



## 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

February 16, 2021 12:00-2:00 p.m. ET

This meeting was held virtually

### **Participants**

Shawn Armstrong, University of Alaska  
Nick Buraglio, ESnet  
Rich Carlson, DOE/SC  
Tom Carey, NOAA  
James Deaton, GPN  
Basil Decina, NRL  
Dave Diller, MAX  
JJ Jamison, Juniper  
Ann Keane, NOAA

Jonah Keough, PNWGP/Pacific Wave  
Michael Lambert, PSC/3ROX  
Paul Love, NCO/NITRD  
Joe Mambretti, StarLight/MREN  
Linden Mercer, NRL  
Rob Sears, NOAA  
Dan Taylor, Internet2  
George Uhl, NASA/GSFC

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

### **I. Action Items:**

- Report back from LSN re: topics for the JET to brief to the LSN
- Internet2 and ESnet updates on their respective new networks.

II. **Review of the Minutes** of the January 2021 meeting: Corrections were received and will be reflected in the posted minutes. (*n.b.:* They were.)

### **III. 2) Update on N-Wave's planning to support NOAA sites in Alaska – Rob Sears**

*For reference, the slides for this talk are online at:*

<https://www.nitrd.gov/nitrdgroups/images/8/83/JET-Rob-Sears-02162021.pdf>

- A. Background: NOAA has sites over much of Alaska from Dutch Harbor in the Aleutian Islands, to Metlakatla in the panhandle to Utqiagvik (Barrow) on the Arctic Ocean and to islands in the Bering Sea. Historically each of NOAA's six line offices (LO) have taken care of their networking needs by various means including microwave and communication satellites. N-Wave is working to build infrastructure within Alaska, build PoPs and connect Alaska with N-Wave's core via Seattle, WA, to provide a service that can be shared. N-Wave is concurrently looking at ways to keep intrastate traffic within the state.
- B. Past N-Wave activities:
  - a. In 2014-2015 NOAA's satellite LO worked with N-Wave to provide network services from its major Alaskan downlink site at Gilmore Creek (GC) (outside

Fairbanks) via a 1G path to the N-Wave core node in the Westin Building in Seattle, WA.

- b. In 2018 N-Wave brought up a 10meg link from Utqiagvik to GC. This was over a submarine cable which runs from Nome around to Prudhoe Bay/Deadhorse and then south to Fairbanks and supports the satellite group and the atmospheric observations done at NOAA's Barrow Observatory. The service was subsequently upgraded to 20 Mbps.
- C. N-Wave's current projects:
- a. Operationally several new groups are looking to leverage the satellite downlink infrastructure in place at GC. The NOAA Fisheries service has also recently requested N-Wave to provide networking for many of its sites in Alaska. The anticipated growth at GC along with the Fisheries request has enabled N-Wave to look at new architectures that will be able to support multiple LOs and locations throughout the state.
  - b. The nearly resolved architecture centers around two PoP sites, one in Anchorage the other in Fairbanks. 1-2G circuits will connect each to the N-Wave core in CONUS. Another 1-2 G circuit will connect Fairbanks with Anchorage with full diversity from the Fairbanks<>Seattle circuit. Most end sites will connect to one or both PoPs.
  - c. The circuit from Utqiagvik will be rehomed from GC to the new Fairbanks PoP. GC will also connect using the existing 1G circuit and diverse 1G microwave backup.
  - d. NOAA's Dallas, TX, multi-agency TIC is being repurposed and moved to the Anchorage PoP. This will be a great benefit for NOAA and other user agencies in keeping instate traffic within Alaska whether agency<>commercial or inter-agency.
- D. Questions/discussion:
- a. What are the timelines? The first round with the Fisheries Service will be complete this FY. This will include much of the WAN pieces. Still working out circuit costs for much of the rest. Until those are in N-Wave won't be able to develop timelines for the remaining pieces.
  - b. For remote sites would LEO satellites be acceptable from a technical, fiscal or political point-of-view? N-Wave has had some discussions with Alaskan providers on this. Many sites in the state would benefit from LEO broadband. Also for NOAA's ships when in coastal waters as LEOs could provide significantly more bandwidth than the VSATs now use for underway connectivity. For more operational sites, such as the Weather Service, LEOs could be a good backup.
  - c. The University of Alaska (UoA) would be interested peering with N-Wave when the TIC is in place. UoA is glad to see what's coming together. It'd be happy to lean a hand by providing hands & eyes.
  - d. Any plans to connect with the existing instate exchange, Hnix, located near Delta Junction? Once the foundation is in place N-Wave can grow where it makes sense to peer. Since N-Wave is a multi-agency provider and its TICs are approved for multiagency use it can go where a mission's needs take it.

