XRootD Monitoring: Status and Road to DC27

Summary of the monitoring talks at the XRootD and FTS Workshop

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WLCG OTF · 17 September 2026

Two complementary tracks

- **OSG collector** (WLCG Operations & MONIT)
  - Go collector from OSG, improved and validated at CERN
  - In production at CERN for all LHC experiments, all improvements contributed upstream
  - The collector we deploy at sites for DC27
- **Native XRootD monitoring** (XRootD team)
  - XrdMetrics: Prometheus metrics built into the server
  - xrdmoncollect: a new collector shipped with XRootD, error reporting added to the stream
  - Pre-production, planned for XRootD 6.3 (Dec 2026)

- Same goal: **VO-agnostic, trustworthy XRootD transfer monitoring for WLCG, with one collector per site**

Details: two talks by G. Amadio and two by B. Garrido Bear, P. Paparrigopoulos and K. Singh, XRootD and FTS Workshop, 16 September 2026

OSG collector: validated, running at CERN

- **Five areas of improvement**
  - **Observability:** metrics on packets, parsing, site resolution and drops
  - **Configurability:** new site-level configs to enable deployment at heterogeneous sites
  - **Enrichment:** SciTags activity, auth method, read + readv bytes
  - **Topology:** sites resolved from CRIC, LAN / WAN and XRootD internal traffic
  - **Bug fixes:** t-stream no longer parsed as f-stream, no more exabyte records

