



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

September 21, 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

Nick Buraglio, ESnet

Todd Butler, NASA/GSFC

Bobby Cates, NASA/Ames

Rich Carlson, DOE/SC

Dave Diller, MAX

Martin Doczkat, FCC

Yang Guo, NIST

Mallory Hicks, NCO/NITRD

Ann Keane, NOAA/N-Wave

Jonah Keough, PNWGP/Pacific Wave

Michael Lambert, PSC/3ROX

Joyce Lee, NSF

Paul Love, NCO/NITRD

Linden Mercer, NRL

Tim Moyer, NTIA

Aruna Muppalla, NASA/GSFC

Jason Schuette, DARPA

Christian Todorov, Internet2

George Uhl, NASA/GSFC/ESDIS

Chris Wilkinson, Internet2

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

I. Action Items:

- Internet2 and ESnet updates on their respective new networks.
- Send the possible tasking items to the JET list prior to the October meeting.

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

III. Brief on NTIA's Indicators of Broadband Need map – Tim Moyer

For reference, information can be found at:

<https://broadbandusa.ntia.doc.gov/resources/data-and-mapping>

The direct link for the map is:

<https://broadbandusa.maps.arcgis.com/apps/webappviewer/index.html?id=ba2dcd585f5e43cba41b7c1ebf2a43d0>

The speaker demonstrated the use of the Indicators of Broadband Need map (IBN) while describing its features.

- A. The IBN was created by National Telecommunications and Information Administration (NTIA) as its first publicly available map of the status of broadband in the US. It uses variety of public and proprietary sources to show information on broadband availability within the United States. It is built on a commercially available product from ESRI.
- B. Layers in the map were created using data from several sources. Some of the underlying aggregated data can also be pulled up however some is proprietary and can't be.

- a. The American Community Survey collected by the U.S. Census.
 - b. Ookla (aka Speedtest).
 - c. The Measurement Lab (M-Lab).
 - d. Microsoft (anonymized data from what Microsoft observes when software updates are downloaded).
 - e. The Federal Communications Commission (FCC).
- C. There are also layers in the map that display:
- a. The locations of higher education institutions eligible as Minority Serving Institutions (MSIs) under NTIA's Connecting Minority Communities grant program.
 - b. Areas designated as American Indian, Alaska Native and Native Hawaiian Areas by the U.S. Census in 2020.
- D. Some of the indicators of the data of Broadband Need data is at the county level, some at the census tract level and some at the census block level. The county, census tract and census block level data used in the map can also be downloaded.
- E. Regardless of the sources of the data being displayed, the color coding remains the same: Red for need, green for no need and gray for no data (for the data sets being shown). As additional datasets are displayed the colors are combined as a summing of the data.
- F. A user can toggle on or off each of the layers of Needs data from one to all. Other options let the user change the underlying base map or MSI type.
- G. The option to combine reported and measured data with data on poverty can make clear the digital divide. It shows infrastructure and its lack and also if people are using what's available to them.
- H. The IBN maps can provide views from the national level down to the county level. If the data supports on down to the census tract and block levels.
- I. Users are able to download the aggregated data.
- J. NTIA recently bought broadband pricing data back to 2016. The next iteration of the IBN map will have that data accessible to the resolution available
- K. Questions:
- a. Are all the US territories covered? Yes. But the results are only as good as the data and some areas are sparse.
 - b. Are there tools to look at other speed ranges other than the FCC's current 25/3 mbps? This is NTIA's first tool. Others will be coming which will support changing definitions.
 - c. Besides the ISP reported data to the FCC, does the IBN reflect data measured by some states? There are 37 states that partner with NTIA including some that do their own on the ground measurements. This is reflected in the National Broadband Availability Map (NBAM) map but isn't in the IBN map as it's considered to be proprietary.
- L. Question to Tim: What questions would you like help answering?
- a. NTIA's big challenge is finding out where broadband isn't. The crowd sourcing data helps but there is still the question if broadband is affordable in an area and

folks are using it or not. The FCC is working towards a new data collection met which looks interesting.

- b. Does NTIA have school district information? Some districts are doing analysis on how well they are reaching out to their communities. Is there data these districts could mine? NTIA has some school district data but Tim said he'd have to dig a bit to see how robust it is. He'd welcome suggestions and contacts to point NTIA to he'd be happy to follow up.
- c. Is there a level that talks to the level of education? NTIA will soon be publishing its Community Report (CR). The CR combines broadband with data about the community – education, ethnicity, etc.

