



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 15, 2021 12:00-2:00 p.m. ET

This meeting was held virtually

Participants

Shawn Armstrong, University of Alaska
Joe Breen, UTEN/University of Utah
Rich Carlson, DOE/SC
Bobby Cates, NASA/Ames
Eli Dart, ESnet
Basil Decina, NRL
Phil Dykstra, DREN
Bill Fink, NASA/GSFC
JJ Jamison, consultant
Jonah Keough, PNWGP/Pacific Wave
Michael Lambert, PSC/3ROX
Paul Lang, NASA/GSFC

Paul Love, NCO/NITRD
Joe Mambretti, StarLight/MREN
Linden Mercer, NRL
Heidi Morgan, ISI
Edward Moynihan, Indiana University
Aruna Muppalla, NASA/GSFC
Per Pedersen, NOAA
Jennifer Schopf, Indiana University
Pat Smith, NSF
Kevin Thompson, NSF
George Uhl, NASA/GSFC

Proceeding: This meeting was chaired by Rich Carlson (DOE/SC) and Kevin Thompson (NSF).

I. Action Items:

- Internet2 and ESnet updates on their respective new networks.

II. Review of the Minutes of the May 2021 meeting: No corrections were received.

III. Description of NSF's Antarctic Subsea Cable Workshop – Pat Smith

- A. This workshop is to explore a possible submarine cable from McMurdo Station to New Zealand.
 - a. Able to tie into REANNZ and/or AARnet, then onward to international R&E networks.
- B. Driver is the need for more bandwidth to support science.
 - a. Reviews of NSF's support for the last five years have all be very good except for the need for more bandwidth.
- C. An option being explored is to instrument the cable – to make it a SMART cable as is being planned for the 75km Funchal branch of the Ella-Link cable - thereby getting a lot more benefit for a relative small delta in cost.
- D. Question: What is the timeline
 - a. Six months to a year for an updated feasibility study
 - b. Once construction starts estimated three years to complete.

IV. Trans-Pacific R&E connectivity: The Asia Pacific Oceania Networking Collaboration (APONet) – Jennifer Schopf

Note: The slides for this talk are posted on the JET's web page at:

<https://www.nitrd.gov/nitrdgroups/images/2021/JET-Jennifer-Schopf-06112021.pdf>

- A. Before APONet several organizations formed the Asia Pacific Ring (APR)
 - a. MOU signed in December 2017:
 - i. Internet2, NICT, NII, Pacific Wave, SingAREN, TransPAC and WIDE
 - b. Primary goals:
 - i. Coordinate new capacity
 - ii. Handle backups – both planned and otherwise.
- B. A new agreement was found to be needed due to:
 - a. Explosive growth in instruments, sensors and high resolution imagery all driving the growth in experimental data.
 - b. Multidisciplinary teams of experts spread around the world.
 - c. Each member of the new collaboration contributes specific resources that coordinated together create a resilient, high speed services delivery network spanning the Pacific.
 - d. The existing seven APR members were joined by AARnet, KISTI, REANNZ and the University of Hawaii.
 - e. The APONet MOU will be signed tomorrow, 16 June 2021.
- C. Planned activities to maximize resiliency:
 - a. Build multiple paths between the participating R&E networks.
 - b. Backup traffic will be handled on a best effort basis.
 - c. The planned backup design will increase the overall robustness as it allows for cable cuts from a variety of reasons including earthquakes, fishing trawlers, etc.
 - d. Regular coordination meetings for both engineering and policy.
 - e. A Coordinator selected annual.
- D. Other planned activities:
 - a. APONet will also work to support network research and services by cooperatively developing and deploying emerging network technologies and services.
 - b. To support application development APONet plans to:
 - i. Encourage application developments that are aimed at using the new trans-Pacific infrastructure including those with high bandwidth requirements
 - ii. Troubleshoot connectivity issues end-to-end
 - iii. Make available the full bandwidth for application experimentation.
 - c. APONet plans to develop and support shared routing practices between its members to develop preferred route identification and its use.
 - d. APONet will also support sharing of measurement data – SNMP, streaming telemetry or ammonized flow data. See:
<https://aponet.netsage.global>
- E. Asiapacific-Europe Ring (AER): R&E networking between Asia and Europe
 - a. AER is a ring London<>Amsterdam<>Tokyo-Hong Kong<>Singapore<>London planned as a 15 year, 100G Asia-Europe backbone

- b. Its circuits are provided by NORDUnet/Surf, SINET/NII, NICT/SingAREN, and the CAE-1 Consortium
- c. The King Abdullah University of Science and Technology (KAUST) has established a 100G ring between Netherlight/SURF in Amsterdam, KAUST in Thuwal and SOX/SingAREN in Singapore with 15 year IRUs on diverse providers. There are discussions on KAUST joining the CAE-1 Consortium (Singapore<>London).
- d. With AER the expectation is that the bulk of traffic between Europe and Asia will travel over CAE/AER. This is not yet the case (see section D.c. above). GNA-G has a routing WG working to address these issues (and other suboptimal routing between international R&E networks). To be added to its mailing list (routing-wg@gnag.net) send a request to be added to:
[Hans Addleman <addlema@iu.edu>](mailto:Hans.Addleman@iu.edu)

V. Discussion of the JET's tasking on tools to help with inter-domain issues – Joe Breen, all

This is a community project to collect shared data from all who are willing to share.

