

# LHCOPN/ONE meeting BNL 4-5 of April 2017 summary report

GDB 12<sup>th</sup> of April 2017  
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# At BNL 4-5<sup>th</sup> of April 2017

**Hosted at BNL, organized by ESnet**

38 participants

25 organizations

27 presentations



# LHCOPN updates

# T1s' reports

**CA-TRIUMF:** is moving to SFU; TRIUMF dismantled by 2020

**UK-T1-RAL:** setting up 3<sup>rd</sup> 10G link; IPv6 configured

**CH-CERN:** 3<sup>rd</sup> 100G link to Wigner-DC; tendering for DC routers; construction of 2<sup>nd</sup> network hub almost completed

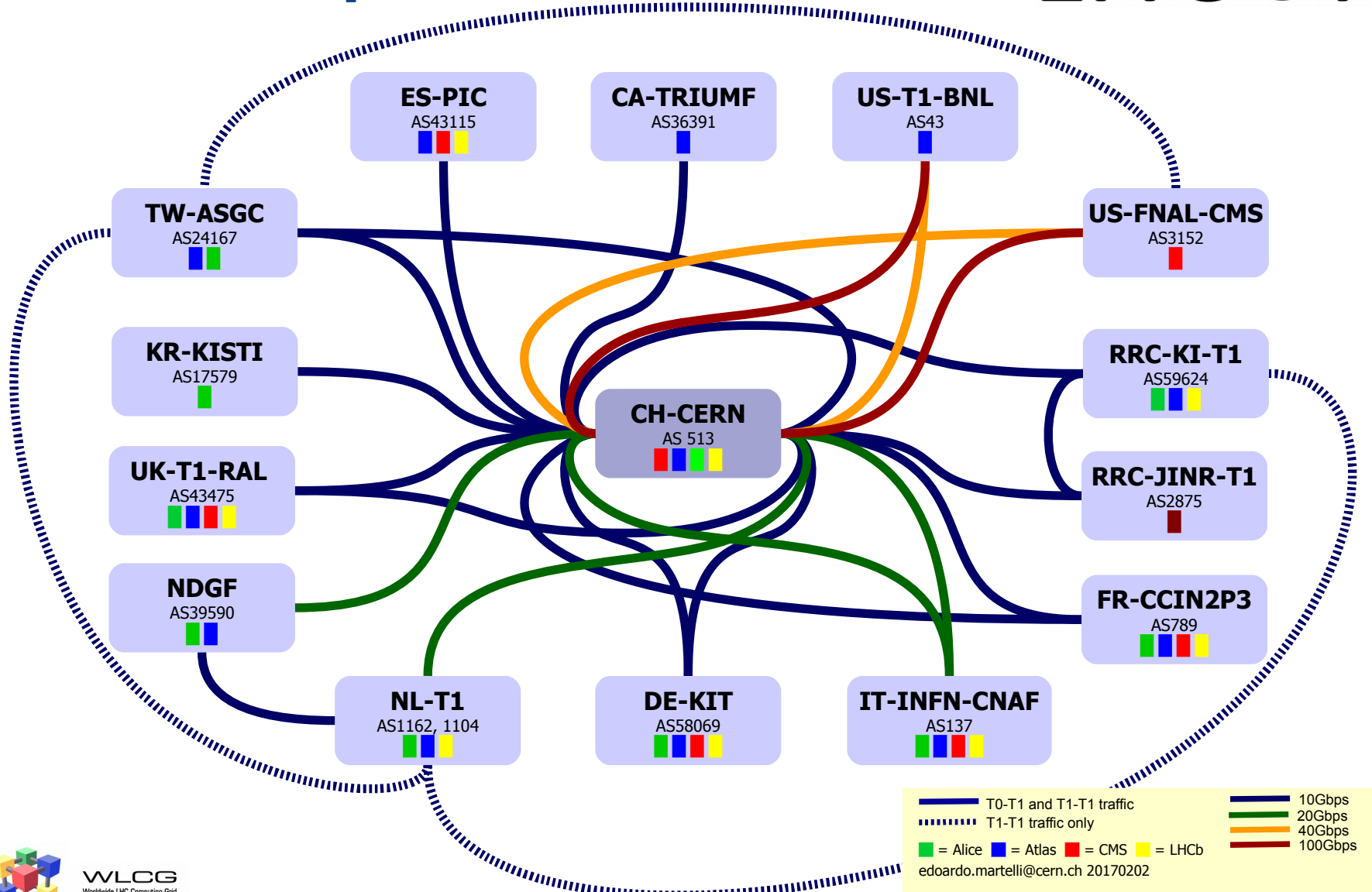
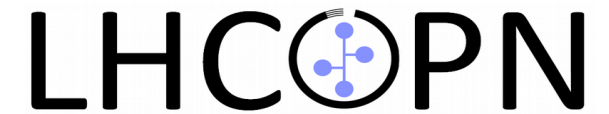
**NL-T1:** will provision more bandwidth on backup path via NORDUnet

