



ATLAS Quarterly Report and Plans

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Outline

This is just an update wrt the more complete report given on 6 November 2007

- Data distribution tests
- Simulation production
- FDR-1 (4-8 February) and CCRC-1 (now till end of February)
- Plan of activities until LHC turn-on



Data Distribution Tests

- The throughput tests will continue (a few days/month) until all data paths are shown to perform at nominal rates
 - This includes:
 - a) Tier-0 → Tier-1s → Tier-2s for real data distribution
 - b) Tier-2 → Tier-1 → Tier-1s → Tier-2s for simulation production
 - c) Tier-1 ↔ Tier-1 for reprocessing output data
- Test a) is now OK almost everywhere
 - Run again in January (but with SRM v1 end-points, see later slide)
- Test b) is part of simulation production since a long time
- Test c) started with the BNL-IN2P3CC-FZK combination
- The Functional Test will also be run in the background approximately once/month in an automatic way
 - The FT consists in low rate tests of all data flows, including performance measurements of the completion of dataset subscriptions
 - The FT is run in the background, without requiring any special attention from site managers
 - It checks the response of the ATLAS DDM and Grid m/w components as experienced by most end users



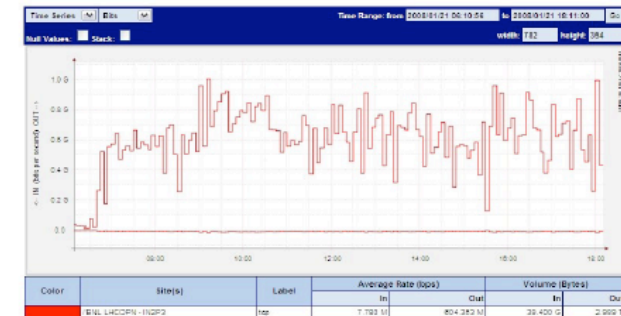
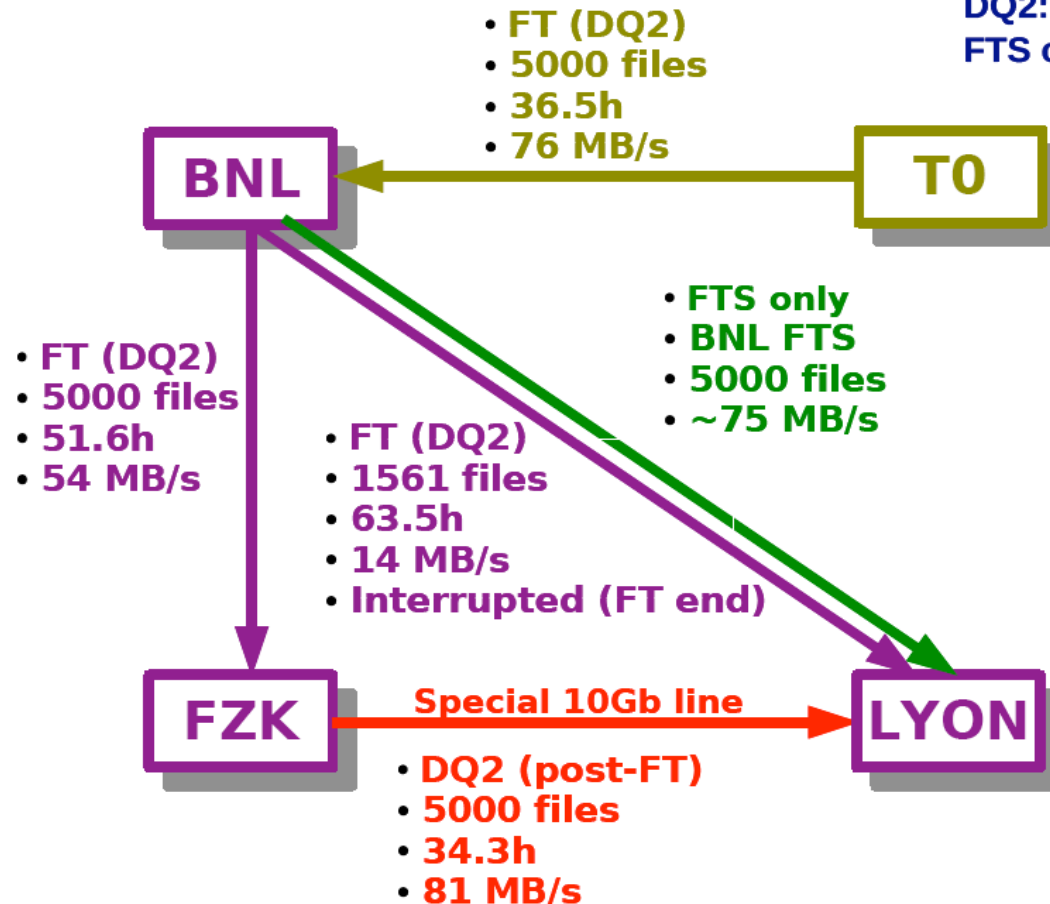
Example of Tier-1-Tier-1 Transfer (1)

