



CERN openlab Technical Workshop 2016

Welcome and Introduction

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CERNopenlab

Overview

CERN openlab V Research Areas



Data acquisition and filtering
Collecting data



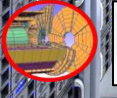
Networks and connectivity
Connecting resources



Data storage architectures
Storing and serving data



Compute management and provisioning (cloud)
Managing resources for processing



Computing platforms, data analysis, simulation
Improving processing and code efficiency

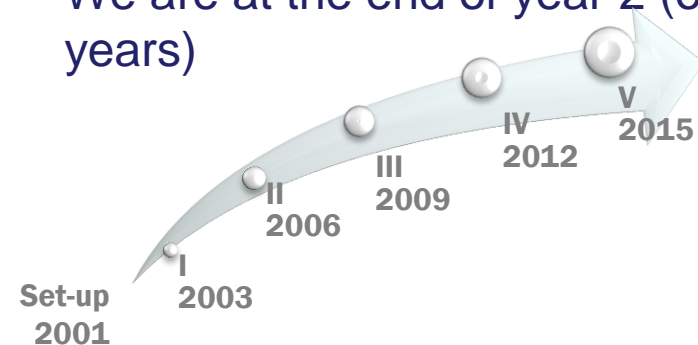


Data analytics
Extracting information

Medical applications

- This workshop is organized around six research areas
 - Review the status of the current projects in the 6 **CERN openlab V** research areas
- AND**
- Look at the challenges ahead (run3 and run4) and start discussions on **CERN openlab VI**

- We are at the end of year 2 (out of 3 years)



The Agenda

Thursday

Data Acquisition and Filtering
9:15-11:00

Coffee IT Auditorium

Networks and Connectivity
11:20-12:30

Lunch 12:30-13:30 513-R-070

Compute Management and Provisioning
13:20-14:30

Coffee IT Auditorium

Data Storage Architectures and Databases
15:00-17:00

Welcome drink 17:00-19:00 Restaurant 2

Friday

Compute Architectures, Software
Performance and Benchmarking
9:10-11:00

Coffee IT Auditorium

Data Analytics and Machine Learning
11:20-13:00

Lunch 13:00-14:00 513-R-070

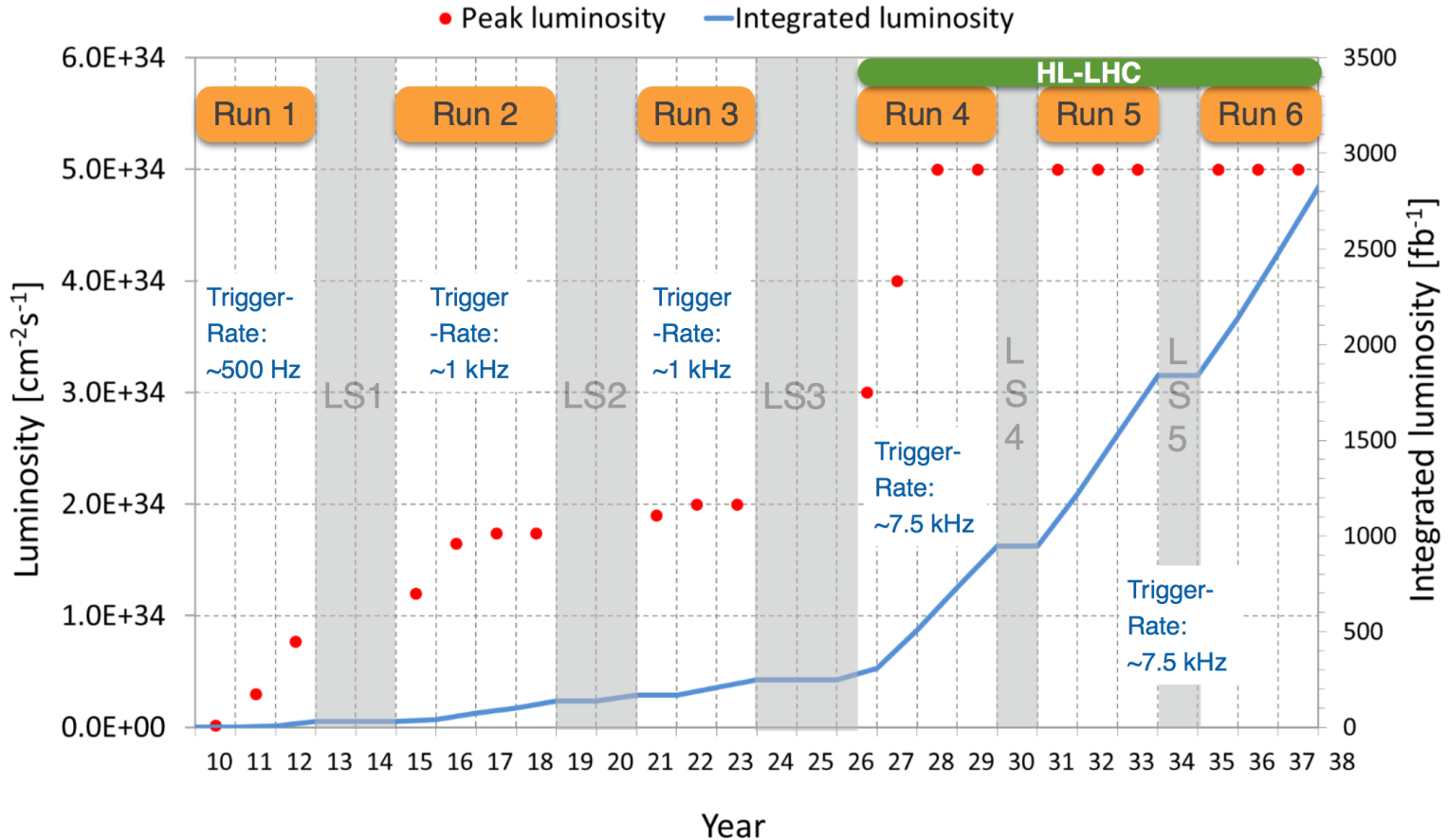
Data Analytics and Machine Learning
14:00-15:15

