Production Activities and Requirements by ALICE

Patricia Méndez Lorenzo

(on behalf of the ALICE Collaboration)

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Outline

- PDC'06/SC4 goals and tasks
- General aspects of ALICE software
- Principles of operation
- Medium-term plans – FTS transfers
- Site actions and requirements
- Open questions and conclusions

Main tasks of the ALICE Physics Data Challenge 2006 (PDC'06)

- Validation of the LCG/gLite workload management services
  - Stability of the services is fundamental for the entire duration of the exercise
- Validation of the data transfer and storage services
  - 2nd phase of the PDC'06
  - The stability and support of the services have to be assured beyond the throughput tests
- Validation of the ALICE distributed reconstruction and calibration model
- Integration of all Grid resources within one single – interfaces to different Grids (LCG, OSG, NDGF)
- End-user data analysis

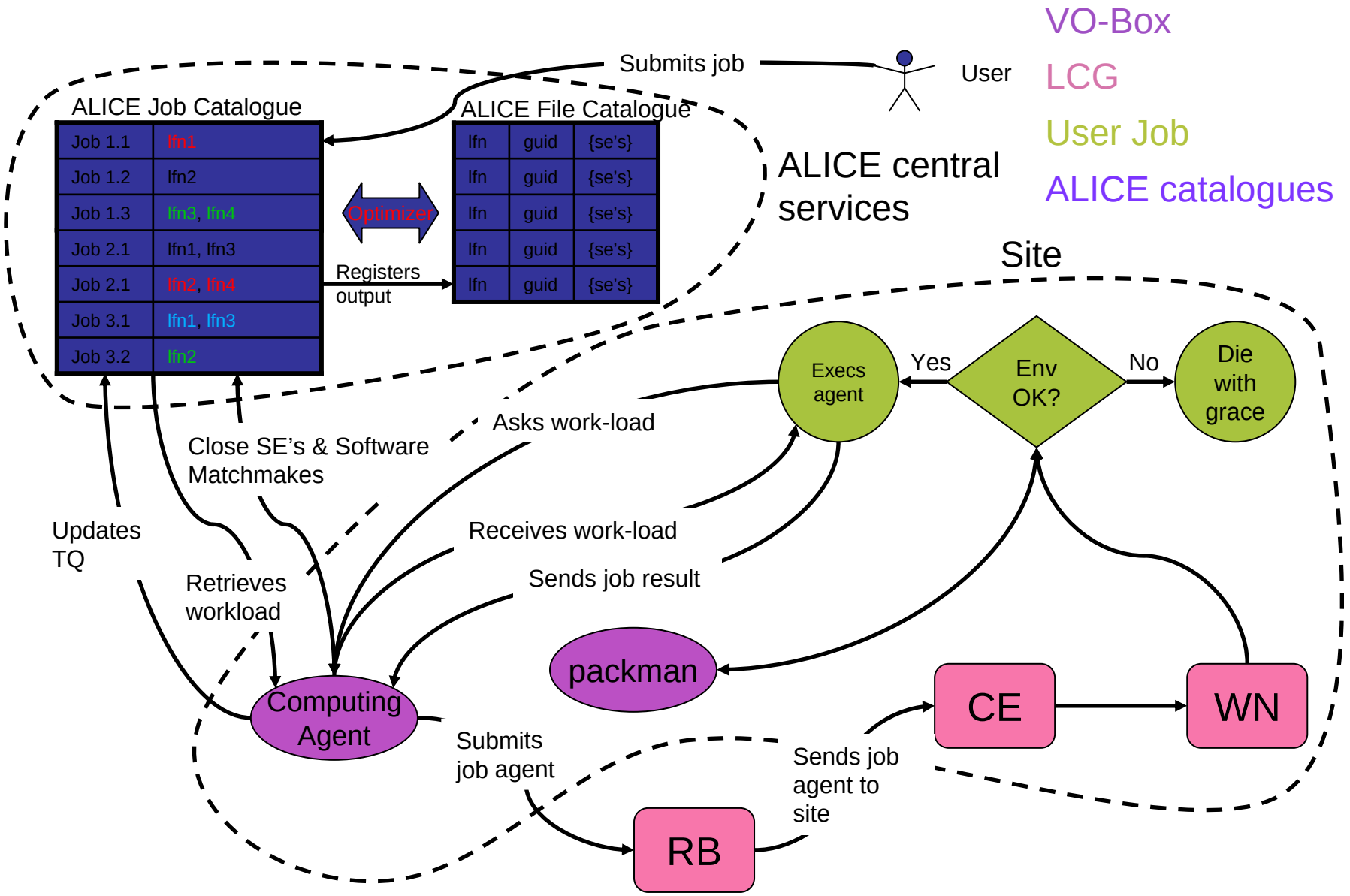
PDC'06 phases

- First phase (ongoing):
  - Production of p+p and Pb+Pb MC events
  - Conditions and samples agreed with PWGs
  - Data migrated from all Tiers to CASTOR@CERN
- Second phase (July/August):
  - Scheduled data transfers T0-T1
  - Reconstruction of RAW data: 1st pass reconstruction at CERN, 2nd pass at T1 (August/September)
  - Scheduled data transfers T2- (supporting)T1
- Third phase (September/October)
  - End-user analysis on the GRID

