



ESnet Science Engagement ESnet Site Ambassadors

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ESnet

February 25, 2014





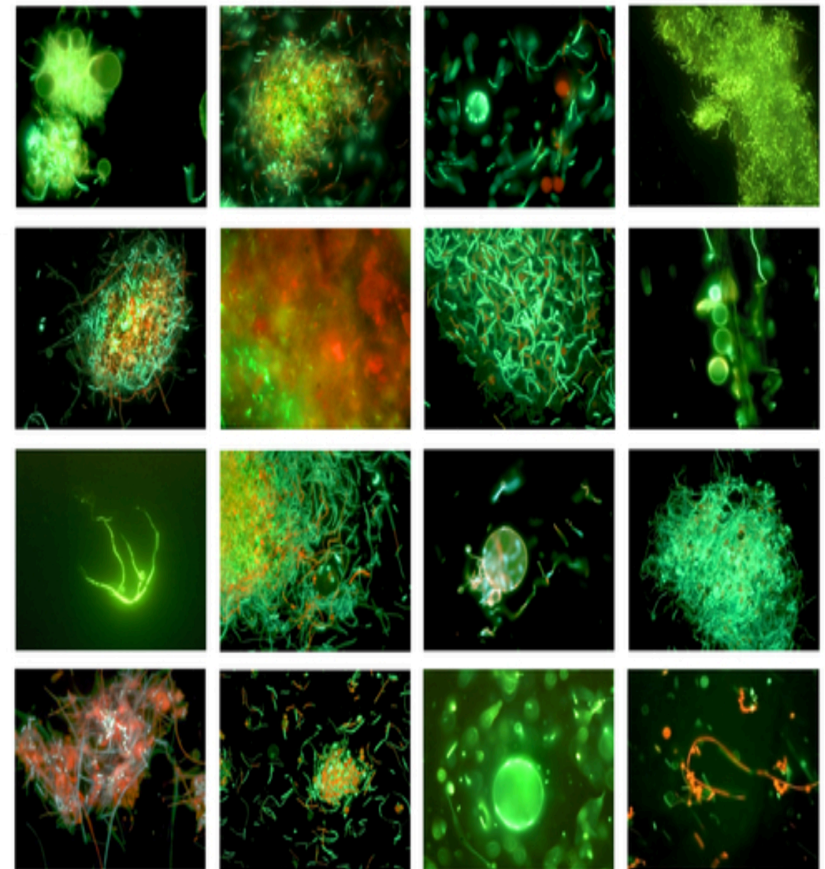
Presentation Outline

- Science Engagement Context Setting
- The Capability Gap
- ESnet Science Engagement Strategy
- Success stories
- Ambassador Program Overview
- Engagement and Ambassador collaboration, thus far
- Questions?

