



**GridPP**

UK Computing for Particle Physics

# ATLAS Computing TDR extracts

Alessandra Forti  
UKI operations  
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# Computing Model: central operations

- Tier-0:
  - Copy RAW data to Castor tape for archival
  - Copy RAW data to Tier-1s for storage and reprocessing
  - Run first-pass calibration/alignment (within 24 hrs)
  - Run first-pass reconstruction (within 48 hrs)
  - Distribute reconstruction output (ESDs, AODs & TAGS) to Tier-1s
- Tier-1s:
  - Store and take care of a fraction of RAW data
  - Run “slow” calibration/alignment procedures
  - Rerun reconstruction with better calib/align and/or algorithms
  - Distribute reconstruction output to Tier-2s
  - Keep current versions of ESDs and AODs on disk for analysis
- Tier-2s:
  - Run simulation
  - Keep current versions of AODs on disk for analysis



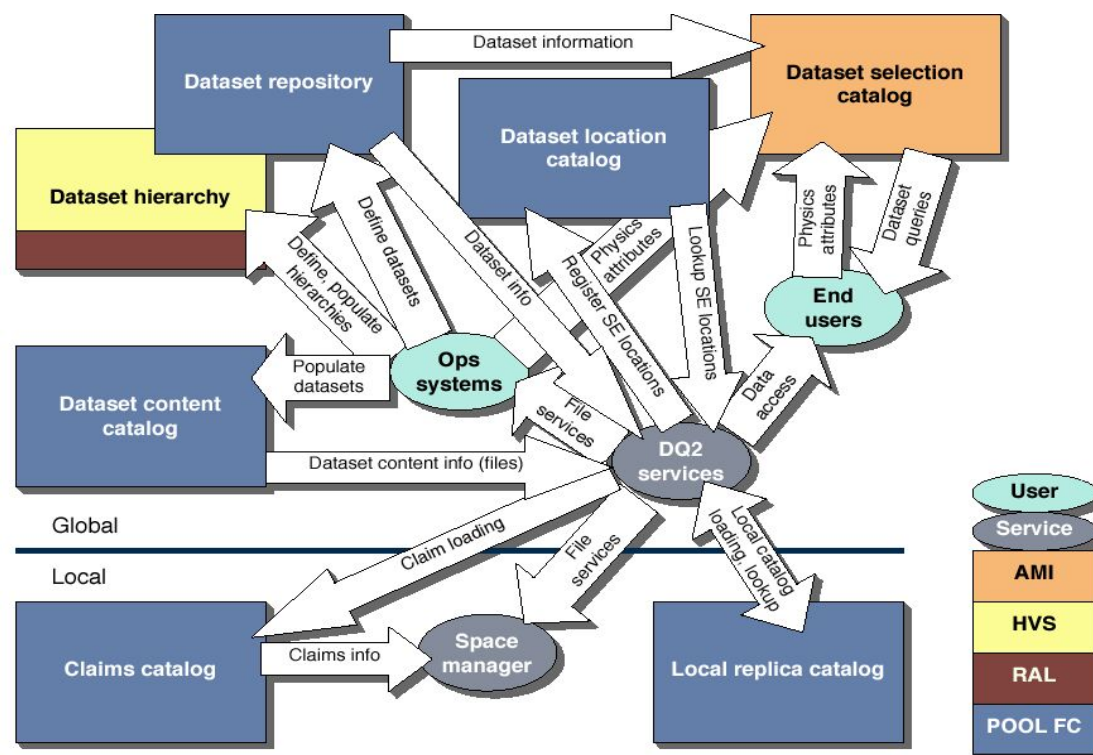
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# Event Data Model

- RAW:
  - “ByteStream” format, ~1.6 MB/event
- ESD (Event Summary Data):
  - Full output of reconstruction in object (POOL/ROOT) format:
    - Tracks (and their hits), Calo Clusters, Calo Cells, combined reconstruction objects etc.
  - Nominal size 500 kB/event
    - currently 2.5 times larger: contents and technology under revision, following feedback on the first prototype implementation
- AOD (Analysis Object Data):
  - Summary of event reconstruction with “physics” (POOL/ROOT) objects:
    - electrons, muons, jets, etc.
  - Nominal size 100 kB/event
    - currently 70% of that: contents and technology under revision, following feedback on the first prototype implementation
- TAG:
  - Database used to quickly select events in AOD and/or ESD files

# Distributed Data Management

- The DB/DM project takes care of all types of ATLAS data
- Accessing distributed data on the Grid is not a simple task
- Several DBs are needed centrally to hold dataset information
- “Local” catalogues hold information on local data storage
- The new DDM system (right) is under test this summer
- It will be used for all ATLAS data from October on (LCG Service Challenge 3)





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# Computing Operations

- The Computing Operations organization has to provide for:
  - a) CERN Tier-0 operations
    - from output of EF to data distribution to Tier-1's, including calibration/alignment and reconstruction procedures
  - b) World-wide operations:
    - simulation job distribution
    - re-processing of real and simulated data at Tier-1's
    - data distribution and placement
  - c) Software distribution and installation
  - d) Site and software installation validation and monitoring
  - e) Coordination of Service Challenges in 2005-2006
  - f) User Support
- ... along the guidelines of the Computing Model
- Some of the needed components already exist
  - and have been tested during Data Challenges



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# ATLAS Virtual Organization

- Right now the Grid is “free for all”
  - no CPU or storage accounting
  - no priorities
  - no storage space reservation
- Already we have seen competition for resources between “official” Rome productions and “unofficial”, but organised, productions
  - B-physics, flavour tagging...
- The latest release of the VOMS (Virtual Organisation Management Service) middleware package allows the definition of user groups and roles within the ATLAS Virtual Organisation
  - and is used by all 3 Grid flavours!
- Once groups and roles are set up, we have to use this information
- Relative priorities are easy to enforce if all jobs go through the same queue (or database)
- In case of a distributed submission system, it is up to the resource providers to:
  - agree the policies of each site with ATLAS
  - publish and enforce the agreed policies