv4space	2	313,417
Routers	2	31,496
Small	2	< 2,000
DNS Clients	6	58,318

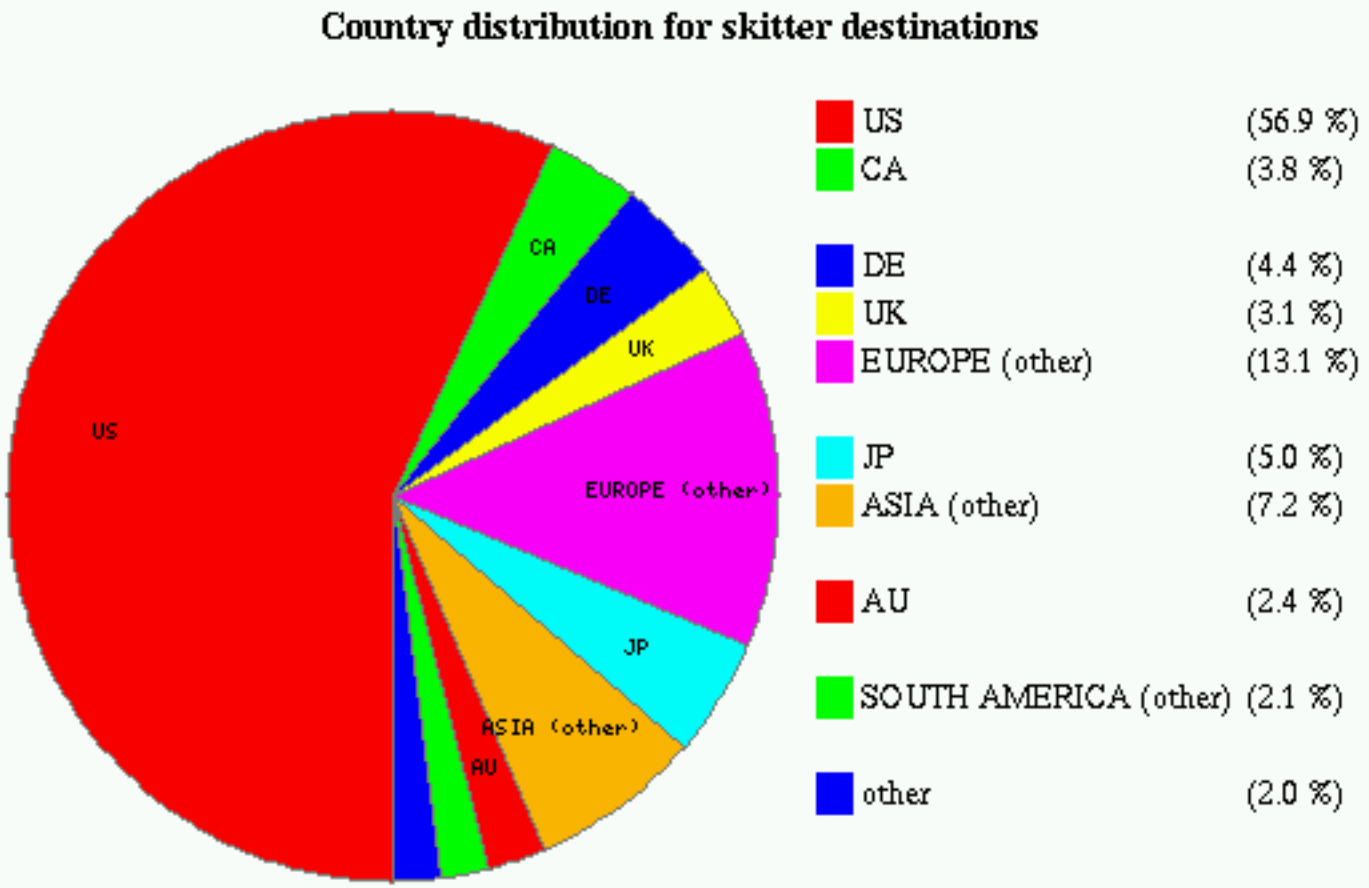
destination locations (all lists)



North America (209,542), Europe (69,996), Asia (41,482)

