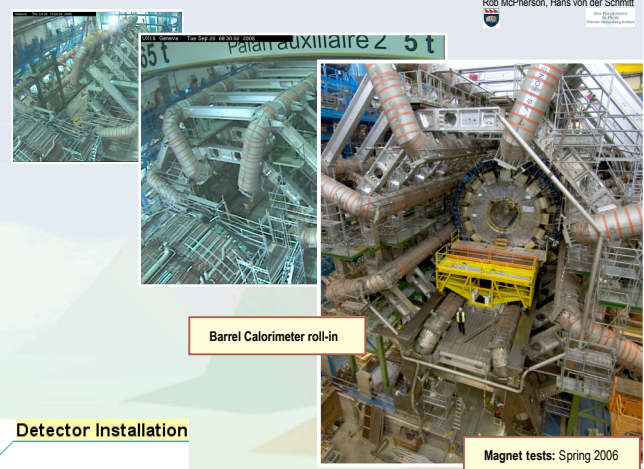


Commissioning the ATLAS detector

will be a major focus of the collaboration for the next few years.

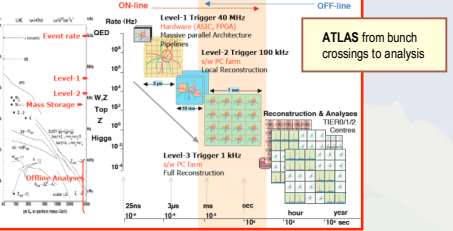
Use of Offline Software in Commissioning

The use of offline tools, including the Athena offline software, computing, databases and monitoring, can both facilitate the detector commissioning and ensure that the offline is itself ready for ATLAS data analysis from the earliest collisions.

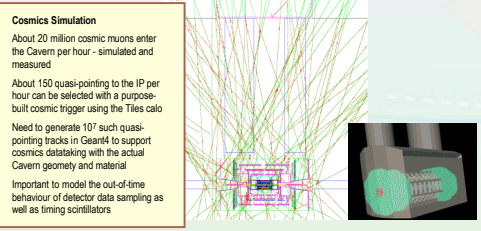


Barrel Calorimeter roll-in

Magnet tests: Spring 2006



ATLAS from bunch crossings to analysis

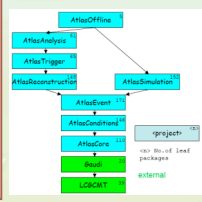


Cosmos Simulation
 About 20 million cosmic muons enter the cavern per hour - simulated and measured
 About 150 quasi-pointing to the IP per hour can be selected with a purpose-built cosmic trigger using the Tiles calo
 Need to generate 10⁷ such quasi-pointing tracks in Geant4 to support cosmos databanking with the actual cavern geometry and material
 Important to model the out-of-time behaviour of detector data sampling as well as timing scintillators

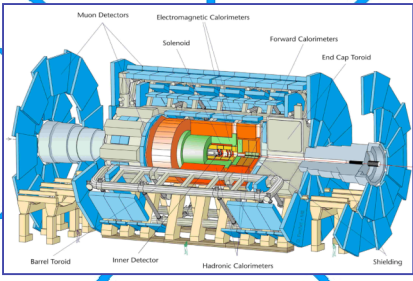
Make ATLAS Systems operational and integrate them
 Systems are
 The detectors: ID, LAr, Tiles, Muons, and their subdetectors
 DAQ
 Trigger levels: LVL1, HLT
 Offline software, physics, simulation
 Supported by
 Databases and Data Management (e.g. Conditions DB)
 Monitoring: Histogramming, Event display, both online/offline
 Software infrastructure (e.g. release building), for all of online/trigger/offline
 Detector Control + Safety: DCS, DSS

Simulation **From just installed to operational** **Detector Installation**

The offline software Athena comprises ~1000 packages C++, Python, some Java, control files for the build process
 Nightly builds, major and minor release cycles
 Packages are grouped into a few projects from Core to Analysis with unidirectional dependency
 Online releases (excluding Simulation) need to be integrated with the HLT (Trigger Levels, Event Filter, Online Monitoring) and with the DAQ releases in order to be usable online at the Cavern
Tools used
 cvs and cmt for code maintenance, pacman for software distribution and installation