TRANSFER RATE SUMMARY

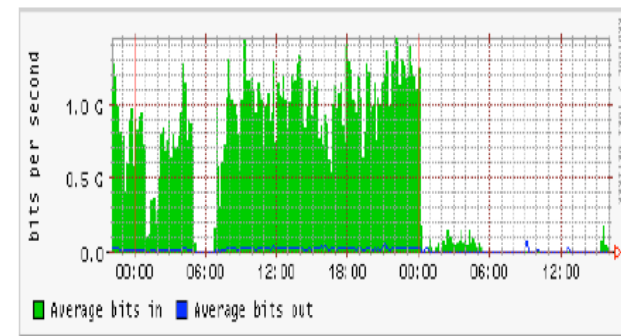
FT: functional test

DQ2: through dataset subscription (pull mode)

FTS only: Hiro load generator



Hironori Ito, BNL-LYON "FTS only"



FZK-LYON transfer rate (post-FT)



Example of Tier-1-Tier-1 Transfer (2)

REMARKS AND PLAN

FTS channels:

- FTS channels at BNL and LYON differ
 - DQ2 uses the pull mode (5 // files)

FTS	Nb of stream	Nb of // files
BNL (to LYON)	10	10
LYON (to BNL)	10	5

Traffic jam:

- Continuous MC files transfer from BNL to LYON (DQ2)
- While, during the FZK-LYON transfer, very few other transfers.
- Is it a matter of competition between files ? non appropriate FTS parameters ?

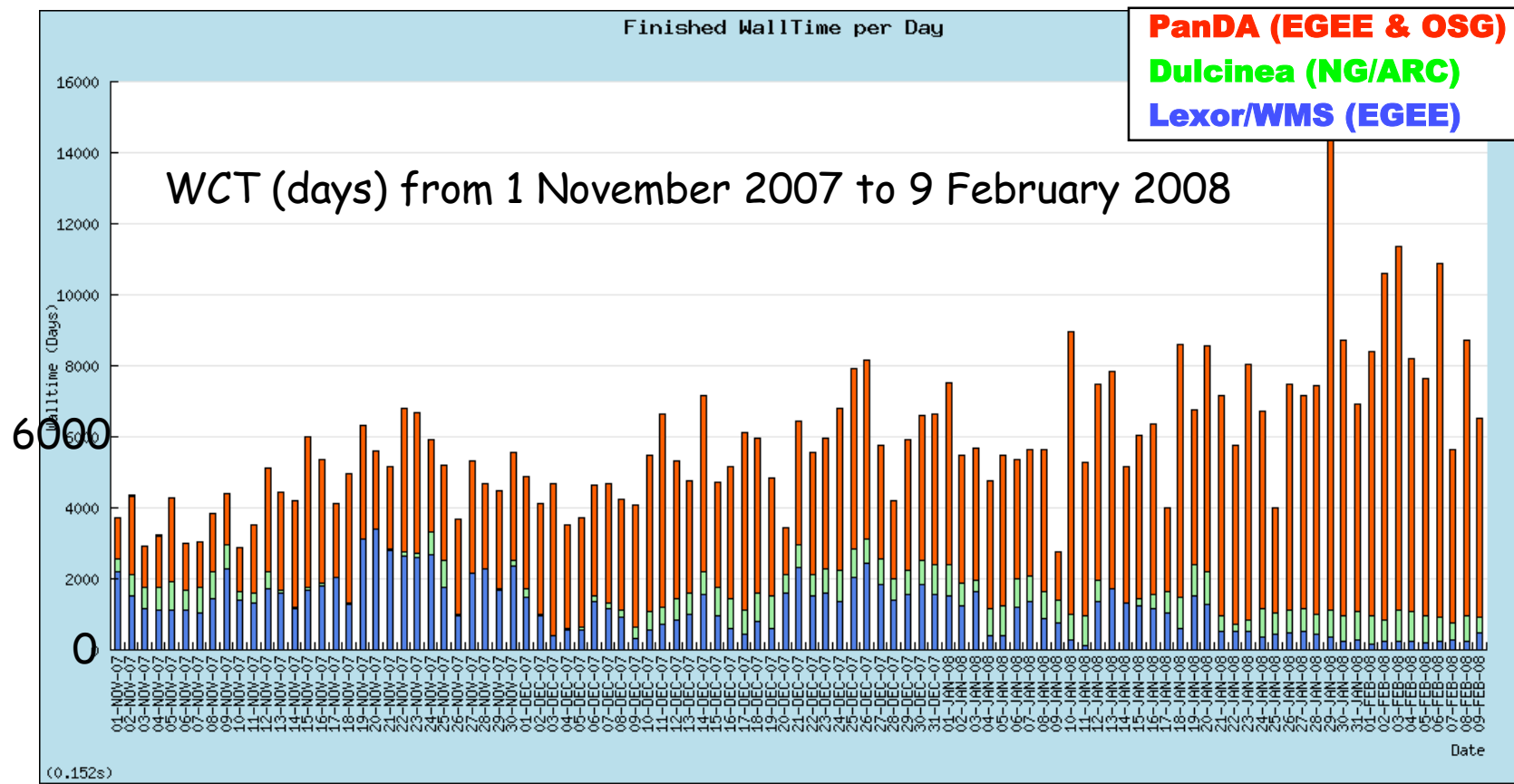
Next:

