XRootD Deployment Task Force

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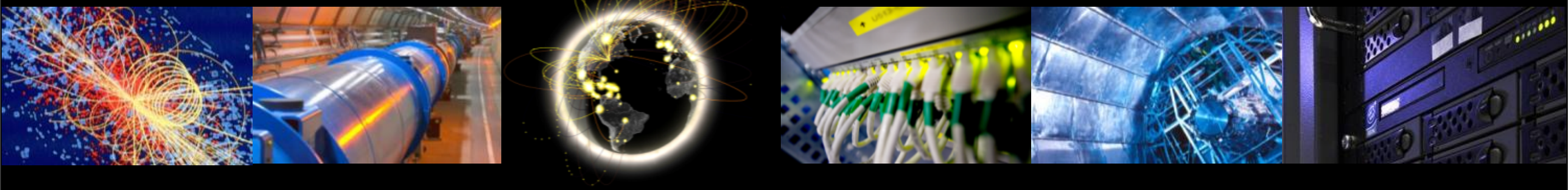
GDB 8 May 2013



WLCG
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XRootD deployment TF

Main goals of this task force are

- Provide support to the XRootD deployment
  - driven internally by each project: AAA, FAX
- Liaise the monitoring efforts , collect the monitoring requirements
- Identify common needs among CMS and ATLAS to be addressed uniformly

Currently followed topics

- Monitoring
  - Workflow, plugins, configuration for dCache sites, DPM sites
- Repository for common third party plugins
- Privacy aspects of the monitoring infrastructure
- Monitor the XRootD service availability at sites

