OSG Area Coordinators

Network Monitoring Update: **January 27 2016**

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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. (But issues…)**
- 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 (60%).** Problems with OU, Langston and UM identified and fixed using OSG perfSONAR dashboard and metrics. See concerns later
  - **Jan 22: ATLAS reported transfer problems between Germany and Canada, suspecting network issues. perfSONAR was used to identify a real network issue…fixed in 1 day by Canarie**
- 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 (55%).** Starting from Esmond. Publishing to **AMQ**
  - **Need to revisit in light of recent MQ interruptions.**

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 (60%):** 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
  - **15% Options being thought out. In the PuNDIT satellite project and MadAlert. Have Check_MK/OMD rule-based notifications too**

Key Initiatives in Network Area

- Improving perfSONAR-PS toolkit for OSG
  - Track adoption at http://grid-monitoring.cern.ch/perfsonar_coverage.txt
  - Soichi has well developed prototype of mesh-config
- OSG modular dashboard service / OSG network service
  - Lots of problems since start of 2016. Meeting today to discuss issues and solutions.
- Outreach and community interaction
  - Working with LHCb on integrating pS metrics.
  - Ongoing meetings/interactions with perfSONAR developers (Shawn attends weekly meetings)
  - PuNDIT testing on perfSONAR testbed in OSG.
  - ATLAS sites jamboree presentation tomorrow.

Recent Accomplishments

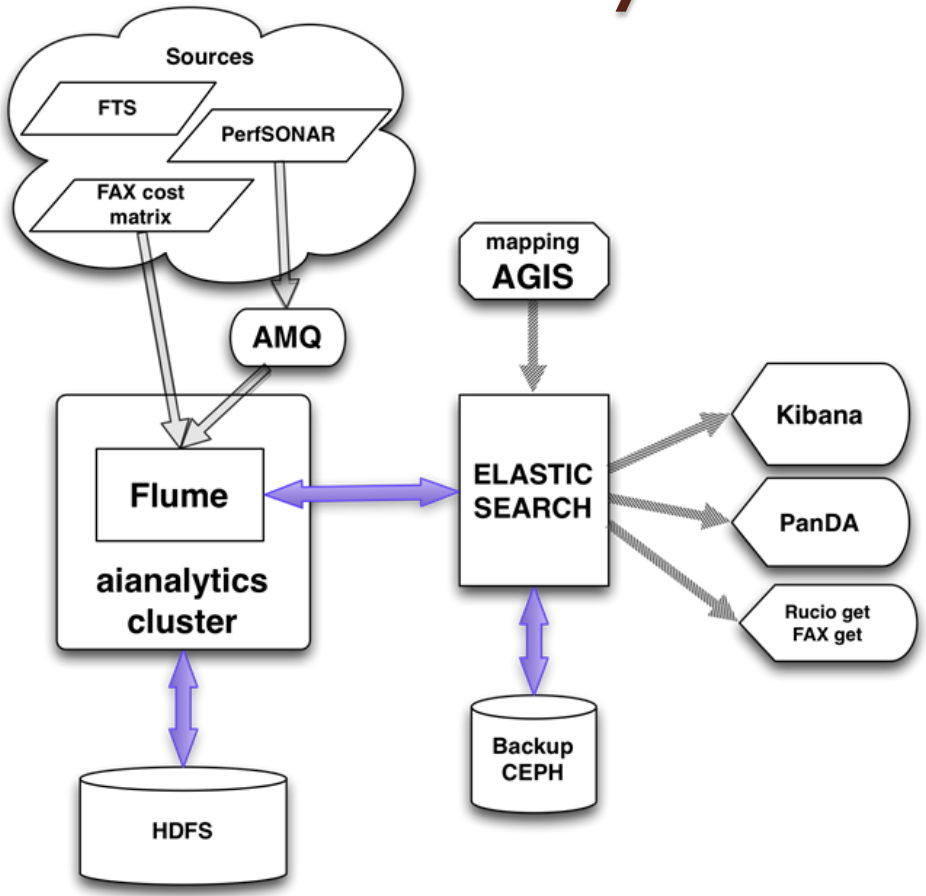
- MadAlert initial version ready : http://madalert.aglt2.org/madalert/index.html
- OSG perfSONAR published to CERN Active MQ bus being used by both ATLAS and LHCb
  - OSG perfSONAR data pipeline into ElasticSearch providing an Analytics Platform
  - http://cl-analytics.mwt2.org:5601
- Soichi has finalized beta version of new mesh-config
- Continued documentation updates for v3.5, network debugging and OSG datastore operations guide
- Improvements to OMD/Check_mk probes including a transition to ETF (WLCG Experiments Test Framework) are ready to start deploying.

