

JET Meeting Minutes
July 17, 2018
National Coordination Office for Networking and Information Technology R&D
(NCO/NITRD)
490 L'Enfant Plaza SW, Suite 8001 (8th floor)
Washington, DC 20024

Participants (In-Person *)

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Summer and Face-to-Face meetings: Paul Love

After additional comments and internal discussions, the August meeting will be virtual. Going forward the June, July, and August meetings will be virtual. September and March will be held as DC area Face-to-Face meetings with all in the DC area encouraged to attend at the NCO's office. Other meetings when the JET is not meeting concurrent with SC or Internet2's Global Summit will also have meeting space at the NCO for those who wish to attend in person.

Review of the Minutes of the June 2018 meeting

No corrections have been received by e-mail since there were sent to the JET's list on 10 July 2018. None were brought up during the meeting.

- None were subsequently received.

Action Items (new):

- 1) Paul Howell will check with The Quilt to see if their Security Cookbook can be shared with the JET.
- 2) JET members should invite their security groups to participate in the Security roundtable at the upcoming meetings.
- 3) Nick Buraglio and Dale Finkelson will draft a short description of the automation/orchestration tasking item for discussion in Aug.

Action Items (carry forward):

- 1) NORDUnet to share how it is doing spectrum sharing with its members.
Tentatively scheduled for Nov meeting
- 2) Type of meetings during the summer:
See initial paragraph in these minutes.
- 3) R&E network infrastructure security discussion: how these functions/services are being deployed, debugged, and integrated into the normal NOC operation:
See these minutes for details.

Proceedings

This meeting of the JET was chaired by Kevin Thompson (NSF) and Rich Carlson (DOE/SC.)

Networks Roundtable

CARREN: Andrew Gallo

- Standard upgrades on their optical ring:
 - Additional 100G capacity.
 - Adding protection through McLean and Equinix.
- CARREN has applied for and been accepted as a participant in the Internet Society's Mutually Agreed Norms for Routing Security.

ESnet: Nick Buraglio

- ESnet is undertaking several Proof of Concept (PoC) labs on routing:
 - One finished, one just coming up and a third after that.
 - They are covering items such as MPLS, segment routing, traffic control, programmatic interface testing, and protocols.
- ESnet is investigating other options for the optical platform.
 - ESnet hope to be able to share the results of this investigation.
- ESnet is devoting significant time to understanding the software pieces for ESnet6. These are anticipated to be the hardest portion of development ESnet6. ESnet is looking at commercial management platforms.

Internet2: Dale Finkelson

Internet2 continues to do requirements collection for its next generation network.

NASA EOS: George Uhl

- EOS is leveraging NASA's direct connections to AWS East and West.
- EOS is planning on moving its DACs into the cloud.

NIH/NLM: Mike Gill

No update today.

NOAA: Mark Mutz

- N-Wave is building out a cluster of sites in the Tidewater area of Virginia centered on a new aggregation site in Norfolk, VA.
- N-Wave continues with cloud experiments with both AWS and Azure. N-Wave is working to develop a NOAA-wide model.

NRL: Linden Mercer

NRL is continuing to work with its partners on plans for SC18.

International networking at Indiana University: Hans Addleman

- TransPAC
TransPAC is working to deploy 2 10G circuits between Guam and Hong Kong. It will place a switch in the Hong Kong Open Exchange. The switch is expected to be installed in early August. It expects that the pair of 10G circuits will come up in mid-August.
- NEAAR
No changes to report since last time.

SCinet: Hans Addleman and Nick Buraglio

- Anticipating WAN 100G circuits into Dallas for SC18:
 - CenturyLink: 19
 - Zayo: 2
 - ESnet: 4
 - Internet2: 2
 - LEARN: 1
 - Pacific Wave: 1
- On the show floor:
 - Harvey Newman is working to have 400G between booths.
 - Some test set vendors are very excited to have their 400G gear used by SCinet.
- SCinet's Xnet has been revived this year. The FAUCET controller will be used to manage 3 dNOCs and an aggregation switch in the SCinet NOC. SCinet plans to build this out ahead of time, then ship to show. Of note is that one of the dNOC switches will be P4 based.

US Ignite: Glenn Ricart

Nothing new to report this month.

Exchange Points Roundtable**WIX and MAN LAN: Dale Finkelson**

Internet2 is working on the requirements document for the hardware upgrades at both locations. Target is for the upgrades to be done before the end of the year but after SC.

