DOMA TPC Update

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DOMA Meeting, 12 September 2018

Overview

- Current milestone period as set by project plan:
  - “Survey available replacement protocols. Common storage implementations (EOS, DPM, dCache, standalone Xrootd, StoRM) aim to have at least one production site enable a non-GridFTP third-party-copy. Compatibility and performance tests are performed.”
  - Runs until 31 December 2018.
- Quite good progress to report across the board! Very active subgroup.
  - Meets biweekly on Wednesdays at 17:30 CERN.

Areas of Activity

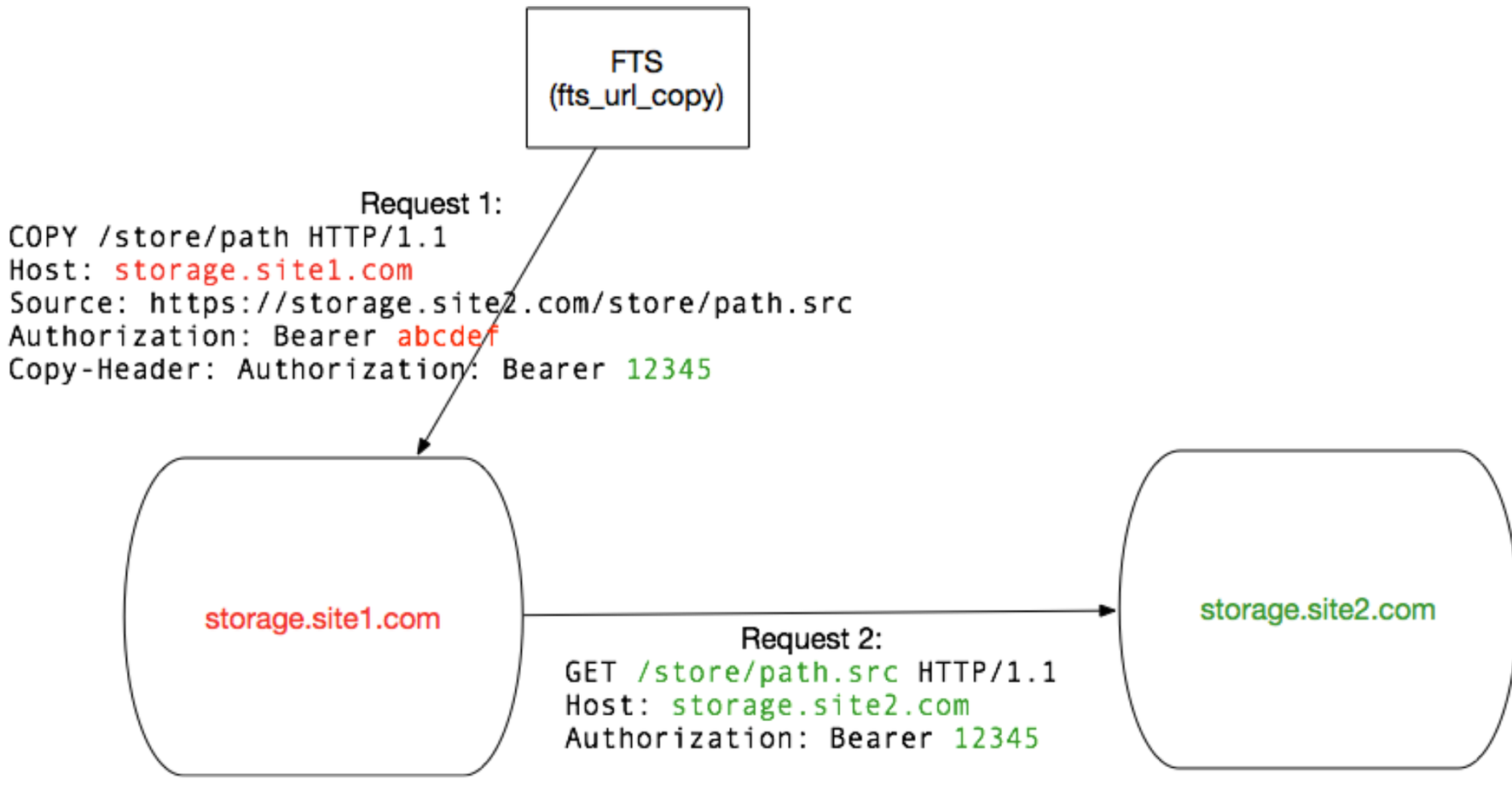
- Xrootd (protocol): Connectivity tests led by Wei Yang
- HTTP (protocol): Connectivity tests led by Brian Bockelman
- Storage Providers: Involvement from Xrootd, DPM, dCache, EOS, StoRM, Echo.
  - 17 sites participating, including production and test endpoints.
- Testing Instance: Working with Rucio team to setup automated transfer instance for verifying connectivity.
  - Hope to continue to grow this instance to perform scalability tests.
- Requirements document: Just started yesterday - try to gather items we think are important in replacing GridFTP.

