

From INSTOOLS to GEMINI

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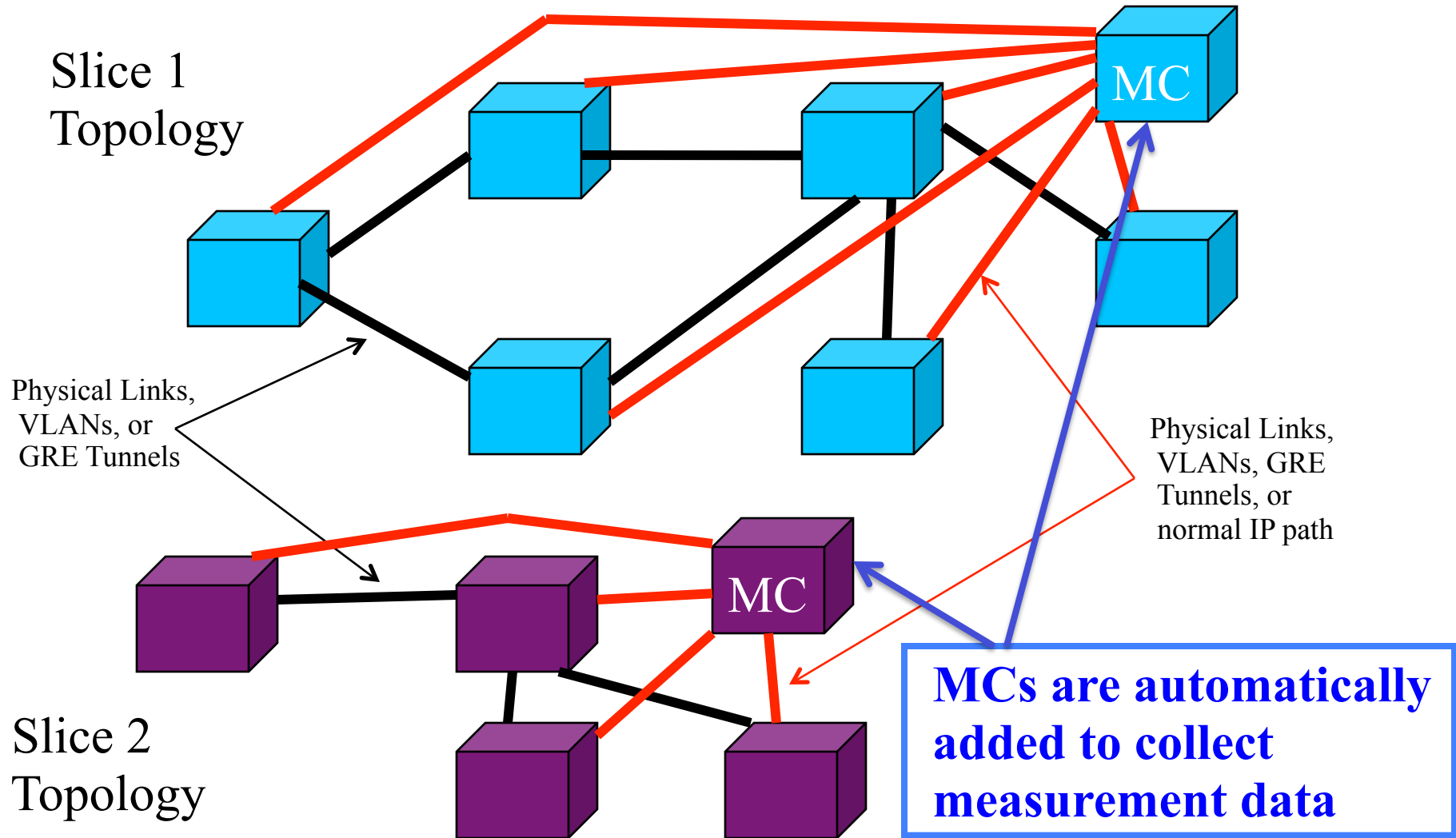
INSTOOLS Objectives