StarLight: Joe Mambretti

- At TNC18 StarLight (SL) supported a demonstration of 100G measurements by Yan Luo as part of the Advanced Measurement Instrument Service. AMIS is an IRNC project showing software defined measurements.
- SL is working with the GENI program to implement a P4 testbed at SL using a new chip that simplifies the rule implementation.
- SL continues to work with Alex Szalay (John Hopkins University) on his Open Storage Network (OSN.) OSN has recently received additional funding. SL will have a 1.5 PB node on OSN.
- SL is preparing for the 2nd National Research Platform Workshop in Bozeman, MT.
- Another major effort by SL is preparing for SC18. SL has been working with the SCinet WAN team and has requested 12 100G circuits from SL into its booth and 6 100G circuits with Linden Mercer and Bill Fink from DC into the booth. SL is also planning for 2 100G circuits from DC to SL as well as some from West Coast sites into SL. SL is working on several demonstrations for Dallas. Last year SL had 32 and is approaching that number for Nov.
- SL is working with Harvey Newman on the 400G booth to booth circuits. SL is optimistic that this demo will come together in time for SC18.

NASA Ames: Bobby Cates

- Ames is working with ESnet to relocate a 10G peering circuit for NREN and NASA. There may also be a tunnel for Internet2 on this link.
- Ames is working to get some old FIX-West and MIX multicast assignments into the RIR.
- Status of USGS' relocation from Menlo Park to AMES:
 - The 10G circuit to CENIC came up last week.
 - A 10G circuit between Ames and the old USGS campus in Menlo Park is in the works.
 - The initial group of USGS staff will be arriving in late summer.

ESnet's plans for secure remote management plane access - Nick Buraglio

ESnet has been looking at new ways of doing out-of-band (OOB) management for not only ESnet6 but potentially for ESnet5 as well. Currently ESnet has a POTS line drop anyplace there is a layer 3 box. Just getting POTS lines has become significantly harder than a few years ago. The goal of the new effort is to find a "more modern" way of doing things. However, there is no single way of doing OoB especially with an international footprint.

- OOB & management network goals - needs and requirements:
 - Remove POTS lines as entry point wherever possible.
 - Simple, easy to use interface for access to all resources.
 - Reliable and supportable out of band (OOB) connectivity in the instance of a failure of equipment, facility, or connectivity directly related to operation of data transit of ESnet or ESnet constituents.
 - Greater than serial access for management of optical gear (e.g. need for IP connectivity OOB for access using optical management software).
 - Better visibility into management plane traffic.
 - Easier and more robust management of legacy management devices in remote points of presence.
 - Ability to automate deployment and management of ESnet PoP support equipment. If a product can't be automated then it's probably the wrong piece of gear.

- Multi-Factor Authentication access control for all OOB management resources.
- Reduce the number of devices needed in support of management network access. Saving rack space and power.
- OOB & management - two overlapping networks issues
 - Optical network management:
 - Currently managed by Level3/Internet2.
 - Optical Side Channel/“shadow” parallel OSPF network.
 - Out of scope for this prototype.
 - Will return in future if needed.
 - For this prototype just looking at the out of band management network:
 - Currently POTS lines.
 - Console servers.
- Gear selected for the OOB management network prototype. Very robust, very resilient, and affordable.
 - OpenGear IM7216-2-24E-DAC-LMV
 - Specs
 - 16 port L2 switch
 - 2 combo ports for L3 access
 - LTE
 - GPS
 - WiFi
 - 16 ports serial console
 - Dual power supply (AC and DC available)
 - 2 x USB (UPS management, etc.)
 - LTE failover
 - LTE MGMT (designed for machine to machine link. Not fast (1 meg) but gives very good inside building penetration.)
 - Stackable console ports
 - Supports most protocols.
 - Software
 - Linux under the covers.
 - Supports configuration backups.
 - It has a management system that operates with out a direct connection. It can “call home” through most any sort of NAT’s, etc and regardless of how it’s configured and establish a VPN tunnel.
 - Can be automated.
 - Status
 - ESnet has exercised it extensively in a prototyping lab.
 - ESnet is planning on how to push out a pilot using the box.
 - First site may well be ESnet’s Ames, IA, lab since has some cell coverage issues
 - For wider deployment ESnet is hoping to have 90% cell coverage between Verizon and AT&T. Looking into external antenna to help.
 - For the remaining 10% will need to be POTS

