

Draft JET Meeting Minutes  
July 19, 2006

**I. Participants**

Guy Almes	Internet2	<a href="mailto:almes@internet2.edu">almes@internet2.edu</a>
Jeff Bartig	Un. Of Wisc.	<a href="mailto:jeffb@doit.wisc.edu">jeffb@doit.wisc.edu</a>
Joe Burescia	ESnet	<a href="mailto:joeb@es.net">joeb@es.net</a>
Rich Carlson	Internet2	<a href="mailto:rcarlson@internet2.edu">rcarlson@internet2.edu</a>
Bobby Cates	NASA	<a href="mailto:bcates@mail.arc.nasa.gov">bcates@mail.arc.nasa.gov</a>
Ben Chinowsky	Internet2	<a href="mailto:chinowsky@internet2.edu">chinowsky@internet2.edu</a>
James Cook	DREN	<a href="mailto:jrcook@hpcmo.hpc.mil">jrcook@hpcmo.hpc.mil</a>
Steve Cotter	Internet2	<a href="mailto:scotter@internet2.edu">scotter@internet2.edu</a>
Cas D'Angelo	SOX	<a href="mailto:cas.dangelo@oit.gatech.edu">cas.dangelo@oit.gatech.edu</a>
Jan Eveleth	NWGPoP	<a href="mailto:eveleth@cac.washington.edu">eveleth@cac.washington.edu</a>
David Farmer	UMN	<a href="mailto:farmer@umn.edu">farmer@umn.edu</a>
Nasir Ghani	Tenn. Tech. Un.	<a href="mailto:nghani@tntech.edu">nghani@tntech.edu</a>
Peter Gutierrez	UMass	<a href="mailto:peterg@nic.umass.edu">peterg@nic.umass.edu</a>
Louis Hammond	UMN	<a href="mailto:louis@umn.edu">louis@umn.edu</a>
Dave Hartzell	NASA/Ames	<a href="mailto:dhartzell@arc.nasa.gov">dhartzell@arc.nasa.gov</a>
Dan Hitchcock	DOE/SC	<a href="mailto:daniel.hitchcock@science.doe.gov">daniel.hitchcock@science.doe.gov</a>
Russ Hobby	Internet2	<a href="mailto:rdhobby@internet2.edu">rdhobby@internet2.edu</a>
Shumon Hugue	Un. Of Penn./MAGPI	<a href="mailto:shugue@isc.upenn.edu">shugue@isc.upenn.edu</a>
Wendy Huntoon	NLR	<a href="mailto:huntoon@psc.edu">huntoon@psc.edu</a>
Rich Ingram	Un. Of Minn.	<a href="mailto:rni@umn.edu">rni@umn.edu</a>
Bill Jensen	Un of Wisc.	<a href="mailto:wej@doit.wisc.edu">wej@doit.wisc.edu</a>
Bill Johnston	ESnet	<a href="mailto:wej@es.net">wej@es.net</a>
Kevin Jones	NASA/Ames	<a href="mailto:kjones@arc.nasa.gov">kjones@arc.nasa.gov</a>
Michael Lambert	3ROX	<a href="mailto:lambert@psc.edu">lambert@psc.edu</a>
Tom Lehman	ISI	<a href="mailto:tlehman@isi.edu">tlehman@isi.edu</a>
Paul Love	NCO	<a href="mailto:love@nitrd.gov">love@nitrd.gov</a>
Joe Mambretti	Northwestern Un.	<a href="mailto:j-mambretti@northwestern.edu">j-mambretti@northwestern.edu</a>
Joe Metzger	ESnet	<a href="mailto:Metzger@es.net">Metzger@es.net</a>
Grant Miller	NCO	<a href="mailto:miller@nitd.gov">miller@nitd.gov</a>
Debbie Montano	Force10	<a href="mailto:dmontano@force10networks.com">dmontano@force10networks.com</a>
John Moore	MCNC	<a href="mailto:jhm@mcnc.org">jhm@mcnc.org</a>
Thomas Ndousse	DOE/SC	<a href="mailto:tndousse@er.doe.gov">tndousse@er.doe.gov</a>
Bill Nickless	PNNL	<a href="mailto:bill.nickless@pnl.gov">bill.nickless@pnl.gov</a>
Kevin Oberman	ESnet	<a href="mailto:oberman@es.net">oberman@es.net</a>
Ana Preston	Internet2	<a href="mailto:apreston@internet2.edu">apreston@internet2.edu</a>
Nagi Rao	ORNL	<a href="mailto:raon8@orn.gov">raon8@orn.gov</a>
Mike Rechtenbaugh	USGS/EROS	<a href="mailto:rech@usgs.gov">rech@usgs.gov</a>
David Reese	CENIC/Pac Wave	<a href="mailto:dave@cenic.org">dave@cenic.org</a>
Don Riley	Atlantic Wave	<a href="mailto:driley@umd.edu">driley@umd.edu</a>
Chris Robb	IU/TransPac2	<a href="mailto:chrobb@grnoc.iu.edu">chrobb@grnoc.iu.edu</a>
Ernesto Rubi	FIU/Ampath	<a href="mailto:ernesto@cs.fiu.edu">ernesto@cs.fiu.edu</a>
Dave Ruddick	PNWGP/UW	<a href="mailto:druddick@whington.edu">druddick@whington.edu</a>

