OSG Area Coordinators

Network Monitoring Update: **August 16, 2017**

Shawn McKee

Open Science Grid

Status of Issues from Last Time

- Rebalancing of VM resources successful
  - Small tweaks to fix some remaining issues
- Successfully migrated mesh-configuration from MyOSG/OIM to the new standalone instance (http://meshconfig.grid.iu.edu)
  - URL redirection in place for toolkit instances using the old URL
  - Docs updated to point to new location
- The ETF monitoring instance has been updated and is working well

Open Science Grid

OSG Network Services Status

- Since the last meeting the OSG network services have been running well (mostly)
  - Some issues with RSV stopping mysteriously
  - Edgar couldn't find a root cause
  - Restart of rsv fixes the issue
- No significant other issues discovered and services are generally running well
  - Would like to maintain current status of 'non-production' until RSV issues are resolved and new data flow is in place and tested

Open Science Grid

perfSONAR Update Released

- Yesterday the perfSONAR developers release perfSONAR v4.0.1
    - This is a minor feature and bugfix release.
    - Sites with auto-updates enabled will automatically install the release sometime in the next few days
    - For a list of changes see https://www.perfsonar.net/release-notes/version-4-0-1/

- As of mid-day today about 15% of our instances had upgraded.
    - We expect ~80% to be upgraded in about 48 hours

Open Science Grid

Updated Documentation

- Our existing documentation at https://twiki.opensciencegrid.org/bin/view/Documentation/NetworkingInOSG has been revised
  - Streamlined
  - Updated for v4.0
- The perfSONAR developers provide excellent documentation on installation and configuration of perfSONAR
  - We pointed to that and provided details on the few specific things we need to worry about for OSG/WLCG installations
    - Firewalls configured allowing our access to the data
    - Configuration for auto-mesh and information about MCA
    - Information about OSG network services
    - Information about OSG and WLCG support
- Two reviewers of the docs suggested some updates…