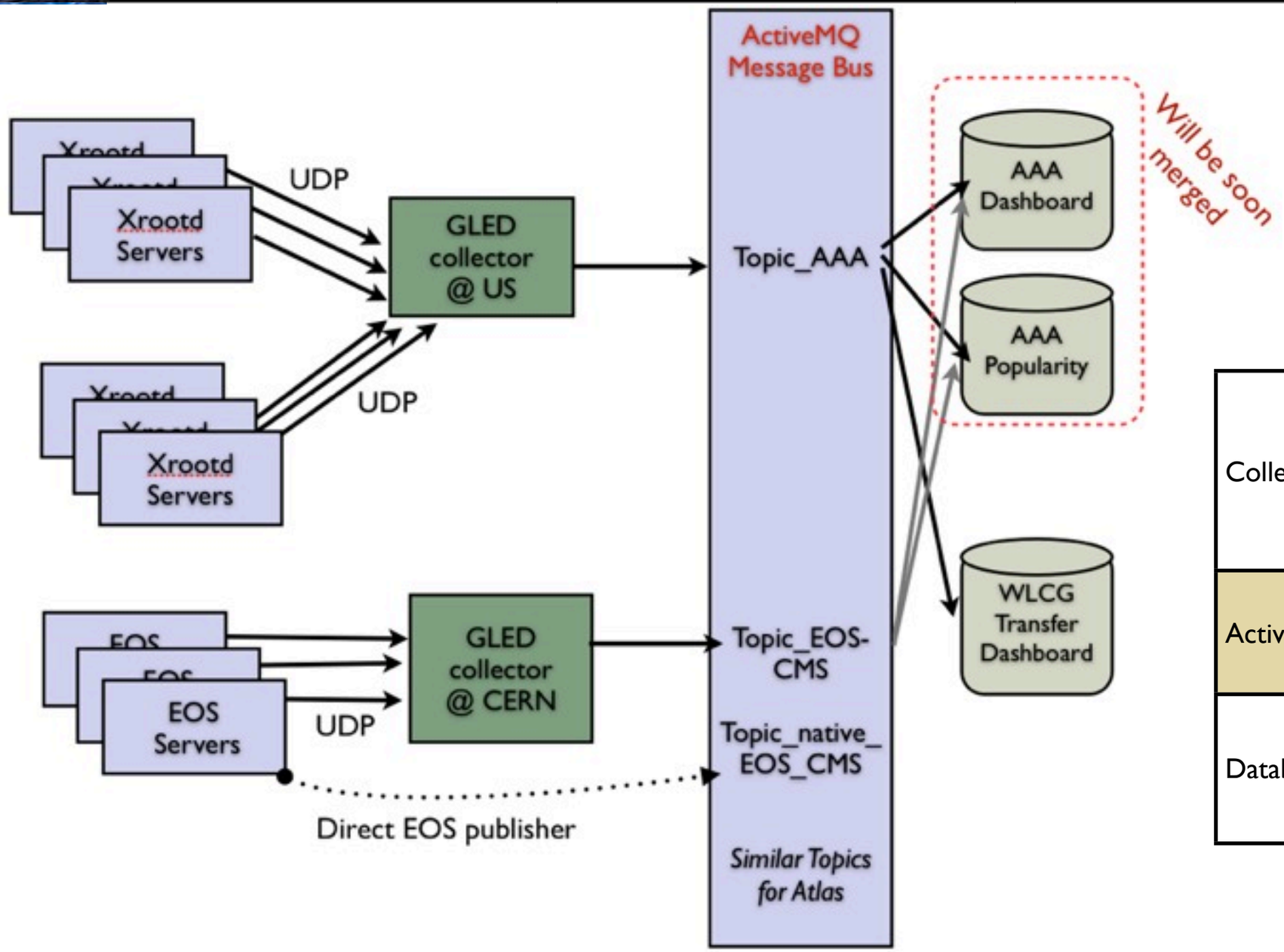
XRootD monitoring universe

XRootD monitoring infrastructure is implemented at different levels

- Two UDP streams of monitoring from XRootD
  - **Summary**: high-level statistics exposed in MonALISA
    - ✴ # connections, #authentications, failures, in/out network traffic
  - **Detailed** (and f-stream): trace the user's activity at the level of each file open
    - ✴ Accessed File LFN, user DN and VO, read/write operations, timestamps, client/server host & domain
    - ✴ Requires a dedicated collector for the aggregation of single UDP packets: GLED collector (a.k.a. UCSD collector)

- In addition
  - External server health checks based on Nagios
  - SAM tests of fallback and redirections (for CMS)
  - Dedicated tools for testing, deployment tracing, performance studies

XRootD Detailed Monitoring Workflow



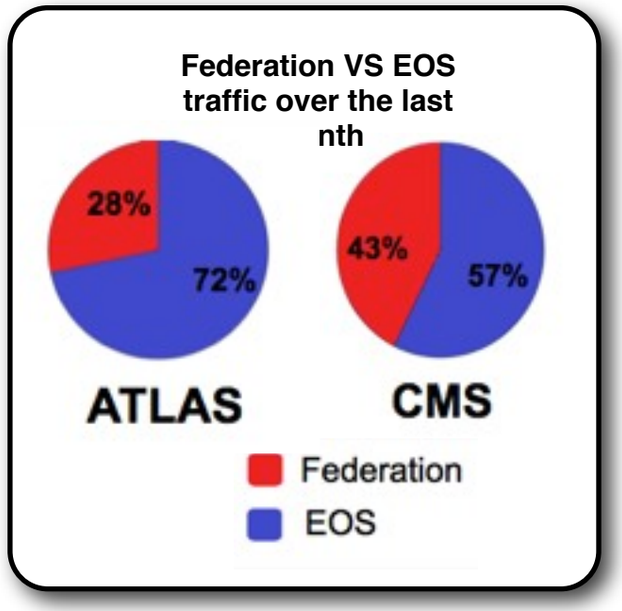
Collectors	1 for AAA federation (running @ UCSD) 1 for FAX federation (running @ SLAC) 1 for EOS-CMS (running @ CERN) 1 for EOS-ATLAS (running @ CERN)
ActiveMQ	1 topic per collector 3 virtual queue per topic
Databases	Currently three different DB, associated to each activity: Data Popularity, AAA Dashboard, WLCG Transfer Dashboard

The detailed monitoring system and its complexity is growing

- Effort to unify the monitoring workflow for Dashboard and Data Popularity
  - unify the database schemas and possibly the Web UI
  - monitoring data will be kept for a period long enough to assess popularity metrics

