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Project Summary

The INSTOOLS project has two primary goals:

1. To transform the existing University of Kentucky Edulab facility – a specialized version of the Utah Emulab system – into a GENI prototype system and integrate the new system into the federated ProtoGENI backbone network, and

2. To implement and deploy instrumentation capabilities that will enable ProtoGENI users to better understand the runtime behavior of their experiments.

Objective 1 was completed during Spiral 1 and is currently providing resources to the ProtoGENI users. Our initial implementation of an instrumentation toolset (Objective 2) was released this past year, demonstrating core instrumentation functionality.

Milestone & QSR Status

ID	Milestone	Status	On Time?	On Wiki?	GPO signoff?
S2.a	Identify Security Point of Contact	Information was sent on time	OnTime	Yes	Yes
S2.b	Contribute Instrumentation Tools project Software	We released two stable releases of the code this past year - initial code tarball was available on-time	?	Yes	No
S2.c	Provide project draft input to GENI Spiral Security Review 2	Met with the Security team and discussed INTSOOLs requirements	OnTime	Yes	Yes
S2.d	Contribute Instrumentation Tools project software into GENI cluster	Released and demo'd second version of the code at GEC 8	OnTime	Yes	No
S2.e	Support limited educational use	This was contingent on an easy-to-use user interface which did not materialize. We attempted it anyway in the Spring 2010 semester but were not able to make it usable by students in time.	OnTime	Yes	No
	QSR: 4Q2009	Submitted and posted on Wiki	OnTime	Yes	Yes
	QSR: 1Q2010	Submitted and posted on Wiki	OnTime	Yes	Yes
	QSR: 2Q2010	Submitted and posted on Wiki	OnTime	Yes	Yes

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GENI Spiral 2 Goals are described in "GENI Spiral 2 Overview", section 7. Project SoWs and milestones were crafted to support those goals. On this slide, summarize project accomplishments this year that contribute to the Spiral 2 goals.

Accomplishments toward Spiral 2 Goals:

- *Integration:* We continued to support the Kentucky Edulab facility and upgraded it several times to keep it well-integrated with the ProtoGENI system.
- *Instrumentation and Measurement:* Our instrumentation and measurement software (INSTOOLS) has progressed significantly in the past year. We developed two different releases of the code, the first working within an aggregate, and the second working across aggregates. We also significantly improved the monitoring capabilities by fully integrating with a content management system, adding support for additional data sources including netflow data. We also contributed to the I&M design documents that have emerged from the GENI I&M Working group.

- We had various discussions about our security issues and requirements and have made several changes to our INSTOOLs software to improve security.

- We continue to interact with the Utah ProtoGENI group suggesting changes to the system, RSPECs, and manifests to help support instrumentation.

- Worked with other measurement groups to integrate our software with theirs. The On-Time-Measure group demonstrated their code integrated with ours at GEC 8.

- We began thinking about the problem of adding new instrumentation and measurement into our system, and revised our design to make it easier to do this.

- Assisted earlier users/testers of our code and helped them to get it working at their location.

- Together with the ProtoGENI group, gave a tutorial at GEC 8 on ProtoGENI and INSTOOLs. Resources from the tutorial are on the GENI wiki pages.

- The format and information contained in RSPECS and Manifests continues to be an issue and will likely be an issue as long as these important data structures evolve. We must constantly adjust our code to adapt to these changing data structures.

- Authentication/Authorization to use/access instrumentation and measurement continues to be an issue.

- Virtual slivers (i.e., OpenVZ containers) are still not stable enough in ProtoGENI to be instrumented with our software.

- GENI archival services to send our data to do not yet exist.

- Differences between sliver software (i.e., underlying OS) make it more challenging to port our software to new types of resources.

- What are you plans for the remainder of Spiral 2?
    - Better integrate netflow data into our content management system.
    - Further enhance the user interface to make it easier to use the system

- The GPO is starting to formulate goals for Spiral 3. What are your thoughts regarding potential Spiral 3 work?
    - We plan to design a portal that gives users access to their measurement data regardless of the aggregate where it is being collected.
    - We would like make our software work in virtual ProtoGENI slivers (i.e., OpenVZ container) when they become stable.
    - We plan to add other measurement capabilities such as collecting packet traces
    - We would like to add a "control" interface that will allow users to control what information is collected