GLIF Americas (GLIF-Am) Community Meeting
Wednesday, October 10, 2012 (3:30 – 6:30 pm)
Chicago, IL

DRAFT Minutes
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A. Meeting Objectives

Key topics/conclusions from the GLIF-Am 2011 meeting in Rio de Janeiro, Brazil: Joe Mambretti reviewed some of the findings from the GLIF-Am 2011 meeting; specifically, large capacity networks and better utilization of that capacity through flexibility and programmability. Efficient utilization is managed through control frameworks, edge applications, people and processes. Private networks, which traditionally have been based on dedicated infrastructure (e.g., LHCOPN), are now being provisioned on shared infrastructure (LHCONE) and through virtualization, becoming more granulated so that many networks can share the same foundation infrastructure. This characteristic has been inherent in the GLIF environment since its inception. This trend is being accelerated through SDN, programmable networking, the architecture of GENI (National Science Foundation's Global Environment for Network Innovations), the EU's FIRE initiative (Future Internet Research Environment), and related projects in Japan, Brazil, etc. Network exchanges capable of this type of flexibility are increasing and more such exchanges are being implemented, as discussed in the GLORIAD meeting earlier today, such as BIX in Bangalore, in Cairo, etc.

B. Major Trends in the Americas International Connection Requirements and Communities Served. That is, what resources are required *beyond* bandwidth (a topic that is well known), for the period 2012-2017?

What is the status of NLR? NLR retains its R&E commitment. Its major thrusts are in advanced healthcare applications (genomics) and in growing application usage of the network. NLR is moving toward 100 Gbps architecture, to make such applications as surgical and home healthcare available as national resources for advanced clinical care. NLR will let the Regional Optical Networks (RONs) develop the network to reach more institutions. NLR needs to get to more sites; it has a partnership with AT&T to extend its backbone. (This AT&T partnership facilitates the last-mile gap if RONs cannot provide this service.) CENIC became the NOC for NLR in the past few months.

Areas of major potential new opportunity (e.g., 100 Gbps networks, programmable networks – aka Software Defined Networks, Cloud Computing, Green Networking, Transoceanic Fiber Builds, Distributed NOCs, etc.) There is an increasing number of OpenFlow testbeds being deployed. Many researchers from various communities (GLIF, OGF, GENI, iGENI, FIRE, RNP, JGN-X, et. al.) are interested in federations of control frameworks and there are processes to do this. Members of GLIF community are assisting with such testbeds. The iGENI initiative has deployed a large-scale international OpenFlow research network.

C. Key Initiatives Related to North and South American R&E International Networking

GLORIAD – Greg Cole
Greg Cole gave a brief synopsis of the successful GLORIAD meeting held earlier that day. There was a successful Hong Kong workshop in January 2012 that is leading to the refurbishing of HKOEP, with larger circuits and more circuits. GLORIAD signed an agreement with APAN; Greg Cole got a warm reception at the most recent APAN meeting. John Jamison is working on some Middle East initiatives; he

is exploring building an exchange in UAE *(*Fallujah). NORDUnet has fiber from Helsinki to Russia, so Russia can be better connected, with potentially an NSF-funded 10Gb transatlantic link.

AmLight – Julio Ibarra
PPTs

TransLight/PacificWave – Dave Reese and Ron Johnson
Dave Reese said that Brocade has a protection layer they use to do OpenFlow within Pacific Wave. Currently talking to other networks (ESnet, Internet2, JGN-X) about expanding the OpenFlow fabric. They use OSCAR for dynamic provisioning.

Ron Johnson said it's hard to integrate Layer 2 networks that require coordination. (Perhaps this type of coordination could be a role for the GLIF?) OpenFlow still needs control frameworks, and there are a many that could be implemented. The transition is happening faster than PNWGP can handle. At the CANS meeting, Dr. Wu was saying the CERNET backbone is going to 100Gb – how does PNWGP deal with that? Pacific Wave is trying to align with ESnet/OSCARS. Pacific Wave now has a Northern Wave component, which just arrived at StarLight from Seattle – this will establish a persistent peering fabric between TransLight/Pacific Wave and TransLight/StarLight. NSF's Ocean Observatory Initiative has one project (tectonic plates) that's now running and will be in production within a year. The AARNet link hasn't been announced yet, but they want to upgrade to 40-100Gb to the U.S.

TransPAC3 – Dale Finkelson
TransPAC3 is putting a Brocade switch in LA to do OpenFlow tests with JGN-X.

ACE – Dale Finkelson
Dale Finkelson now works 20% time as the ACE engineer. Finkelson, Gerben van Malenstein and Erik-Jan Bos are putting OpenFlow-capable switches on the CHI/AMS circuit. They are investigating how one asks permission, protects their circuit, etc., as one goes inter-domain (Internet2, IRNC, SURFnet). They allow separate controllers to handle separate segments. There is a third ACE circuit from DC to Frankfort.

Joe Mambretti and Finkelson are looking at load balancing for LHC traffic, primarily related to LHCONE. GÉANT is dedicating a 10Gb circuit between LHC and StarLight. GARR has a 10Gb link between LHC and StarLight. ACE gives a percentage of its bandwidth to LHC traffic to StarLight. This is a very complex problem.

There is a link from Beijing to London. The circuit from NYC to London is 50% ACE and 50% Internet2. NORDUnet has links to London. Working together to do backups, maintenance, etc. The London Open Exchange is developing a pilot for next year at no charge; if successful, it will be a production exchange.

