



# WLCG Service Outlook - COOL services

Reports from the 3D workshop

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# COOL: LCG Conditions Database



- **COOL: insert/retrieve/manage conditions data**
  - Non-event detector data that:
    - vary with time
    - may exist in several versions
  - Several data producers
    - Online: detector control system, monitoring, run configuration...
    - Offline: calibration, alignment...
  - Several data consumers
    - Online: detector experts...
    - Offline: event reconstruction and analysis, calibration, alignment...
- **COOL users: Atlas and LHCb**
  - Different choices in Alice (ROOT) and CMS (CMSSW)



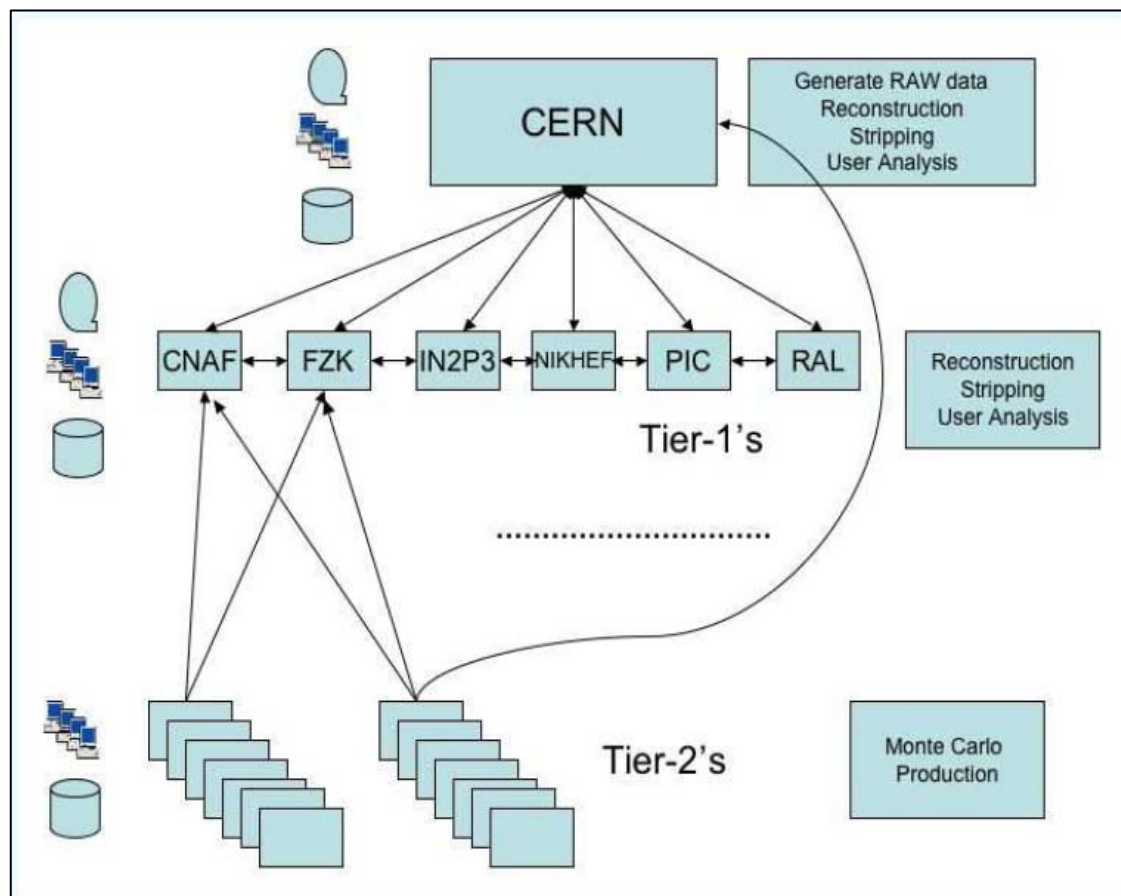
# COOL database backends



- Four supported relational technologies (via CORAL)
  - Oracle database server
  - MySQL database server
  - SQLite files
  - Frontier web cache + application server + Oracle db server
- COOL service deployment model
  - Based on generic 3D distributed db deployment model
    - *Oracle at Tier0 and Tier1 (with distribution via Oracle Streams)*
    - *Other technologies elsewhere if at all needed*
  - Details depend on each experiment's computing model