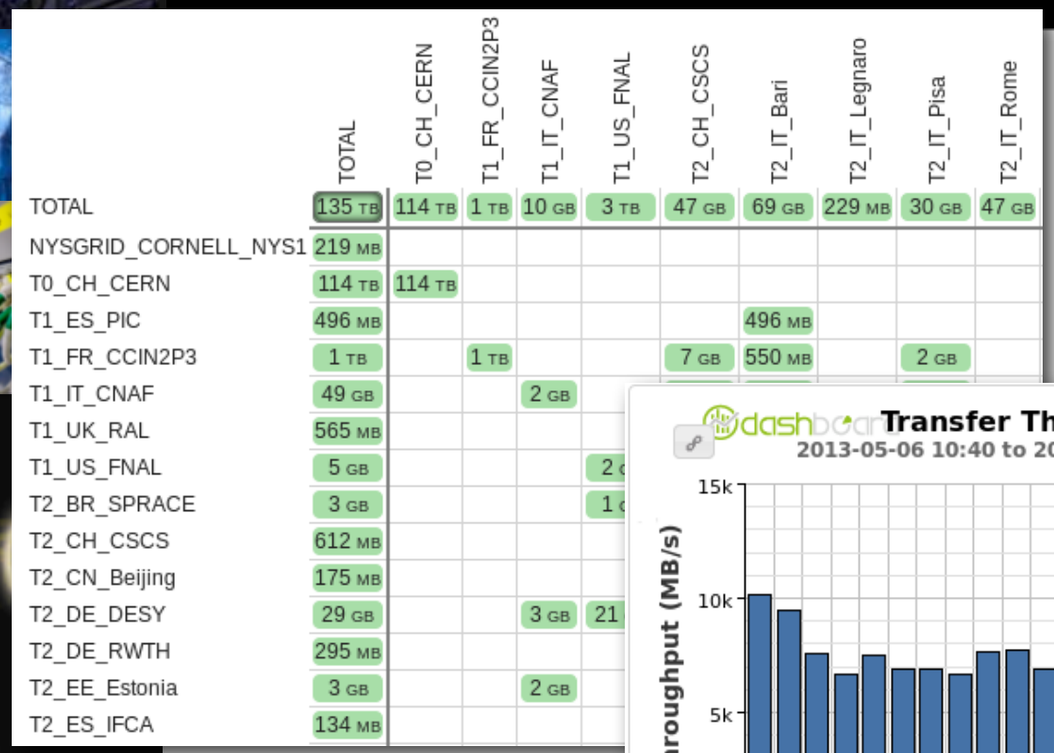
FAX and AAA monitoring Dashboard

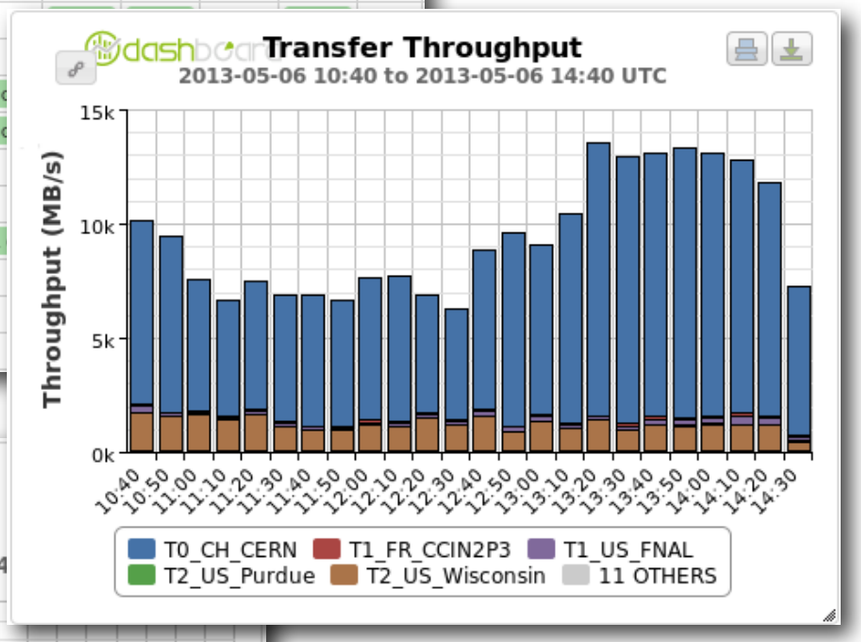
- Common monitoring solution for ATLAS and CMS
- Production quality data
  - Include federation and EOS traffic
- System usage growing in parallel with the federation deployment