- Test the LYON FTS service with the "FTS only" method (first try yesterday, but other problems at LYON delayed the test; today, dCache is upgrading)
- If slowness is observed, tune the channel parameters (number of // files)



Distributed Simulation Production (1)

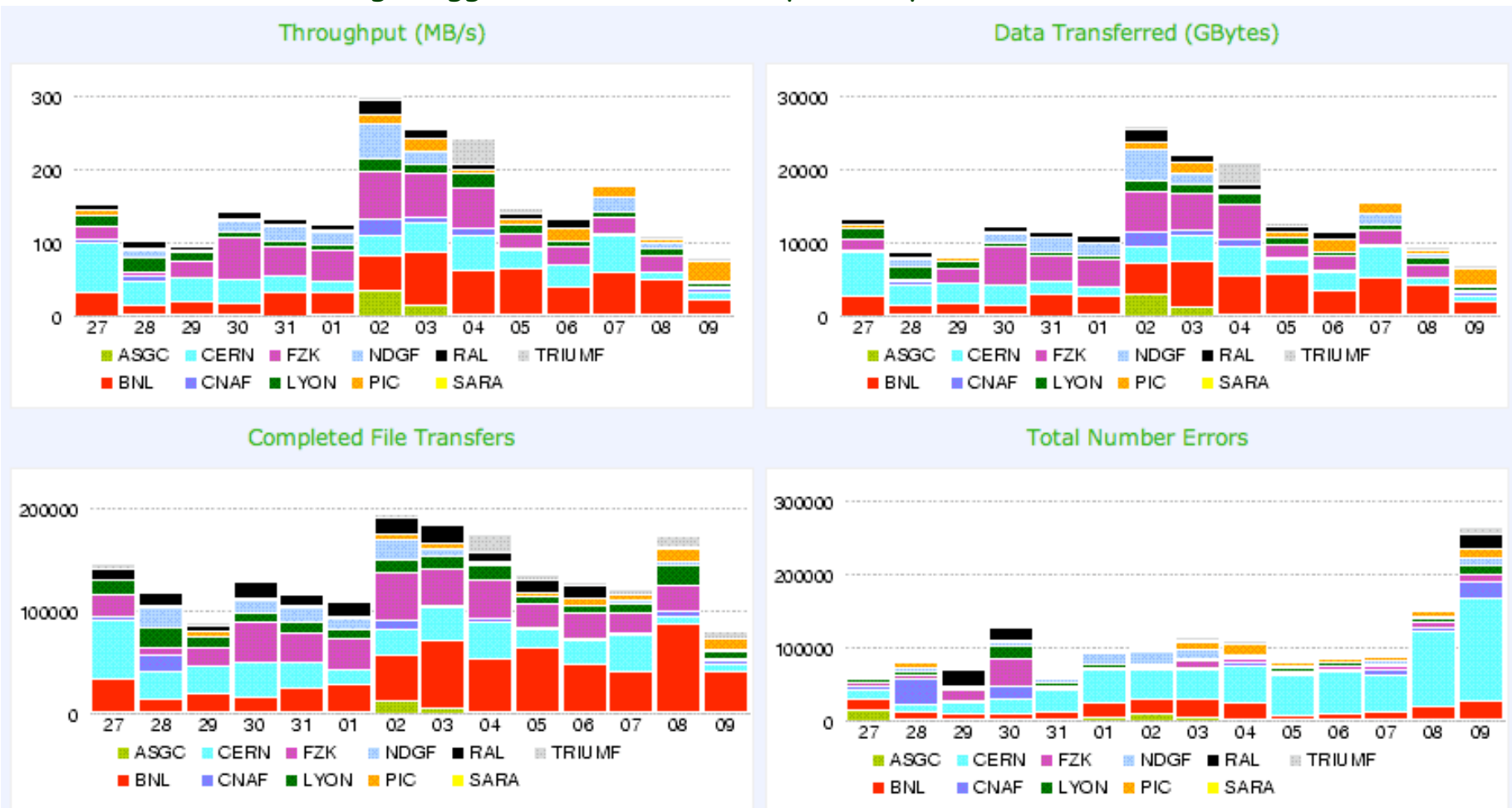
- Simulation production continues all the time on the 3 Grids (EGEE, OSG and NorduGrid) and reached 1M events/day recently
 - The rate is limited by the needs and by the availability of data storage more than by resources
- Validation of simulation and reconstruction with release 13 is still in progress





