

JET Meeting Minutes

April 21, 2009

I. Participants

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Action Items

1. Phil Dykstra will approach Tim Mowing of DREN to talk about the DoD DMZ project.
2. Dave Hartzel will identify a speaker on the WAAS acceleration experiments to talk to the JET.
3. Grant Miller will work with Rich Carlson to develop a formal proposed recommendation for the LSN to endorse the use of the PerfSONAR infrastructure as a ubiquitous end-to-end performance measurement platform.

4. Rich Carlson will work with the Joint Techs organizers to provide a BOF at the next Joint Techs Meeting on PerfSONAR.

Proceedings

This meeting of the JET was chaired by Vince Dattoria of DOE.

Network and Exchange Point Roundtable

C-Wave

C-Wave had nothing new to report

DREN

DREN is in the process of connecting to the LA NAP. They are working on connectivity to NAP of the Americas in Washington, DC. DREN is working on a DoD project for the JTF GNL to move all public facing services to a separate DMZ. Services are being moved to specific approved machines which will affect performance.

AI: Phil Dykstra will approach Tim Mowing of DREN to talk about the DoD DMZ project.

DREN is using Flow Stack. If addresses are suspect they are routed to a special network for analysis.

AI: Phil Dykstra will ask Rob Hartman to talk about the DREN Flow Stack capabilities.

ESnet

The ESnet 4 network was awarded the Excellence.Gov award for leveraging technology. ESnet has initiated a 100 Gbps project to deploy a prototype network in conjunction with Infinera and others. This is an acceleration of the initiative of the same consortium to field and demonstrate 100 Gbps at SC09. The prototype network will cover the full footprint of the contiguous states.

Internet2Net

Internet2 Network is implementing parallel 10 Gbps links between several sites including Washington to Saint Louis. The University of Florida is upgrading to a 10 Gbps interface. They are migrating their MAX connection to 10 GE. ReNOG is holding a discussion of IPv6 routing policy on how to treat commercial routes. They are surveying international networks for IPv6. Internet2 Network is implementing suite expansions in Salt Lake City and Kansas City.

Atlanta is officially connected to Florida LambdaRail/ University of South Florida. DC routes are now all 20 Gbps.

NIH

NIH is planning to carry out a DCN experiment at the Internet2 Member's Meeting next week. It will demonstrate how "Just-in-time" connections can help medical

applications. The traffic on the 10 G NIH network is increasing. Originally people were uploading data to databases. Now people are seeking and using the datasets.

NISN

NISN is implementing NASA Multicast TV in a project with the University of Colorado. They are currently choosing encoders to implement a capability by June or July 2009. NASA TV would then be uploaded to Internet2 Network out of Goddard Space Flight Center. NISN is planning to upgrade its backbone network to 10 GE and is currently prototyping 10 GE. NISN is working with CNES on international connectivity.

NLR

NLR has completed the upgrade of its northern network links to use Cisco 14454s. This increases the reliability of the network and reduces the regenerative footprint by 50 percent. The upgrade will enable NLR to provide 40 Gbps at Layers 1 and 3. The NLR telepresence exchange is now operational. Several international calls were demonstrated over this application. NLR is converting an amplifier node in Philadelphia to an add/drop multiplexer at Layer 1. NLR will be offering FrameNet at Broad Street in Philadelphia in the end of May time frame.

NREN

NREN is completing a Memorandum of Agreement by the Office of the Chief Information Officer to transition HEC traffic from NREN to NISN. This particularly affects traffic from Langley and Goddard to Ames Research Center. An emergent network is being tested by Ames, supported by Langley and Goddard.

NREN is testing a Cisco equipment wide area acceleration WAAS TCP. It is transparent and, in testing, has accelerated traffic from 100 Mbps to 500-600 Mbps for one user using the WAAS box. The WAAS boxes are Linux-based and accelerate traffic between WAAS boxes. WAAS provides window tuning, on the fly compression and on the fly data reduction. Encryption negates the gains of WAAS

AI: Dave Hartzel will identify a speaker on the WAAS acceleration experiments to talk to the JET.

NGIX-West: Ames Research Center

NGIX-West is expanding connectivity to carrier hotels and exchange points in the Bay area.

MANLAN

MANLAN is working with European networks on circuit cross-connects

MAX: NGIX-East

MAX is working with the Indiana Global NOC 2 for NOC services. The MAX is supporting the Internet2 Member Meeting in Washington, DC. The MAX will respond to the NSF international networking solicitation expected soon.

