ALICE TDR Tier 2 requirements

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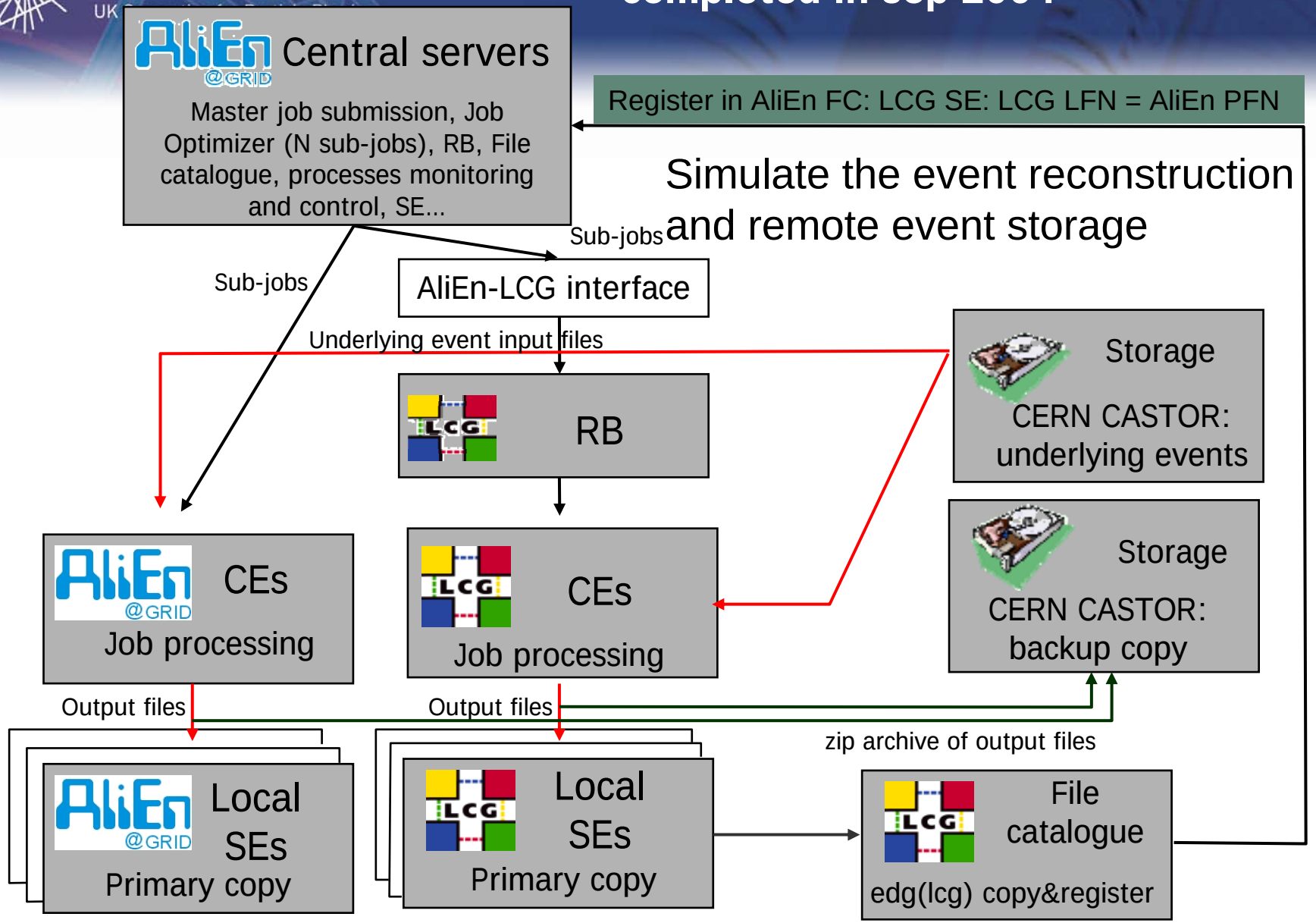
Oxford

