ESnet

ENERGY SCIENCES NETWORK

ESnet Update

15th Global LamdaGrid Workshop
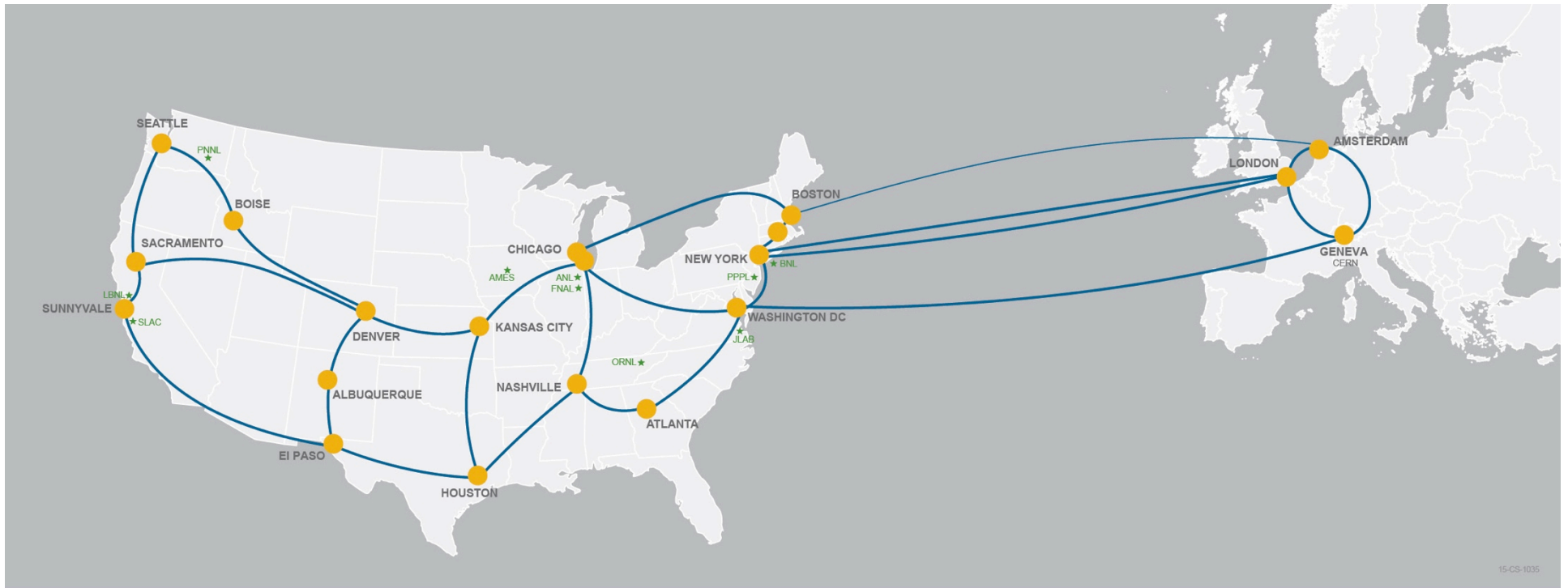
September 28-30, 2015

Prague, Czech Republic

Chin Guok, Network Engineer

Energy Sciences Network (ESnet)

Scientific Networking Division

Lawrence Berkeley National Laboratory

U.S. DEPARTMENT OF **ENERGY**

Office of Science

BERKELEY LAB

ESnet is a **dedicated mission network** engineered to accelerate a broad range of science outcomes.

We do this by offering unique capabilities, and optimizing the network for data acquisition, data placement, data sharing, data mobility.

Our vision:

Scientific progress will be **completely unconstrained** by the physical location of instruments, people, computational resources, or data.

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Some recent news:

340 Gbps transatlantic extension in production since Dec 2014.

- strong partnership with GÉANT
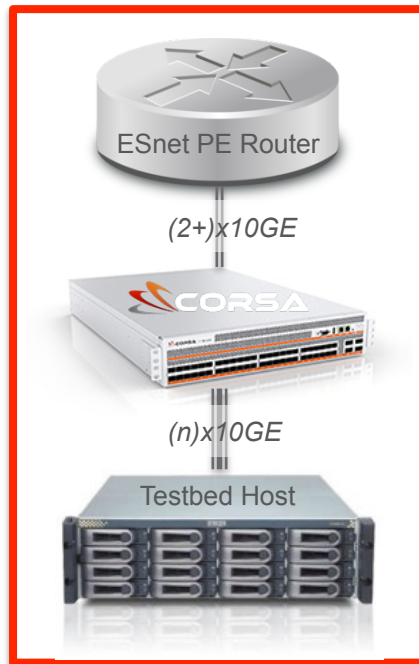- now peering with some US research universities to support LHCONE (yes, transit)

400Gbps project underway.

