OSG Area Coordinators

Network Monitoring Update: **March 30 2016**

Shawn McKee

Networking Area Goals Year 4

- We will put the OSG network datastore into production. Data from all registered perfSONAR instances in OSG and WLCG will be continuously gathered and reliably stored.
  - **Done as of September 14, 2015 and announced.**
- The USATLAS and USCMS sites will be used to demonstrate a robust network monitoring infrastructure from OSG. We will use the data collected to identify networking issues between USATLAS and/or USCMS sites and document how we resolve those issues.
  - **In progress (80%), more later on alerting and engaging**
- We will produce Release 1.0 of the datastore API providing access to all the perfSONAR metrics we gather: traceroute, bandwidth, latency and packet-loss. In addition this API may contain additional derived and transformed data as requested by our client users.
  - **In progress (75%).** Starting from Esmond. Publishing to **AMQ**
  - **What use-cases are not (yet) well served by current API?**

Networking Stretch Goals Year 4

- We will create a network cost-matrix (rows: sources, columns: destinations) containing estimated bandwidth values between our USATLAS and USCMS sites.
  - **In progress (70%):** Jorge Batista and Ilija Vukotic are working with me on producing a bandwidth estimate using Mathis's Formula (which relates packet-loss and round-trip-time to bandwidth).
- We will prototype various alarming and alerting components for use in OSG
  - **35% Options being thought out in the PuNDIT satellite project and MadAlert.**
  - **NEW: Implementing Check_MK/OMD rule-based notifications in progress**

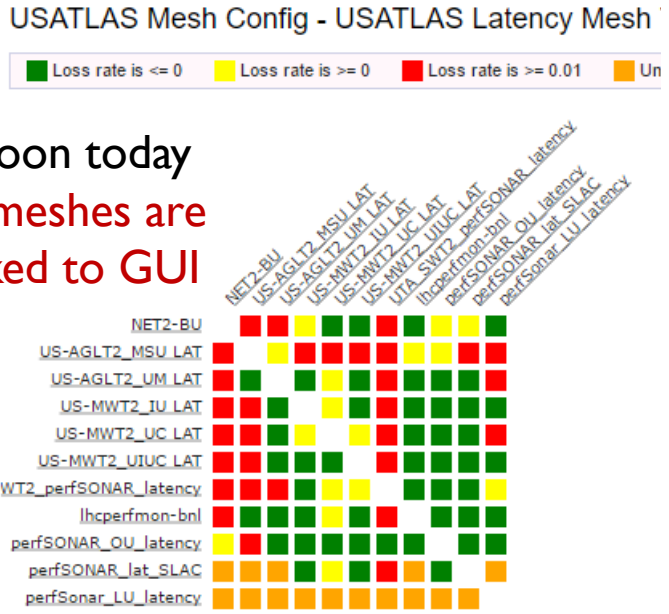
Key Initiatives in Network Area

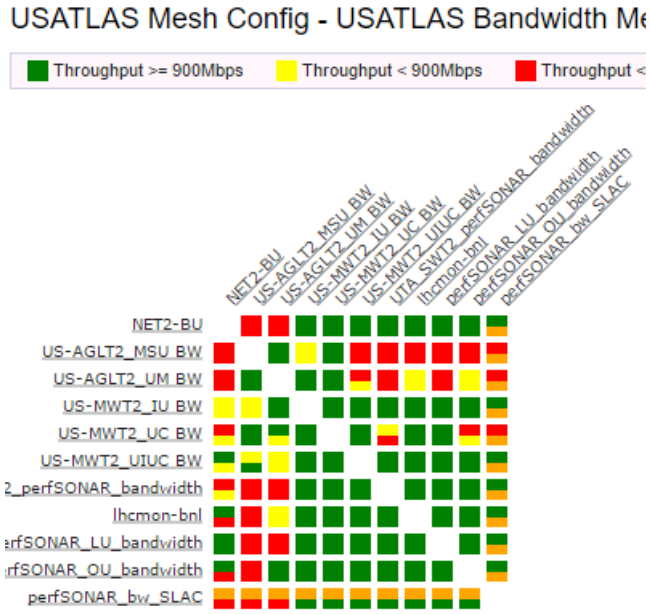
- Improving perfSONAR-PS toolkit for OSG
  - Track adoption at http://grid-monitoring.cern.ch/perfsonar_coverage.txt
  - Mesh-config standalone from Soichi in final testing
- OSG dashboard service / OSG network service
  - Has been operating OK in the last few weeks.
  - Latency of results is a concern (time to show up in mesh) but depends upon use-cases
- Outreach and community interaction
  - Working with WLCG on new networking initiatives
  - CHEP abstract submitted, HEPiX presentation in April
  - Presentation at the All-hands meeting
  - Ongoing meetings/interactions with perfSONAR developers (Shawn attends weekly meetings)

