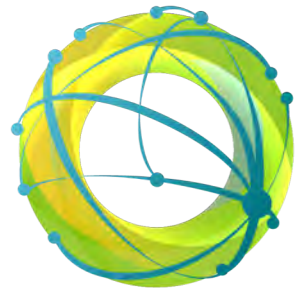


FTS

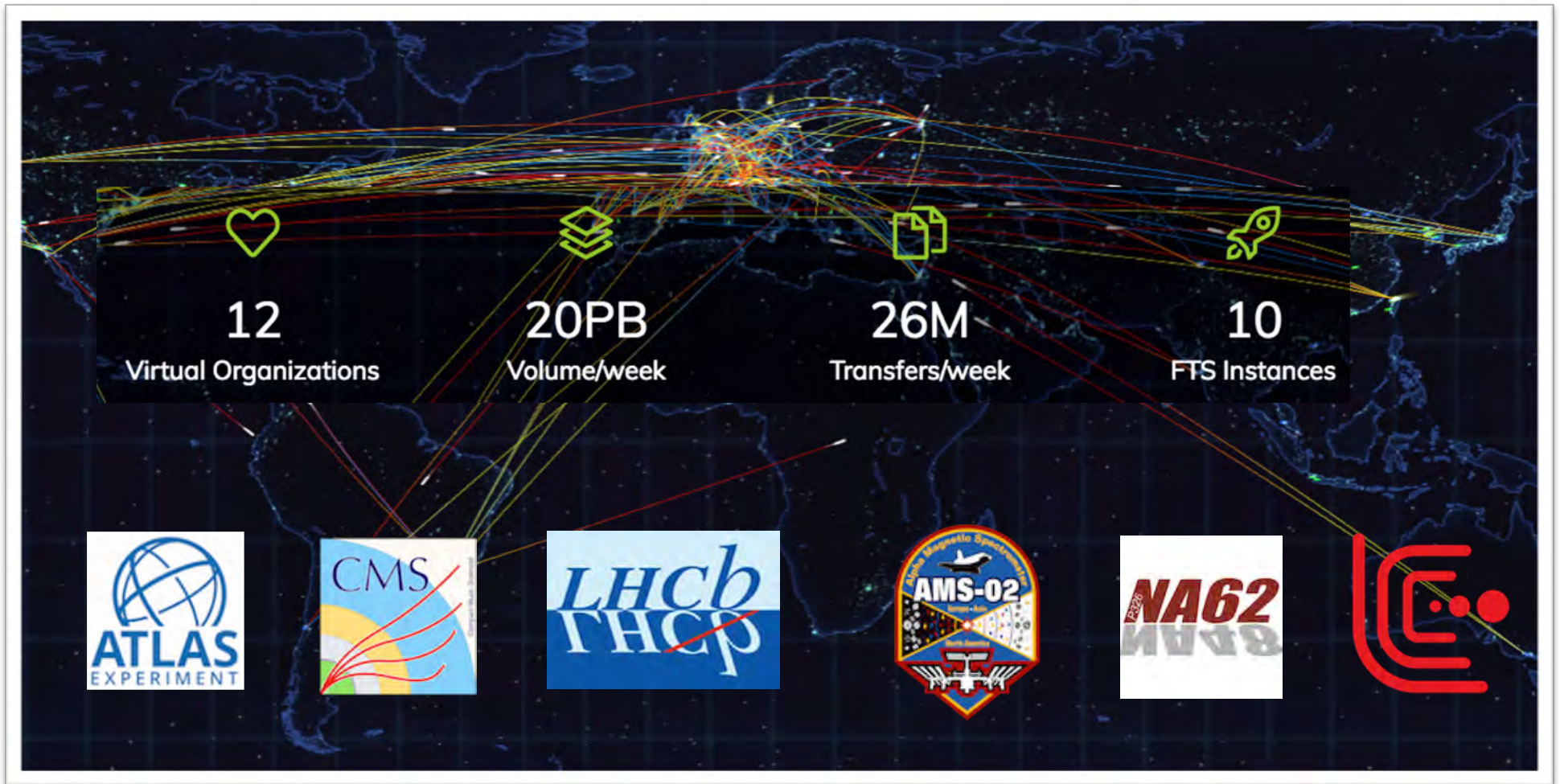
File Transfer Service

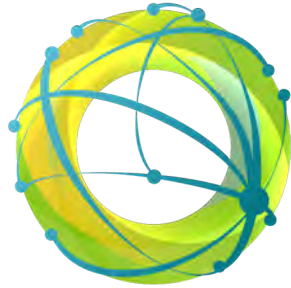
- 
- Distributes the majority of Large Hadron Collider data across the World LHC Computing Grid (WLCG) infrastructure.
 - Developed at CERN



FTS

File Transfer Service





FTS

File Transfer Service

• Main Components



WebFTS - Simplifying power

WebFTS is a file transfer and management solution which allows users to invoke reliable, managed data transfers on distributed infrastructures.



FTS-REST - Python bindings

FTS-REST provides python bindings for easy integration with frameworks and a command-line interface for copying transfers from one site to another.



Real-Time Monitoring

FTS provides monitorization for several profiles: **General monitoring** (Grafana) for general users, **Discovery Data** (Kibana) for researches and Service Specific (ftsmon/Kibana) for service managers.



Optimizer - Taking the most from our infrastructure

The optimizer makes possible to run transfers between any two random endpoints with good reliability and performance with zero configuration by default.



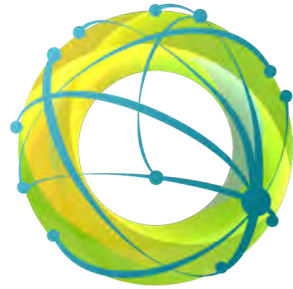
GFAL - Multiprotocol support

GFAL-2 is a group of command line tools for file manipulations with multiple protocols (Webdav/https, GridFTP, xroot, SRM).



Support

FTS is full-supported thanks to the FTS team at CERN.



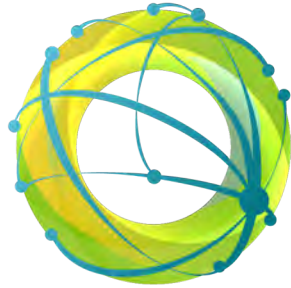
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File Transfer Service

- [WebFTS](#) – Transferring files from your browser