#### IV. Discussion of the JET's tasking on tools to help with inter-domain issues – James Deaton, all

- A. Prototype/pilot: The various pilots are progressing. Working to get basic measurement from different universities and RONS.
  - a. Working with AmLight to finish one more location.
  - b. Working with OSHEAN whose data is collected by the Global NOC to finalize what to filter and what to provide.
  - c. NCSA is progressing on the use of the plug-in of project's Telegraf container - hopeful to finish an iteration in next two weeks.

#### B. Update Regarding The Quilt:

At last week's Winter Quilt meeting the project updated the regionals on the project – its status, etc. This reinvigorated interest from regional networks to participate. There was interest in developing a live Quilt map based on the collected data and the Global NOC's Global Research Map.

#### C. Background on efforts lead by Eric Boyd, Joe Breen, James Deaton, Dan Doyle, and Karl Newell:

- a. The project gets basic SNMP metrics from groups around the country that are willing to share for trouble shooting and research. Metrics include link utilization, discards and errors. These are collected hop by hop as the path crosses multiple domains.
- b. Several prototypes are going along with the drafting a basic letter of intent for those wishing to participate.
- c. Tools: Telegraf container as an option for local collection. Nearly ready for production use.
- d. Tracking sheet of networks willing to share data. Please update your network's entry. See:  
[https://docs.google.com/spreadsheets/d/1pMW\\_PNVpeT42nAxa3bW4QostMxcHTXkWSPbZOpIFwE/edit#gid=0](https://docs.google.com/spreadsheets/d/1pMW_PNVpeT42nAxa3bW4QostMxcHTXkWSPbZOpIFwE/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/1-LRyiril6u4AvBeY6NlvYYalNRpjByA>
- e. The Internet2 Performance Working Group Community Measurement, Metrics, and Telemetry project holds meetings on the second Tuesday for those participating or interested. If you are interested, please contact Joe:  
[Joe Breen <Joe.Breen@utah.edu>](mailto:Joe.Breen@utah.edu)
- f. While NASA polices preclude EOS from sharing this data, EOS has an internal perfSONAR (pS) mesh. They are happy to open their firewalls to permit pS testing by prior arrangement. Contact George at:  
["Uhl, George D." <george.d.uhl@nasa.gov>](mailto:Uhl, George D. <george.d.uhl@nasa.gov>)

#### V. Operational network security roundtable

- A. 3ROX (Michael Lambert): Andrew Gallo (GW University and CAAREN) is the co-chair for the MANRS Advisory Council this year.

## VI. Network roundtable

- A. ESnet (Nick Buraglio):
  - a. ESnet is rolling out the platform for ESnet6.
  - b. There is a lot of effort with automation and finishing up its automated deployment strategy.
  - c. Optical deployment has completed.
  - d. Work on traffic engineering continues.
  - e. IPv6 only management network:
    - i. Overall this is looking pretty good
    - ii. A couple of small exceptions to pure IPv6 are being addressed by the vendors
    - iii. The ease of getting this up is partly the result of ESnet being dual stacked since 1999
    - iv. Its monitoring has been done over v6 for long time.
  - f. ESnet is developing the documentation compliant with OMB's revised IPv6 [only] policy. These will incorporate what ESnet has already done and what it may need to revisit. It is also matching the memo's milestones with dates and what these dates entail for migrations. Being a transport network with two small datacenters it has many fewer end devices to deal with than many organizations.
- B. GPN (James Deaton): No updates today.
- C. NASA GSFC (George Uhl): No update today.
- D. NOAA (Ann Keane): No update today.
- E. NRL (Linden Mercer): Nothing to report today.
- F. Pacific Wave (Jonah Keough):
  - a. Pacific Wave (PW) is discussing interconnection options for FABRIC Across Borders, FABRIC's international effort, for both of its West Coast sites, Seattle, WA, and UC San Diego.
  - b. PW is also preparing to upgrade its West Coast optical to Ciena's WaveLogic 5.
  - c. PW is starting the evaluation of route server software.
- G. 3ROX (Michael Lambert):
  - a. 3ROX: No update.
  - b. PSC has turned up its Bridges-2 supercomputer.
  - c. XSEDE continues the process of connecting the Massachusetts Green High Performance Computing Center to XSEDE's L3VPN.
- H. University of Alaska (Shawn Armstrong): No update today.

