

File transfer services  
-overview of results and experiences-

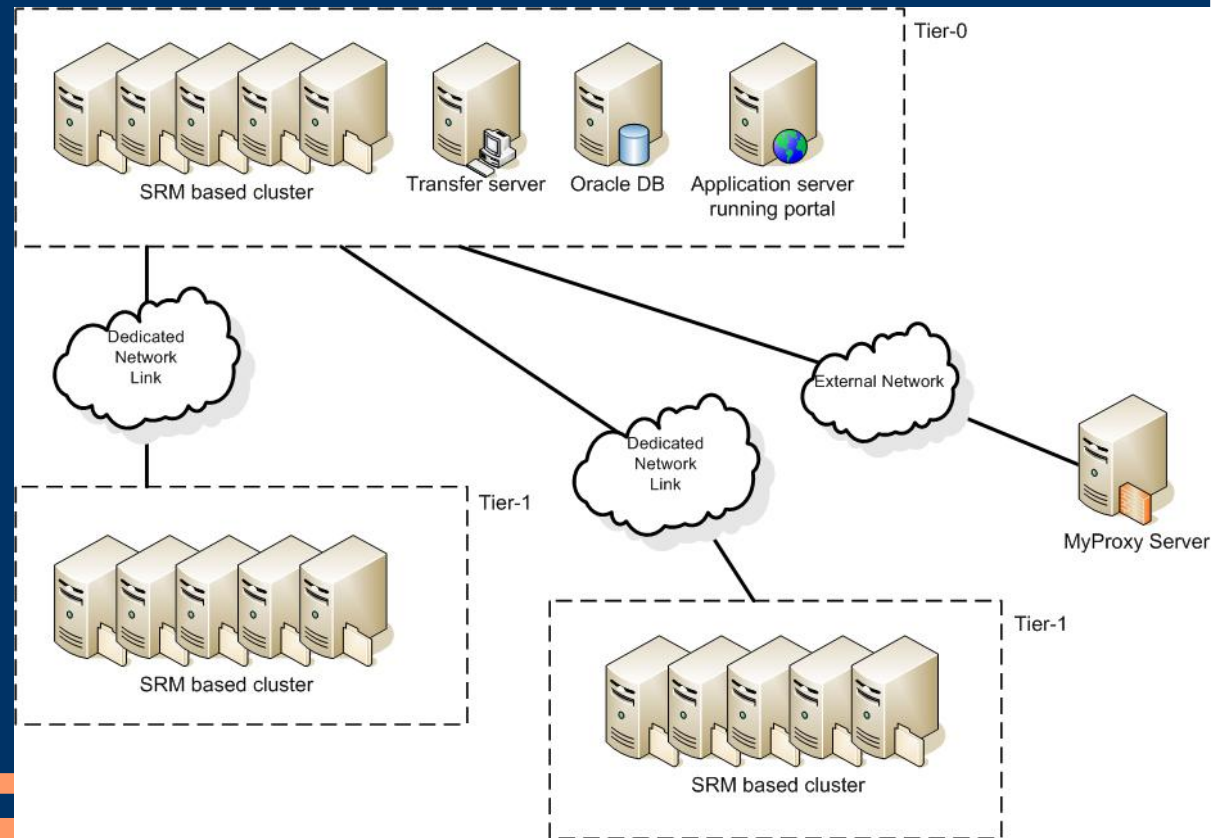
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# *Outline*