ALICE

- Offline Framework
  - Based on AliRoot, and ROOT, integrated with DAQ and HLT (High Level Trigger)
  - EGEE + AliEn
- Detector Construction Database
  - Distributed Sub-detector groups pass data via XML to Central db
- Simulation
  - Currently Geant3 will move to FLUKA and G4
  - VMC insulates users from the transport MC
- Reconstruction strategy
  - Very high flux, TPC (Time Projection Chamber) occupancy up to 40%
  - Max information approach
- Condition and alignment
  - ROOT files with condition info
  - Published on Grid and distributed by the Grid DMS (Data Management System)
  - No need for a distributed DBMS
- Metadata
  - Essential for event selection
  - Grid file catalogue for file level MD
  - Collaboration with STAR (Solenoidal Tracker At RHIC) (RHIC is the Relativistic Heavy Ion Collider at Brookhaven)
  - Prototype in prep for PDC 05
- Physics Data Challenges
  - PDC04 Goals
    - Validate model with ~10% of SDTY data
    - Use offline chain, the Grid, PROOF and the ALICE ARDA prototype

Phase 2 job structure for PDC04

completed in Sep 2004



PDC04

- Summary MonALISA (Monitoring Agents using a Large Integrated Services Architecture)
  - 400 000 jobs, 6 hours/job, 750 MSi2K hours
  - 9M entries in the AliEn file catalogue
  - 4M physical files at 20 AliEn SEs world-wide
  - 30 TB@CERN CASTOR
  - 10 TB@remote SEs + 10 TB backup@CERN
  - 200 TB network transfer CERN –> remote centres
- Summary of PDC04
  - Middleware
    - Phase 1 & 2 successful
    - AliEn fully functional
    - LCG not yet ready
    - No AliEn development for phase 3, LCG not ready
  - Computing model validation
    - AliRoot worked well
    - Data analysis partially tested on local CN, distributed analysis prototype demonstrated

GridPP
UK Computing for Particle Physics

ALICE Computing model

- ALICE computing model
  - T0
    - First pass reconstruction, storage of one copy of RAW, calibration data and first-pass ESD's (Event Summary Data)
  - T1
    - Reconstructions and scheduled analysis, storage of the second collective copy of RAW and one copy of all data to be kept, disk replicas of ESD's and AOD's
  - T2
    - Simulation and end-user analysis, disk replicas of ESD's and AOD's (Analysis Object Data)
  - Difficult to estimate network load
- ALICE MW requirements
  - Baseline Services available on LCG (in three flavours?)
  - An agreed standard procedure to deploy and operate VO-specific services
  - The tests of the integration of the components have started

Needs vs Pledges

	Tier 0	Tier1	Tier1ex	Tier2	Tier2ex	Total	CERN
CPU (MSI2k)	8,3	18,7	12,3	21,4	14,4	35,0	8,3
			35%		41%	100%	24%
Disk (PB)	0,2	8,6	7,4	5,3	5,1	14,1	1,7
	2%	60%	52%	38%	36%	100%	12%
MS (PB/y)	2,5	8,1	6,9			10,6	3,6
	23%	77%	66%			100%	34%
Network in (Gb/s)	8,00	2,00		0,01			
Network out (Gb/s)	6,00	1,50		0,27			

Pledged % of Needed
~60% cpu in 2007
~47% Disk in 2007

	2005	2006	2007	2008	2009	2010
Tier1						
CPU (MSI2k)	0,48	1,03	2,91	8,94	14,88	14,81
Disk (PB)	0,09	0,50	1,53	3,48	5,70	5,88
MS (PB)	0,11	0,85	2,53	5,86	9,93	8,59
Tier2						
CPU (MSI2k)	1,82	2,92	4,81	6,18	8,34	9,01
Disk (PB)	0,28	0,61	1,07	1,68	2,58	3,41

Conclusions

- ALICE choices for the Computing framework have been validated by experience
  - The Offline development is on schedule, although contingency is scarce
- Collaboration between physicists and computer scientists is excellent
- Integration with ROOT allows fast prototyping and development cycle

- Early availability of Baseline Grid services and their integration with the ALICE-specific services will be crucial
  - This is a major “risk factor” for ALICE readiness
  - The development of the analysis infrastructure is particularly late