Context Setting

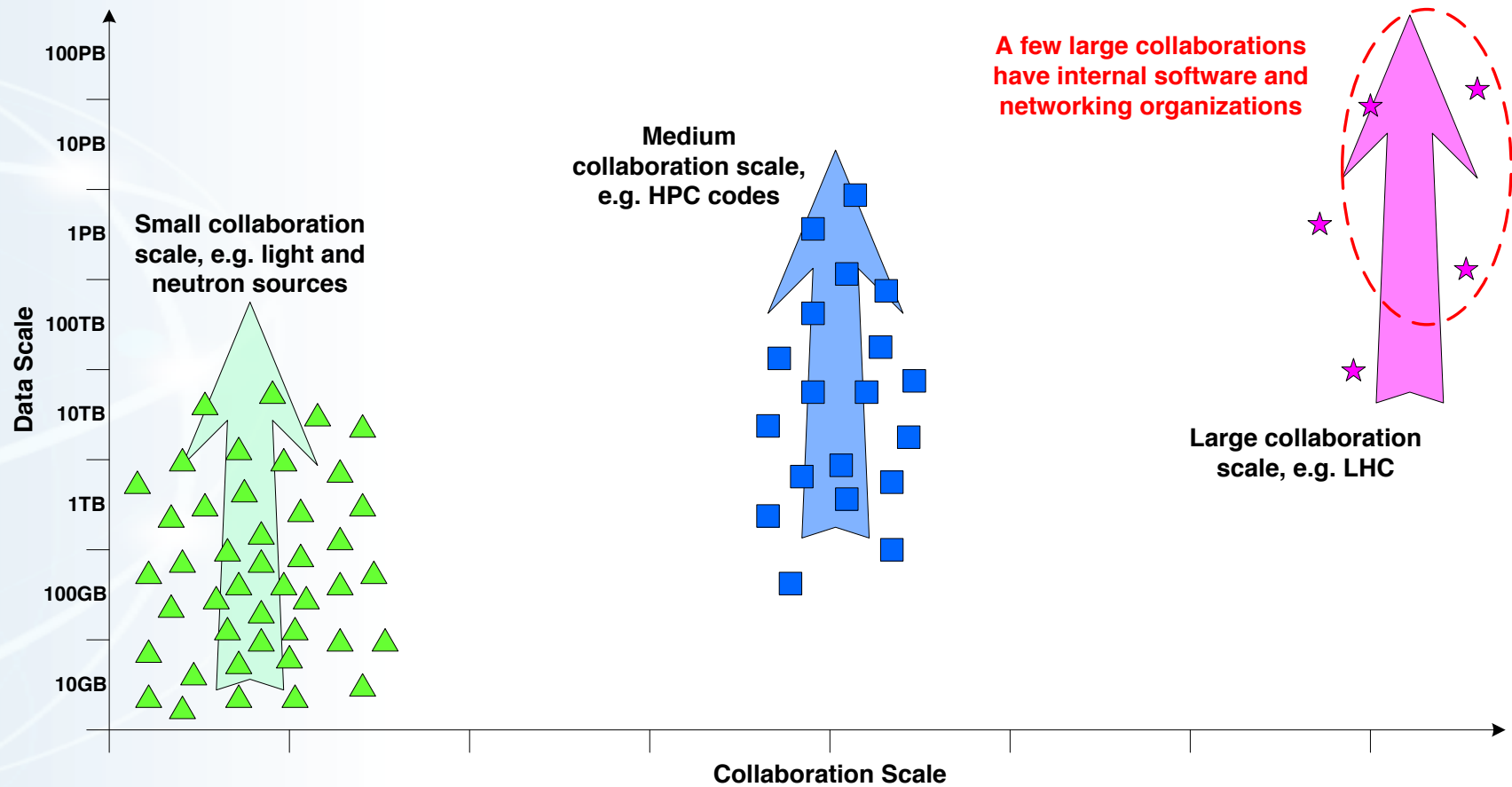


- DOE is investing tens to hundreds of millions of dollars in state-of-the-art cyberinfrastructure to support data-intensive science
- Most researchers do not understand the value of these services and have difficulty using them.
- A proactive effort is needed to drive adoption and accelerate science output



2/25/14 photo courtesy of LBNL, JGI collage poster of 16 photos from Yellowstone Hot Pool Microbes Joint Genome Institute (JGI)