The screenshot shows the WebFTS web interface in a browser. The address bar displays `https://webfts.cern.ch/submit.php`. The page header indicates the user is authenticated as `Robot: fts3 testsuite` and shows `No delegation detected`. The main navigation bar includes `Home`, `My Jobs`, and `Submit a transfer`. The interface is divided into three main sections:

- Left Panel:** A `Grid SE` dropdown menu, an `Endpoint path` input field with a `Load` button, and buttons for `Create Folder`, `Delete`, and `Rename`. Below this is a table with columns `Name`, `Mode`, `Date`, and `Size`, and a `0 File(s) Selected` indicator.
- Center Panel:** Navigation arrows, checkboxes for `Overwrite Files`, `Compare Checksums`, and `LFC Registration`, and a text input field containing `lfc://`.
- Right Panel:** A `Grid SE` dropdown menu, an `Endpoint path` input field with a `Load` button, and buttons for `Create Folder`, `Delete`, and `Rename`. Below this is a table with columns `Name`, `Mode`, `Date`, and `Size`, and a `0 File(s) Selected` indicator.



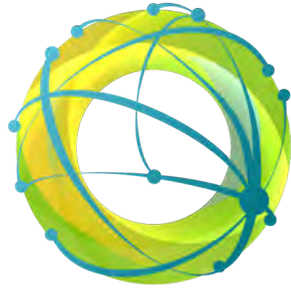
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File Transfer Service

- FTS REST bindings: Command line example

```
[marsuaga@lxplus053 public]$ fts-transfer-submit -s https://fts3-devel.cern.ch:8446 srm://dpmhead-rc.cern.ch:8446/srm/manag
erv2?SFN=/dpm/cern.ch/home/dteam/install.log root://castorpps.cern.ch//castor/cern.ch/c3/ maria/install.log
f2298a00-e19d-11e7-affd-02163e00a077
[marsuaga@lxplus053 public]$ fts-transfer-status -s https://fts3-devel.cern.ch:8446 f2298a00-e19d-11e7-affd-02163e00a077
FINISHED
```