Open Science Grid

Documentation Additions Planned

- Create a page discussing http and https requirements
  - The pscheduler now **requires** port 443 to be open between perfSONAR instances that test to one another
- Add some sections to cover important deployment options
  - Deployment models (VMS, containers, etc) and their pros/cons
  - Multiple NICs and their pros/cons
  - Requirements for bandwidth vs latency perfSONAR boxes
- Describe psetf (Experiments Testing Framework for perfSONAR; see https://psetf.grid.iu.edu/etf/check_mk/)
- Update the FAQ for new tests available in perfSONAR v4.x
- Augment troubleshooting information to enhance pS troubleshooting web page
- Create page on installation/upgrade to CentOS7 so users know they don't need to migrate their data
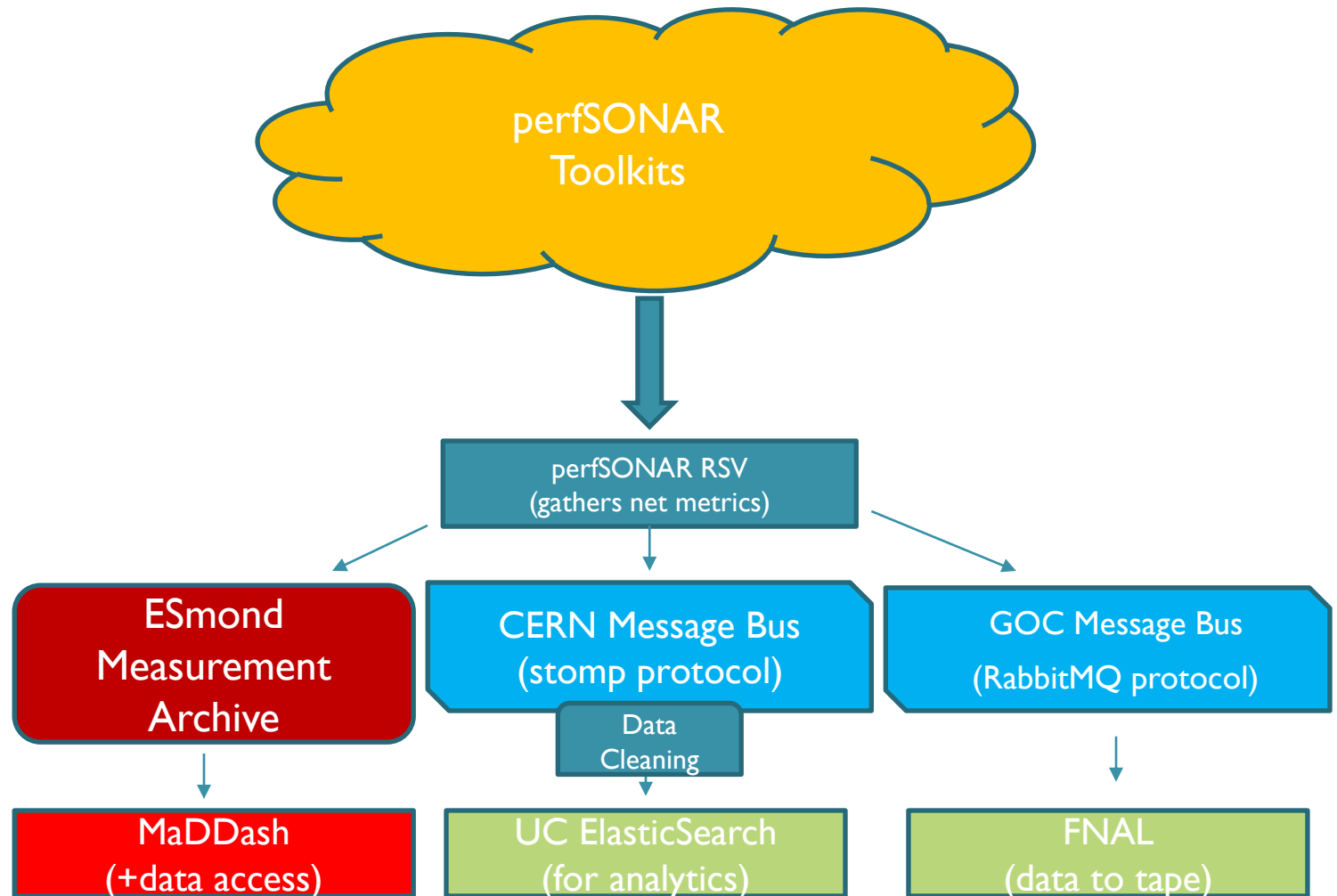- Refactor docs to provided a better detailed a step-by-step guide

Open Science Grid

Recent GGUS Network Tickets

- Contacted by CERN about Pakistan transfer issues
  - Transfer rates are ~< 2 Mbps
  - perfSONAR results showed problem was some kind of network shaper/limiter
- Lancaster – SARA (bad link on a LAG)
- Dubna – Moscow (Bad fiber identified)
- Transfer to Oxford (dCache issue)
- Brazil (CBPF) to elsewhere (MTU issue)

Open Science Grid

Action Items from the Retreat

- During the retreat we identified a few action items

    ◦ We wanted to start gathering the HTCondor Schedd network information

    ◦ We wanted to change the network data pipeline to ensure the critical services for OSG networking were within OSG control

