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
April 21, 2020 12:00-2:00 p.m. ET

Participants

Hans Addleman, Indiana University
Henrik Axelsson, KenCast
Joe Breen, UTEN/Univ of Utah
Nick Buraglio, ESnet
Rich Carlson, DOE/SC
James Deaton, GPN
Dave Diller, MAX
Andrew Gallo, CAAREN/GWU
Michael Gill, NIH
Mark Johnson, UNC
Kevin Jones, NASA
Ann Keane, NOAA
Jonah Keough, PNWGP/Pacific Wave
Padma Krishnaswamy, FCC
Andrew Lake, ESnet
Michael Lambert, PSC/3ROX
Paul Love, NCO/NITRD
Joe Mambretti, StarLight/MREN
Aruna Muppalla, NASA/GSFC
Mark Mutz, NOAA
Anne Richeson, CenturyLink
Rob Sears, NOAA
Kevin Thompson, NSF
George Uhl, NASA/GSFC
Chris Wilkinson, Internet2

Proceeding: This meeting was chaired by Kevin Thompson (NSF) and Rich Carlson (DOE/SC).

I. **Action Items**:

- ESnet update on its operational network security use of Rapid7.
- Internet2 and ESnet to updates on their respective optical rollouts.

II. **Review of the Minutes** of the March meeting: One correction was provided during the meeting; another was received after the meeting. The Meetings of Interest section was updated to reflect changes due to COVID-19.

III. D**iscussion of the JET's tasking on tools to help with inter-domain issues**

A. Current status of efforts lead by Eric Boyd, Joe Breen, James Deaton, Dan Doyle, Dale Finkelson and Karl Newell:
   a. Discussed which networks are willing to share data and the related tracking sheet. See: https://docs.google.com/spreadsheets/d/1pMW_PNVpeT42nAxa3bW4QostMxccHTXkWSPbZOplFwE/edit#gid=0
   The spreadsheet also has an embedded link to measurement templates for campus, regional and national networks setting out what data is desired. See: https://drive.google.com/drive/folders/1l-LRyril6u4AvBeY6NlvyYYalNRpjByA
   b. The project has two pilots in operation: University of Michigan and Imperial College London. These follow the initial pilot between University of Utah and

Pennsylvania State University that produced the augmented trace routes demonstrated at the February meeting. A third pilot is starting very soon with Link Oregon.

c. The Michigan pilot is developing a small container that can be used to collect the data to be shared.
d. ESnet has an exposed API from a NetBeam project. There is an effort to see if this can that be queried to collect the shared telemetry data.
e. Work on a draft MOU for telemetry sharing continues.
f. The Internet2 Performance Working Group Community Measurement, Metrics, and Telemetry project holds meetings on the second Tuesday for those participating or interested. The projects website is: https://docs.google.com/document/d/1A_6Ooowm33MZR3A-fuTnhGwIUX6UEeaPumRfGUSBEgI/edit#heading=h.5ewsdfd8qqs3
Contact Joe:
Joe Breen <Joe.Breen@utah.edu>

B. Questions/Discussion:
a. NOAA/Rob Sears: N-Wave is happy to share data. Polling would be a showstopper but data from N-Wave's border pushed out should be OK. The data is at the Global NOC due to the services it provides N-Wave.
Questions to be answered are: how is it transported, how is it protected, and who has access? Discussions with the Global NOC should resolve.
b. EOS/George Uhl: The parameters look fine, but EOS will be taking the lead from the agency position on this. Transport by a protected means will be essential. EOS should be moved out of the backbone category in the tracking sheet. (Note: EOS is now in the "Universities/End Sites/Projects/Experiments" section.)
c. NREN/Kevin Jones: Participation is under review.
d. ESnet/Andy Lake: ESnet is already making this data available and is fine with the project.
e. Questions: Has any network shifted to the streaming telemetry model? ESnet6 is planning to use. Some preliminary lab work on how, what available from vendors, etc. Not planned to retrofit to ESnet5.
f. Rich Carlson: Automation of tools is the goal. As this goes forward if you find there is information that would be valuable but isn't available what sort of research portfolio is needed to develop?

IV. O**perational network security roundtable** (only those who had comments are noted)

A. Internet2 (Chris Wilkinson): With Google's release of its first "real" date for IRR adoption Internet2 has started some internal review. It will be contacting its members regarding their IRR entries along with their IPv4 and IPv6 route objects. Steve Wallace and Jeff Bartig will be heading this project.
B. 3ROX (Michael Lambert): Pushing forward with RPKI. 3ROX has all the PSC blocks signed along with some of the space it has reassigned to 3ROX members. At a recent meeting with its members 3ROX gave the members a heads up on the coming importance.

