

# XRootD

Data Challenge 24 Workshop

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Andrew Hanushevsky, SLAC

# SciTokens Support

- # Appeared in **XRootD** 5.1.0 (Feb-23-2021)
  - **XRootD** supported SciTokens first
    - dCache implementation used **XRootD** as template
      - Both should provide equivalent functionality
        - xroots and HTTPS protocols fully supported
- # Many bug fixes and features added since
  - Importantly, support for the WLCG profile
- # Tokens can be used in DC24
  - Appear already in use for some TPC transfers

# Monitoring Features I

- # **XRootD** provides extensive monitoring
  - Periodic summary statistics
    - Used by some k8s sites via Prometheus add-on
  - File level I/O data (f-stream)
    - Used generally throughout HEP
      - Data reported to central collector at CERN
  - Real time I/O event data (t-stream)
    - Used to understand data access patterns
      - Not widely used any more

# Monitoring Features II

- # Specialized g-stream data
  - TPC transfer events (xroot and HTTP)
    - Successful and failed transfers
  - **Xcache** transfer events (xroot and HTTP)
    - Per file statistics when all uses of a file end
- # Who gets g-Stream data is unknown to me
  - E.g. OSG captures this for its own use
  - Likely not yet centralized for various reasons

# XRootD Monitoring Usage

- # Does monitoring data identify issues?
  - It does to the extent it's analyzed as such
    - Largely depends on the rendering infrastructure
      - How it's used locally if at all
    - This is beyond XRootD's purview
- # There's also talk about using perfsonar
  - Developed to identify bottlenecks & issues
    - May need to cross-reference XRootD monitoring
      - To get any real specificity about an issue

# XRootD Packet Pacing (aka marking)

- # Supported in **XRootD** 5.4.0 (Dec-10-2021)
  - Uses Firefly packets with (optional) flowd
    - Identifies Experiment/Activity network flows
      - Demonstrated at SC22 (also will be in SC23)
  - HTTP SciTag support added in 5.6.3 (latest)
    - Useful if SciTags supported in FTS and Rucio
      - However, still functional without SciTag support
- # Networking plans to use this in DC 24
  - Exact plans are still being formed

# Conclusion

- # **XRootD** is ready for DC 24
  - # It's literally oozing with data about I/O flows
    - # **XRootD** may be the most instrumented framework in HEP
- # It's usefulness depends on the monitoring infrastructure and how it's
  - # Used
  - # Displayed
  - # Analyzed
  - # Reported