38th INTERNATIONAL CONFERENCE
ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **1497** Type: **Poster**

HEP Computing for the Greater Good

Saturday 6 August 2016 18:00 (2 hours)

Out of necessity, the computing model for HEP was transformed over the past two decades from being one confined to a centralized data center, usually situated at the host laboratory, to one fully network-based, distributed across institutional boundaries and geographical regions. This shift from centralized to an intrinsically distributed model has allowed accumulations of diverse collections of resources, opened up new modes of institutional contribution and sharing, and has democratized access to processing and analysis capacity creating an environment where individual and group-level talent and imagination flourishes across collaborations. Indeed HEP has forged new modalities of scientific computation at scales characterized by reading exabytes of data, consuming a billion CPU-hours annually, with resource contributions coming from hundreds of data centers linked with networks of up to 100 gigabits per second bandwidth capacity. A natural question arises as to what impact the innovative methods, software, services and distributed cyberinfrastructure can have on scientific computation outside of HEP. Which science domains have workflow patterns resembling those commonly used in HEP computation and stand to benefit from lessons learned in the LHC computing era? In this presentation we explore how HEP computing is already enabling domains well outside of physics and prospects for transformative impact for disciplines in the so-called “long tail”of science.

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Session Classification: Poster Session

Track Classification: Computing and Data Handling