21st International Conference on Computing in High Energy and Nuclear Physics **CHEP2015** Okinawa Japan: April 13 - 17, 2015

Contribution ID: **499** Type: **oral presentation**

Designing Computing System Architecture and Models for the HL-LHC era

Monday, 13 April 2015 14:00 (15 minutes)

The global distributed computing system (WLCG) used by the Large Hadron Collider (LHC) is evolving. The treatment of wide-area-networking (WAN) as a scarce resource that needs to be strictly managed is far less necessary that originally foreseen. Static data placement and replication, intended to limit interdependencies among computing centers, is giving way to global data federations building on computing centers whose maturity has increased significantly over the past decade. Different modalities for provisioning resources, including commercial clouds, will coexist with computing centers in our labs and universities. Compute resources may increasingly be shared between HEP and other fields.

By necessity today's computing system is evolving in an adiabatic fashion due to the need to support the next LHC run. In the medium and long term, however, a number of questions arise regarding the appropriate system architecture, for example: What ratio of storage to compute capabilities will be needed? How should storage be deployed geographically to maximally exploit owned, opportunistic and cloud distributed compute capabilities? What is the right mix of placement, WAN reads, and automated caching to optimize performance? How will the reliability and scalability of the system be impacted by these choices? Can different computing models or computation techniques (map reduce, etc.) be deployed more easily with different system architectures?

In this presentation we report results from our work to simulate future distributed computing system architectures and computing models to answer these questions. When possible we also report our efforts to validate this simulation using today's computing system.

Primary authors: BOCKELMAN, Brian Paul (University of Nebraska (US)); WUERTHWEIN, Frank (Univ. of California San Diego (US)); BAUERDICK, Lothar A.T. (Fermi National Accelerator Lab. (US)); TADEL, Matevz (Univ. of California San Diego (US)); Dr ELMER, Peter (Princeton University (US)); GOWDY, Stephen (Fermi National Accelerator Lab. (US))

Presenter: GOWDY, Stephen (Fermi National Accelerator Lab. (US))

Session Classification: Track 5 Session

Track Classification: Track5: Computing activities and Computing models