- production link for NERSC supercomputing center
- dark fiber testbed in deployment

Areas of strategic focus: software, science engagement.
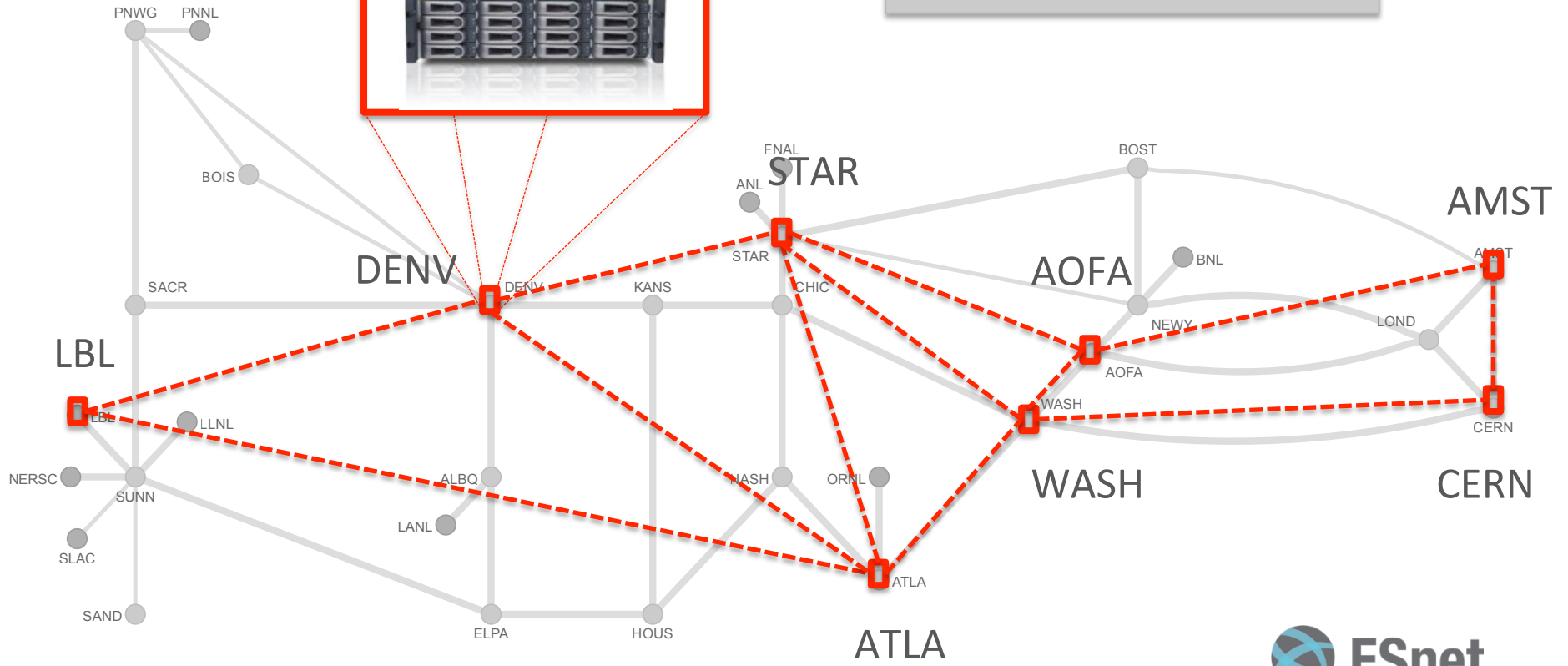
- Engagement effort now **12% of staff**