- What is FTS?
  - Why do we use it?
  - How do we use FTS?
  - Experiences
  - Where are we?
  - Conclusions
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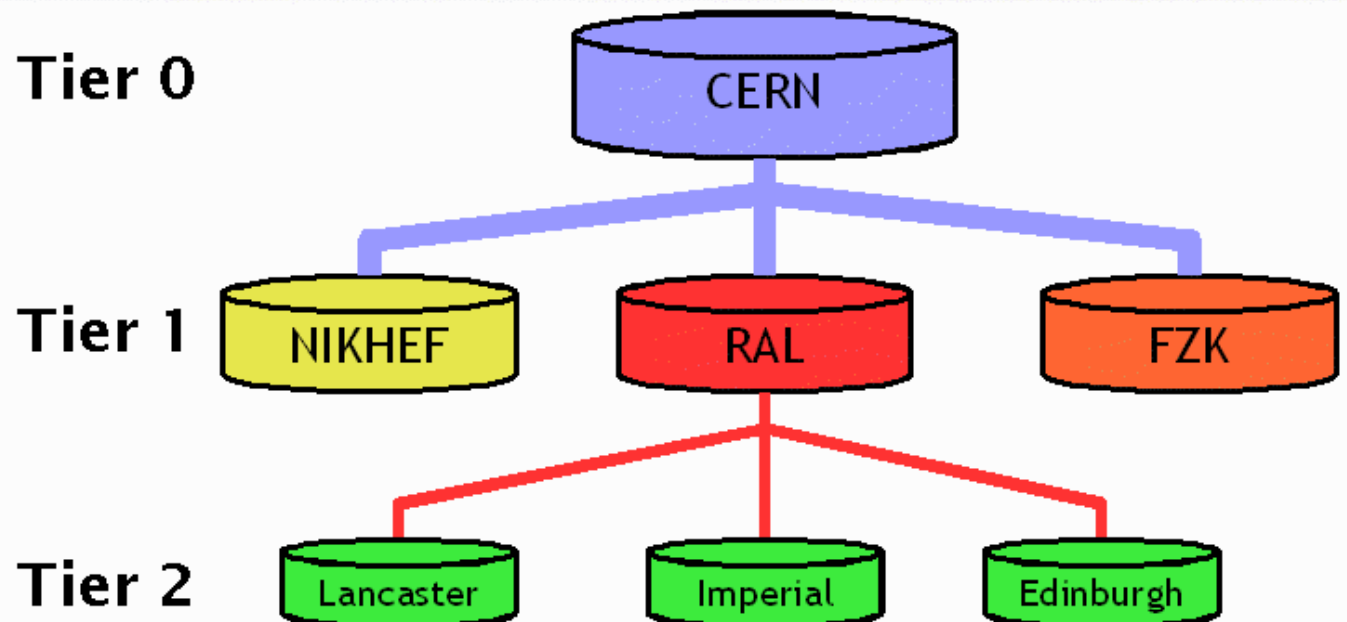
# What is FTS ?

- FTS stands for *File Transfer Service*
- Component provided by the GLite middleware
- Uses 3<sup>rd</sup> party copy (gridftp) to reliably copy one *Storage URL (SURL)* to another, retrying if necessary.



## What is FTS ? (cont.)

- FTS defines *channels* between domains. This is the way to assign transfers to a certain site and to control the data flows between the sites (bandwidth and the number of concurrent transfers)
- This has nothing to do with the network layer, the actual routing of the data is done via the existing physical paths



