

## **JET Meeting Minutes**

### **April 29, 2015**

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#### **Action Items**

#### **Proceedings**

This meeting of the JET was led by Paul Love of the NCO.

#### **Network Roundtable**

**MCNC: Mark Johnson**

North Carolina has finished its BTOP buildout. NOAA in Ashville is served by it with 2 x 10G diverse paths. The network can deliver SDN. They are looking to build a fiber connection to EPA and other local facilities in the RTP area.

**CAAREN: Andrew Gallo**

CAAREN just supported the GEC22 Conference demonstrations held at GW University. CAAREN is cooperating with DCnet to support the Global Cities Challenge of June 1 at the Building Museum.

**ESnet; Joe Metzger**

ESnet finished the Trans-Atlantic build and are now establishing new peerings in Europe. They are turning up new LHCONe connections to universities. ESnet is discussing providing backup services with the ANA Trans-Atlantic link.

**I-Light & Indiana GigaPOP: Joe Lappa**

The Indiana GigaPOP installed 2x100G link to Chicago, and a 100G link to Atlanta. They provide multiple 100Gs across Indiana. They are working to implement the same equipment as the Indiana state networking for compatibility.

**MOREnet: Shannon Spurling**

OARnet is providing a regional fiber build in the South East of the state. They are upgrading to 100G interconnections and backbone.

**NASA: Kevin Kranacs**

NASA is moving forward on its TIC migration. They have worked out their routing symmetry for the TICs.

**NOAA: Paul Love**

NOAA continues with its TICAP deployments.

**NIH: Don Preuss**

Nothing new to report

**PacWave: Jonah Keough**

PacWave has implemented a couple of 100G connections, one to ESnet. An Amazon 100G connection is due soon. The links to Australia and SInet will be upgraded to 100G in 2016

**TransPac: Jennifer Schopf**

TransPacific networking is currently operating with 10G links. TransPac has received a new award of 5 years funding. Costs of Trans-Pacific links are rapidly declining so TransPac will be requesting bids for 100G trans-Pacific links.

**ACE: Jennifer Schopf**

ACE links are being extended through the end of the 2015 calendar year. Right now there is 70G transatlantic:

- 10 Chicago<>Amsterdam, experimental only
- 30 MAN LAN<>Amsterdam, production in a 30G lag
- 30 WIX<>Frankfurt, production in a 30G lag

The experimental use Chicago<>Amsterdam is being turned down the end of May (all VLANs are already off.) When the GEANT 100G MAN LAN<>Paris comes online GEANT's 2x10Gs MAN LAN<>Amsterdam will be turned down, leaving the single 10G to be used for experimental traffic if there is interest. The 30G lag WIX<>Frankfurt will remain operational.

### **US Ignite: Glenn Ricart**

This weekend there will be a 5 city hackathon. There is a current emphasis on getting cities to their local NRENs. Ultra-responsive applications are being requested. Google fiber is to peer with links to Provo Utah, Austin, and other sites. There will be a HUD event May 11 to demonstrate Connect-Home. There is a Global Cities Team Challenge June 1 in Washington, DC, Building Museum. The White House is looking for broadband applications from communities for a broadband conference to be held at the end of June.

### **GEANT: Mian Usman**

Trans-Atlantic GEANT connectivity is being upgraded from 3 x 10G to 100G from Paris to New York. GEANT is doing testing of alien waves from Hamburg to Amsterdam for production next year (Infinera on Ciena platforms).

### **RNP: Marcos Schwartz**

In 2014 RNP core network upgrades included:

- 3G to 10G upgrade of Oi circuits
- New 10G Telebras link: Fortaleza to Recife
- New landing points in Rio and Fortaleza for the 10G submarine link
- Incorporating the submarine links into the national backbone
- Ongoing upgrades to metro R&E nets including non-state capital R&E metro networks

A new 2<sup>nd</sup> fiber across the Amazon reaches Macapa and Manaus to provide multi-Gbps access

International networking includes:

- 4 x 10G subsea links Sao Paulo, Rio, Santiago to Miami
- Extensions to Atlantic Wave and Pacific Wave
- Carries 1G for RedClara and 10G general purpose international traffic
- AmLight connection at 10G to Miami
- AmLight Andes: 10G link to Chile

An alien wave 100G on the undersea cable will start operations in June to Miami with 100G extensions within Brazil: Rio and Sao Paulo

In the planning stage a new link to Europe (Spain) at 1/6 of 4 Terabits/sec.

Future internet architecture in Brazil is planning for 100G in the backbone.

**Los Nettos: Celeste Anderson**

USC will be adding a Science DMZ and upgrading their connection to 100G in the near future due to a CC-NIE award.

**FLR: David Pokorny**

FLR is upgrading their backbone to all 100G along with an optical refresh. A GENI rack is being installed in Jacksonville for University of Northern Florida. In June the 100G alien wave to Brazil over AmLight will be turned up.

**Hawaiian networking: Alan Whinery**

Hawaiian connectivity, currently 40G is planning to upgrade to 100G. Additional links are planned to Guam and Tahiti as part of a \$4.6M award for research networking in the Pacific.

**BOREAS: Dave Farmer**

BOREAS has finished its upgrades. Its main ring has 800G between Minneapolis and Chicago. There is 500G on a spur to Kansas City. The Northern Lights GigaPoP is connecting at 100G.

