



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
April 16, 2024, 12:00 – 2:00 p.m. ET
This meeting was held virtually

Participants

Hans Addleman, Indiana University	Joe Mambretti, StarLight/MREN
Shawn Armstrong, University of Alaska	Ralph McEldowney, DREN
Todd Butler, NASA/GSFC	Linden Mercer, NRL
Dale Carder, ESnet	Aruna Muppalla, NASA/GSFC
Basil Decina, NRL	Michael Sinatra, ESnet
Bill Fink, NASA/GSFC	Mickey Slimp, GPN
Andrew Gallo, CAAREN/GWU	Tony Stagnitta, Verizon
Scott Kohlert, Ciena	Bobby Thompson, NIH
Michael Lambert, PSC/3ROX/ACCESS	Kevin Thompson, NSF
Paul Love, NCO/NITRD	

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 March 2024 meeting:** Corrections were received and are reflected in the final minutes posted on the JET's web page.

II. **OFCnet 2024: Scott Kohlert**

The slides for this meeting can be found at:

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

- A. OFCnet is the network for Optical Fiber Communication Conference and Exhibition (OFC). OFC started in 1975 while OFCnet began in 2022. This year OFC had approximately 12.5k attendees from 74 countries with 100s of sessions as part of its technical program, short courses, panels and plenaries. OFCnet is targeted at supporting live demonstrations that highlight the networking aspect of OFC. In doing so it has drawn new classes of attendees and exhibitors. There were 630 exhibiting companies. The exhibition portion of OFC is free to attend.
- B. OFCnet is designed and operated by volunteers and utilizes a combination of the hosting convention center's infrastructure and OFCnet dark fiber to the outside world. It doesn't support the general conference or commodity internet to the exhibitors (with a few exceptions where commodity traffic is needed for an OFCnet) nor does it run dark fiber

- to individual booths. Equipment facilitating or using OFCnet for demos are either in the OFCnet NOC or in the demo kiosks. (A diagram of OFCnet can be found on slide 12.)
- C. OFCnet 2024 increased the number of volunteers, equipment and service providers – it generally built on the lessons learned from the initial two years.
 - a. As in 2023 there were three fiber pairs into OFCnet: data intensive classical networking, remote sensors and quantum networking.
 - b. In 2024 there about 30 volunteers from 18 organizations.
 - c. Sixteen organizations provided services or loaned equipment.
 - i. Of note were a pair of optical switches. One was located in the OFCnet NOC, the other in Lumen’s San Diego Datacenter. These greatly facilitated trouble shooting and hands on training/workshops.
 - d. A total of twenty different demonstrations were given for both classical and quantum networking by 28 different exhibitors.
 - D. Some Demonstration highlights (with thanks to Scott Kohlert)
 - a. QKD encryption solution demos
 - i. L2 MACsec QKD encryption
 - ii. L1 OTN QKD encryption with trusted node
 - iii. QKD encrypted video conferencing
 - b. Next gen Quantum networking experiments
 - c. Novel multipurpose hybrid fiber cables
 - d. High Performance 400GE single flow transfers over a 9300 km WAN.
 - e. Travelling FABRIC node
 - f. High Luminosity LHC workflows
 - g. Open Line System and Open transponder platforms
 - h. Fiber longitudinal remote sensing using an800G muxponder.
 - i. 110 GHz Opto-electronic network analysis system
 - j. Network security using micro-services and in-band network telemetry
 - E. Oher items
 - a. OFCnet held a workshop to discuss how it could be improved for future OTCs
 - b. OFCnet ran a workshop that combined theory on fiber and optics along with hands-on use of test gear on OFCnet. One of OFCnet’s vendors, EXFO, was heavily involved.
 - c. OFCnet organized seven panel discussion on an OFCnet theater on topics ranging from optical benchmarks to quantum key distribution options.
 - F. OFCnet 2025
 - a. First time in a new location for OFCnet – Muscone Center in San Francisco, CA
 - b. March 30 – April 3, 2025
 - c. The planning is already starting – if you’d like to be part in any capacity please contact Sana Bellamine: sbellamine at cenic.org
 - d. The calls for demonstrations and submission will be out earlier to allow longer for OFCnet, the contributing vendors and the exhibitors to work together.
 - e. Expanded focus on the needs of production networks in the short term.
 - f. Increase the number and type of demonstrations and contributors.

Question: A few more words on Longitudinal Sensing

Answer: It's doing remote sensing from changes in the in the state of polarization.

Unlike the sensing demonstrations done last year which was designed for use on a dark fiber, this year it could be done on an amplified line system. It was possible to sense issues with the fiber and some of the photonic hardware, such as in the amplifier. This was a demonstration by NTT and ran from the convention center to the Lumen POP and back on a fiber using a different line systems.

Question: How was the apparent move to more of a systems flavor received?

Answer: It does seem to be very well received – things at the kiosks were well attended with lots of good interactions with the attendees.

