

## GEC9 Demo : Measurement Manager – Indiana University OpenFlow Campus Trial

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URL: <http://e-geni.grnoc.iu.edu/>

### Abstract

The Indiana University Measurement Manager collects data from Flowvisor instances controlling each OpenFlow campus or backbone network. The Measurement Manager builds a view of the network at the aggregate and slice level. It uses this model to enable the retrieval of information about each component and the state and topology of each slice. Data can be retrieved both in-band (through OpenFlow) or out-of-band (through SNMP or a query to another GENI component)

The collected model and data can include:

- Aggregate and Slice Topology
- Port Utilization through OpenFlow or out of band (SNMP, GENI I&M, etc..)
- OpenFlow specific utilization information (# of flows, flow table sizes, etc..)
- Geo-location of devices (DNS LOC records, IP Geo-location, WiFi location based)
- Monitoring and Status information

The data collected can be output to the experiment, to researchers as part of their results, sent to other GENI components (such as GIOC, LAMP/PerfSONAR or NetKarma), or to be used by the aggregate owners to help in maintaining and operation of their OpenFlow aggregate.

The Measurement Manager utilizes a plug-in architecture to allow the development of additional tools to capture additional information from the network and include it in the network model or data collected. For example, a wireless plugin can be developed that captures information unique to wireless OpenFlow deployments.

Our demonstration shows a hosted deployment of the Measurement Manager with Flowvisor API connections to Flowvisors in multiple networks. Future deployments will have closer integration between Opt-In Manager/Expedient and the Measurement Manager. Closer integration will allow the Measurement Manager to collect information without additional manually entered configuration.