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ESnet SDN Testbed

ESnet PE Router

(2+)x10GE

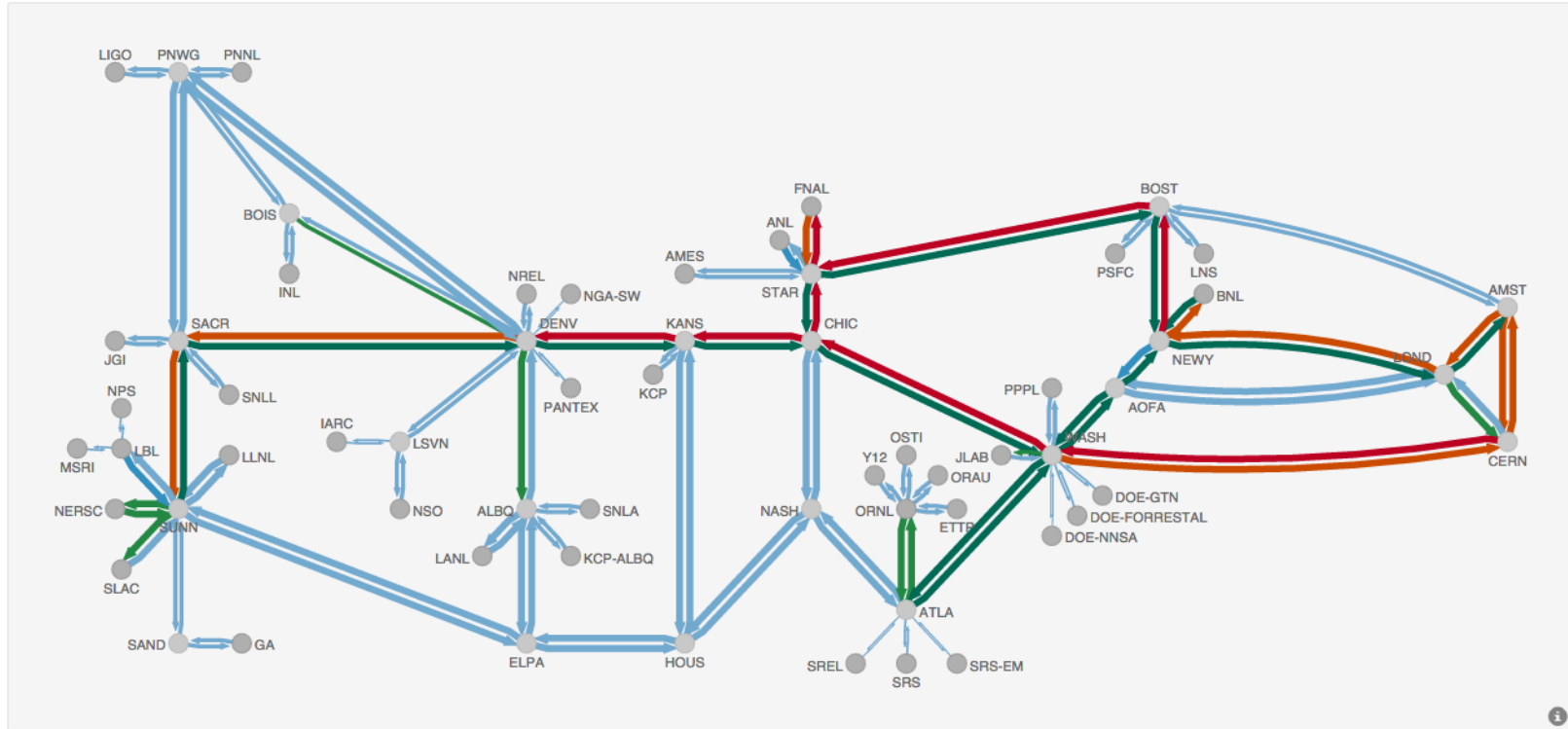CORSA

(n)x10GE

Testbed Host

Status Update:

- Testbed deployed at all locations
- QoS support verified, press release next week
- ENOS demo on Testbed @ SC

🔲 Deployed SDN Testbed node locations

- - - Planned SDN Testbed connectivity overlay (using OSCARS circuits)