Distributed Simulation Production (2)

- Simulated data must be transferred to other sites
 - Including the RDOs to CERN for the FDR-1 data preparation exercise
 - Event mixing, trigger selection and output to bytestream formatted files





Global schedule: M^* , FDR & CCRC'08

- FDR must test the full ATLAS data flow system, end to end
 - SFO → Tier-0 → calib/align/recon → Tier-1s → Tier-2s → analyse
 - Stage-in (Tier-1s) → reprocess → Tier-2s → analyse
 - Simulate (Tier-2s) → Tier-1s → Tier-2s → analyse
- The SFO→Tier-0 tests interfere with cosmic data-taking
- We decouple these tests from the global data distribution and distributed operation tests as much as possible
- CCRC'08 must test the full distributed operations at the same time for all LHC experiments
 - As requested by Tier-1 centres to check their own infrastructure
- Proposal:
 - Decouple CCRC'08 from M^* and FDR
 - CCRC'08 has to have fixed timescales as many people are involved
 - CCRC'08 can use any datasets prepared for the FDR, starting from Tier-0 disks
 - CCRC'08 can then run in parallel with cosmic data-taking
 - Tier-0 possible interference and total load has to be checked
 - Cosmic data distribution can be done in parallel as data flow is irregular and on average much lower than nominal rates