Project Update: MadAlert

- Recap: Gabriele Carcassi (original author of GUMS) is working with me at Michigan on a new project for one of our OSG Networking Goals: alerting on problems
- Updates since last time
  - GUI improvements and fixed minor bugs
  - http://madalert.aglt2.org/madalert/diff.html
- Much to do to create an alerting system with proper notfications
  - Will be integrated with ESnet's next MaDDash

ATLAS perfSONAR Data Analytics

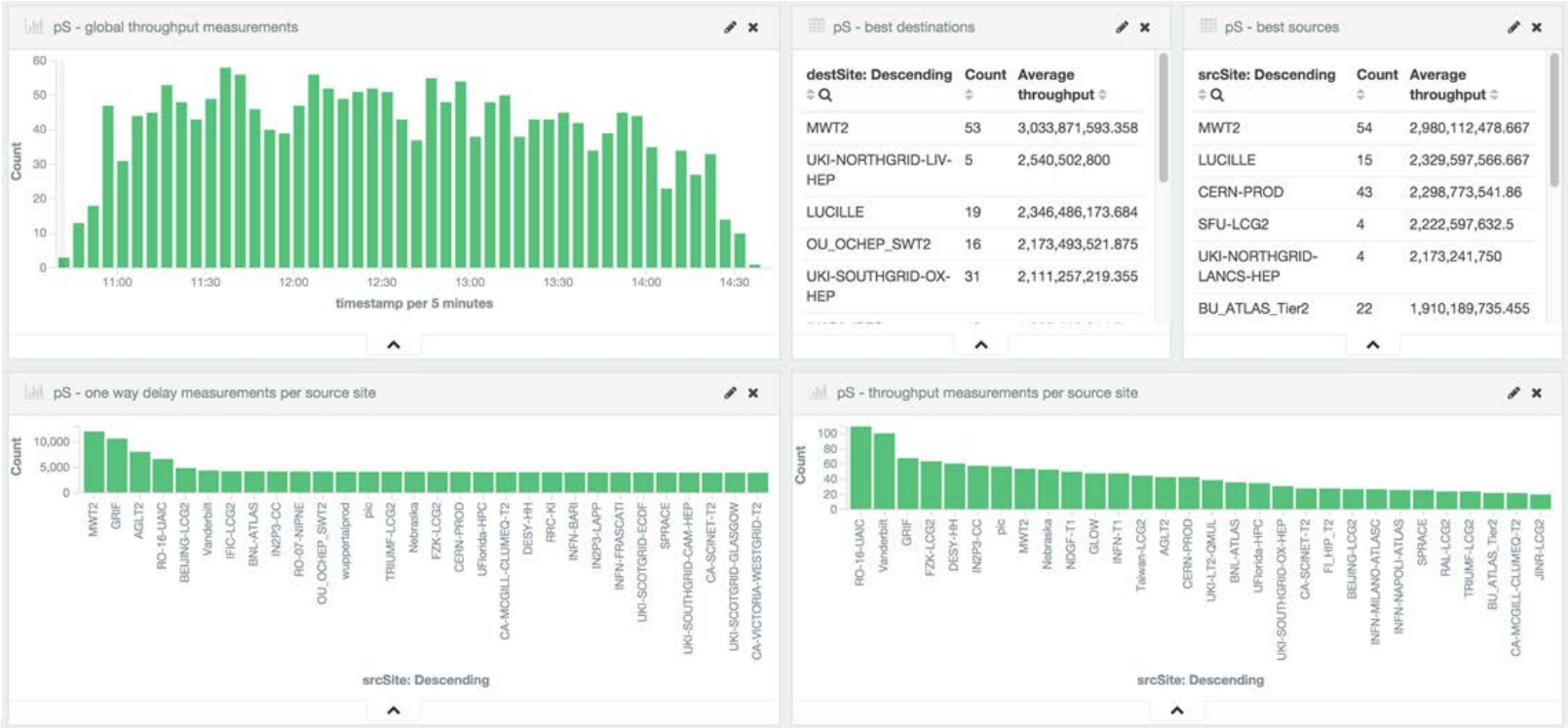
- Ilija Vukotic has ATLAS analytics pipeline using OSG network metrics in place



- See talk from today's throughput meeting https://docs.google.com/presentation/d/1hnKjcE3FJjgSHTFhM2XfVpASZRT4UsbdEiW5L0yEOCU/edit?usp=sharing

ElasticSearch Analytics

- Example for perfSONAR



http://cl-analytics.mwt2.org:5601/app/kibana#/dashboard/perfSONAR

New Standalone Mesh-Config

- Soichi, with debugging help from Andy Lake, Marian Babik and I, has prepared a new standalone mesh-config
  - 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

Known Issues in OSG Networking

- OSG datastore is too fragile.
  - Maintenance/reboots seem to break the system
  - Fixes are lost or not properly persisted
  - Problem diagnosis not very timely
  - Monitoring not sufficient to identify root causes
- Message bus pipeline interruptions can cause clients to lose data
  - If publishing stops for a while, clients can crash. When publishing restarts data can be missed.
- Recovery from datastore service interruptions takes too long. After extended downtime, querying for data from the downtime is taking longer than the downtime to catch up.

Top Concerns

- OSG Network Datastore is still primary concern
  - **Even though it is production, every time we make any change we seem to hit issues that require a bit of work to track-down and fix. Fixes aren't properly persisted?**
  - **Today's meeting is trying to address this**
  - **Adding additional check_mk monitoring should help**
  - **Deploy SSDs stragegically?**
  - **We need to also continue to update our living operations document: http://tinyurl.com/z7c9azb**
- Still pending: must 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? Waiting for process from Esnet…
- Getting better engagement from US LHC sites. Need to work on likely network issues but need some partners.

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/