Joint Engineering Team (JET) Meeting Minutes

National Coordination Office for Networking and Information Technology R&D (NCO/NITRD)
490 L'Enfant Plaza SW, Suite 8001, Washington, DC 20024
July 16, 2024, 12:00 – 2:00 p.m. ET
This meeting was held virtually

Participants

Shawn Armstrong, University of Alaska
Ed Balas, ESnet
Jeff Bartig, Internet2
James Deaton, Internet2
Basil Decina, NRL
Phil Dykstra, DREN
Jonah Keough, Pacific Wave
Bill Fink, NASA/GSFC
Ann Keane, NOAA
Michael Lambert, PSC/3ROX/ACCESS
Paul Love, NCO/NITRD
Joe Mambretti, StarLight/MREN
Ralph McEldowney, DREN
Edward Moynihan, Indiana University
Aruna Muppalla, NASA/GSFC
Michael Sinatra, ESnet
Nik Sultana, IIT
Bobby Thompson, NIH

Proceeding: This meeting was coordinated by Paul Love (NCO).

I. **Action Items**: (none pending)

II. **Review of the Minutes of the June 2024 meeting:** Corrections were received and are reflected in the final minutes posted on the JET's web page.

III. **The MetrANOVA: Ed Balas**

MetrANOVA is a consortium of ESnet, GEANT, Indiana University, Internet2 and TACC for advancing network observation and analysis. https://www.metranova.org
The slides for the presentation are available on the JET's web page at:
https://www.nitrd.gov/coordination-areas/lsn/jet/jet-meetings-2024/

IV. **Operational Security Round Table**

A. Internet2 (James Deaton): The FCC has a NPRM related to risk mitigation and BGP. Internet2 and The Quilt have joined together to submit comments. After comments are submitted (due date is 17 July 2024) there will be a subsequent period for replies on the submitted comments. Ref:
https://www.fcc.gov/document/reporting-border-gateway-protocol-risk-mitigation-progress

V. **Network roundtable**

A. DREN (Phil Dykstra):
   a. DREN will be holding a Technical Advisory panel for the next two days.
   b. Upcoming collaborations:
      i. Phil just attended a week long program review of CAIDA's work. One item that will support that is the possible placement of CAIDA's Archipelago monitors at DREN exchange points.
      ii. Phil also has a meeting at LBL with ESnet to discuss items of mutual interest. One topic will be to examine requests DREN has had for layer 2 connections to traverse DREN into ESnet.

B. ESnet (Michael Sinatra):
   a. ESnet is updating its Pacific Rim peering locations.
      i. It's has added Los Angeles, CA, to Sunnyvale, CA, and Seattle, WA.
      ii. With this addition would like to be discussing with DREN where to peer going forward. (ESnet continues to have a presence in a Lumen facility in San Diego, CA, if that expands the options.)
      iii. ESnet will also be discussing peering upgrades with NASA Ames re; NASA's NREN.
   b. Dale reports that at the Integrated Research Infrastructure (IRI) meeting he's at that:
      i. They have started engagement with the initial user communities' Pathfinder Projects. These are from the IRI architecture blueprint report.
      ii. The initial multi-facility workflows will be the arena on these will world in practice; what works well and what needs some tuning.
      iii. The user facilities may include sites outside the Department of Energy.
   c. ESnet continues to turn up new trans-Atlantic connectivity with 3x400Gs in use: Boston<>Cern, Boston<>London, and New York<>London. More capacity will be coming up.
   d. A few months ago ESnet signed its first trans-Atlantic spectrum agreement.

   Question: Referencing a Bloomberg News article on a pair of Norwegian cable cuts, how does ESnet allow for intentional or accidental cable cuts?

   Answer: ESnet's current planning is to be able to run steady state with two or three circuits unavailable (regardless of the reason.)

C. International Networking at Indiana University (Ed Moynihan)
   a. All NEA3R circuits are stable.
   b. As has been mentioned, there's a movement from 100G circuits to 400G in the Atlantic. Within the ANA consortium there's currently 2.4T capacity.
   c. In my fifteen years working in the international space the level of cooperation and collaboration has never been greater. This is a testament to work put into working together and a reflection of the importance to these projects. Capacity is no longer the problem. It's having redundant/diverse links and making good use of then to support every ANA member's mission needs. A lot of effort into this for the trans-Atlantic circuits. Trans-Pacific circuits are being monitored for this as well.

d. Potentially there maybe be further upgrades in the Atlantic.
e. For the Pacific it's still being monitored to see if there's the need yet for 400G links. There are some additional investments in the Pacific that should be coming online in the next year or so that should help to stabilize the market which may help.
f. On fiber cuts. One of NEA3R's partners uses the SEACOM cable through the Red Sea. It's been cut since late February with restoration now scheduled by the end of July (though this date is not looking good).
g. International Networking at Indiana University (IN@IU) with one of its partners, NORDUnet, is tracking the status of the trans-Polar projects. There is funding for a third cable between Svalbard and Norway, given further redundancy to one of the cables cut mentioned earlier. Timelines and funding for the balance of the trans-Polar projects connecting the Nordic countries to Japan and Asia, keeps getting pushed back.
h. IN@IU is doing all it can to support the NA-REX project. This will insure that research traffic arriving at either coast that's destined for the other coast and onward receives a similar experience to continental traffic.
i. The European Union's MEDUSA project will connect North Africa and the Middle East with southern Europe. The project is planned to build both the needed submarine cables and the needed infrastructure to connect R&E sites to the cables.