South America (7,085), Africa (2,103), Oceania (9,346)

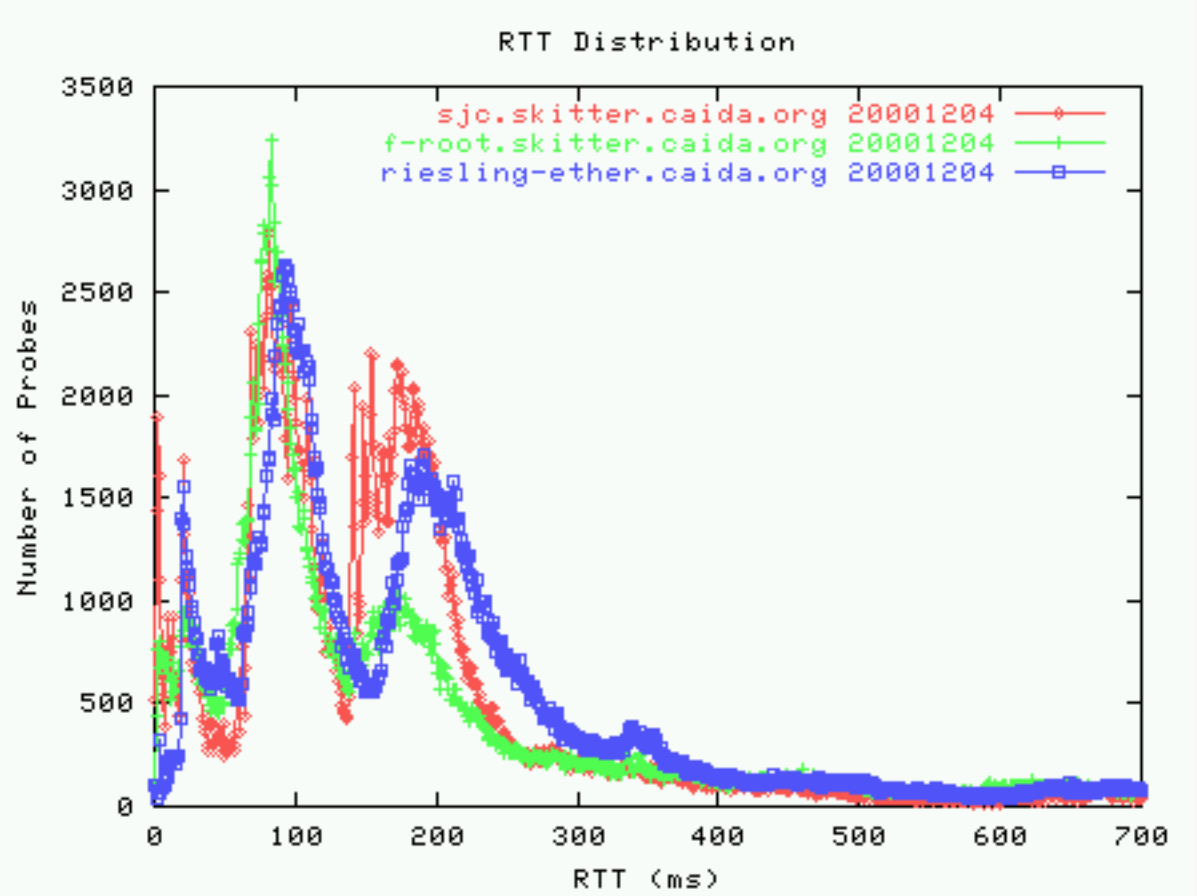
per-country distribution (all lists)