- <http://fts3-docs.web.cern.ch/fts3-docs/fts-rest/docs/cli/index.html>

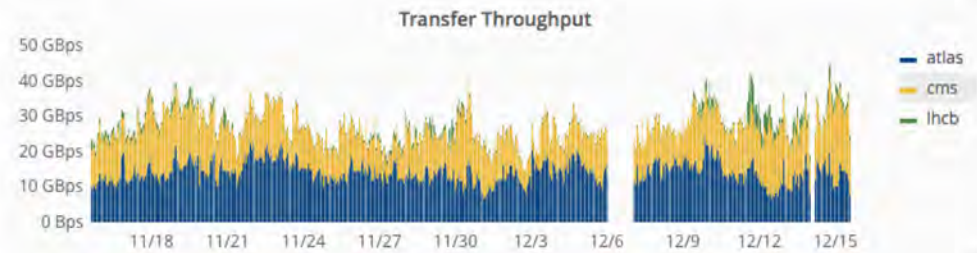
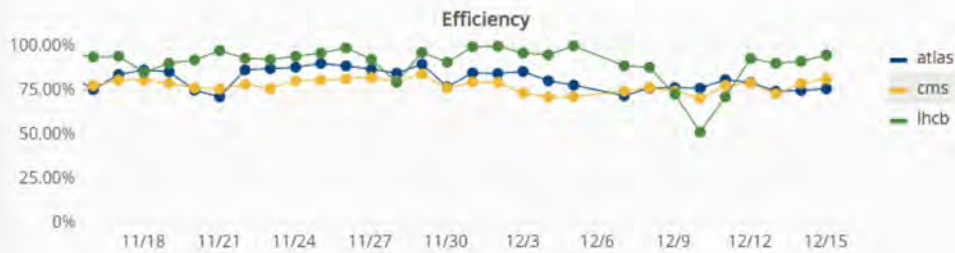


FTS

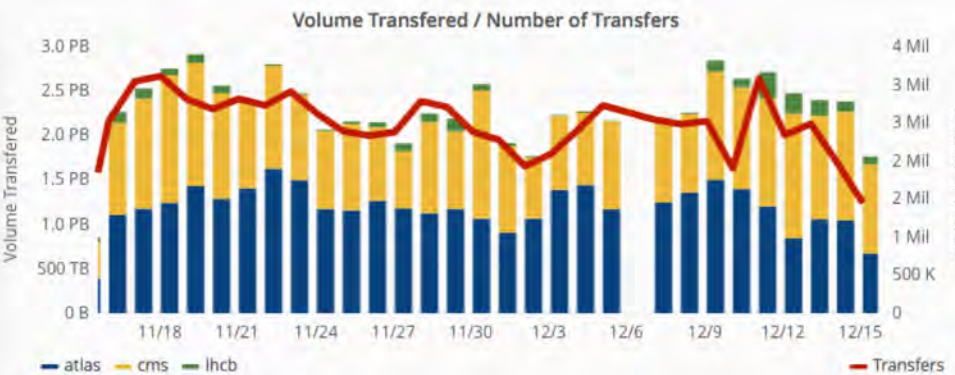
File Transfer Service

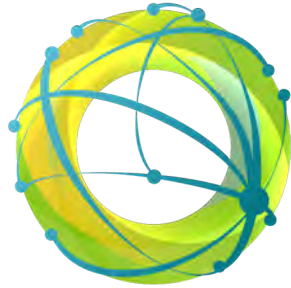
- Real Time Monitoring: [Grafana](#)

FTS Transfers (LAST 30 DAYS)



Volume Statistics





FTS

File Transfer Service

- Real Time Discovering: [Kibana](#)

