



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

June 18, 2024, 12:00 – 2:00 p.m. ET

This meeting was held virtually

Participants

Basil Decina, NRL

Jonah Keough, Pacific Wave

Michael Lambert, PSC/3ROX/ACCESS

Paul Love, NCO/NITRD

Joe Mambretti, StarLight/MREN

Ralph McEldowney, DREN

Linden Mercer, NRL

Michael Sinatra, ESnet

Nik Sultana, IIT

Bobby Thompson, NIH

Kevin Thompson, NSF

Matt Zekauskas, Internet2

Proceeding: This meeting was chaired by Kevin Thompson (NSF) and Ralph McEldowney (DREN).

I. **Action Items:** (none pending)

II. **Review of the Minutes of the May 2024 meeting:** Corrections were received and are reflected in the final minutes posted on the JET's web page.

II. **The NIH Enterprise Network: Bobby Thompson**

NIH's Enterprise network, hardware in use and TIC deployments were described.

The slides for the presentation are available on the JET's web page at:

<https://www.nitrd.gov/coordination-areas/lsn/jet/jet-meetings-2024/>

III. **Operational Security Round Table**

A. Internet2 (Matt Zekauskas):

- a. Internet2 (I2) had an attack on its DNS infrastructure. I2 was working on moving its DNS to the cloud but hadn't yet. I2 made use of Radware's scrubbing service for all its DNS traffic which resolved the issue. Unclear if I2 was targeted or just a "if it's an .EDU let's see what we can do" sort of thing.

- b. The attack didn't affect I2's backbone nor the network. The attack did affect access to some of I2's trust and identity platforms.

Question: Could you elaborate on the attack?

Answer: Best source would be the NTAC as a Christ Wilkinson sent it a note. I2 did add ROAs to some of address blocks.

Discussion: Though not this year, ESnet has had past experiences with Water Torture attacks where there are lots of inquiries for non-existent names. There

are some pretty good defenses against this sort of attack including using NSEC rather than NSEC3 if you're doing DNSSEC signing as NSEC allows for aggressive negative caching. Also, many DNS servers are tuned with very little TCP capabilities, but they can be tuned the other way which is a big help in this type of attack.

Discussion: Since COVID NIH has had many DDoS attacks and has implemented a variety of things to mitigate. NIH has used Radware and is currently using Arbor with varied results. It's maxed out so NIH security staff are rotating about 10k lines of blocking as the attack change through the week.

It was noted that sometimes a Water Torture attack will use open services such as Google and Cloudflare. If you start blocking those addresses, you can degrade the responses they can provide to their users to access your resources.

Discussion: DREN has also seen DNS Water Torture attacks. Pretty service impacting. It implements some fixes in its F5 hardware which may have helped. The attacks have stopped.

IV. Network roundtable

A. DREN (Ralph McEldowney):

- a. Verizon has used the same routing hardware – Cisco 9900/9000 ASRs – for DREN as NIH is using.

Discussion: NIH seems to be on Cisco's cutting edge on how its backbone is deployed. NIH typically receives Cisco's provider releases which NIH then needs to tune to its enterprise environment.

- b. DREN has two outstanding bugs on the Cisco gear:

- i. IS-IS issue: Cisco thought by increasing the class of service on the IS-IS packets the issue would be resolved. It wasn't resolved so DREN is awaiting the completion of regression testing on a new IOS load. When ready it will be installed on some of DREN's routers to see if the issue is corrected.

- ii. MACsec: DREN runs MACsec hop by hop on its backbone. Sites were getting to a state where packets stopped flowing to them. Cisco recommended enabling the XPN cypher followed by a twelve-hour key update. Things have settled down a lot after this step, but the issue has reoccurred at two sites since the change. Net result: A big help, but not a final resolution.

Discussion: NIH is testing MACsec. It's had to upgrade its ASR 9000 model before it can be deployed. Just four routers remain to be upgraded.

Depending on how the testing goes NIH will deploy in a few locations in the next 30-60 days.

- c. DREN's annual Technical Interchange Meeting is coming up in August at Kirkland AFB. The meeting will be hybrid. It's invitation only.

B. ESnet (Michael Sinatra):

- a. As Matt noted, ESnet is peering at 400G at MAN LAN and WIX.
- b. Most of ESnet's other XP locations will move to 400G when able.