Initial discussion on possible JET tasking for next year – Rich Carlson, Kevin

Thompson, Joyce Lee, and Paul Love

- Continuing JET Tasks
 - Continue to plan demonstrations of Big Data and SDN applications and technology at SC19.
 - Continue co-located JET meetings:
 - Internet2 Global Summit: March 2019.
 - SC19.
 - Track Technologies: SDN/SDX/SDI, Science DMZ, TIC, perfSONAR and Identity Management.
- Possible new JET Tasks
 - Will other networks be following ESnet's lead and move to control more of the lower levels of the infrastructure?
 - If they are then we should track.
 - If not then perhaps a one off session.
 - Tracking automation of network management as well as the entire ecosystem; workflow/orchestration.
 - Explore the issues in supporting the streaming of instrument data.
 - The question was raised if the JET should explore supporting the NITRD Smart Cities WG in the area on advanced networking support as a tasking. Appropriate to be at the behest of the Smart Cities WG.
- Workshops
 - *TBD*

AI: Nick Buraglio and Dale Finkelson will draft a short description of the automation/orchestration tasking item for discussion in Aug.

Continued discussion of how R&E networks are handling cyber security – Rich Carlson and Von Welch

After June's initial discussion, Von Welch (PI on NSF's Trusted CI program) discussed with others if there was a forum for sharing best practices on operational cyber security particularly for the R&E networking community. The consensus was that there wasn't anything with an R&E focus. There was also a consensus that such a forum would be useful. Von stated that Trusted CI would be happy to host such a forum if the community felt that would be useful.

Rich asked those on the call what forum would be most useful going forward. Discussion ensued on framing what this forum would cover. It was stated that there already is plenty of resources and coverage for building a campus network, the LAN, etc. inside a well-defined perimeter. That is, up to the WAN boundary.

While commercial ISPs have done this, their scope seems not a good match to R&E networks. Having some Best Practices (BP) for building a RON or a national footprint network such as Internet2 or ESnet would be extremely useful to many.

An example of what it would be very useful to have a BP for. How do networks develop and plan for the handling of their NetFlow data? How does a net maximize their sample data? What ratio? What might trigger 1:1 data?

There was discussion of what was involved in taking procedures, etc. from a large campus environment and implementing them for a national footprint network. There is a lot of

information available such as The Quilt's Security Cookbook. A good deal may be accomplished by taking the campus information and adjusting to the needs of a regional or national network. The question is: what are the subtleties in adjusting?

The Quilt's Security Cookbook can be found at:

https://docs.google.com/document/d/11lreq2MZL_TRxOVXU5bcqIBICTvwmVXCMRdffPuui0c/edit?usp=sharing

There was also discussion related to the sharing of information such as patterns noticed in the analysis of unauthorized traffic. Many campuses are currently doing this.

Next steps:

- A new roundtable to start this discussion at JET meetings for the balance of this year to see if this has traction.
- Determine if it will work to leave as an ongoing roundtable in the JET, spin off into another team under the LSN, or into something like Von's Trusted CI program.

AI: Paul Howell will check with The Quilt to see if their Security Cookbook can be shared with the JET

AI: JET members should invite their security groups to participate in the Security roundtable at the upcoming meetings.

Meetings of Interest Roundtable

August 6-7	2nd National Research Platform Workshop , Bozeman, MT
August 6-10	APAN46 , Auckland, New Zealand
September 18-20	NORDUnet 2018 , Helsingør (Elsinore), Denmark
September 20-21	18th Annual Global LambdaGrid Workshop , Helsingør (Elsinore), Denmark
September 25-27	2018 NSF, ESCC & The Quilt Collocated Program , College Park, MD
October 1-3	NANOG74 , Vancouver, BC, Canada
October 4-5	ARIN 42 , Vancouver, BC, Canada
October 15-18	2018 Technology Exchange , Orlando, FL
November 3-9	IETF 103 , Bangkok, Thailand
November 11-16	SC18 , Dallas, TX
December 2-3 2018	e-AGE18 , Amman, Jordan
February 18-20	NANOG75 , San Francisco, CA
February 18-22	APAN47 , Daejeon, Korea
March 5-8	Global Summit , Washington, DC

Next JET Meetings:

August	Aug 21, 12-2 p.m. EDT, NCO/NITRD, Washington, DC
September	Sep 18, 12-2 p.m. EDT, NCO/NITRD, Washington, DC <i>nb: This will be the 2nd DC area Face-to-Face meeting of the JET. The room will be available 11:30-2:30.</i>
October	Oct 16, 12-2 p.m. EDT, NCO/NITRD, Washington, DC

November Nov 13, 1:30-3:30 p.m. CST, Room D175, Kay Bailey Hutchison
Convention Center, 650 S Griffin St, Dallas, TX 75202
nb: This meeting is concurrent with SC18