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
May 19, 2020 12:00-2:00 p.m. ET

Participants

Shawn Armstrong, University of Alaska
Joe Breen, UTEN/University of Utah
Nick Buraglio, ESnet
Rich Carlson, DOE/SC
Bobby Cates, NASA/Ames
Eze Eqwuatu, NASA/Ames
Bill Fink, NASA/GSFC
Dale Finkelson, Internet2
Michael Gill, NIH
Mark Johnson, University of North Carolina
Jonah Keough, PNWGP/Pacific Wave
Kevin Kranacs, NASA/GSFC – EOS
Michael Lambert, PSC/3ROX
Paul Love, NCO/NITRD
Linden Mercer, NRL
Alex Moura, RNP
Ed Moynihan, Indiana University
Aruna Muppalla, NASA/GSFC
Kevin Thompson, NSF
George Uhl, NASA/GSFC
Chris Wilkinson, Internet2

Proceeding: This meeting was chaired by Kevin Thompson (NSF).

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 April meeting: Corrections were received before the meeting and found after. 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 - Joe Breen, all**

A. Background on efforts lead by Eric Boyd, Joe Breen, James Deaton, Dan Doyle, Dale Finkelson and Karl Newell:
   a. Tracking sheet of networks willing to share data. Please check and update your network's entry. 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 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. Prototype/pilot status:
    a. University of Michigan: This protype using a container to collect the data is nearly complete.
    b. Imperial College of London: This is ramping up with initial tests underway between the DTN end points. The intervening networks need to be picked up.
    c. Link Oregon: Discussion continue technical details. A small pilot should start in a few weeks.
    d. University of Hawaii: It is willing to test using the new container.
    e. For each pilot the project is capturing lessons learned, issues and areas that would benefit from more research. Layer 2 data is one area with difficulties in collection.
C. MOU rough draft: Work continues but more feedback from the community is needed.
D. During the last code sprint one student was able to pull data from Indiana University using Dan Doyle's tools. Another pulled directly from ESnet. During the next sprint they will work to merge.

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

A. ESnet (Nick Buraglio):
    a. ESnet is turning up additional capacity to Comcast and a few other commodity providers. The inherent asymmetry has created issues with Zeke on the WAN. The addition of Comcast adds a further complication as much more to be backhauled to the central Zeke cluster. ESnet is working on improved efficiencies as 100% mirroring isn't needed for a reasonable look at the data.
    b. ESnet is prototyping how it will implement both customer and ESnet initiated filtering in ESnet6 to determine the best mechanism to signal a filter change. Lots of work with Flowspec. ESnet is also investigating using NSO as an alternative to push ACLs.
B. Internet2 (Chris Wilkinson):
    a. Steve Wallace and Jeff Bartig are working with Internet2's members to bring their IRR entries up to date and become MANRS compliant. The driver for this effort is Google's (and other large CDNs) require it for settlement free peerings. The effort is about halfway done with this.
    b. Internet2 has brought on several new security engineers for Paul Howell's security group.

V. **Networks Round Table**

A. ANA (Dale Finkelson): Traffic on the trans-Atlantic circuits has remained relative steady over the last 6-8 weeks.
B. ESnet (Nick Buraglio):
    a. As mentioned, it is turning up additional capacity with Comcast

b. ESnet6:
    i. The packet RFP is very close to award – perhaps next week. ESnet will be able to give an update on this award shortly after.
    ii. OLS deployment continues with minor impact from CV-19. Should complete approximately on schedule. The exceptions are three nodes located in labs which are currently physically unreachable.

C. International Networks – Indiana University (Ed Moynihan): Circuits for TransPAC and NEAAR are stable.
    a. NEAAR:
        i. There have been significant cable cuts off both southwestern and southeastern Africa – resolved after 6-8 weeks. During this time significant losses into Lagos, Nigeria, and South Africa.
        ii. A new perfSONAR mesh has been setup for all partners in Africa and the Middle East. A result of the project's extensive training and equipment installs over the last few years. A very useful tool especially for some of the harder to reach NREN's in Africa.
        iii. The project is using NetSage to work with partners in Europe to make sure the network is available to support CV-19 research.
        iv. The project will work to have its partner NRENs in Africa join the ESnet run NREN Slack.

