



GIMI: Large-scale GENI Instrumentation and Measurement Infrastructure

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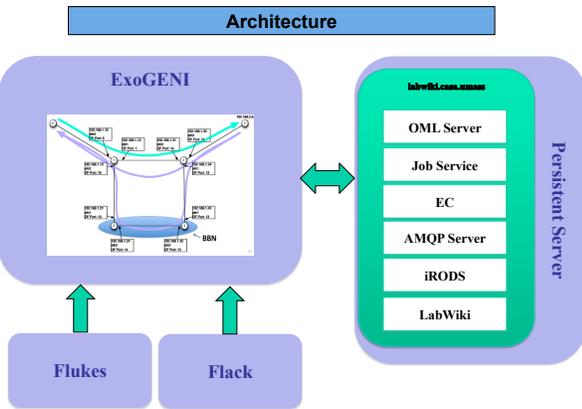


Abstract: This project develops and deploys the GIMI instrumentation and measurement framework, capable of supporting the needs of both GENI experimenters and GENI infrastructure operators. It uses the ORBIT Measurement Library and Framework (OML/OMF) and integrated Rule Oriented Data System (iRODS) as its basis. With LabWiki, GIMI offers a web-based tool that allows users to plan, execute, and analyze their experiments in a structured manner.

It provides libraries to instrument resources, to filter and process measurement flows, and to consume measurement flows. It uses the iRODS data grid for archiving and further processing. Access control is based on accepted GENI policy and authorization mechanisms.

Tools

The screenshot shows the LabWiki interface with a 'Plan' tab selected. It displays a list of nodes and their connections, along with a graph showing the Round Trip Time (RTT) of received packets. The interface includes a 'Run' button and a 'Log' button.

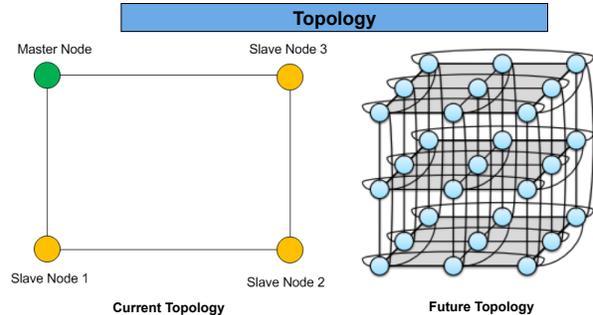


Control Architectures

The section features logos for ExoGENI and protogeni.

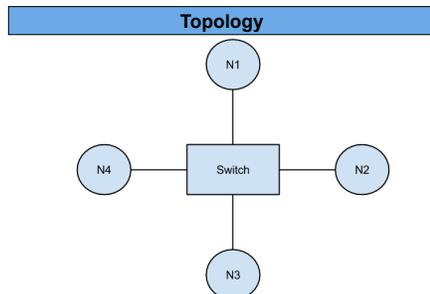
Demo 1: Adaptive Video Streaming

- This demo shows the performance of cloud computing testbed behaving as a High Performance Computing (HPC) cluster.
- It shows the functionalities and capabilities of various GIMI tools with graph 500, a benchmark for evaluating and ranking the super computers.
- Graph 500 is the first serious approach to complement the Top 500 with data intensive applications using Message Passing Interface (MPI).
- Different metrics of the HPC application will be measured within the topology.
- The measurement results allows experimenters to analyze the performance of HPC application on cloud computing testbeds.



Demo 2: Virtual Computer Network Lab

- To demonstrate GENI testbed usage for virtual computer networks lab.
- Example: Learning Switch.
 - Have students implement the learning functionality of a standard Ethernet switch
 - Use 5-node topology: 4 nodes, 1 switch
 - Switch runs OVS to allow learning switch implementation via OpenFlow.
- Modules:
 - OF controller template
 - OEDL experiment script
- Final experiment run from LabWiki
- Linked to chapter 6 of Kurose and Ross "Computer Networking" Book.



Partners

The section features logos for NYU-poly and the UNIVERSITY of HOUSTON.