PennAnalytics: Network Visualization and Analytics

Project

PennAnalytics is an application that enables real-time network visualization and analytics. The system consists of the entire stack from data aggregation from network devices to data visualization and analytics via web browser.

Motivation

- Increasingly networked world requires visualization and analytics tools that are intuitive to use
- Existing tools are
  - Text-based
  - Clunky UI
  - Not cross-platform

Features

- Real-time data pipeline
- Network topology in which nodes change color to indicate health
- Link-level information including capacity, bytes received/sent, input/output utilization as % of capacity, etc.
- Easily extendable!

System

PennNetwork

Collector

Aggregates Network data (e.g. snmp lldp)

Servers

Receives data from the collectors and controls
data processing
Stores data for processing and processed data
Runs web server that displays processed data

Web Interface

Real-time network statistics

Client

Data

Manager

GET / SET Request
GET / SET Response

Network Topology

Link-Level Information

Future Work

- Simple Network Management Protocol
- CETS gave access to 5 network switches that support SNMP
- NetFlow
- Anomaly detection
- Larger scale