Focusing our efforts

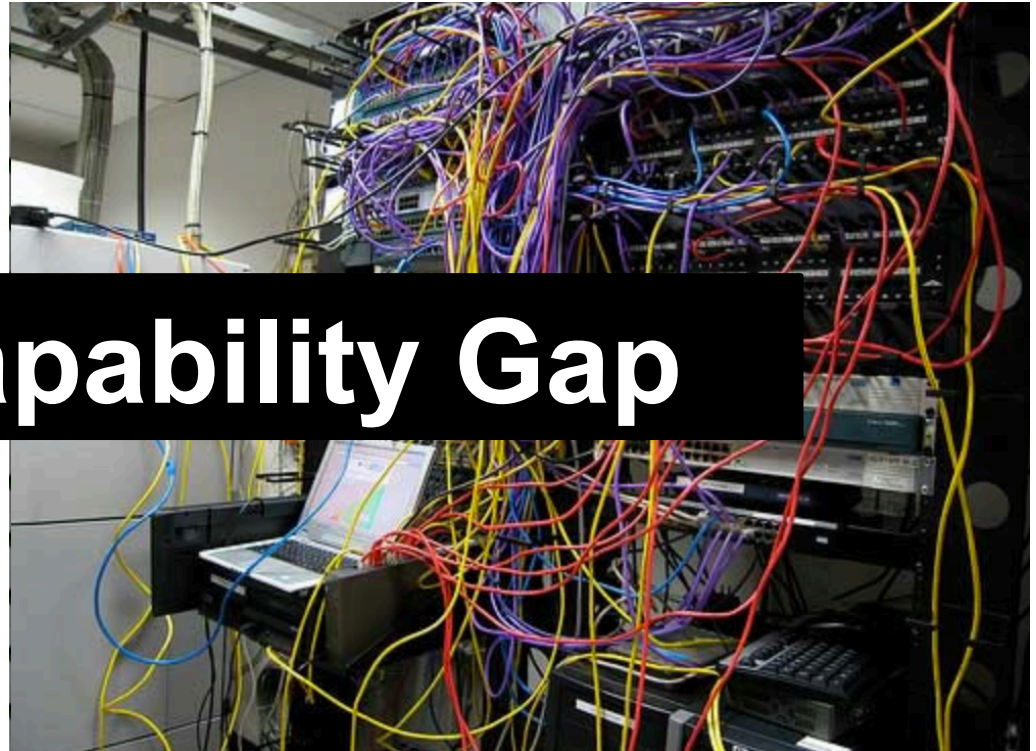


Challenges to Network Adoption



- Causes of performance issues are complicated for users.
- Lack of IT expertise within a science collaboration or experimental facility
- User's performance are low ("Too slow", "I tried it and it didn't work").
- Cultural change is hard ("we've always shipped disks!").
- Scientists want to do science not IT support

The Capability Gap



The Capability Gap



Excerpt from a recent email between an ALS Beamline Scientist and ESnet Engagement describing a particular university user's perceptions:

From the user:

"So, my question is, do you think that I need to set up my computer for Globus if we are downloading our data and then doing all of our work on our local machines? I am so pressed for time that I do not want to go through that whole process if we only need it for a day or so"

From the beamline scientist:

"This user is in the Bay Area, and has spent many days in the past making special trips up [to LBNL] to the beamline to copy data, so the person knows what a pain that is. But apparently that pain is perceived by that user as preferable to the pain of setting up Globus."

Engagement Team Vision



Collaborations at every scale, in every domain, will have the **information and tools** they need to achieve maximum benefit from global networks.



ESnet Science Engagement Team



Lauren Rotman

Science Engagement Group Lead

*Engagement strategy, effort focus in national context,
cross-organizational and multi-agency work*

Eli Dart

Science Engagement Engineer

*Architecture, performance engineering, instruction,
multi-agency work*

Jason Zurawski

Science Engagement Engineer

*Architecture, performance engineering, instruction,
multi-agency work*

Mary Hester

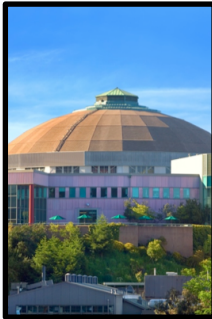
Science Engagement Coordinator

*Multi-disciplinary integration, international
coordination, communications, technical writing*



ENGAGE@ES.NET

ESnet Science Engagement Services



Partnerships

With facilities / research teams / providers, building foundation for lasting impact.



Education & Consulting

Webinars, workshops, 1:1 data mobility consultations with scientists, support teams.



Resources & Knowledgebase

Reference designs, case studies, papers, FAQs – tailored for multiple audiences.

Success stories: Partnership examples



Success stories: Education

The FTW logo is a green rounded rectangle with the text "[FTW]" in red, bold, sans-serif font.

[FTW]

Focused Technical Workshops

- Intends to bring together domain scientists with engineers for productive problem solving and dialogue
- In collaboration with Internet2

The OIN logo is a black rounded rectangle with the text "OIN" in white, sans-serif font.

OIN

Operating Innovative Networks Workshops

- Hands-on training for network engineers interested in deploying and supporting Science DMZ, perfSONAR and SDN
- In collaboration with Internet2, and IU GRNOC



SC13

- Science DMZ paper nominated for Best Paper
- Tutorial with Globus on Science DMZ and Globus Toolkit
- Hands-on perfSONAR Tutorial

The Webinar Series logo is a blue rounded rectangle with the text "http://www" in white, sans-serif font.