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

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

The related, live map is at: <https://www.globalresearchmap.org/>

- A. Prototype/pilot: The various pilots continue to progress. Work continues to get basic measurement data from different universities and RONS.
 - a. FRGP is providing additional data. The project is working on building the topology to reflect.
 - b. Additional routers from UETN have been added.
 - c. After discussions with LEARN their data is being added and their topology is being built.
 - d. Merit's data is now being made available. The topology is being developed.
 - e. The project is working to start discussions with Sun Corridor in AZ.
 - f. GÉANT has provided some additional locations that can be queried.
 - g. Red Clara's data is now visible:
 - i. Red Clara has a good amount of overlay with AmPath. Red Clara's unique circuits are the ones currently shown.
 - h. There are discussions with Brazil and some Brazilian states who have agreed to provide their data. It'll be coming online over the next few months.
 - i. After discussions with TENET, it has agreed to make its data available. That will become visible after its topology is built.
- 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
 Templates for campus, regional and national networks setting out what data is desired can be found at:
 Campus template: (for a Science DMZ or research segment)
https://docs.google.com/spreadsheets/d/1v7iFw8_YoMpa3wjpgwcmIzgy0QsTi1bHb4Qk1cV6qfAM/edit#gid=1161461998
 Regional template:
<https://docs.google.com/spreadsheets/d/1ElqYiLTLn-Q07doDzHb5vtUCUosFLNbNSgiumm145d4/edit#gid=0>
 National backbone template
https://docs.google.com/spreadsheets/d/14CQi67LjJ_hlnrjL8WpTbHmQSW112zzvKPBp6fx8Gw/edit#gid=0
- 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 policies preclude EOS from sharing this data, EOS has an internal perFONAR (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)

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

VI. **Network roundtable**

- A. ESnet (Nick Buraglio): ESnet has been doing a lot of decommissioning of old gear. There has also been a significant number of peer migrations to the new backbone. Work is underway for the plan to migrate the routed network to VRFs.
 ESnet has just published internally to the IPT and to the relevant personnel in DOE the implementation plan for the OMB IPv6 only requirement – version 1.0. The plan is due the end of the month. ESnet has also published the ESnet6 management network as one of the required pilot network.
- B. Internet2 (Christian Todorov):
 - a. NGI progress:
 - i. Internet2 (I2) is about two thirds of the way through its IP migration to the new infrastructure. Progressing reasonably well – a few bumps.
 - ii. The target is to have the translon to its NGI by year's end with the remaining decommissioning to follow.

- iii. I2 is already doing some decommissioning. The intent is to have most done by the time the translon is completed with the rest to follow.
 - b. To be sure all are aware, I2 is planning on deprecating ASMC. It will continue to support SSMC using GRE tunnels.
 - i. Dave Diller added that when he migrated to the new infrastructure his multicast was cut off and nobody noticed.
 - ii. Michael Lambert added that once multicast is re-enabled he intends to turn on at the edge but not in the GigaPOP unless that is requested.
- C. NASA ESDIS (George Uhl): No update for today.
- D. NOAA (Ann Keene):
 - a. N-Wave has finished deploying its 1 GE backbone ring Seattle<>Anchorage<>Fairbanks<>Seattle.
 - b. N-Wave is in process of installing a POP at NASA/GSFC. It is expected to be turned up in mid-October.
- E. NRL (Linden Mercer): NRL continues to prepare for its demos at SC21 and the related circuits. Despite the uncertainty over the final form of SC21 NRL is planning on accomplishing a lot with the resources available. NRL is working with GSFC & StarLight and leveraging ESnet and the ESnet test bed.
- F. Pacific Wave (Jonah Keough):
 - a. Pacific Wave (PW) is working on supporting demos for SC21. These will be virtual – this has the nice side benefit of working with permanent infrastructure. PW is turning up some additional capacity across PW to support the demos.
 - b. PW is starting to see additional data from performance measurement and monitoring IGROK tools from collaboration with UC San Diego.
 - c. Its west coast optical systems upgrade is continuing. The Cisco portion in Southern CA is basically complete. They are awaiting some pieces for the Ciena portion with the goal of wrapping up by year’s end.
- G. PSC/3ROC/XSEDE (Michael Lambert): No updates this month.
- H. University of Alaska (Shawn Armstrong): Not a whole lot of active changes. The University of Alaska (UAK) is getting ready for an RFP to go out for the next round of services both intra- and inter-state. Goal is to have the new services in place by Q2 of 2022.
- I. University of Utah/UETN (Joe Breen): The University of Utah and UETN are continuing to roll out new hardware as it arrives. It’s arriving slowly so the optical upgrades to 100G and 400G is impacted.