**IT-INFN-CNAF:** new core network devices

**FR-CCIN2P3:** new core network devices

**US-T1-BNL:** implemented IPv6

# LHCOPN map



# LHCONE updates

# LHCONE L3VPN update

Stable amount of traffic in the last months

Connected Russian LHCONE VRF in Amsterdam and Geneva

Connected Ukraine LHCONE in Frankfurt



# LHCONE L3VPN operations

New sites connected:

- Academic Computer Centre, Krakow, Poland
- University of Warsaw Poland
- Boston University, USA
- DUKE University, USA
- Taiwan Research Network, Taiwan

Now ESnet sees more LHCONE traffic than LHCOPN





# perfSONAR update

Some degradation in the data retrieving of the LHCOPN/ONE MaDDash. Upcoming upgrade to v4 should be the opportunity to make the nodes more resilient

Completed MCA (Mesh Configuration Admin) tool

WLCG is working on ETF (Experiment Test Framework) to monitor perfSONAR services



# perfSONAR update

ATLAS is working on getting network metrics into an analytics platform:

- packet loss from perfSONAR
- network stats and flows from ESnet routers
- stats from CERN routers will be added

Looking for more router sources



# Collaborations updates

# BelleII update

Using DIRAC for workload management

Setting up perfSONAR infrastructure and MaDDash

Latest WAN data challenge:

found asymmetric performances between some pairs of sites. It may be related to fragmentation due to the use of different packet sizes



# NOvA update

FNAL and FZU NOvA traffic rerouted over LHCONE in October 2016

NOvA traffic traffic loads on LHCONE have been modest

No new NOvA site requests for using LHCONE



# Pierre Auger Observatory update

Undergoing major upgrade (2016-2019)

Will run until 2025

Experiment in Argentina

Data storage in Lyon (FR)

Using DIRAC for workload management

# XENON update

Using Rucio for data management

1.5TB/day produced at LNGS (Gran Sasso, IT)