StarLight

StarLight provided connectivity between Iowa Health Care and MREN for health-related applications. StarLight issued a call for circuits to support SC09. StarLight is supporting future demonstrations at the GLIF meeting in Daejong, Korea. StarLight is implementing a test bed link to Hewlett Packard labs using a high performance protocol.

Security Weaknesses in Broadband Fiber Access Networks

Professor Leonid Kazovsky of Stanford University provided a presentation of security weaknesses in broadband fiber access networks and how to address them. The full briefing is available at: <http://pnrl.stanford.edu>

Weaknesses:

Eavesdropping upstream and downstream can take place without wiretapping. Upstream attacks include masquerading and denial of service. There is no way to identify malicious users and no way to disconnect them. Many users are also susceptible to disconnection due to single fiber failures.

Currently central provider offices connect to street cabinets which use a splitter or WDM to provide service to businesses, neighborhoods and single users over single fibers. Communications are subject to passive listening downstream. Currently encryption using a symmetric key (AES-128 Standard) is used to thwart passive listening.

A passive splitter is not a one-way device. Reflections allow a perpetrator to intercept keys and listen to both upstream and downstream data, a breach of security. The perpetrator, using an intercepted key, can pose as the user of the key.

A perpetrator can send in-band signals to interfere with data transmissions. With current Passive Optical Networks (PONs) there is no way to identify the perpetrator or stop the attack.

Optical service can be disconnected with a single fiber cut. A single cut, before the passive splitter can cut off multiple users.

Solutions to weaknesses:

For existing networks we can address the weaknesses by

- Reducing reflections
- Introducing optical monitoring
- Relying on higher-layer protections

For new networks you can:

- Introduce novel reconfigurable devices (while retaining the passive network)
- Introduce new networks gracefully so they can co-exist with existing technology

For secure upstream transmission paths you can use dual-fiber with an isolator architecture to protect keys. You can use PHY keys, codes and modulation formats. Using optical signatures can provide discovery and identification of intruders. After identification of an intruder an active switch could block the intruder.

An integrated security approach could:

- Provide wavelength and power reconfigurability
- Reconfigure power distribution to block reflections and to cut off the intruder
- The device could be controlled from the Optical Line Terminal (OLT)

Continuing research will address:

- Fiber access security weaknesses
- Learning how to exploit fiber access security weaknesses

Performance Measurement

Information was solicited from science networks on their implementation of PerfSONAR tools and capabilities. No new information was received but DREN indicated it will provide the information.

Discussion among the JET members indicated that the JET needs to provide a formal response to the LSN tasking to develop a performance measurement plan. A recommendation, based on the performance measurement white paper should:

- Describe the PerfSONAR performance measurement infrastructure
- Identify this infrastructure as a basis for fostering increased end-to-end performance measurement capabilities among science networks
- Provide the Excel spreadsheet description of science networks that has been received to date
- Propose a formal LSN recommendation for the LSN to endorse that PerfSONAR be adopted as the standard science network performance measurement infrastructure and that the science networks be urged to implement the PerfSONAR infrastructure.

AI: Grant Miller will work with Rich Carlson to develop a formal proposed recommendation for the LSN to endorse the use of the PerfSONAR infrastructure as a ubiquitous end-to-end performance measurement platform.

Last month it was proposed that a PerfSONAR workshop be held to inform the science community of the development of the PerfSONAR infrastructure, its usefulness and the utility in implementing the PerfSONAR tools. Discussion identified that the JET should hold a BOF at the next Joint Techs Meeting to inform networkers of the PerfSONAR capabilities.

AI: Rich Carlson will work with the Jt Techs organizers to provide a BOF at the next Joint Techs Meeting on PerfSONAR.

Meetings of Interest

April 27-30 in Arlington, VA: Internet2 Members Meeting

U.S. Atlas presentation Monday at 2:30 and Wednesday 3:00

June: San Diego: DOE and DREN are holding a conference

End of June: NISN Forum in Boston

July 19-22 ESCC/Internet2 Joint Techs, Indianapolis, IN

July 22-23 ESCC, Indianapolis, IN

Aug 3-7 DREN meeting, Nashville, TN

Oct 13 LSN Annual Planning Meeting

Future JET Meetings

May 19, 2009, 11:00-2:00 at the NSF, Room 1160 (Note: this change of meeting room)

June 16, 2009, 11:00-2:00, NSF, Room 1150

