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
October 15, 2019, 12:00-2:00p.m. ET

Participants

Rich Carlson, DOE/SC	Padma Krishnaswamy, FCC
Bobby Cates, NASA/Ames	Michael Lambert, PSC/3ROX
Bill Fink, NASA/GSFC	Paul Lang, NASA/GSFC
Dale Finkelson, Internet2	Paul Love, NCO/NITRD
Michael Gill, NIH	Joe Mambretti, StarLight/MREN
JJ Jamison, Juniper	Linden Mercer, NRL
Ann Keane, NOAA	Mark Mutz, NOAA
Scott Kohlert, Scinet WAN/Ciena	Aruna Muppalla, NASA/GSFC
Kevin Kranacs, NASA/EOS	Chris Wilkinson, Internet2

Proceeding: This meeting was chaired by Rich Carlson (DOE/SC).

I. **Action Items**:
- Ongoing discussion of LSN's Strategic Plan and the JET's role in it.
- ESnet update on its operational network security use of Rapid7.
- Internet2 and ESnet to updates on their respective optical rollout plans.

II. **Review of the Minutes** of the September 2019 meeting: No corrections were offered during the meeting. (*Note*: One was received during the balance of the week).

III. **Operational network security roundtable** (only those who had comments are noted)
   A. 3ROX (Michael Lambert): Jim Marsteller, a co-PI on the NSF Trusted CI award, has moved from PSC to the University of Pennsylvania. His PI duties will be reassigned.

IV. **Networks Round Table**
   A. Internet2 (Chris Wilkinson): Most of its efforts are in support of SC. It is continuing to make improvements at its I2PX locations. It has started briefings on its new fee structure. These are being done by Linda Roos and George Loftus. (Their addresses can be found in Internet2's online staff directory.) They'll be happy to answer any questions. The initial briefings are focused on regional networks – others to follow.
   B. NASA/EOS (Kevin Kranacs): No changes this month.
   C. NIH (Mike Gill): Nothing significant to report.

D. NOAA/N-Wave (Mark Mutz): The 100Gbps upgrades for the N-Wave backbone and the DC DWDM metro ring are operational. The upgrades to 2x100Gbps to the NOAA facility in Fairmont, WV, should be completed this week.

E. NRL (Linden Mercer): NRL is using he testbed between Washington, DC; Baltimore, MD; and Chicago, IL, to help in getting ready for SC. NRL has a great deal of other projects focused on SC as well.

F. SCinet WAN (Scott Kohlert): (For reference, SCinet's current planned WAN circuits are: Seattle: 2x100Gbps, Sunnyvale: 2x100Gbps, Los Angeles: 7x100Gbps, Dallas: 1x100Gbps, Miami: 2x100Gbps, McLean 2x100Gbps, Washington, DC: 6x100Gbps, New York: 2x100Gbps and Chicago: 11x100Gbps plus 1x400Gbps. Locally in Denver: 3x100Gbps routed R&E plus 2x10Gbps commodity services.)

    a. Changes on California bandwidth: Some 100Gbps circuits that were going to Sunnyvale are now going to Los Angeles. Additional circuits are also scheduled for Los Angeles. These are primarily to support Caltech.

    b. SCinet's WAN team is working hard with all the WAN providers (CenturyLink/Infinera, Zayo, Internet2 and ESnet) to get the WAN circuits up before SCinet's staging starts next week (on the 23rd).

    c. Pre-staging hardware install and local testing in Chicago, IL (StarLight) is going very well. Hardware has already been installed in Seattle, WA; the last for Los Angeles is scheduled for today; and the hardware for Dallas, TX, is planned for tomorrow.

    d. Staging runs from October 23 to November 1. Once the gear for the WAN circuits is installed the balance of the 10 days will be used to bring up and test circuits. Normally a few circuits will need further work the week after staging to be ready for the SCinet setup which commences on November 11.

    e. 400Gbps circuit between Denver and StarLight relies on Internet2's new optical path and has a very aggressive schedule to be ready for setup. Chris Wilkinson added that it is still gated on some fiber and power assets – very tight.

