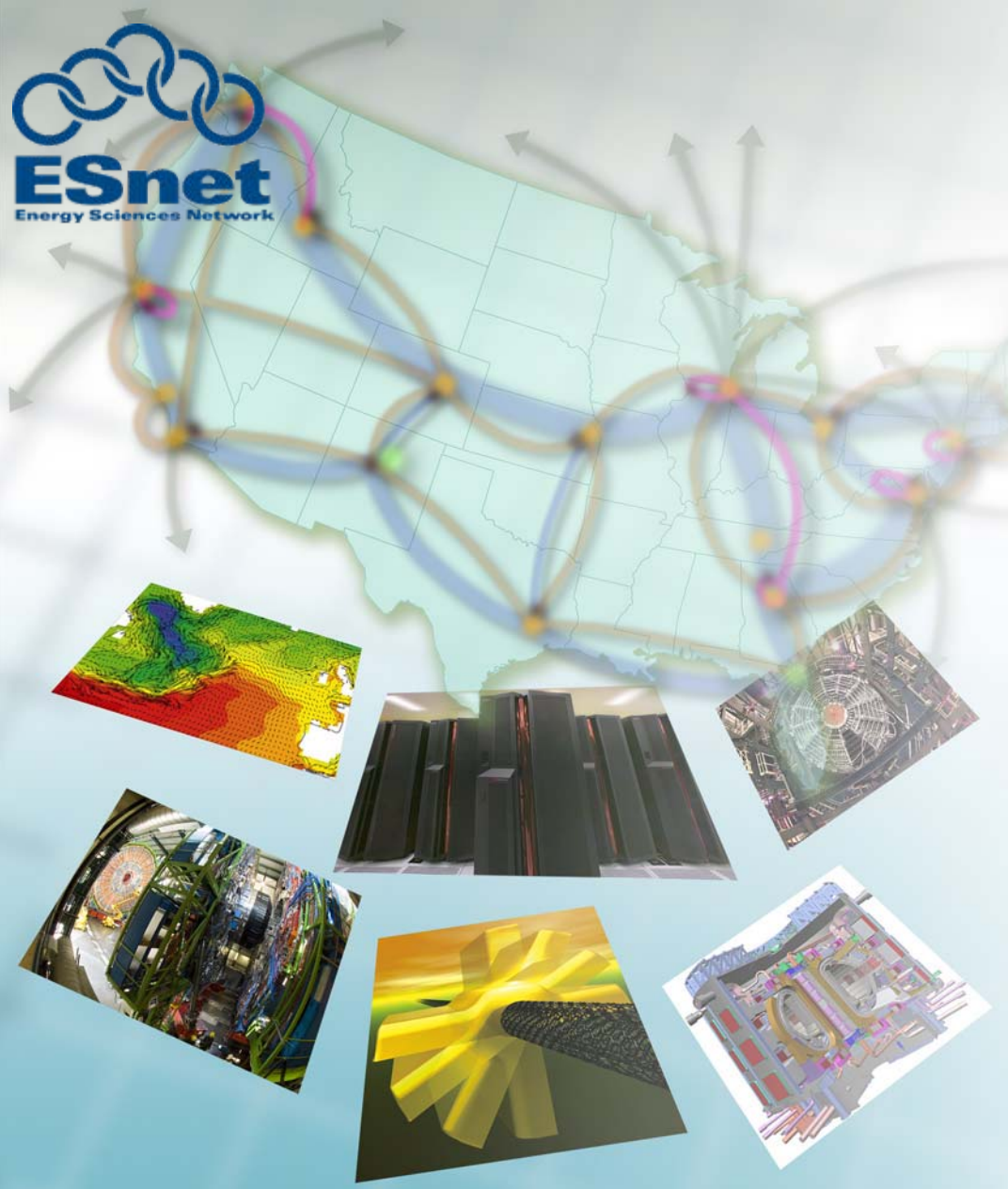

GNI API Task Force

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Network Engineering Group

Energy Sciences Network
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GLIF meeting
Salt Lake City, Feb 3 2010

Networking for the Future of Science

GNI API Task Force Overview

- Motivation:
  - There exist several different guaranteed bandwidth services, that do not interoperate due to diverging APIs.
  - We can fix this.
- Targets:
  - Bring network resource management developers together,
  - Develop a common GNI interface for guaranteed bandwidth reservation requests.
  - Develop a software framework (Fenius) to facilitate translation between the GNI interface and the different APIs.
- Non-Objectives:
  - To become a standard.
  - To get everything 100% correct.
- Code contributores so far:
  - Representatives from G-lambda, IDC, Harmony, KISTI, NCSU

