

- **Computing resource needs to the changing LHC schedule:**
 - A schedule **delay of a few months** **does not really change the schedule of hardware acquisitions** for CERN and the other computing centres
 - **On the other hand**, it is now evident that we are not going to have 50 full days of data taking in 2007 and 200 days in 2008 (as assumed in the Computing TDR)

- ATLAS (together with the other LHC experiments), is in the process of **“recalculating” the resource needs for 2007-2008** with the following basic assumptions:
 - **~25 days of data taking at the end of 2007**
 - at 900 GeV CoM energy, low lumi., 10^7 events/day
 - **~100 days of data taking in 2008** (starting in April)
 - at increasing CoM energy, low luminosity

 - The CoM energy has:
 - **a small effect on event size** (because of the full read-out of the LAr calorimeters) and
 - **a larger effect on processing time** (lower occupancy, fewer tracks)

 - Both to need be evaluated soon through full simulation



Tier-0 and DDTests

- In the context of Computing System Commissioning (CSC) and Service Challenge 4 (SC4) a series of tests of the Tier-0 system tests in 2nd half of 2006 and 1st half of 2007 are running:
 - Data throughput between disk buffers, tapes and the CPU farm
 - Data export to Tier-1 centres
 - Repeat of last year tests
 - But going down to Tier-2s, proper cataloguing..
- More realistic components (tested first time in Tier-0 context)
 - Download of conditions/alignment data at beginning of 'reconstruction' job
 - Reconstruction: first-pass ESD (Event Summary Data), AOD (Analysis Object Data) and TAG production
 - Archiving of RAW data and first-pass ESD/AOD/TAG on tape
 - Distribution of RAW data and first-pass ESD/AOD/TAG to the 10 Tier-1 centres
 - One copy of RAW
 - Two copies of ESD
 - 10 copies of AOD/TAG
 - Uploading of TAG files into TAG database
 - Extensive monitoring
 - <http://atlas.web.cern.ch/Atlas/GROUPS/SOFTWARE/DC/Tier0/monitoring>
- The data distribution tests are showing that DDM can work at the required scale
 - Problems of CPU overloading for high-rate data transfer and cataloguing can be solved



Data Distribution to Tier-1s

- ❑ We have 10 Tier-1 centres for ATLAS
 - ❑ BNL Brookhaven, CCIN2P3 Lyon, NIKHEF/SARA Amsterdam, RAL, FZK Karlsruhe, CNAF Bologna, PIC Barcelona, NDGF, TRIUMF, ASGC Taipei
- ❑ **Each one will take**
 - ❑ a fraction of **RAW data** (to be archived to tape),
 - ❑ a fraction of **ESD** (full reconstruction) and
 - ❑ a full set of **AOD** (reconstruction summary) data (to be kept on disk for analysis access)
- ❑ **Run complete flow (Tier-0 + Tier-1s export) at nominal rate**
 - ❑ **Aim** is not to provide a constant stream of data to Tier-1s *but rather to provide a realistic stream of data from the Tier-0 to Tier-1s*
- ❑ The total export rate from CERN will be 800 MB/s (time averaged)
 - ❑ This is a non-negligible rate that needs careful preparation
 - ❑ An OPN (Optical Private Network) has been prepared for the LHC data transfers between CERN and the Tier-1 centres



Grid - Distributed Productions

- ❑ CSC production running on all grids
- ❑ We are routinely producing between 1 and 2 million simulated events/week
- ❑ **All productions starting with release 12.0.x (end of last June) are using the new ProdSys infrastructure:**
 - ❑ Python based job transformations
 - ❑ DDM-integrated ProdSys executors
 - ❑ **Therefore the produced datasets will be correctly registered with the dataset catalogues and readily findable BUT**
 - ❑ productions are still running with older s/w releases (11.0.x) and (except for the OSG Grid in the US) scattering output files randomly around the world
 - ❑ These datasets have to be collected to the same location and registered to DDM catalogues "by hand":
 - ❑ work in progress...
- ❑ Test planned for Oct 2006
 - ❑ 2 week ramp up, 2 week steady state, 2 day post-mortem
 - ❑ Metrics:
 - ❑ 4000/6000 kSi2k/day and/or 2M events/week (average now is 1M ev/week)



Further CSC & SC4 Tests

- ❑ Physics Samples
 - ❑ Initial plan for 10M events using 11.0.X branch
 - ❑ Redone using 12.0.X
 - ❑ ~10 broken samples out of ~210 (much better than Rome)
 - ❑ CSC Note - 15M+ events with misaligned geometry (+10M single particles)
 - ❑ Tight schedule (production complete by end of Oct)
- ❑ Critical issues:
 - ❑ 12.0.X validation
 - ❑ Need >3M events/week
 - ❑ Space in storage elements (ESD/AOD currently too large)



ATLAS Software Release Status

- ❑ **Release 11.0.X branch has been terminated** : 11.0.0 (21 Oct 2005) to 11.0.6 (5 Jul 2006)
 - ❑ *Preliminary physics sample production, ATLAS commissioning, HLT testbed*
- ❑ Long, painful migration to release 12 (3 month delay relative to original plan)
 - ❑ Due to ROOT5 migration, other externals, introduction of Project Builds



ATLAS Software Release Status (cont'd)

- ❑ **Release 12.0.X branch begun**
 - ❑ 12.0.0 (25 May 2006) to 12.0.3 (1 Sep 2006) - 4 releases scheduled
 - ❑ Trigger (L1+L2+EF) simulation in place for trigger aware analyses
 - ❑ Set and check performance targets (time, memory, robustness)
 - ❑ E.g. L2 crashes less than 1 in 360M events
 - ❑ Develop and optimize event selection
 - ❑ Selection software ready for cosmics run in Oct 2006
 - ❑ Misalignment (as installed geometry) simulation and reconstruction
 - ❑ Time-varying misaligned in place for most detectors but not fully validated
 - ❑ Ongoing Validation for MuonSys
 - ❑ Atlfast production quality
 - ❑ Parameterized Showers first production quality version
 - ❑ Beam-gas simulation (Hijing) - Minimum bias scintillators
 - ❑ **Major effort now is in validation, not development**
 - ❑ **Used for CSC Physics Notes, TDAQ/HLT Large Scale Tests, ATLAS Commissioning**