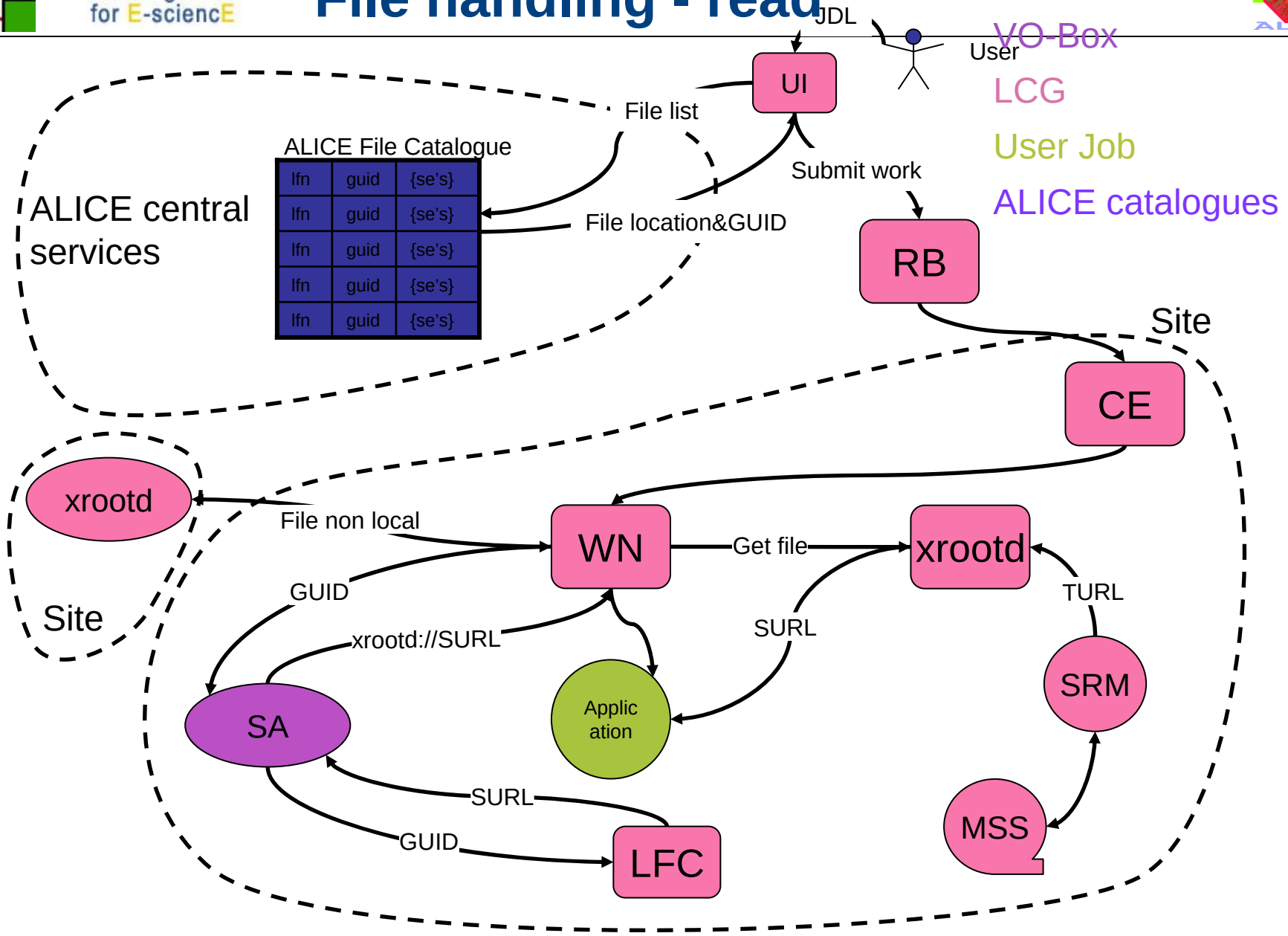
ALICE Software: General Aspects

- AliEn is the single entry point for all ALICE users to the Grid
  - Through interfaces it interacts with the services offered by the various Grids
  - Provides set of tools to complement the missing functionality in the Grid(s) implementation
- Central Task Queue and related services
  - Job optimization – job is sent to the data location
  - Resources use prioritization – down to user level
- Make full use of the underlying services
  - RB for the job agent submission
  - Data transfer and management
- Integration of the LCG services using high-level tools and APIs
  - Development with a high level of abstraction, thus hiding the complexity and shielding the users from implementation changes