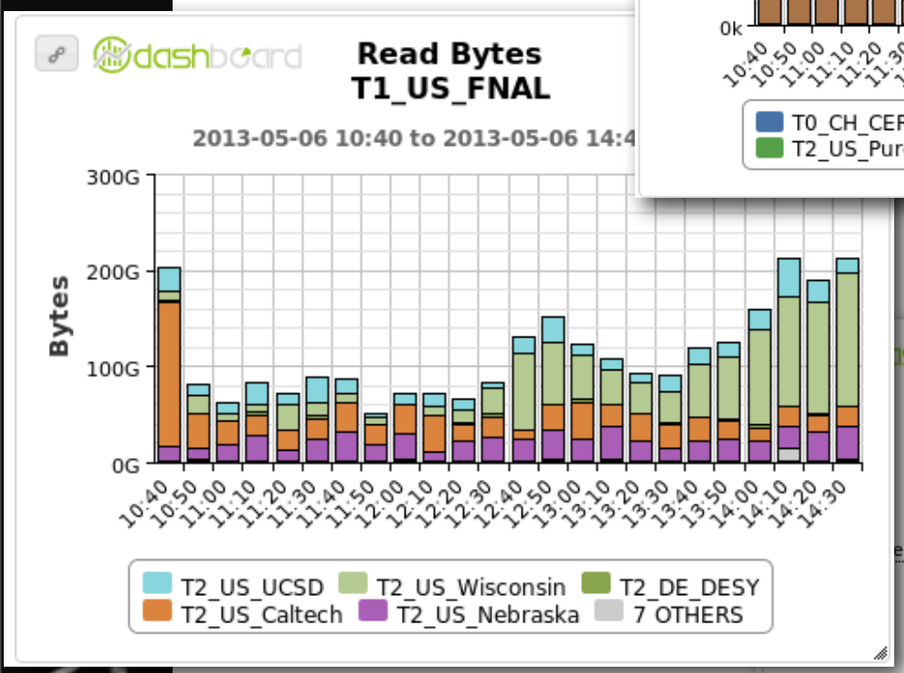


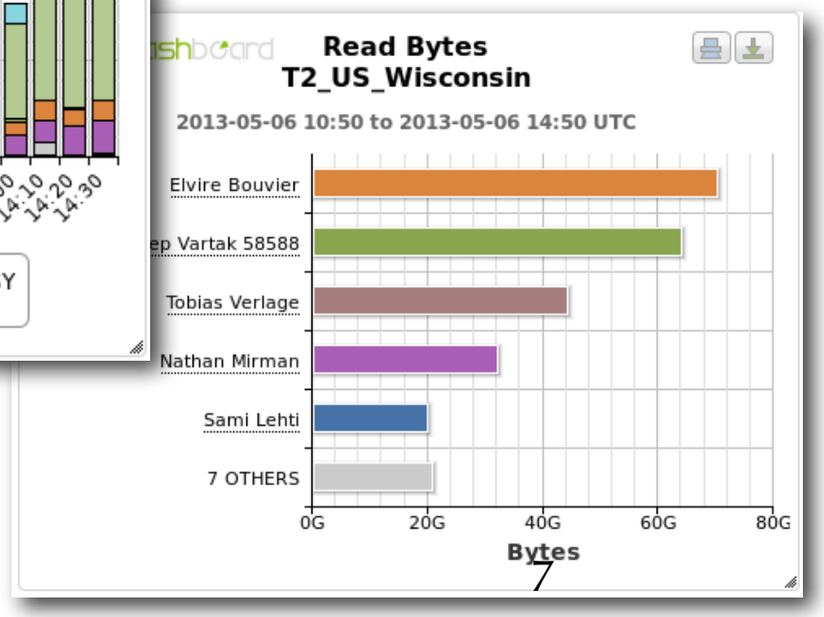
User accesses

Monitoring metrics









Several levels of aggregation

- Traffic between sites
- Aggregated throughput for a given site
  - Time bin granularity from 10 mins up to day
- Server access patterns
  - breakdown by clients
- User access patterns
  - volume of data read/user
  - File lfn and fraction of read files

