



ESnet

ENERGY SCIENCES NETWORK

SIG-NOC Flash Presentation: ESnet NOC

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CSUC
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U.S. DEPARTMENT OF
ENERGY
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What is ESnet

- United States Department of Energy dedicated science network
- Funded by the DOE Office of Science
- ESnet is managed and operated by the Scientific Networking Division at Lawrence Berkeley National Laboratory
- <https://www.es.net>



Network

- **Optical:**
 - Ciena optical layer on (mostly) Level3 (now CenturyLink) fiber
 - Shared with Internet2
 - Fiber, Ciena chassis and commons are shared. ESnet and I2 each have their own transponders.
 - Infinera ring connecting Brookhaven National Lab (BNL) in Long Island
- **Routing:**
 - Nokia (ALU) 7750SR routers at all core / hub sites for 100G and 10G.
 - Juniper EX switches for 1G connections
 - Juniper MX routers at some older and/or smaller locations.
- **Services:**
 - Global IP routing service (includes commodity)
 - Point-to-point virtual circuits (OSCARS)
 - LHCONE layer 3 VRF
 - Several layer 2 VPLS services

NOC Structure

- The ESnet NOC is manned 24x7
 - shared with National Energy Research Scientific Computing Center (NERSC)
 - (almost) always one operator on duty dedicated to ESnet
 - Monitors ESnet layer 2 and layer 3 equipment along with ESnet server infrastructure.
 - Handles inbound email and phone calls to ESnet NOC.
 - Prepares and sends maintenance and outage notifications to ESnet sites and other constituents.
- Shared Optical Infrastructure
 - NOC operations are handled by GlobalNOC in cooperation with Level3 (now CenturyLink)
- Long Island Infinera equipment
 - NOC operations handled by Level3 professional services
- Escalation and On-Call
 - Two ESnet engineers available for escalation with a weekly rotation



NOC Tools

- **Monitoring**
 - CA Spectrum for routers, switches, etc.
 - Opsview Nagios for server infrastructure
 - Infinera DNA and Ciena OneControl
 - syslog
- **Others**
 - ServiceNow for ticketing
 - Maintenance calendar and notifications via in-house tool 'PMC'
 - Contact and circuit database via in-house tool 'ESDB'

NOC Communication

- **Internal communication**
 - Slack is the primary communication tool between Operators and Engineers
 - Secondary communication via phone (especially off-hours) and email
- **External communication**
 - Email is the primary communication method.
 - Except for carriers who still prefer the phone
- **Contact Information**
 - Stored in in-house web-based tool 'ESDB'
 - Includes information on sites (i.e. customers), peers, circuit providers, etc.

Documentation

- Wiki and ESDB
 - ESDB for contact and circuit information.
 - Wiki for procedures, diagrams, etc.
 - Wiki is Atlassian Confluence
- Wiki Structure
 - Operations
 - General Procedures
 - Things useful in multiple situations like router commands, sending notifications
 - Specific Operating Procedures (SOP)
 - Procedures for specific types of events (chassis down, circuit down)
 - Networking (i.e. Engineering Docs)
 - As-builts (maps, diagrams, configs)
 - Vendors (vendor-specific docs)
 - Monitoring and management
 - Ports to Protocols (docs roughly by layer)
 - Organizational docs (group information)

Questions?

