

JET Meeting Minutes

August 17, 2010

Action Items

1. If you have an interest in participating in informal discussions of science connectivity under TICs please contact Ken White: ken.white@msfc.nasa.gov
2. Grant Miller will try to identify a NIST point of contact for the informal discussion of TICs.
3. If you need StarLight support for SC10 please let Alan Verlo know:
710engineers@startup.net
4. JET members should provide comments to Joe Metzger on the paper on the Interdomain perfSONAR testbed. metzger@es.net

Proceedings

This meeting of the JET was coordinated by Vince Dattoria of DOE and Paul Love of the NCO.

America Connects to Europe (ACE) and TransPac3: Jim Williams

TransPac3 is a science and education network infrastructure connecting Asia and the U.S. It is an NSF IRNC award with a lead U.S. partner of Indiana University. Other partners include APAN, TEIN3 (Trans-Eurasia Information Network), NICT, NII, CERNET (China), DLT, and others. TransPac3 will provide multiple 10G connections with possible options of 40/100G. Connections continue throughout Southeast and South Asia. The connection to the TEIN3 network provides connectivity to Europe. A connection to GLORIAD/Taj provides a second link to Asia and Europe. TransPac3 has connectivity to Internet2 and NLR on the U.S. West Coast.

ACE has a lead partner of Indiana University with partners in DANTE, NYSERNet, Internet2, DLT, and others. It will provide multiple 10G connections with options for 40/100G service. It initially will provide for 2 x 10G service from the U.S. to Europe matched by 2 x 10G service from Europe to the U.S. provided by the European partners (this does not include LHC-specific network links). Bandwidth will ramp up to a total of 5 x 10G with matching bandwidth provided by the partners. It provides connections across GN3 (GEANT) and TEIN3 to Asia and TransPac3 (TP3). A connection via EUMEDCONNECT provides services to North Africa. It has connectivity to Internet2 and NLR on the U.S. East Coast. It partners with GLORIAD to provide backup and service redundancy.

These networks provide accountability through end-to-end measurement including perfSONAR. Utilization statistics are needed. Custom networks and connections are enabled through dynamic circuits provisioned by researchers. Network operators will need to become more accountable and proficient to enable the services. Better tools are needed to support researcher-provisioned connections and to simplify collaboration. Huge increases in data transport projected for the near-future will need to be supported. Increased coordination in the U.S. for outreach and cooperation to other

countries and areas of the world are critical tasks. Security services are critical. All international network providers are cooperating to provide security services.

The IRNC kickoff workshop had an extensive set of presentations. They can be found off of: <http://irnworkshop.indiana.edu/>.

Roundtable

DREN: John Baird

The DREN procurement for its basic network services is proceeding. DREN has extensive experience in deploying DNSSec, IPv6 and other technologies and will share its experience with other networks.

ESnet: Joe Metzger

ESnet has implemented a 3rd10G service into the last of the three Equinix sites. They are implementing the Advanced Networking Initiative (ANI). The ANI RFP for transport services is due back this week.

Internet2Net: Chris Robb

Internet2Net implemented connector upgrades to:

- Oregon GigaPoP: 2nd 10G this to Seattle
- MAGPI: 2nd 10G this to DC
- CENIC: 2nd 10G this to Kansas City via FRGP
- Utah: 2 x 10G in progress
- FLRSox: 2 x 10G terminating in Atlanta

Memphis was Internet2Net's last SONET circuit. It was upgraded to 10G. Ciena-based services are being terminated in November as ION is now fully on their Junipers. NOAA services were installed in Atlanta, Chicago, and Denver. The NOAA backbone network will be turned on imminently.

NISN: Ken White

NISN is working on implementing multicast support for NASA TV. It is considering a Goddard to MANLAN circuit to replace the current 2 x E3 service. NISN is moving its Denver equipment to Confluent. The University of Colorado has new requirements. An OC12 will be provided from the U. of Colorado to Dallas. The NISN 10G upgrade is continuing. It is expected to be completed soon.

This winter NISN expects to implement IPv6 with external peers. DREN expressed an interest in working with NISN on IPv6 peering.

TIC Informal discussion group: Ken White

An informal discussion group on science connectivity under TICs was developed. Ken White invites participation in weekly teleconferences to discuss this topic. They have informal coordination with the DHS TIC architect's office.

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NLR: Grover Browning

NLR has completed its 10G backbone with open-flow. It is ready to deploy 40G on the network. They have completed testing and will be implementing a 40G native wave over a 50 GHz spacing. They are purchasing new cards for 40G Muxponders to deploy on the network. They are trying for a 2400 Km reach. With the Mux they will try to get 2000 Km reach. When 100G is available, they will deploy that technology replacing the 40G. They are waiting for development of 100G transponders. They anticipate the deployment reach of 100G will be 1500-2000 Km.

NOAA: Mark Mutz

NOAA has installed three core sites. Its last core site in McLean, Virginia will be installed next week. They will work on edge connectivity after that.

NREN: Bobby Cates

NASA is re-homing its Level3 Cross-connects from 1360 Kifer to 1380 Kifer. They are implementing 10G C-Wave to StarLight to support research with Joe Mambretti. They are implementing a shared link to the University of Illinois to support Bob Grossman. Grover Browning of NLR indicated NLR has been holding discussions with Level3 on cross-connects and their Mux cross connects to reduce Level 3 costs. He suggested coordinating with NASA Ames on Level3 connection issues. They are working on CWDM technology which will be cheaper than DWDM.

