

# Status of perfSONAR Tools

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# Outline

- What is perfSONAR?
- Who is perfSONAR?
- Current Tools/Development Status
- Looking Ahead

# What is perfSONAR?

- Performance Monitoring Middleware
  - Set of protocol standards
    - Fosters interoperability between measurement and monitoring systems
  - Set of open source web services
    - mix / match (extend?) each to create a performance monitoring infrastructure
  - International consortium of partners

# High Level Description

- Standards-based (NM-WG)
- Modular
- Decentralized
- Locally controlled
- Open Source
- Extensible / Customizable

# Who is perfSONAR?

- perfSONAR is a joint effort:

- ESnet
- GÉANT2 JRA1
- Internet2
- RNP

- ESnet includes:

- ESnet/LBL staff
- Fermilab

- Internet2 includes:

- University of Delaware
- Georgia Tech
- SLAC
- Internet2 staff

- GÉANT2 JRA1 includes:

- Arnes
- Belnet
- Carnet
- Cesnet
- CYNnet
- DANTE
- DFN
- FCCN
- GRNet
- GARR
- ISTF
- PSNC
- Nordunet (Uninett)
- Renater
- RedIRIS
- Surfnet
- SWITCH

# But What is it REALLY?

- Network measurement tools
  - Network measurement archives / points
  - Discovery
  - Authentication and authorization
  - Data manipulation
  - Resource protection
  - Topology

# Current Development

- **Network measurement archives/points**
  - Data Gathering / Storage
- **Discovery**
  - Service Discovery / Cataloguing
- **Authentication and authorization**
  - Centralized Authentication / Identity management
- **Data manipulation/Presentation**
  - Prepare / Present data in different formats
- **Resource protection**
  - Limit access to and quantity of data from services.
- **Topology**
  - Glean useful network status/state.

# Current State of the Art

- **Network measurement archives**
  - RRD / SQL MA (Maturing, Deployed)
    - RRD – 'Utilization focused' information (byte counters, errors)
    - SQL – Link Status information (E2EMon, Light Paths)
- **Discovery**
  - LS (Maturing, Limited Deployment)
- **Data manipulation/Presentation**
  - perfSONAR UI (Maturing, Available for Download)
  - Google Maps (Beta, Limited Deployment)
    - Utilization
    - Topology
  - Speedometer / Utilization (Beta, Limited Deployment)