Paul Schopis	OARnet	<a href="mailto:pschopis@oar.net">pschopis@oar.net</a>
David Sinn	PNWGP/Pac. Wave	<a href="mailto:dsinn@cac.washington.edu">dsinn@cac.washington.edu</a>
Christina Sirosky	Internet2	<a href="mailto:csirosky@internet2.edu">csirosky@internet2.edu</a>
Michael Smith	FIU/Ampath	<a href="mailto:msmit006@fiu.edu">msmit006@fiu.edu</a>
Rick Summerhill	Internet2	<a href="mailto:rrsum@internet2.edu">rrsum@internet2.edu</a>
Brent Sweeny	Ind. Un.	<a href="mailto:sweeny@iu.edu">sweeny@iu.edu</a>
Kevin Thompson	NSF	<a href="mailto:kthompso@nsf.gov">kthompso@nsf.gov</a>
Alan Verlo	StarLight	<a href="mailto:alan@cs.uic.edu">alan@cs.uic.edu</a>
Alan Whinery	Un. Hawaii	<a href="mailto:whinery@hawaii.edu">whinery@hawaii.edu</a>
Jim Williams	TransPac	<a href="mailto:williams@indiana.edu">williams@indiana.edu</a>
Linda Winkler	ANL	<a href="mailto:winkler@mcs.anl.gov">winkler@mcs.anl.gov</a>
Matt Zekauskas	Internet2	<a href="mailto:matt@internet2.edu">matt@internet2.edu</a>

### **Action Items**

1. Contact Wendy Huntoon if you wish to use NLR lambda connectivity to SC06.
2. JET should arrange for a Gloriad update during its August meeting
3. Anyone interested in participating in the network performance initiative should contact Matt Zekauskas.
4. If you have any comments or suggestions on the Land Speed Record and its extension to campus infrastructure efficiency, contact Rich Carlson at: [lrs@internet2.edu](mailto:lrs@internet2.edu)

### **Proceedings**

This meeting of the JET was coordinated by Paul Love of the National Coordination Office.

### **Network Roundtable**

#### **Abilene**

Abilene has completed its move off of Level3 services; they are now using Qwest for the Sunnyvale to Seattle and Seattle to Denver links. The Abilene connection to UT, Austin has been increased to GigE.

#### **AmPath**

AmPath continues to work with CLARA. A link to RNP in Sao Paulo, Brazil to Abilene will be completed in about one week. AmPath is working with Atlantic Wave to provide South American connectivity to SC06.