http://www

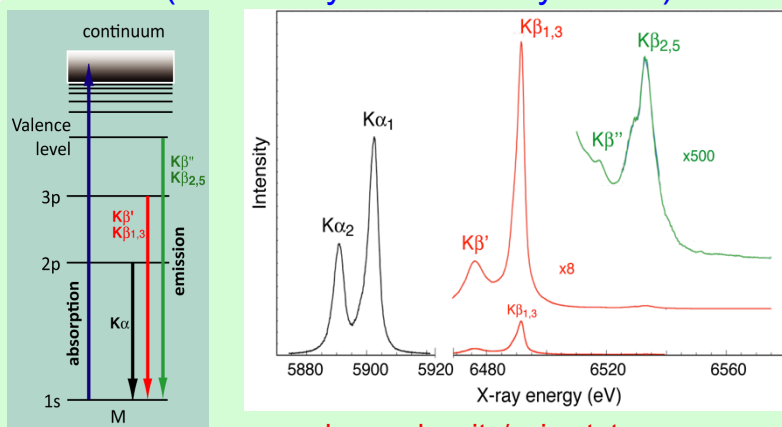
Webinar Series

- Host regular webinars on perfSONAR, Science DMZ and other data transfer topics focused for particular science domains

Success Stories: Science Workflow Consultation

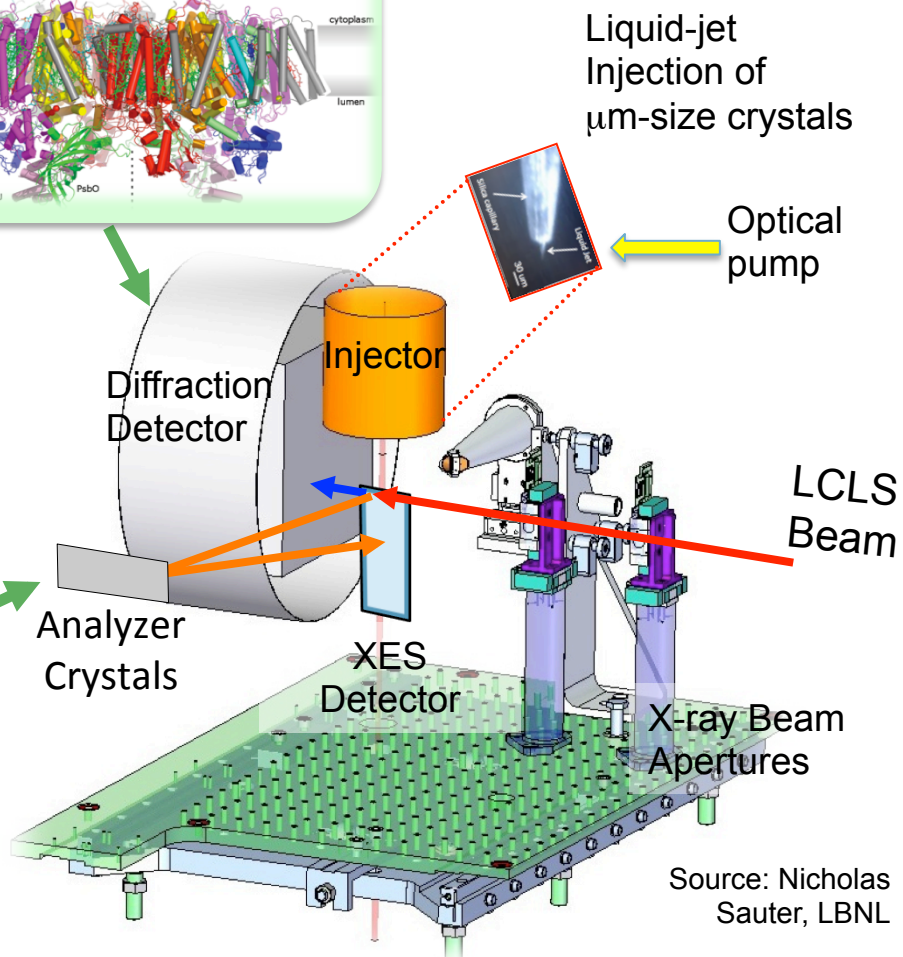
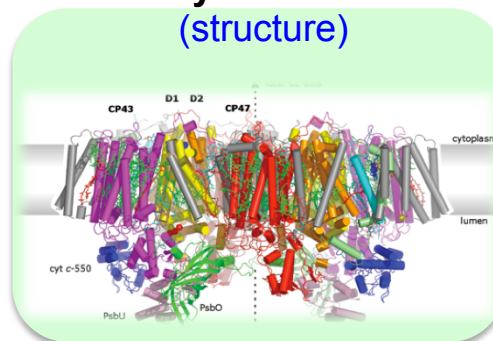
- Recent beam time on free-electron laser (LCLS) at SLAC to take ‘snapshots’ of catalytic reaction in Photosystem II (Nick Sauter et al).
- Data transported to a nearby HPC resource (NERSC) for real-time computational analysis.
- This one experiment *tripled* NERSC’s network utilization.

