Technology Developments for 2020

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Big pictures for 2020

I want to leave 4 impressions today in the 20-minute timeslot:

1. OSG has a big year planned in 2020 in order to remove Globus dependencies.
2. Transition from GridFTP is making progress through the WLCG DOMA TPC group.
3. WLCG JWTs are gaining the functionality needed to replace GSI.
4. OSG 3.6 is coming next year with some major changes.

To get through these topics, I'm going to have to skip through some major, important things like:

- New deployment methodologies and support of container-based releases.
- Progress in network monitoring and management.

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Tracking the GridFTP & GSI Migration

The OSG has been working on transitioning from the Globus Toolkit since 2017; progress is well underway.

- In 2019, OSG posted a [formal timeline with milestones](#).

Biggest milestones are:

- **Jan 2021: OSG 3.6 released; does not include Globus**.
- Jan 2022: EOS for OSG 3.5.

Date	Milestone or Deliverable	Completed
Aug 2019	Beginning of OSG 3.5 release series (last release series depending on GCT)	✅
Aug 2019	Including HTCondor 8.9.2 in the 'upcoming' repository (first HTCondor version with SciTokens support).	✅
Oct 2019	OSG no longer carries OSG-specific patches for the GCT. All patches are upstreamed or retired.	✅
Mar 2020	"GSI free" site demo. Show, at proof-of-concept / prototype level, all components without use of GCT.	✅
July 2020	All GCT-free components are in OSG-Upcoming.	
Jan 2021	OSG series 3.6, without GCT dependencies, is released.	
Jan 2022	End of support for OSG 3.5.	

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Over the course of 2019, we have been fixing a number of HTTP bugs in XRootD – and working to validate FTS's support for HTTP-TPC.

- At this point, the **WLCG tests are about 5% of the global WLCG traffic**.
- Recently, Nebraska started to get serious about moving data over HTTP-TPC in production.
  - Petr Vokac (Prague) is leading up the work in ATLAS. The ATLAS production Rucio instance triggered a FTS3 bug; fix is being released this week.
- Please [aggressively report issues](#) you see with XRootD: even if they aren't fixed immediately, it allows us to get a feel for the level-of-pain.
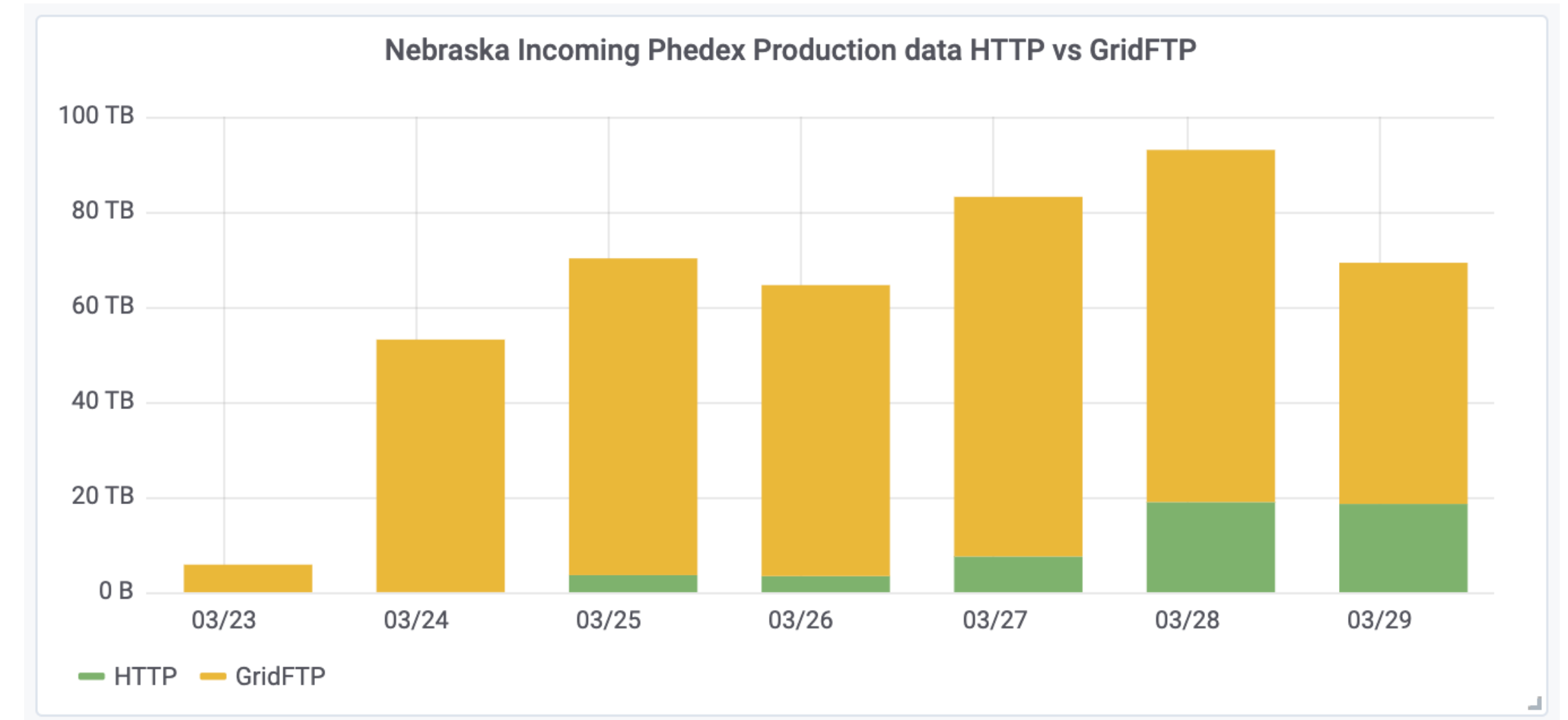
Above plot is production transfers to Nebraska over HTTP-TPC and GridFTP: Goal is 30% of total traffic over HTTP-TPC over the course of a month for one U.S. LHC site.