G. 3ROX (Michael Lambert): No changes to report.

V. **Exchange Points Round Table**

A. NASA Ames (Bobby Cates):

    a. No significant changes at the exchange work continues with Amazon and Equinix to get some cloud connectivity.

    b. Kevin Jones is working to reconstitute NASA's R&E network, NREN, with NAS and will be joining the JET calls.

    c. USGS' relocation from Menlo Park, CA, to Ames: The next service to be provided will be a connection to CENIC.

B. StarLight (Joe Mambretti):

    a. StarLight (SL) has large number of SC demos with its partners ready to go. Many of these are looking forward to the 400Gbps channel from SL to SC.

    b. SL supported last month's Global Research Platform workshop held at UCSD.

    c. SL is working with the South Asian research community toward the SupercomputingAsia 2020 (SCA) conference scheduled for Singapore in

February. SL is participating in SCA's Data Mover Challenge and is starting trials of large scale data transfers between DTNs.
- d. SL will be supporting the FABRIC testbed with a pair Tbps circuits – one to Washington, DC, with the other to Houston, TX (and onto San Diego, CA). FABRIC is led by the Renaissance Computing Institute (RENCI) and is a $20M NSF project to build a national infrastructure allowing the testing of new network architectures.
- e. SL is part of a consortium with Argonne National Laboratory and Fermi National Accelerator Laboratory that is designing and will build a quantum communications and quantum networking testbed.

C. Internet2 (Dale Finkelson):
- a. MAN LAN (ML): The hardware upgrade, which replaced the Brocade with a pair of QFXs, is complete and operational. A small amount of software remains to be finished. Among much else this upgrade provides the needed two ports for the 2x100Gbps Zayo circuits to SC.
- b. WIX: A similar upgrade is planned for the week of October 28.
- c. Internet2 and CENIC are continuing discussion on the Atlantic Pacific Research and Education Exchange (AP-REX) collaboration. As part of AP-REX an express 100Gbps circuit has been installed from Los Angeles, CA, to WIX and thence to ML.
- d. If users of either ML or WIX have issues after the hardware upgrades, please contact Dale. (His address can be found in Internet2's online staff directory.)

VI. **Further details on Internet2's Optical Deployment Plans – Chris Wilkinson**

A. Of the five pieces of the next generation network (optical, packet, automation, orchestration and telemetry) optical is in the final stage with procurement underway. The major contract has been awarded with the remaining contracts in process and expected to let this week. These include Internet2's protected transponders for CY2020.

B. The next piece, packet, will have its RFP released during the next two weeks.

C. Automation, orchestration and telemetry are still in the scoping effort.

D. For the optical piece there were four finalist that were all very close. Ciena was very aggressive in their pricing with a solid transition path and won. Its selection of will make for a smoother transition as the existing hardware is also Ciena. Key pieces of the selection were the support of alien waves, flex grid, DCI style transponders and 400Gbps; an updated automation/orchestration platform; a reduced footprint and lower power needs.

E. CenturyLink (CTL) has provided roll fiber pair for most of the network's footprint which will facilitate a smoother transition.

F. Internet2 has broken the deployment into 13 phases. The target for completion is the end of 2020.
- a. Phases 1-4: Kansas City; Chicago; Washington, DC; New York; Salt Lake City and Los Angeles are slated for Q3/Q4 2019 and encompass the segments with the highest wave demand. These may stretch into Q1 2020.

b. Phases 5-8, Q1/Q2 2020 includes Texas, Gulf Coast, Seattle and the San Francisco Bay area.

c. Phases 9-12+, Q3/Q4 2020 includes Atlanta, north and south from Los Angeles, possible alternative fiber paths Salt Lake City-Denver-Kansas City, El Paso and Albuquerque. There might also be additional fiber builds in the final phase.

G. Northern Tier: Internet2 is having good discussions with local groups on options for the future of a Northern Tier path. The current Zayo service remains in place.