X-ray emission spectroscopy (Chemistry at the catalytic site)



- charge density/spin state
- ligand environment

X-ray diffraction (structure)



Source: Nicholas Sauter, LBNL

Kern et al (2012) PNAS 109: 9721
Sierra et al (2012) Acta Cryst D68: 1584
Mori et al (2012) PNAS 109: 19103

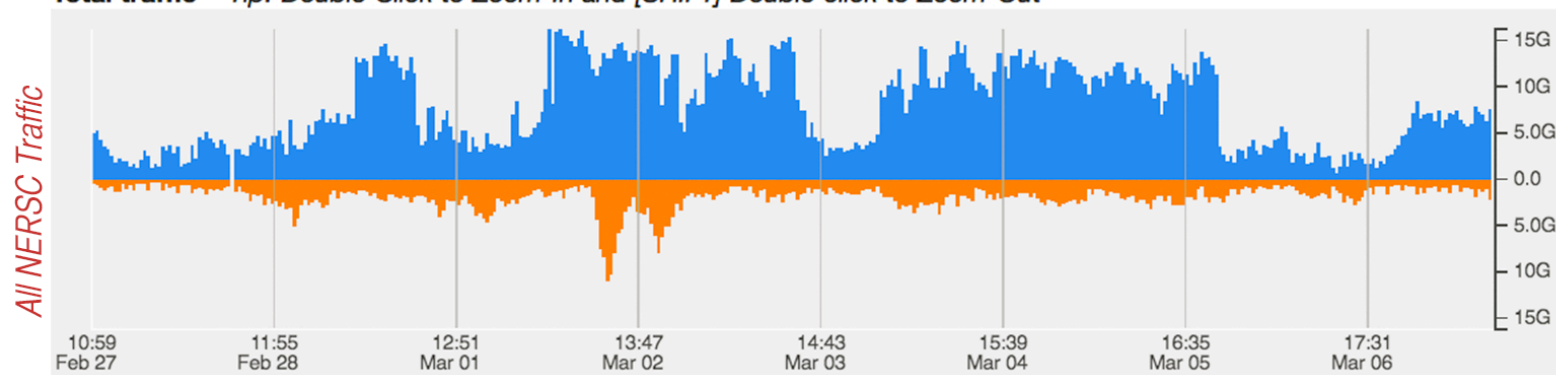
SLAC / LCLS → NERSC (<http://my.es.net>)



From : Wed Feb 27 10:59:00 2013 To : Thu Mar 7 10:59:00 2013

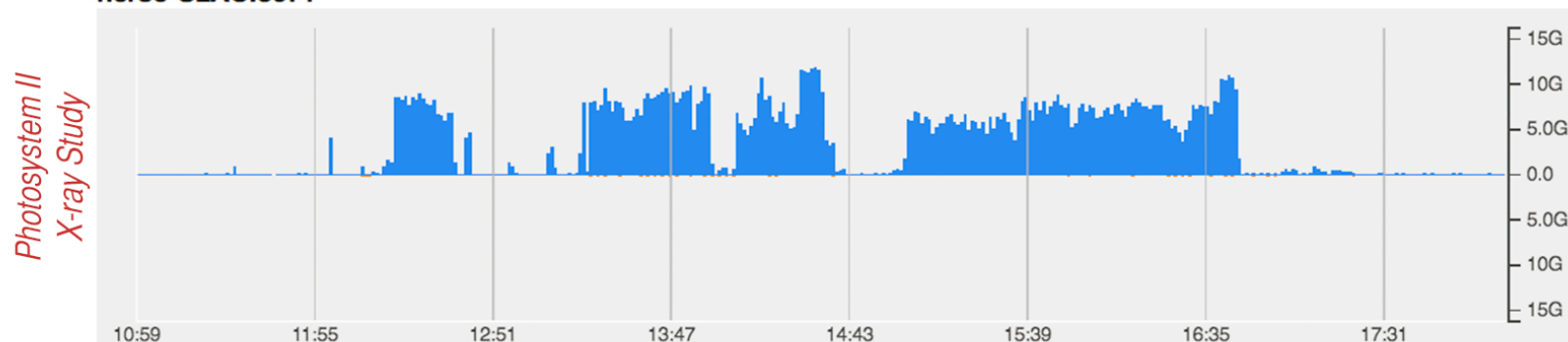
■ To site ■ From site

Total traffic *Tip: Double Click to Zoom-In and [SHIFT] Double click to Zoom-Out*

