National LambdaRail

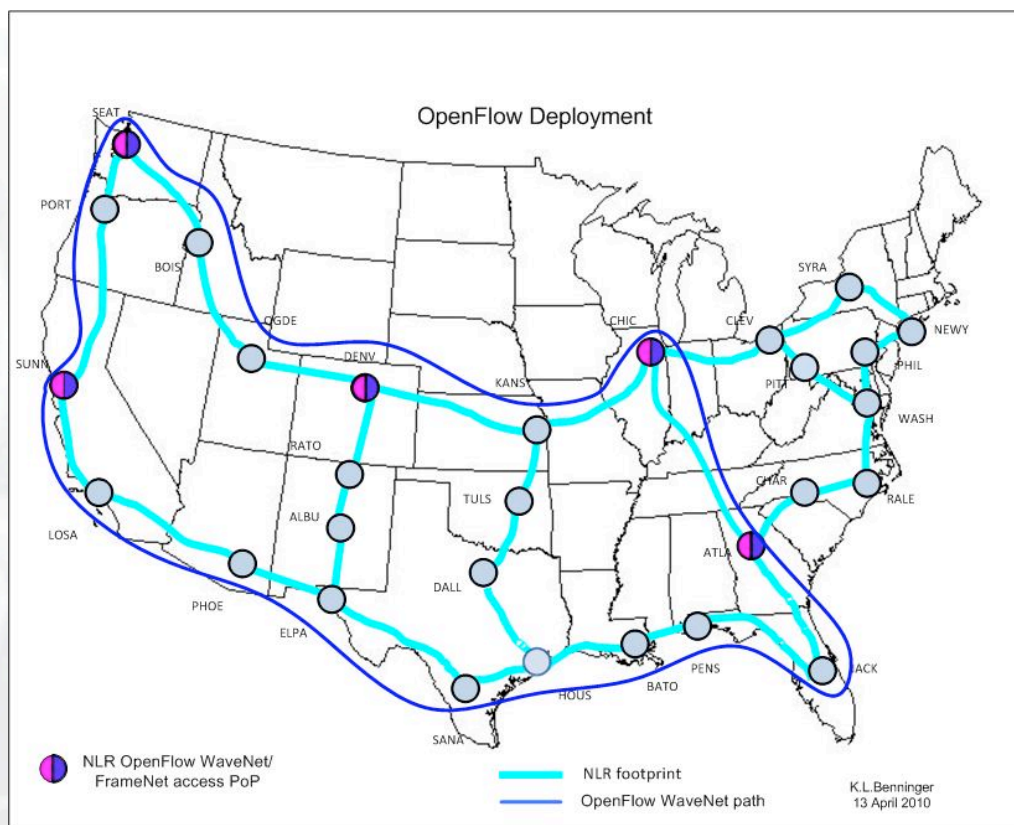PI: Glenn Ricart

Staff: Kathy Benninger, Grover Browning,

Andrew Lee, Ron Milford, Chris Small

Student: John Meylor

25 August 2010

- Deploy and operate OpenFlow-enabled HP Procurve 6600 switches at 5 NLR PoPs and interconnect NLR's FrameNet network to the GENI OpenFlow-enabled backbone, permitting members and non-members of NLR to connect to GENI OpenFlow services.

OpenFlow Deployment

NLR OpenFlow WaveNet/ FrameNet access PoP

NLR footprint

OpenFlow WaveNet path

K.L.Benninger
13 April 2010

Milestone & QSR Status

ID	Milestone	Status	On Time?	On Wiki?	GPO signoff?
OFNLR: S2.a	Complete NLR deployment plan for year 1 (5 cities).	Completed. Deployment plan and schedule submitted.	On Time	Yes	Yes
OFNLR: S2.b	Lab test OpenFlow 1.0 capable switch and controller with NLR Aggregate Manager for year 1 deployment.	In process	<2 months late	No	No
OFNLR: S2.c	Deploy OpenFlow switches and controllers to 5 NLR Points of Presence.	•Switch installation and FrameNet connections completed July-2010 •Layer 1 connections completed Aug-2010 •Demonstrated connectivity at GEC8 between host at IU and test host in Seattle PoP. •Controllers installed at GRNOC	Early	No	No

Milestone & QSR Status

ID	Milestone	Status	On Time?	On Wiki?	GPO signoff?
OFNLR: S2.d	Engineer and test regional network connections to FrameNet for active OpenFlow campuses (including GPO OpenFlow integration site in Cambridge).	NLR FrameNet integration planning started in June-2010 with provisioning and testing beginning in July-2010 between Stanford and the GPO. Completed: •Stanford—GPO •IU—Stanford •UWisc-Madison—Stanford •GaTech--Clemson. Additional FrameNet VLAN provisioning will be done as requested.	Early	No	No
OFNLR: S2.e	Provide access to OpenFlow slices in NLR for testing (GPO, Stanford, perhaps others).				
OFNLR: S2.f	Conduct end-to-end demonstrations and early experiments with other GENI sites.				

Milestone & QSR Status

ID	Milestone	Status	On Time?	On Wiki?	GPO signoff?
	QSR: 4Q2009	Contract negotiation during this quarter			
	QSR: 1Q2010	Deployment plan and schedule created and submitted.	> 2 months late and complete	Yes	No
	QSR: 2Q2010		< 2 months late	No	No

- 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.

Deployment of OpenFlow enabled switches and dedicated wave segments within NLR's network has created the first dedicated nationwide OpenFlow Backbone (OF BB) available to the GENI community. The OF BB itself will be configurable by the GENI Control Frameworks and will be a fundamental part of the GENI-enabled infrastructure connecting GENI research sites.

NLR is working with Internet2 to create a cross-connect point in Atlanta between the two OpenFlow backbones. This cross-connect will eventually enable seamless collaboration between OpenFlow collaborators regardless of whether their campus is connected to NLR or to Internet2.

- On this slide highlight additional project accomplishments that contribute to GENI's development.

OF BB deployment has motivated ongoing discussion and testing for integration between the OpenFlow-enabled campuses.

Issues

- On this slide summarize any issues which cause you concern. The GPO is particularly interested in any issues which have or may affect your ability to complete the work described in your SoW/milestones. However, this is a chance to raise other issues as well.

25 August 2010

- What are your plans for the remainder of Spiral 2?
  - Standardize VLAN configuration
  - Provision FrameNet connections for any additional OF campus requests
  - Complete test of Layer1 backbone infrastructure
  - End-to-end testing between OF campuses
  - Planning and testing for GEC9 demos

- The GPO is starting to formulate goals for Spiral 3. What are your thoughts regarding potential Spiral 3 work.
  - Expand the OF BB with additional switches and waves