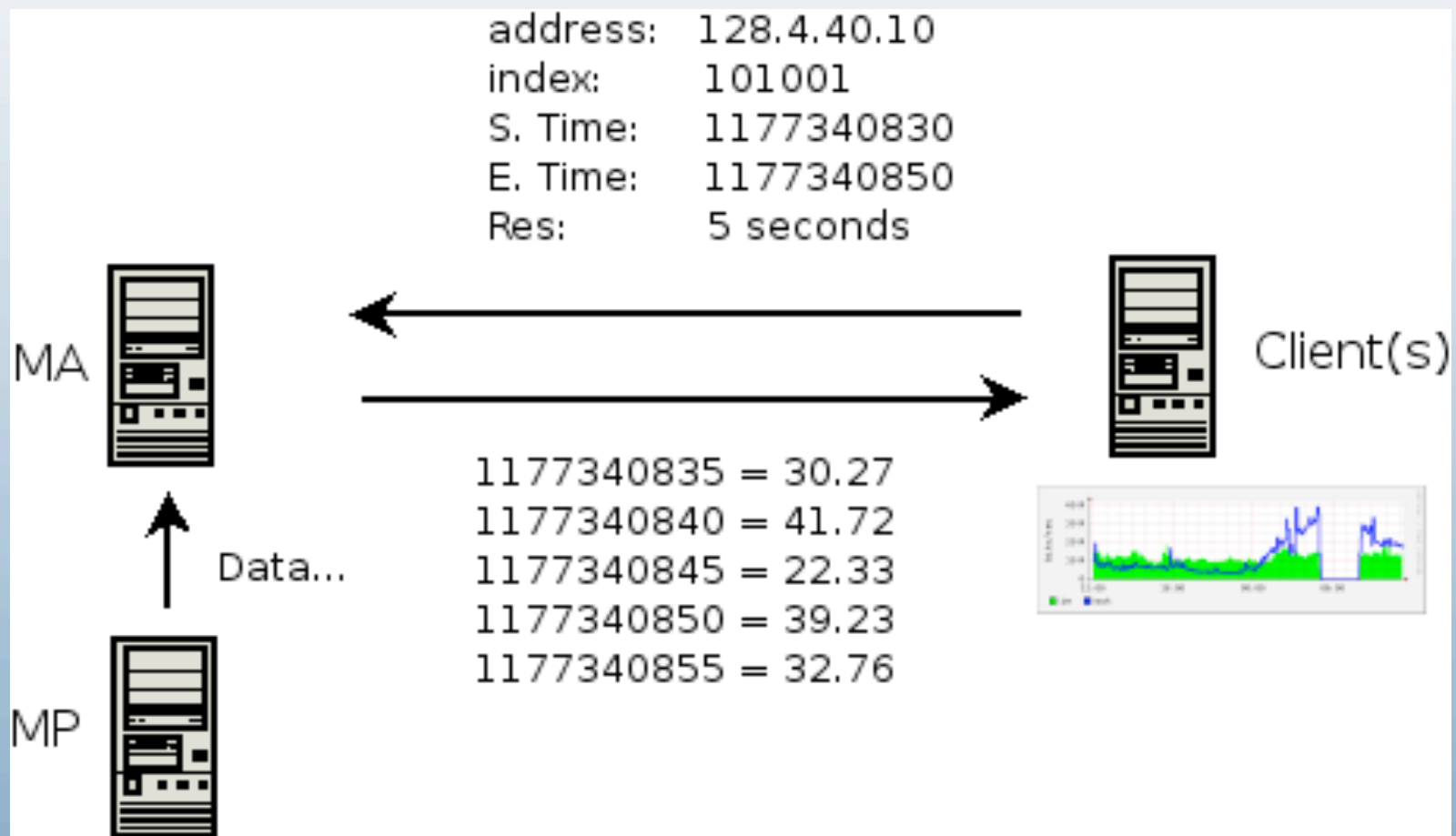
# Measurement Archives/Points

- **MA/MP Service(s)**
  - Publishes measurement data
  - Accepts and writes measurement data
  - **Formats:**
    - RRD (Round Robin Database) Format
    - SQL (MySQL, SQLite, Oracle, Postgres) Format
    - Native XML (eXist, BDB) Format
  - **Available in many flavors**
    - Java (Latest release = v 2.0)
    - Python (Limited Development)
    - Perl (perfSONAR-PS)

# Measurement Archives/Points

- **Currently Deployed:**
  - Geant and NREN Partners
  - RNP (Brazil)
  - ESNet
  - Fermi NAL
  - Internet2
    - Limited 'new' network deployment
    - Full monitoring as network comes up