- c. Transatlantic circuits
 - i. ESnet's newest transatlantic link, Boston to London, is in production at 400G. (This may well be on the same cable as I2's Boston<>London circuit.) With this ESnet has 3x400G dedicated waves across the Atlantic.
 - ii. ESnet also has some capacity on the NEA3R links via VLANs. ESnet is working hard to get value from these circuits without hogging them.
 - iii. There is also a circuit direct Boston<>CERN (though passing a good bit of infrastructure along the way). It's been in commission for two or three months.
 - iv. Additionally, ESnet has 400G on the Aqua Comms that goes from New York City to London. It's currently out of service due to preventive maintenance for two to three weeks. (A NEA3R circuit is also affected.)
 - v. These are all part of ESnet upgrading its transatlantic capacity to all 400G circuits.
 - vi. Once all are at 400G, ESnet plans to work on another round to perhaps higher levels.
- d. The migration of ESnet's transit service to L3VPNs is going along pretty well via ESnet's automation tools.
- e. The issues ESnet has had with some Nokia hardware has a very good path to resolution with a combination of hardware and software updates. Accomplished with great help from Nokia.
- C. NRL (Linden Mercer):
 - a. NRL is working on getting demos and experiments ready for SC24 in Atlanta, GA, in November.
 - b. Helping with the planning is the great bandwidth at the Joint Big Data Testbed (JBDT) in McLean, VA. The bandwidth is through NRL and NASA/GSFC working with Joe Mambretti (StarLight) and MAX. Ciena has worked closely to upgrade some infrastructure. The JBDT is anticipating FABRIC capacity as well in the near future.
- D. Pacific Wave (Jonah Keough):
 - a. Nothing new this month on plans for SC, 400G upgrades and integrating Pacific Wave's new hardware into its automation tools.
 - b. Conversations continue with folks in Fairbanks on the location of Pacific Wave hardware there, also with NOAA on some potential sharing. Pacific Wave is exploring all the options. The project remains on track for fall.
- E. PSC/3ROX/ACCESS (Michael Lambert): No report for today.

V. Exchange Points Round Table

- A. WIX, MAN LAN & Boston (Matt Zekauskas)
 - a. All three have new Arista switches that are 400G capable
 - b. The new 400G transatlantic link from Boston to London is in and up.
 - c. ESnet's connections have been upgraded to 400G.
 - d. The existing transatlantic link from WIX is being decommissioned.
- B. PNWGP (Jonah Keough): No update today.

C. StarLight (Joe Mambretti):

- a. The workshop last month during TNC on large-scale scientific computing was a success. It discussed and explored the networks that are evolving with the growth at the LHC, the development of the SKA's Verira Rubin Observatory and some future large scientific instruments around the world where large amounts of data need to be shared with researchers worldwide. The exchange of architectures and technologies were very useful.
- b. The agenda for the Fifth Global Research Platform Workshop (5GRP) is developing nicely. The 5GRP will be held in conjunction with IEEE's eScience meeting in Osaka, Japan, in September.
- c. Preparations for StarLight's (SL) participation at SC24 continue for the demonstrations and experiments SL is involved in or coordinating. The current focus is on the infrastructure:
 - i. With upgrades the 1.2 T between SL and the Joint Big Data Testbed (JBDT) in McLean, VA, will this year be over 2x600G waves.
 - ii. Also provisioned will be 1.2T from FABRIC/ESnet6: three cross connects in SL and three at the JBDT. At each location there will be 3x400G gen5 DTNs making use of SmartNICs.
 - iii. Circuits to the SC show floor there will also include 1.2T each from the JBDT and SL.
 - iv. SL is working with ESnet to extend ESnet's Test Bed to Atlanta through Sunnyvale. This will support an interesting set of experiments.
- d. This year SCinet is expecting 34 Network Research Exhibits (NRE) submissions. SL is involved, in a variety of ways, with 22:
 - i. Demonstrating the use of scitags. These are used to identify scientific flows facilitating analytics on the flows. ESnet's Yatish Kumar will be using the High Touch system for the measurements.
 - ii. AutoGOLE/SENSE will also be demonstrated.
 - iii. SciStream, a joint project with ANL, will be shown. SciStream uses in-net processors for flow control.
 - iv. A gamma ray analytics project from ESnet also will be using in-net processors for pipelining.

Meetings of Interest 2024

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| Jul 20-26 | IETF 120 , Vancouver, B.C. Canada |
| Jul 21-27 | PEARC24 , Providence, RI |
| Aug 9 | AINTEC 2024 , Sydney, Australia |
| Aug 26-30 | APAN58 , Islamabad, Pakistan |
| Aug 27-28 | DREN TIM , Albuquerque, NM. |
| Aug 30 – Sep 6 | APNIC 58 , Wellington, New Zealand |
| Sep 16-19 | Fifth Global Research Platform Workshop at IEEE eScience , Osaka, Japan |
| Sep 17-19 | The Quilt Fall Meeting , Hartford, CT |
| Oct 9-10 | CANARIE Summit , Ottawa, Canada |
| Oct 21-23 | NANOG 92 , Toronto, ON Canada |

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| Oct 24-25 | ARIN 54 , Toronto, ON Canada |
| Oct 28 – Nov 1 | RIPE 89 , Prague, Czech Republic |
| Nov 2-8 | IETF 121 , Dublin, Ireland |
| Nov 17-22 | SC24 , Atlanta, GA |
| Dec 9-12 | Internet2 Technology Exchange , Boston, MA |
| Feb 3-5, 2024 | NANOG 93 , Atlanta, GA |
| Feb 3-6, 2024 | The Quilt Winter Meeting , Tempe AZ |
| Feb 2024 | APAN59 , Japan |
| Mar 15-21, 2024 | IETF 122 , Bangkok, Thailand |

Next JET meetings

Note: It is anticipated that most JET meetings will remain virtual for the foreseeable future

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| Jul 16, 2024 | 12-2 p.m. ET |
| Aug 20, 2024 | 12-2 p.m. ET |
| Sep 17, 2024 | 12-2 p.m. ET |