

JET Meeting Minutes

March 21, 2017

Participants

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Action Items

1. ESnet will give an update on its ESnet6 design and implementation at the July JET meeting.

Proceedings

This meeting of the JET was chaired by Kevin Thompson of the NSF. The participating Federal agency representatives described the status of their TIC/TICAP facilities.

Federal agency TIC status

ESnet: Nick Buraglio

ESnet has not deployed a TIC and is not required to deploy TICs. However, they are compliant with DoE requirements. ESnet monitors TIC deployments in peer networks to understand how and what they are doing.

NASA: Bobby Cates

NASA TICs are a work in progress with approximately 90% compliance at their last audit. NASA has instituted a corporate LAN symmetry project to so that a flow passing through a TICAP will use the same one in both directions. This is needed for the TICAP's software stack as it retains state between external and internal networks. TICs have been deployed at Marshall, Ames, and Goddard. Current focus topics are:

- How to make the JPL LAN TIC compliant: potentially implementing a 5th TIC at JPL as a last resort. Currently address space at Cal Tech is being renamed and rehomed so JPL will not be a NASA site.
- USGS-Menlo Park is moving on-campus and they have their own TIC. An effort is underway to rationalize the TICs to minimize duplication of services. A commodity TICAP will not be implemented.
- Provide cloud compliance: NASA has .gov compliance. They are doing demonstrations with Amazon and DHS to demonstrate the AWS/NASA interface

NASA is E3A compliant for email and DNS. Right now all E3A is single homed - anticipated to be a good time before anything else. Other services use E1 and E2.. The plan is to implement E3A and then to determine how it might support a TIC3. There is no TIC3 yet; DHS is considering architectures. Cost constraints dictate the DHS prefers 10 x 10G which the Einstein boxes can deal with vs 100G links. DHS has stated they need to see science network flows to the NASA corporate network.

NASA EOS: Kevin Kranacs

NASA EOS has a 40G internal network with 100G external links, currently E1 & E2 compliant. They are considering how to support E3A. They would like to get out of needing a provider. They expect to implement another TIC iteration a year out.

NIH: Mike Gill

NIH is TIC compliant. They have 3 TICs – Atlanta, Washington, DC and Albuquerque. Each TICAP operates independently.

NOAA: Jeff Flick

NOAA is implementing 5 TICAPs: Seattle, Denver, Washington DC, Hawaii, and Dallas. Each location follows the same three high level project phases. 1. Engineer and deploy the infrastructure of networking and security. 2. Migrate the region to the new TICAP infrastructure in TIC bypass mode. This allows for network transport optimization and stability while NOAA Cyber Security validates and tests the security enclave of In-Line and out of band hardware/services. 3. Migrate the region in-line for full TIC 2.0 compliance. Hawaii, Seattle, and Dallas have completed all 3 phases & all traffic goes through the TICAPs. NOAA is currently in network migration for DC and Denver. Migration is expected to run through the end of Q3.

The NOAA TICAPs are architected for 40G at the two larger locations, DC and Denver.

JETnet Roundtable

Internet2: Dale Finkelson

Internet2 is implementing MPLS on its backbone through 6 maintenance events. The process is expected to be completed April 14-15. Then the MPLS service will be their BB transport.

Internet2 continues planning for its next-generation architecture. John Moore addressed the JET last month about this planning process. (A further updated is expected at a summer JET.)

ESnet: Nick Buraglio, Patty Giuntoli

ESnet6 planning is taking a lot of effort. They are currently focusing on hybrid architectures (Chin Guok is the point of contact). They will implement segment and packet optical networking as part of the architecture.

ESnet will be considering vendors to support the hybrid architecture this summer.

AI: ESnet will give an update on its ESnet6 design and implementation at the July JET meeting.

NASA: Kevin Kranacs

Nothing new to report

NIH: Mike Gill

Nothing new to report

NRL: Linden Mercer

Nothing new to report

NOAA networking: Jeff Flick

Nothing new to report

PacificWave: Jonah Keough

PIR&D has implemented a new link from Guam. There will be a meeting on this link at the upcoming Internet2 Global Summit meeting. PacificWave is working with its Japanese partners to implement mutual backup across the Pacific.

Exchange Points

Pacific Northwest GigaPoP (PNWGP): Jonah Keough

PNWGP is continuing their 100G upgrades. Peering networks are moving up to 100G native.