rtt performance data

- RTT distributions
- RTT distribution by continent
- RTT vs longitude

rtt distributions

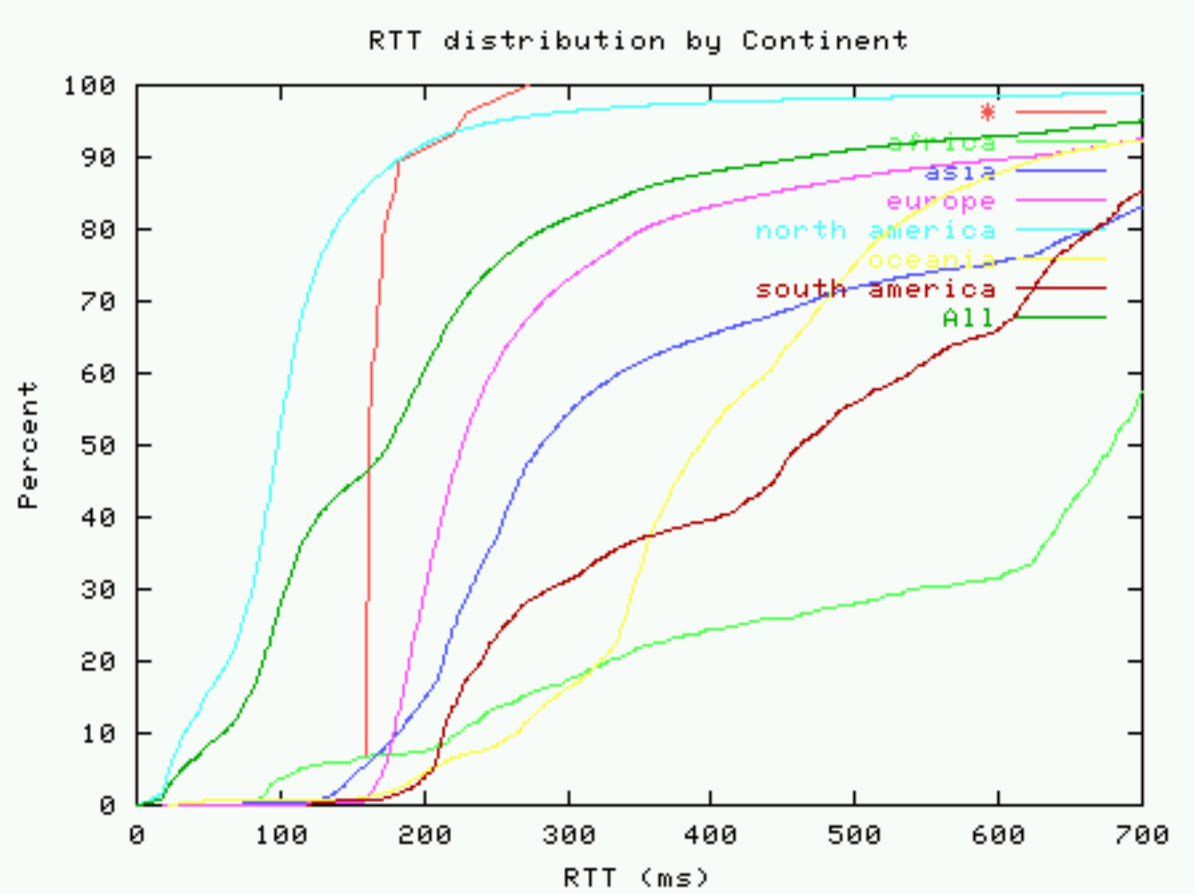


San Jose (sjc and f-root) and San Deigo Monitor (riesling) on Dec. 4th 2000

Important points: 3 peaks at 50 ms, 100 ms and 175 ms.
Caused by geographical clustering of destinations.