Job Submission Structure



File handling - read



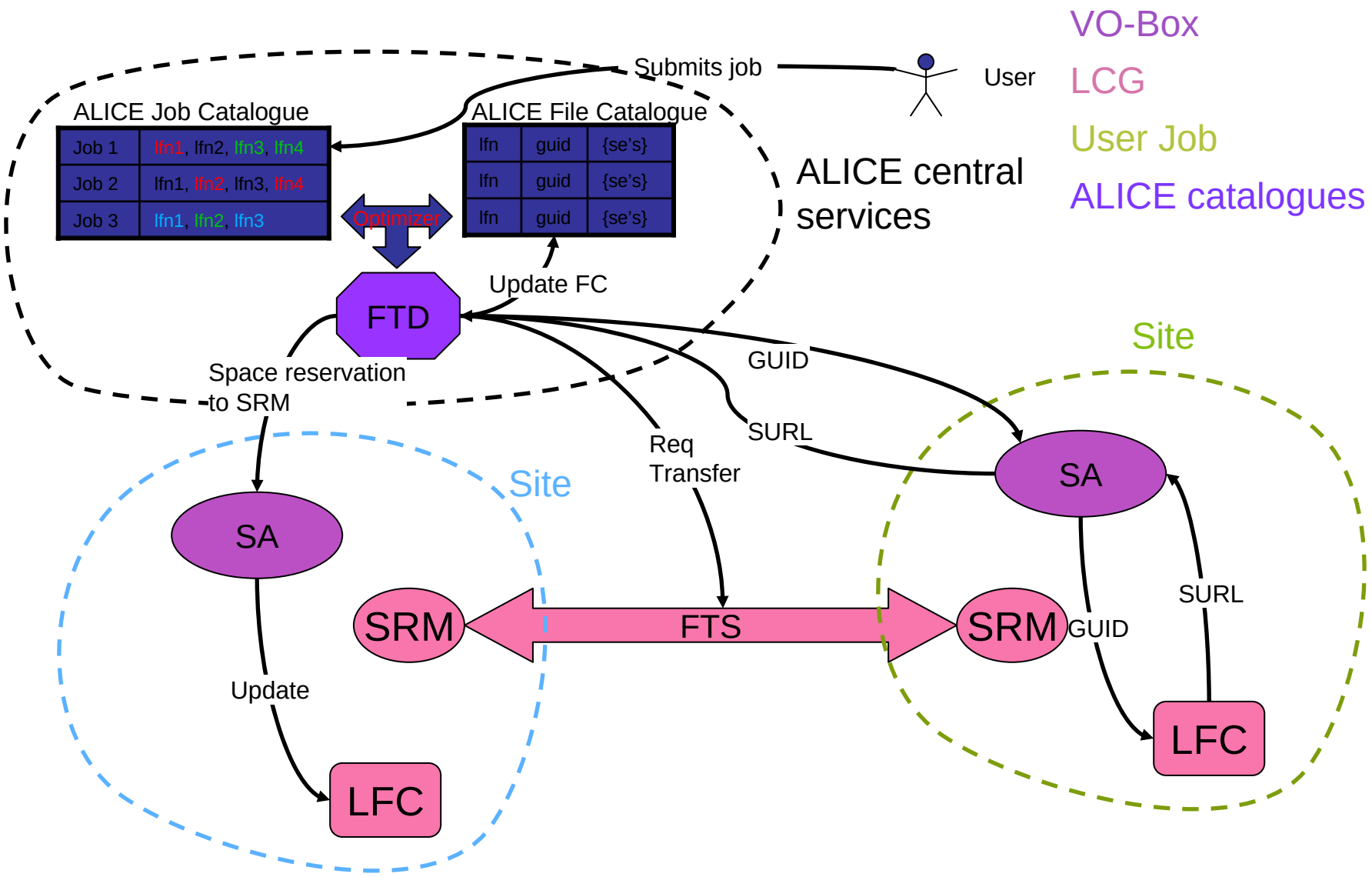
Principles of Operation: VO-box

- VO-boxes deployed at all T0-T1-T2 sites providing resources for ALICE
  - Required in addition to all standard LCG Services
  - Entry door to the LCG Environment
  - Runs standard LCG components and ALICE specific ones
- Uniform deployment
  - The services are exactly the same everywhere
- Installation and maintenance entirely ALICE responsibility
  - Based on a regional principle
  - Set of ALICE experts matched to groups of sites
- Site related problems handled by site administrators
- LCG Service problems reported via GGUS

