# Table of Contents

Welcome to the LHCb Computing page........................................................................................................1

- Project Management...............................................................................................................................1
- General documentation...........................................................................................................................1
  - LHCb Computing Publications and Talks.........................................................................................1
  - Software training, FAQs.....................................................................................................................1
  - Software development environment and tools..................................................................................1
- Core Software.........................................................................................................................................2
  - Core Software Infrastructure...............................................................................................................2
  - Meetings...........................................................................................................................................2
  - Event Model.....................................................................................................................................2
  - Ariadne.............................................................................................................................................2
  - Conditions DataBase..........................................................................................................................2
  - FileSummaryRecord...........................................................................................................................2
- Work in progress.................................................................................................................................2

Distributed Computing.................................................................................................................................3

- Distributed Analysis - Ganga..................................................................................................................3
- Operations........................................................................................................................................3
- Data Management...............................................................................................................................4
- Computing Model & Deployment..........................................................................................................4
- Volunteer Computing............................................................................................................................4
- Vacuum Computing: Vac and Vcycle......................................................................................................5
- WLCG Operations Coordination and Grid Deployment Board............................................................5

Physics software......................................................................................................................................5

- Physics Analysis Applications...............................................................................................................5
- Simulation, Reconstruction and Alignment Software............................................................................5
- Data Quality.....................................................................................................................................5
- Sub-Detector Software...........................................................................................................................5
- MicroDST..........................................................................................................................................5
- Multivariate Selections..........................................................................................................................6
- Open List of Tasks...............................................................................................................................6

Data Preservation and Open Access........................................................................................................6

- Many-Core Architecture......................................................................................................................6
- Collaborative Working............................................................................................................................6
- Computing for the Upgrade....................................................................................................................6


Welcome to the LHCb Computing page

Do you have a question and are looking for an answer? Try the LHCb Q&A website

Project Management

- Computing Project Management Team
- Computing Project Institutes
- National Computing Board
- Reviews

General documentation

LHCb Computing Publications and Talks

- Publications
- Talks

Software training, FAQs

- LHCb Starterkit - Introduction to LHCb software
- LHCb Software Training (some parts obsolescent, hackathon talks fully relevant)
- LHCb Q&A website
- FAQs and manuals (older)

Software development environment and tools

- LHCb Environment UNIX shell support
- Git for LHCb users
- Guidelines for writing LHCb code
- LHCb nightly builds and LHCb build machines
- Supported platforms
- Setting up the environment
- Reporting bugs
- CERNVM Virtual Machine
- Linux code analysis tools
- Gaudi Testing Infrastructure
- Using Boost.Test for unit testing and test driven development
- Software installation
- EclipseConfiguration △ preliminary
- EclipseTutorial △ preliminary
- RemoteLxplusConsoleHowTo
- PreparingEclipseDistributionEnvironment (for expert, to migrate to new versions of Eclipse)
- Environment Tool
- C++11 How To
- Software Archive
- Jenkins Configuration
- Software Configuration DB Prototype
- Gaudi CMake Configuration
- GaudiExcise: create a sandbox such that one algorithm can run alone.
- GaudiDiff: evaluate the differences between two gaudi jobs, any two gaudi jobs
- Adding a new project
• Periodic Test XML Scheduler syntax
• How to test the performance of the nightly builds
• How to set up a CERN OpenStack instance with AFS and GRID access
• FromLbLoginToLbEnv
• LHCbGroupLogin

Core Software

Core Software Infrastructure

• Core Software Infrastructure description and procedures (a.k.a lbdevops)
• Coverity
  ♦ InstallCoverityIntegrityManager
  ♦ Coverity Usage

Meetings

• Minutes of the meetings
• Programme of Work Workshop Agenda, Planning TWiKi

Event Model

• Event Model pages

Ariadne

• Ariadne pages

Conditions DataBase

• GitCondDB
• CondDB pages

FileSummaryRecord

• FileSummaryRecord: a header-like part of a DST which records metadata about the file

Work in progress

• Programme of work
• Available development projects
• Software Profiling and Optimization
• SLC6 and HEPOS libs RPM
• Software deployment using RPM
• Creating and releasing RPMs for LHCb Software
• LHCb environment and group login
• LbEnv: LbLogin replacement prototype
• LHCb Software - Development tools Use cases
• Changes to the LHCb Computing Environment in 2017
Distributed Computing

- DIRAC Project
- Guides for DIRAC users
- LHCbDIRAC release process
- LHCbDIRAC releases schedule
- LHCbDIRAC Mesos Cluster
- LHCbDIRAC Operations

