Scalable, Extensible and Safe Monitoring of GENI (S³ Monitor)

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http://illusion.hpl.hp.com/genis3monitor

Motivation

Ø Provide monitoring information (especially network state information) to ProtoGENI system administrators **and** experimenters

Goals

Ø Provide ProtoGENI system state *in real-time*
Ø Obtain network (and maybe node) state
  Ø *Active* and passive measurements
  Ø E2E or leverages network element information when available
Ø Flexible and extensible
  Ø Easy to add new measurement tools to be developed
  Ø Configurable time scales (start time, frequency, number)
Ø Share measurement info across applications/slices
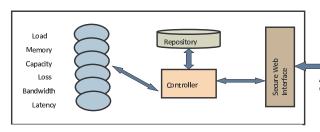Ø *Scalable*, secure, and reliable

Challenges

Ø Active measurement tools previously tested only in point-to-point configurations
Ø Deployment in a large scale setting exposes several issues
  Ø Hard-coded port numbers leading to port conflicts
  Ø Need to be started at source and destination simultaneously
  Ø Large resource requirements leading to end-node crashes
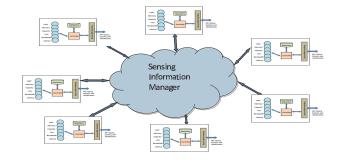 Ø Long running times leading to web server timeouts

Scalable Sensing Service (S³)

Ø Sensor pods
  Ø Measure system state from a node perspective
  Ø Web-service enabled collection of sensors

Ø Sensing information manager
  Ø Controls pods and aggregates measurements
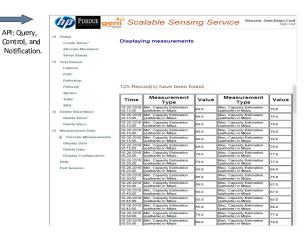 Ø A portal to request and invoke measurements
  Ø Answer research queries

Ø Inference engines
  Ø Infer $O(n^2)$ E2E path info by measuring a few paths
  Ø Dynamically schedule measurements on sensor pods

Year 1 Accomplishments

Ø Integration with ProtoGENI API and mechanisms
Ø S3 Monitor platform v1.0 available for deployment
  Ø Sensor pod
  Ø Sensing Information manager
Ø Support for on-demand and periodic measurements
Ø Archiving and querying capabilities for measurement data

Year 2 Planned Work

Ø Include measurement admission control
Ø Extend deployment to PlanetLab and ORCA GENI Clusters
Ø Integrate S3 Monitor data with GENI's I&M Measurement WG's data and meta-data formats
Ø Enable and support experimenters for using S3 platform on GENI clusters