



www.internet2.edu

The Internet2 Observatory

The Internet2 Observatory supports the development of an integrated data archive of the performance and network status information collected on the Internet2 Network with the aim of providing information to researchers who wish to study an operational network in a way not possible in a laboratory environment or on the commercial Internet. The Internet2 Observatory project—envisioned as an integral part of the Internet2 network upgrade—provides a significant level of support for the network research community at Internet2 member universities. In addition, the Observatory provides for the collocation of network experiments and measurement servers developed by the research community.

NMS Data Collection

Internet2 collects a variety of data, both for operational and research projects. Depending on the site, there are between one and nine primary servers located in the Internet2 racks. The Network Measurement Servers (NMS) provide the majority of the data measurements. They are standard PC type machines that have either 1 Gbps or 10 Gbps interfaces. Data collected by the NMS machines is distributed to other database servers.



Datasets

Data is continuously collected from the NMS machines in the following formats:

Usage Statistics – collected from the routers using SNMP. Includes a variety of router interface data.

Flow Statistics – collected using sampled Netflow data. Data is anonymized by zeroing the low-order eleven bits to protect privacy.

Routing Data – collected from measurement peers that collect IGMP and EGBP data.

Latency Measurements – collected using OWAMP methods.

Throughput Measurements – collected using regularly scheduled BWCTL/iperf¹ measurements.

Router Data – a variety of “show” statistics collected from the Internet2 network routers.

Syslog Data – data collected by syslog hosts reporting router information and logging.

The research community is encouraged to suggest other datasets important for network research.

¹ <http://dast.nlanr.net/projects/lperf/>

Collocation Projects

Researchers are encouraged to submit proposals to network@internet2.edu for collocation projects. Measurement or storage devices may be located in the Observatory, although space is limited and the devices must satisfy special requirements. For example, devices may be required to run on DC power and have acceptable access interfaces.

The current collocation projects include:

- **PlanetLab** – <http://www.planet-lab.org/>
- **Phoebus Project** – <http://e2epi.internet2.edu/phoebus.html>

PlanetLab will have servers deployed at all Internet2 router nodes. Phoebus will be deployed initially at Chicago, Houston, Los Angeles, and New York.



Examples of Current Research Projects

The Wisconsin Advanced Internet Laboratory (WAIL) – Flow sampling and anomaly detection using Abilene flow data. <http://wail.cs.wisc.edu/>

Network Research Lab at Case Western Reserve University – The presence and incidence of alpha flows in backbone links. <http://vorlon.ces.cwru.edu/~vxl11/netlab/>

Kent State University Department of Computer Science – Traffic management and QoS provisioning in IP networks. <http://www.cs.kent.edu/department/index.html>

Boston University Department of Computer Science – Spatio-temporal network analysis. <http://cs-www.bu.edu/>

University of Minnesota MINDS Project – Develop high performance data mining algorithms and tools. <http://www.cs.umn.edu/research/minds/>

Computer Networks Research Group, Department of Computer Science, University of Massachusetts at Amherst – Temporal-spatio correlations in network traffic on the Internet2 network. <http://www-net.cs.umass.edu/>

Internet Tsunami Warning System Project – Automatic detection of network attacks.

Niagara Project, University of Wisconsin-Madison and the Oregon Health & Science University – Query processing over data streams. <http://www.cse.ogi.edu/dot/niagara/>

Department of Computer Science, University of Pennsylvania - Impact of aggregation of traffic on routing performance. <http://www.cis.upenn.edu/>



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