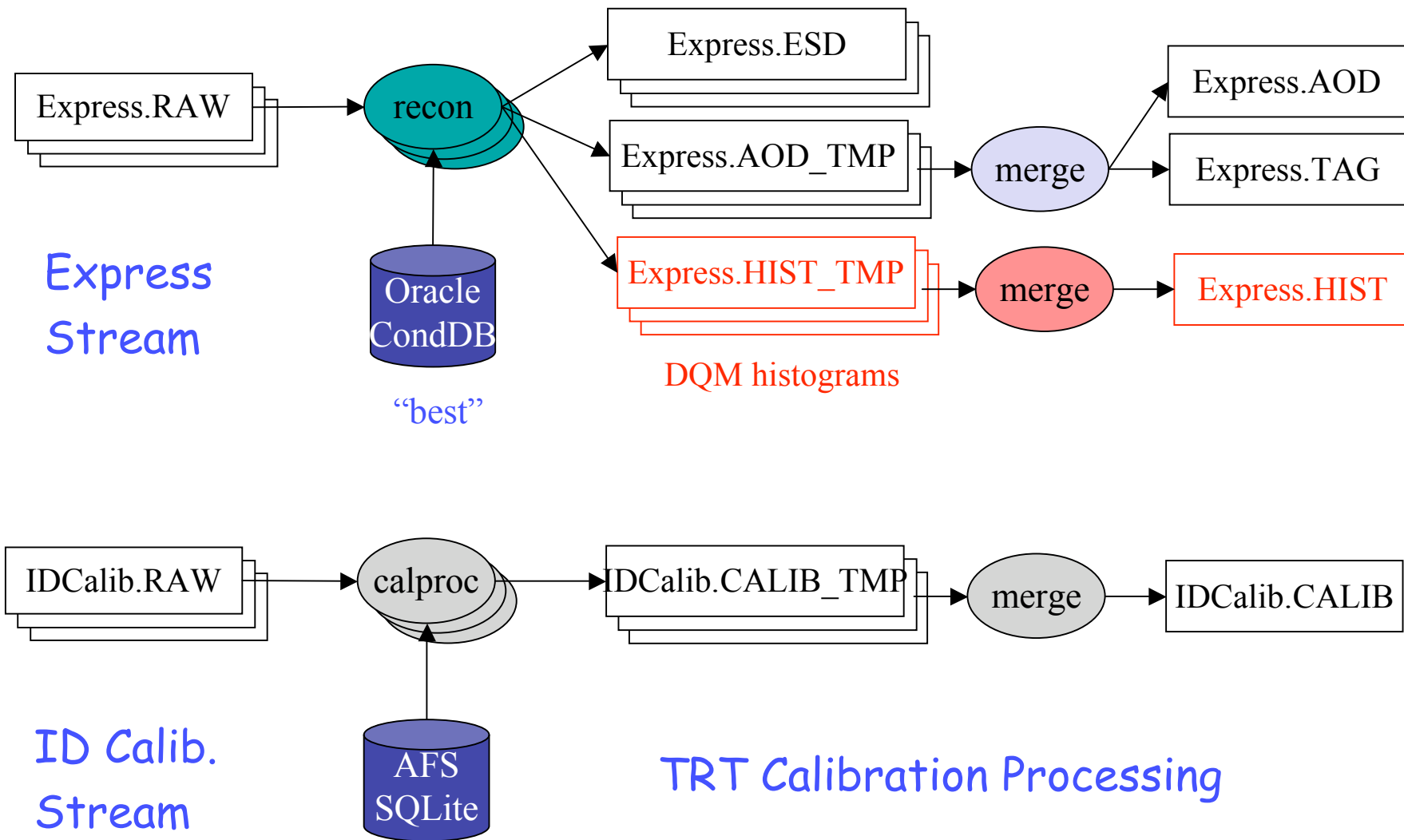


FDR-1: Preparation

- The original aim was to prepare 10 hours of run at luminosity 10^{31} and one hour at 10^{32}
 - Using release 12 for the simulation and release 13 for trigger and bytestream generation code
 - 5 physics streams (e.m., muons/B-physics, jets, taus, min_bias)
 - Express stream (10% of nominal rate)
 - Inner detector alignment stream (as example of calib/align data streams)
- Getting trigger and mixing code to work took MUCH longer than anticipated
 - Event mixing requires lots of simulation output files from different physics channels in the same location (Castor @ CERN)
 - Not easy given the general disk space crisis we are still in
 - Most of trigger selection code was delivered at the last minute and was only superficially validated
 - We found that the trigger rates were a factor 3-4 less than what we wanted to have
- In the end we had far fewer events than anticipated, and many small files...
 - Although we had doubled the luminosity block size just to avoid small files!
- Most SRM 2.2 end-points, space tokens and storage areas were really set up and configured only at the end of January
 - We could start testing them in earnest only last week (the FDR-1 week)

