GLIF Americas (GLIF-Am) Community Meeting
Wednesday, 28 September 2016 (1:30 – 5:30 pm)
Co-Located With the 16th Annual Global LambdaGrid Workshop
Sandringham/Windsor Room (Level 2), Intercontinental Hotel, Miami, Florida, USA
September 28, 2016
Organized by Joe Mambretti and Maxine Brown
DRAFT NOTES – October 9, 2016

ATTENDEES

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A. Meeting Objectives

Last year, 3 themes emerged, which we will explore today:
1. Enhanced capacity
2. Programmability of networks
3. Innovations at many levels of the network (analytics, measurements, provisioning, control planes, chips for advanced networking, communication services, orchestration, etc).

B. Major Trends in Americas' International Connection Requirements and Communities Served

We briefly discussed new opportunities for 100 Gbps international paths and new technologies. We talked about the need for resources required *beyond* bandwidth (e.g., programmable networking).

Tom DeFanti talked about the PRP, which has scaling issues. How do we change the world of scientific usage with funding for only a few FTEs? Also, how do we deal with the security issues of interoperating among DMZs.

Cees DeLaat, during his sabbatical last year in the USA, looked at trends in computing. In the past, supercomputers were large simulation machines, but are now doing stream processing. Also, we are collecting big data from large scientific and societal instruments (IoT, smart cities). We are using machine learning to learn from the data, predict and classify. For exascale computing, the memory wall (i.e., the network between CPUs and memory) is a problem. High-performance networks are required to keep exascale computers busy. We are seeing more cloud computing, virtualization (scientists want services, complexity and data without knowing the technology). There are huge gaps between advanced networks and users (in part because of limited and limiting edge capabilities); we need to know more about where the computing is happening, where the storage is located, and we need to keep exascale computers busy, e.g., doing machine learning. Science DMZ at the edges is a start – but we also need to know about what this means for processes at the core.

Lars Fischer discussed how the business model of R&E networks is changing; specifically, what is the business of R&E networks? Users want more advanced technologies than just raw networking. Another mega-trend is moving to cloud computing and getting data to move to/from/between clouds. Joe Mambretti said GÉANT is now being asked to move campus computing to many distributed clouds and back.

Network functions/virtualization are being driven by commercial providers; they are doing network/cloud integration Larry Peterson is architecting one such solution (e.g., the CORD project – Central Office Redesigned as a Data Center).

C. Key Initiatives Related to North and South American R&E International Networking
1. NSF IRNC Awards
   a. IRNC: ENgage: Building Network Expertise and Capacity for International Science Collaboration – Dale **Smith**, U Oregon – See PPTs
   b. IRNC: AMI: InSight Advanced Performance Measurement System – Jens **Gregor**, University of Tennessee, and Carter **Bullard**, QoSient – See PPTs
   c. IRNC: AMI: NetSage: An Open, Privacy-Aware, Network Measurement, Analysis, and Visualization Service – Jennifer **Schopf**, Indiana University – See PPTs
   d. IRNC: AMI: Collaborative Research: Software-Defined and Privacy-Preserving Network Measurement Instrument and Services for Understanding Data-Driven Science Discovery – Yan **Luo**, University of Massachusetts Lowell – See PPTs
   e. IRNC: NOC: Global Research Network Operations Center at Indiana University: Performance Engagement and Monitoring and Visualization –Luke **Fowler**, Indiana University – See PPTs
   f. IRNC: Backbone: AmLight Express and Protect (ExP) – Julio **Ibarra**, Florida International University – See PPTs
   g. IRNC: Backbone: SXTransPORT Pacific Islands Research and Education Network (PIREN) – David **Lassner**, U Hawaii, presented by Dave Reese, CENIC – See PPTs

h. IRNC: Backbone: ACE - NEAAR: Networks for European, American, and African Research – Jennifer **Schopf**, Indiana University – See PPTs
i. IRNC: Backbone: TransPAC4 – Andrew **Lee**, Indiana University – See PPTs
j. IRNC: RXP: AtlanticWave-Software Defined Exchange – Jeronimo **Bezerra**, Florida International University – See PPTs
k. IRNC: RXP: Pacific Wave Expansion Supporting SDX & Experimentation – John **Hess**, CENIC, presentation, which Dave Reese talked about. (PPTs first given during the GLIF meeting, Friday, September 30) – See PPTs
l. IRNC: RXP: StarLight SDX – Joe **Mambretti**, Northwestern University – See PPTs

2. DOE ESnet international networking initiatives – Brian **Tierney**, ESnet – See PPTs

3. LHCOPN/LHCONE –Edoardo **Martelli**, CERN, presented by Joe Mambretti – See PPTs

4. Internet2 international networking initiatives – Dale Finkelson, Internet2 – No PPTs
There has been another year of ANA activity. Internet2 is working with its partners to evaluate, look at performance, backup, etc. In future years, Internet2 wants to make sure that the consortium delivers to its customers.

In the Pacific, Internet2 has worked with SingAREN and partners to implement a 100 Gbps network to the US. This network may extend via Guam. How do we do an Exchange Point in the North Pacific (Guam) area? Singapore (located in the South Pacific) is working on developing its open exchange point.

Tom Lehman is working on SDX at MAX/WICS. It will be extended to MAN LAN.

Internet2 is working with the Global Network Architecture (GNA) Technical Committee, and contributed to a standards document. What's the best way to organize our global connectivity?

A lot of LHC activity is going on, but not as much traffic goes over Internet2 as before. However, Internet2 is committed to supporting this project.

5. CANARIE international networking initiatives – Mark **Wolff**, CANARIE – See PPTs
ANA 200 is now ANA 300. Montreal is a landing site – CANARIE will build a Montreal Open Lightpath Exchange (not named yet). NORDUnet will help its development with support.

6. RNP/SouthernLight international networking initiatives – Michael **Stanton**, RNP, presented by Heidi Morgan, Florida International University – See PPTs

Luis **Lopez**, ANSP, gave an update on the state of Sao Paulo. – See PPTs
He talked about connecting the Amazon to Fortaleza.

7. A*STAR/NSCC/SingaREN international networking initiative– Yves **Poppe**, A*STAR Computational Resource Centre – See PPTs

8. NSF CC*DNI Pacific Research Platform (PRP) – Tom **DeFanti**, UC San Diego – See PPTs

D. Progress On Implementing International Control Frameworks, Specifically Migrating the Emerging Standard Network Service Interface Connection Service (NSI-CS 2.0) To Production
We did not have time to address this topic.

E. Wrap-Up