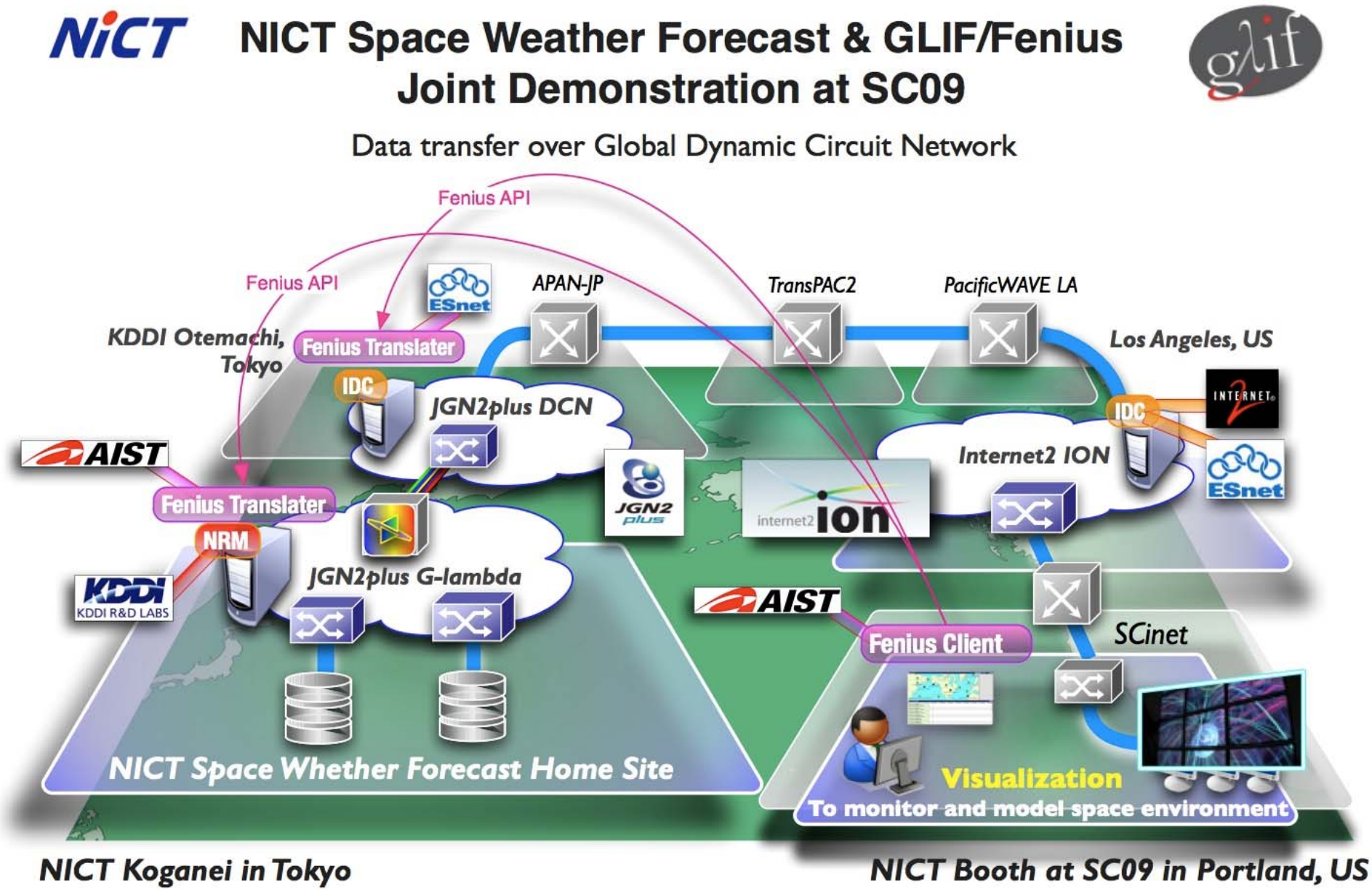
Agenda

- Review objectives
- SC09 post-mortem, lessons learned
- Collaborations and growth
- Deployment and demos
- Topology exchange & pathfinding
- Authentication & Trust
- Authorization & Policy
- Fenius 2.0