III. Operational Security Round Table: No updates were received.

IV. Network roundtable

- A. CAAREN (Andrew Gallo): No updates this month.
- B. DREN (Ralph McEldowney): DREN is focused on enhancing physical path diversity for its high bandwidth and supercomputing sites. DREN has noticed an increase in fiber vandalism – fiber being shot at - and resulting loss of connectivity.
- C. ESnet (Dale Carder, Michael Sinatra): Nothing significant to report today.
- D. GPN (Mickey Slimp):
 - a. GPN has just finished deploying the last four nodes in its NSF funded GP-ENGINE Project (Great Plains “Extended Network of GPUs for Interactive Experimenters). These were two each in South Dakota and Arkansas. The project covers eleven institutions with a total of 14 HPC and 47 GPU nodes. Over the next year GPN will be bringing these into production and training researchers in their use.
 - b. GPN is having its annual meeting in Lincoln, NE, this June. GPN has invited the Northern Tier Network Consortium (NTNC) to join GPN. NTNC will have its meeting the two days prior GPN. GPN's focus will be on how GPN funds its network with a spotlight on USDA. A representative from USDA will be giving the keynote.
- E. International Networking at Indiana University (Hans Alderman):
 - a. Both NEA3R and TransPAC circuits are up without issues.
 - b. International Networking at Indiana University (IN/IU) is working with ESnet and other partners to ensure that backups are identified for all circuits across both the Atlantic and Pacific. As the number of circuits has grown the need for diverse backups has become more significant. IN/IU had to scramble a bit to get some VLANs setup when it lost a couple of transatlantic circuits at the same time during the LHC High Luminosity trials.
- F. SCinet (Hans Alderman): The Network Research Exhibition (NRE) call is open. NREs are where the exhibitor works with SCinet to develop demonstrations and experiments on the show flow. Preliminary abstracts are due in early June. Details can be found at: <https://sc24.supercomputing.org/scinet/network-research-exhibition/>
- G. NASA/GSFC (Bill Fink): We're working with Linden Mercer and Joe Mambretti on early preparations for SC24.

- H. NIH (Bobby Thompson): This my first time on the call. I'd like to get a bit better understanding of the participants to prepare for NIH's update at the June meeting.
- I. NRL (Basil Decina): No updates other than starting to prepare for SC24
- J. PSC/3ROX/ACCESS (Michael Lambert):
 - a. This month seems to have been a rodent party as PSC/3ROX has had two or three incidents of rodent chewing fibers. Rats in Pittsburgh and mice in a fiber tray.
- K. University of Alaska (Shawn Armstrong): UAF has been dealing with loose lab rats in their utility floors.

V. Exchange Points Round Table

- A. StarLight (Joe Mambretti):
 - a. The week prior to OFC in San Diego there were FABRIC and National Research Platform (NRP) workshops at UCSD. Demos at these two workshops used infrastructure similar what was used at the OFC demos.
 - b. The demos at the two workshops and OFC the next week used the combined resources of FABRIC, NA-REX, ESnet, NRP and OFCnet. The demos ran to several sites including the Joint Big Data Testbed at McLean, Virginia, and StarLight (SL). Resources included Gen5 DTNs and high performance storage.
 - c. The DTNs are capable of single stream 400G with their SmartNICs. They feed into deep buffer switches. These demos of a 400G single stream were run over about 4,000 miles with good results (388-397G with essentially no packet loss).
 - d. Last year at OFC SL focused on co-propagation of quantum and classical networking on the same fiber. This year the focus was moved to large scale streaming.
 - e. SL participated in a next generation networking conference organized by GEANT at Catania, Italy. It was collocated the LHC networking meetings for the LHC's High Luminosity planning. There was also a retrospective on the recent Data Mover Challenge and discussions on the networking ecosystem for the SKA. Several radio telescopes have adopted the Rucio tools.

Meetings of Interest 2024

Apr 14-17	ARIN 53 , Bridgetown, Barbados
Apr 30 – May 2	ESCC , Berkeley, CA
Apr 30 – May 2	ARTIC Annual Meeting , Anchorage, AK
May 7-10	Smart Cities Connect Conference and Expo , Raleigh, NC
Jun 9-10	Northern Tier Network Consortium , Lincoln, NE
Jun 10-12	Great Plains Network Annual Meeting , Lincoln, NE
Jun 10-12	NANOG 91 , Kansas City, MO
Jun 11	IT Modernization Summit , Washington, D.C.
Jun 10-14	TNC24 , Rennes, France
Jun 14	Global Science Network Forum , Rennes, France
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 [TIM](#), Albuquerque, NM
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
Oct 24-25 [ARIN 54](#), Toronto, ON Canada
Nov 2-8 [IETF 121](#), Dublin, Ireland
Nov 17-22 [SC24](#), Atlanta, GA
Dec 9-12 [Internet2 Technology Exchange](#), Boston, MA

Next JET meetings

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

May 21, 2024 12-2 p.m. ET
Jun 18, 2024 12-2 p.m. ET
Jul 16, 2024 12-2 p.m. ET