



ALICE Roadmap for 2009/2010

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Short summary of Offline tasks

- RAW data registration (Grid) and replication T0->T1
- Conditions data gathering and publication on Grid
- Quasi-online reconstruction T0 (Pass 1), ESD/AOD replication
- Delayed reconstruction at T1 (Pass 2), ESD/AOD replication
- Prompt online reconstruction (subset of data @P2)
- Batch @Grid and prompt @CAF user analysis

Registration/replication of RAW

- Data volumes (2008)
 - Total 310 TB at CERN + 200 TB replicated at T1s
 - Includes cosmic data, detector calibration
- Tools and procedures
 - T0 registration -> CASTOR2 and AliEn file catalogue
 - Routine operation, high redundancy of servers and software
 - Problem-free operation
 - All updates carried out transparently by IT/FIO
 - Replication FTD/FTS
 - Tested extensively@CCRC08
 - All goals (rate/stability) met and exceeded
 - Routine operation during data taking (cosmics, calibration)

Registration/replication of RAW (2)

- No major issues
- Confidence in the storage and Grid tools is high
 - Middleware and computing centres storage (T0 and T1s) have been fully certified
- The RAW registration at T0 will be tested at full p+p and Pb+Pb rates (up to 1.5GB/sec) in May-June 2009
 - Replication at p+p rate (100 MB/sec) in the same period

Conditions data - Shuttle

- Shuttle (subsystem DBs to Grid conditions data publisher) system is in operation since 2 years
 - In production regime for the whole 2008
- Detector algorithms (DAs) within Shuttle have evolved significantly, ready for standard data taking
- High stability of primary sources of conditions data: DCS, DAQ DBs and configuration servers
- Toward the end of last cosmics data taking period (August) – all pieces, including DAs fully operational

Conditions data – Shuttle (2)

- Major efforts concentrated to provide new conditions data
 - Critical LHC parameters
 - Newly installed detectors and control hardware
- Some improvements on replication of conditions data on the Grid (file replicas)
 - So far, ALICE maintains 2 full replicas
- Conditions data access is the area with least problems on the Grid
 - Both in terms of publication and client access for processing and analysis
- **System in production, no special test foreseen**

Offline reconstruction

- Reconstruction parameters
 - Detector dependent beam/multiplicity/luminosity conditions fully introduced in the AliRoot and conditions framework
- Quasi-online reconstruction status
 - All runs from 2008 cosmics data processed
 - Emphasis on 'First physics' detectors
 - Selected runs already re-processed as 'Pass 2' and 'Pass 3'
- Re-processing of all cosmics data – general 'Pass 2'
 - After completion of alignment and calibration studies by detectors
 - **By April 2009**

Offline reconstruction (2)

- Development of quasi-online processing framework
 - Further refinement of Online QA
 - Speed up the launch of reconstruction jobs to assure 'hot copy' of the RAW data
 - January 2009 – detector code readiness review and new set of milestones adapted to the run plan
- The middleware and fabric are fully tested for 'pass 1' (T0) RAW data processing
 - To a lesser extent at T1s – limited replication of RAW to save tapes

Grid batch analysis (1)

- **Highest priority task**
- Predominantly MC data analysis
 - Each new MC production cycle accelerates the trend and user presence
- RAW (cosmics) data is still to be re-processed to qualify for massive analysis
 - First pass has been extensively analyzed already by detector experts
- Ever increasing number of users on the Grid
 - 435 registered, ~120 active

Grid batch analysis (2)

- Internal ALICE prioritization within the common task queue works well
 - Production user is 'demoted' in favor of normal users in the queue
 - Generic pilot jobs assure fast execution of user jobs at the sites
- Introduction of Analysis Train
 - Grouping many analysis tasks in a common data set
 - Allows for better CPU/Wall and reduces load on the storage servers
 - Advanced tests – in production by **end of March 2009**

Prompt analysis (1)

- PROOF enabled facilities currently available at two sites
 - CAF@CERN
 - GSIAF@GSI Darmstad
 - Project starting: LAF@CCIN2P3
- Extremely popular with users
 - ~150 active
- Fast processing of
 - MC ESDs – critical for first physics, tested extensively in 2008
 - Calibration and alignment iterative tasks, tested with cosmics and detector calibration data

Prompt analysis (2)

- CAF@CERN was recently upgraded with higher CPU and local disk capacity
- ALICE encourages centres to install PROOF-enabled analysis facilities
 - Open to all ALICE users
- Good integration with the Grid on the level of data exchange
 - Data can be reconstructed/analysed directly from Grid storage
 - Results can be published on the Grid