GNI API TF Objectives

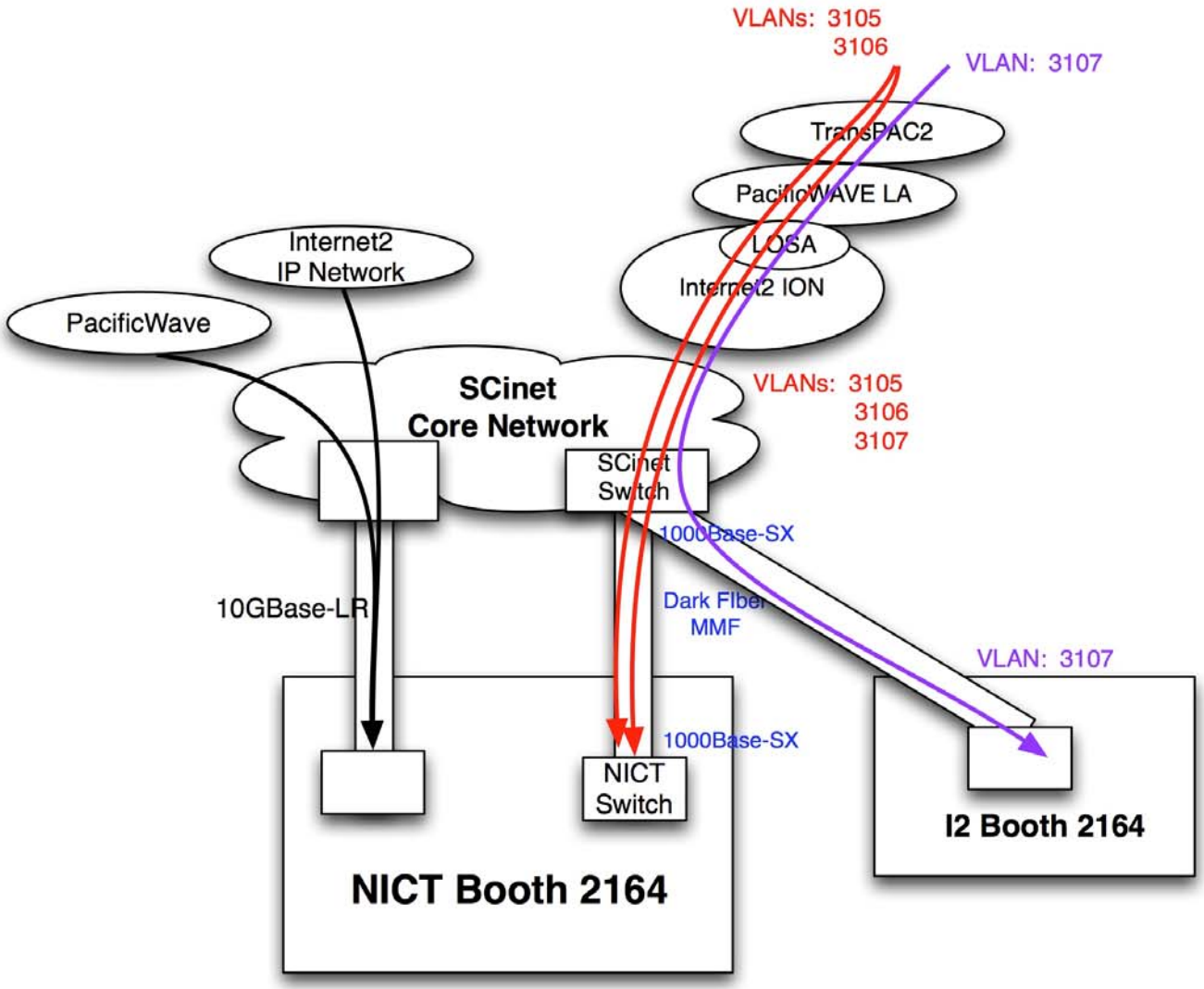
- Collaborate
  - Provide feedback, lessons learned to NSI
  - Provide framework to rapidly test out potential NSI interface
  - Use NML for topology exchange
- Grow
  - DRAC, AutoBAHN, others into the task force
  - Align Fenius and Harmony
- Develop
  - Continue work on Fenius, productionalize, document
  - Enrich internal and external interfaces
  - Extend security layer
  - Add topology exchange, pathfinding features
- Deploy
  - Deploy improved Fenius instances on real networks and GOLEs