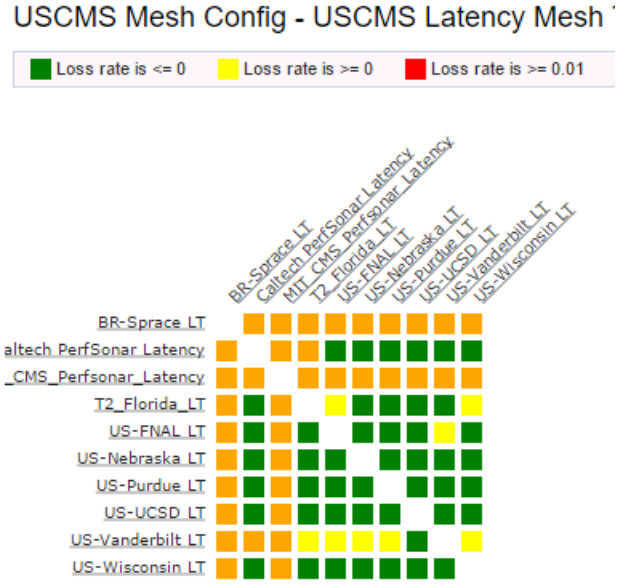
Mesh Status: USATLAS & USCMS

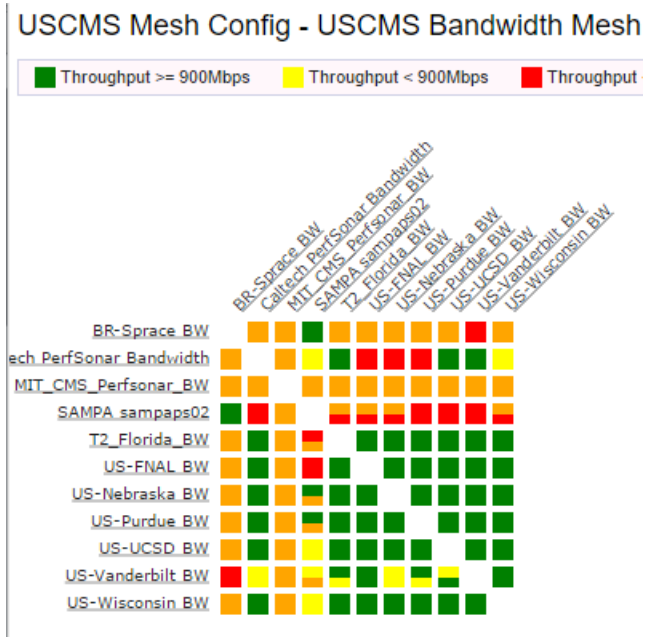
From ~noon today

Latency meshes are hyperlinked to GUI









Recent Accomplishments

- Analytics platform with perfSONAR data deployed and operating. Used by ATLAS and LHCb so far
  - http://cl-analytics.mwt2.org:5601
- Soichi has finalized beta version of new mesh-config
- Documentation updates for v3.5.1 released March 3, clarifications and updates to the OSG datastore operations guide
- Debugging various networking issues
  - Problems between CERN and Portugal Tier-1 used perfSONAR to identify overloaded link. Fixed: adding 10G
  - Problems getting data to (US)CMS site in Brazil. Bad ESnet connection/route found and fixed
  - Problems from Caltech to FNAL under investigation (ticket included me yesterday).