PNWG   PNNL
BOIS
PNWG
SACR
LBL
NERSC
SUNN
SLAC
SAND
LLNL
ALBQ
LANL
ELPA   HOUS

DENV
DENV
KANS

FNAL   STAR
ANL
STAR
CHIC
NASH   ORNL

BOST
AOFA   BNL
NEWY
AOFA
WASH
WASH
ATLA
ATLA

AMST
AMST
LOND
CERN
CERN
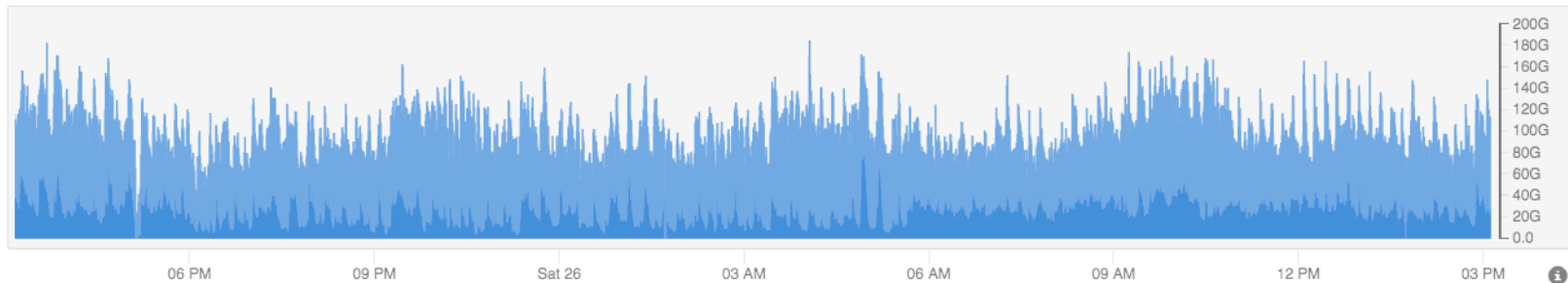
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iDiscovery 2020 Inder Monga

Network Wide Total Traffic

This map highlights the sites ESnet serves, the structure of the network and the current traffic load. Clicking on a node or edge will show details. Please note that this map does make some simplifications, click ⓘ on the map or chart for more details. The map of the transatlantic extension is a work in progress, more details are available in the info box.

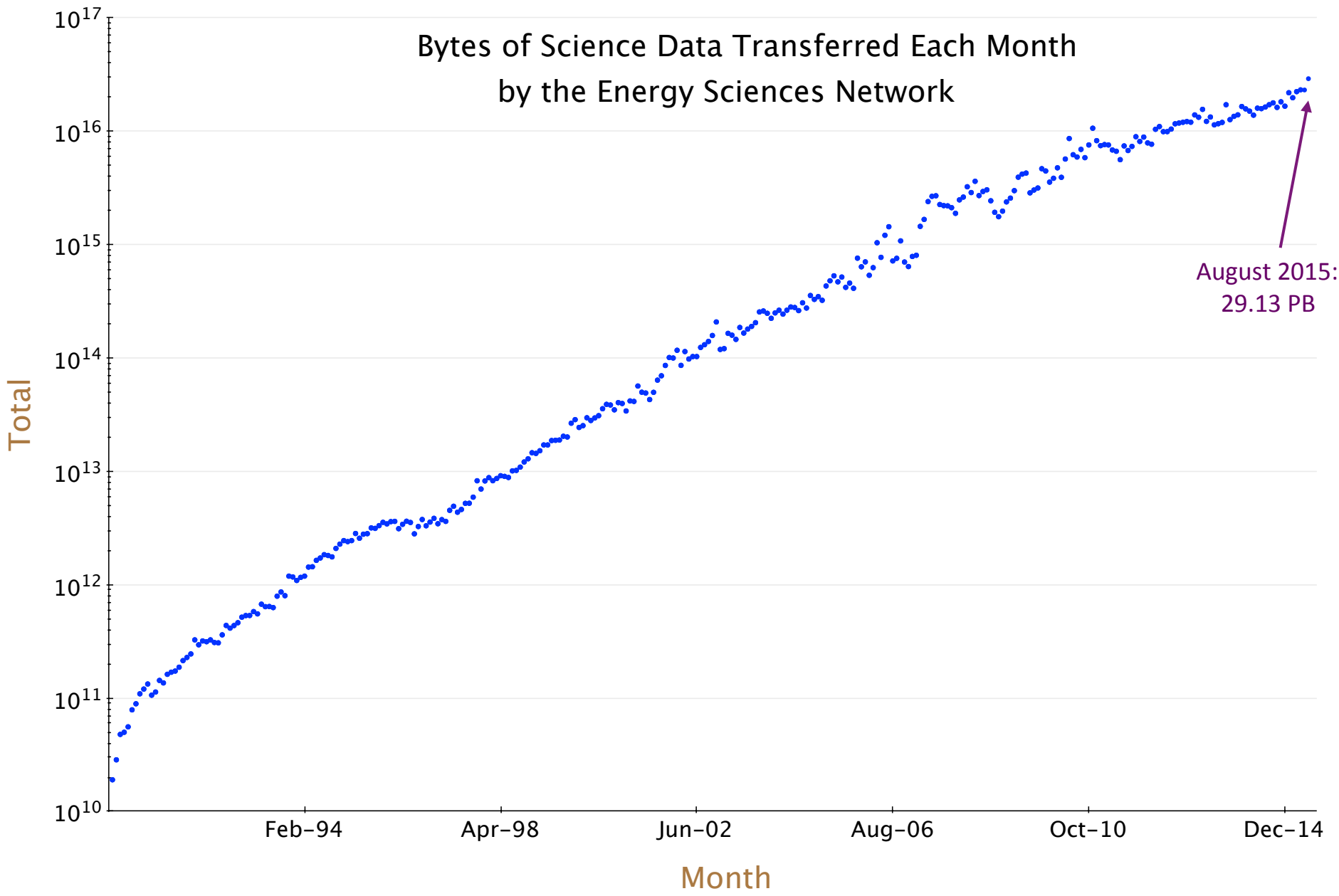|		
● ESnet Site	━━ 100G	▇ >=50 Gbps	▇ 2 - 5
○ Hub	━ 10G	▇ 20 - 50	▇ 1 - 2
	— 1G	▇ 10 - 20	▇ 0 - 1
	· < 1G	▇ 5 - 10	