V. **Networks Round Table**

A. CAAREN (Andrew Gallo): No update.
B. ESnet (Nick Buraglio):
    a. ESnet6 activities are continuing:
        i. The packet RFP is very close to award – in the next few weeks. ESnet will be able to give an update on this award shortly after.
        ii. Deployment of the new OLS and IPv6 management network are going forward. CV-19 has had some impact but not significant.
    b. ESnet is seeing a big increase in traffic from the networks supporting working at home. Comcast is significantly higher than any other.
    c. Nick gave an update on running an IPv6 only network on one of Jason Zurawski's Friday brown bag talks. It's available on YouTube.
C. GPN (James Deaton):
    a. GPN is looking forward to working with Internet2's NGI.
    b. The work GPN is doing with the ESnet and Indiana University EPIC teams to locally anonymize flow data so that it can be shared is a great help in understanding the network beyond GPN's domain. It is hoped that these techniques will allow other networks to share similar data in the future.
D. International Networks – Indiana University (Hans Addleman): All good with TransPAC and NEAAR.
E. Internet2 (Chris Wilkinson):
    a. Internet2 (I2) has just completed a round of upgrades for its peerings with networks supporting working from home. Most are now 100G (for example I2 now has 6 100G peerings with Comcast at various points around the country).
    b. I2 has also upgraded its internal commodity capacity with CenturyLink from several 1Gs to several 100Gs.
    c. Next Generation:
        i. Optical deployment is going forward though at a reduced rate. I2 expects to be doing its first major transition in early May. NGI isn't a green field rollout (reusing amps, etc.) so lots of maintenance windows needed. Still doing fiber acceptance and colo buildouts. Some CV-19 impacts – mostly being in CentauryLink facilities has mitigated this.
        ii. The packet RFP is on the second round with all four finalists. I2 is starting to do some hardware validations. June is the expected date for the selection to be announced. Deployment either late this year or early in 2021. Gated on when the 400G transponders will be in the field.
        iii. Target for optical being out is the end of this year – CV-19 may push a bit into 2021 with packet gear following.
F. NIH (Mike Gill): No update today.
G. NOAA (Mark Mutz):
    a. Major effort has been with its new data center at the zColo facility in Ashburn, VA. Several of NOAA's Line Offices will be moving into the datacenter in the near future.
    b. It continues the design of its next generation TICAPs using TIC 3.0.

c. N-Wave is making available several different methods for secure cloud access both directly and working with I2.

H. Pacific Wave (Jonah Keough,): Pacific Wave has selected its new platform, the Juniper MX10k, and is working on deploying them in Seattle, WA, and Sunnyvale and Los Angeles, CA. The new platform gives higher density for 100G along with a path to 400G.

I. SCinet (Hans Addleman):
See the appendix for the SCinet
   a. This year the SCinet WAN team has distributed a map showing what SCinet is planning to deploy. If you have, or know of, needs that are different please contact Hans:
      Hans Addleman <addlema@iu.edu>
   b. The map represents asks to CentauryLink, Zayo, ESnet and Internet2. If something different is needed it will be much easier asked for up front rather than in August.
   c. There was discussion on maximum provision capacity - 4.2Tbps (in 2019) vs. 4.3Tbps (for 2020). Additional discussion on increasing the utilization of these donated waves.
   d. This year SCinet is planning to expand the use of optical layer switches. These have significantly reduced the amount of fiber patching and made remote, hands-off testing possible.
   e. SCinet is also investigating with donor vendors hardware that would permit the largest demonstration flows to avoid the core router infrastructure by using a box that combines DWDM and layer2 switching.

J. 3ROX (Michael Lambert): PSC's machine room is on the edge of upgrading to 100G. The needed DWDM gear arrived the day before Pennsylvania's Stay-at-Home order.

K. UTEN (Joe Breen): UTEN continues to expand 100G statewide. The deployed platform has the capability of going to 400G. The wireless research Powder Project is deploying 5G on campus and mobile end points. It will add small parts of Salt Lake City, UT, in the future.

L. University of North Carolina (Mark Johnson):
   a. The jump in home usage by all of MCNC's members saturated its peering with Spectrum. MCNC resolved this by upgrading its Spectrum peering capacity.
   b. UNC is mapping where the campus population is now working from vs. broadband availability. It plans to expand to this systemwide.
   c. Related to 5G, I2 has started the Future Wireless WG to look at what might be done with private LTE on campuses.

VI. **Exchange Points Round Table**

A. PNWGP (Jonah Keough): PNWGP is doing some upgrades on commercial peerings.

B. StarLight (Joe Mambretti):
   a. StarLight (SL) is assisting ESnet with the ESnet6 deployment: fiber testing, remote hands and eyes, etc. Due to CV-19 it has developed some special procedures to help with this.

b. SL has participated in the NSF Large Scale Networking Big Data workshop at University of Illinois at Chicago (UIC) - converted from physical to virtual. FABRIC also help a workshop was at UIC - also virtualized.
c. SL is working with FABRIC to host a FABRIC core node.
d. SL is planning for SC20.

