Draft JET Meeting Minutes
June 20, 2006

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Action Items

1. If you are interested in peering with NLR please send a message to **noc@nlr.net**

2. If you are interested in using NLR service to support a bandwidth challenge at SC06, please contact Wendy Huntoon, **huntoon@psc.edu**

3. Heather Boyles will send out the URL for the community meeting on NewNet.

4. Please send Nagi Rao (**raons@ornl.gov**) any comments or suggestions on his work on the DRAGON Control Plane.

5. If you are interested in purchasing dark fiber, contact Ana Preston at: **apreston@internet2.edu**

Proceedings

This meeting of the JET was coordinated by Doug Gatchell of NSF and Paul Love of the National Coordination Office.

Network Roundtable

Abilene

Abilene is developing plans to transition to NewNet, which will be discussed later

DREN

DREN is holding its User Group Conference for HPC users in Denver next week. DREN is holding its Networkers Conference in August in Sonoma, California.

ESnet

ESnet is installing a Brookhaven Laboratory vLAN. They are reorganizing their connectivity architecture to StarLight. Connectivity to JLab is being increased. ESnet is talking to MAGPIE about connectivity to Princeton. They are establishing Layer2 connections to Cal Tech and Brookhaven National Labs. They are testing SDN routers.

NLR

NLR is installing 21 new circuits by August 1 to provide Packetnet service. It will provide mainly 10 GE connections; 3 sites will be connected by 1 GE or multiple 1 GEs. Many of the sites have to upgrade their local equipments to accommodate the 10 GE service. Peering exchanges will be located at PacWave, StarLight, and MANLAN. They will peer with ESnet at multiple locations.

AI: If you are interested in peering with NLR please send a message to **noc@nlr.net**

NLR is providing point-to-point dedicated and non-dedicated services. Many RONs are using NLR as a backup service. For SC06, NLR is providing 2 x 10 GE service from Jacksonville to Tampa and 2 x 10 GE service from Pensacola to Tampa.

AI: If you are interested in using NLR service to support a bandwidth challenge at SC06, please contact Wendy Huntoon

NREN

NREN is building out its network to NASA Centers. The link between Langley Research Center and Sunnyvale, California will establish collocation this week.

Northwest GigaPoP

The Northwest GigaPoP (NWGP) is connecting New Zealand soon with an OC12 1 G link. Fiber is being pulled by Equnix to Ames Research Center. NWGP is starting an IPv6 Multicast subnet next week. Connectivity to 1400 Kifer Avenue still awaits approval. NWGP is considering a wavelength or fiber into the PAX.

StarLight

StarLight initiated a 1 G link to Texas A&M. Cornell is establishing a 10 G link to StarLight. The circuit between StarLight and Seattle has been turned up. Other new

links include Illinois State University and SURNet. The USGS OC3 link is being upgraded to OC12 in the latter half of July.

MANLAN
   GEANT is establishing a link between Paris and MANLAN. They will connect to NewNet for an Internet2/GEANT trial with a 1 GE link.

Atlantic Wave
   Atlantic Wave placed an order for a 10 GE wave linking Miami, Jacksonville, Atlanta, Washington DC, and New York. It is due for completion in August or early September and will be used to support SC06 in Tampa, Florida.

Upcoming Meetings of Interest
July 17 ESSC/Joint Techs meeting, Madison, Wisconsin

SCV06 Bandwidth Challenge
   The SC06 Bandwidth Challenge is focusing on end-to-end (E2E) performance from home institutions to the SC06 floor using real firewalls and real policies. The applications demonstrated should be reproducible by other institutions. Focus is on 10 G paths E2E.
   Florida LambdaRail (FLR) is providing lambda transport to SC06. There will be 12-14 10 G circuits including links to Abilene, Atlantic Wave, and UltraLight

DNSSec User's Group
   Internet2 has established a DNSSec Pilot Group. They are meeting by teleconference. An update on their activities will be given at SC06.

Optical Networking Testbed 3 (ONT3) Workshop
   The US and Japan are jointly sponsoring an ONT3 Workshop September 7-8 in Tokyo Japan. NASA Ames is hosting a Web site for the workshop. The workshop will provide discussion of theories and concepts for next generation optical networking. It will identify means and initiatives to assure implementation and use of optical networking. The ONT3 workshop extends optical networking into the international context. How do we internationally emphasize optical networking, develop informed designs of future capabilities, and implement optical links and architectures. Recently the international iGrid Conference was a showcase for international cooperation. GLIF is providing leadership in optical interoperability. They maintain a GLIFmap of optical connectivity. The ONT3 Workshop will be collocated with the next GLIF Conference.
   For information on the ONT3 Workshop see: **www.nren.nasa.gov/workshop9**

NewNet
   Internet2 is in the process of designing new networking to provide an infrastructure where the user community retains extensive control of the infrastructure. The network will provide a reduced overhead for setting up links and architectures.