Principle of Operations: FTS and LFC

- FTS Service
  - Used for scheduled replication of data between computing centers
  - Lower level tool that underlies the data placement
  - Used as plugin in the AliEn File Transfer Daemon (FTD)
    - FTS has been implemented through the FTS Perl APIs
    - FTD running in the VO-box as one of the ALICE services
- LFC required at all sites
  - Used as a local catalogue for the site SE

File replication



FTD-FTS Wrapper

- The wrapper has two main tasks
- Submission
  - The user specifies the SURL in the origin and in the destination... And that`s all
    - It will extract the SEs at the origin and the destination
    - From the IS, the names of the sites will be extracted and also the FTS endpoint
    - The proxies status will be also checked
    - The transfer is performed
- Retrieve
  - Retrieves the status of all transfers associated to the previous submission
- Additional Features
  - Creates automatically a subdirectory where the IDs and the status of the transfers are stored
  - Allows the specification of a file containing several transfers

FTS Tests: Strategy

- The main goal is to test the stability of FTS as service and integration with FTD
  - T0-T1 (disk to tape): 7 days required of sustained transfer rates to all T1s
  - T1-T2 (disk to disk) and T1-T1 (disk to disk): 2 days required of sustained transfers to T2.
- Data types
  - T0-T1: Migration of raw and 1st pass reconstructed data
  - T1-T2 and T2-T1: Transfers of ESDs, AODs (T1-T2) and T2 MC production for custodial storage (T2-T1)
  - T1-T1: Replication of ESDs and AODs

FTS transfer plans

- Synchronized with the SC4 plans:
  - From 10th-23th July:
    - TEST AND DEBUGGING OF THE FTS WRAPPER AND STATUS OF THE SITES
  - From 24th-30th July (throughput and stability test):
    - Sustained export to the T1 sites at 300MB/s from the WAN pool (disk to tape)
    - Test the reconstruction part at 300MB/s from the Castor2-xrootd pool
  - From 31st July-6th August:
    - Run the full chain at 300MB/s DAQ-T0-tape+reconstruction+export from the same pool

FTS: Transfer Details

- T0-T1: disk-tape transfers at an aggregate rate of 300MB/s from CERN
  - Distributed according the MSS resources pledged by the sites in the LCG MoU:
    - CNAF: 20%
    - CCIN2P3: 20%
    - GridKA: 20%
    - SARA: 10%
    - RAL: 10%
    - US (one center): 20%
- T1-T2: Following the T1-T2 relation matrix
  - Test of the services performance, no specific target for transfer rates

FTS tests remarks

- For the throughput test (24th-30th July) the transferred data can be removed at the T1s
  - The sites should provide mechanism for garbage collection
- The FTS transfers will not be synchronous with the data production
- Transfers based on LFN is not required
- The automatic update of the LFC catalogue is not required
  - ALICE will take care of the catalogues update
- Summary of requirements:
  - ALICE FTS Endpoints at the T0 and T1
  - SRM-enabled storage with automatic data deletion if needed
  - FTS service at all sites
  - ***Support during the whole tests (and beyond)***

Proposed ALICE T1-T2 connections

- CCIN2P3
  - French T2s, Sejong (Korea), Lyon T2, Madrid (Spain)
- CERN
  - Cape Town (South Africa), Kolkatta (India), T2 Federation (Romania), RMKI (Hungary), Athens (Greece), Slovakia, T2 Federation (Poland), Wuhan (China)
- FZK
  - FZU (Czech Republic), RDIG (Russia), GSI and Muenster (Germany)
- CNAF
  - ItalianT2s
- RAL
  - Birmingham
- SARA/NIKHEF
- NDGF
- PDSF
  - Houston

L. Robertson is setting up a working group to resolve the T1-T2 coordination

Open questions

- We have some open questions, before the FTS transfers begin:
  - FTS service channels, endpoints and SRM-enabled SEs for ALICE
    - Is it a site-experiment negotiation?
    - The SC team will set-up and test the service, before a handling it to ALICE?
  - Support during the exercise
    - Location of the support team (central, distributed), site contacts
    - Everything through GGUS?

Conclusions

- The ALICE PDC`06
  - Complete test of the ALICE computing model and Grid services readiness for data taking in 2007
  - Production of data ongoing, integration of LCG and ALICE specific services through the VO-box framework progressing extremely well
  - Building of support infrastructure and relations with ALICE sites is on track
- The 2nd Phase of PDC'06 will begin with the FTS transfers (in the framework of SC4)
  - Test of the service stability and support
  - T0-T1 test will also show the sustainability of the target transfer rates (as specified in the ALICE computing model)
  - Still some open questions regarding the T2 association to a host T1
- The 3rd phase (end-user analysis) at the end of the year