- **High-level Goal:** Make it easy for users to see what is going on in their experiment - i.e., make it trivial to monitor a slice.
- **Sub-Goals:**
 - Automate the task of dynamically deploying an instrumentation and measurement infrastructure within a GENI slice.
 - Provide users with a convenient and simple-to-use interface to the measurement infrastructure.
 - Allow users to customize the interface.
 - Provide a way to save/archive measurements
 - Don't reinvent the wheel - leverage existing solutions to the greatest extent possible.

Measurement Controllers

- INSTOOLS dynamically creates and deploys slice-specific monitoring infrastructure (adding resources to the slice if necessary).
- INSTOOLS uses Measurement Controller (MC) nodes to control/manage the measurement infrastructure, collect measurement data, and make the data available to users.
 - MCs distribute the load of data collection and data presentation.
 - MCs localize data collection network traffic.
 - MCs keep measurement data private within the slice.
 - MCs can be tailored to each aggregate.

INSTOOLS Architecture: (Automated Setup)



INSTOOLS Usage Model

1. Create a GENI slice
2. Invoke INSTOOLS to "instrumentize the slice (i.e., create the measurement infrastructure and start it running).
3. Setup the experiment
4. Run the experiment
5. Use INSTOOLS to view the (live) measurement data (control the measurement and or measurement interface)
6. Use INSTOOLS to archive the collected data for future viewing.

INSTOOLS Role In GEMINI

- INSTOOLS provides much of the “glue” needed to interface the I&M infrastructure with the underlying control frameworks, and has been integrated into the FLACK user interface.
- INSTOOLS provides several of the components required by the emerging I&M architecture.
- INSTOOLS provides a “GENI Portal Service” that unifies a variety of different measurement tools and interfaces.
- INSTOOLS will benefit from the perfSONAR and MDOD standards and metadata definitions.
- INSTOOLS will leverage the *GEMINI Global Registry*