# Measurement Archives/Points



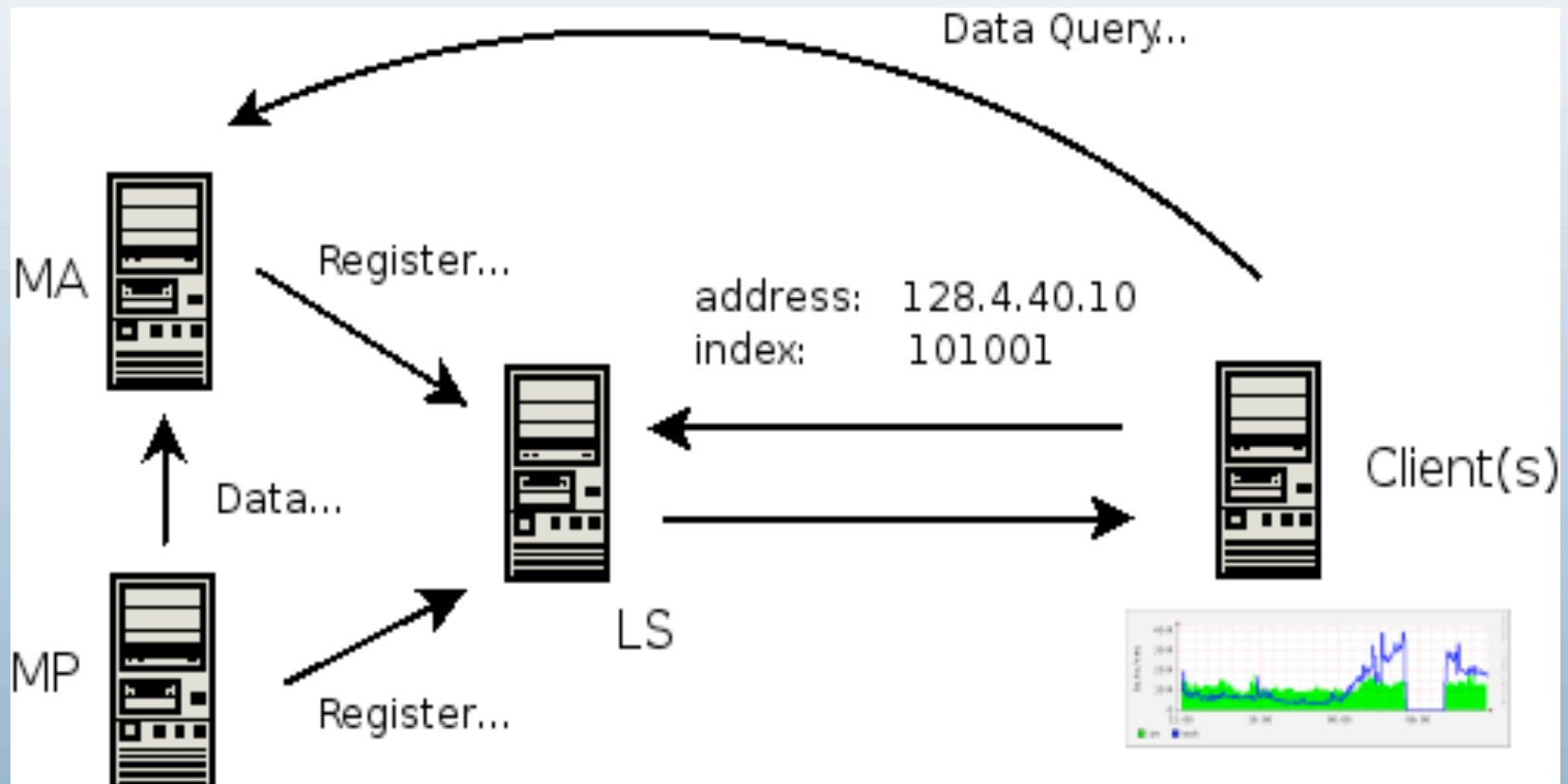
# Lookup Service

- **LS Service:**
  - **Use of native XM L DB backend (eXist currently, BDB soon)**
  - **Service registration operations**
    - **(Register/De-register/Refresh/Query)**
  - **Lookup request and reply interface, using XPath/XQuery**
  - **Client API to help build [or avoid] XQue**

# Lookup Service

- **LS Service:**
  - **Currently limited deployment for use in 'single domain' situations ('local' lookup)**
  - **Multi-domain use in development**
  - **Flavors:**
    - **Java (mLS in progress)**
    - **Perl (s/mLS In Progress)**

