CERN-RRB-2009-128
7 OCTOBER 2009

PRINCIPAL LHCC DELIBERATIONS

16TH MEETING OF THE COMPUTING RESOURCES REVIEW BOARD

13 OCTOBER 2009

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GENERAL

This document summarises the principal LHCC deliberations concerning the World-wide LHC Computing Grid (W-LCG) Project at the Committee's sessions in July 2009 and September 2009.

The LHCC considers that the W-LCG has made excellent progress in all aspects and is ready for the start of the LHC.

CONCERNS FROM THE PREVIOUS COMPUTING RESOURCES REVIEW BOARD

SUB-SYSTEM	CONCERN	STATUS
Resources	The pledged resources do not fully match the ALICE requirements.	Re-profiling of resources requirements has improved the situation for 2009/2010. ALICE now has 1.5 PB of disk buffer prior to the main storage, representing a standard year of proton-proton running at the LHC.

GENERAL STATUS

The experience of the W-LCG operations in 2009 has been very positive and stable operation of the W-LCG has been reported through the summer. A significant improvement in the reliability of the Tier-2 centres has been reported. A clearer situation of the transition from Enabling Grids for E-sciencE (EGEE) to the European Grid Initiative (EGI) has emerged recently, with CERN now being a member of the EGI Council and being proposed as a special support centre for high-energy physics.

LHC EXPERIMENTS

The LHCC has reviewed the merit of the computing resources request presented by the experiments to the Computing Resources Scrutiny Group (CRSG). Requirements for computing resources have been updated and follow the current LHC accelerator schedule. Given the broad agreement between the experiments and the CRSG computing resources estimates, the LHCC recommends that the experiments' estimates, which are based on more detailed inputs, should be taken when assessing the actual resources to be installed. Computing resources for 2009 are being currently installed and the computing models for 2011 and beyond should be reviewed in view of the first experience with LHC data taking and processing.

The experiments request an enhanced CPU and disk capacity at the CERN Analysis Facility (CAF) for calibration/alignment and validation purposes, and multiple fast processing of data at Tier-1 sites, with the aim of providing expeditious feedback to the experiments. The LHCC finds the approach by the experiments to be well motivated and sensible.

Given the important investment made in the construction of the LHC and the detectors during many years, the physics outcome using the very first LHC data should be maximized and not limited by computing resources. The Committee also realizes that current estimates for computing needs suffer from large uncertainties. The LHCC does not consider the crucial and long-awaited first year of LHC operations to be an appropriate time to attempt to cut back substantially on the procurement of computing resources. However, with better knowledge and experience from the first year of operations, and with the possible need for a long LHC shutdown for machine consolidation, some potential savings in the computing budget may present themselves in the future.

The ATLAS and CMS experiments have recently achieved an average 80% success rate for job submission to Tier centres during the last Scale Testing for the Experiment Programme 2009 (STEP09) challenge, a co-ordinated effort by ALICE, ATLAS, CMS and LHCb for scale testing of the LHC computing. The LHCC is concerned by the fact that the average is biased downwards by the reduced output of few underperforming Tier sites, while the efficiency at well-performing Tier centres exceeds 90%. The LHCC encourages the experiments to continue their work with the various sites to improve the average efficiency. The LHCC notes that close communication between service providers and consumers is an important factor at the successful Tier sites. Indeed, the local presence of experiment-specific expertise at Tier sites is also identified by the collaborations as an additional factor in success.

The LHCC considers that the disk, processor, and tape resources requested by the experiments permits the collaborations to store the data needed for understanding the detectors and processing the data on time scales appropriate for the initial LHC programme. The current request ensures the experiments have contingency with respect to uncertainties involving the machine schedule and operating parameters. In a scenario with limited funds, this request should be regarded as exceptional, and driven by the start-up of the LHC programme. Estimates based on figures from the Computing Technical Design Reports correspond better to steady operations of each of the experiments as the LHC programme matures. Re-profiling of the ALICE resources requirements has improved the situation for 2009/2010. ALICE now has 1.5 PB of disk buffer prior to the main storage, representing a standard year of proton-proton running at the LHC and allowing for more flexibility on the offline selection.

The LHCC understands the need to ensure fast feedback from the Tier-0 centre first pass reconstruction and from CAF for calibration/alignment and detector performance studies. However, experiments should not devote these resources to performing any significant fraction of their physics analyses.