# LHCb computing model

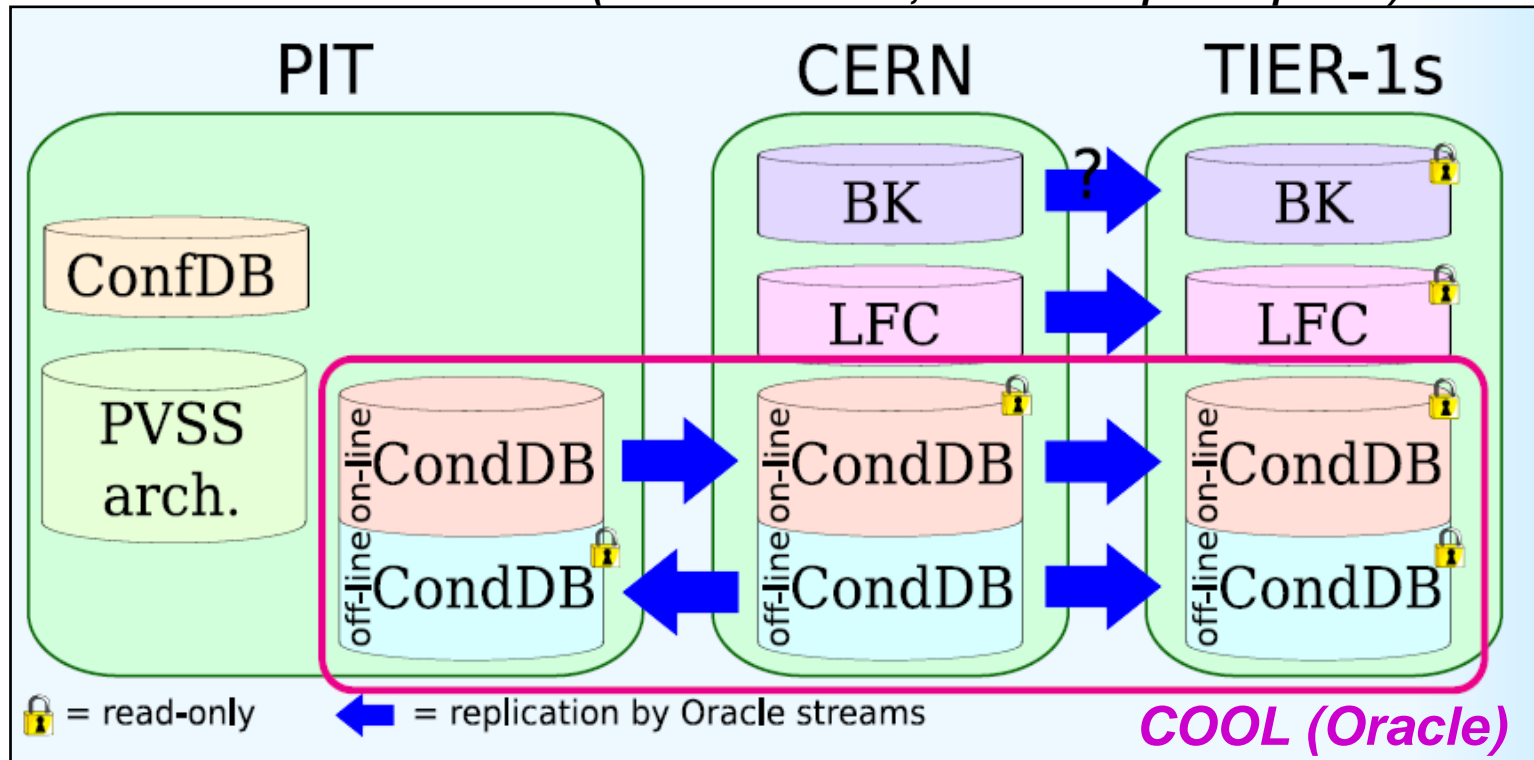


(Marco Clemencic, 3D workshop 13 Sep 2006)

**COOL only stores the conditions data needed for event reconstruction**

- Oracle at Tier0
- Oracle at Tier1's (6 sites)
- COOL not needed at Tier2's (only MC production there)
- SQLite files may be used for any other special need

(Marco Clemencic, 3D workshop 13 Sep 2006)



- Two servers at CERN - essentially for online and offline
  - Replication to Tier1's from the online database is a two-step replication