# Lookup Service



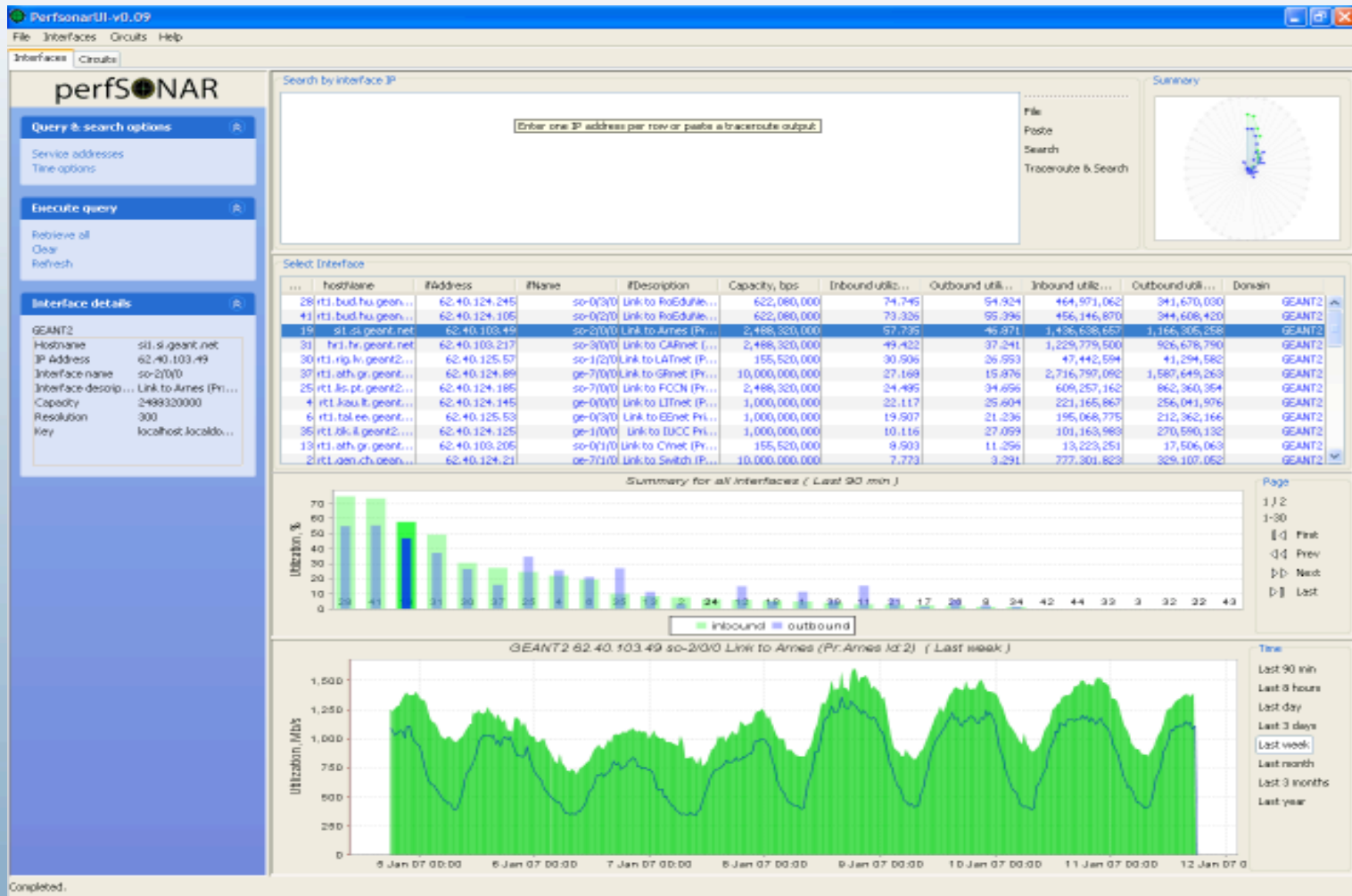
# GUI/Data Presentation

- perfSONAR UI
  - Visualization tool (Java Client) that allows seamless access to deployed MA instances (utilization data commonly).
- Google Maps
  - Similar to perfSONAR UI
  - Map of Monitored Routers (Long/Lat Based)
  - Clickable Utilization Statistics
- perfSONAR Speedometer (perfOMeter)

# perfSONAR UI

- Easy to use / powerful GUI client
  - capable of querying a range of perfSONAR services.
  - targets:
    - NOC and PERT staff
    - Research that demands network performance information
    - End-users

# perfSONAR UI



# Google Maps

- Map routers across a gmap based on LOC records
- 'clickable' balloons will trigger LS/MA queries for data
- Display Utilization/Summary information

# Google Maps

The screenshot shows a Google Maps interface with a map of Europe and Africa. Several red location pins are placed on the map, primarily in Europe. A sidebar on the right contains a list of network-related URLs, each with a checkmark in a box. The sidebar also includes controls for 'show links' and 'markers'.