Working with other Sciences
15:15-15:45

Coffee IT Auditorium

Feedback and wrap-up

LHC Schedule



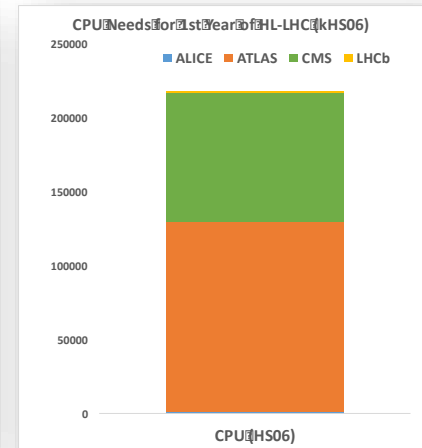
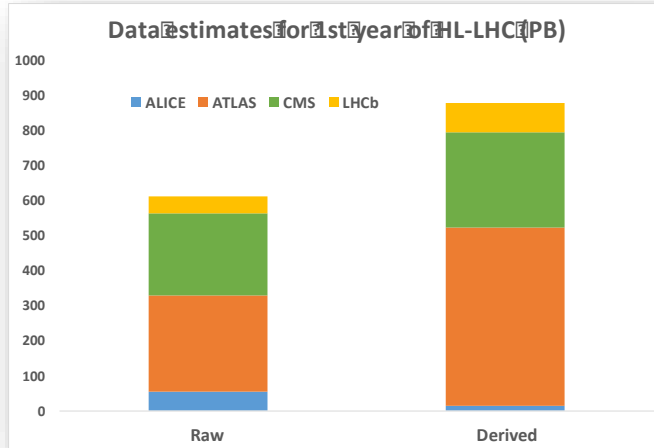
LHC Run3 and Run4 Scale and Challenges



Raw data volume for LHC increases exponentially and with it processing and analysis load

Technology at ~20%/year will bring x6-10 in 10-11 years

Estimates of resource needs at HL-LHC x10 above what is realistic to expect from technology with reasonably constant cost



Data:

- Raw 2016: 50 PB → 2027: 600 PB
- Derived (1 copy): 2016: 80 PB → 2027: 900 PB

CPU:

- x60 from 2016

Technology revolutions are needed

Courtesy of I. Bird

Towards CERN openlab VI

- In 2017, CERN openlab will prepare for the next phase
- **This workshop** is the start of a journey to collect requirements and needs from the community
 - › CERN openlab white paper, expected in Fall 2017
 - Following the activities of HEP Software Foundation for the Community White Paper
- We will have **3 thematic 1-day workshops** in Spring 2017 (end February, end March, end April, final dates TBC) open to industry, CERN groups and experiments
 - › Data Center Technologies (Clouds, Data Storage, Networks, ...)
 - › Compute architectures, platforms, software performance
 - › Data Analytics and Machine Learning

These two days

■ We have a very dense agenda..

■ (speakers) please stay within the allocated time 😊

■ ..but at the same time we encourage discussions during the presentations and at the end of each session

■ Coffee breaks, lunches and a welcome drink are opportunities for discussions too

■ We will conclude with a wrap-up session to summarize status, findings and next steps