Question: Have the political changes in Africa, particularly West Africa, had any impact on what NEA3R sees.

Answer: Not really – right now there's not a lot or research traffic moving to/from Africa. The biggest effort is planning for the traffic SKA will generate and how to move it around the globe.

Question/comment: Michael Sinatra will be giving a talk at TechEX on using segment routing techniques to efficiently managing the trans-Atlantic links when they have disparate capacities.

Answer/comment: The challenge comes from when the circuits involve eight or nine different organizations using different gear and with varying missions. ANA and APOnet both reflect these challenges. But there's an appetite now like I've never seen before for getting the solutions right.

D. Internet2 (Jeff Bartig):
    a. Internet2 (I2) now has a 400G circuit Boston<>Europe. This is replacing the current Washington, DC<>London circuit. All traffic has been migrated.
    b. Registration for I2's TechEX conference is now open (December in Boston).
E. NASA/GSFC (Bill Fink): No updates today.
F. NIH (Bobby Thompson): Nothing new today.
G. NRL (Basil Decina): Nothing special - working on the circuits to support NRL's demos at SC24.
H. Pacific Wave (Jonah Keough):
    a. Pacific Wave's (PW) projects continue on pace as discussed last month.
    b. There will be a panel discussion on NA-REX at I2's TechEX.

c. Regarding Alaska and Nordic connectivity PW is continuing to have good conversations in the community about standing up the Anchorage and Fairbanks exchanges mated in some way. Pretty interesting conversations and with multiple carriers involved. Adding local content providers will be the next big step.

I. PSC/3ROX/ACCESS (Michael Lambert): No report for today.

J. University of Alaska (Shawn Armstrong): After 25 months the university has received the needed hardware and the pair of 40G circuits to the lower 48 are up (Fairbanks<>Seattle and Anchorage<>Portland).

VI. **Exchange Points Round Table**

A. WIX, MAN LAN & Boston (Jeff Bartig)
   a. All three of Internet2's (I2) East Coast exchange points are up on the new Arista hardware, all 400G capable. These replace the previous Juniper Qfx10002 hardware.
   b. I2 is working with the NA-REX project to connect these three exchange points with other IXPs involve in the project.

B. PNWGP (Jonah Keough): Nothing for today.

C. StarLight (Joe Mambretti):
   a. StarLight (SL) is continuing its preparations for SC24.
      i. 2x600G between SL and the Joint Big Data Testbed (JBDT) in McLean, VA, using Waveservers. There will also be 3x400G over the FABRIC /ESnet6 infrastructure between the same end points.
      ii. Another pair of 1.2Ts (both 3x400G) will be between SC and both SL and the JBDT.
      iii. The above are all being driven by planning for the coming growth in data intensive science such as LHC's Tier 1 locations where each site is anticipated to need a terabit.
      iv. SL is working to build out 400G WAN services using deep buffer switches and Gen 5 DTNs with SmartNICs. There will be SDN and SDX using P4.
      v. Yatish Kumar from ESnet will be engaged with measurements and analytics at SC.
      vi. There will be demonstrations using AutoGOLE/SENSE and scitags. Also of pipelining using in-net processors to avoid requiring the traffic to leave the net and then be reinserted.
      vii. Hans Addleman is leading the coordination effort with SCinet.
   b. SL continues to work with the NA-REX project. Production circuits are up SL<>Los Angeles and SL<>Seattle. The remaining circuits are expected to be up before SC24.

   Question: What are you using for hardware for P4?
   Answer: SL has been using Tofino switches. Also using algorithms in SmartNICs to manipulate traffic streams.

Meetings of Interest 2024

Jul 20-26	IETF 120, Vancouver, B.C. Canada
Jul 21-27	PEARC24, Providence, RI
Aug 9	AINTEC 2024, Sydney, Australia
Aug 26-30	APAN58, Islamabad, Pakistan
Aug 27-28	DREN TIM, Albuquerque, NM.
Aug 30 – Sep 6	APNIC 58, Wellington, New Zealand
Sep 16-19	Fifth Global Research Platform Workshop at IEEE eScience, Osaka, Japan
Sep 17-19	The Quilt Fall Meeting, Hartford, CT
Oct 9-10	CANARIE Summit, Ottawa, Canada
Oct 21-23	NANOG 92, Toronto, ON Canada
Oct 24-25	ARIN 54, Toronto, ON Canada
Oct 28 – Nov 1	RIPE 89, Prague, Czech Republic
Nov 2-8	IETF 121, Dublin, Ireland
Nov 17-22	SC24, Atlanta, GA
Dec 9-12	Internet2 Technology Exchange, Boston, MA
Feb 3-5, 2025	NANOG 93, Atlanta, GA
Feb 3-6, 2025	The Quilt Winter Meeting, Tempe AZ
Feb 2025	APAN59, Japan
Mar 10-13, 2025	SCA25, Singapore
Mar 15-21, 2025	IETF 122, Bangkok, Thailand

Next JET meetings

Note: It is anticipated that most JET meetings will remain virtual for the foreseeable future

Aug 20, 2024	12-2 p.m. ET
Sep 17, 2024	12-2 p.m. ET
Oct 15, 2024	12-2 p.m. ET
Nov 20, 2024	10-11:30AM ET. This will be a hybrid meeting held in conjunction with SC24 in Atlanta, GA. The meeting will be in room A-313 of the Georgia World Congress Center, 285 Andrew Young International Blvd NW, Atlanta, GA 30313