VII. Exchange Points Round Table

- A. WIX/ML (Christian Todorov and Chris Wilkinson): I2 is reviewing some software integrations for MAN LAN and WIX – OESS and potential integration of NSI. This is in support of community initiatives and FABRIC. Once the internal review is completed the plan is carefully get a more robust automated support model for provisioning across both ML and WIX. This is proceeding as resources permit as most of I2 is focusing all needed staff on the rollout of its NGI

- a. MAN LAN (ML): I2 is planning on moving ML within 32 Avenue of the Americas in the next few weeks. The exact date isn't set.
 - b. WIX: During the past month there was a successful technology migration at WIX.
- B. MAX (Dave Diller):
- a. Final procurement PO for MAX's new gear was issued last week. The equipment selected was Cisco and Ciena.
 - b. For the Cisco equipment MAX will be using 2 platforms; one for the core, the other for the edge. These are slightly update versions of what I2 has deployed. For the core it is the 8201-32FH with 400G links. For the edge MAX has selected Cisco's NCS 5501-SE with deep packet buffer and fib and with uplinks of 100G.
 - c. For the optical platform MAX will be using Ciena 6500 with either seven slots (edge locations) or 14 slots (or core locations) with Waveserver AIs and 5s depending on the need for native 400Gs in the core and 100G at the edges.
 - d. MAX's lambda count will be drastically reduced with Layer 3 at every POP.
 - e. The Cisco gear is expected to start arriving in six weeks. For Ciena MAX doesn't yet have delivery dates. Therefore the upgrade will run well into next year.
- C. StarLight (Joe Mambretti via email):
- a. With its national and international partners the StarLight (SL) consortium is preparing for the Global Research Platform Workshop (co-located with eScience) the week of September 20.
 - b. The SL community is also organizing the Americas Research Platform Workshop scheduled for Sept 24.
 - c. Another major activity is planning for SC21:
 - i. SCinet is working with SL to design and implement a national WAN testbed that will support the Network Research Exhibition (NRE) demonstrations.
 - ii. This testbed will include 2x400G waves between the Joint Big Data Tasking Facility at McLean, VA, and SL, 1.2T (2x600G waves) between SL and SC21 in St Louis, MO, and 2x100G from Pacific Wave to SL.
 - iii. One demonstration will be a collaborative project of the Open Science Grid on a 500G demonstration that may be of use to High Energy Physics.
 - iv. Another collaboration is with CERN, KIT, CANARIE, TRIUMF and others on CERN's AI/ML NOTED project (Network Optimized for Experimental Data). NOTED attempts to predict large flows and provision circuits in anticipation.
 - d. SL and GÉANT have conducted successful experiments on their integrated P4 testbeds.
 - e. SL is developing plans to integrate the Chameleon testbed with FABRIC.
 - f. SL supported the design and implementation of the Data Mover Challenge testbed for SupercomputingAsia (March 2022). Since it became available the testbed is being used for experiments to be submitted in the Challenge.
 - g. SL is investigating techniques and technologies required to provide production services on circuits at 400G, 800G and 1T.
 - h. SL is developing a Precision Timing Protocol service.

- D. Ames (Bobby Cates): Nothing interesting today.
- E. PNWGP (Jonah Keough): No update this month.

VIII. JET Tasking for CY 2022 was discussed. The JET's suggestions to the LSN will need to be decided at the October meeting as the LSN will be discussing at its November meeting.

AI: Send the possible tasking items to the JET list prior the October meeting.

Meetings of Interest 2020

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

Sep 20-24	The 2nd Global Research Platform (2GRP) Workshop , virtual meeting
Sep 24	Americas' Research Platform Working Group , virtual meeting
Sep 28-30	The Quilt Fall Members Meeting , virtual meeting
Oct 19-20	ARIN 48 , virtual meeting
Oct 19-21	ESCC , virtual meeting
Oct 28	ARIN 48 , virtual meeting
Nov 1-3	NANOG 83 , Minneapolis, MN, hybrid meeting
Nov 4	ARIN 48 , Minneapolis, MN, hybrid meeting
Nov 6-12	IETF 112 , in person cancelled, moved to a virtual meeting
Nov 14-19	SC21 , St. Louis, MO, hybrid meeting
Jan 16-19, 2022	PTC'22 , Honolulu, HI
Jan, TBA	Hawaiian Intranet Consortium
Feb 9-10	The Quilt Winter Meeting , virtual
Feb 14-16	NANOG 84 , Austin, TX
Mar 1-3	SupercomputingAsia 2022 , Singapore
Mar 7-11	APAN53 , Bangladesh
Mar 19-25	IETF 113 , Bangkok, Thailand
Apr 24-27	ARIN 49 , Nashville, TN

Next JET meetings

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

Oct 19, 2021	12-2 p.m. ET
Nov 16, 2021	12-2 p.m. ET
Dec 21, 2021	12-2 p.m. ET <i>n.b. Will be held only if needed</i>