#### **BossNet**

DRAGON is working with Jerry Sobieski to implement dynamic interdomain control plane interoperability. They are supporting HOPI, DRAGON, ESnet, BREW, and OSCARS.

#### **ESnet**

ESnet has been experiencing over a PetaByte per month for data transfers. June 2006 showed transfers of 1.2 Petabytes. The Chicago MAN will be used to connect FermiLab to Chicago and StarLight. ESnet is connected to the NGIX-East thru the MAX. ESnet is demonstrating interoperability between OSCARS and BREW using virtual circuit services. The complete ESnet update may be found at: <http://www.internet2.edu/presentations/jt2006jul/200607017-esnetupdate-burrescia.htm>

### **DREN**

Peering has been established at StarLight and in Seattle between DREN and National LambdaRail. Internet2 and DREN are cooperating on performance testing. DREN is establishing its first foreign node in the UK at a defense laboratory. They will be doing a site survey next month. The site will peer at Seattle and StarLight.

### **HOPI**

HOPI is working with DRAGON on control plane interoperability to provide management and services requests between two administrative domains. They plan to demonstrate interoperability among HOPI, DRAGON, GEANT, and Canarie. Over the next two months they will perform a service trial using hand labor. They will subsequently develop and extend automated controllers among the networks. They are looking at how to incorporate these concepts into NewNet.

Comments among the JET participants identified that the Europeans, NetPhy, and the LSU RONS are also interested in this testing and should be interested in cooperating.

### **NewNet**

NewNet is using Level3 supplied waves that have carrier-class capabilities. They will create a network supporting many different services, e.g. production networking and network research experiments. NewNet will have an optical network with 24 nodes. An IP network will be overlaid on the optical network. Add/drop multiplexers (ADMs) will create circuit-like subchannels across the optical fabric. HOPI services will initially be based on the ADMs. They anticipate migrating to Level3 equipments at a later date.

### **NISN/NLR**

NLR will be supporting layer 3 NISN connectivity to SC06.

AI: Contact Wendy Huntoon if you wish to use NLR lambda connectivity to SC06.

### **NREN**

NREN has equipments collocated at Sunnyvale. They have implemented a 10 G link from Ames to Goddard. In August the new equipments will be supporting connectivity to Langley. Marshall connectivity will be completed in early October. Connectivity in Atlanta will be provided using Southern LightRail.

### **UltraScience Net (USN)**

USN has established a link from Atlanta to Oak Ridge. USN is carrying out experiments on connecting VLANs using MPLS.

## **USGS**

USGS is completing an OC12 link to StarLight in August. They are supporting data flows from Goddard for the EROS mission. They are peering with Packetnet.

## **Northern Tier**

Northern Tier meets twice annually. They provide connectivity to smaller cities across the northern territory of the U.S. They have an NSF planning grant for connectivity to Montana, South Dakota, North Dakota, and Idaho. They have identified fiber that is available and are looking for the money to support contracting for the fiber. A northern route goes through Minneapolis, Fargo, and Sioux Falls to Kansas City. They also are planning connectivity from Canada across South Dakota to Rapid City. For information on Northern Tier please see: [www.northerntier.org](http://www.northerntier.org)

## **Northwest GigaPoP in Seattle**

Pacific Wave is now connected to StarLight using NLR on a wave donated by the IRNC. People using StarLight can participate in Pacific Wave. Starlight is effectively part of the extensible Pacific Wave fabric but the latency from Chicago to Seattle to Los Angeles should be kept in mind.

AI: JET should arrange for a Gloriad update during its August meeting.

## **MANLAN**

GEANT is completing a 10 G circuit from Paris. There is also a 10 G link from London. Both circuits will be used for point-to-point experiments. NewNet will use Level 3 to light a ring around Manhattan and connect to MANLAN.

## **AWave**

AWave has ordered lightwaves from Washington, DC to New York that will be up in a few days. Jacksonville to Miami will use Florida Light Wave. In September the cards will be in-place to support this link. AWave will test the full network in October and will be functioning to support SC06. They will use NLR for the connectivity from New York to Washington, DC, to Atlanta, to Jacksonville.