■ OSCARS ■ Total

Bytes of Science Data Transferred Each Month
by the Energy Sciences Network
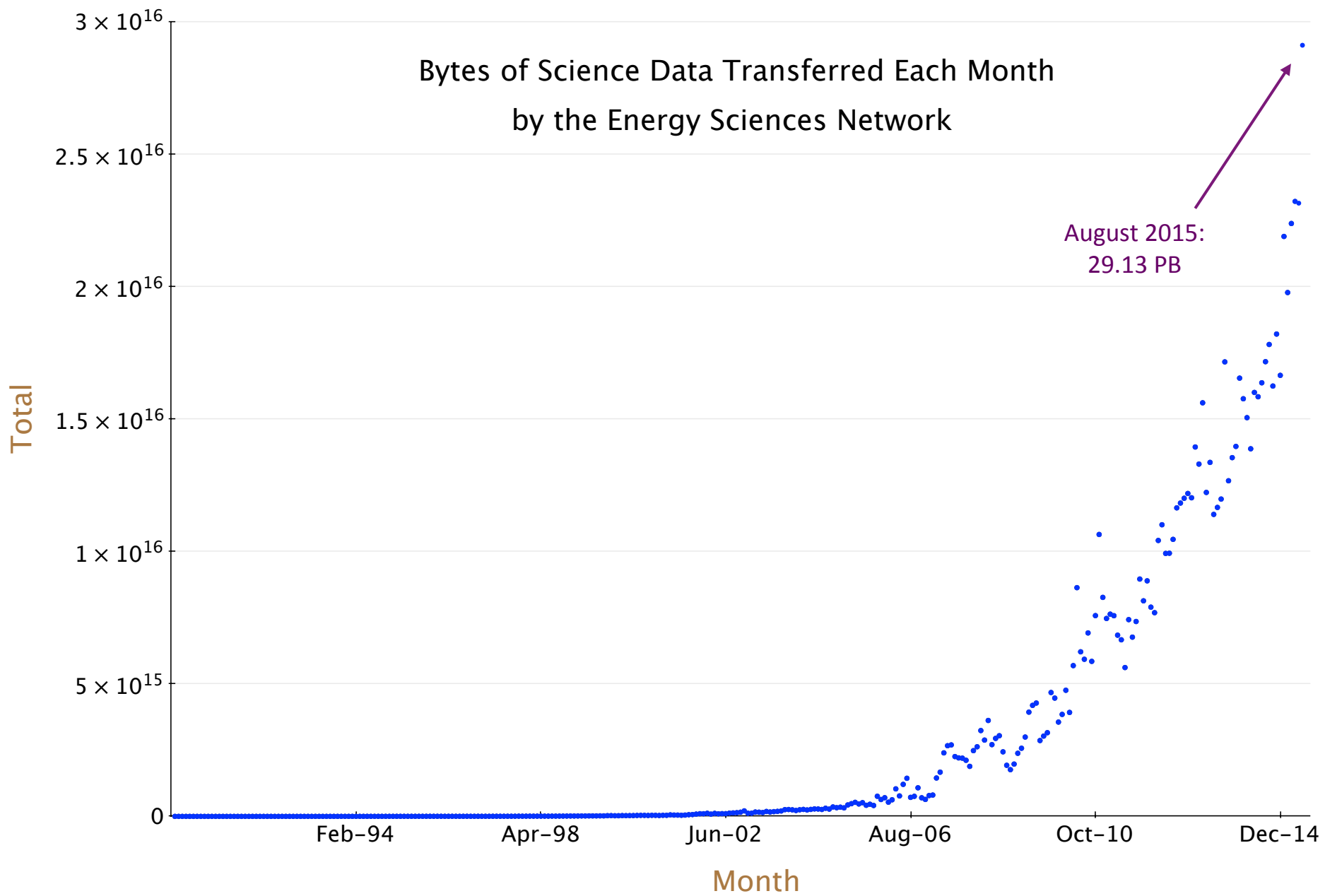
August 2015:
29.13 PB