North American West Coast, North American East Coast, Europe/Asia

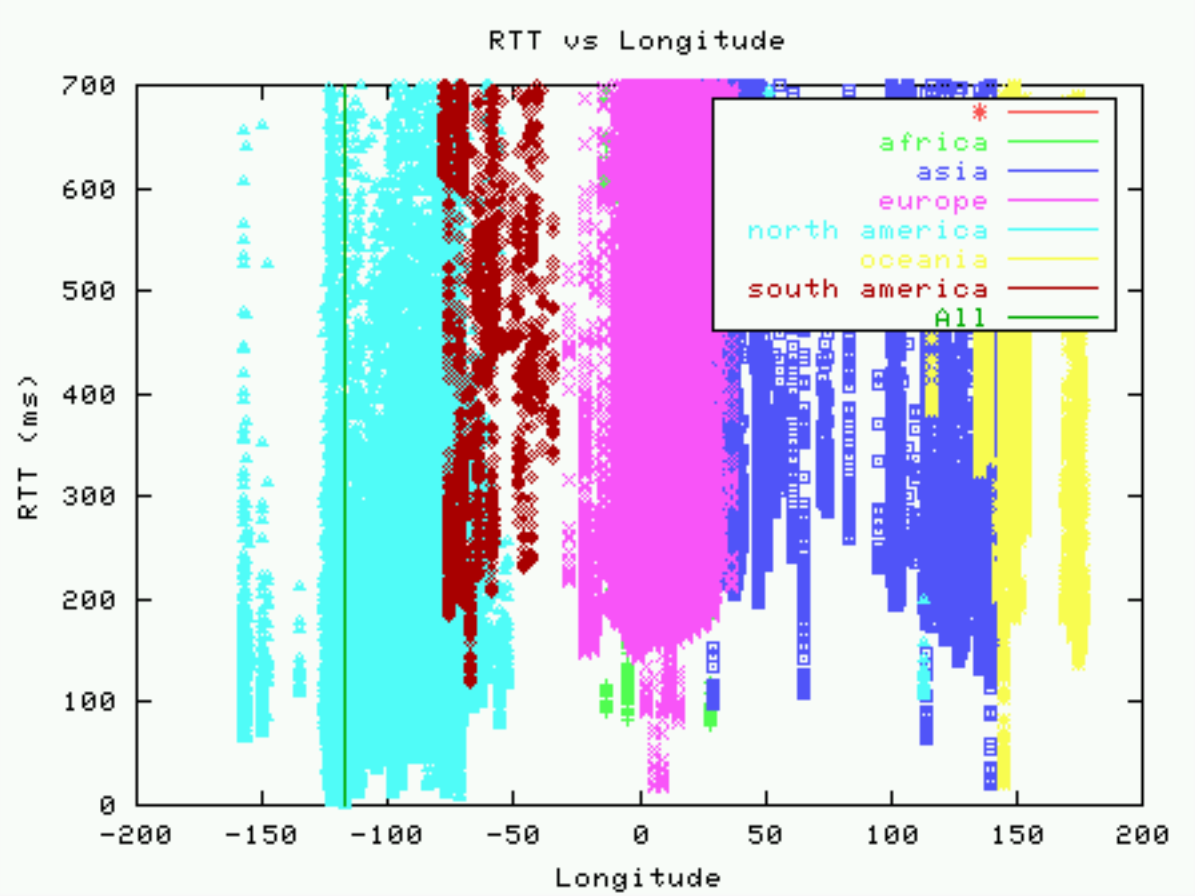
rtt distribution by continent



San Diego Monitor (riesling) on Dec. 4th 2000

Percentage of probes reached <= a given RTT.
Steep lines: most probed IP addresses in continent have low RTT

