

# Computing for AMBER

Antonín Květoň

DAQFEET 2021  
10 March 2021, Remote



# Contents

- 1 Hardware available for the pilot run
- 2 Online directory carry-over and reorganization
- 3 Database carry-over and reorganization
- 4 Miscellaneous
- 5 Computing support from CERN IT

# Hardware available for the pilot run

- Server type 1 "Amber Server V1" (2500€ ea) – **4 available**
  - 1U
  - AMD EPYC 7282 – 16core, 2.8 GHZ (3.2 GHZ turbo boost)
  - 64 GB RAM
  - 512 GB M.2 SSD
- Server type 2 "Barebone" (800€ ea) – **2 available**
  - Intel Xeon E3 – 4core, 3.0 GHZ
  - 16 GB RAM
  - 256 GB M.2 SSD
- Server type 3 "pccore" – existing pccore machines – **3 available**
  - Intel Xeon E5-2620 - 12core, 2.1 GHZ
  - 32 GB RAM
  - 512 GB HDD
- More detailed specs → Moritz' talk

# Server-role allocation

- NFS Online directory – Server type 1
- Master database – Server type 1
- Gateway – Server type 2
- Local web server – Server type 2
- DAQ Master server – Server type 3
- Readout server – 2x Server type 3 + 1x Server type 1 to test AMD architecture

# What's missing?

- Online directory backup – possible to find a single-server solution though
- Database backup – replication to DBOD?
- X2Go server
- Still a possibility to free up one type 1 by transitioning to DBOD completely
- Could also request a VM from the CERN IT to free up the type 2 server
- (One type 1 servers still not allocated)

# Online directory

- The plan is to start fresh and take only what we need in order to weed out all the legacy stuff
- Rather ambitious, but very much needed
- Overview of the subdirectories follows – if you are aware of something that should be kept → discussion

# Online subdirectories

- **/online/CMAD** – remnants from DAQ SW development in 2013-2014 (libraries, packages, scripts, log files...)
  - Relevant scripts moved to the RCCARS directory
  - Still being used as a directory for creation of temporary DAQ config files → move these to RCCARS directory
  - **Conclusion:** won't be copied
- **/online/RCCARS** – Source codes, binaries, configuration files of the DAQ software
  - **Will be fully copied**

# Online subdirectories

- **/online/detector** – Detector-specific and personal directories, detector maps, detector geometry files
  - **Directory will be kept, but not entirely copied. It will be left to the experts responsible for the subsystems to decide what to copy**
  - Could be renamed to /online/subsystems?
  - Separate personal directories to /online/nfshome?
- **/online/daq** – daq user home directory. Mostly just random garbage accumulated over the years and the shifter directory.
  - **Only the /online/daq/shift directory will be (partially) copied**



# /online/soft

- Current contents:
  - Symlinks to executables which should be present in PATH (/online/soft/daq))
  - Libraries (both 3rd-party and COMPASS)
  - daq user environment and administration (/online/soft/daq)
  - Many disorganized directoroes containing source code, compiled binaries, in many cases in multiple versions, etc. Unclear what is still needed
- Calls for a reorganization of this directory going forward

# /online/soft

- Potential plan for reorganization:
  - Keep the /online/soft/daq directory as-is
  - Keep /online/soft/bin, but start anew
  - Move installation of all common non-compass libraries to /online/soft/lib
  - Move installation of all non-compass software with executables (e.g. root) to a new subdirectory (/online/soft/???)
  - Move DAQ-related software to the RCCARS directory (software concerned: check\_daq, config\_server, DaqDataDecoding, errorDumpAll, eventDumpAll)
  - Move any remaining detector-specific software to the /online/detector directory
  - Maybe create another subdirectory (/online/soft/???) for compass-specific, general software (e.g. coral, cool)

# Databases – what to copy

- Similarly to the /online directory, we will start anew
- However, the structure will be preserved
- Some data will be preserved as well (enumerators etc) – this has to be hand-picked
- Sequences will be reset and start from 1 once again

# Overview of our (major) databases

- **runlb** – Our bookkeeping database. The range of information stored is huge (92 tables). Stored information includes Runs, shifts, comments, but also data taking conditions, calibrations, filesystem directory locations by workstation – **Almost deserves a workshop in itself**
- **CMAD2012** – DAQ configuration database. Comprehensively describes the structure of the DAQ (50 tables). Also contains CDR file metadata and transfer state info. – Some enums will be kept, but will be mostly started from scratch. A rename is probably also warranted.

# Overview of our (major) databases

- **beamdb** – Data taking conditions (scalers, beamfile used, ECAL/HCAL monitoring info...). Also contains maps. Mostly safe to start from scratch, but discussion with experts needed to determine the fate of certain tables.
- **devdb** – Our frontend DB. The fate of this one is currently unclear. New frontends incompatible with it as they are configured over IPbus. Could potentially be absorbed into the CMAD database.

# Database sizes

DB Name	SizeInGB
beamdb2011	229.9
beamdb2014	112.5
beamdb2009	104.0
DATE2011_log	59.3
DATE2009_log	44.9
RCCARS_log	28.4
beamdb2006	16.3
daqmon	15.1
runlb	6.1
work	5.6
DATE2006_log	3.9
CMAD2012	1.6
QA	0.9
speed_test	0.9
DATE_cleanroom_log	0.3
devdb	0.3
DATE_spare2_log	0.1
test	0.0
beamdb2020	0.0
mysql	0.0

DATE2009	0.0
DATE_cleanroom2_log	0.0
mon	0.0
DATE_spare2	0.0
DATE_cleanroom2	0.0
hltdb	0.0
DATE_spare1_log	0.0
DATE2006	0.0
pubcomdb	0.0
DATE_cleanroom	0.0
devlogdb	0.0
DATE_spare1	0.0
phpmyadmin	0.0
DATE_ecalH2_log	0.0
information_schema	0.0
performance_schema	0.0
DATE2011	0.0
testdb	0.0
DATE_ecalH2	0.0
mysql_copy	0.0

# AMBER machine nomenclature

- Gateways – PCAMGWnn
- Fileservers – PCAMFSnn
- Database servers – PCAMDBnn
- Readout engines – PCAMREnn
- DAQ master – PCAMMAnn

# Miscellaneous

- There are many "hidden" tasks that will pop up as we transition!
- E-Groups
- LanDB sets
- And many more..



# CERN IT – computing support

- We still have the option to use VMs provided by CERN IT for our purposes (none currently planned for AMBER)
- DBOD option still on the table
- We have also been asked to outline our computing needs for production (batch) for the next 3 years. This concerns both COMPASS and AMBER.
  - Current/foreseen data rates
  - Amounts of files
  - Time distribution of our storage needs (estimate)
  - Specific CPU architecture?
  - Computing accelerators(GPUs)?
  - etc..



Thank you!