Just started process to connect LNGS to LHCONE



# LHCONE in Asia



# LHCONE development in Asia

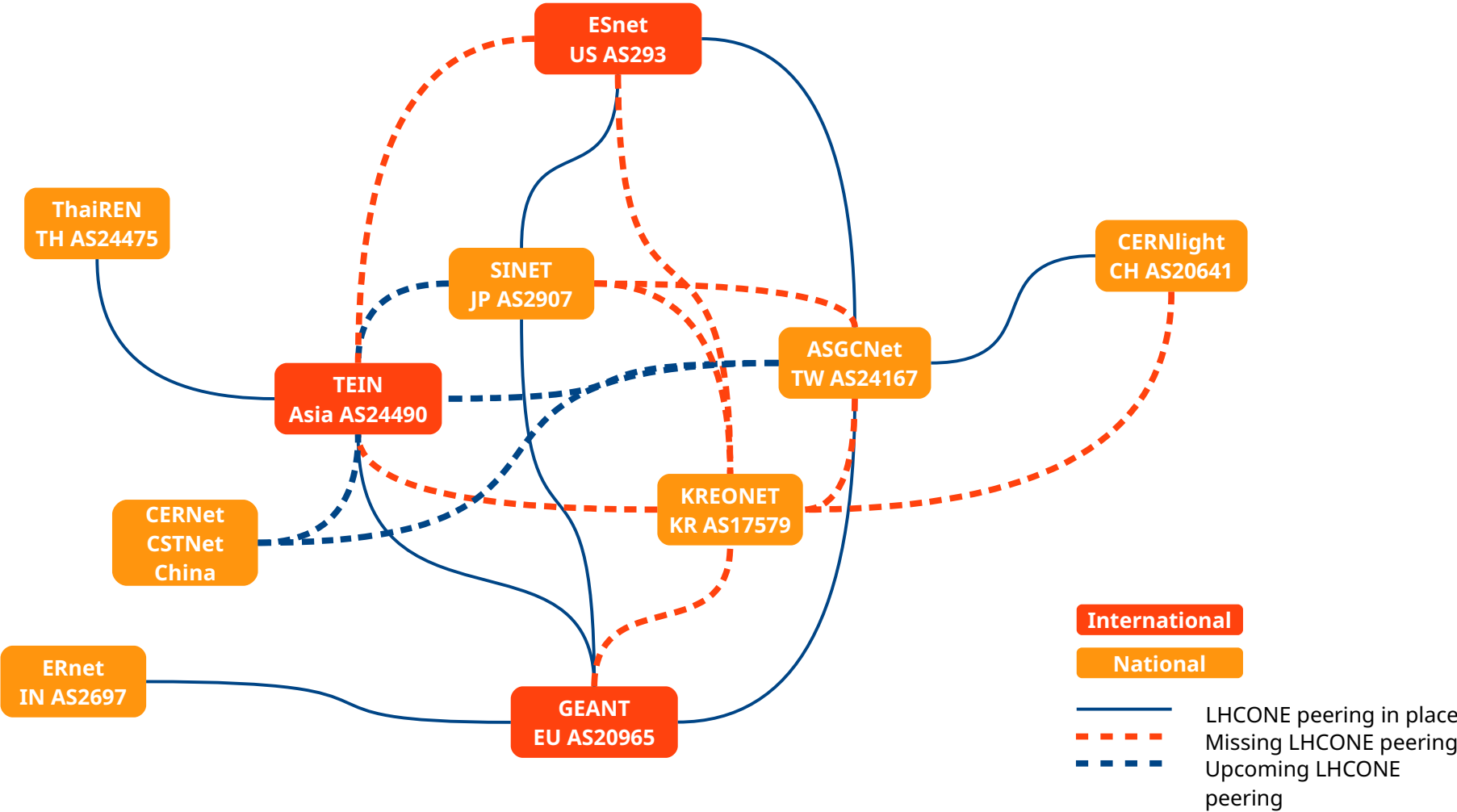
SINET Japan ready to peer with TEIN in Hong Kong, but existing interconnection turned out to be just 1Gbps. Will wait till TEIN's routers are upgrade in June 2017

Other peerings with TEIN are waiting for the TEIN's routers upgrade

IHEP and CCNU interested to connect to LHCONE. Discussion started with CERnet and CSTnet



# Next developments



# TransPAC

Cooperative partnership among Indiana University, APAN, TEIN, JGN/NICT-Japan, NII-Japan, CERNET, and others.

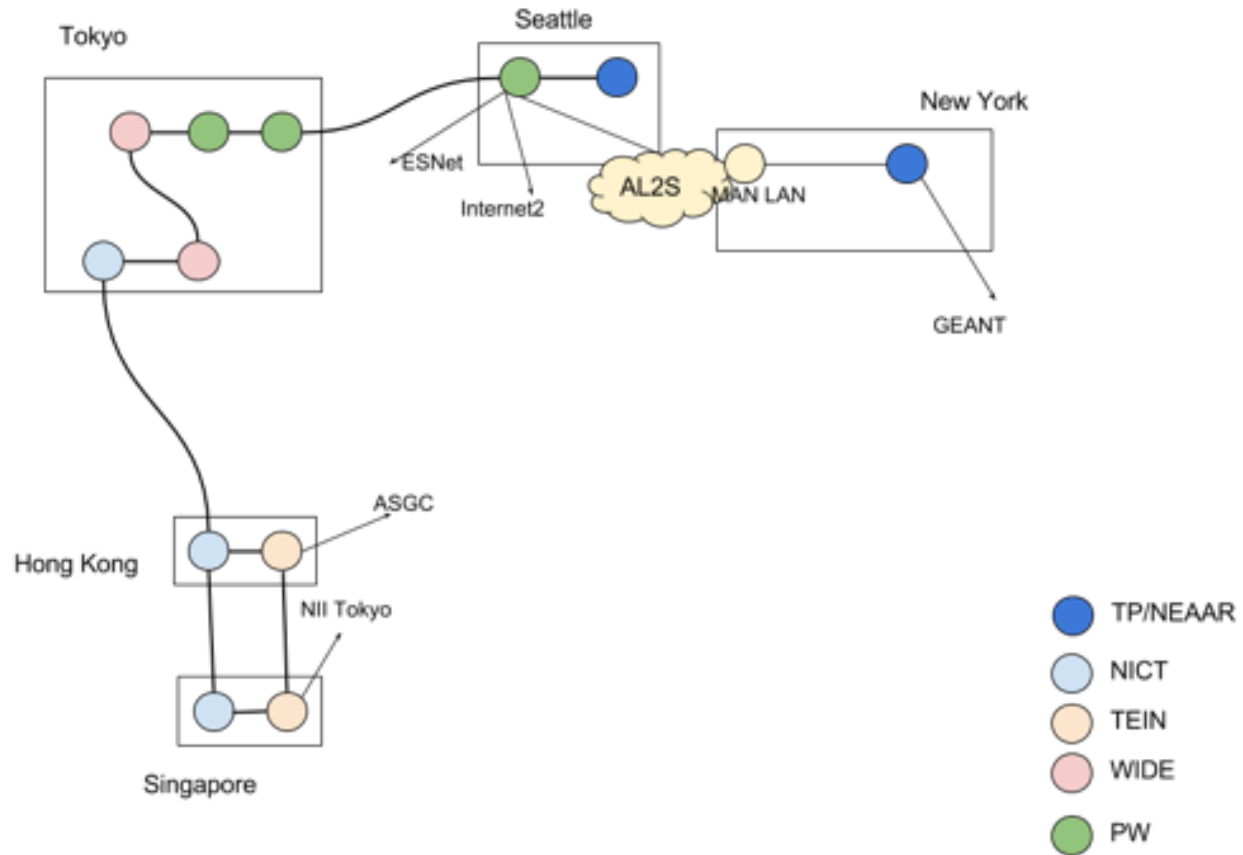
Started in March 2015, running through Feb 2020