    ◦ We will decrease our reliance on Esmond, keeping the current instance for only a few weeks of data (supports MaDDash)
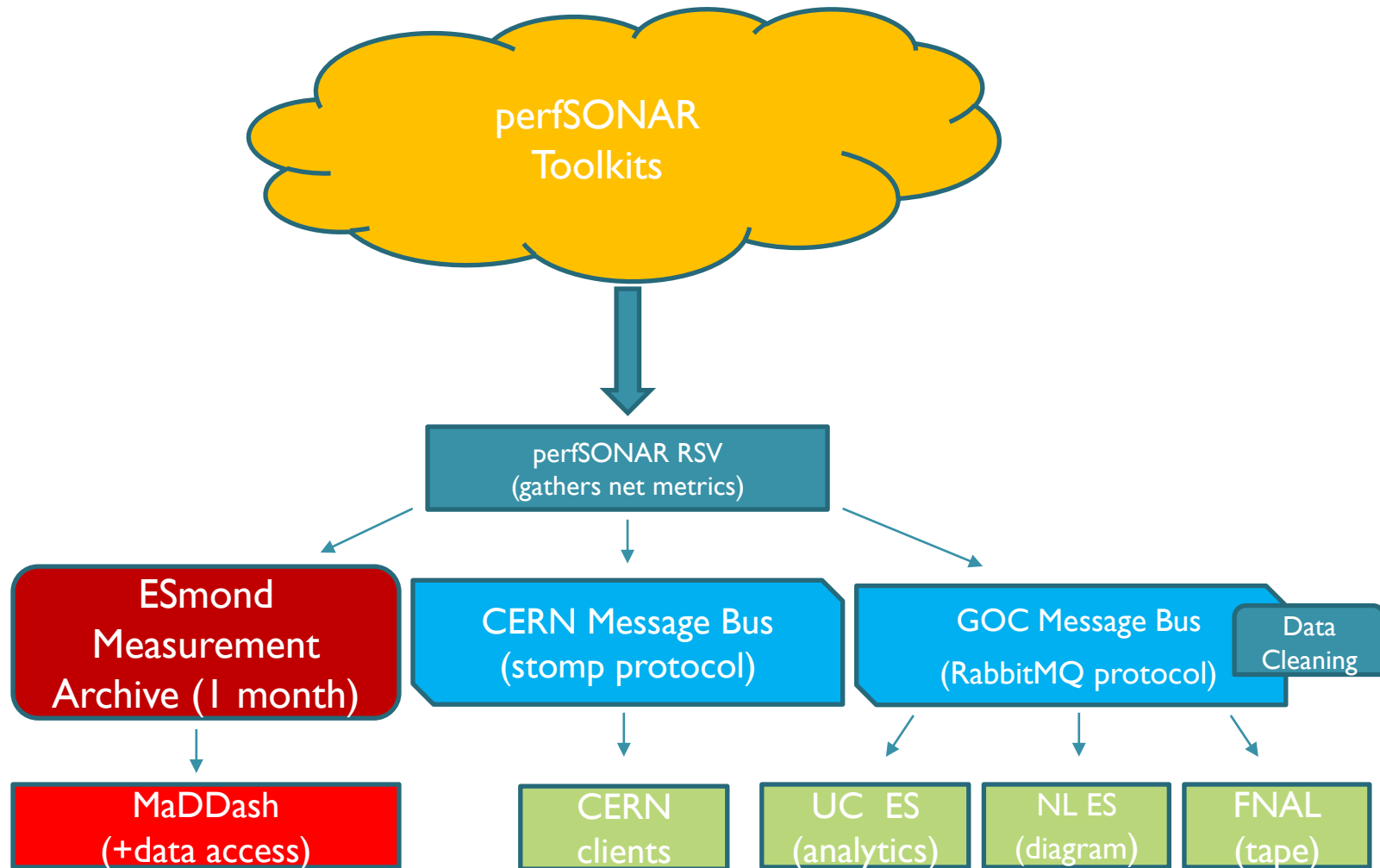
Open Science Grid

Current Net Metrics Flow

perfSONAR
Toolkits

perfSONAR RSV
(gathers net metrics)

ESmond
Measurement
Archive

CERN Message Bus
(stomp protocol)

GOC Message Bus
(RabbitMQ protocol)

Data
Cleaning

MaDDash
(+data access)

UC ElasticSearch
(for analytics)

FNAL
(data to tape)

Open Science Grid

Planned Pipeline Changes

- The data pipeline will be modified to have use the GOC RabbitMQ message bus.
  - Raw JSON data will go to tape at FNAL for long term storage
  - Network metrics will be sent to ElasticSearch at Nebraska for use in non-interactive exploration and display of data, e.g., 1 year graphs of quantities of interested updated daily
  - Network metrics currently be read from CERN's bus and sent to UC will be reconfigured to use the OSG message bus as a source
    - Data cleaning and transformation is currently done by Ilija using a VM at CERN. This will be migrated to the US and will use the GOC bus
    - The STOMP protocol will be enabled on the GOC bus
  - We will continue to send data to CERN for their use
  - We will reconfigure ESmond on OSG to only host a few weeks of data to support our MaDDash instance (to quickly view net status)

Open Science Grid

Planned Net Metrics Flow

perfSONAR Toolkits

perfSONAR RSV (gathers net metrics)

ESmond Measurement Archive (1 month)

CERN Message Bus (stomp protocol)

GOC Message Bus (RabbitMQ protocol)