SC09 Post-Mortem



SC09 Post-Mortem

Internet2 ION VLAN requests for NICT booth and Internet2 booth



SC09 Post-Mortem

Fenius Reservation Creator

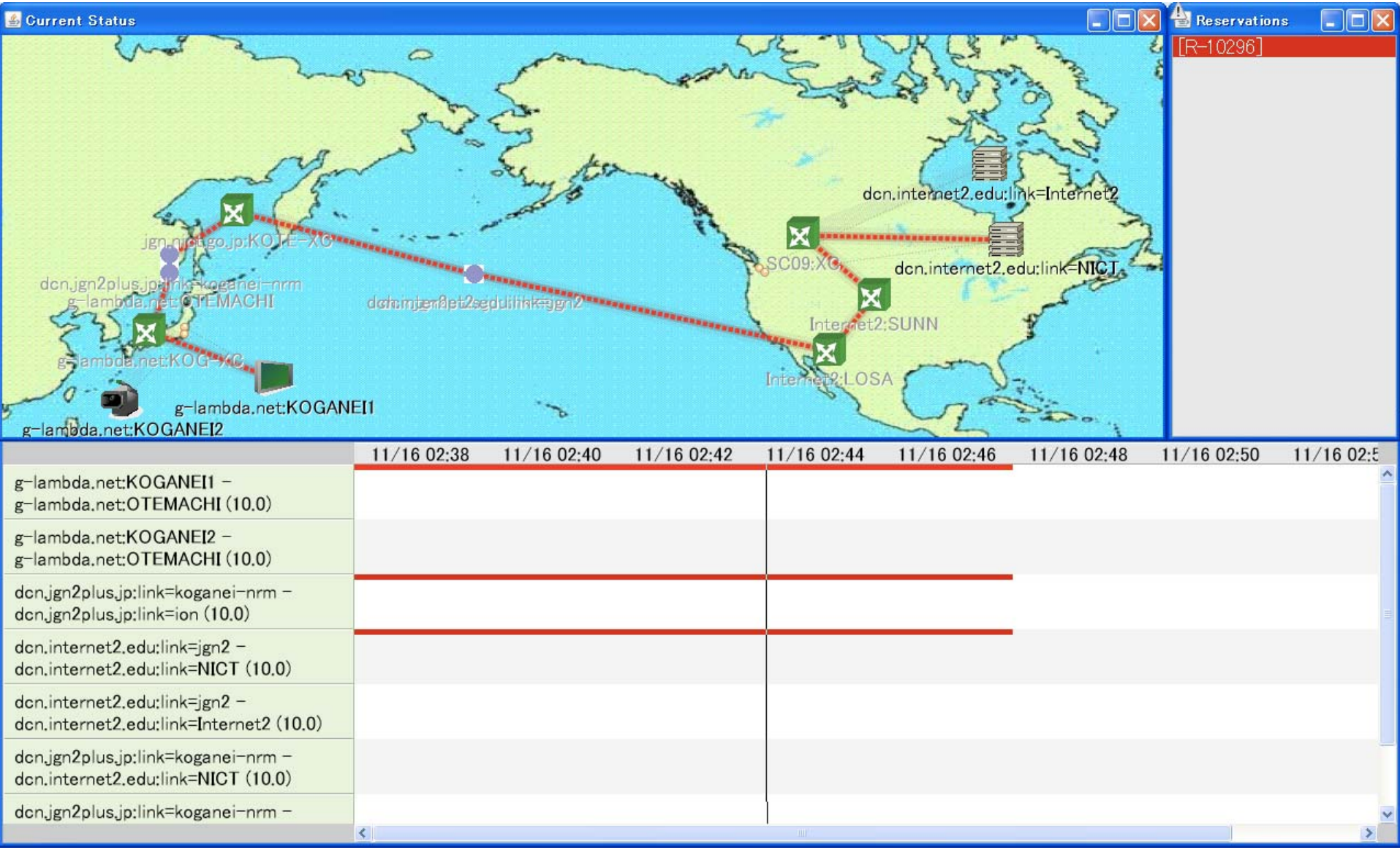
Reservation ID	Terminal Point	Terminal Point	Activate Time	Duration (sec)	BW (Mbps)	VLAN	SUBMIT
R-10298	dcn.internet2.edu:link=NICT	dcn.internet2.edu:link=NICT	2009/11/16 2:43:4	180	1000	3105	CREATE CANCEL

Fenius Reservation Monitor

dcn.jgn2plus.jp (JGN2plus DCN)	g-lambda.net (JGN2plus G-lambda)	ion (Internet2 ION)	Reset Information	Current Time
up	up	up	RESET	11/16 2:41:32(UTC)