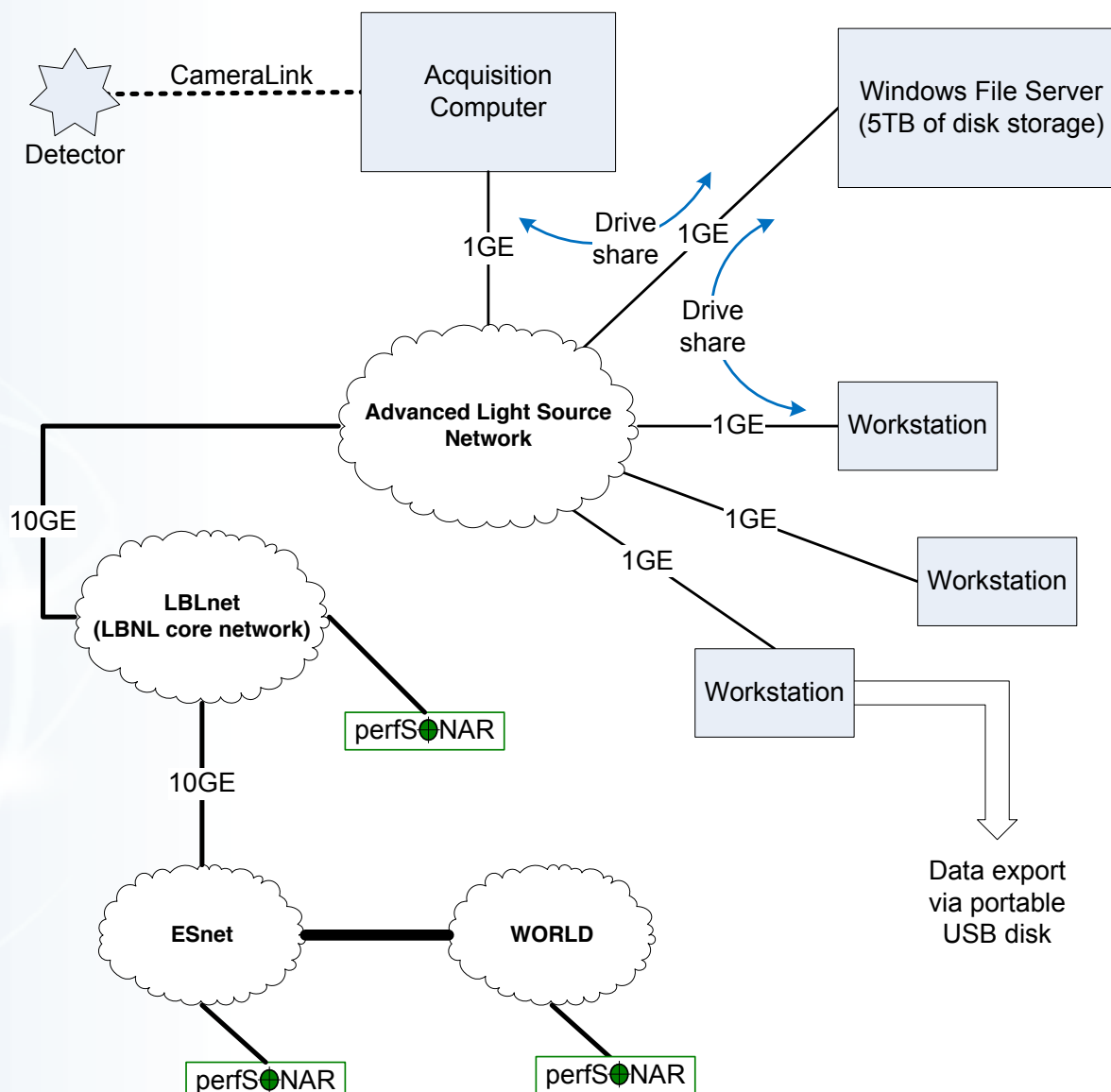


Traffic split by : 'Autonomous System (origin)'