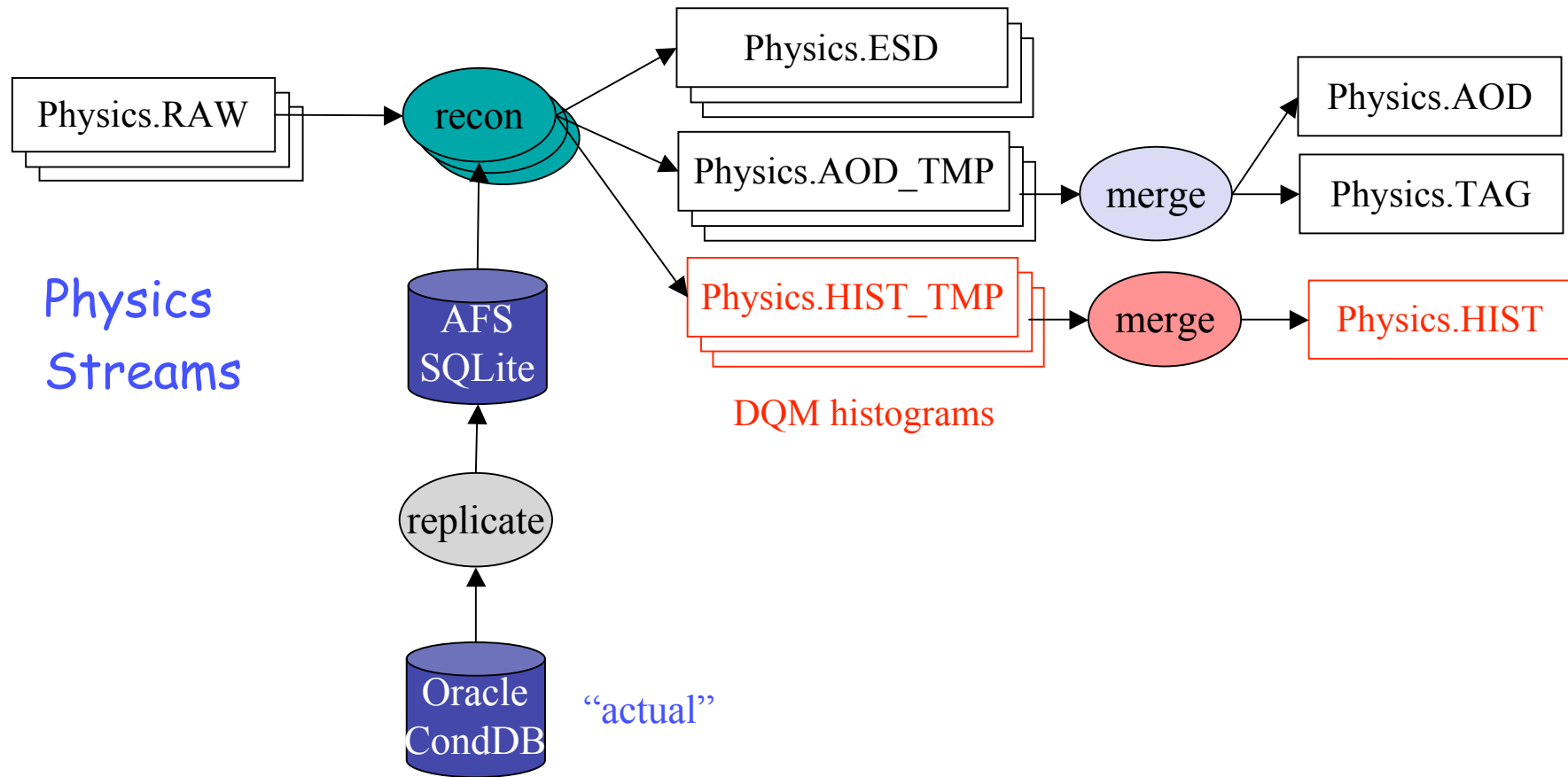


Calibration Data and Work Flows





Reconstruction Data and Work Flows



Physics Streams: MinBias, Egamma, Jet, Muon/B-Phys, Tau/Etmiss



FDR-1: Execution (1)

- Day 1: Mon 4th Feb
 - Decided to continue event mixing using the Tier-0 farm to have a more reasonable event sample to work with. Start of FDR delayed.
- Day 2: Tue 5th Feb
 - Run started at 9 am. 8 runs, 1 hour each.
 - Processing of express stream on Tier-0 started to produce monitoring and calibration data.
- Day 3: Wed 6th Feb
 - New run started at 9 am. Same events, new run numbers.
 - Processing of express stream as before.
 - 4 pm: sign-off by Data Quality group of Tuesday data; start of bulk reconstruction.
 - More testing of SRM 2.2 end points and storage areas. No transfer yet...
- Day 4: Thu 7th Feb
 - New run started at 9 am. Same events, new run numbers.
 - Processing of express stream as before.
 - 4 pm: sign-off by Data Quality group of Wednesday data; start of bulk reconstruction.
 - Processing of Tuesday bulk completed.
 - More testing of SRM 2.2 end points and storage areas. NIKHEF problem. RAL power cut.



FDR-1: Execution (2)

- Day 5: Fri 8th Feb
 - 4 pm: NO sign-off by Data Quality group of Thursday data as there was a mix-up with updated Inner Detector alignment constants. Express stream processing restarted. Bulk reconstruction started later on.
 - Processing of Wednesday bulk completed.
 - More testing of SRM 2.2 end points and storage areas. NIKHEF problem. RAL power cut.
- Day 6-7: Sat-Sun 8-9th Feb
 - Tier-0 processing completed
 - Should have finally started data transfer to Tier-1s but more configuration problems hit us
- Day 8: Mon 10th Feb
 - Data transferred to Tier-1s. So little data that it took only one hour (not a stress test!)
- Post-mortem meetings
 - Mon 11 Feb: data preparation steps
 - Wed 13 Feb: Tier-0 processing and data export operations
 - Tue 19 Feb: data quality assessment and sign-off procedures



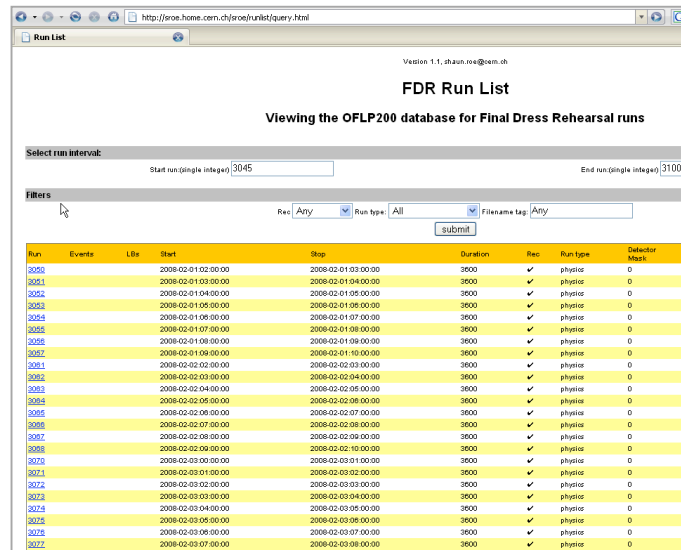
FDR-1: Execution (3)

■ Impressions ...