Level3 will provide an SLA on lightwaves. Internet2 will provide control over those waves. NewNet will make use of the knowledge gained from the DRAGON, CHEETAH, and UltraScienceNet experiments. The network will support both advanced applications and networking research over the same fabric. It will be based on the Infinera platform, which is scalable and has good add/drop capabilities. Each Regional Optical Network (RON) will be able to monitor each wave on the system. Lightpaths may be constructed over either SONET or Ethernet. About 20-24 connectors are anticipated.

The Abilene network will be placed on top of the NewNet, probably with fewer routers than currently in use. Routers, now at the Qwest PoPs will be moved to the Level3 PoPs using Infinera equipments. PoPs will be slowly replaced across the US with no disruption of services.

Infinera equipments initially will support 10 x 10 G wavelengths for a total of 100 G. This can be increased to 80 x 10 G. They will use advanced DWDM equipments. Services on NewNet over the short term (less than one day) will be dynamically configured STS-1 granularity using SONET or GFP mapped Ethernet. Long term full wave circuits will be configured for a minimum of one year, provisioned thru Infinera equipments.

NewNet is carrying out a service trial with GEANT to create 1 G lightpaths form any campus in the U.S. to any campus in Europe. They will use reprogrammable cards at the router or control plane level. They will also consider how policies and financial structures affect the infrastructures. Network Use Policy will allow any research capabilities.

Infinera is interested in full control plane operability. They will work with Juniper. FiberCo will continue to provide fiber and O&M services on the fiber. A BOF will be held at the Joint Techs meeting in July. The network will be rolled out over the next 15 months. Workshops will be held for potential users of the NewNet capabilities.

NewNet anticipates that a 2 G link on NewNet will be approximately the same cost as a 1 G link on Abilene.

 AI: Heather Boyles will send out the URL for the community meeting on NewNet.

Integrated Control Planes and Schedulers

Nagi Rao provided a briefing on the current status of research on control planes and schedulers. Nagi has built the control planes for DRAGON and CHEETAH. In addition he has been coordinating in the development of control planes for OSCARS-ESnet, UCLP, USN and HOPI-DRAGON.

There are two paradigms for control planes, on-demand using TL1, CLI or MPLS for Layer 3, and in-advance provisioning using path computation or bandwidth optimization.

- HOPI-DRAGON provides on-demand with GMPLS front end and CLI/TL1 for lower layers and Ethernet switches and routers
- OSCARS-ESnet provides in-advance paths using path computation, MPLS at Layer 3 and Cisco routers.
- USN provides in-advance paths using bandwidth optimization, CLI/TL1 plus

Ciena CDCI and Force10 E300
- CHEETAH provides on-demand control using GMPLS and Sycamore SN16000 switches

The DRAGON Tetbed uses a GMPLS Control Plane with a virtual label swapping router, a network-aware resource broker (NARB), and an advanced constrained shortest path computation element. It provides application specific topologies and photonic metro-scale wavelength services.

The briefing provides a wealth of technical information and is available on the NCO Web site: **www.nitrd.gov**

AI: Please send Nagi Rao any comments or suggestions on his work on the DRAGON Control Plane.

FiberCo

FiberCo is an Internet2 initiative to support the networking community in the purchase of dark fiber. FiberCo has negotiated deep discounts for the purchasing of dark fiber. Between 2003 to March 2006, FiberCo has expedited the purchase of 13,000 miles of dark fiber to regional and state networks. Members have requested additional services to enable the dark fiber once it has been purchased such as configuring, lighting, O&M and NOC services.   FiberCo has prenegotiated IRU and O&M agreements that save a lot of legal effort and time. FiberCo offerings will continue to support NewNet. WaveCo is a circuit version of FiberCo that is being developed. Costs are under development for WaveCo.

AI: If you are interested in purchasing dark fiber, contact Ana Preston at: **apreston@internet2.edu**

Next JET Meetings
July 19, 5:30-7:30 PM at the Madison Concourse Hotel (the Joint Techs meeting hotel), Madison, Wisconsin
August 15, 11AM-2PM, NSF Rm 1150
September: No meeting due to overlap with the ONT3 Workshop in Tokyo.