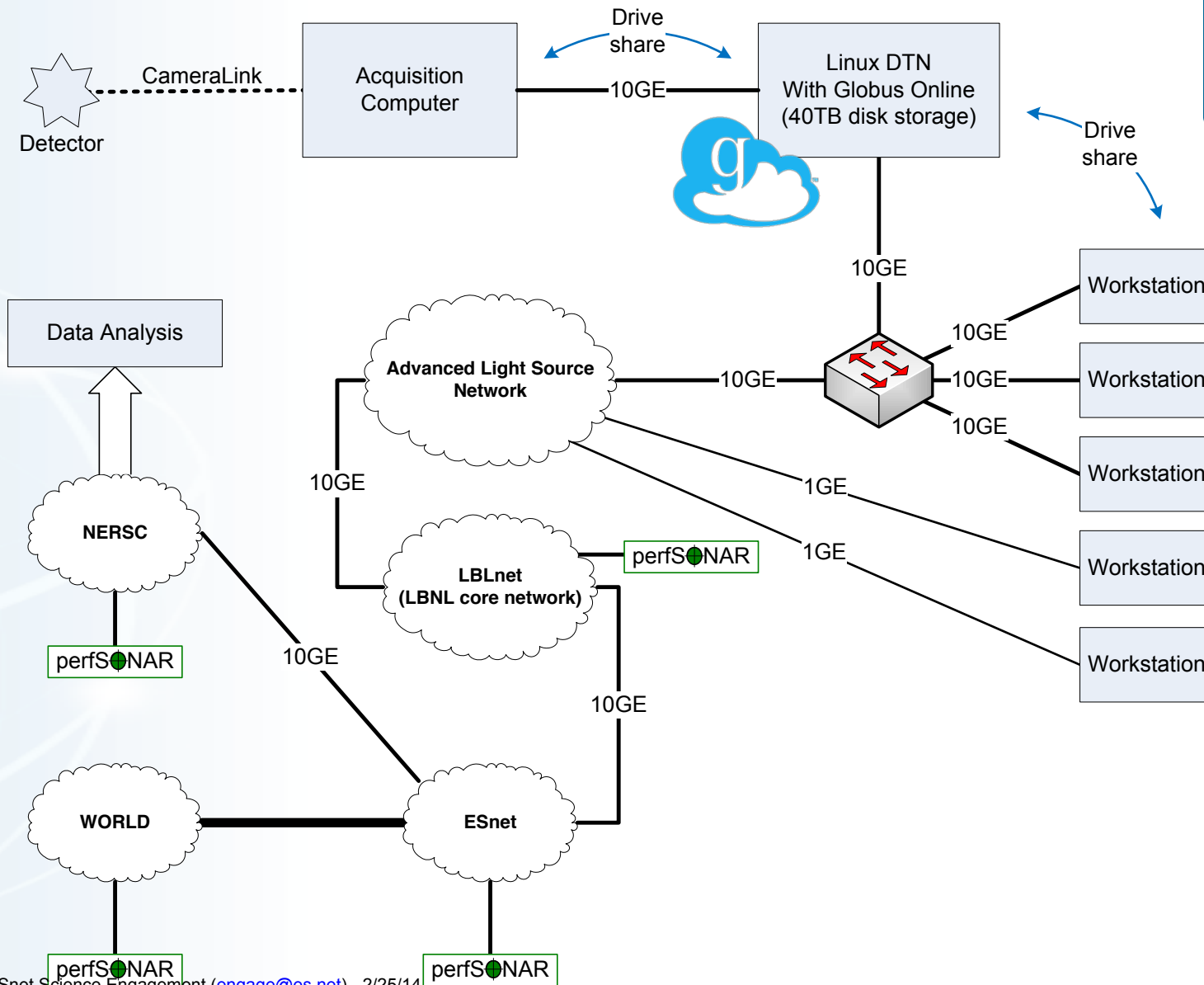
nersc-SLAC:3671



Success Stories: Science Workflow Consultation



Improved Workflow Infrastructure





Site Ambassadors



Recap: ESnet5 Transformation

ESnet4 → ESnet5 transition was during “changing of the guard”

- Jim and JoeB. Retired
- Mike Bennett was recently hired
- Site and network architecture changed, dark fiber etc....

That led to the realization (with some healthy feedback)

- Lack of information going to the site coordinators
- Assumption that ESCC presentations and site meetings were conveying enough bi-directional information not accurate
- Site coordinators were not reaching out (through routing or personal emails) to solicit information
 - And whether that was a good model anyway?