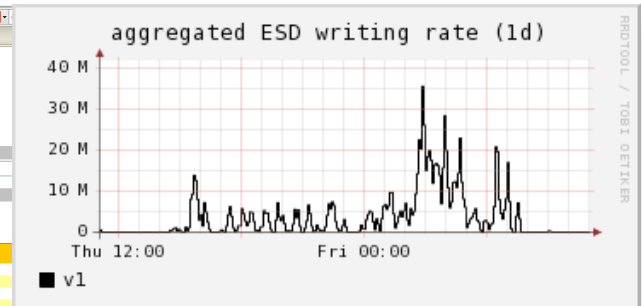
Sub-farm outputs



Run-summary browser

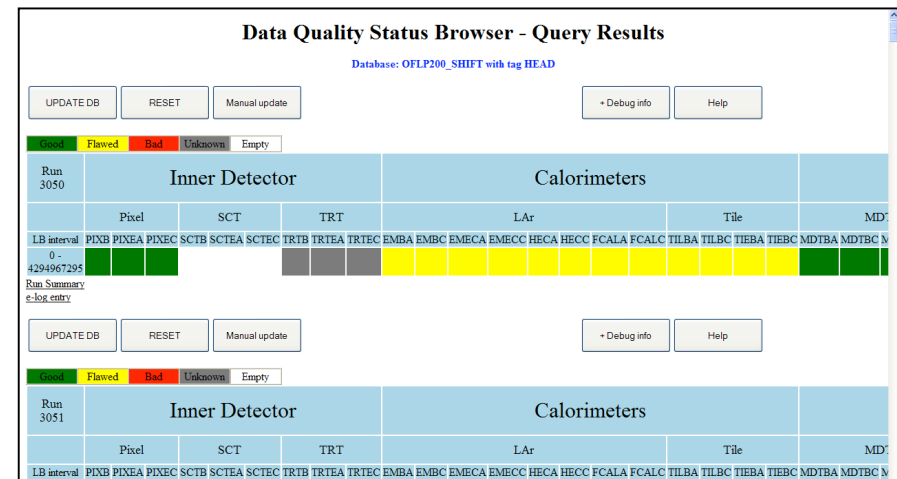
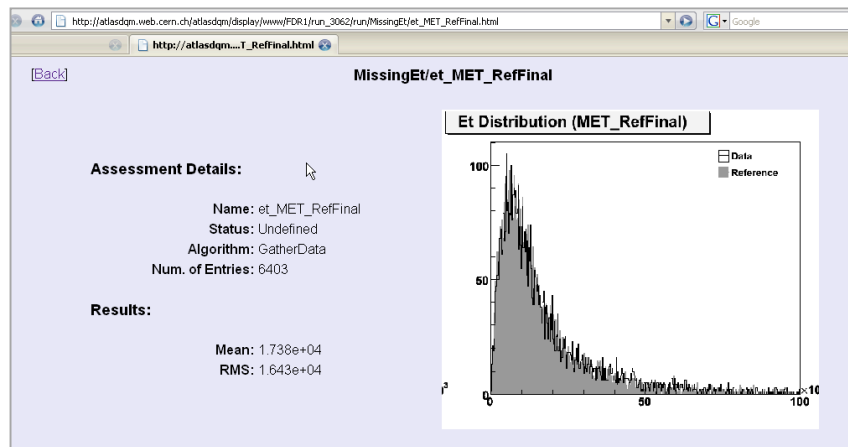


Tier-0 monitoring



Data quality status in conditions database

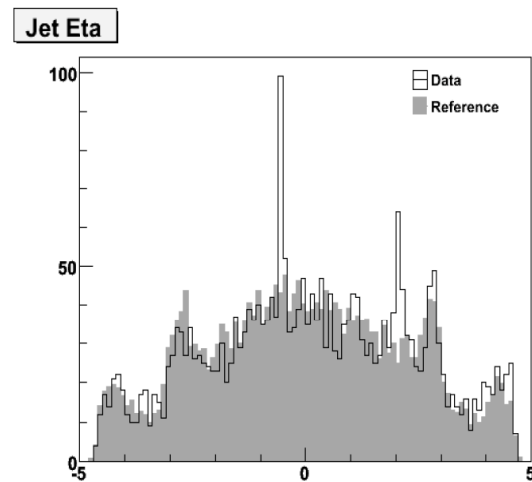
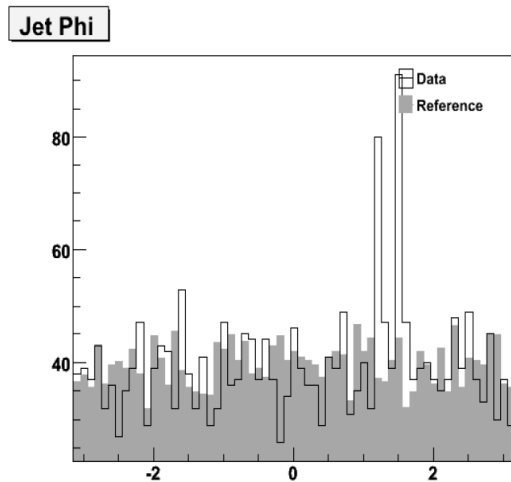
Data quality browser