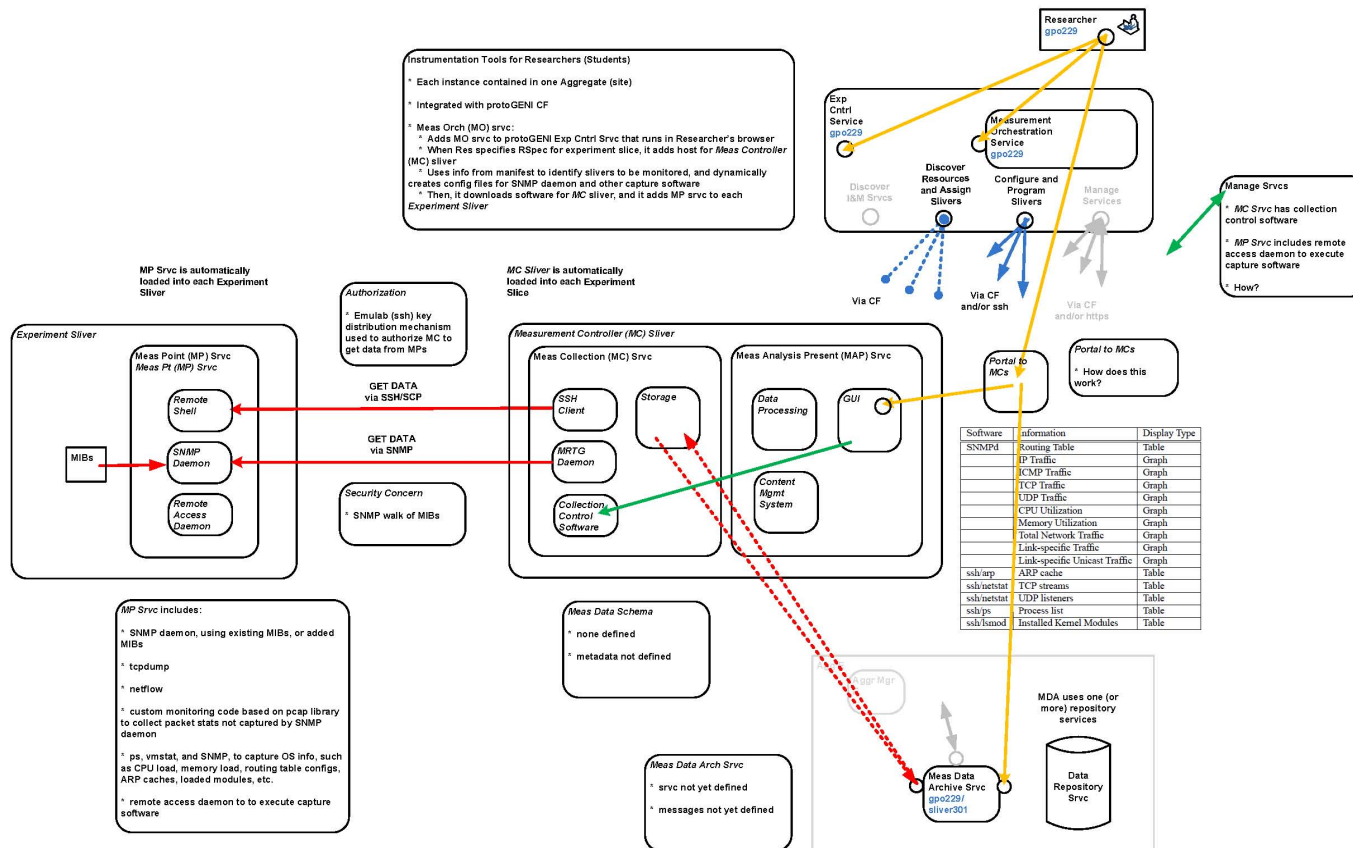
INSTOOLS and the I&M Architecture

(Thanks to Harry Mussman)

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GENI I&M Architecture: 4b) INSTOOLS Svcs and Msgs

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GENI Project Office at BEN Technologies

The Manifest

(At the heart of INSTOOLS)

- Most INSTOOLS components revolve around the **manifest** - something of a glorified RSPEC - which holds all the information about the slice.
- The **manifest** is use to:
 - Deploy I&M software to slivers
 - Define the structure the data stored at the collection service (MC)
 - Define the structure of the data presented on the MC's user interface (i.e., web pages)
 - Visualize the topology at the GENI portal
 - Assist with authorization to various resources
- Moreover, we have enhanced the manifest to include information only used by INSTOOLS components. Stated another way, the CF manifest does not include all the information needed by I&M Services.

The GEMINI Global Registry

- The goal of the **GEMINI Global Registry (GGR)** is to store complete, time-sensitive information about the resources that comprise a slice - the type of information needed by the I&M infrastructure.
- In general the GGR will contain a superset of the information contained in manifests.
- INSTOOLS will leverage the GGR both as a replacement for manifests and as way to interact and share information with other GEMINI services. (i.e., we see the GGR becoming the new "heart" of the INSTOOLS components).

