scamper

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What is scamper?

- Packet prober designed for large-scale active measurement of the Internet
  - Probes at supplied packets-per-second rate
- Traceroute
  - tcp, udp, icmp, ipv4, ipv6, paris, pmtud, double-tree, load-balancer
- Alias Resolution
  - mercator, ally, radargun
- Ping
- Sting

Approach

- Original goal to replace use of /sbin/traceroute
- Flexible
  - Standalone measurement utility
    - does not require ruby interpreter or perl or any libraries.
  - Control socket: dynamically feed scamper work to do on demand
  - CLI: one-shot measurements
- Focus just on implementing a good prober
- Portable
  - *BSD, Linux, MacOS X, Solaris, **Windows**

scamper control socket

```
trace -P icmp-paris -q 1 130.217.250.39
OK
MORE
DATA 544
M$@4`!@```8#___\/`#$````!`````0````P````+2=:1IP`,U(!```!``0`
M+)&4@IL!``4!``X%`0``#@````S_CP(`%@````$!0!$`````!`L0``"P`."H9
M``#_CP(`%@`````("_A$```#SA@L``"P`.*54``#_CP(`%@``,#_A$```#"
MM`L``"P`.+\I``#_CP(`%@`````0$_1$```#`#0L``"P`.!FI#_SP(`%P``
M``4%?!$```#16@L``"P`.````````_X\"`!8````%!GP1````PH```L`#@`
M`````_X\"`!8````&!WL1````S;@+```L`#@``````_X\"`!8``'"7H1````
MQ,L+```L`#@``````_X\"`!8`````("GD1````U>0+```L`#@``_X\"`!8`
M```)"_@1````S_P+```L`#BG],``_X\"`!8`````*#/<1`````\T```L`#C^
@OL``_X\"`!8`````+#O41`````\`0+```L`#B;Y,``````
`
```

Data comes back in uuencoded binary warts format.

i.e. records a lot of response detail

Client can send commands whenever scamper says “MORE”.

scamper command line

- scamper –c ‘trace –P icmp-paris’ <filename>
- scamper –c ‘trace –P icmp-paris’ –i <ip1> <ip2> … <ipN>

Approach

- Good science
  - Uses best timestamps available
    - Datalink timestamps (BPF)
    - Socket timestamps
  - Binary file format records details of responses and meta-data of measurement

Example Use Cases

- CAIDA IPv6 AS core poster (Brad)
- Dual-stack path analysis (Kenjiro Cho)
- IMC papers:
  - 2005: Inferring and Debugging Path MTU Discovery Failures
  - 2008: Traceroute Probe Method and Forward IP Path Inference

Why implement your measurement techniques in scamper?

- Portability taken care of, e.g.
  - Datalink for putting crafted frames onto a link
  - Route socket for finding appropriate interface
  - Byte ordering requirements for raw sockets, etc.
  - Every operating system does things slightly differently
- Event driven; don’t have to use threads to get parallelism
- Lends itself to integration with Ark

How to get?

- http://www.wand.net.nz/scamper/
  - – Source code GPLv2
- FreeBSD, NetBSD, Debian packages.