VII. **Update from the LSN on its Annual Planning Meeting – Rich Carlson**

A. The LSN relies on the JET to coordinate operational activities between federally and non-federally operated networks belonging to the international R&E networking community. Once a year the JET reviews its tasks from the past year and provides the LSN suggestions for tasks the LSN should consider at its Annual Planning meeting usually held in October. For 2020 the JET suggested the following. These were approved by the LSN.

    a. Ongoing JET tasks:

        i. Assist in the planning of technology and application demonstrations of SDN & Big Data at SC20

        ii. Technology tracking: perfSONAR, SDN/SDX/SDI, Science DMZs, and network automation & orchestration

        iii. Hold two meetings collocated with R&E networking community conferences:

            1. Internet2 Global Summit (29 March-1 April)

            2. SC20 (November)

        iv. Continue to schedule meeting round tables of updates on members' networks, operational network security, exchange points and meetings of interest to the community

    b. Possible New JET Tasks

        i. Track segment routing

        ii. Coordinate the development of tools to monitor cross-domain workflows and facilitate the sharing of measurement date between networks anonymized as needed

    c. Potential JET Workshop: TBD

B. There are ongoing discussions between NITRD and the LSN on the future role of the LSN. These are around what sort of research is still needed for networking. The LSN very much appreciates the work the JET members do in keeping high performance networks working and the community's traffic flowing between the JETnets and the wider community. The LSN needs to understand how to collect the right kind of data to manage and understand what networks are doing. The data collected from various services must be able to be correlated across layers in a meaningful way (time stamps or whatever) to fully understand the observed behavior of application/workflow behavior (e.g.; correlate GLOBUS Online logs with GFTP logs with the underlying packet data generated by NetFow). The currently collected data won't support the building of the

increasing needs of scientific research.
C. The LSN would like the JET's members to consider what are the threats and issues that would prevent them from sharing network performance data with their peer organizations and network researchers around the world. How can the data collected by the operational communities be used by researchers?
D. The JET's members are in the ideal position to collect the data to understand how networks interact at their interconnection points as flows transit. It is going to be very important to articulate what the networks are doing and how this correlates with the middleware, the science applications and the more complex infrastructures these workflows are going to create.
E. Discussion:
   a. At the January meeting bring forward what each JET would need to have to be able to share any performance data. What/how needs to be anonymized, for example.
   b. It was suggested that Internet2's recently formed telemetry WG has a very overlapping goal though in the context of Internet2. It is chaired by Eric Boyd and Joe Breen and is open to any who are interested. Drop Dale Finkelson a note to be added to the WG's mailing list. (His address can be found in Internet2's online staff directory.)

Meetings of Interest 2019

Oct 28-30	NANOG77, Austin, TX
Oct 30 – Nov 1	ARIN 44, Austin, TX
Nov 16-22	IETF 106, Singapore
Nov 17-22	SC19, Denver, CO
Dec 9-12	TechEX19, New Orleans, LA
Jan 15-16, 2020	HIC, Hilo, HI
Jan 19-22	PTC'20, Honolulu, HI
Feb 10-12	NANOG78, San Francisco, CA
Feb 24-27	SupercomputingAsia 2020, Singapore
Mar 2-6	APAN49, Kathmandu, Nepal
Mar 3-4	ESCC, Berkeley, CA
Mar 21-27	IETF 107, Vancouver, BC, Canada
Mar 29 – Apr 1	Internet2 Global Summit, Indianapolis, IN
Apr 7-8	US Ignite Application Summit, Denver, CO
Apr 26-29	ARIN 45, Louisville, KY

Next JET meetings

Nov 19, 2019   10 a.m. - 12 p.m. MT
                n.b.: This meeting is concurrent with SC19. It will be held in room 711 of the
                Colorado Convention Center. Remote access is expected to be available.
Dec 17, 2019   12-2 p.m. ET (n.b.: This meeting will be held only if needed.)
Jan 21, 2020   12-2 p.m. ET