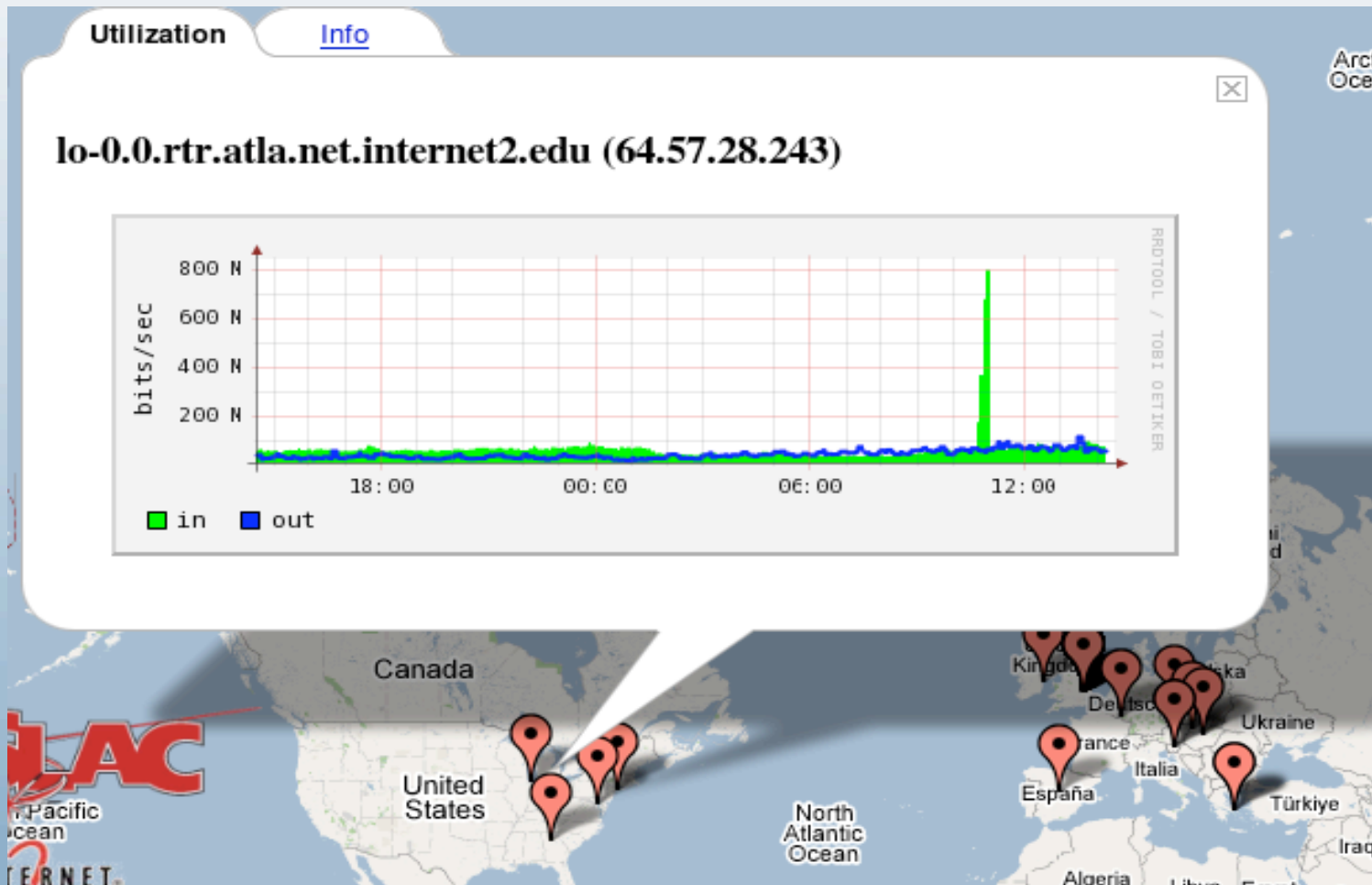
Map controls: Map, Satellite, Hybrid

show links

markers:  Invert  All  None

- [istf.rtl.bud.hu.geant2.net](http://istf.rtl.bud.hu.geant2.net)
- [switch.rtl.gen.ch.geant2.net](http://switch.rtl.gen.ch.geant2.net)
- [litnet.rtl.kau.lt.geant2.net](http://litnet.rtl.kau.lt.geant2.net)
- [malta-bckp.rtl.ams.nl.geant2.net](http://malta-bckp.rtl.ams.nl.geant2.net)
- [gnet.gr1.gr.geant.net](http://gnet.gr1.gr.geant.net)
- [carnet.hr1.hr.geant.net](http://carnet.hr1.hr.geant.net)
- [janet-bckp.rtl.par.fr.geant2.net](http://janet-bckp.rtl.par.fr.geant2.net)
- [belnet-bckp.rtl.lon.uk.geant2.net](http://belnet-bckp.rtl.lon.uk.geant2.net)
- [arnes-bckp.si1.si.geant.net](http://arnes-bckp.si1.si.geant.net)
- [nordunet-bckp.rtl.cop.dk.geant2.net](http://nordunet-bckp.rtl.cop.dk.geant2.net)
- [rediris.rtl.mad.es.geant2.net](http://rediris.rtl.mad.es.geant2.net)
- [cynet.gr1.gr.geant.net](http://cynet.gr1.gr.geant.net)
- [pionier-backup.rtl.poz.pl.geant2.net](http://pionier-backup.rtl.poz.pl.geant2.net)
- [garr.rtl.mil.it.geant2.net](http://garr.rtl.mil.it.geant2.net)
- [ulakbim.rtl.ath.gr.geant2.net](http://ulakbim.rtl.ath.gr.geant2.net)
- [pionier.rtl.poz.pl.geant2.net](http://pionier.rtl.poz.pl.geant2.net)
- [nordunet.rtl.cop.dk.geant2.net](http://nordunet.rtl.cop.dk.geant2.net)

