JET Meeting Minutes
February 19, 2013

I. Participants

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Action Items
1. JET members are requested to identify networking science priorities (in addition to Big Data and SDN testbeds) to forward to OSTP.

2. JET members are asked to identify NITRD topics they feel are important to coordinate and collaborate with LSN.

3. NOAA will give a discussion at the March JET meeting on its concept of a shared TIC in Hawaii.

Proceedings
        This meeting of the JET was chaired by Vince Dattoria of DoE. Ezra Kissel gave a briefing on Phoebus

Phoebus Update: Ezra Kissel
        Martin Swany and Ezra Kissel developed the Phoebus WAN accelerator to support bulk data movement. Protocol tuning is needed to achieve good performance to overcome a number of issues, to treat known problems with existing transport protocols and to address the "wizard gap". Hybrid networks present challenges for dynamically

allocating links for high-demand flows, to create virtual circuits, and to implement SDN. Phoebus addresses how to effectively utilize these high-performance paths.

Phoebus helps bridge the end-to-end performance gap. The eXtensible Session Protocol (XSP), a session-layer protocol for IP networks, provides generalized messaging between gateways and intermediate devices and services. Phoebus offers a gateway for legacy applications to use advanced networks such as the Internet2 ION virtual circuit network. This is currently being extended to the AL2S via OESS. Phoebus supports standard interfaces at the edge with innovation in the core. Phoebus provides:
- Transparent wrapper: Intercept socket calls (LD_PRELOAD)
- XSP client library
- iptables redirection
- Packages for setting up new gateways

Phoebus provides an XIO driver for GridFTP, a modular Phoebus Transport driver for use with the Globus Toolkit: See: http://damsl.cs.indiana.edu/phoebus/wiki/GridFTP The Globus GridFTP server may load the Phoebus XIO driver as requested by a client application. New connections are made to the specified Phoebus gateways.

Phoebus/XSP drivers enable signaling into the network. A prototype is now working with GlobusOnline.

Dramatic Phoebus performance improvements have been demonstrated over the CERN to Vanderbilt link and over 10 G links. TransPac testing is underway from IU to Tokyo over the I2 network using the TransPac3 host in LA. Phoebus gateways have been deployed at the 9 router nodes of the Internet2 network.

Current Phoebus development includes:
- Efficient gateway discovery
- Improved client support : Windows and OSX widgets
- Openstack appliance
- Phoebus RoCE/SLaBS backend

For questions, please see: http://damsl.cs.indiana.edu/phoebus

For the complete briefing please see the JET Wiki, February 19, 2013 meeting at: http://www.nitrd.gov/nitrdgroups/index.php?title=Joint_Engineering_Team_(JET)#title

JET Big Data Testbed Project: Eli Dart

The JET Big Data Testbed team has held several teleconferences and a BOF at the January TIP meeting. Discussion at TIP focused on what a successful demonstration would look like. Four potential scenarios for demonstration were identified:
- Transfer of large data sets between facilities
- WAN accelerators such as Phoebus
- Near-real-time access
- Multicast distribution

The team is currently focused on demonstration of Sloan Digital Sky Survey (SDSS) data transfer at 100 Gbps for demonstration at SC13 and potentially demonstration of near-real-time access to genomic data. Eli Dart is in discussion on access to genomic data.

Kevin Kranachs said that there weren't many resources within Earth Sciences at GSFC. Perhaps at the supercomputer group with their 100G test bed efforts. They are looking at Phoebus for long distance transfers.

NITRD Report: Grant Miller

OSTP annually identifies science priorities, generally high level topics such as energy independence or infrastructure security. NITRD has the opportunity to identify science topics we feel are important to focus on in the upcoming year and each NITRD Group is asked to identify two priorities they feel are important. Two topics that have been identified include:

- Big Data testbeds to improve end-to-end performance of data transactions.
- Testbeds for Software Defined Networking on a continental and intercontinental basis over dynamic optical links.

AI: JET members are requested to identify networking science priorities (in addition to Big Data and SDN testbeds) to forward to OSTP.

NITRD groups have been asked to identify NITRD topics they feel are important for coordination and collaboration (in addition to those topics the group has immediate responsibility for such as networking, cloud computing, and identity management). Three topics that have been identified as priorities are:

- Big data
- Cybersecurity
- Complexity: modeling and analysis

AI: JET members are asked to identify NITRD topics they feel are important to coordinate and collaborate with LSN.

Network Roundtable
ESnet: Patrick Dorn

Internet2 and ESnet are discussing 100 G peering. A draft plan exists to peer at 4 locations: WIX, MAN LAN, Chicago, and Sunnyvale. The Chicago location may move to the StarLight facility. ESnet is working on 100G site upgrades at FermiLab and Brookhaven. NERSC, Oak Ridge, and Argonne are connected at 100G as core nodes.

Internet2: Dale Finkelson

Internet2 has changed routers to MX960s in Cleveland and Chicago with Kansas City scheduled next week. AL2S nodes have been installed in Raleigh and Seattle, with Ashburn scheduled soon. Internet2's NTAC is discussing the provisioning of some Layer 3 over the AL2S fabric. Internet2 is planning TR-CPS connections for augmentation.

NOAA: Paul Love

The Fairmont, WV, site is close to being multi-homed for greater reliability.

AI: NOAA will give a discussion at the March JET meeting on its concept of a shared TIC in Hawaii.

ACE: Dale Finkelson

The replacement link between Amsterdam and Chicago is operational now. OpenFlow will be implemented on that link soon. A third circuit between Frankfurt and

Washington is due to be completed March 1 to provide 30 G on a LAG for the path. There is already 30 G on a LAG New York City<>London. ACE is developing protocols and methodology to test circuits in the LAGs.

TransPAC: Brent Sweeny

GEANT has brought up the London to Beijing circuit. CERNET implemented an LA to Beijing circuit that was tested in January. OpenFlow switches were installed in LA for implementing trans-Pacific OpenFlow. The Japanese are installing OpenFlow equipment in March. There is a lot of interest in testing OpenFlow in the Asian countries. Interdomain OpenFlow remains problematic.

Exchange Points
StarLight: Alan Verlo

StarLight has implemented the new ACE circuit. It is still carrying production traffic. StarLight is working with SURFnet to implement 10 G connectivity to Greece. StarLight is supporting InstaGENI community interactions

WIX and MAN LAN: Dale Finkelson

IDCs to support dynamic circuits are being installed in both WIX and MAN LAN. MAN LAN is 90% deployed and WIX is 60% deployed. Peerings are being implemented and will be ready over the next week to 10 days.

Meetings of Interest:
February 4-6   **NANOG, Orlando, FL**
March 19-21   **GENI Engineering Conference (GEC16), Salt Lake City, UT**
April 21-24   **Internet2 Member Meeting, Arlington, VA**
April 21-24   **ARIN, Bridgetown, Barbados**
June 3-5   **NANOG, New Orleans, LA**
June 3-6   **TNC, Maastricht, Holland**
July 15-16   **ESCC, Berkeley, CA**
July 17-19   **Big Data Fast and Frugal Meeting, LBL**
July 21-23   **GEC17, Madison, WI**
Next JET Meetings:
March 19   **11:00-2:00, NSF, Room II-415**
April 16   **11:00-2:00, NSF, Room II-415**