Achievements / Milestones

- Gathered test endpoints for all SEs for both protocols. More are welcome:
  - https://twiki.cern.ch/twiki/bin/view/LCG/ThirdPartyCopy#Sites_and_contacts
- FTS and Rucio
  - Patches deployed to fts3-devel for HTTP.
  - Rucio and FTS integration completed for Xrootd.
- HTTP
  - Significant stress testing of XrdHttp implementation — and many corresponding patches.
  - All SEs that implement active HTTP TPC (DPM, dCache, Xrootd) appear to be interoperable.
- Xrootd
  - Significant stress testing of Xrootd TPC implementation using existing AA model.
  - Implement X509 proxy delegation.

HTTP Protocol Recap

- The WebDAV “COPY” verb is used to orchestrate transfers.
- The “active” side performs a GET / PUT against a remote endpoint.
- COPY command includes URL for passive side
- Passive side sees pure HTTPS.
- Active side can use a bearer token or the third party (FTS) can delegate an X509 proxy.



HTTP Connectivity

- Working through minor bugs or compatibility issues in effectively each implementation. Bugfixes and new features across about 10 projects (around 2 dozen PRs since the working group started).

- **dCache**: largely working and interoperable.

- **DPM**: largely working and interoperable.

- **Xrootd**: Works in active mode (with tokens) or passive mode; does not support X509 delegation.

- **EOS**: Works only in “passive mode”, no support for token-based transfers. Some DNS issues with test endpoint.