## *Why do we use FTS ?*

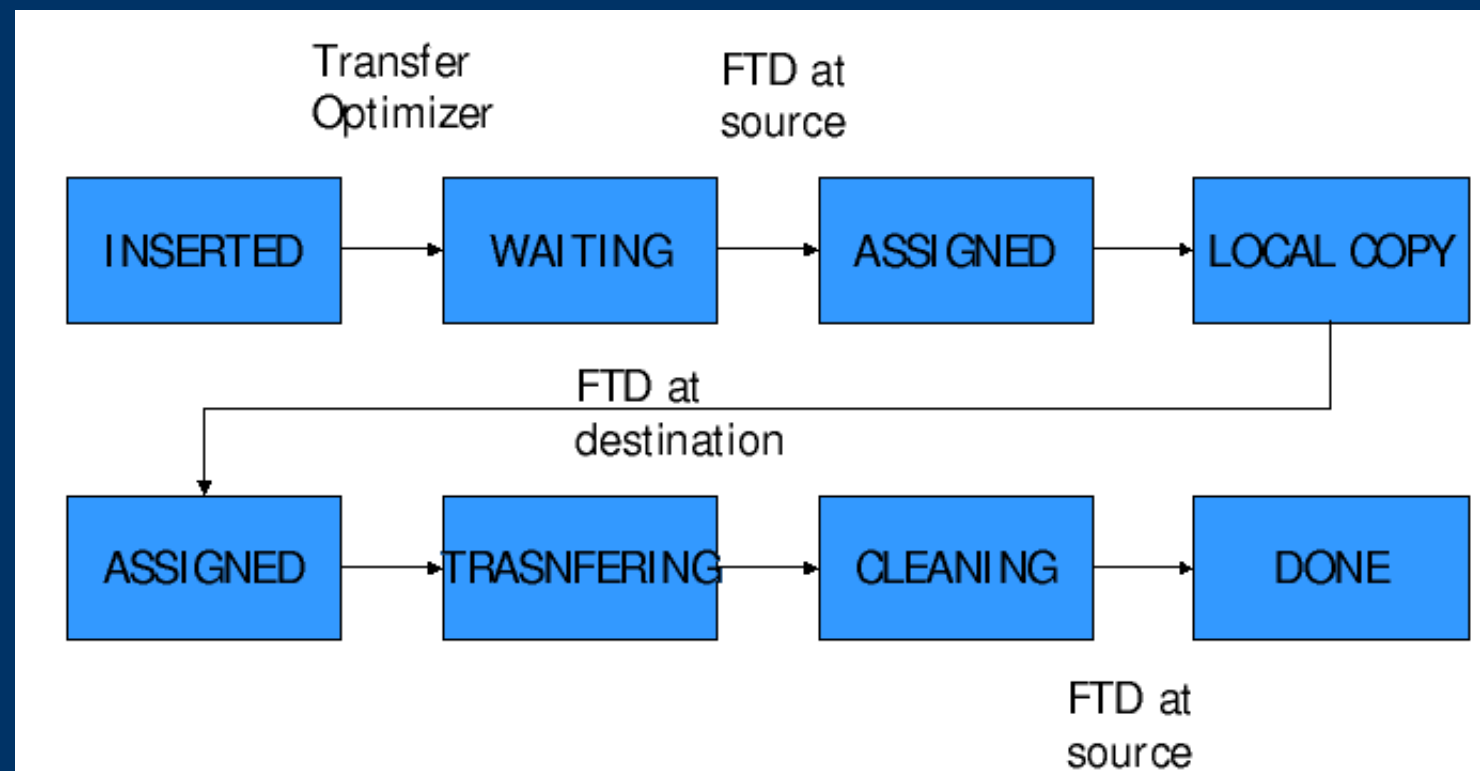
- Provides an uniform access to underlying storages.
  - Since this is a middleware-provided tool it would be easier for the sites to provide it as a service to all the VOs.
  - Less development from our point of view.
  - Less control over what happens ...
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# How do we use FTS ?

- ALICE computing data replication paths:
    - RAW data replication from T0 to T1
    - ESD/AOD replication from T0/T1 to T1/T2
    - ESD/AOD replication from T2 to host T1
  - Rates
    - During the LHC shutdown, the Pb+Pb data will be replicated to the T1s with a rate of 300MB/sec
    - This is what we are testing this year
    - List of participating T1s (5):  
CCIN2P3, CNAF, FZK, RAL, SARA/NIKHEF
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## How do we use FTS ? (cont.)

- FTS doesn't handle catalogs or any other higher-level functions.
- AliEn's wrapper for file transfers is *FTD*.
- FTD has distinct queues per each destination SE.