Bytes of Science Data Transferred Each Month
by the Energy Sciences Network

August 2015:
29.13 PB

New feature for my.es.net portal: monthly traffic volume, including LHCONE.

Traffic Volume
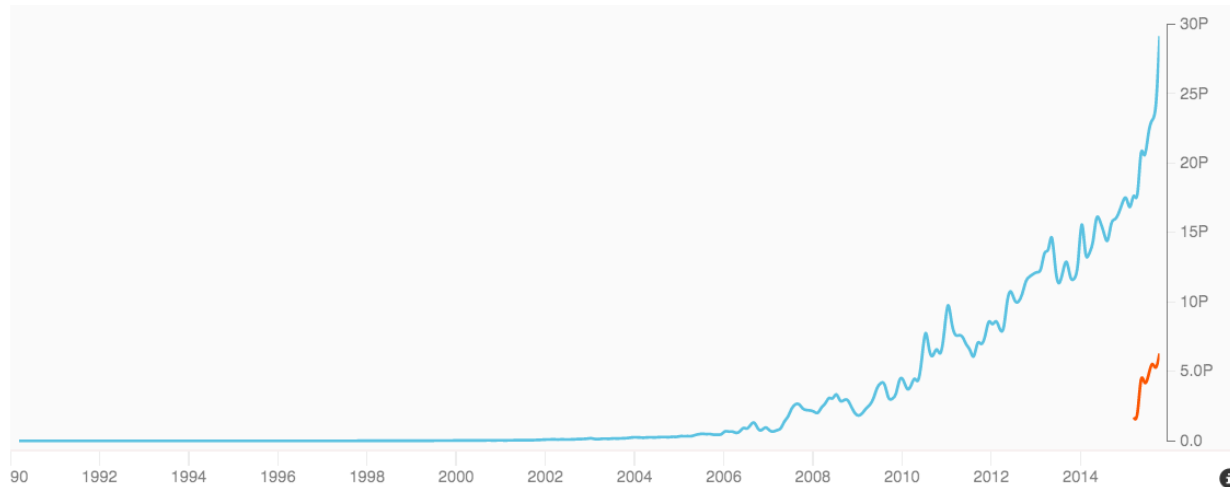
	Bytes	Percent of Total	One Month Change	One Year Change
bnl(as43) 100ge site_conn-l_v4_vrf-lhcone intercloud aofa-cr5 111-4_2_1-3900 `lhcone`	1.08 PB	3.69%	+38.1%	+22.1%
geant(as20965) 100ge v4v6_l3vpn-lhcone int-intercloud cern-513-cr5 111-4_1_1-111 `lhcone`	563.41 TB	1.93%	+38.0%	-
internet2(as11537) 100ge(vlan) manlan_lhcone ren-intercloud aofa-cr5 111-2_1_1-2001 `lhcone`	541.79 TB	1.86%	+27.1%	+66.8%

Our portal components are now available for anyone to use.

- Four libraries open-sourced, code available at ESnet github
  - Pond (http://software.es.net/pond/#/)
    - Provides consistent and basic timeseries functionality for communication of data between the various components of ESnet tools
  - Charts (http://software.es.net/react-timeseries-charts/#/)
    - A set of modular charting components used for building flexible interactive charts
  - Network Diagrams (http://software.es.net/react-network-diagrams/#/)
    - Ability to create network maps like the front page of my.es.net

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perfSONAR 3.5 released today!

- Main themes:
  - Modernized user interfaces
  - Support for central host management and node auto-configuration
  - Support for Debian, VMs, and other installation options
  - Support for low cost, 1Gbps nodes
- This collaboration has great energy: ESnet, Internet2, Indiana University, GÉANT

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Our new home (starting December):

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And the view (please come visit)!

A reminder of our vision:

Scientific progress will be **completely unconstrained** by the physical location of instruments, people, computational resources, or data.

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Questions?

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