  - Currently, HTTP support is based on nginx; plans on switching to XrdHttp

Xrootd Protocol Recap

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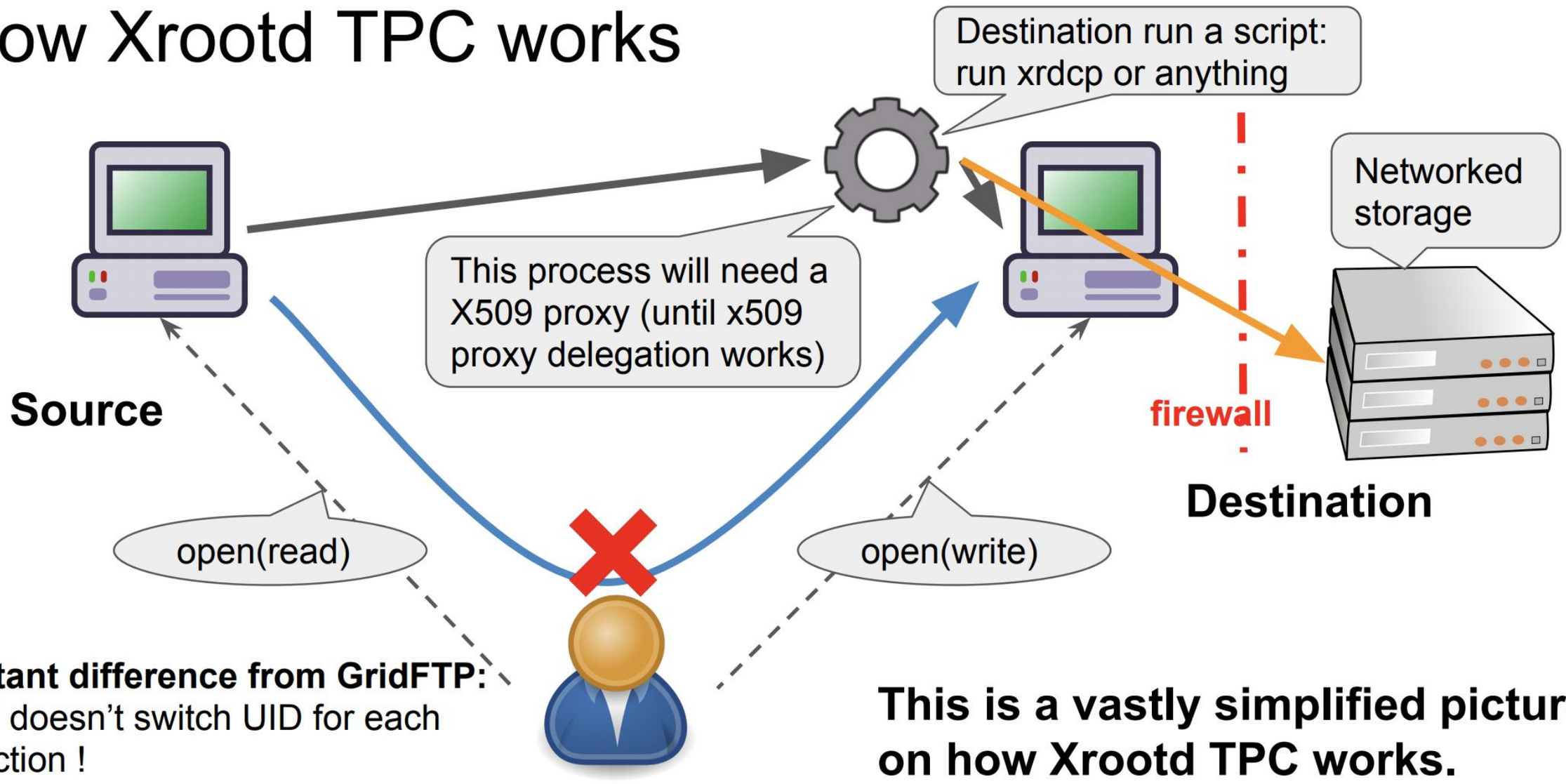
How Xrootd TPC works



Important difference from GridFTP:
Xrootd doesn't switch UID for each connection !

This is a vastly simplified picture on how Xrootd TPC works.

Link: W. Yang, WLCG DOMA TPC

Xrootd Connectivity

	Xroot	dCache	DPM	EOS	Storm	CEPH
Xrootd						
dCache						
DPM						
EOS						
Storm						
CEPH						

Work (robot certificate)

Work without GSI

Not tested

DPM is missing checksum query in xroot protocol

Link: [W. Yang, WLCG DOMA TPC]

Activities going forward

- Both HTTP and Xrootd need to continue to expand connectivity matrices.
- More protocol-level documentation needed.
  - GSI-like handshake for Xrootd undocumented.
  - Documents on agreed-upon HTTPS/WebDAV semantics need to be refreshed / reviewed.
- Xrootd is investigating doing transport over TLS.
- Rucio-based transfers are just getting off the ground in the last week or so.
- Requirements document not yet discussed or at first draft yet.

Quite happy with the progress over the past 45 days - still need lots of help!