Items Underway

- CHEP abstract submitted that will include OSG networking
- HEPiX presentation proposed for April meeting
- **Reorganization of WLCG related efforts at CERN**
  - New document proposing network related efforts being drafted
  - http://tinyurl.com/wlcg-net-plans
- Upcoming perfSONAR annual developers face-to-face meeting May 10-11
  - PuNDIT targeting initial version/demo then
- Revising the OSG/WLCG bandwidth testing
  - One big mesh with 28 day cadence will be redone to 2 (or more) meshes with 20 hour cadence
  - Need more timely bandwidth results.
  - Node services currently reset nightly which interferes with scheduling beyond >24 hours
- Soichi has a well developed standalone mesh-config being tested.
  - Will require a "private" lookup service for OSG and WCLG to allow controlled access to perfSONAR registration information
- Planning a new CLI tool to help debugging and diagnosis of network problems.
  - Will directly query perfSONAR toolkit MAs to extract additional details not currently stored in the central MA
  - Will automate "standard" data gathering that is currently tedious and error prone
  - Will also exercise our current API to the datastore
- **Alerting is the next big target**

Standalone Mesh-Config

- Soichi has an almost final version for testing at https://ps-test.sca.iu.edu/meshconfig/
- Can be installed outside OIM
  - Target is Universities or VOs who want to create and manage their own meshes
- OSG Goal is to replace the mesh-config currently in OIM. Soichi has provided a roadmap to operations
  - Uses information the toolkit publishes to the global perfSONAR lookup service
- **Complication** is that we need to make available "private" registration information in a perfSONAR lookup service…can't be "public"
  - Solution?: create a private version of the lookup service
  - Would need to be hosted somewhere; OSG?

Alerting on Obvious Problems

- As I have noted many times, alerting on potential network issues is fraught with many problems about **who to notify** and **when**
- The central OSG datastore is giving us measurements for all sites and paths, some of which have fairly clear indications of problems that are associated with specific sites
  - Sites having large packet loss to or from many other sites
  - Site experience low bandwidth to or from many other sites
- In these cases we would like to notify the specific "site" about the problem including
  - Information about the problem (why it is "bad")
  - Common causes of the problem (what to check)
  - Where to go for follow-on help
- We are working on augmenting our check_mk monitoring infrastructure to create contacts from perfSONAR emails and OIM and GOCDB emails
- Once suitable contacts are configured (and automatically updated when the sources change) we intend to enable "alert" emails for "obvious" problems
  - May take some tuning for when to send email and how often.

Top Concerns

- Using our data effectively. Now that we have a rich dataset we need to get problems found and fixed.
- Datastore infrastructure still not as reliable and responsive as we want it to be.
  - Monitoring needs tuning to better identify problems that impact the performance of the system
  - Reconfiguration to use SSDs still needs exploring
- Getting better engagement from US LHC sites. Need to work on likely network issues. **Goal is to use new alerting to help engage and motivate sites and users.**
- Address the data migration process.
  - How do we move "older" data off the primary system and onto a new location while retaining some means of access? Still waiting for process from ESnet…

Questions or Comments?

Thanks!

URLs of Relevance

- OSG Network Datastore Documents
  - Operations https://docs.google.com/document/d/11144BSo-88M0cLMMjKcKMIE-Q5s21X-w3IYI-0Pn_08/edit#
  - SLA https://twiki.grid.iu.edu/bin/view/Operations/PSServiceLevelAgreement
- Network Documentation https://www.opensciencegrid.org/bin/view/Documentation/NetworkingInOSG
- perfSONAR adoption tracking: http://grid-monitoring.cern.ch/perfsonar_coverage.txt
- Deployment documentation for both OSG and WLCG hosted in OSG (migrated from CERN)

  https://twiki.opensciencegrid.org/bin/view/Documentation/DeployperfSONAR
- ATLAS Analytics: http://cl-analytics.mwt2.org:5601/
- Mesh-config in OSG https://oim.grid.iu.edu/oim/meshconfig
- Beta Mesh-config: https://ps-test.sca.iu.edu/meshconfig/
- MadAlert: http://madalert.aglt2.org/madalert/diff.html
- perfSONAR homepage: http://www.perfsonar.net/