JET Meeting Minutes
June 19, 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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Review of the Minutes of the May 2018 meeting

No corrections have been received by e-mail since there were posted on 11 June 2018. None were brought up during the meeting.

- None were received during the balance of June.

Action Items (new):

1) Are security folks in JET members' respective organizations interested in discussing infrastructure security issues at the national level through a separate JET forum or setting aside time during JET meetings? Also, please identify any existing forums your organization knows of that currently serves this purpose. Please note that discussions would not focus on the policy issue of should such security be deployed (outside of JET's scope). JET discussions would be addressing how these functions/services are being deployed, debugged, and integrated into the normal NOC operation.

2) Are folks planning to drop by during the JET July and August meetings? Otherwise they can be deemed virtual until the September in-person meeting, and the issue revisited at that time.

- After evaluating the e-mail replies to this question the JET meetings will remain with a meeting room at the NCO supported by WebEx and a telephone bridge.

Action Items (carry forward):
1) NORDUnet to share how it is doing spectrum sharing with its members.
2) ESnet to possibly brief the JET on the work to date of the design of the ESnet6 management network.

Proceedings
This meeting of the JET was chaired by Rich Carlson (DOE/SC).

Networks Roundtable
ESnet: Nick Buraglio
- ESnet's major effort remains ESnet6:
  - Finishing up the preparation for the next step in its review process (DOE's Critical Decision Review.)
  - One of the goals of ESnet6 is to have it as fully automated as possible. This effort will be used for the new network and will be applied as much as possible to ESnet5.

NIH/NLM: Mike Gill
No update today.

NOAA: Mark Mutz and Ann Keene
- No major updates since last month. Still working to rollout N-Wave's
  - Enterprise wireless.
  - Enterprise VPN solutions.
- Resolving the funding needed to upgrade the backbone and other portions of the network to 100G.

NRL: Linden Mercer
NRL is continuing to work with MAX and GSFC on its plans for SC18.

SCinet: Nick Buraglio and Hans Addleman
Nick asked if GSFC or any others planning to be at SC18 would consider running their links over FAUCET controlled paths. This would be especially useful if they are 100G links.
Hans reminded everyone to please let the SCinet WAN team know about circuit needs for demonstrations as the team's planning is ramping up. If you have any questions for the WAN team, Hans can be contacted at: addlema@iu.edu

3ROX: Michael Lambert
No updates for either 3ROX/PSC or XSEDE.

Exchange Points Roundtable
NASA Ames: Bobby Cates
- The migration of USGS from Menlo Park to the Ames campus is still in progress.
  - USGS will be turning up a DOI TIC service.
  - Initially they will have a 10G connection to CENIC.
  - Will look at peering connections at Ames in a year.

o USGS circuit turn ups for the transition team will be in June. Other groups will be moving over the next year. Expect to be relocated next summer.

StarLight: Joe Mambretti
- Starlight (SL) just completed providing facilities support for demonstrations at TNC18 in Trondheim, Norway. Part of the Advanced Measurement Instrument and Services Programmable Network Measurement International Research Network Connections project to do measurements at 100G including real time analytics.
- SL is working with Alex Szalay (John Hopkins University) on his Open Storage Network (OSN.) OSN is a nationally distributed storage facility for science data. Alex has announced that the project has received additional funding from NSF. SL implemented the first storage node outside JHU with 1.5 PB available directly connected to a WAN.
- SL continues to work on next generation DTNs. SL has partnered with NCSA on this specifically aimed towards supporting data from the Large Synoptic Survey Telescope.
- SL continues to prepare for SC18.
- A question was asked if SL publishes the architectures and performance of its storage and DTN efforts. SL has recently hired a new staff member with a doctorate in measurements who has written and submitted a paper on optimal affinity binding for threads supporting large data flows on DTNs. SL will distribute the paper as soon as it's published. The demonstrations at TNC18 were organized by Yan Luo (University of Massachusetts Lowell) and Gabriel Ghinita (University of Massachusetts Boston.) A paper was published last year at the Innovating the Network for Data-Intensive Science Workshop held as part of SC17.