Future monitoring objectives

Provide through Dashboard a single entry point for all information relevant to XRootD federation monitor

- Integration of the summary flow in the monitoring data
  - Connections #, authentications #, authentication failures, …
  - Expose through Dashboard the information provided by ML-based monitor
- Link to XRootD server status monitoring
- Add runtime view of the single file accesses
  - Useful for debugging and specific studies
- Adding new functionality
  - Interactive view, geographical presentation of the accesses
  - Automatic validation of Dashboard information

GLED collectors

GLED Collectors are a key point of the detailed monitoring workflow

- New features included in the past months (by M. Tadel)
  - Publishing messages directly in ActiveMQ
  - Accepting other UDP streams from XRootD disk servers (f-stream)

- Deep validation campaigns allowed to certify the application
  - Comparison among Summary and Detailed Monitoring
  - Comparison Vs a native collector developed by IT-DSS for EOS

Need to guarantee the steady operation of the deployed collector instances

- To be considered a critical service, up and running 24/7

WLCG Repository for third party plugins

Organize distribution and deployment of external plugins

- WLCG repository will host some packages connected to the XRootD deployment and not already associated to other repositories
  - Guarantees traceability of the packages
- Repository available at http://linuxsoft.cern.ch/wlcg/

Packages already identified

- GLED UDP Collector for detailed monitoring (developed by M. Tavel)
- VOMS-XRootD plugin (developed by G. Ganis)
  - Extract and validate the VOMS attributes from a proxy
  - It is meant as an add-on to the libXrdSecgsi authentication plugin
- dCache-XRootD monitoring plugin for f-stream (developed by I. Vukotic)
  - dCache sites require a dedicated monitoring plugin in order to be monitored
  - Plugin developed in the Atlas-FAX context, now adopted also by CMS dCache sites
    - ✳ Will be improved, adding missing functionalities such as user DN identification

Open Issue: Privacy & Detailed Monitoring

Detailed monitoring allows to trace the user activity at the level of single open file

- Is there any potential concern about the user privacy?
  - Does this hold even if the user information is just stored in the monitoring DB and not exposed?

Two domains

- LHC VOs (ATLAS, CMS) rules allow monitoring of the user activities
  - Indeed it's a functionality requested by the experiments

- WLCG sites serving multi-VOs paying closer attention to the privacy
  - If disk servers are shared among multi-VOs, XRootD UDP streams will trace file accesses for all served VOs
  - In this case skimming the monitoring information from other VOs can be implemented at different levels
    - ✴ Solution A: filter on the user_VO at the level of GLED collector
    - ✴ Solution B: filter on the user_VO (or basepath, .,.) at the site level (more work needed)

Open to discussion/feedback

Publication in GOCDB/OIM

Two service types available in GOCDB

- "XRootD": XRootD entry point for the SE (including site local redirector)
- "XRootD.redirector": regional/global redirector

Sites should publish both (if available) in order to

- Flag service downtimes to be used by VO's automated actions
- Implement service specific SAM tests (analogous to existing SRM tests)

Summary

XRootD deployment Task Force is an initiative transversal among AAA, FAX, WLCG Operation coordination, Dashboard team

- contributes in the areas where effort can be shared
  - Monitoring, third party plugins, SAM tests, deployment instructions

Monitoring is a crucial part of the XRootD federation projects

- Intensive WAN access is a new scenario: monitoring helps to understand and improve it
- Monitoring is in quite advanced status
  - Several level of monitoring: Service availability, Summary and Detailed XRootD streams

Confidentiality of the monitored accesses is an open question, mainly for sites serving multi-VOs

As all WLCG services, XRootD federation services need to be instrumented with dedicated service availability tests

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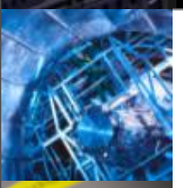