D. Internet2 (Chris Wilkinson):
    a. Next Generation:
        i. Internet2 (I2) has completed its first transition to the new optical infrastructure around Kansas City, MO. The next will be in the Chicago, IL, area. Not being a green field build complicates the deployment.
        ii. For its packet RFP I2 is doing a testbed effort with the four finalists and lab validations for the services needed. It is anticipating some limited field trials as it is starting to receive its 400G transponder infrastructure. Selection is expected in late June or July.
        iii. CV-19 impact on schedule: Segment delivery has seen some impact (done by a subcontractor to CenturyLink(CTL)). CTL is doing a great job keeping its teams in the field. The primary gating factor is the available of hardware rather than field teams. I2 is seeing some staffing impact internally and with CTL.
    b. I2 has done interconnect upgrades driven by the jump in working from home:
        i. Comcast: 70G to 600G
        ii. Zoom: 30G to 200G
        iii. TW/Charter: Legacy TW 2x, Charter 3x
        iv. Connections at many public exchanges have been upgraded to 100G. I2 is analyzing what additional home internet peering can be brought online at these exchanges.
        v. To support its staff I2 has increased its commodity capacity with CTL from 2x1G to 4x100G. These upgrades would also provide a path of last resort

for commercial services for its members. (A requested but as yet not needed service.)

E. NASA EOS (George Uhl, Kevin Kranacs and Bill Fink): The focus for the science and engineering network at GSFC is supporting cloud work. The networking for this is primarily provided by the agency.
F. NRL (Linden Mercer): The lab has encountered some performance issues with RDMA over distance. It is making good progress in resolving. NRL is starting to think about SC though noting there are questions around the format of SC this year.
G. Pacific Wave (Jonah Keough):
    a. Pacific Wave (PW) is continuing the migration to its new switch platform (Juniper MX10k) with the first customer in Los Angeles, CA, moved last week. PW is giving this migration a bit of time before the next customer is moved to determine what issues develop. . So far only a couple of minor issues with NetFlow on Layer 2. PW has found work arounds and is working with Juniper on feature requests for a permanent solution.
    Next will be all the customers in Sunnyvale, CA, followed by the balance in Los Angeles, Seattle, WA, and concluding in Denver, CO.
    b. While domestic connector networks have seen some traffic decreases traffic over PW has remained relatively steady through recent months.
H. RNP (Alex Moura):
    a. RNP has been developing measurement tools focused on last mile.
    b. The new undersea cable between Fortaleza, Brazil, and Sangano, Angola, has been activated. With that there is now a 100G R&E connection over it with onward connectivity to South Africa via an existing cable. RNP makes use of this with its new 100G path in the northeast of Brazil.
    c. RNP is still working on 100G paths in other areas of Brazil.
    d. RNP is still investigating CV-19 related traffic changes in metro areas. Inter-metro traffic has dropped 20-30%.
I. 3ROX (Michael Lambert): No updates.
J. University of Alaska (Shawn Armstrong): The university is watching the possible development of a terrestrial fiber path from Alaska to the Lower 48.
K. University of North Carolina (Mark Johnson):
    a. MCNC's upgrade of its connection to Spectrum to 2x20G resolved the congestion issue.
    b. The University of North Carolina (UNC) has been notifying other schools of its work to map where a campuses' population is now working from vs the availability of FCC defined broadband (from FCC Form 477 data). It is happy to help others with this effort. Contact Mark at:
        Mark Johnson <smj@email.unc.edu>
    Mark has already spoken with the North Carolina system, the Maryland system, the Arkansas system, some individual schools, Internet2 and EDUCAUSE. For UNC approximately 4.5% don't have broadband. Approximately 90% of UNC's population live in North Carolina. (The mapped population includes students, staff and faculty.)

L. UTEN (Joe Breen): The 100G rollout across the state continues. It has an RFP out for the 5G core's equipment.

VI. **Exchange Points Round Table**

A. PNWGP (Jonah Keough): No update.
B. Ames (Bobby Cates): No update. A facility power upgrade scheduled for June has been postponed indefinitely. It will provide another diverse feed along with an auto-transfer switch.
C. MAN LAN and WIX (Dale Finkelson):
    a. MAN LAN is working with Joe Breen on the shared telemetry pilot with Imperial College.
    b. A MaDDash is now up between MAN LAN, WIX and Pacific Wave locations.

Meetings of Interest 2020

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

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
Aug 3-7	APAN50, in person cancelled, moved to a virtual meeting
Sep dates TBD	GNA Technical WG, in person cancelled, moved to a virtual meeting
Sep 15-17	NORDUnet 2020, Reykjavik, Iceland
	n.b. Postponed one year to Sep 14-16, 2021
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.

Jun 16	12-2 p.m. ET
Jul 21	12-2 p.m. ET
Aug 18	12-2 p.m. ET