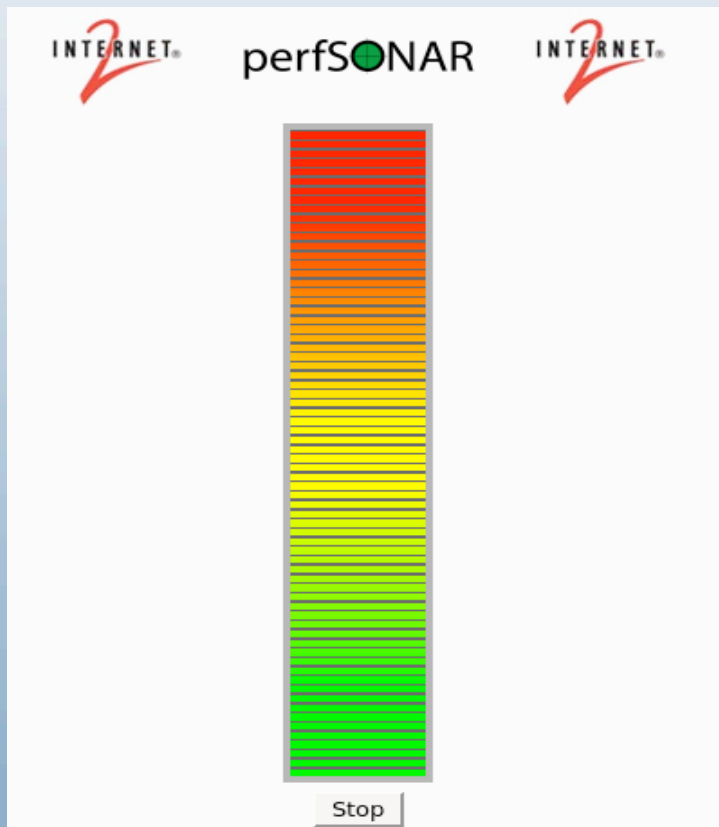
# Google Maps



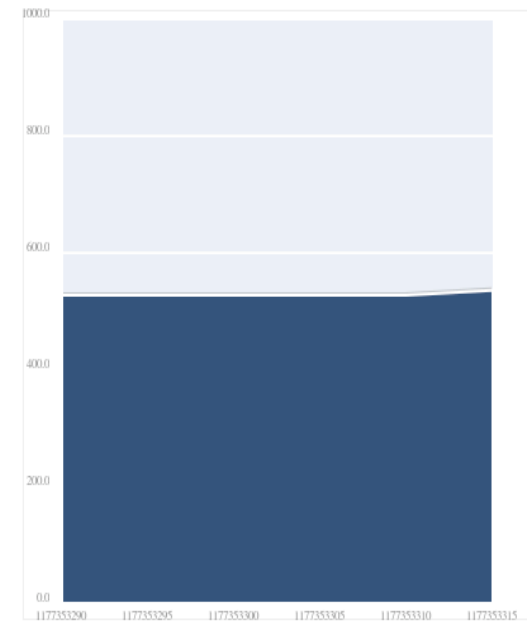
# perfOMeter

- perfSONAR Speedometer
- perfSONAR-PS (Perl based) MP/MA to extract and store SNMP Data
- Javascript based GUI to display utilization, current speed

# perfSONAR Speedometer



Network Utilization



Stop  
[PlotKit](#)

# Looking Ahead

- Improved installer(s) (Perl, Java)
- Deployment to I2, Local Partners
- Additional  
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ta sets will be come available over time
- Visualization Improvements

# Resources

- Web:
  - [www.perfsonar.net](http://www.perfsonar.net)
  - [wiki.perfsonar.net](http://wiki.perfsonar.net)
- Mailing List:
  - [mail.internet2.edu/www/info/perfsonar-user](mailto:mail.internet2.edu/www/info/perfsonar-user)
- Me:
  - [zurawski@internet2.edu](mailto:zurawski@internet2.edu)