## *How do we use FTS ? (cont.)*

- For the beginning we mirrored the production files, that are ~0.8GB each.
  - This proved to be insufficient, since we do not produce as much as to saturate the network.
  - To simulate the expected environment we have created the LPM framework, that acts as a load generator:
    - 100 files x 1.9GB / site are continuously mirrored then deleted from the sites.
  - This is supplemental to the production data, making sure that the transfer queues are always full.
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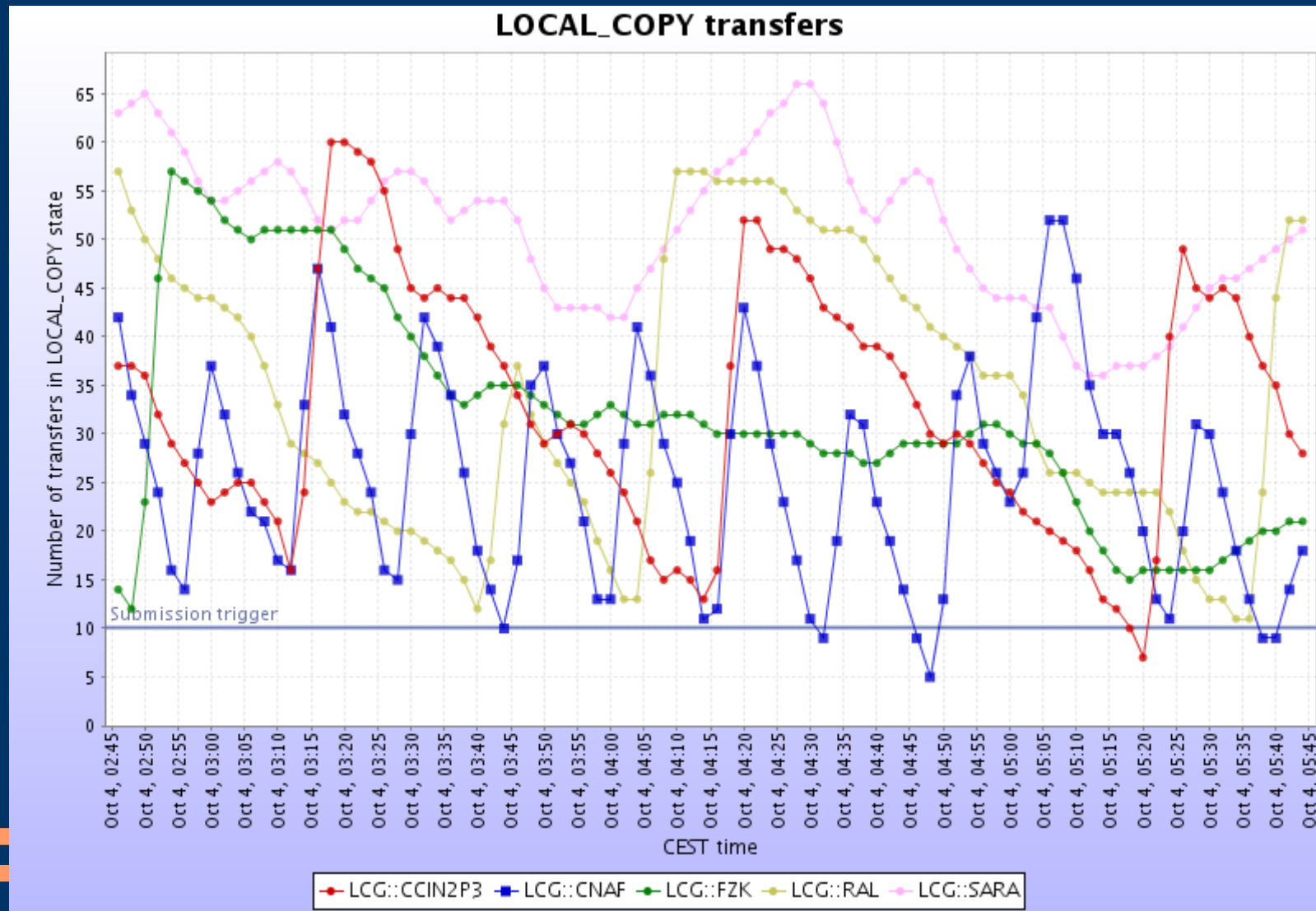


## ***How do we use FTS ? (cont.)***

- *LOCAL COPY* is the last state for the transfers in the central queue.
  - Watching the number of files in this state for each target SE we can decide when and where to submit more files.
  - This process is automatic, keeping the queues full all the time, but not overloading them.
  - The dummy files have lower priority than the produced ones, if there are enough real data files that enter the queue then there is no reason to submit dummy files.
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# How do we use FTS ? (cont.)