WIX and MAN LAN: Dale Finkelson
- A couple of minor outages have been experienced on an ANA circuit. All rolled over to other circuits.
- The 100G Los Angeles<>Singapore has been reengineered to avoid a very busy shipping channel between Hong Kong and Singapore. It had been experiencing numerous, long duration breaks that were believed to be due to dragging anchors. The circuit had been using the AAG cable system all the way from Los Angeles to Singapore. The reengineering continued to use AAG from Los Angeles to the Philippines were it now transfers to the ASC cable system thereby avoiding the waterway.
- The reengineering is part of the Asia Pacific Ring that Francis Lee from Singapore put together for cooperation among a number of players in Asia Pacific R&E networking.

Meetings of Interest Roundtable
Note: Going forward the listing of upcoming meetings of interest has been moved to the end of the minutes, just before the list of upcoming JET meetings

Internet2's plans for short term improvement over the next 18 months - Chris Wilkinson
- Today's brief is focused on short term engineering and planning steps.
- Internet2 is in an interesting place right now:
  o Its network is coming up on being 10 years old.

- o A lot of activities are ongoing to maintain the existing network.
- o Concurrently, Internet2 is planning for its new network.
- o The result has been realignment inside Internet2 to free up resources for the work on the future network.
- Current network:
  - o AL1S (optical transport).
  - o AL2S (software provisioned layer 2).
  - o AL3S (layer 3, TR-CPS, R&E, cloud access).
  - o Cloud Connect (AWS, GCP, Azure).
  - o Supporting both the academic enterprise and data intensive science.
  - o Footprint:
    - ▪ 85 layer 1 optical add/drop sites (with 320 amp sites).
    - ▪ 46 sites are also layer 2/3.
  - o Light layer 2/3 refresh in 2016-1027 to move from a mixed vendor network built on OpenFlow to a single vendor network built on MPLS.
- Internet2 has these ongoing (routine) projects:
  - o Connector restructuring and 100G upgrades:
    - ▪ 10G to 100G upgrades.
    - ▪ Changes in how 100G connectors access the network.
  - o Cloud Connect rollout for ExpressRoute, GCP, AWS:
    - ▪ This is just getting started; light uptake so far.
    - ▪ Internet2 has a strong presence in both Ashburn and Chicago.
    - ▪ Still completing details for similar options in the balance of the country.
  - o Optical network optimization:
    - ▪ Nationwide review of amp settings and padding.
    - ▪ Goal is to bring the existing platform into a more optimal operational alignment. Maximize throw (now able to do upwards of 50% longer) and minimize number of regeneration sites.
  - o Optical shelf, power, and collocation expansions at 4 locations.
  - o Internet2 has been rolling out a DDoS service over the past 12-18 months:
    - ▪ Six members are actively provisioning.
    - ▪ Additional members are in operation.
    - ▪ Starting to see mitigation events.
  - o Router fabric upgraded as needed to support increased port/card density.
  - o Operational support systems restructuring at two sites
    - ▪ Where are the sites hosted?
    - ▪ Are they in hardened sites?
    - ▪ What are they collocated with?
  - o Configuration standardization:
    - ▪ Auditing configurations and services and their identification in the data base.
    - ▪ Confirming/correcting their reports of backbone and edge utilization are accurate.
  - o Eight backbone segments have had capacity augments over next three months.
  - o Security review of the routing platform.
- Ongoing planning activities - focused on the next 12-18 months and independent of network planning:
  - o Cloud/interconnect edge improvements:
    - ▪ These complement the improvements made to the core.
    - ▪ Short term will use some aggregation.
    - ▪ Medium term perhaps RFPs for new interconnect hardware.

- o Performance Assurance Services restructuring/expansion (including cloud extensions)
  - ▪ Aimed at giving better visibility into cloud providers.
  - ▪ May only be used periodically – still TBD.
- o Node slicing/router virtualization:
  - ▪ This may yield smaller boxes where possible to share physically with other members of the community.
  - ▪ Community group investigating.
  - ▪ Aiming for a proof of concept in late summer/early fall.
- o Internet2 has recently started investigating the possibilities infrastructure sharing:
  - • Fiber plants.
  - • Foreign lambdas on common line systems.
- o Facilitation of DTNs and science data flows:
  - ▪ Over the last few months three has been significant discussion on Internet2 supporting them over its network.
  - ▪ It has been a learning curve on how to support beyond just the transport level.
  - ▪ Internet2 is working hard to learn where and how they can be most supportive.
- o Border anti-spoofing effort starting up being led by Internet2's security group
- o MAN LAN & WIX hardware refresh:
  - ▪ Current hardware will be EOL around the end of CY18.
  - ▪ Issuing an RFP for new equipment set
  - ▪ Final decision is still to come but RFP will probably be linked to Internet2's next gen network determinations.
- o Internet2 is spinning up its support for SC18 – wavelengths, etc.
- o It is assessing its collocation sites.
- • Future network planning:
  - o It is intertwined with planning for the current network and with operations - each of which is also discrete.
  - o Internet2 has decided to not look at this as only a hardware refresh but to look at the new network holistically to ensure it will meet the needs of the entire community. To do so, it has broken its future network planning into three sectors, with kickoff meetings in two to three months:
    - ▪ Community service requirements, service definitions, and business model (led by George Loftus).
    - ▪ Infrastructure planning - optical and layer2/3 (led by Chris Wilkinson).
    - ▪ Automations and software planning, member facing services, and internal operations (led by Karl Newell).