rtt vs destination longitude



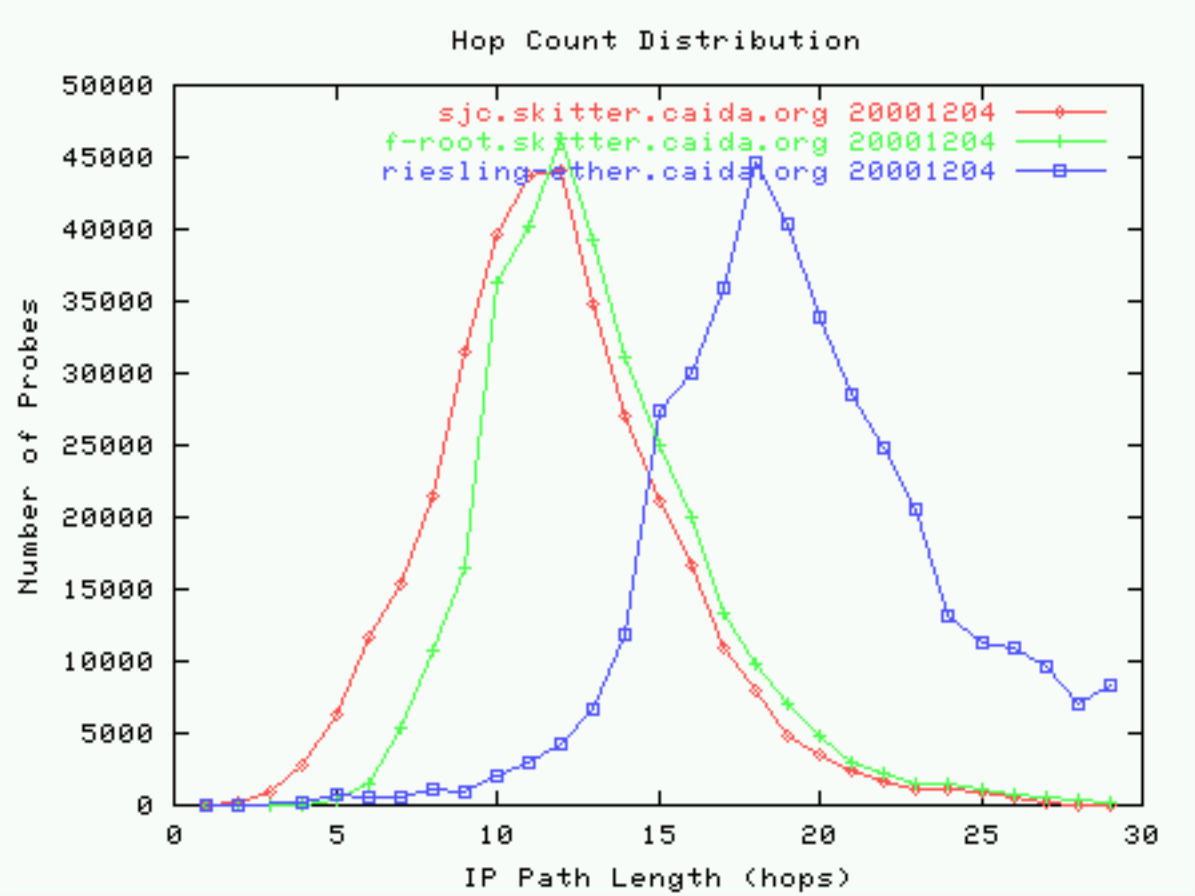
San Diego Monitor (riesling) on Dec. 4th 2000

- RTT (in msec) versus longitude
- light cone
- outliers (probably) not faster than speed–of–light
- more likely geographic mapping wrong

