SINET 5 LAUNCH

Global Network Architecture Overview

Rob Vietzke
Internet2 VP

May 25, 2016

INTERNET2®

Global Network Architecture Overview

Agenda

- Congratulations NII & SINET-5!
- Brief Internet2 Overview

- Global Network Architecture: Advancing research and education capabilities for researchers, educators and global collaborations

CONGRATULATIONS!

SINET5

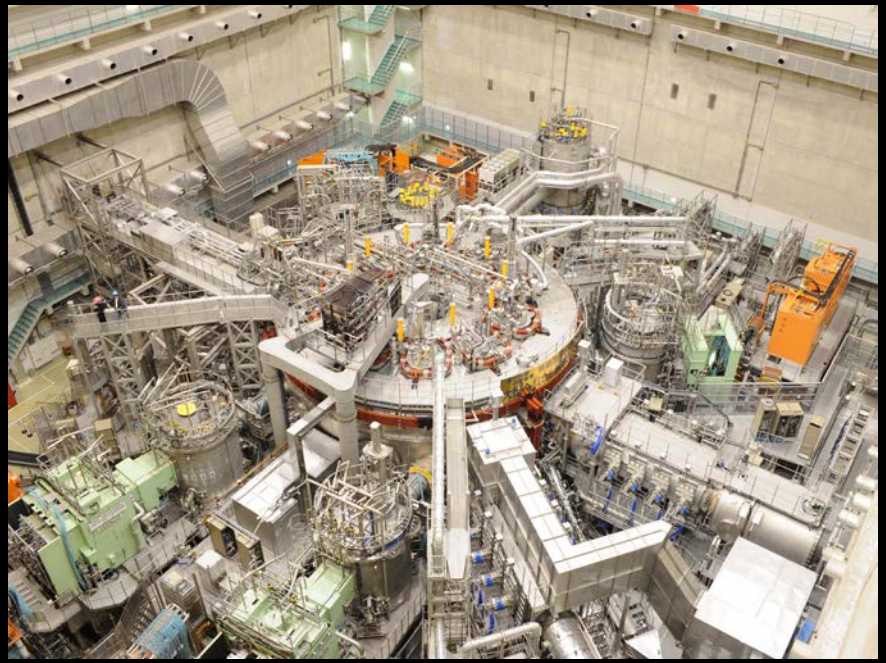
Ultra high speed / low latency network throughout Japan

SINET5

NII 大学共同利用機関法人 情報・システム研究機構 国立情報学研究所 National Institute of Informatics

CONGRATULATIONS!

- New 100Gbps national backbone provides extraordinary new fabric for national and global collaboration!
- Internet2 deeply values the leadership & collaboration with NII & SINET5 and all of our Japanese colleagues in supporting Global Research!



About Internet2: An unparalleled human network

- Internet2 brings together thought leaders from member organizations and the broader research and education community
- Our community advances frontiers of network-enabled applications
- Our community accelerates innovation and enables transformation
- We deliver community led services at scale and at production quality

Internet2 National Backbone

Global Services in Support of Research and Education

Global connectivity today

This looks great, right?

- Simply having big pipes between countries perhaps is not enough?
- What matters now is:
  - Can you deliver the SERVICES your researchers and education teams require on a global end to end basis?
  - Is the operation consistent? Do you know who is responsible and what service levels they strive for?
  - Does our local national topology encourage others to see us as great place to interconnect with us and others?
- Recognition that nations must work together towards a consistent set of goals and build a system where these issues are addressed.

GNA: Network Services

- Deterministic Services:
  - Guaranteed BW Service
  - Guaranteed BW Service with Bursting
- Non-deterministic Services:
  - Best Effort Service
  - Flow and IP Routing Separation
- Other Services:
  - Special Use & Innovation Enablement