**APAN: Yasuzchi Kitamura**

Upgrades to 100G are taking place. The ISOC Atlantic Exchange point in Bangkok has its first customer, UniNet (Thailand). The equipment in Katmandu is all alive but there is no power to enable it.

**USDA: Paul Gibson**

USDA is working with Internet2 to establish connectivity to 6 sites. They are in the early stages of establishing a network that will support HPC access.

**W Virginia: Stephen Belcher/Don McLaughlin**

A 10G West Virginia fiber build is completed between NRAO Greenbank and West Virginia University. There is 2x10G capacity to Pittsburgh.

**OARnet: Paul Schopis**

OARnet is running a NG911 pilot program. SMS will be online by the end of July. They have a 2<sup>nd</sup> 100G to Internet2 and the University of Cincinnati.

OARnet is working with NASA Glenn to monitor Harmful Algae Bloom (HAB) using satellite and manned and unmanned aircraft monitoring. This will start in June. Early warning of algae blooms enables water supplies to be turned off, minimizing disruption to the water supply infrastructure.

**Utah: Jim Stewart**

Utah received \$4 million funding to provide connectivity connectivity to K-12 schools. They are doing an inventory of networks supporting K-12 sites. They are seeking reviewers for the document. Any money left over will be used for connectivity within the state.

Utah is issuing a call for circuits next week. Circuits are to be completed by the end of May

Joe Breen is working with RENCi to move data on hurricanes into GENI. This will serve to move computation away from the impacted area (move the infrastructure).

**Internet2: Grover Browning**

The Internet2 ring build out in Marietta is completed. It is being shared with ESnet. Reno, Cincinnati, Indianapolis, Louisville, and Las Vegas layer 2 nodes are connected. Internet2 is starting its next rounds of reach outs and testing for performance assurance. perfSONAR will be placed on the far side of XCs.

**3ROX: Michael Lambert/ Ken Goodwin**

3ROX is establishing a GRE tunnel to Oregon. Un of Pittsburgh is being upgraded to 100G. Juniatta College is adding a 2<sup>nd</sup> GE to 3ROX in support of their CC\*IE award.

**Pacific Northwest GigaPoP: Jonah Keough**

Nothing new to report.

**Ames GigaPoP**

Nothing new to report.

**MAN LAN/WIX: Grover Browning**

Nothing new to report

**StarLight: Joe Mambretti (via email)**

A new 100 Gbps path between the Pacific Northwestern GigaPoP and StarLight has been implemented (last week), and a second CANARIE 100 Gbps path has been implemented also last week to provide redundancy for their existing 100 Gbps path. There are now about 32 100 Gbps connections at the StarLight facility. The StarLight consortium is preparing to stage demonstrations at the GEC 23 at UIUC, at the CVS in Ottawa, at the TNC in Porto, at the GLIF annual meeting in Prague, and at SC15. The StarLight consortium has been awarded a National Science Foundation International Research Network Connections grant that will develop a state of the art international SDX.

**ARIN: Dave Farmer**

IPv4 addresses will be depleted over the next couple of months. Minor blocks are still available but requests for larger blocks will be denied. AFRINIC still has significant capacity. RIPE and APNIC are both operating under special rules for their final /8.

**SDI Workshop: July 14-16, Berkeley California: Grant Miller**

LSN is holding a Software Defined Infrastructure Workshop July 14-16 in Berkeley, California. It is being sponsored by ESnet, NSF, and Internet2 and will include participants from the research community, the commercial sector and Federal agency

networking representatives. Please save the date. The workshop is focused on identifying the needed actions over the next 3 years to implement cross-domain software defined infrastructure (networking, storage, compute, security, applications, and other resources). An objective is to provide a roadmap identifying players and actions to provide the cross-domain infrastructure.

Additionally, a workshop is planned for the October time frame in Washington, DC on SDN to identify the longer term research needs (5 year time frame) to implement needed services and resources over SDN to facilitate user applications.

**Meetings of Interest:**

June 1	<a href="#">Global Cities Team Challenge</a> , National Building Museum, Washington, DC
June 1-3	<a href="#">NANOG64</a> , San Francisco, CA
June 15-18	<a href="#">TNC2015</a> , Porto, Portugal
June 15-18	<a href="#">GEC23</a> , Urbana Champaign, IL
July 14-16	<a href="#">SDI next steps planning and coordination</a> , Berkeley, CA
July 19-24	<a href="#">IETF93</a> , Prague, Czech Republic
August 10-14	<a href="#">APAN40</a> , Kuala Lumpur, Malaysia
September 21-23	<a href="#">CANS2015</a> , Chengdu, China
Sep 29-Oct 1	<a href="#">Global Lambda Grid Workshop</a> , Prague, Czech Republic
October 4-7	<a href="#">Technology Exchange</a> , Cleveland, OH
October 5-7	NANOG65, Montreal, QC, Canada
October 8-9	ARIN 36, Montreal, QC, Canada
Nov 15-20	<a href="#">SC15</a> , Austin, TX

**Next JET Meetings:**

May 19	11:00-2:00, NSF
June 16	11:00-2:00, NSF
Nov 17	1:30-3:30 CDT, Austin Convention Center, Austin TX

*nb:* This is concurrent with SC15.