topology data

- IP count distributions
- AS dispersion graph
- country dispersion graph

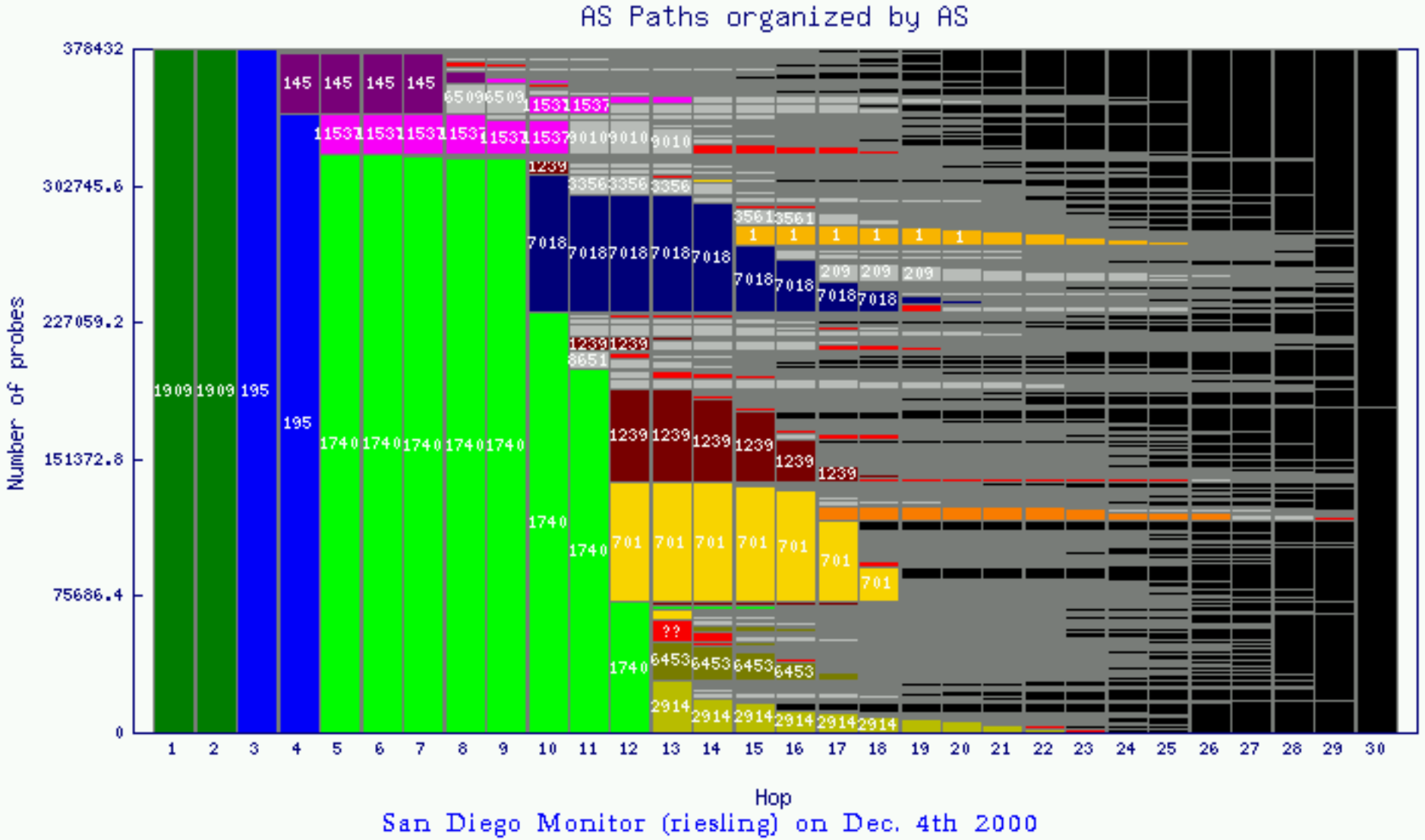
ip count distributions



San Jose (sjc and f-root) and San Deigo Monitors (riesling) on Dec. 4th 2000

Note: riesling, our San Diego monitor, is shifted over about 10 hops
Cause: 9 IP addresses must be traversed before hitting 'core'

