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XRootD Collaboration Meeting Summary

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Participants and communities

- XRootD Devs
- CTA (Tape archive)
- EOS (XRootD file system)
- FTS (Bulk File Transfer System)
- ROOT (Parallel File Format based on XRootD)
- ALICE (LHC Experiment)
- CMS (LHC Experiment)
- LHCb (LHC Experiment)
- RAL (GridPP/UK)
- GSI (German Site)
- Pelican (US file transfer federation project)
- WLCG (Worldwide LHC Computing Grid)

XRootD Dev session

- Introduction on how the collaboration works
- Three significant active roles exist, two of which are defined:
  - Principal Architect • Andrew Hanushevsky, SLAC
  - Release Manager • Guilherme Amadio, CERN
  - Developers, testers, re-packagers
    - Average of 3 Full Time Employees officially
- Joining the Official Collaboration needs the institute to sign an MOU to pledge resources (FTEs)
  - Possible changes to this procedure to be discussed at the next meeting
- The Unofficial Collaboration includes all members of the WLCG (including GridPP)
  - Provide requirements, testing, bug reports and patches.

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XRootD Dev session

- XRootD Github project
  - https://github.com/orgs/xrootd/projects/1/views/1

high 15 ...

1	Add reflink capability #1795	high	In Progress	Feature	EOS
2	Expand test suite to cover Kerberos5 authentication method	high	In Progress		
3	Expand test suite to cover X509 authentication method	high	In Progress		
4	Finalize implementation of Tape Rucio Storage Element plugin (TapeRSE)	high	In Progress		
5	Expand test suite to cover scitokens authentication method	high	Done		
6	[XrdTpcTPC] WebDAV Error Message Improvement Project #2261	high		Feature	ALICE
7	Adjust XrdCl operation timeouts based on forward progress #2333	high		Feature	CMS
8	XrdClHttp evolution based on curl rather than Davix	high			
9	Expand test suite to cover macaroons authentication method	high			
10	Expand test suite to cover XCache use cases (single cache server, clustered cache)	high			

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High level summary

- Most requested:
  - Logging and monitoring improvements
    - XRootD 6 aims to standardize log format
  - HTTP improvements
- Generally, XRootD works well but new features can result in breaking backward compatibility sometimes

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CTA/EOS

- Generally stable and quickly patched Alma9 ssl issues
- XRootD HTTP left hanging on stale requests, would rather get an immediate 503 error when the server gets overloaded.
- Moving to gRPC at the end of Run 3 for dCache support
- ----------
- Interest in improved monitoring and client-side diagnostics
- Additional protocol supports
  - Possible contributions:
    - XrdS3 – S3 gateway server
    - Jcache – journaling cache for shared filesystems
- Xrootd-multiuser review

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ROOT/FTS

- Users expect local performance from remote reads ☺
- Wishlist
  - Performance improvements
  - Reliability (testing and debugging XRootD appreciated)

- DaviX client support may be taken up by XRootD
  - Some improvements expected by end of November

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ALICE

- Only using xrootd protocol since 2006
- “It just works!”
- Uses ROOT, the python bindings for XrootD as well as the CLI
- Interest in tagging traffic to separate internal and external traffic.

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ATLAS/GridPP

- A lot of sites moved to XRootD following DPM's decommission
- But there's no easy way to differentiate which kind of xrootd setup they're currently on.
- Would like a general streamed checksum solution to reduce readback overhead
- Data Challenge wishes – testing throughput without needing storage allocation
  - Writing to /dev/null
  - Xrootd iperf mode for testing TPC transfers – task was added to the board
- Old client compatibility:
  - Policy on fixing client versions with breaking bugs is having the user/site upgrade the client version in place to the next working one.

CMS

- Would like to have:
  - vector reads/multisource improvements
  - error reporting and monitoring improvements
  - redirector reliability and intelligence enhancements
- WAN redirectors a bit unstable.
- data taking is the highest priority.

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LHCb

- Would like a longer-term client server compatibility
  - Newer server versions sometimes do not support older clients
- Wheels for python bindings
- Xrootd-fsspec support
- Async support (primarily for python)

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RAL Contributions

- XRootD Server (root:// and davs://)
  - Used for both our external gateways and XCache endpoints
  - We have found and provided PRs to fix protocol mismatch issues.
  - We created and run a pre-production testing framework (See XRootD workshop,2024)
- CMSD
  - Used to load balance our main external facing SE, as well as for CMS AAA
  - Improved on load balancing functionality
- XCache
  - Our batch farm uses XCaches for fetching data for jobs.
  - We've found and helped fix minor bugs (such as the message size mismatch)
  - Implemented a write redirect for them (See Alex Rogovskiy's slides).
- Authentication
  - We support both gsi and scitokens
  - Helped improve the scitoken implementation in XRootD to match the WLCG specs and VO use cases.
- Our XrdCeph fork has now been merged back upstream (4 years of changes, contributed by Ian Johnson, James Walder, George Patargias, Jyothish Thomas and Alex Rogovskiy)

RAL

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- Checksum on the fly
  - Test involves computing checksum on the fly, writing it to a logfile and comparing with the readback value.
  - V1 tested but failed validation (2% mismatch rate)
  - V2 in development
- Scitags
  - Current (5.7.3) xrootd version requires the following additional line to be added:
  - xrootd.pmark map2act <vo> default default
  - Fix should be out with the next version (5.8.1)

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GSI

- Interesting configuration options used
  - Split network routing
  - Fallback xrootd managers
  - Custom quota
- Observed scaling issues with scitokens

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PELICAN/IRIS-HEP

- Driving improvements in XrdHTTP and XCache and gradually merging them into core XRootD
- HTTP TPC improvements planned
- Would like:
  - logging improvements, especially around consistent formatting
  - Documentation and contribution workflows
  - Increasing server debug level without needing a restart

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WLCG

- The software is widely used in most of the Grid
- Good support currently and in active development
- Community engagement and requests from both WLCG and other communities

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Thank You