C. MAX (Dave Diller):
a. MAX implemented several upgrades last month that had been on hold all were brought forward.
b. MAX is getting ready for FABRIC.
c. No issues to date due to its members users moving to working remotely.

D. MAN LAN and WIX (Chris Wilkinson): No active changes.

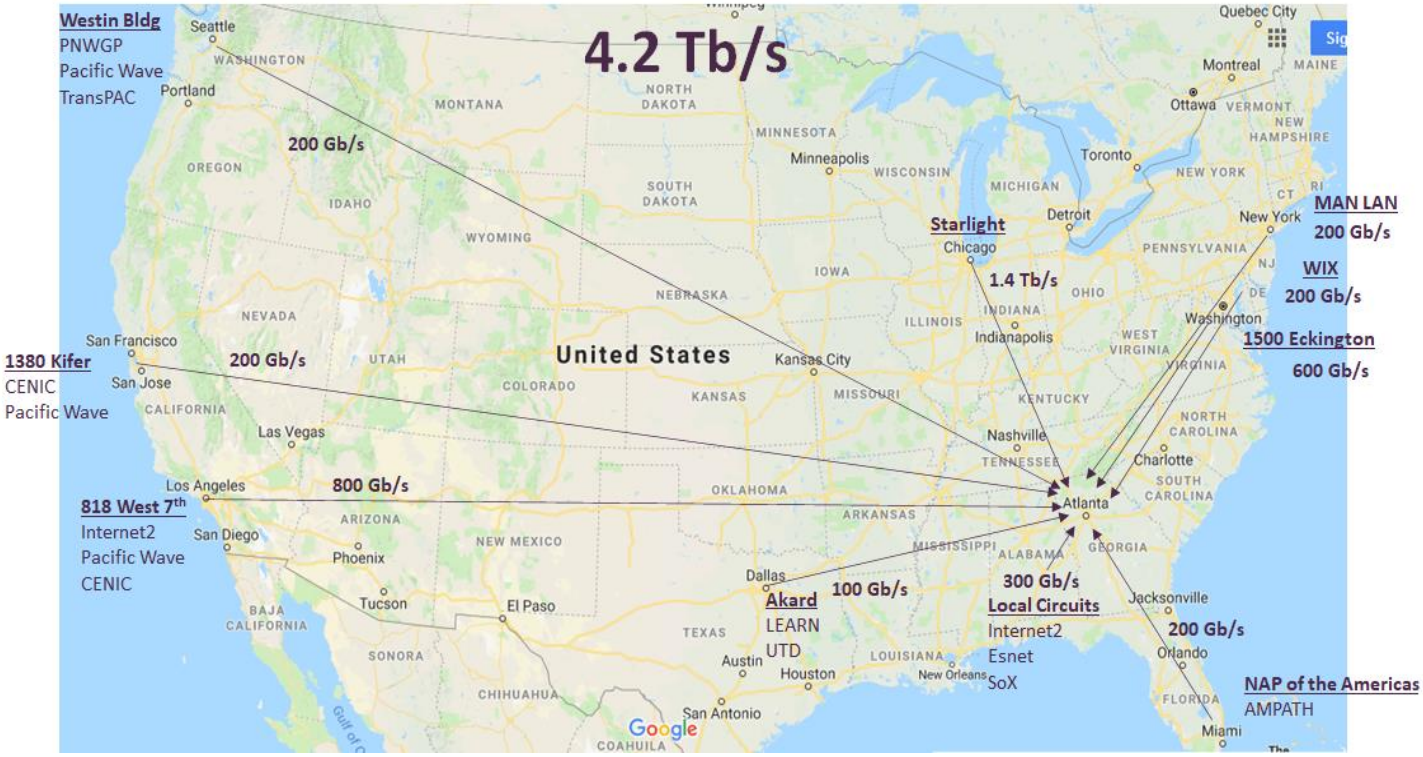
Meetings of Interest 2020

Note: Meetings cancelled since the April JET have been removed from this list.

Apr 26-29	ARIN 45, In person cancelled, moved to a virtual meeting
Jun 1-3	NANOG 79, in person cancelled, moved to a virtual meeting
Jul 25-31	IETF 108, in person cancelled, moved to a virtual meeting
3-7 Aug	APAN50, in person cancelled, moved to a virtual meeting
Oct 19-21	NANOG 80, Seattle, WA
Nov 14-20	IETF 109, Bangkok, Thailand
Nov 15-20	SC20, Atlanta, GA

Next JET meetings

Note: It is anticipated that JET meetings through August will be virtual due to COVID-19 guidelines and the JET's usual summer schedule.

May 19	12-2 p.m. ET
Jun 16	12-2 p.m. ET
Jul 21	12-2 p.m. ET

Appendix: SCinet WAN Initial Circuit Plan: End Points and Proposed Bandwidth