Reservation ID	Terminal Point	Terminal Point	Activate Time	Duration (sec)	BW (Mbps)	VLAN	Status
R-10296[1]	dcn.jgn2plus.jp:link=koganei-nrm	dcn.jgn2plus.jp:link=ion	2009-11-16T11:37:00.000+09:00	600	1000	3107	ACTIVE
R-10296[0]	g-lambda.net:KOGANEI1	g-lambda.net:OTEMACHI	2009-11-16T02:37:00.000Z	600	1000	3107	ACTIVE
R-10296[2]	dcn.internet2.edu:link=jgn2	dcn.internet2.edu:link=NICT	2009-11-15T21:37:00.000-05:00	600	1000	3107	ACTIVE

SC09 Post-Mortem



Lessons Learned from Fenius 1.0

- Specify and document in **LOTS OF DETAIL**:
  - expected agent behaviors,
  - timing,
  - semantics,
  - software deployment procedures,
- Debug and test a lot.
- We need a (scalable) security model
- Enrich a few things in the interface
  - VLAN translation,
  - Listing, querying stuff
- See Google doc at:

http://docs.google.com/Doc?docid=0AW5LXoHHqRZVZGZuOGJkbTNfMGczOTlrcWRm&hl=en

Collaborations and growth

- Provide feedback to NSI
  - 1st draft of lessons learned document ready, to be reviewed
  - Adapt document to NSI context
- Work with NDL / NML / PerfSONAR for topology exchange
- Release Fenius framework to community
  - Produce developer guide
  - Produce user / deployment guide
- Harmony / Fenius collaboration
- Invite AutoBAHN, DRAC, Sherpa, others into TF
  - GENI: ORCA-BEN
  - EGEE: AMPS

Deployment and demos

- Fenius is not 100% ready for production use.
  - But getting closer!
- Networks that have successfully run Fenius:
  - ESnet, Internet2, JGN, G-Lambda
- Where & how to expand Fenius usage
  - Document the framework & the benefits it brings.
  - Run on more networks.
  - Run on strategic GOLEs.
- Demos discussion:
  - GLIF 2010
  - Supercomputing 2010

Topology Exchange & Pathfinding

- Evangelos' proposal:
  - Use NML schema to describe the topology.
  - Use only an "abstracted" topology view, keep it SIMPLE.
  - We have topology servers, each authoritative for a number of topology documents,
  - No topology exchange between topology servers.
  - But a number of topology cache servers can be used to collect all topology information & offload the authoritative ones. These can be tuned for performance.
  - Clients can pull topology documents from the caches, selectively or bulk.

- Is pathfinding even in scope for Fenius?
  - Evangelos: No – but it's probably not hard to develop a reference interdomain pathfinder for NML given the above.

Authentication & Trust

- Evangelos' Authentication Proposal:
  - SSL for message security (already there as of Fenius 1.0)
  - Allow different methods for user authentication:

  a) Shibboleth
  b) Username/password
  c) None! (i.e. if used with a ticketing / leasing broker)

- Trust:
  - In current paradigm only needed between client and Fenius server.
  - Do we need / want to change this?

Authorization & Policy

- Authorization
  - Authorization decisions should be made according to user attributes and domain policy.
  - Alternately, we can use tickets for authorization.
  - Need to enumerate common user roles & rights.
  - An attribute infrastructure must exist

- Evangelos' Policy Wish List:
  - A dynamic resource allocation policy component
  - With APIs & web UIs to manage policy decisions
  - Each domain runs one, Fenius & the NRMs use it as the policy decision point.
  - It can also be part of a ticketing / leasing system
  - Need to find some trick to do the GOLE case (2 connectors needing to agree while GOLE has open policy)

Fenius 2.0

- Target features
  - Fix Fenius 1.0 inconveniences
  - Add VLAN translation, untagged (?), QinQ (?)
  - Add SONET / SDH
  - Add L1 service parameters
  - Support multi-layer L1 & L2 service requests
  - Add different styles of service requests (i.e. repeating, soonest-possible, deadline, etc.. TBD)
  - Add AuthN / AuthZ / Policy - TBD

- Development Schedule
  - Next API : Mar 2010
  - Port old code: Apr 2010
  - Finish adding new features: Jun 2010
  - Test, debug, document: over summer
  - Real demo at GLIF in Geneva, Oct 2010
  - Real demo at SC10 in New Orleans, Nov 2010