\$4.8M over 5 years. Includes funding for circuits (100G), exchange points, application support/engagement, research

Increased engagement with the wider community through groups such as APAN, TEIN/Asi@Connect, GNA, GLIF, LHCONE, Internet2, etc

**Offers capacity over transpacific 100G link to LHCONE, to connect TEIN with Internet2 and ESnet**

# LHCONE connectivity via TransPAC



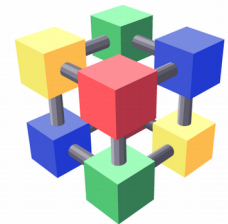
# Requirements and plans for Run3

# LHC experiments' requirements for Run3

Report of the pre-GDB on networks held in January 2017

Acknowledged the usefulness of gathering Experiments, Sites and Network operators all together

Request to repeat the event every 1-2 years



**WLCG**  
Worldwide LHC Computing Grid

# ESnet plans

Ongoing project to build next-generation network. Right now at the approval phase

Considering various models, from classic hardware layers to mostly virtualized

Key goals: capacity, reliability and resiliency, flexibility

Some concern on future funding



# GEANT plans

Tendering for next generation network

Improvement and cost reduction by

- remove vendor lock-in
- strict necessary feature sets
- open source software
- keep control of data
- layer1-2-3 integration
- separation of management, control and data planes





# NORDUnet plans

Establishing a PoP in Hong Kong for Global Campus project

Planning for next network

- disaggregation
- network virtualization
- global services without private resources



# SURFnet plans

Upgrading to SURFnet8

Optical layer contract assigned to ECI telecom

Tender for packet devices is ongoing

Implementing automation and orchestration

Increasing cross-border connections footprint



# Clouds activities

# Cloud activities

**sshuttle**: advanced ssh tunneling for networking for opportunistic clouds developed by UVIC

**HNSciCloud** update:

- completed Design Phase
- just selected 3 procurers for Prototype Phase:
  - T-Systems, Huawei, Cyfronet, Divia
  - IBM
  - RHEA Group, T-Systems, exoscale, SixSq

# CMS GoogleCloud engine demo at SC 2017

Challenge: Doubling CMS computing using Google Cloud Engine  
Expand the Fermilab facility to an additional 160,000 cores  
Use HEPCloud technology to do this as transparently as possible  
to the application

Live demo during Supercomputing 2016

730172 simulation jobs submitted; only 47 did not complete

205 M physics events generated, yielding 81.8 TB of data

Cost: ~1.6 cents per core-hour (on-premises: 0.9 cents per core-hour assuming 100% utilization)



