

Update on OSG Token & Transfer Transition



MORGRIDGE
INSTITUTE FOR RESEARCH
CORE COMPUTATION

FEARLESS SCIENCE

Context

In 2017, Globus announced they would stop supporting the venerable Globus Toolkit and focus on their closed-source cloud services.

- While Globus services use pieces of the toolkit internally, new features are using HTTP (for transfers) and tokens (for authentication).
- In response, in 2017-2018, many in the community forked the toolkit and has been doing minimal maintenance.

In 2019, OSG posted its transition plan to migrate off the former Globus Toolkit:

- <https://opensciencegrid.org/technology/policy/gridftp-gsi-migration/>
- Final end-of-life is targeted for 2022.

Forward-looking

Beyond some minor services, the WLCG uses two major features from the toolkit: GridFTP and GSI; these are being transitioned to HTTP-TPC and tokens, respectively.

- **HTTP-TPC:** Bulk data movement utilizing the ‘COPY’ verb from WebDAV along with agreed-upon interpretations of the response and some headers.
 - Several mature implementations; functionality shown for each of the major storage provider used by WLCG.
 - ATLAS has transitioned almost 30 sites to use HTTP-TPC.
- **Tokens:** Use JWT-based bearer tokens with the WLCG Common Authorization profile.
 - Uses the idea of **capabilities**: authorization is based on signed statements in the token, not based on mapping the identity.
 - Similar to the venerable ALICE approach.

Separating Grid Community Toolkit from the Full Transition

An important distinction to make is between these two events:

- Retiring the Grid Community Toolkit (formerly, Globus Toolkit) from the OSG Software stack.
- Finishing the transition to tokens.

While the only supported GridFTP implementation in the OSG is the GCT (meaning that a transition to HTTP-TPC is required), there are several implementations GSI (notably in XRootD).

- We do need to transition pilot submission to tokens. This is significantly easier than the storage use case given how few factories exist.
- We do need to put concrete timelines together to move forward as a community. We cannot stop the transition at the GCT.

Progress on HTTP-TPC

The HTTP-TPC transition is most advanced. From last week in the WLCG/HSF workshop:

- [ALICE](#): Done for quite some time via xrootd; no dependency on Globus.
- [ATLAS](#): **“Plan to completely transition by May 2021”**
- [CMS](#): “Substantial work ongoing and much progress made in the area of HTTP-TPC”.
- [LHCb](#): “Adding an extra TPC in DIRAC is trivial” “All our TPC are going through FTS”
 - LHCb brings up a significant unresolved question about staging in CTA (no SRM support; currently FTS has custom CTA code).
 - We actively move quite a bit of data via HTTP-TPC in FTS.
- See additional progress reports from [DUNE](#), [JUNO](#), and [BelleII](#).

Progress on Tokens

OSG has demonstrated the ability to use tokens to replace all our supported authorization use cases:

- Submitting pilots to a CE (Harvester, glideinWMS).
 - Production version of glideinWMS released a few weeks ago – bug fix iterations starting.
 - The OSG frontend test instance has been upgraded and kicking the tires.
- Data transfers (XRootD, EOS, dCache) over HTTP protocol.
 - Even did a proof-of-concept for xrootd protocol (real implementation forthcoming).
- Management of tokens & token lifetime (clients and workflow support)
- Active participation with the WLCG AAI WG. A common token format has been standardized and many tests on compatibility have been ongoing.

Thoughts on Timelines

The OSG is proceeding mostly according to the timeline set out in 2019.

- Next deliverable is a new OSG release series, 3.6. Targeted for January 2021; may be a month or so late.
 - OSG 3.6 will not have any toolkit dependencies for supported components.
 - We will wait for HTCondor 9.0 to be released first.
- End-of-life for 3.5 is nominally “start of series + 1 year” -> January 2022.
 - This can be adjusted according to the needs of stakeholders.
 - Aligns well with USLHC transition to HTTP-TPC.

Will the WLCG token transition be done by January 2022? Probably not.

- This does not necessarily affect transition plans: recall the supported HTTP-TPC implementation (XRootD) does not use the toolkit for its GSI support.

Critical path items before January 2022:

- HTTP-TPC transition.
- Submit pilots via tokens to OSG sites.

Proposed Timelines

We all work better with a strawman to argue against:

- **March 2021:** Baseline services for WLCG sites includes HTTP-TPC endpoint.
- **July 2021:** IAM services available, including VOMS endpoint.
- **October 2021:** All WLCG pilot factories have the ability to submit to CE using WLCG tokens.
- **December 2021:** VOMS-Admin shutoff; IAM becomes authoritative identity provider endpoint (including VOMS endpoint).
- **January 2022:** OSG ends support for Grid Community Toolkit. Globus GridFTP support no longer required at WLCG sites.
- **March 2022:** Baseline services for WLCG sites include token support for HTTP endpoints.
- **October 2022:** Rucio transfers performed with token auth in production.
- **March 2023:** Experiments stageout performed via tokens.
- **March 2024:** X.509 client auth becomes optional.
- 2025 serves for schedule contingency.
- **Token transition must be done by 2025** to allow for experiments to complete their other HL-LHC activities.

I don't claim this must be our schedule – but it is along the lines of what we need to coordinate the community.



MORGRIDGE
INSTITUTE FOR RESEARCH
CORE COMPUTATION

morgridge.org

This material is based upon work supported by the National Science Foundation under Grant No. 1836650. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

FEARLESS SCIENCE