Data Cleaning

MaDDash (+data access)

CERN clients

UC ES (analytics)

NL ES (diagram)

FNAL (tape)

Open Science Grid

Results of Changes

- While it may some more complex, the pipeline changes result in simplifications in use and operations
  - All critical data stays within OSG controlled resources allowing easier debugging and management
  - One primary bus setup at GOC that we need to worry about
  - Data endpoints have very specific tasks allowing simpler configuration and better resource use
  - The Esmond instance can be very much scaled down. **No need to address data lifecycle management via Esmond!**
- Enables a future improvement: perfSONAR 4.1 should support central configuration to send data from our toolkit instances directly to a RabbitMQ bus like the one at GOC

Open Science Grid

Status of Retreat Changes

- Lincoln Bryant / UC tried to reconfigure HTCondor per instructions to cause it to emit the network data to a log file.
  - Didn't work: "I tried turning on the recommended knobs but never saw any network logging."
- Data pipeline reconfiguration has not happened yet…Ilija, Shawn and others too busy with various meetings since the retreat
- Esmond use in OSG still working OK. Next steps will be to setup 8 week limit on the data retained.

Open Science Grid

New 'https' issue found

- Since the release of perfSONAR 4.0 we have seen issues in measurement coverage (enabled by our new dashboards)

    ◦ We have identified an issue: perfSONAR 4.0 now requires port 443 (https) be open between instances.

        • We previously told sites to open either 80 or 443

    ◦ A test from site 'A' to site 'B' initiated by site 'B' requires that site 'A' upload its results to site 'B' via https (pscheduler) and some sites block 443

    ◦ We will discuss this at the next perfSONAR developers meeting tomorrow

Open Science Grid

Publishing New Dashboards?

- We (Marian Babik and I) are almost ready to publish some new Kibana dashboards which provide useful task-specific information for various use-cases:
  - Site problems
  - Link problems
  - perfSONAR infrastructure problems
  - R&E network visibility
- **Question to OSG: are we ready to do this?**
  - Concern is that the UC analytics platform really needs to be "production" level once we point users at these new dashboards
  - Discussion? Additional concerns? Suggestions?

Open Science Grid

Involving an Undergraduate in OSG Networking

- I am putting together an UROP proposal (Undergraduate Research Opportunity Program) to have an suitable undergraduate work with me on OSG network related tasks
  - Would be for Fall 2017 (no cost to OSG)
  - If they work out I can offer to hire them hourly continuing forward
  - Proposal is due August 21st

Open Science Grid

Concerns

- Issue with https needs resolving: what should we tell our sites?
- Need to implement data pipeline changes but will require help from outside OSG networking
  - Main issues are location of VM for data cleaning/augmentation and setup of GOC message bus to support "transparent" change for VM to receive data
- Still on the list: recruit additional non-WLCG sites using our developing capabilities as a "carrot" (new dashboards and docs will help)

Open Science Grid

Questions or Comments?

Thanks!

Open Science Grid

URLs for Reference

- OSG Network Datastore Documents
  - Operations https://docs.google.com/document/d/11144BSo-88M0cLMMjKcKMIE-Q5s21X-w3lYl-0Pn_08/edit#
  - SLA https://twiki.grid.iu.edu/bin/view/Operations/PSServiceLevelAgreement
  - Data lifecycle https://docs.google.com/document/d/1mJ1kf43nZf6gvKoNtiTOc0g0MYDv_wSfSm7YdiMs3Lo/edit#
- Current OSG network documentation https://www.opensciencegrid.org/bin/view/Documentation/NetworkingInOSG
- OSG networking year-5 goals and milestones: https://docs.google.com/document/d/1FzmXZinO4Pb8NAfd5SWUzaAFYOL23dt66hQsDmaP-WI/edit
- 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:
  - Packet-loss: http://tiny.cc/PktLossNoUnknown (6 month view)
  - perfSONAR dashboard: http://tiny.cc/pSDash
  - perfSONAR link details: http://tiny.cc/pSLink
- Mesh-config in OSG https://meshconfig.grid.iu.edu/
- Pre-Production Meshconfig https://meshconfig-itb.grid.iu.edu/
- perfSONAR homepage: http://www.perfsonar.net/

Open Science Grid