# R&D

# GNA - Global Network Architecture

Sharing of R&E network resources for common benefit

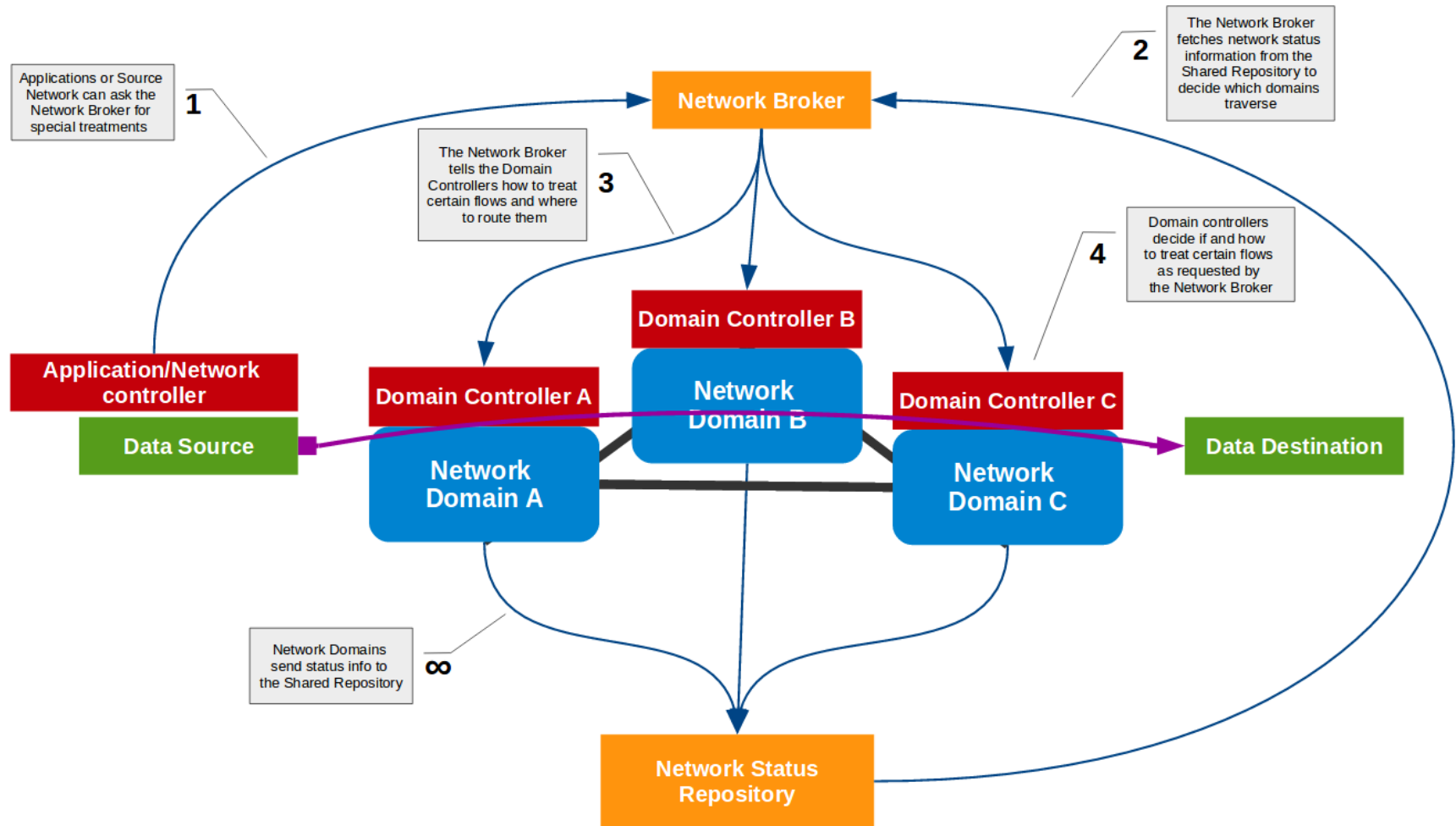
Extend benefits gained with ANA-300G experience  
(sharing of three 100G transatlantic links)

Pillars:

- resource sharing
- aligning operational standards
- maximizing funding and investments
- knowledge sharing and outreach
- increasing global collaboration

# Networking for Run4

Proposed project to improve network utilization efficiency





# Conclusion

# Summary

## LHCONE:

- extended mostly in East Europe
- few progresses in Asia, waiting for major upgrades during the summer

## Network operators:

- tendering for next cycle of upgrades
- confident to be ready for Run3

Discussion started for networking for Run4

# Next meeting

Co-located with HEPiX fall 2017

Where: KEK, Tsukuba – Japan

When: 16-20 of October 2017

Preceded by 3<sup>rd</sup> Asia Tier Centre Forum in South Korea,  
11-13 of October 2017 (date to be confirmed)

# More information

All presentations here:

<https://indico.cern.ch/event/581520/>

*Questions?*

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