# **NETI@home**: A Distributed Approach to Collecting End-to-End Network Performance Measurements

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# Goals of NETI@home Project

- Passive Internet measurement from world-wide vantage points
- Capture “Real” users’ experiences
- Satisfy need for collection of end-to-end network measurements
- User privacy protected and assured, while maximizing research potential – not “spyware”

# Goals of NETI@home Project (cont.)

- A large variety of measurements collected, for the most commonly used Internet protocols
- Software should minimally affect user and user's system, to have little impact
- Large user base
  - Multiple platforms
  - Run in background, requiring little or no intervention
  - All-in-One distribution (future)
  - Provide user motivation

# Goals of NETI@home Project (cont.)

- Collected measurements reported to Georgia Tech
- Collected measurements made publicly available
- Scalable collection method
- Easily upgraded

# Overview of NETI@home

- Software designed to be run by regular Internet users (anyone and everyone)
- Monitors Internet connection while surfing
- Users can specify a privacy level
- Results sent to Georgia Tech, where they will be made publicly available
- Will provide network researchers the much-needed passive, end-to-end, network measurements from the perspective of regular Internet users

# Description of NETI@home

- Open-Source (GNU GPL)
- Written in C++
- Built on top of Ethereal, an open-source packet sniffer
- Available for:
  - Windows >= 95
  - Linux
  - *NIX's

# Description of NETI@home (cont.)

- Packets are *not* sniffed in promiscuous mode
- Measurements kept on a per flow (bidirectional) basis
- Collected for TCP, UDP, ICMP, and IGMP
- Results compressed and reported periodically

# Collected Measurements

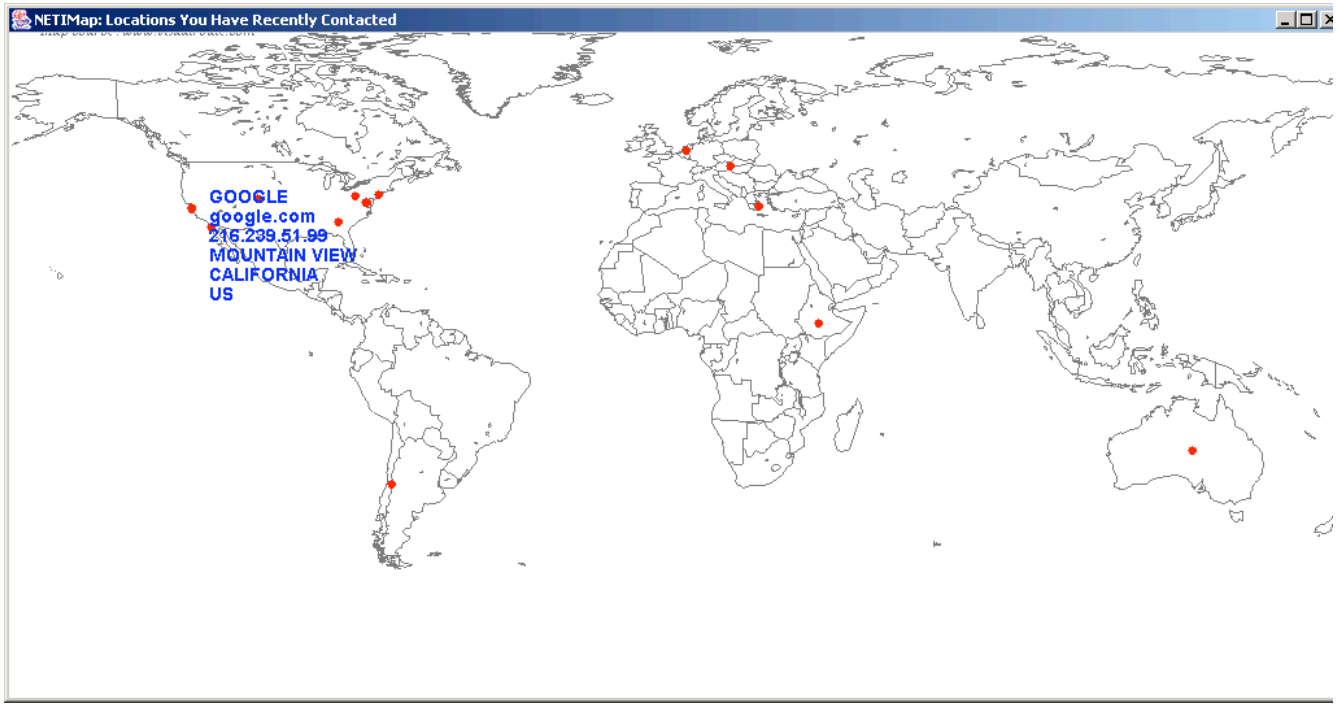
- Easily Gathered
  - IP Addresses
  - Ports
  - Times
  - Flags
  - Packets Sent and Received
  - Bytes Sent and Received
  - TTL Values
  - ….
- Not So Easily Gathered
  - Round Trip Times
  - Lost  Packet Count
  - Connection Closure Method
  - Retransmissions
  - Operating System
  - TCP Internals (cwnd)….