Distributed Analysis - Ganga

- Ganga homepage
- Getting started with Ganga (page maintained by UniZH)
- How to install and configure Ganga
- Ganga LHCb specific documentation
- DIRAC job monitoring
- DIRAC Bookkeeping Web Interface
- Instructions for LHCb Distributed Analysis Support Team

Operations

- General Links
  - WLCG critical services
  - Operations ELOG
  - Production Monitoring
  - Job Monitoring
  - Bookkeeping Web Interface
  - Real data processing passes
  - Upcoming Data Processing deadlines
  - Reprocessing Checklist
  - Information for Tier2 sites

- For Production shifters
  - Distributed Computing Shifter for Run2 and beyond
  - Production Shifter Guide (previous twiki)
  - Production Shifters Check List

- Monitoring
  - SAM/ETF in LHCb including Description of LHCb specific probes at CERN/IT SAM/Nagios and the LHCb SAM framework for ETF
  - Details about the IT provided SSB pages
  - Publication of LHCbDIRAC SAMJob results to SAM-Nagios

- For Grid Expert on Call (GEOC)
  - GEOC Guide
  - TeamViewer administration of the screens in the computing operations room

- For all the users of the Production System (comprising shifters and GEOC)
  - LHCb Applications and Workflows
  - Production Status machine
  - MC production requests
  - Portal to Submit Production Requests
Older instructions are available here (2010) and here (2012).
Instructions on Submitting MC Filtered requests and tutorial given in Dec. 2014.

- Working Groups Customized Productions
- Testing and Launching Productions from Production Requests
- Testing and Launching Productions prior to submit to production request system

For Production Managers
- Production Management Guide
  - Production Management for Run 2 Data Processing
  - Preparing Histo Merging productions
- Create a replication transformation
- Documentation on LHCbDirac transformation plugins
- List of productions candidate for cleaning
- How to create an empty production
- How to create a processing pass
- How to create a step
- Closing procedure

Data Management

- BookKeeping
- Data flow transformations for 2018 data taking
- Archiving datasets
- Create a replication transformation
- DataPopularity
- Using storage at CERN
- Using Tier1-BUFFER storage elements
- ArchivedDMPages
- LHCbDirac data management commands
- Event Index
- EventTypes

Computing Model & Deployment

- Overview
- Storage Classes
- SRM v2.2 spaces
- Namespace for LHCb RAW and production files
- Computing Model Review 2013

Volunteer Computing

+++ note: the LHCb BOINC system has been stopped

- Participating in the LHCb volunteer computing project
- BOINC FAQ
- BOINC server administration
- BOINC volunteers feedback
- DIRAC Secure Gateway Service
- BOINC TODO list
Vacuum Computing: Vac and Vcycle

- Vcycle for CERN and Yandex OpenStack
- Vac
- Vac configuration for LHCb
- Vac site commissioning

WLCG Operations Coordination and Grid Deployment Board

- WLCG Task Forces & Working Groups

Physics software

Physics Analysis Applications

For a complete list of applications, see the LHCb computing home page

- Release Schedules
- Software Installation
- DaVinci twiki
- Noether twiki
- LoKi twiki
- Stripping twiki
- Erasmus twiki
- Bender Twiki

Simulation, Reconstruction and Alignment Software

- Simulation in LHCb
- Tracking in LHCb
- Primary Vertex reconstruction in LHCb
- NeuralNet Tools in Brunel
- LHCb Global Particle ID
- Detector Alignment
- Production Owners’ manual
- Run 1-2 Performance

Data Quality

- LHCb Data Quality

Sub-Detector Software

- Velo Software Pages
- ST Software Pages
- Outer Tracker Software Pages
- RICH Software Pages
- Calo Software Pages
- Muon Software Pages
- SciFi Software Pages
MicroDST

The MicroDST uses the standard LHCb DST format to store all information about the particles of interest. Links pointing to the original information ensure that all information is still available. Further information can be found on the MicroDST page. See also the Open task to implement MicroDST for MC

Multivariate Selections

The multivariate selections use the result of training datasets for selecting signal events and rejecting background events for each physics channel within the DaVinci framework. Further information on this topic can be found on MultiVariateSelections page.

Open List of Tasks

- You can find at ComputingTaskList the list of Tasks related to Physics Software.

Data Preservation and Open Access

- See LHCbDataPreservation TWiKi and the list of Tasks
- LHCb Masterclass Software documentation

Many-Core Architecture

- You can find the activities at this page

Collaborative Working

- Tmate terminal sharing
- LHCb Questions and Answers

Computing for the Upgrade

- The entry point for activities related to computing for the LHCb Upgrade is available at this page