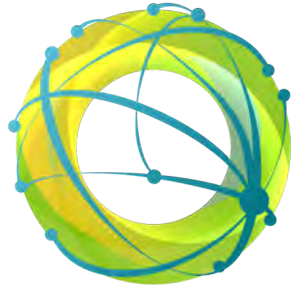
The screenshot displays the Kibana interface with the following components:

- Header:** "kibana" logo, "2,700,212 hits", and search bar with "Search... (e.g. status:200 AND extension:PHP)".
- Left Sidebar:** Navigation menu with "Discover", "Visualize", "Dashboard", "Timeline", "Indices", "Own Home", and "Management".
- Search Bar:** "Search... (e.g. status:200 AND extension:PHP)" and "Uses lucene query syntax".
- Filters:** "Add a filter +", "monit_prod_fts_raw_*", and "December 15th 2017".
- Selected Fields:** List of fields including "_source", "_id", "_index", "_score", "_type", "data.agentfqdn", "data.dest_se", "data.dest_srm_v", "data.dst_hostname", "data.dst_site_name", "data.dst_url", "data.endpnt", "data.file_id", "data.file_metadata", "data.file_metadata.activity", "data.file_metadata.adler32", and "data.file_metadata.dest_rse_id".
- Charts:**
 - "_project fts Staging: Average file size in Queue" (Bar chart showing average user file size over time).
 - "_project fts Staging: Average file size in Successful State" (Bar chart showing average user file size over time).
 - "_project FTS Staging: Staging Duration" (Bar chart showing number of files over time).
 - "_project FTS Staging: Filter by File ID" (Table listing file IDs and counts).
 - "_project FTS Staging: Failed transfers with staging" (Bar chart showing number of files over time).
 - "_project FTS Staging: Staging Error Logs" (Table listing error messages and counts).
- Table Data (Filter by File ID):**

File ID	Count
1920275999	9
1920286245	9
584389310	9
1920284240	8
1920284831	8
584405711	8
584407544	7
1920276618	6
- Table Data (Staging Error Logs):**

data.reason	Count
STAGING [5] error on the bring online request: [SE][StatusOfBringOnlineRequest][SRM_FAILURE] Stager did not answer within the requested time	6,120
STAGING [5] error on the bring online request: [SE][StatusOfBringOnlineRequest][SRM_FAILURE] Unable to issue PrepareToGet request to Castor	21
STAGING [70] srm-ipc err: Communication error on send, err: [SE][GetSpaceTokens][SRM_INTERNAL_ERROR] http://srm-ihcb.cern.ch:8443/srm/managementv2: ORA-02391: exceeded simultaneous SESSIONS_PER_USER limit	10

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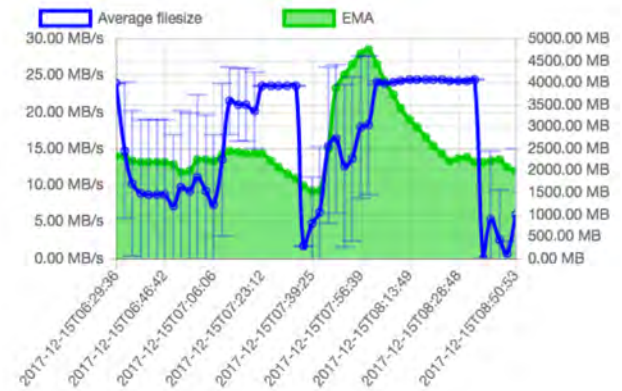
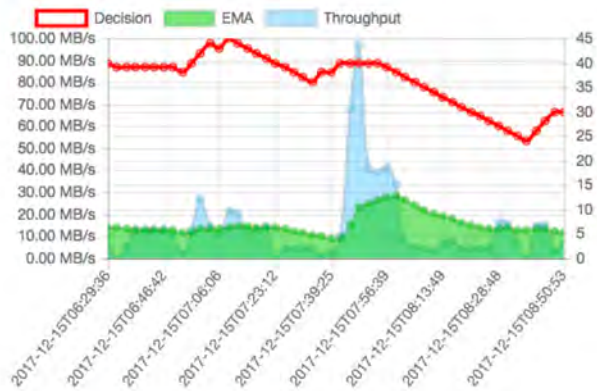