Taj: Greg Cole

Taj has implemented a 1G link to Russia where they are seeing single flows of 700 Mbps. A 1G to Singapore and India will be installed soon. A 1G from the U.S. to Egypt is due to be implemented next week.

Pacific NorthWest GigaPoP: Jan Evelyth

Nothing new to report

StarLight: Alan Verlo

StarLight is implementing a vLAN from NetherLight to Brazil. They are working on the Dynamic Circuit project under GLIF and will be demonstrating it at the October GLIF meeting. StarLight is supporting SC10. They are supporting a streaming demonstration in Prague.

AI: If you need StarLight support for SC10 please let Alan Verlo know:

710engineers@startup.net

TeraGrid: Joe Mambretti

TeraGrid is holding a cloud demonstration with NASA Goddard. It is integrated with the Magellan Cloud at Argonne National Laboratory. Bob Grossman is coordinating with this demonstration. Under the GENI Project they are developing trans-

coding in clouds based on dynamic circuits. A cloud implementation at UCSD using dynamic circuits has been completed. They are preparing for a GDC9 November 3-4 showcase. TransLight has an IRNC award with Maxine Brown and Ton DeFanti.

GLIF Dynamic Circuit Project: Alan Verlo

Alan Verlo reported that currently dynamic circuits are established by researchers using static dynamic circuits (pre-established circuits that are configured into a virtual network). The GLIF international dynamic circuit project is working to dynamically enable exchange of interdomain attributes to enable service requests for dynamic circuits. The DYNES project is working to provision dynamic circuits to the network edge.

MANLAN

No changes. They are still working to enable MANLAN as a GOLE.

Meetings of interest

August 16-18 NASA IT Summit, Washington, DC

August 16-19 DREN Networking and Security Conference, Monterey, CA

August 28-September 1 NSF/NASA/LSN Highly Dynamic Networking Workshop,
Ames Research Center, Mountain View, CA

October 13-15 GLIF Meeting, Geneva, Switzerland

November 13-19 SC10, New Orleans, LA

January 30-February 3 2011: ESCC/Internet2 Techs Workshop, Clemson, SC

February 3-4 2011: ESCC, Clemson, SC

January-February 2013: Techs in Paradise

perfSONAR Workshop: Matt Zekauskas

The perfSONAR workshop was held over a 1.5 day period in Washington DC. It had four tracks of:

- Operational barriers
- Community building
- Operational issue
- Expanding perfSONAR technology

Meeting participants identified the need to expand perfSONAR technology, particularly for security. A write-up of workshop results is expected to be available in about two months.

Interdomain perfSONAR Testbed: Joe Metzger

Joe Metzger organized a JET interdomain perfSONAR testbed among the U.S. science networks with a goal of understanding the issues involved with deploying multi-domain network measurement services. It addressed:

- Deploying open source network measurement among diverse organizations
- Identifying security issues for testing across domains
- Identifying policy issues
- Identifying network measurements that are useful across domains

perfSONAR infrastructure was deployed by Internet2Net, ESnet, NASA (EOS), NLR, NOAA and UEN. The project identified that:

- There needs to be an up-front identification of the extent to which each network will participate for deploying and managing tools, for debugging measurement infrastructure, and for debugging network performance problems
- Not all JETnets exchange traffic (e.g., Internet2Net and NLR)
- Each network operates under different constraints and policies
- An expanded pilot is needed that includes additional networks and IPv6.

AI: JET members should provide comments to Joe Metzger on the paper on the Interdomain perfSONAR testbed. metzger@es.net.

Topics for JET to suggest to LSN at the Annual Planning Meeting

Discussion among the JET members identified and refined topics for the JET to recommend to LSN as focus topics for FY2011. They include:

1. perfSONAR
 - a. Testbed: In FY2010 JET developed a testbed for perfSONAR among several science networks. The testbed coordination, testing process, conclusions, and recommendations are described in an attached document. The perfSONAR infrastructure would benefit from the extension of the perfSONAR testbed to a perfSONAR Pilot Project with participation by additional science networks and expansion of the information collected and shared by the perfSONAR infrastructure.
 - b. Workshop: A perfSONAR workshop was held in FY2010 focused on the topics of operational barriers, community building, operational issues, and research issues. The workshop was critical in defining needed improvements to perfSONAR and in soliciting community support for perfSONAR. It is recommended that a perfSONAR workshop be held in FY2011 with increased emphasis on outreach and enlarging the user community.
2. Track technologies: JET should track the developments in several networking areas where fielding and infrastructure are currently developing. These areas include:
 - a. IPv6
 - b. DNSSec
 - c. International networking infrastructure
3. Organize a BOF for Joint Techs: Optical Dynamic Circuits: Automated configuration of optical dynamic circuits is a topic of interest to many science networks and several organizations are working on developing and coordinating aspects of this technology,. It is proposed that the JET organize a BOF meeting at the next Joint Techs workshop in February, 2011 to identify community interest in the topic and to discuss existing and potential mechanisms for fostering its development.

Next JET Meetings

September 21, 11:00-2:00 NSF, Room TBA
October 19, 11:00-2:00, NSF, Room TBA