# LHCb - status and plans



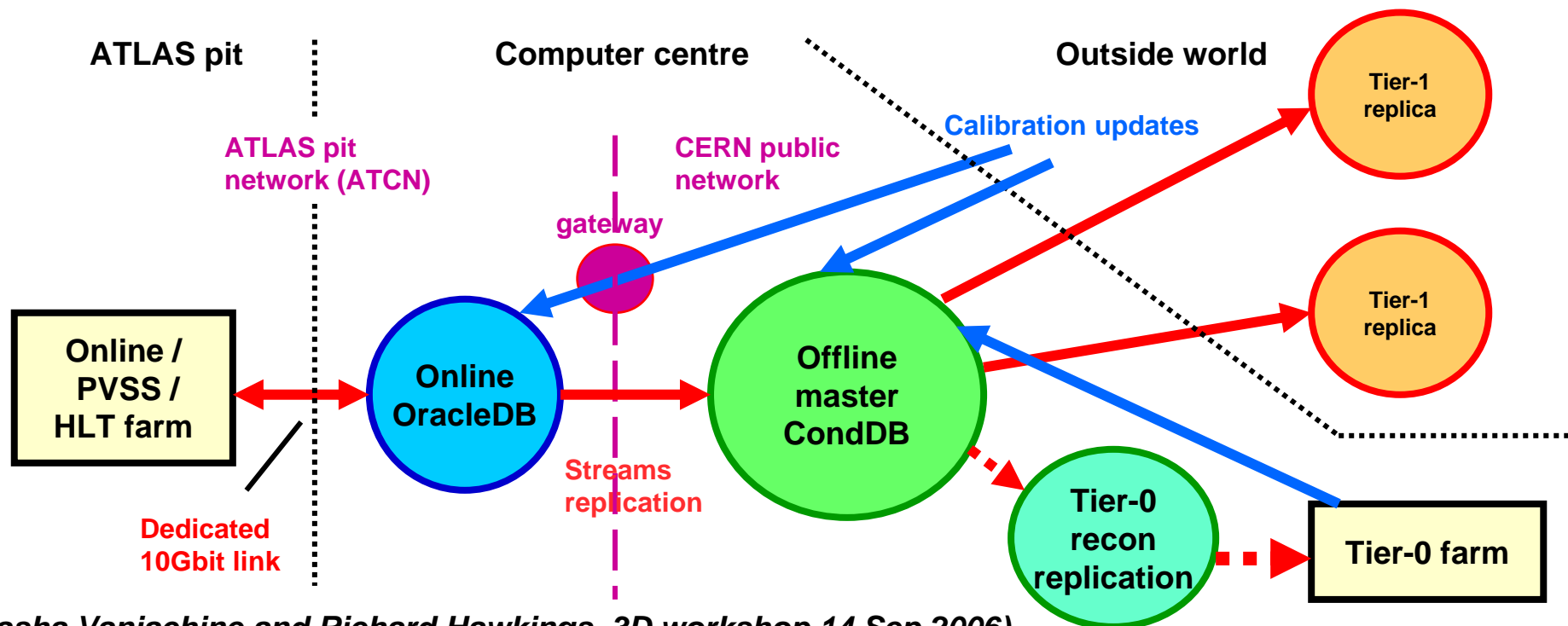
- **Streams replication set up between CERN and 3 Tier1's**
  - Gridka, RAL, then Lyon
- **Still to do**
  - Setup online database and replication to offline database
    - Then two-step replication to Tier1's
  - Test distributed access to data at Tier1's
  - Add three missing sites: PIC, Nikhef, CNAF
- **Open issues for database access from jobs on the Grid**
  - Database lookup (choose closest physical db replica of given logical db)
    - Could use different dblookup.xml (or local LFC catalogs) at different sites
  - Secure authentication to the database server
    - No Oracle proxy certificates - username/password (later LFC, Kerberos?)



# Atlas - COOL service model



- COOL Oracle services at Tier0 and Tier1's
  - Two COOL servers at CERN for online/offline (similar to LHCb)
    - Online database within the Atlas pit network, but physically in the CC
  - In addition: Oracle (no COOL) at three 'muon calibration center' Tier2's