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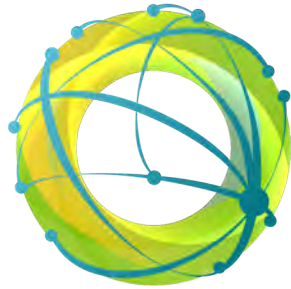
- ## Optimizer

Details for <srm://srm-cms.cern.ch> → <gsiftp://eoscmsftp.cern.ch>



First Previous 1 2 3 4 5 Next Last

Timestamp	Decision	Running	Queue	Success rate (last 1min)	Throughput	EMA	Diff	Explanation
2017-12-15T08:50:53	30	1	33	100.00%	6.42 MiB/s	11.81 MiB/s	0	Good link efficiency, small throughput deterioration
2017-12-15T08:47:31	30	0	37	100.00%	3.30 MiB/s	12.41 MiB/s	2	Good link efficiency, throughput deterioration, avg. filesize decreasing
2017-12-15T08:44:53	28	0	40	100.00%	14.90 MiB/s	13.42 MiB/s	2	Good link efficiency, current average throughput is larger than the preceding average
2017-12-15T08:42:16	26	0	46	100.00%	14.58 MiB/s	13.26 MiB/s	2	Good link efficiency, current average throughput is larger than the preceding average
2017-12-15T08:39:35	24	0	33	1.00%	0 bytes/s	13.11 MiB/s	-1	Bad link efficiency, no changes



FTS

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- Gfal: Multiprotocol support

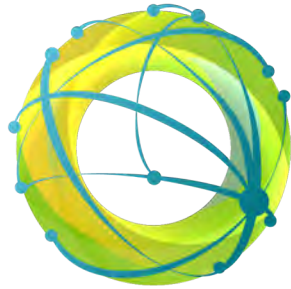
```
[marsuaga@lxplus053 public]$ gfal
gfal-cat          gfal-legacy-register  gfal-mkdir          gfal-stat         gfalFS
gfal-chmod        gfal-legacy-replicas  gfal-rename         gfal-sum          gfalFS_umount
gfal-copy         gfal-legacy-unregister gfal-rm              gfal-xattr        gfal_srm_ifce_version
gfal-legacy-bringonline gfal-ls                gfal-save           gfal2_version     gfal_version
[marsuaga@lxplus053 public]$
```

- <https://dmc.web.cern.ch/projects/gfal2-utils>

STORAGE INTERFACE

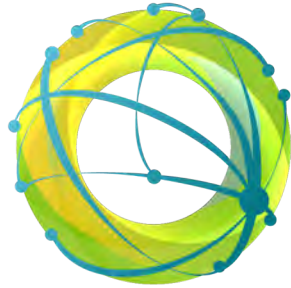
 <p>CLOUD STORAGES</p> <p>Any cloud storage in the market with S3 compatibility.</p>	 <p>DPM</p> <p>Disk Pool Manager: Storage system for grid sites.</p> <p>developed by CERN</p>	 <p>EOS</p> <p>EOS Open Storage: Large disk storage at CERN.</p> <p>developed by CERN</p>
--	--	---

18/12/17 Maria Arsuaga-Rios 9



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- Ready to go:
 - You only need a user certificate
 - Use one of our FTS instances
 - Install one of our docker containers to ensure 3rd party copy for all types of storages
- <https://gitlab.cern.ch/fts/ready-to-go>
- FTP server
 - GridFTP server with host certificates auto-generated
 - GridFTP server with your host certificates
- Install FTS-Rest python bindings



FTS
File Transfer Service

- FTS Support

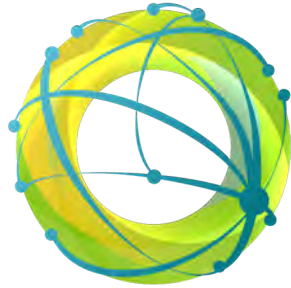
- fts-support@cern.ch



fts-support

- Full-documented:

- <http://fts3-docs.web.cern.ch/fts3-docs/>



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File Transfer Service