## VII. Exchange Points Round Table

- A. MAX (Dave Diller): MAX has started exploring options for 400G for both its optical and packet layers.
- B. StarLight (Joe Mambretti):
  - a. StarLight's (SL) discussions with GÉANT to connect their P4 testbeds has been successful and the two are actively working to complete.

- b. SL continues to work with the international AutoGOLE/SENSE consortium to develop a global multi-point testbed. New participants include Singapore, Guam, Hawaii, Copenhagen and KAUST.
  - c. SL is working with CERN on its new NOTED project. NOTED is being done in anticipation of large scale data transfers. The project will attempt to forecast when the flows will happen and dynamical setup the needed circuits. The proof-of-concept is being setup as point-to-point and will involve Machine Learning. NOTED maybe showcased at SC21.
  - d. SL continues to support the FNAL integration project of the Rucio data manager, FNAL's Big Data Express and DOE's SENSE data orchestrator.
  - e. SL's FABRIC rack has arrived and is in place. SL is awaiting the FABRIC team's turning it up.
  - f. SL continues to work with Internet2 (I2) on I2's new optical backbone. I2 had an engineering team onsite for a week. SL is finishing the last details.
  - g. SL is planning for several Network Research Experiments tied to SC21. SL is anticipating that several 400Gs and DTNs along with some innovative software stacks will be involved.
  - h. SL is planning for the Asia-Pacific Research Platform Workshop, collocated with Supercomputing Asia 2021, in March as well as the Global Research Platform meeting in September.
- C. PNWGP (Jonah Keough): Nothing for today.

#### IX. LSN update – Rich Carlson

The discussion on which topic the JET might brief the LSN's federal members on was picked up. The brief would be done by somebody working on the project, rather than the JET's chairs or coordinator. Last month four topics were identified:

- FABRIC & FAB
- The JET's tasking on tools to help with inter-domain issues lead by the team from Internet2's Performance WG
- ESnet 6
- Internet 2's NGI

Another possible topic would be the brief the JET just had on NOAA's plans for networking in Alaska.

While the five are all of interest, the project on automating inter-domain issue resolution seemed most interesting to the federal program managers who comprise the LSN and would probably have the widest interest. The LSN has been hearing about measurement in the commercial area, the research area would be a nice complement. There being no objections the JET will put forward the measurement topic at the next LSN (Tuesday, March 9, 2021).

Question: Would the JET be interested in hearing from the LSN's Broadband team on measurements in the commercial area? Very much. Rich Carlson will discuss with Broadband on how and when to arrange.

Action Item: Report back from LSN re: topics for the JET to brief to the LSN

### **Meetings of Interest 2020**

*Note: Meetings cancelled since the February JET have been removed from this list. Those moved to a virtual format have been updated.*

Feb 17-18	<a href="#">HIC</a> , virtual
Mar 2-4	<a href="#">Supercomputing Asia 2021 (SCA21)</a> , virtual
Mar 3 (afternoon)	<a href="#">Asia-Pacific Research Platform Workshop</a> , virtual (collocated with SCA21)
Mar 8-12	<a href="#">IETF 110</a> , virtual
Apr 11-14	<a href="#">ARIN 47</a> , in person cancelled, moved to a virtual meeting
Jun 14-16	<a href="#">NANOG 82</a> , in person cancelled, moved to a virtual meeting
Jun 21-25	<a href="#">TNC21</a> , hybrid cancelled, moved to a virtual meeting
Jul 24-30	<a href="#">IETF 111</a> , San Francisco, CA
Aug/Sep	<a href="#">APAN52</a> , Indonesia
Sep 20-21	<a href="#">The 2nd Global Research Platform (2GRP) Workshop</a> , Innsbruck, Austria

### **Next JET meetings**

*Note: It is anticipated that many of the JET's meetings in CY2021 will be virtual due to COVID-19 guidelines.*

Mar 16, 2021	12-2 p.m. ET
Apr 20, 2021	12-2 p.m. ET
May 18, 2021	12-2 p.m. ET