



# **MINOS Database Software Support Requirements**

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- **MINOS Database Model**
- **Migration to Oracle for MINOS DB Warehouse**
- **Software Needing Continuing Maintenance**
- **Possible future projects**

# MINOS Database Model

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- **Relational Database (MySQL + Oracle)**
  - **Used for “Constants”, also for Archival (i.e., Construction) Data.**
  - **Starting to use SAM for Event Data File Metadata [A. Kreymer, E. Buckley-Geer]**
  - **Software components:**
    - **DBU** – online/quasi-realtime filling of Master DB (i.e., Acnet data for beam spills)
      - *Up till now, master is a MySQL server; migrating to Oracle (see next slide).*
    - **DBI** – Database Interface package for data access [D. Box, V. Onuchin, N. West\*\*]
      - *Based on ODBC middle layer for ‘easy’ interoperability...*
      - *MySQL interface is well-tested and debugged*
      - *MySQL Clients are running on Linux boxes for MINOS analysis jobs everywhere*
    - **DBM** – Automated data distribution/replication system [D. Box, N. West\*\*]
      - *Used to get data from Master DB to MySQL ‘data marts’ around the collaboration*
      - *Also used to get data from (say) Soudan Mine DB to Master @ FNAL.*

# Migration to Oracle

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- **We are migrating Master DB to Oracle...**
  - **Motivated by DBA support from CD. Also interoperability w/ SAM.**
  - **We thought ODBC would make adoption of Oracle easy!**
    - This turned out to be far from true.
      - *Annoying Oracle conventions:*
        - *(i.e., caps for tablename, reserved words, data type representations, etc.)*
        - *We hadn't anticipated the need for primary keys, having to add them...*
        - *Most annoying: 'S' in SQL definitely does not stand for 'Standard'*
  - **Efforts (on all three fronts: *DBU, DBI & DBM*)**
    - *Needed an Oracle ODBC Driver for Linux [D. Box – completed]*
    - *Needed to address above-mentioned idiosyncracies*
    - *Much work on validation of DBM replication.*

# Migration to Oracle – cont'd

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- **Migration Plan (in MINOS-ese):**

1. Complete the software development section of *The Task: ROW\_COUNTER support and Table Conversion* so that we can convert the automatically updated tables (although we don't need to convert them all yet). This is now done.
2. Confirm that the reconstruction software runs with an mixed cascade: MySQL (for temp); ORACLE.
3. Complete the software development *The Task: Generation of SQL for Table Meta-Data* so that drop/create table ddl is handled symmetrically between MySQL and ORACLE.
4. Pick a regularly updated table. I suggest SPILLTIMEND as it already has a ROW\_COUNTER, but if we choose one without a ROW\_COUNTER then it will need to be added first.
5. Prime this table into the ORACLE server minosora1 and set up a DBMauto feed from minos-db1.
6. Run daily checksums and confirm that no checksum conflicts are reported. Fix any false positives by refining the checksum algorithm (although there should not be anything left to do here).
7. Run for several days to show that it's stable.
8. Run some test jobs with an updater writing directly into minosora1.fnal.gov, by this time it will need a GLOBALSEQNO table. Show that it works.
9. Reverse the flow i.e. have the updater write to minosora1 and feed it back to to minos-db1. This has to be carefully managed, suspending updating and draining DBMauto feeds so that no data is lost.
10. Repeat the process with other regularly updated tables. We could do this in blocks e.g. all the DCS tables. We may have to hold back on some of the really big ones until we have *checksum support for large tables*
11. Fix up *Checksum Compatibility for Character Data* so that we don't get false positives from character data and then start priming the ORACLE server with other tables, ensuring we get no checksum conflicts.

- **Contributions from Dennis Box have been critical to progress along this path !!!**

- *At every step, we encounter obstacles. We had expected to be done by now!!*
- *We estimate 3 months till migration is complete.*
- *Continuing participation by Dennis (at a moderate duty factor) is essential !!*

# Long Term: Software Maintenance

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- **For DBI: `external packages` now maintained by D. Box**
  - **libodbc++**
    - freeware no longer under active support by original developer
    - needed by V. Onuchin's RDBC pkg – xface of Root TSQL classes to ODBC (had expected this to be adopted by Root, but this hasn't happened)
    - we are also using MyODBC & unixodbc packages, but these are supported
  - **Oracle ODBC driver for Linux**
    - this is Dennis' package.
- **MINOS-specific software**
  - **DBM** – *Oracle-isms need to be tracked as new versions are introduced*

# Long Term: Abandon ODBC ?

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- **Concern about dependence on 3<sup>rd</sup>-party packages.**
- **Also sense that ODBC isn't buying us much**
  - **Supposed universality of SQL & ODBC interfaces is not there**
  - **MySQL and Oracle are both mature & stable products,**
    - *Unlikely that we would be forced to abandon one or the other in favor of another product.*
- **Writing direct interfaces to MySQL & Oracle would be a major overhaul of our database software.**
  - *We would definitely need help from CD with this.*