- A. Prototype/pilot: The various pilots continue to progress. Work continues to get basic measurement data from different universities and RONS.
 - a. Discussions with C-Light reached a successful conclusion. This project has been finalized and the results are being put up on the regional map.
 - b. Work continues in moving data to the Internet2 Performance Working Group's web site and a Google shared drive from personal drives. This will make the data more widely available and accessible.
 - c. Majority of work done for UETN's sharing of data as it has over 50 devices streaming data. Issues remain to be resolved on exporting the data.
 - d. Work continues with The Quilt on overall maps of R&E networks.
- B. 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 of 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
 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/1L-Ryri6u4AvBeY6NlvYYaINRpiByA>

- 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. General information about this project can be found at:
<https://spaces.at.internet2.edu/display/PerformanceWG/Internet2+Community+Measurement%2C+Metrics+and+Telemetry+Project>
- g. 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:George.D.Uhl@nasa.gov)

VI. **Operational network security roundtable** No updates were received.

VII. **Network roundtable**

- A. DREN (Phil Dykstra): The contract for DREN 4 has been awarded to Verizon (CenturyLink/Lumen has the current contract). The target for the transition to be completed is December 2022.
- B. Internet2 (Chris Wilkinson):
 - a. Internet2 (I2) continues testing the packet platform.
 - b. A month into the shimming in of the new hardware. There were a few hiccups at the start but nothing major.
 - c. The new backbone is up:
 - i. A few segments will need to be moved to the proper path
 - ii. Testing shows the expected results.
 - d. Edge services are due in August.
- C. International Networks – Indiana University (Ed Moynihan):
 - a. NEA³R is stable. Work continues on the measurement infrastructure and peering.
 - b. The Arctic Connect submarine cable planning has had a hiccup – perhaps of a geopolitical in nature.
 - c. IN/IU will hold a BOF during July’s TNC21.
- D. NASA GSFC (Bill Fink): No update today.
- E. NRL (Linden Mercer): NRL continues to work on plans for SC21 with GSFC and StarLight. Its plans for connectivity include several options pending resolution of what circuits will be available.
- F. Pacific Wave (Jonah Keough):
 - a. Pacific Wave (PW) is working on demos for SC21.
 - b. PW has updated its routing policies.
 - c. PW is testing its new flow monitoring tools. These are based on IGROK from UCSD’s Calit2.
- G. PSC/3ROC/XSEDE (Michael Lambert): No updates this month.

VIII. Exchange Points Round Table

- A. StarLight (Joe Mambretti):
- a. With the SCinet WAN team, StarLight (SL) is preparing for SC21 in November with its own demos and those with partners such as NRL, GSFC and CERN.
 - i. It's anticipating 1.2 TB will be available between SL and SC21
 - ii. With NRL and GSFC, SL is working on a 800G testbed between McLean, VA, SL & SC
 - iii. SL hopes to have a 400G circuit from SC to UCSD.
 - b. The p4 testbeds of GÉANT and SL have been integrated.
 - c. SL continues to assist in the design of the Data Mover Challenge testbed that will be used in the run-up to next spring's Supercomputing Asia.
 - d. SL continues its work with the international AutoGOLE/SENSE consortium on a global multi-point testbed.
 - e. SL continues working on CERN's NOTED project – the use ML do just-in-time circuit provisioning in anticipation large flows of experimental data.
- B. Ames (Bobby Cates): Nothing significant since last month.
- C. PNWGP (Jonah Keough): No updates today.

Meetings of Interest 2020

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

Jun 14-16	NANOG 82 , virtual meeting
Jun 21-25	TNC21 , virtual meeting
Jul 24-30	IETF 111 , virtual meeting
Aug 2-6	APAN52 , moved to a virtual meeting a
Sep 20-24	The 2nd Global Research Platform (2GRP) Workshop , virtual meeting
Sep 28-30	The Quilt Fall Members Meeting , virtual meeting
Nov 1-3	NANOG 83 , Minneapolis, MN
Nov 4-5	ARIN 48 , Minneapolis, MN
Nov 6-12	IETF 112 , Madrid, Spain
Nov 14-19	SC21 , St. Louis, MO. Anticipated to be a hybrid meeting
Jan 16-19, 2022	PTC'22 , Honolulu, HI

Next JET meetings

Note: It is anticipated that JET meetings will remain virtual for the foreseeable future. The possible exception will be the November meeting if SC21 remains a hybrid conference.

Jul 20, 2021	12-2 p.m. ET
Aug 17, 2021	12-2 p.m. ET
Sep 21, 2021	12-2 p.m. ET