## **LSN Items**

LSN plans to hold a workshop in the Washington, DC area in coordination with the commercial sector and networking researchers. The workshop will develop a Networking Hard Problems List.

## **Meetings of Interest**

September 7-8 ONT3 Workshop in Tokyo followed by the annual GLIF meeting the following Monday and Tuesday.

October 21-25: Annual DREN networkers conference in Sonoma.

Fall 2006: Quilt Workshop on peering

November 13-17: SC06 in Tampa, Florida

## **RENOG**

RENOG was started at the APAN meeting in Tokyo this spring. It provides contact among Network operators of Research and Education networks. RENOg maintains a Web site at: [www.renog.net](http://www.renog.net). About 75-100 people subscribe to RENOg. It does not duplicate NANOG or GLIF.

## **Performance Measurement Update**

The JET Measurement initiative provides coordination among several networks (Abilene, DREN, ESnet) to solve policy and technical issues for performance measurement (e.g. PCP, latency, throughput) across domains. Ports were just opened up to support the measurements. Perf-Sonar testing will be ramping up.

AI: Anyone interested in participating in the network performance initiative should contact Matt Zekauskas.

## **Linear Hadron Collider (LHC) Support**

Level one sites for analysis of LHC data have all been connected to the CERN LHC with adequate bandwidth, 10 G. Brookhaven and FermiLab have been connected. Almost all Tier 2 sites have 10 G connectivity to StarLight that will provide adequate capacity. New England, Boston, and Harvard have connections to the NOX, which is connected to NewNet. The University of Chicago has NewNet connectivity to StarLight. Indiana University has a 10 G connection to StarLight in progress. SLAC has a collaboration with LBL. SLAC connectivity is completed. The University of Michigan has a 10 G connection into StarLight now.

The LHC connectivity depends on many different networks and network links in a complex web. Something is likely to be broken at most times. The LHC program is looking at management alternatives to manage this complex of networks. They are considering Perf-Sonar as a tool.

Perf-Sonar is a framework for collecting measurement information. It is a service-layer for capturing information and encapsulating it in standardized formats. You can build a user interface to look at end-to-end paths. ESnet, GEANT2 and RNP are all using Perf-Sonar. The first version of the software was released yesterday.

## **Land Speed Record**

The Land Speed Record is a measure of speed and distance for characterizing network performance. It has provided a 6-year contest that has awarded 42 awards. It is oriented toward TCP and algorithms for congestion control. It tests both IPv4 and IPv6 capabilities. All traffic must be from a single IP source. If you exceed the previous record by 10% you win an award. In February a demonstration from Tokyo to the Netherlands to Tokyo (30,000 Km) demonstrated 8.8 Gbps. The IPerf test ran for over 30 minutes. This is close to the maximum possible with 10 G circuits.

The Land Speed Record purpose is to share community experience and lessons learned. A new challenge might be for campuses to demonstrate how efficiently they can use their networks. Provide awards for campus infrastructure efficiency. Discussion among the JET members strongly endorsed this idea.

AI: If you have any comments or suggestions on the Land Speed Record and its extension to campus infrastructure efficiency, contact Rich Carlson at: [lsr@internet2.edu](mailto:lsr@internet2.edu)

### **Upcoming JET meetings**

JET members discussed the possibility of moving JET meetings at Joint Techs from Wednesdays to Tuesdays. Discussion identified that the Joint Techs meeting agendas are already overcrowded so Wednesdays are a good time for the JET.

### **Next JET Meetings**

August 15, 11AM-2PM, NSF Rm 1150

September: No meeting due to overlap with the ONT3 Workshop in Tokyo

October 17, 11AM-2PM, NSF Rm 1150

November 15, 9-11:30AM Eastern. This will be held in Tampa, FL, coincident with SC2006

December 19, 11AM-2PM, NSF Rm 1150. Only if needed.