Network Measurement Reporting

Start with a dream…

- Data collection is a persistent problem for network measurement efforts
  - Diversity of observation points
  - Diversity of measured things
- On the other hand, there are tons of pings and traceroutes going on all the time
- Wouldn't it be nice if researchers could take advantage of these "ambient measurements"?

A question of values

- High-volume, widely-dispersed Internet measurements have high value to the research community
  - Possibly the operational community as well
- Measurements don't typically have a lot of privacy sensitivity for the measurer
- So we're creating value if we make a low-cost way to collect and disseminate measurement results

NMR

- Create a simple, standard reporting mechanism that requires no configuration
- Augment existing tools to report measurements that they collect
  - ping, ping6, traceroute
  - Apache, jabberd, Firefox, Skype
  - Host TCP stacks?

NMR

ICMP ECHO REQUEST

ICMP ECHO REPLY
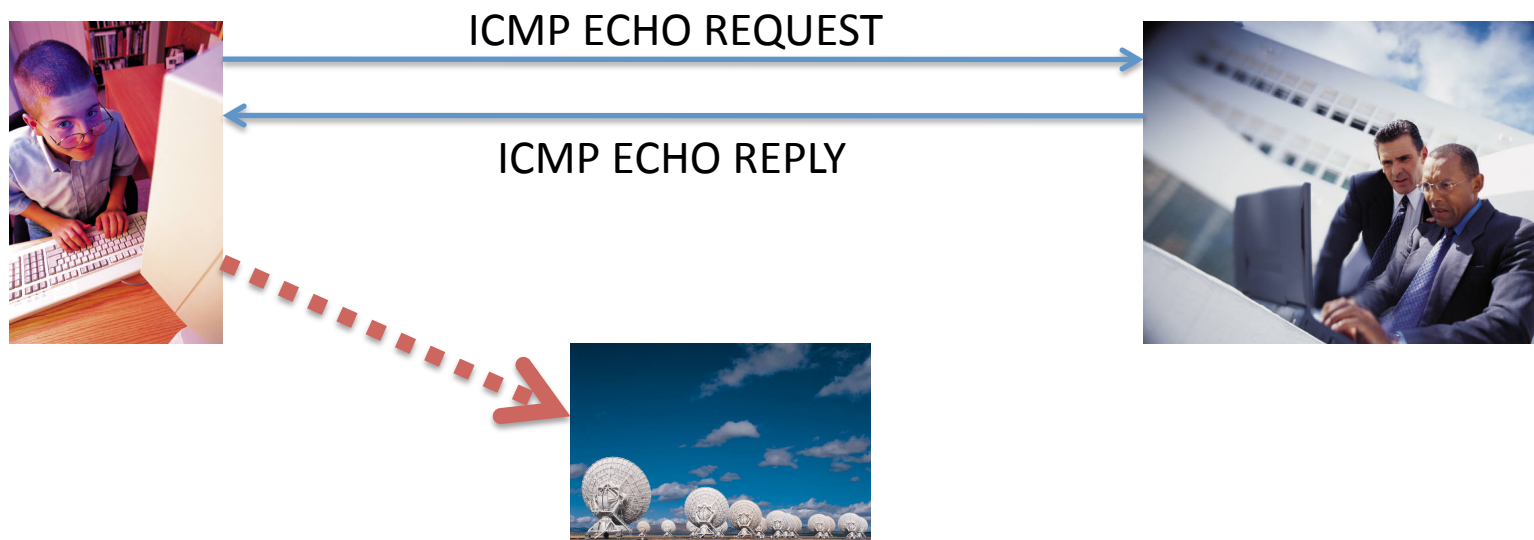
- Host does a measurement
- Host constructs a UDP datagram describing the results of the measurement
- Host sends datagram into the ether
  - ... to a pre-defined [any|multi]cast address

Drawbacks

- Privacy: Not everyone wants to report their measurement results
  - Filter the standard port/address at the edge
  - Opt-out options in tools
- Traffic volume:
  - Ping: 50% increase, but can summarize instead
  - Traceroute: Much smaller percentage
  - Application streams: Miniscule
  - Measurements aren't overwhelming the network already, and this isn't a huge increase

Running Code

- http://nmr.googlecode.com/
  - Draft format specification
  - Encoding library (358 lines, mostly structs)
  - NMR patch to iputils ping and ping6
    - 32 lines, ~10K bytes increase in binary

Questions?

- Would anyone allow this to run on their network?

- Would anyone listen if the data were available?

- Would anyone incorporate this into their software?