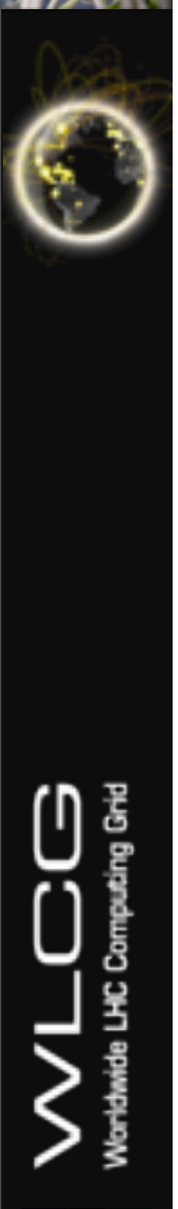
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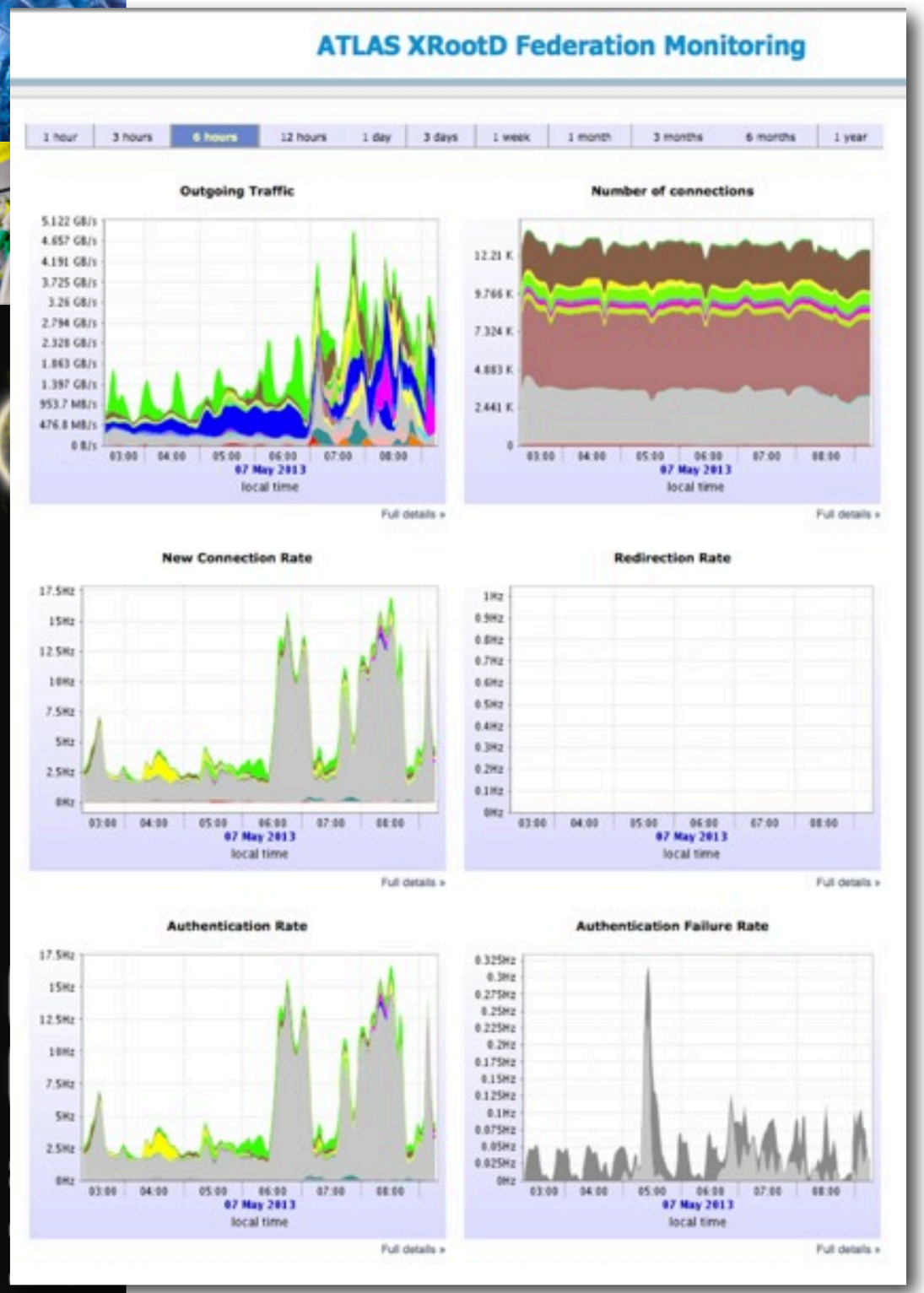