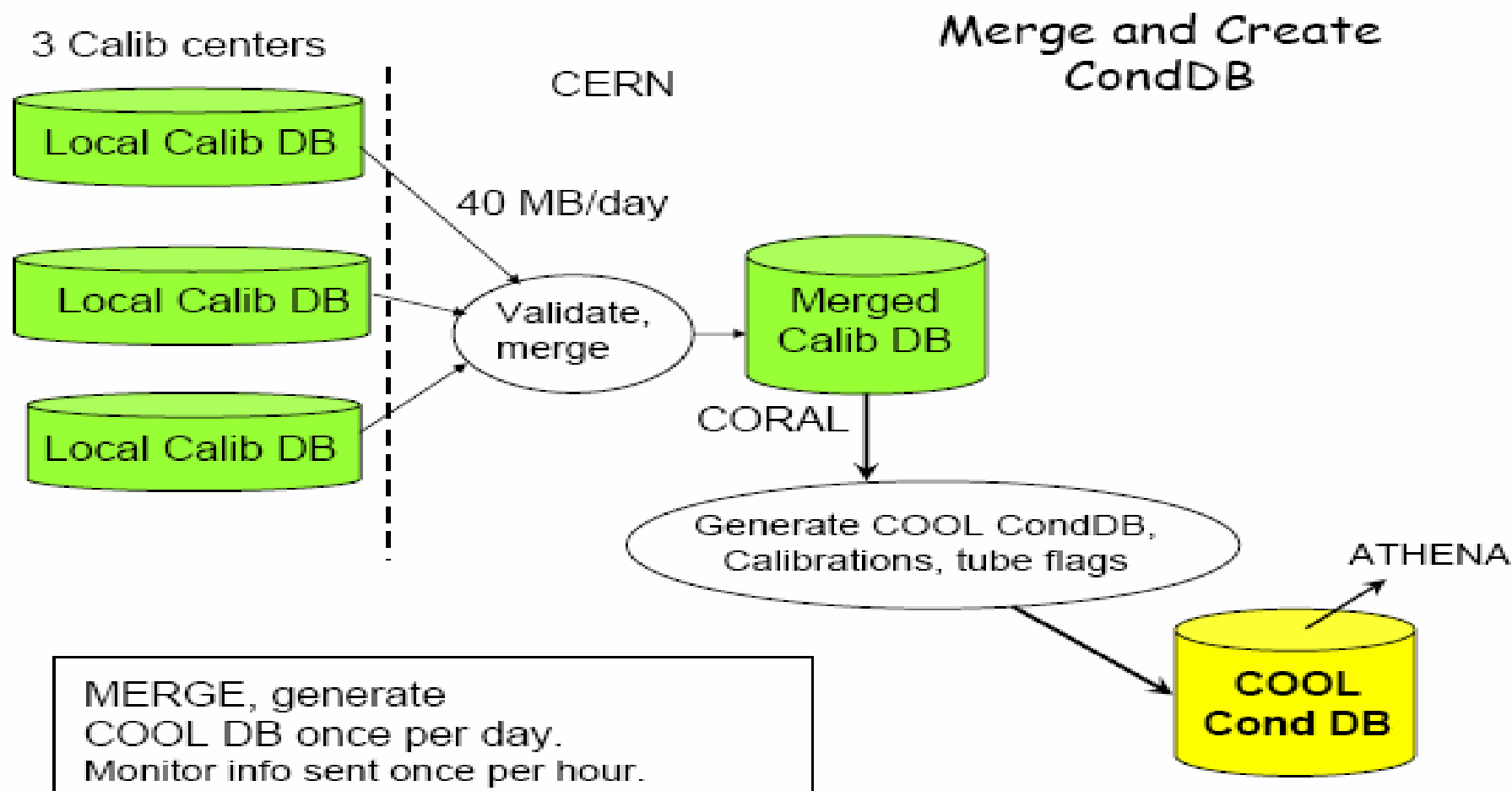
(Sasha Vaniachine and Richard Hawkings, 3D workshop 14 Sep 2006)



# Atlas - muon calibration centers



(Sasha Vaniachine and Joe Rothberg, 3D workshop 14 Sep 2006)





# Atlas – status and plans



- **Calibration data challenge starting in November 2006**
  - Offline calibration sets are produced at remote sites and shipped to CERN (SQLite files) to be uploaded into COOL master Oracle database
    - Calibration data challenge will test calibration produced at many T1 and T2's
    - Muon case: data produced and stored into Oracle at the calibration centers
  - COOL calibration data replicated from CERN master to Tier1 replicas
    - Needs replication via Oracle Streams from CERN to Tier1's
- **Open issues**
  - Uncertainties in DCS data volume
    - Not all PVSS data needs to be replicated/extracted into COOL
  - Replication to Tier2's
    - COOL 'dynamic replication', e.g. to MySQL - under development
    - Evaluating COOL Frontier backend (performance, cache consistency...)



# Summary



- **COOL will manage Atlas and LHCb conditions data**
- **Oracle services for COOL needed at T0 and T1's**
  - Oracle Streams replication is being setup and tested
  - Both Atlas and LHCb require two T0 servers (online/offline)
- **Service requirements at T2's less stringent**
  - No COOL service at T2's for LHCb
  - Atlas evaluating Frontier and MySQL
- **Open issues in database access from Grid jobs**
  - User authentication and choice of database replica