TransLight/StarLight – Joe Mambretti
The IRNC program supports international services, including iGENI, SAGE, GreenLight, distributed Clouds for science, HPDMnet, and CineGrid.

DOE ESnet international networking initiatives – Brian Tierney
Brian Tierney reported ESnet is deploying 100Gb backbone that will be completed in another month, using Alcatel equipment. Bringing 300Gb to SC12.

DOE USLHCnet/LHCOPN/LHCONE – Artur Barczyk
Artur Barczyk showed some PPTs as examples of LHCONE. Will give a full presentation at the GLIF Tech Working Group meeting. Joe Mambretti explained LHCOPN – a private network that meshes Tier0 and Tier1 sites.

Internet2 international networking perspective – Dale Finkelson
Internet2 is working with Tata to create a colocation facility in Singapore for U.S. institutions with campuses in Asia, and is installing a telepresence exchange at this facility. Internet2/Tata are also making a connection between Singapore and Hong Kong. To support trans-Pacific traffic, many links will be used, such as IRNC links, including GLORIAD links, and TEIN links. International traffic continues to increase; most traffic is from the exchange to local campuses. There has been discussion about administration traffic versus science traffic. Kevin Thompson noted that NSF doesn't police what data campuses put over their links.

NLR international networking perspective – Kurt Snodgrass
NLR no longer has an international circuit to the Netherlands.

CANARIE international networking perspective – Jim Ghadbane
Jim Ghadbane mentioned the SKA; David Wilde from AARNet will talk about ASCAP at GLIF. He mentioned transatlantic circuits; it was suggested that he talk with NORDUnet. Does South Africa have capacity to handle the data from the SKA?

RNP – Michael Stanton
PPTs
Michael Stanton reviewed AmLight, RNP upcoming plans, RedCLARA and South American connectivity. Approximately 20% of Brazilian traffic goes to the U.S. The city of Fortaleza is a landing site for international networks to South Africa, Angola, and Europe. RNP has expectations to increase bandwidth between Rio and Sao Paulo, which is currently 10Gb. CPqD has been developing 100Gb technology, but right now there is no investing in 100Gb fiber in Brazil.

Innova-Red
No update available.

KyaTera-Fapesp – Louis Lopez
Louis Lopez gave an ANSP update. International connectivity is still expensive. By next year, ANSP will connect six big universities in the State of Sao Paulo. KyaTera is an optical network connected to the SouthernLight GOLE, and was originally a testbed for experiments. The project ended in 2010, but given that the infrastructure existed, the science foundation continues to light it, based on the needs of the academic community. There has been discussion of lambdas from Sao Paulo to Barcelona.

RedCLARA
No update available.

REUNA – Michael Stanton
Sharing with RedCLARA, REUNA has a 2.5Gb link from Santiago to its border, so they have more connectivity than ever before. The European project ALMA is located in Northern Chile so the bandwidth was improved.

D. Potential for Implementing International Control Frameworks, Specifically Migrating the Emerging Standard Network Service Interface (NSI) To Production

There was discussion about moving NSI out to GOLEs for production.

E. Projected Future Plans (2-3-5 Years) for the Americas GLIF GOLE Exchange Points

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SouthernLight – Michael Stanton
SouthernLight only has 1 connection currently. Would like Argentina and Chile to connect. The most promising is using Forteleza as an international exchange – making SouthernLight a distributed GOLE.

Pacific Wave/PNWGP – Dave Reese
Dave Reese would love a Tb link up the west coast, but doesn't think he can afford the switch. He will need to do 10/100Gb integration. Looking at additional landing sites in California (e.g., San Luis Obispo) and connections to other sites in Mexico.

MAN LAN – Dale Finkelson
MAN LAN will hopefully have 100Gb connections as well as 100Gb transatlantic connections. What does it mean to run an exchange point in an OpenFlow world? Building OSCARS implementations at MAN LAN and WIX.

Ampath/Atlantic Wave – Julio Ibarra
Ampath is currently enhancing its switch/fiber structure for redundancy, the link aggregation capacity, and investigating equipment to support 100Gb. Working with carriers to provide bandwidth to the academic community. Working on a new Atlantic Wave 5-year project – coherent infrastructure with IRNC ProNet, OpenFlow, etc. More news will be coming in the next few months.

StarLight – Joe Mambretti
StarWave is a new multi-100Gb exchange designed and implemented for data-intensive science, located at StarLight, which will be demonstrated at GLIF. Joe Mambretti estimates that StarLight will get 22 100Gb links in the next year. GENI, NSI, federation – lots of work to do in these areas. Mambretti is building, under the iGENI project, an international OpenFlow network, which will be demoed at GLIF. In addition to large-scale science streams, iCAIR is also developing technologies for large-capacity digital media (8K, which is 8,000 x 8,000) – 73Gbps uncompressed as a single stream.

MAX
It was noted that Abdella Battou recently resigned as MAX director and is going to NIST.

F. Processes for Implementing Innovative New Services Across International Facilities, Including for Large-Scale Research Projects

Doing federations among domains is important and we have an opportunity with NSI.

G. International Research Testbeds (US's iGENI/GENI, Europe's FIRE, Japan's New Generation Network (NWGN), G-Lab, etc.)

There are many distributed experimental instruments (environments) being developed to support network science – highly programmable resources using virtualization – which reflect the way networks will be designed and implemented in the future.

H. Wrap-Up

These notes will be distributed and posted on the GLIF website.