Discussion of how networks are handling cyber-security – Rich Carlson

Co-chair Rich Carlson raised the question of whether JETnets are thinking about operational cybersecurity issues, particularly when infrastructure is critical to many organizational activities. Do JETnet organizations deal with their infrastructure security and does a forum for these discussions exist? If not, the JET may be a forum that can be leveraged for these discussions.

Discussion
- • In response, all the JETnet participants on the call (Internet2, ESnet, NOAA, NRL, StarLight, 3ROX, NASA/Ames and NRL) stated they have security groups in place.

- o Internet2 – Paul Howell would be interested in participating.
- o ESnet – Building extensive portfolio now. Building toolkit based on Core flow project to offer as "Security assist" to any site that wants to use it. Can give examples on those capabilities; in sum, robust and extensive set of mechanisms to go into ESnet5 because mechanisms of execution on the back end for the toolkit are easy to change. Can adjust to expand capabilities. We will integrate if high touch edge provides any further capabilities.
- o NOAA: There are several security groups under OCIO office. In order to meet TIC 2.0 mandate, NOAA built its own TICAP stacks, reduced internet access points from hundreds to 5, including Hawaii. If wanted to do a dedicated section, NOAA can get more security oriented folks on.
- o One participant described the Global NREN Security Group, which is comprised of higher level NREN folks as helpful on the international level. It was agreed that collaboration could be beneficial if something was set up.
- Security folks: what campus folks or in-site folks do not provide that a transit provider or network would feel useful? There is much focus on in-host campuses and system but not on the backbone. Here, we are focused on network infrastructure and any support services or servers required maintaining our infrastructure (Covers campus networks, regionals, national backbones, peering points, international partners). Does it make sense to tell a story on how you would like security to work? Are we doing anything in cybersecurity in our area?
- Folks are concerned and interested in infrastructure security. Perhaps separate infrastructure security from security of applications running on top of infrastructure as separate issues.
- Will send out email to JET regarding:
  - o Whether its members are interested in discussing infrastructure security issues at the national level through a separate JET forum or setting aside time during JET meetings.
  - o Identification of any existing forums your organization knows of that currently serves this purpose.
  - o Please note that discussions would not focus on the policy issue of should such security be deployed (outside of JET's scope). JET discussions would be addressing how these functions/services are being deployed, debugged, and integrated into the normal NOC operation.
  - o Report back next month on status and whether would like to move forward.

Discussion on holding summer JET meetings as virtual meetings: Joyce Lee and Paul Love

The question was raised if the July and August meetings should be held as virtual meetings. This arose as recent JET meetings in DC, aside from the newly re-instituted in-person meetings, could have been held virtually as there was no physical attendance outside NCO staff. Prior to the re-instituted in-person meetings, a few individuals came to the NCO's office for a meeting - and only prior to the NCO's move to L'Enfant Plaza. NCO was clear that it is happy to host monthly meetings, but only the designated in-person meetings provide certainty of member attendance.

AI: Are folks planning to drop by during the JET July and August meetings? Otherwise they can be deemed virtual until the September in-person meeting, and the issue revisited at that time.
- After evaluating the e-mail replies to this question the JET meetings will remain with a meeting room at the NCO supported by WebEx and a telephone bridge.

Meetings of Interest Roundtable

June 25-27	NANOG73, Denver, CO
July 14-20	IETF 102, Montreal, Canada
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	e-AGE18, Amman, Jordan

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
	nb: This will be the 2nd DC area Face-to-Face meeting of the JET. The room will be available 11:30-2:30.
October	Oct 16, 12-2 p.m. EDT, NCO/NITRD, Washington, DC