5

collectors at CERN
4 LHC experiments + CMS pilot

121 M

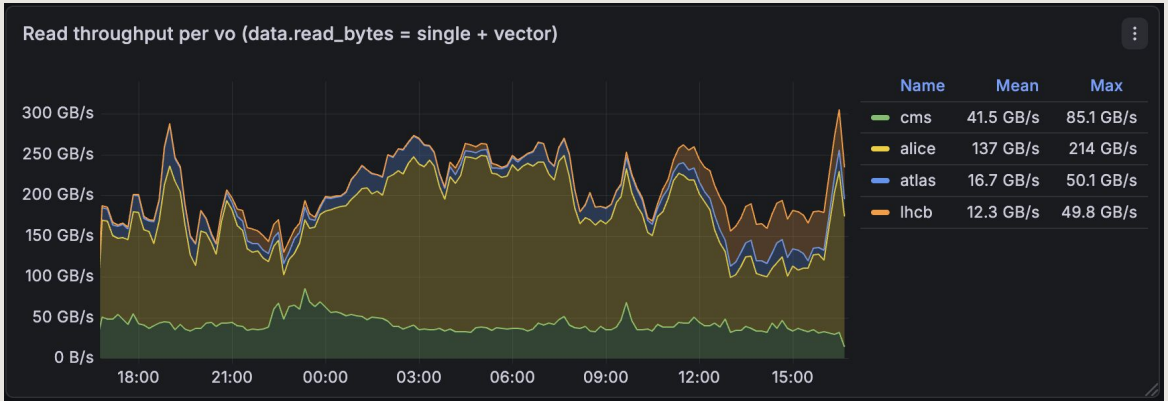
enriched transfer records
per day

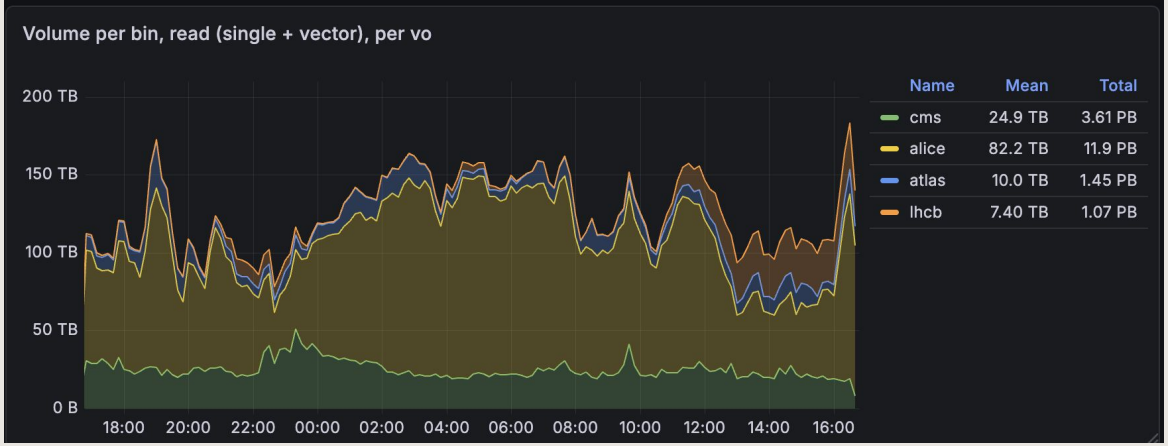
3.5 %

mean difference vs MonALISA
(Well understood)

Golden release available, remaining changes being merged upstream: github.com/opensciencegrid/xrootd-monitoring-shoveler

OSG collector: validated, running at CERN





24 hours of XRootD traffic, including LAN & WAN

Native XRootD monitoring

- **XrdMetrics**: server metrics
  - Prometheus metrics inside the server, pull on /metrics or push to Pushgateway / OTLP
  - Already used by EOS, faster than eos_exporter. Server health, not transfer accounting
- **xrdmoncollect**: detailed monitoring collector
  - Collector and UDP shoveler in one binary, OpenSearch and OTLP outputs
  - Per-operation records, sessions and OTel traces, site from config, filter rules
- **Errors and client monitoring**
  - Terminal error records on the f-stream, existing collectors keep working
  - Client-side metrics planned after 6.3

Status: pre-production, not yet merged. Release planned with XRootD 6.3 in December 2026, rc1 in the testing repos after 6.2. Field names and configuration may still change.