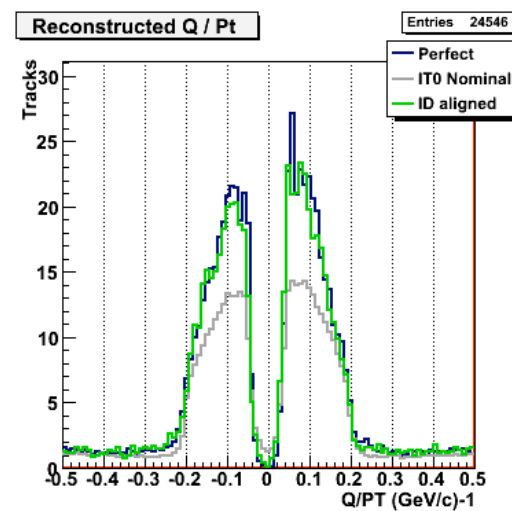
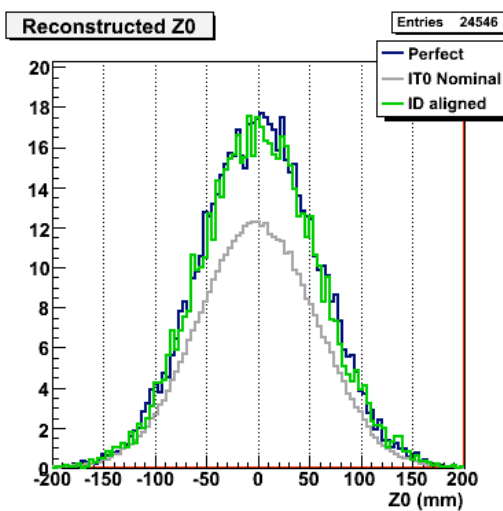
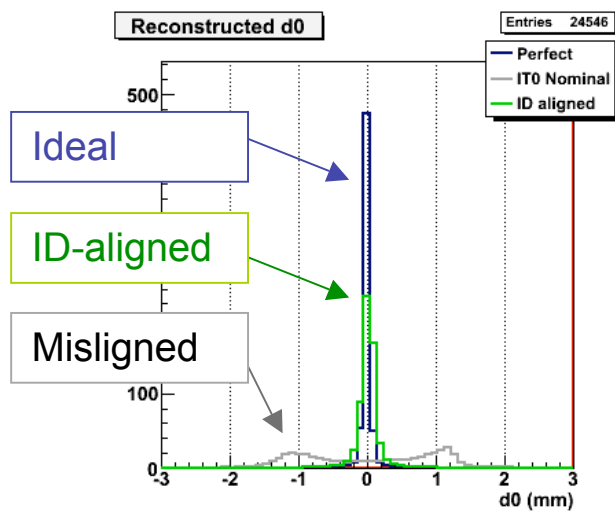


FDR-1: Execution (4)

- Data sporadically included hot LAr cells and noisy/dead crates → spotted (all ?) by data quality experts:



- Ran fast ID alignment of distorted geometry using dedicated calibration stream:



CEP... 12 Feb 2008



Plans

- **Software releases:**
 - **13.2.0**
 - Last week. Targeted at the M6 run in March.
 - **14.0.0**
 - Base release 14.0.0 available end February 2008. Includes LCG_54, new tdaq-common, new HepMC, completion of EDM work for Trigger records and optimisation of persistent representation
 - **14.X.0 releases**
 - Controlled production releases every 4-6 weeks.
 - **14.X.Y releases**
 - Bug fixes only for HLT/Tier-0 and Grid operations
- **Cosmic runs:**
 - **M6**
 - Beginning of March 2008
 - **Continuous mode**
 - Start immediately with detector-DAQ integration and commissioning weeks
- **FDR:**
 - **Phase II**
 - Early May 2008 (to be discussed, possibly before the start of continuous data-taking mode with complete detector)
- **CCRC'08**
 - **Phase I**
 - February 2008 (after FDR-1):
 - Test SRM 2.2 everywhere in earnest using realistic loads and file sizes
 - **Phase II**
 - May 2008 (in parallel with cosmic data-taking activities)



Conclusions

- We have already learned a lot from the FDR-1 exercise
 - Data concentration at CERN
 - Event mixing (jobs with many input files)
 - Late delivery of crucial software components is not a good idea (no surprise!)
 - Our own software
 - SRM 2.2...
 - The data quality loop was tried for the first time
 - Needs some adjustment but basically works
 - The calibration procedures were also attempted for the first time but they need much more thinking and testing
 - Tier-0 internals are not a worry
 - Except for operations manpower (shifts not yet tried)
- We are looking forward to CCRC'08-1 starting now!