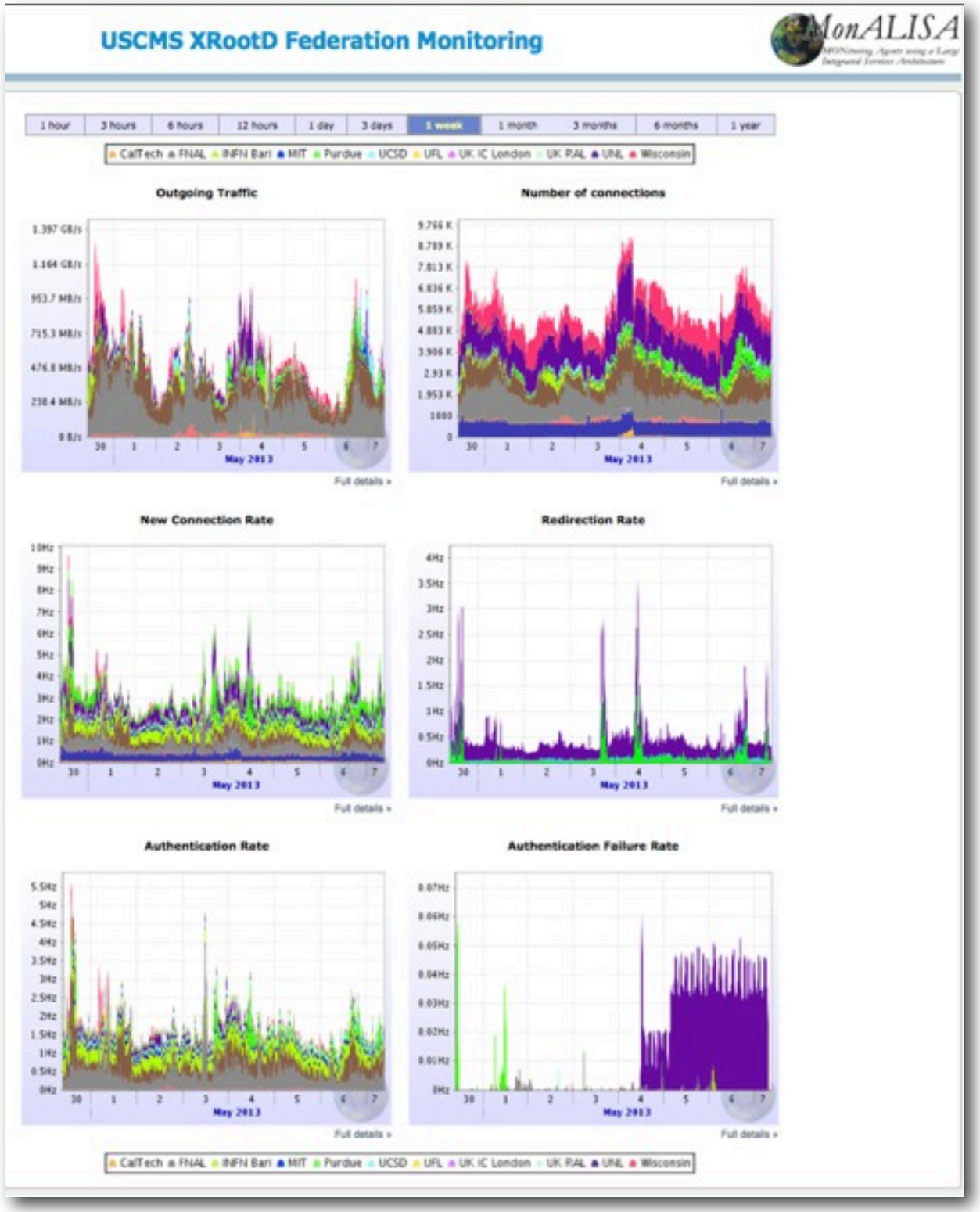
XRootD Summary monitoring



Running @ SLAC



Running @ UCSD