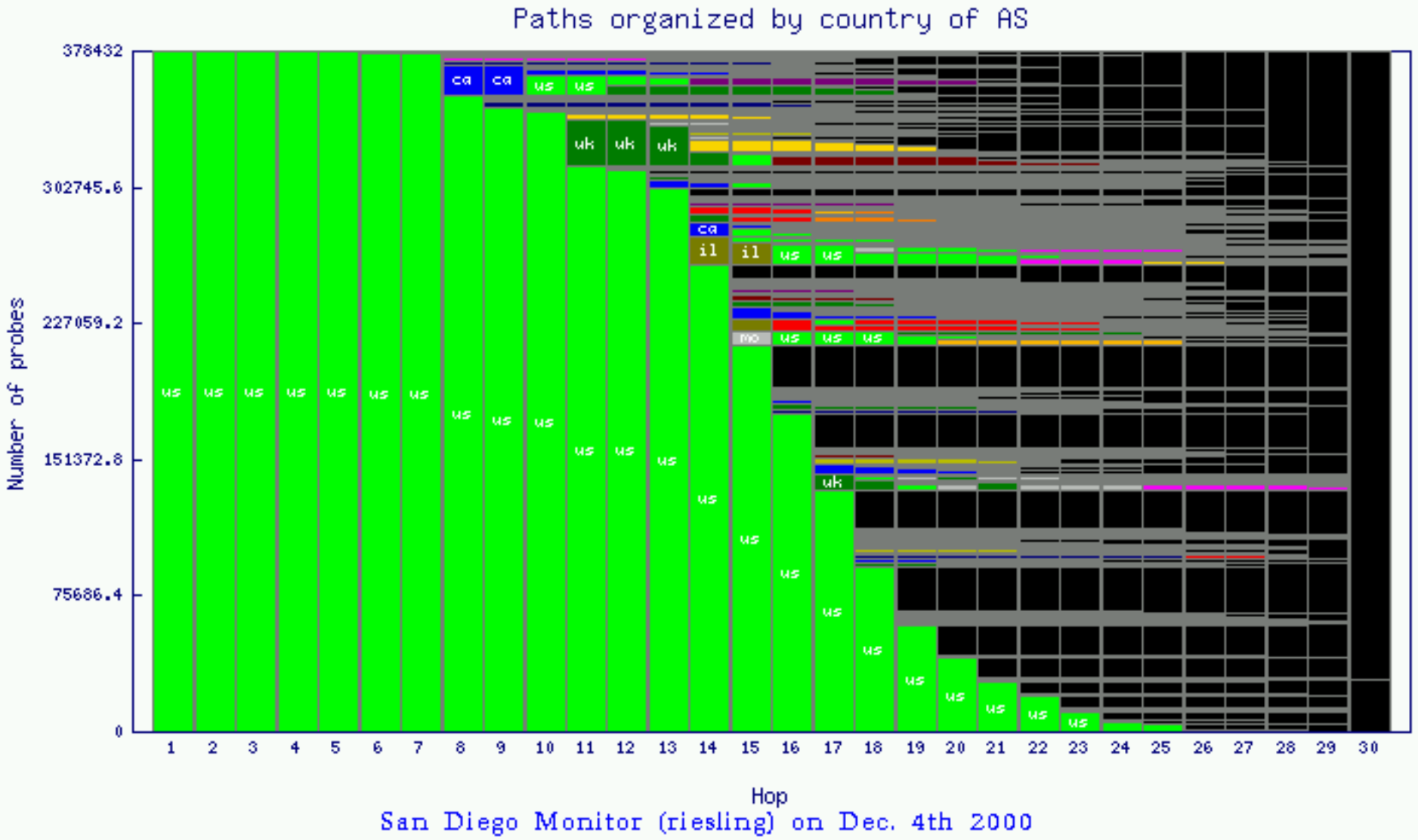
as dispersion graph



breakdown of paths by ASes:

- hop 4: 10% of paths use AS 145
- hop 5: both AS 11531 and AS 1740
- hop 10: some paths via AS 1740 go to 7018

country dispersion graph



breakdown of paths by country:

paths stay in the US until at least the 8th hop and in most cases end there.

urls

http://www.caida.org/cgi-bin/skitter_summary/main.pl

- skitter
  - http://www.caida.org/tools/measurement/skitter
- skitter monitors
  - .../measurement/skitter/monitors.xml
- skitter destination lists
  - ..../measurement/skitter/lists

ip address mapping

- UOregon RouteViews
  - http://www.antc.uoregon.edu/route-views/
  - provides routing tables from 25 ISPs
  - core routing tables used to convert IP address to AS Numbers
- NetGeo
  - http://www.caida.org/tools/utilities/netgeo/
  - whois records
  - headquarters/registered address

example of ip mapping

IP address	AS Number	Country
130.217.248.88	681	NZ
130.217.248.253	681	NZ
130.217.64.2	681	NZ
140.200.128.14	681	NZ
202.37.245.157	4648	NZ
202.37.245.170	4648	NZ
4.24.24.5	1	US
4.24.4.5	1	US
4.24.4.2	1	US
4.24.5.210	1	US
4.0.5.65	1	US
4.0.6.98	1	US
4.0.3.141	1	US
4.0.3.217	1	US
207.45.222.230	6453	CA
207.45.220.100	6453	CA
207.45.212.214	6453	CA
203.150.14.134	4618	TH

furture directions

- more sources
  - non-US (in location and ownership)
  - non-academic
- more destinations
  - try to cover every country
  - try to cover every routed prefix

URLs

http://www.caida.org/outreach/papers/asia_paper

- skitter
  - http://www.caida.org/tools/measurement/skitter
- NetGeo
  - http://www.caida.org/tools/utilities/netgeo
- RouteViews
  - http://www.antc.uoregon.edu/route-views/