Database and EventIndex Readiness for Run 2

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Databases

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- Database and Application infrastructure:
  - Maintaining support for over 300 schemas
    - All New DB and Application hardware – described before
  - PVSS (online supporting DCS):
    - Upgrade to latest version (major task: EN-ICE, ATLAS, IT-DB)
    - Also DBAs improved indexing, partitioning (volume reduced 50%)
- Database Distribution (Geometry, Trigger, Conditions, AMI, PVSS)
  - New schemas under replication to Tier-1s for Run 2:
    - 2 Trigger schemas (real data and MC)
    - Run 2 Conditions DB instance (CONDBR2) - 29 schemas
  - Replication Technology:
    - Oracle Streams --> Golden Gate for remote sites
    - Oracle Streams --> Active Data Guard (PVSS and Standby DBs)
  - Frontier: running smoothly and ready for Run 2 operations
    - excellent cooperation from sites
    - new versions deployed without effect on operations
- ADCR (ADC Databases):
  - smooth DQ2 data transfer to new Rucio system
  - exploit Standby DBs to reduce production DB load
  - exploit archive DB (ATLARC) for historic, read-only data
  - Current work: a lot of new client software: lots of work behind refining queries
    - addressing row contention, performance issues, tuning
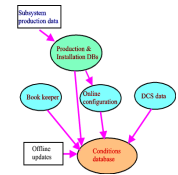
Highlights from the DB applications area

- **ATONR: Performed DB schema upgrades on all PVSS accounts** with advantages in reduction of the future disk space usage by factor 2 plus range partitioning with uniform time interval.

- **ATONR and ATLR: new COOL folder instance CONDBR2 for the Run2 conditions data and new Run2 trigger DB setups.**

- **ADCR database:**

PanDA monitor

PanDA server

Rucio modules

Rucio modules

Id	Name	CPU Usage	CPU Load
1	ADCR1	3%	2.05
2	ADCR2	23%	2.03
3	ADCR3	31%	6.48
4	ADCR4	1%	1.15

- PanDA server and PanDA monitor workloads served by different DB nodes of the Oracle cluster
- Started initiative for distributing the workload of the Rucio modules on different DB nodes

Advantages: 1) much better positioned in case of high workload
2) each DB instance data cache of 200GB can be used

New developments: Use Oracle's "Flashback archive" feature for keeping changes done by update and delete operations. Valuable archive which could have a role as real time machine.

Metadata, Conditions, Other

- Metadata:
  - AMI:
    - pyAMI5 and Tag Collector III: deployment
    - major changes to data sources: ADC DBs and transforms
      - Also changes following Metadata Review (eg: AMI Tags, etc)
    - In the works: association of datasets with publications/analysis and allowing corrected values for MC metadata to be added more easily
  - COMA and CTB (Cool Tag Browser):
    - Improved tools for Conditions management
    - AMI/COMA: Data Periods operational for Run 2
    - major changes to COMA loading workflow (underway)
- Conditions DB:
  - Ongoing activities:
    - provide feedback on ROOTv6/ COOLv3 issues
    - streamlining POOL file movement to online
    - DBRelease size: customized DBReleases for HPC
    - improvements to python based tools
- Other: implemented distribution of CP/Analysis calibration files over CVMFS

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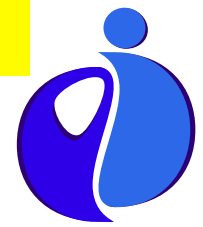
EventIndex Deployment Status (1)

- All major components exist and work satisfactorily:
    - Data Collection: Producer (stand-alone) transform and Consumer
        - Merged transform under development
    - Storage System: Data organisation in Hadoop and indexing in catalogue; also Trigger decoding interface
    - Query System: CLI and web interfaces.
        - Also EventLookup for pathena
    - Monitoring: System level monitoring OK; contents monitoring under development
- ✔ All Run 1 and Run2 Tier-0 production (RAW+ESD+AOD) indexed at Tier-0
    - Decided to run on all first-pass AODs at Tier-0 and last reprocessing version (whichever it may be for each run) on the Grid, starting from M7 and working backwards in time
        - In this way we emulated the 2015 data-taking conditions
    - EventIndex entries now routinely produced for all data15 at Tier-0
        - EI Prducer jobs run automatically in the Tier-0 workflow
        - ➜ Question: do we need to index DRAW/DESD/DAOD at Tier-0 too?
    - Still missing but coming soon: automatic import of Trigger decoding tables from COMA
        - Used to index events by trigger chain
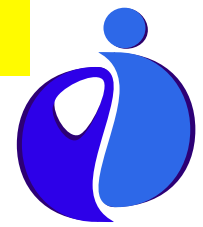
EventIndex Deployment Status (2)

- Currently working on automation of the data flow and system interconnections
  - Discussion this week on integration with ADC tools (ProdSys-2 + Rucio + AMI):
    - Establish EI production as an additional production type
    - Automatically run EI production tasks in ProdSys-2 on all datasets of type EVNT and *AOD*, projects data15* and mc15*, that are "valid" and "closed"
      - Exact definition under discussion
    - Prototype this month
    - Initial operation with EVNT datasets to feed the Event Server
    - Workflow will be revised later this year to see if faster turn-around is possible
- Other work in progress:
  - EventIndex production chain for simulated data exists but not completely tested (especially trigger decoding part)
    - We also need a discussion on which (past) simulated data is useful to index
      - All mc15? Or only newly produced datasets? Any Run 1 simulation needed?
  - Revision of user examples:
    - https://twiki.cern.ch/twiki/bin/view/AtlasComputing/EventIndexTutorial

Dario Barberis: ATLAS Databases

Outlook

- We are ready for Run 2

- We are not scared

  ■ Cross fingers!