Global R&E Network CEO Forum Priority Area

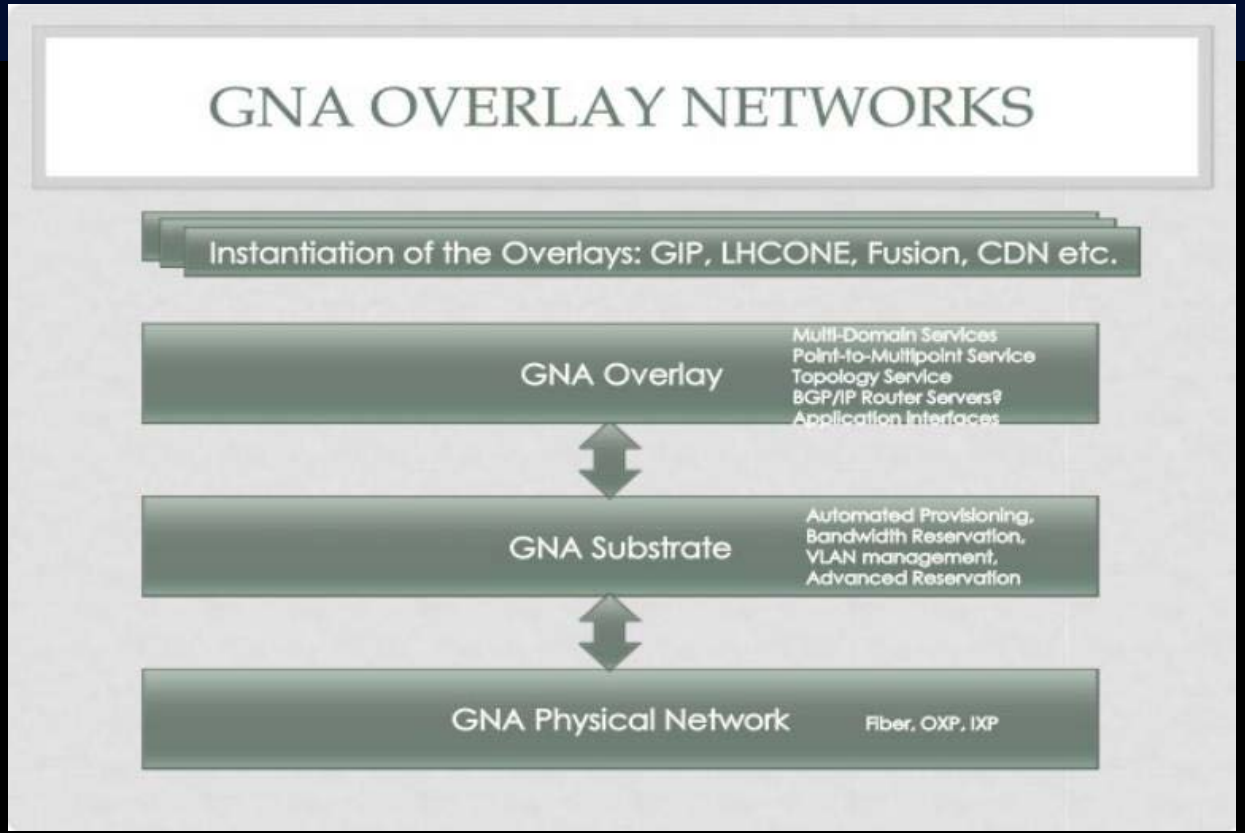
- “Global Network Architecture – A well-defined, inclusive, global architecture for, and a roadmap towards, interconnecting the Research and Education Networks on a global scale, taking into account input from the large science & education projects”

Global Network Architecture (GNA)

- GNA Technical group:
  - Architecture Model
  - Open Exchange Points & Big Pipes
  - Federated Operations
  - Automation
  - The Commons
- Executive Action Team group: narratives & awareness

Early GNA Architecture

GNA is a set of guiding principles that individual NREN's can use to build their own networks so that their portions can co-operate in end-to-end services in conjunction with other NREN networks.



Credit: Inder Monga (ESnet)

Major Components & Key Functions
(if each investor follows this, all benefit)

Exchange Points

- Non Blocking
- Open AUP
- Well Instrumented
- Ports & Speeds Required
- Supports Information Sharing
- Supports Link-Owner Policies
- Clear Privacy Policy
- Supports Cloud Services
- Supports Innovation Projects

Links

- Engineered for Resiliency
- Engineered for Diversity
- Capacity Reserved for Link Investor Interests
- Capacity Reserved for General Purpose R&E Use (The Commons)

- Coordinate availability with other link owners

Operators

- 7x24x365 NOC Services
- Multilingual
- Proficient Engineering Support

- Participate in GNA Planning

- Communicate Roadmaps for their services

GNA website

http://gna-re.net/

Pathfinding Project

- ANA-200G
  - Governance
  - Cost sharing
  - Technical
  - Federated Operations
- Lessons Learned & Observations:
  - Plan for federated operations in a complex environment
  - Act locally and in –small- collaborations to move quickly