Brainstorming led to



NESG Site Ambassadors concept

One NESG Engineer assigned to a site

Responsibilities

- ***Understand***
 - Have understanding of the site's border architecture, requirements and network interface to the site
 - Periodic check-ins with the site coordinators at the discretion of both parties.
- ***Champion***
 - Raise awareness of issues and site requirements in internal discussions
- ***Shepherd***
 - Pursue issues till resolved, gather more information from the site if needed
 - Does NOT mean each site issue will be assigned to the ambassador
 - Watching out for site issues, and being a resource to the person that is assigned the task is the main responsibility
- ***Assist***
 - Interface with Science Engagement team to deal with performance issues or interact with requirements to understand site capacity requirements

Works closely with the O&D Site Ambassador



What are the check-in meetings?

- Check-in meetings
 - Phone call, video call, or face-to-face (if warranted),
 - typically between ESCC meetings
 - Interaction is between network engineer(s) and site coordinator
 - Intended purpose is to communicate changes
 - Network plans
 - Look for opportunities for improvement
 - » Increased bandwidth
 - » Improved resiliency
 - » Reduce costs
- Feedback is welcome
 - We're still figuring out what's the best approach
 - Sounds like periodic check-ins are desirable



How are our groups different?

In case there's any confusion regarding to roles of Site Ambassador and Science Engagement team

- Science Engagement Team deals primarily with the *scientists*
- Science Engagement Team activities include gathering requirements (from the *scientists*), promoting architecture conducive to high-speed science data transfer (science DMZ), and educating the users
- The duration of the problems are days-months
- Site Ambassador deals primarily with the *site coordinator and authorized technical contacts*
- Duration of problems is shorter (hours-weeks)



Engagement Activity With Sites

Science DMZ deployments, configurations, tuning, etc.

- GA
- LLNL
- PPPL

Upgrades to support scientific workflows

- Las Vegas

Ongoing performance enhancement work

- ANL
- JGI
- LBL
- NERSC
- PNNL



Questions? Discussion?

February 25, 2014



Back-up





Who are the Site Ambassadors?

Mike O'Connor

- Brookhaven National Laboratory
- Princeton Plasma Physics Laboratory
- MIT Laboratory for Nuclear Science
- MIT Plasma Science & Fusion Center
- DOE Forrestal
- Thomas Jefferson National Accelerator Lab



Who are the Site Ambassadors?

Vangelis Chaniotakis

- Sandia National Laboratory Albuquerque
- Sandia National Laboratories DC Office
- DOE-ALBQ (Sandia) (NNSA)
- Lawrence Livermore National Lab DC Office
- Pantex Plant
- DOE NNSA



Who are the Site Ambassadors?

David Mitchell

- Kansas City Plant
- KCP Albuquerque
- DOE IN Rocky Mountain Site
- Sandia National Laboratory - New Mexico NGA
- NGA Southwest / White Sands
- NNSA Information Assurance Response Center
- National Renewable Energy Laboratory

Who are the Site Ambassadors?



Chris Tracy

- National Energy Research Scientific Computing Center
- Lawrence Berkeley National Lab
- Joint Genome Institute
- DOE Germantown



Who are the Site Ambassadors?

Patrick Dorn

- Argonne National Laboratory
- DOE Office of Environmental Management at Savannah River
- East Tennessee Technology Park
- CERN¹

¹ Pending ESnet European Extension (EEX) project approval



Who are the Site Ambassadors?

Nick Buraglio

- Oak Ridge National Laboratory
- Oak Ridge Associated Universities
- Savannah River Ecology Laboratory
- Savannah River Site
- Y-12 National Security Complex



Who are the Site Ambassadors?

Joe Metzger

- Fermilab
- Ames Laboratory
- Los Alamos National Lab DC Field Office
- Los Alamos National Laboratory



Who are the Site Ambassadors?

Michael Sinatra

- Stanford Linear Accelerator Center
- Naval Postgraduate School
- General Atomics
- NSTec National Securities Technology
- NGA Nevada Intelligence Center



Who are the Site Ambassadors?

Chin Guok

- Pacific Northwest National Laboratory
- LIGO Hanford Washington Observatory
- Mathematical Sciences Research Institute



Who are the Site Ambassadors?

Yvonne Hines

- Lawrence Livermore National Laboratory
- Sandia National Laboratory Livermore
- Idaho National Laboratory
- Office of Scientific and Technical Information