



## Internet2 Observatory

[www.internet2.edu/observatory](http://www.internet2.edu/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—originally envisioned as part of the third generation Internet2 Network upgrade, and just as integral to following generations—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.

### Network data collection

Internet2 collects a variety of data, both for operational and research projects. Depending on the site, there are between one and five primary servers located in the Internet2 racks. 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. The NMS-collected data is distributed to other database servers. Taken as a whole, the databases comprise a large, correlated database for use by the research community. A significant portion of the status data is collected using various perfSONAR-PS tools (<http://www.internet2.edu/performance/pS-PS/>).

Data collected by network engineers using equipment located in the nodes and operated by the Network Operations Center is open to all research projects and is available either online or through special arrangement.

### 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 (perfSONAR-enabled).
- **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 (perfSONAR-enabled).
- **Throughput Measurements** – Collected using regularly scheduled BWCTL/iperf measurements (perfSONAR-enabled; see <http://sourceforge.net/projects/iperf/>).
- **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.

### Collocation projects

Data is also collected by separate research projects using equipment collocated in Internet2 Network nodes. This opportunity is open to all Internet2 members (higher education, industry or affiliate) and is based on competitive proposals. The goal is to provide the research community with a vehicle for basic network research, and all research results are expected to be open to the public through the process of peer review.

### FOR MORE INFORMATION

Internet2 Observatory page  
<http://www.internet2.edu/observatory/>

Internet2 Network page  
<http://www.internet2.edu/network/>

Internet2 Network Tools page  
<http://www.internet2.edu/network/tools>

To propose a collocation project, contact  
[network@internet2.edu](mailto:network@internet2.edu)

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.

Current collocation projects include the **Phoebus Project** (<http://damsl.cis.udel.edu/projects/phoebus/>). Phoebus is now available in all locations.

Past collocation projects include **PlanetLab** (<http://planet-lab.org>) and **VINI** (<http://vini-veritas.net>).

Researchers are encouraged to submit collocation project proposals to [network@internet2.edu](mailto:network@internet2.edu).



◀ Typical Internet2 Network point of presence (PoP) equipment setup.

Close-up: Network Measurement Servers (NMS) provide the majority of the network performance measurement data.

A significant portion of the status data is collected using various perfSONAR-PS tools. ▼

perfSONAR