ANA-200G: As of 2015

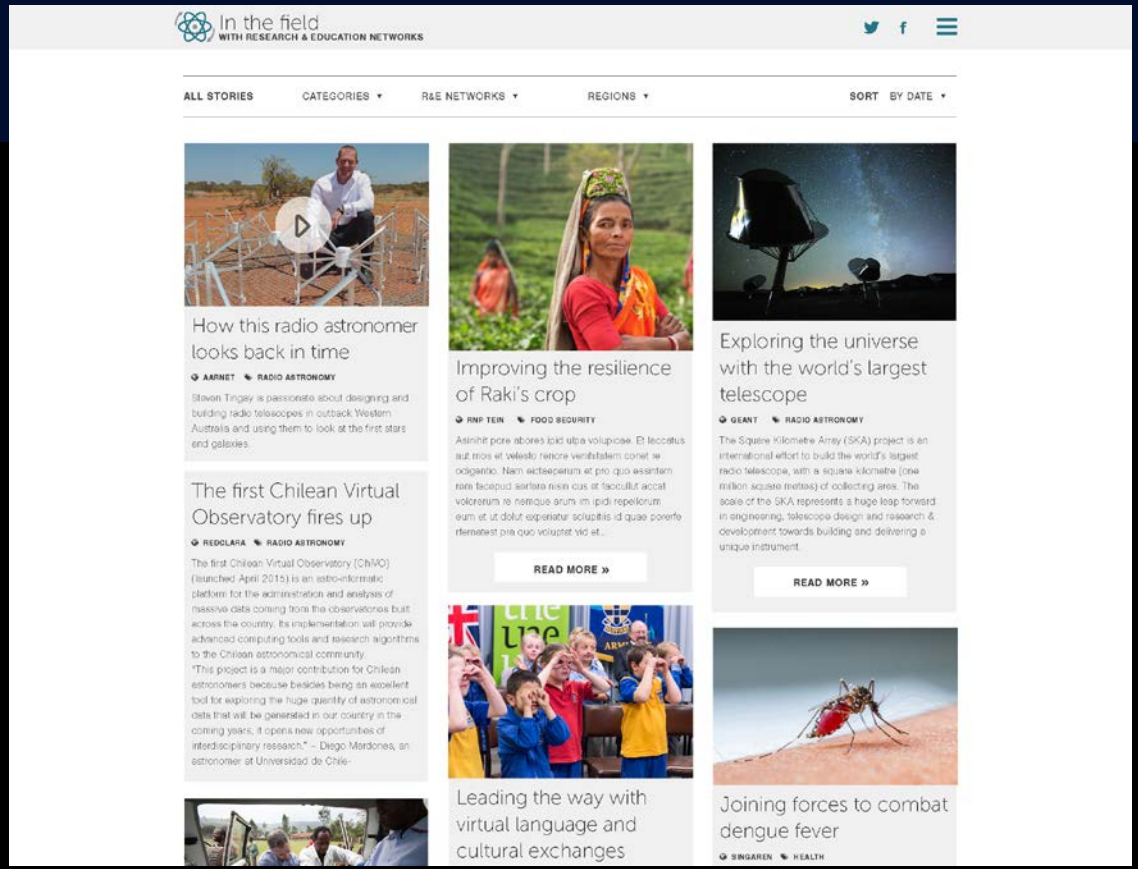
ANA-200G: 100G Production Ring across North Atlantic for R&E

Open Exchange Points & Links

- MAN LAN
- WIX
- NetherLight
- GEANT Open London
- Internet2
- TGN-Atlantic South
- NORDUnet/SURFnet
- Hibernia Atlantic

ANA-100G Production Network: A 100 Gbit/s production quality ring across the North Atlantic for Research and Education. Collaborators: Internet2, NORDUnet, CANARIE and SURFnet.

In the Field Stories Global Blog



http://www.inthefieldstories.net/


With well coordinated global network architecture, each national research and education network can enable its researchers for greater discovery, enable its educators to deliver reliable global services, and continue to enable the R&E community for greater innovation.
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CONGRATULATIONS AGAIN!

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Robert P. Vietzke

Vice President – Network Services
Rvietzke@internet2.edu

SINET 5 Launch Event and GNA Discussion