Bridging the gap between data and visualization of the data

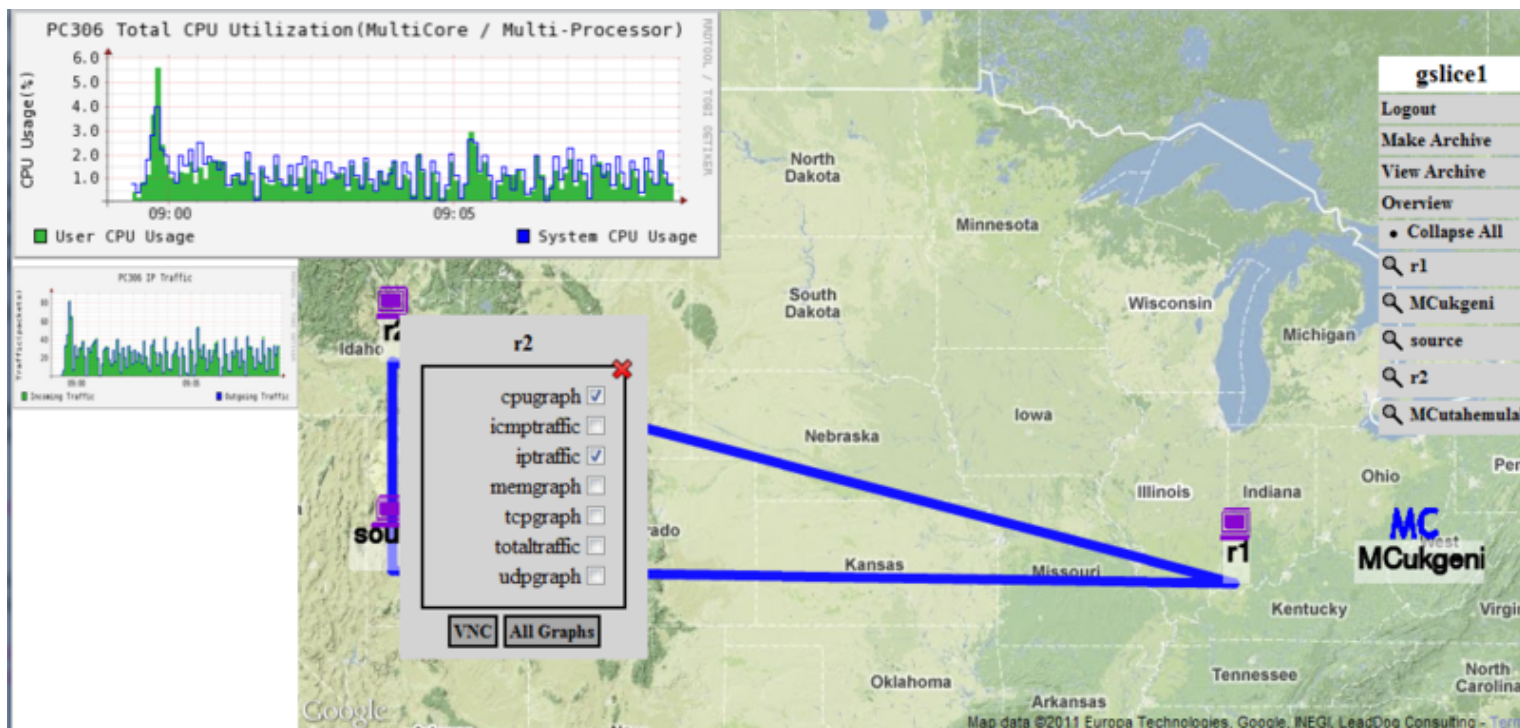
- INSTOOLS is designed to give users the freedom to “see” their data any way they desire.
 - ▣ A content management system (CMS) allows users to control the look-feel of the visualization.
 - ▣ Users can add code (PHP) to process and display data any way they like via the CMS.
- However, INSTOOLS does not do well in defining standards so that other user interfaces can get access to the data.
- Our goal is to use perfSONAR and/or the I&M architecture to define standard ways to access the collected data from external visualization tools.

Some perfSONAR interoperability already exists

- Data is primarily stored in rrd formats which can be understood by perfSONAR clients.
- We have implemented (and tested) a perfSONAR service that reads the rrd files on our MC, and, in turn, makes them available to external I&M user interfaces (e.g., existing perfSONAR tools)
- perfSONAR also brings the ability to perform active measurements (as opposed to INSTOOLS passive measurements only).

GENI Monitoring Portal (GMP)

- Provides Access to all measurement data and archive services.



Thank You!

Questions?

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