Ames: Bobby Cates

The Ames Exchange Point turned up 2 x 10G waves for DREN for connectivity to the Level 3 PoP at 1380 Kifer in Sunnyvale. A 3rd is due soon. DREN is looking to peer

with ESnet and Internet2. There is a new 10G link from Ames to Equinix for Amazon connectivity. A 10G to PAX is expected in April.

StarLight: Joe Mambretti

StarLight supported the demonstration showcase at the GEC25 conference in Miami. StarLight partners with PacificWave using NSI. SDX sites have been implemented at StarLight, MAX (Tom Lehman), Southern Crossroads, Miami, Sao Paulo, Ottawa. These SDXs provide for provisioning dynamic circuits for high-end digital media and data. They enable finding networking resources, setting up dedicated paths, performing the applications, and tearing down the networking resources for reuse. Demonstrations at GEC25 included StarLight/PacificWave audible NSI, an experiment with RNP (Brazil), and Internet2 partnership for intense streaming to Japan. DTNs are part of each of these demonstrations. One demo moved large files to Sao Palo with terrible [performance. When the Sao Paulo DTN was inserted the flow smoothed out and the performance very effectively.

MAX: Dave Diller

The MAX is carrying out maintenance upgrades. They have a PoP on K Street in DC that was completed this year. They are implementing a full DWDM ring in Virginia. They are supporting the streaming of numerous data sets and have added capacity to some data set sources..

WIX: Dale Finkelson

WIX reports no new connections. Tom Lehman presented at the GENI Engineering Conference (GEC) on implementing SDX at the WIX. Contact Tom Lehman <tlehman@maxgigapop.net> if you have an interested in the WIX SDX.

MAN LAN: Dale Finkelson

MAN LAN has a new connection from New York to Europe. It's the NSF funded NEAAR 100G circuit. It is expected to be in service soon.

One of the ANA 100G circuits (NetherLight/NORDUnet) is being rehomed to a Montreal IX operated by CANARIE. Traffic for MAN LAN will ride CANARIE's connection to MAN LAN via a 100G circuit.

Meetings of Interest:

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|-----------------|---|
| March 26-31 | IETF 98 , Chicago, IL |
| April 2-5 | ARIN 39 , New Orleans, LA |
| April 7 | Massachusetts Green High Performance Computing Center, Three Years Later (ENCITE webinar) |
| April 21 | NCGAS: Providing National Cyberinfrastructure to Biologists, with a Focus on Genomicists (ENCITE webinar) |
| April 23-26 | Internet2 Global Summit , Washington, DC |
| May 2-4 | ESCC , Berkeley, CA |
| May 29 – June 2 | TNC17 , Linz, Austria |
| June 5-7 | NANOG70 , Bellevue, WA |
| June 26-26 | US Ignite Application Summit , Austin, TX |

July 9-13 [PEARC17](#), New Orleans, LA
July 16-21 [IETF99](#), Prague, Czech Republic
August 26 – September 1 [APAN44](#), Dalian, China
September 25-27 [GLIF](#) Sydney, Australia
October 5-6 [ARIN 40](#), San Jose, CA
October 15-18 [Internet2 Technology Exchange](#), San Francisco, CA
Nov 12-17 [SC17](#), Denver, CO
Nov 12-17 [IETF100](#), Singapore

Potential Community TICAP in DC Metro Area: Jeff Flick, Dave Diller

NOAA is seeking DHS approval for community TICAPs in Hawaii, Denver, and DC. It will be Federal end-of-year before NOAA is ready to accept other customers. Onboarding customers will initially be limited to 5G each. Traffic on these links will be monitored and a capability of increasing the 5G bandwidth exists for the future if needed. A cost model is being developed and reviewed by management. The needed CONOPS is also being developed.

N-Wave has a pair of 100G links in McLean. Federal agencies at the MAX will be able to use MAX transport to get access to the stack for TIC compliance. N-Wave needs to work on how traffic there travels bi-directionally.

Next JET Meetings:

April Apr 25, 7-8:30AM Eastern, Meeting Room 4, Renaissance
Washington Hotel, 999 9th Street NW, Washington, DC
nb: Concurrent with the Internet2 Global Summit
May May 16, 12-2 Eastern, NSF
June Jun 20, 12-2 Eastern, NSF