Organisation of the Core Computing and Software project

The CCS activities consist of the following sub-projects. The sub-activities are described in the attached diagram.

- Framework
- Physics Applications
- Distributed Analysis
- Distributed Computing Services
- Computing Operations

Framework

Core Software developments are driven from both ends: applications requirements and foundation software evolution. It consists of the Gaudi Software framework and the LHCb framework additions (Event Model, Geometry, Conditions…).

The sub-project provides the necessary infrastructure: software environment, CMT, testing of new compiler and platforms, software distribution, run-time environment setting (including on the Grid).

Application releases are ensured by the LHCb Librarian who is also member of this sub-project.

The Framework coordinator represents LHCb in the LCG Architects' Forum.

Physics Applications

The Physics Applications sub-project coordinates the integration and deployment of new features, new tunings and bug fixes in new releases of the physics software (including simulation, tracking, particle identification, alignment, conditions database).

To this purpose, each application (Gauss, Boole, Brunel, DaVinci, Moore, Panoramix) has an identified Application Coordinator who is in charge of tracking developments and fixes in the application or the related software projects, building development versions and deciding on readiness for releases, according the LHCb plans. The integration team is in charge of defining the release cycle taking into account LHCb requirements (e.g. production schedules) as well as availability of new or improved features. This team is in very close contact with the physics performance working group where the physics performance of the software is evaluated.

The readiness of Physics Applications, alignment/calibrations and their deployment for production are reported to the Operations Coordination (OPG).

Distributed Analysis Framework

The Distributed Analysis system of LHCb is based on the Ganga project (joint project between LHCb and ATLAS). The subproject coordinator is currently leading the Ganga project.

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Distributed Computing Services

LHCb Distributed Computing Services are based on the DIRAC set of services and agents. DIRAC is the LHCb access portal to the Computing resources (Grid and non-Grid), for both Workload and Data management. It provides the LHCb-level middleware for handling LHCb data, managing users' and production jobs. It provides LHCb with the necessary production tools for defining workflows and submitting large number of production jobs.

Computing operations

This sub-project is in charge of defining the Computing activities, integrating requests from both the Physics Planning Group and the Computing Project, as well as ensuring smooth operations of the centrally managed computing activities.

It defines the computing resources needs for fulfilling these activities and prepares the resources requirements of LHCb. It provides these requests to the LHCb Computing Resource manager (see mandate below).

The Computing Operations team organises the production activities and ensures the daily follow-up of the ongoing productions. It reports to the collaboration on progress of the production and provides the necessary tools for the collaboration to be aware of available data.

The Computing Operations coordinator (as Deputy Project Leader) has the responsibility together with the CCS Project Leader and the Computing Resource Manager for ensuring that the Collaboration Computing activities can be carried out efficiently.

Mandate of the LHCb Computing Resource Manager (CRM)

The LHCb Computing Resource Manager is appointed by the LHCb management in order to ensure within the CCS project that an adequate level of resources is granted.

Computing resources can be categorised as follows:

- Computing resources proper: CPU, Storage and networking
- Manpower resources for the project

The level of Computing Resources are defined by the Computing Operations subproject of the CCS project, taking into account the LHCb Computing model as well as the planning for computing activities. The CRM's responsibility is to make sure that sites (Tier0, Tier1s and Tier2s) that claim to support LHCb do actually pledge enough resources as well as later implement these pledges. The CRM represents LHCb in the WLCG Experiment Coordination Meeting for matters related to resources. He assists the Collaboration Spokesperson in preparing reports to the C-RRB and the WLCG-OB. The resource manager has the responsibility to cross check the monthly site accounting reports to the LCG against the use accounted within LHCb.

The LHCb Computing Resource Manager is also the chair of the LHCb National Computing Board (NCB).

Concerning manpower resources, the CRM is in charge of searching in the Collaboration for resources as defined by the CCS project, and according to the commitments contained in the Computing MoU.