Config. Overview

- GW8 test gateway: Xrootd 5.2.0
  - “External” checksum script
- TPC defaults to calculating checksum on transfer
- Xroot and HTTP/webdav running (both operating on port 1094)
- Otherwise a similar configuration to production gateways:
  - e.g. Memcache proxy, etc.
- Macaroons (Storage-provided) tokens supported
- ‘WLCG’-style tokens next on list to deploy
- NB. Pull mode default required WLCG transfer mode.
Functional tests (1)

- ATLAS Functional tests:
  - 1MiB transfers @ ~ 0.5Hz

- Last 30 days transfer eff.
  - Most drops due to development work on server

- However, last 7 days, fine granularity:
  - Several short failures (correlated with high loads from DOMA tests ?)

Transfers with RAL as DST
Functional tests (2)

- Last 30 days with RAL as SRC:
  - Affected also by the DST site

- Last 7 days; RAL as SRC
  - (recent ‘issues’ appear to be from MAN.)
Internal Monitoring (Vande)

- Last 7 days from Vande monitoring (no heavy testing underway however)
fstream monitoring

- New monitoring at RAL based on fstream xrootd monitoring code
- Reads from ~ 25 days on test gateway

239,136TB
of data transferred

608,795
total transfers
Performance testing

• Testing of reads from Echo to RAL UI machine via test gateway
  • ~ 350 MB file transfer over xroot protocol (as part of larger suite of transfer tests).
  • Investigations continuing over typically transfer speeds, and possible optimisations
  • (Some of these tests will have overlapped with DOMA stress tests)
DOMA Functional Tests

• Sets of 1GB transfer across matrix of sites
• Last 24 hours heat map of failure rates
• Xroot transfers generally ~ok for RAL; davs show much more inconsistency (and worse overall performance)
DOMA Stress Tests (webdav)

- Various suites of tests over matrix of sites for xroot and webdav transfers
- 24 hours period with sets of 4GB file transfers;

  - (Heatmap of failure rates):

<table>
<thead>
<tr>
<th>Source</th>
<th>UK1-IC-DCA_H</th>
<th>PRAGUE-LCG2-DPM_H</th>
<th>NEBRASKA2-XRD_H</th>
<th>IN2P3-DCA_H</th>
<th>BRUSSELS-DCA_H</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>8.2%</td>
<td>11.0%</td>
<td>3.5%</td>
<td>4.4%</td>
<td>16.0%</td>
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<tr>
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<td>6.5%</td>
<td>8.4%</td>
<td>5.6%</td>
<td>41.1%</td>
<td>4.0%</td>
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<tr>
<td></td>
<td>7.9%</td>
<td>6.2%</td>
<td>6.5%</td>
<td>34.8%</td>
<td>7.2%</td>
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<tr>
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<td>4.2%</td>
<td>4.9%</td>
<td>6.3%</td>
<td>19.2%</td>
<td>4.7%</td>
</tr>
<tr>
<td></td>
<td>5.8%</td>
<td>6.7%</td>
<td>1.4%</td>
<td>19.4%</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

- Typical errors of form:

9
Checksums

- Basic logging into ES and kibana now available for GW8:
  - Internal xroot checksum code appears to recalculate checksum on any request.
  - Replaced with ‘stopgap’ external script to deal with checksumming.

- Plot shows number of requests per hour (dominated by atlas functional tests).
  - ~ 200ms for retrieval from metadata
  - ~ 10s/GB (e.g 100 MB/s) for calculation from file (in unloaded system)
Dedicated tests

- Multiple transfer tools against multiple storage technologies with various configurations possible
- Example ‘dedicated test’ using Prague DPM site as remote:
  - *(FTS speeds not accurate, as measured from start to end of operation, including any queueing in FTS)*

- In general, transfer speeds not performant:
  - Especially in push mode
  - A few failure modes, to be understood (only in push)
- Even xroot transfer speeds not great:
  - *(Prod. gateways with 5.2.0 do appear to show good speeds however)*

<table>
<thead>
<tr>
<th>TEST</th>
<th>Prot</th>
<th>RESULT</th>
<th>MODE</th>
<th>RAL is</th>
<th>Speed (MB/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GFAL</td>
<td>xrootd</td>
<td>Pass</td>
<td>pull</td>
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<td>XRDPC-delegate</td>
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<td>delegate only</td>
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<td>http</td>
<td>Pass</td>
<td>pull</td>
<td>SRC</td>
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</tbody>
</table>
Ongoing Summary

• TPC via xroot and https/davs deployed on test gateways
• Running in ATLAS, DOMA and private suites of tests
• Functionally running, but issues remain at scale
  • A few failure modes in testings of all potential transfer permutations.
• Xroot transfers generally more performant than equivalent davs transfers

• Transfer speed optimisation and ‘robustness’ remain concern for operations at scale …
Jun 10th Failures

- Note, some timezone differences in plots ...

DOMA functional (1GB) test failures
For RAL as SRC

DOMA Stress (4GB) test failures
For RAL as SRC

Atlas functional test failures

RAL Vande

Rucio DOMA - Failures vs Successes

Transfer Failures

DOMA functional (1GB) test failures
For RAL as SRC

DOMA Stress (4GB) test failures
For RAL as SRC
Jun 10th Failures

• Main errors in period:
  • SOURCE [5] [gfal2_stat][gfal_plugin_statG][davix2gliberr] Result HTTP 500 : Unexpected server error: 500 after 1 attempts
  • TRANSFER [5] [gfalt_copy_file][perform_copy] TRANSFER [gfal_http_copy] ERROR: Copy failed with mode 3rd pull, with error: [davix2gliberr] Transfer failed: failure: Error when interacting with local filesystem: Transfer failed because no bytes have been received in 60 seconds
  • TRANSFER [5] [gfalt_copy_file][perform_copy][gfal_http_copy] DESTINATION OVERWRITE [gfal_http_copy_overwrite] [gfal_http_exists][gfal_http_access][davix2gliberr] Result HTTP 500 : Unexpected server error: 500 after 1 attempts

DOMA functional (1GB) test failures For RAL as DST
DOMA transfer speeds

Private root:// transfer tests

GW8

Private root:// transfer tests

GW2