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In fall 2019, the WLCG published version 1.0 of the token format to replace GSI!

- Initial OSG software support started to show up in late 2019.
- In January 2020, the WLCG hosted a (successful) hackathon to get storage systems to move data without GSI.
- **HTCondor-CE 4.x** series supports WLCG tokens *if* you have the latest 8.9.x version of HTCondor installed on the CE.
  - Fa-Hui from the Harvester team was the first external pilot factory tester.
- During this quarter, we expect a **'prototype'-level version** of the VOMS-Admin replacement to be available. CMS volunteered to go first – as CERN HR database integration is finalized.
  - There has been a WLCG instance for a few months – meant for developers.
  - Follow the progress at the biweekly WLCG authz meetings.

A long road remains to have all the GSI use cases to be replaced by tokens.

- Undoubtedly, the first step is to ensure the leading sites support both X509 and tokens!

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Token Auth – Road to Run!

What sort of things are left for the token transition?

- Get a production quality token endpoints at CERN.
- Make sure the facility has upgraded to HTCondor-CE 4.0. Ensure production pilots utilize SciTokens to submit to CEs.
- Ensure pilots receive valid storage tokens for stage-in and stage-out.
    - Ensure all storage endpoints support token auth.
    - This could really use a champion from the U.S. ATLAS side!
- From a facility point-of-view, the upside is all the requisite technologies are released:
    - HTCondor-CE 4.0, Xrootd + latest SciTokens plugin.
    - Current dCache golden release.
    - Participating in the WLCG working group is the best way to ensure things are working.

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OSG 3.6

OSG 3.6 is expected for January 2021 and will have two major changes:

- Rolling release schedule:
  - As opposed to an ~monthly release cadence (formal release number, detailed release notes, announcement), we plan to release in ~weekly batches.
  - Each weekly set of updates will get a release email and append release notes to a page ([example from 3.5](#)).
  - **Goal**: get bugfixes to you faster and streamline our process.
- No Globus dependencies:
  - Any package or dependency installed from OSG won't bring in an RPM named **globus-***.

OSG 3.5 support (which includes Globus components) **will extend out to January 2022**.

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Standard Updates

While we're working on OSG 3.6, ensure you pay attention to the typical 'odds-n-ends':

- OSG 3.5: OSG 3.4 is on security-fixes-only support. Upgrade all CEs, data servers, and worker nodes to OSG 3.5.

- HTCondor 8.8.8: As always, ensure all installs of HTCondor at your site are on the latest supported series.

- [HTCondor-CE 4.0+](): Support for token-based auth.

- Xrootd 4.12.1: Plethora of fixes, including HTTP-TPC fixes.

  - Xrootd 5.0 should be released in the next few month – update before the end of the calendar year. This version will support the Xrootd-over-TLS protocol, which allows tokens to be used with Xrootd.

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