# Privacy Levels

- **High** - No IP addresses are reported
- **Medium** - Only the network portion of IP addresses are reported (based on old class A, B, and C scheme)
- **Low** - All IP addresses are reported

- `neti.conf`
- Future: Anonymization techniques

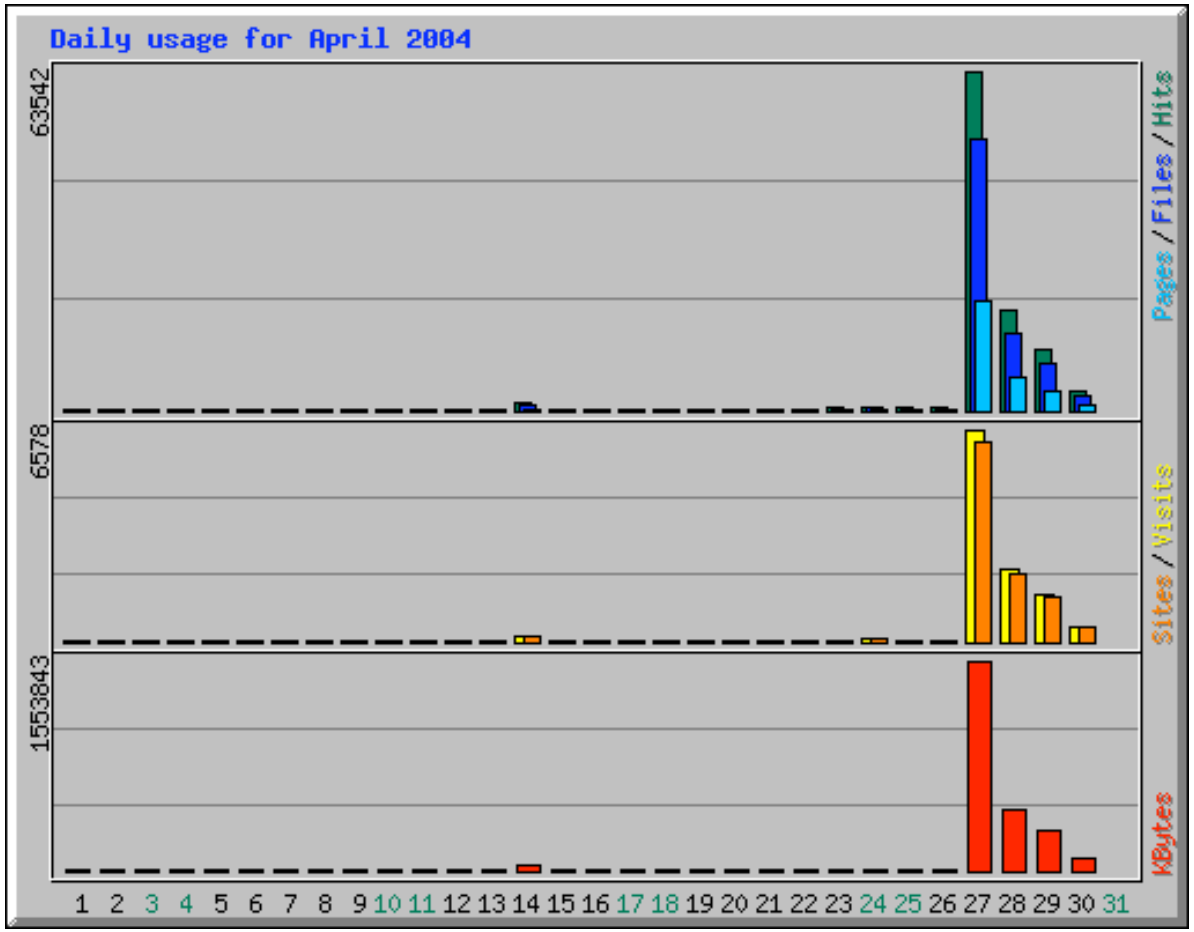
# NETIMap: Motivation




- Graphically plots contacted IP addresses using CAIDA's NetGeo database

# The *Slashdot Effect*

- NETI@home was publicized on Wired.com and Slashdot on April 27, 2004
  - 63542 Hits
  - 6578 Visits



# Current Usage Statistics

- As of June 1, 2004:
  - 4113 downloads
  - Approximately 240 unique users contacted server since May 26 (one week)
  - Approximately 500 MB of uncompressed binary data collected since May 26 (one week)
  - Approximately 730 unique users contacted server since January 7

# Future Work

- Lower-Level measurements (TCP congestion window)
- Traceroutes
- Continuous improvement to measurements and measurement techniques
- Online data repository
- Available bandwidth
- Additional protocols
- Prefix-preserving IP anonymization
- Integrate sniffer
- NETIMap enhancements

# GO GET IT!!!

- Available from: http://neti.gatech.edu
- Available for:
  - Windows operating systems >= 95
  - Linux
  - *NIX's
- Also Available from **SourceForge**
- Ethereal is available from: http://www.ethereal.com

# Questions???