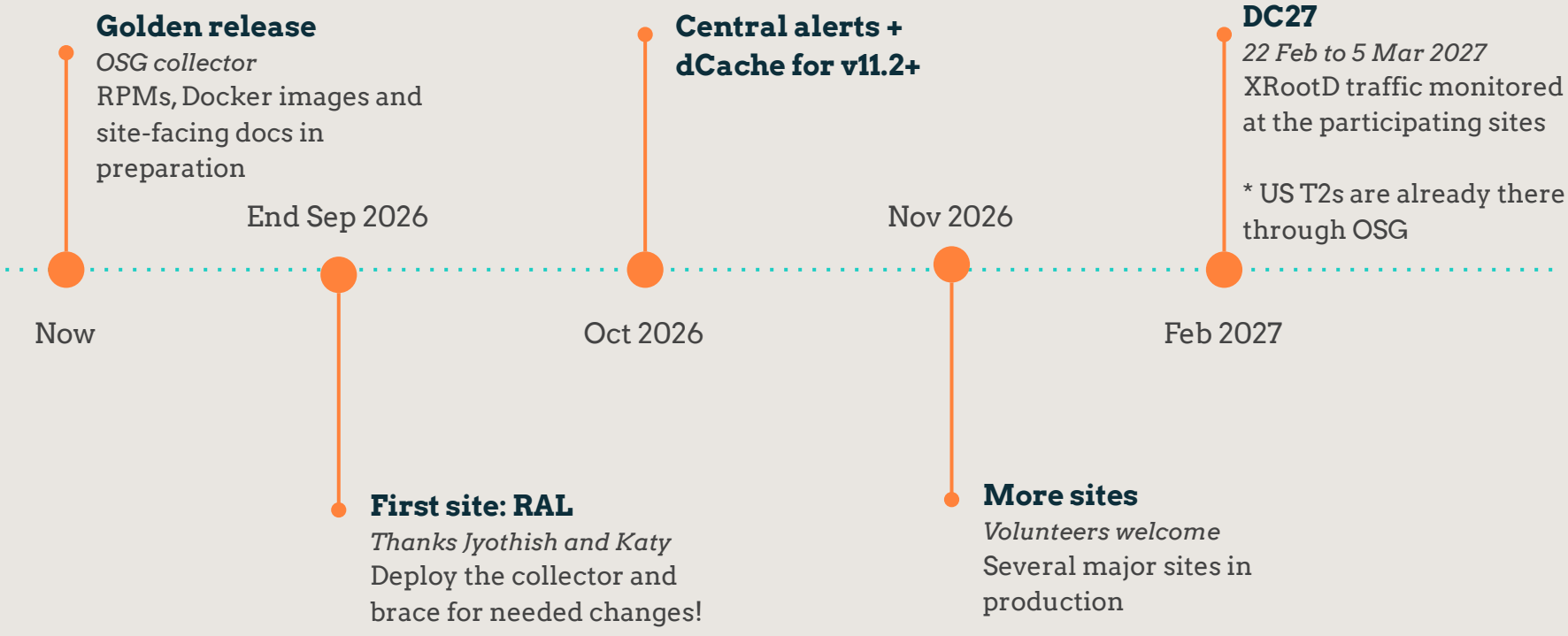
dCache sites

XRootD traffic through dCache doors follows its own flow, independent of the collector choice

- **Today:** sites enable the Kafka bookkeeping module
  - FNAL and PIC already publish
- **dCache v11.2:** records sent out directly, no Kafka at the site
  - Improved collector (ongoing work @DESY), including file names for CMS/LHCb popularity
  - We will try our best to use (as much as possible) a common record schema among the two XRootD collectors and the dCache one!
- **Next:** deployment campaign, enabling the flow at all sites moving to v11.2

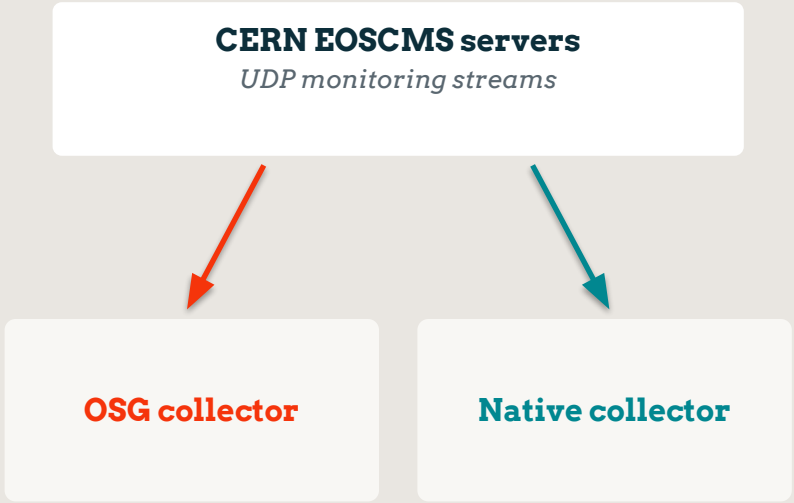
Thanks to the dCache team, and to FNAL, PIC and DESY!

OSG collector: deployment plan



Native collector: next steps

- The XRootD team continues development towards the 6.3 release
- Already deployed in front of CERN EOSCMS, next to the OSG collector
- Same servers, same streams: a direct comparison of the two collectors
- For DC27 we can have both running, at least for CERN EOS instances.



Compare records and throughput on the same traffic

Long-term view

A well supported, native XRootD collector is the right long-term direction

For DC27 we go ahead with the OSG collector, and revisit after DC27

- **Technically preferred:** a native collector is the better design, and the prototype looks solid
- **Why not now:** we needed a validated collector for DC27, the native one was not available when we had to decide
- **Needed first:** a finished, merged product, extended with the functionality WLCG needs
- **Long-term commitment:** XRootD team signs off on long-term support, monitoring becoming a first-class citizen

In parallel, we will continue the excellent collaboration to improve both collectors

Summary

1. XRootD transfer monitoring at CERN is reliable today: OSG collector, 3.5 % from MonALISA

2. DC27 runs on the OSG collector, one per site. RAL first, more volunteer sites welcome (US T2s should already be reporting via OSG deployment)

3. dCache sites: Kafka flow today (FNAL and pic already reporting), direct publishing with v11.2, dCache team is already working on providing us with the records we need from v11.2 sites

4. Native collector: XRootD team continues development and validation, revisited after DC27

Thank you. Questions?