- The decision to submit more files is taken by the LPM, based on the monitoring information in MonALISA



# *Experiences*

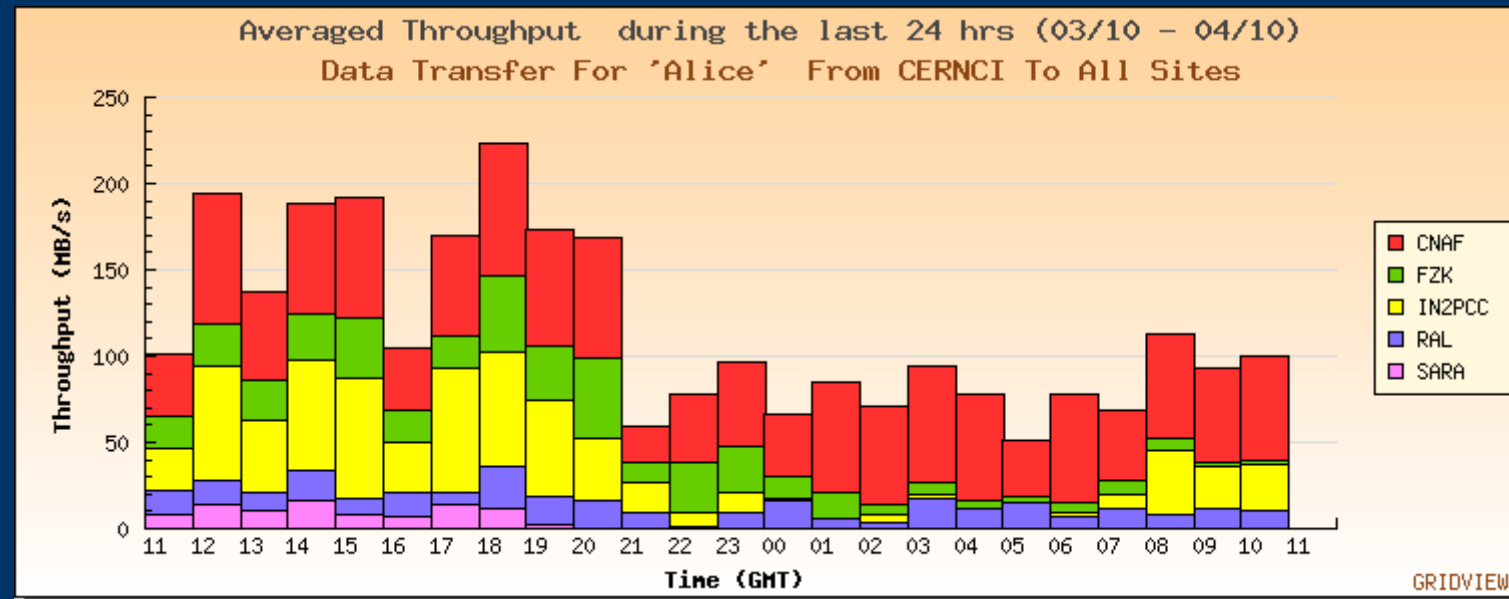
- Lots of sources of instability
    - Networking problems,
    - Site storage problems,
    - Problems with the VOBoxes,
    - FTS central services outages,
    - gridftp bugs.
  - Problems are reported to GGUS, but it takes way too much time for the problem to reach the right people so we try to directly reach the persons involved.
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## *Experiences (cont.)*

- Thanks to Pablo we have a nice interface to see aggregated statistics for the FTD transfer states, so it's easier now to spot outstanding problems:  
<http://dboard-gr.cern.ch/dashboard/data/fts/today.html>
  - To monitor the transfer speeds we have two tools:
    - Gridview: <http://gridview.cern.ch/GRIDVIEW/> which reports all the network traffic
    - MonALISA repository:  
<http://pcalimonitor.cern.ch:8889/display?page=FTD/SE>  
here only successful transfers are shown
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# Where are we?

- We have never reached the target rate of 300MB/sec
- Peak 1-hour average rate: 220MB/sec
- Peak 1-day average rate: 130MB/sec



# *Conclusions*

- FTS is working, but there are still many operational problems that lead to general system instability.
  - We are still pushing to reach the target rate, with no answer yet to where the bottleneck really is.
  - Since all the tools are in place for maintaining a constant load on the system we will go from actively monitoring the state and pushing for an immediate solution to the problems to expecting a higher general quality of the service.
  - We will start testing the T2-T1 transfers in the coming weeks:
    - low transfer rates, test of service availability and stability.
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