Middleware updates

- Fully migrated to WMS submission
- Parallel installation at all sites of CREAM CE
 - Deployment (following recommendations of GD) - CREAM-CE instance in parallel with gLite CE
 - Impressive service stability – test instance was maintenance-free for 4 month period
 - New CREAM-CE installations – stable after initial debugging period
 - All sites with CREAM-CE installation by **June 2009**

| Site | CREAM-CEs | CREAM Status | 2 nd VOBOX | Clients in VOBOX | General Status |
|---------|-------------------|--------------|-----------------------|------------------|----------------|
| FZK | 1 (4 queues) | OK | YES | YES | OK |
| Kolkata | 2 | OK | YES | YES | OK |
| Athens | 1 | OK | NO | NO | NOT OK |
| KISTI | 1 | OK | YES | YES | OK |
| GSI | 1 | OK | NO | YES | NOT OK* |
| IHEP | | | | | |
| RAL | 1 | OK | NO | YES | OK* |
| CNAF | 1 | OK | YES | YES | OK |
| CERN | 2 (3 queues each) | OK | YES | YES | OK |
| Torino | 1 | OK | YES | YES | OK |
| SARA | 1 | OK | In preparation | YES | In testing |

Storage

- New storage at T2s
 - Gradually increasing the number of sites with xrootd-enabled SEs
- Every SE is validated and tuned independently
 - Storage status monitored with MonALISA
- Emphasis on disk-based SEs for analysis
 - Including a capacity at T0/T1s
 - Storage types remain unchanged
 - T1D0 for RAW, production, custodial ESD/AOD storage
 - T0D1 for analysis: ESD/AOD replicas

Storage – MSS use optimization

- File size increase

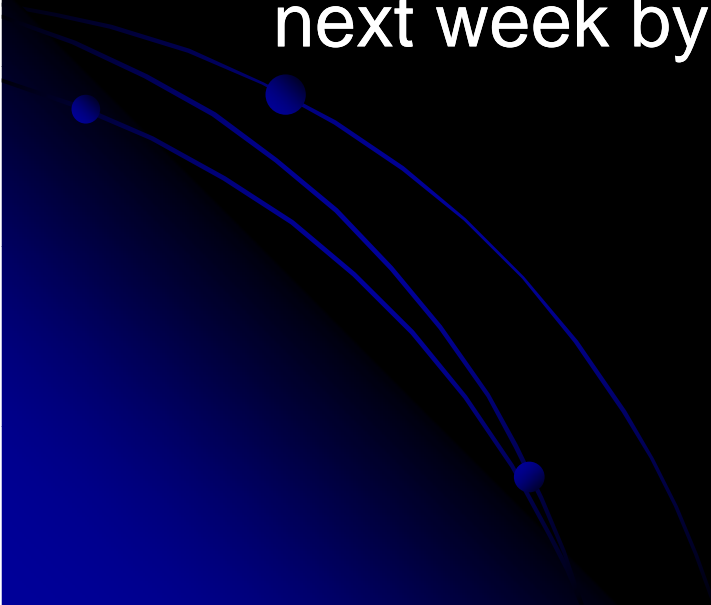
- RAW 1GB->10GB - presently at 3GB due to event size/processing time needed
- Secondary files 100MB->1GB
- Aggressive use of archives, containing multiple files

- File access patterns

- Emphasis on prompt replication and reconstruction – files are still in the MSS disk buffer
- Analysis and chaotic file access moved away from MSS SEs

Data taking scenario, resources

- Data taking programme, rates and resources
 - Based on discussion of LHC Chamonix meeting
 - Resources requirements will be approved next week by the ALICE MB



Data taking scenario

- Cosmics

- Resume data taking in **July 2009**, ~300TB of RAW

- p+p runs

- Running at maximum DAQ bandwidth
 - Few days @ 0.9 GeV (October 2009)
 - 11 months @ 10 TeV
- Machine parameters at P2 - optimum data taking conditions for ALICE
- Computing resources **must be sufficient** for quasi online processing
- Address the ALICE genuine p+p physics program and provide baseline measurements for AA

Data taking scenario (2)

- A+A run

- Fall 2010 - a standard period of Pb+Pb running
- Computing resources **must be sufficient** to process these data within 4 months after data taking (as foreseen in the Computing Model)
- Results to be presented at QM@Annecy (the LHC QM) in Spring 2011

- Monte Carlo

- 2009-2010 are standard years for Monte Carlo production

ALICE Data Taking Scenario

| Year/Operation | | Cosmic | | pp | | AA | | MC |
|----------------|----|-------------|-----------------|-------------|-----------------|-------------|-----------------|----|
| | | Data taking | Data processing | Data taking | Data processing | Data taking | Data processing | |
| 2009 | Q1 | | | | | | | |
| | Q2 | | | | | | | |
| | Q3 | | | | | | | |
| | Q4 | | | | | | | |
| 2010 | Q1 | | | | | | | |
| | Q2 | | | | | | | |
| | Q3 | | | | | | | |
| | Q4 | | | | | | | |
| 2011 | Q1 | | | | | | | |

Resources requirements

- CPU power required per event as in the Computing TDR and validated by cosmic data processing
- Event (RAW/ESD/AOD) sizes as in the Computing TDR and validated by cosmic data processing
- Any Tier category (T0,1,2,3) can perform any task (reconstruction, simulation, analysis)
 - CPU resources dynamically allocated depending on current experiment activity

Activities calendar