Software Releases

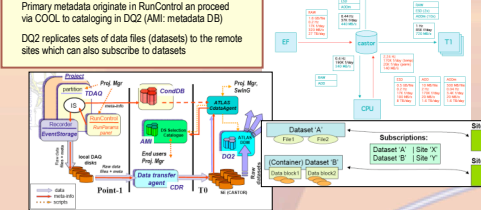


Commissioning Phases

Phase 1 Standalone detector installation	Testing of electronics, DAQ, DCS, gas, power supplies	Summer 2005 to Summer 2006
Phase 2 Integrate systems into full ATLAS detector	Multi-detector DAQ, DCS, DB Calibration runs	Autumn 2005 to Autumn 2006
Phase 3 Cosmics with single and multiple detectors	Record / analyze data Ship data to remote sites	Autumn 2005 to Autumn 2007
Phase 4 Single beam, first collisions, full ATLAS	Minimum bias High rates	From Autumn 2007

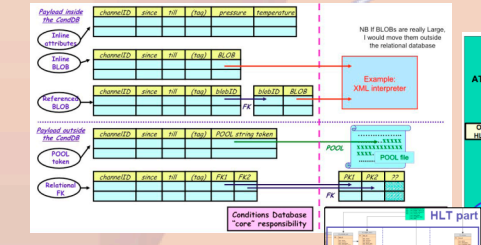
Flow of Data and Metadata from the Cavern via Tier0 worldwide: Distributed Data Management
 Primary metadata originate in RunControl an proceed via COOL to cataloging in DQ2 (AMI: metadata DB)
 DQ2 replicates sets of data files (datasets) to the remote sites which can also subscribe to datasets

ATLAS Tier-0

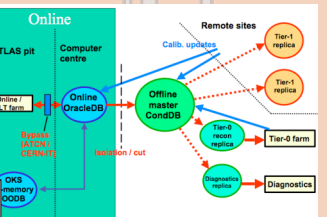


Data Management

Databases



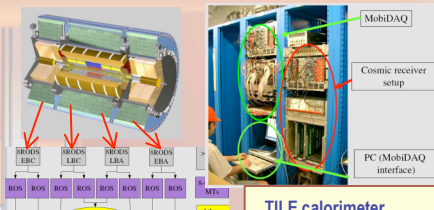
COOL used for storing conditions
 Contents is addressed by Run/Event number or by time (Interval of Validity mechanism)
 Payloads may be external to COOL: useful for large objects, files, additional relational tables - example: Trigger Configuration
 Based on Oracle or MySQL RDBs with CORAL as interface layer



Databases usage
Online: for configuration and to store conditions (including the actual configuration)
Offline: for retrieval / update of conditions and to prepare future configurations

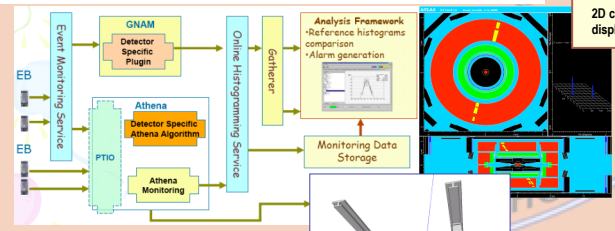
please read clockwise from detector to analysis

Cosmics Databanking



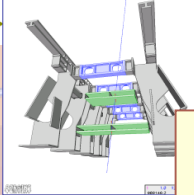
TILE calorimeter cosmics runs in the Cavern, June 2005

Monitoring



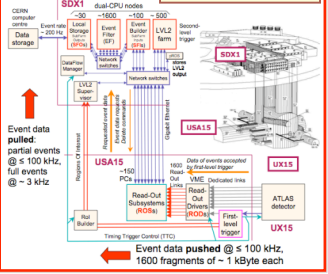
Monitoring framework - Athena plugged into Online with PTIO
 Online histograms generated with Athena or with GNAM - presenter is ROOT based
 Online event displays, 2D + 3D with Athena

2D cosmic event display from Tiles



3D cosmic event display from part of Muon spectrometer (Dec. 2005)

Full TDAQ installation



Event data pushed @ ≤ 100 kHz, full events @ ~ 3 kHz
 Event data pushed @ ≤ 100 kHz, 1600 fragments of ~ 1 kByte each