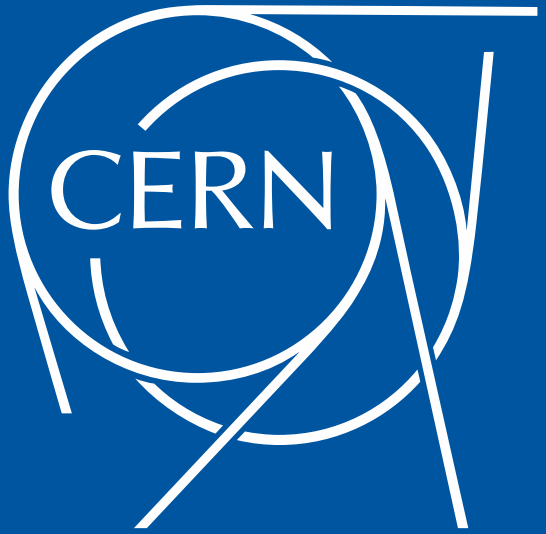
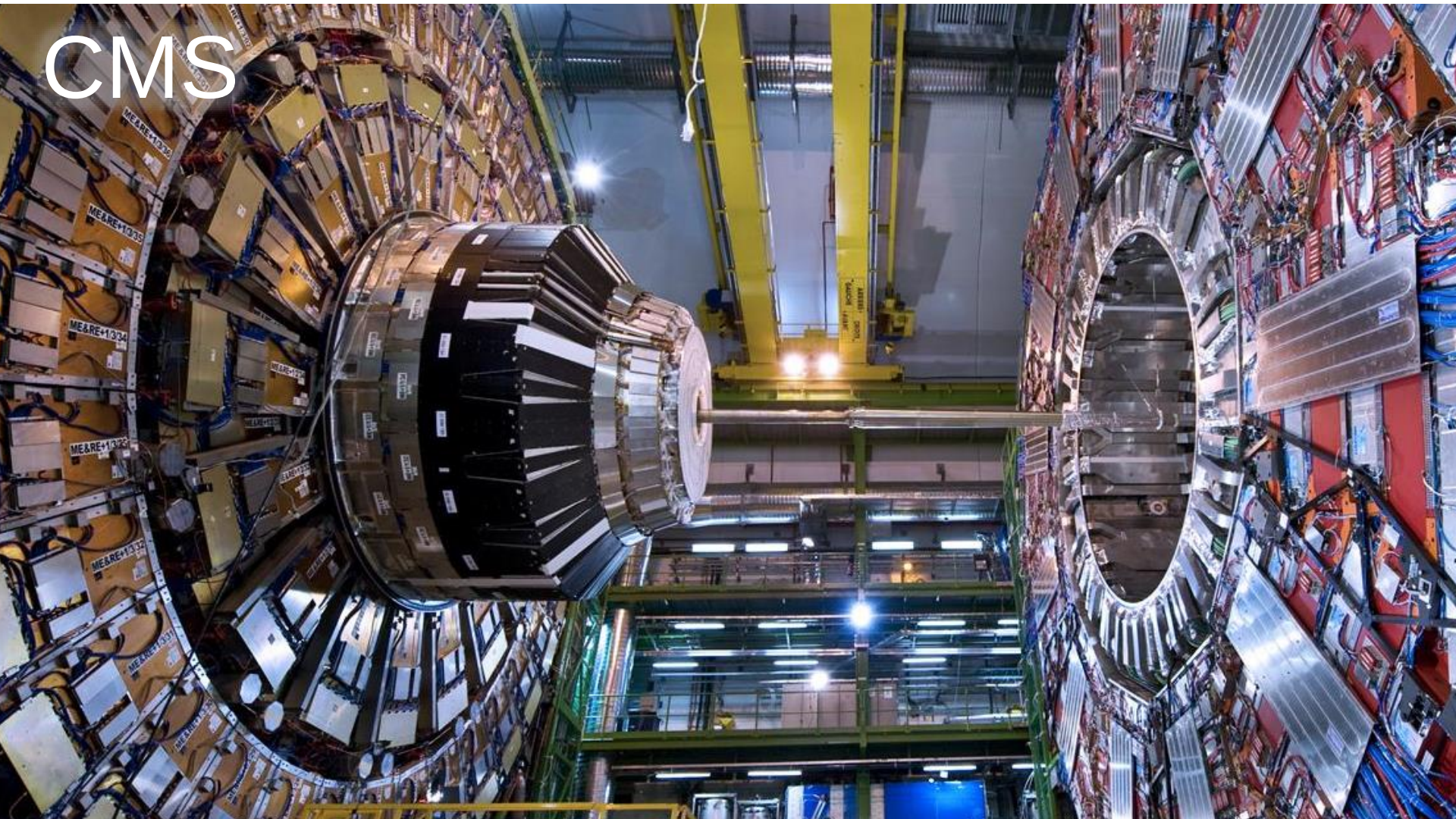

CERN

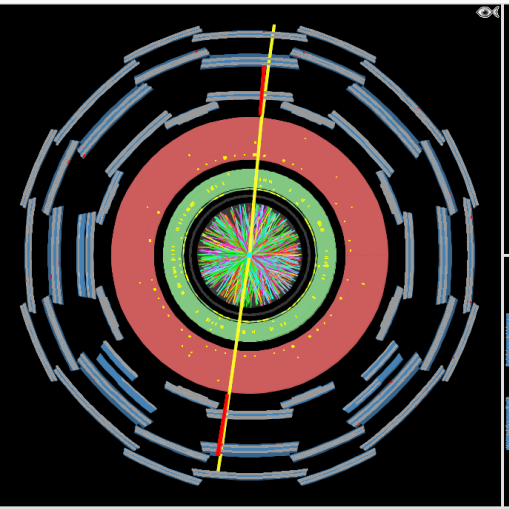
OpenStack at CERN

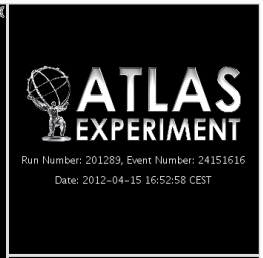
Barcelona Summit 2016

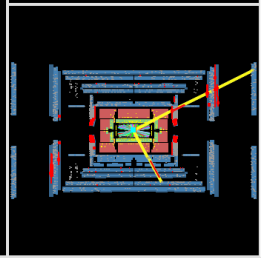

Largest machine on Earth
CMS
CERN
ALICE
ATLAS
LHCb

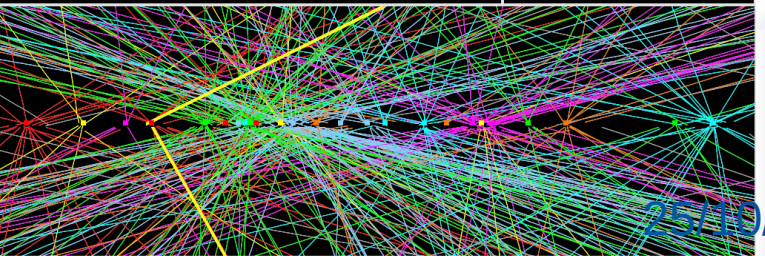

CMS

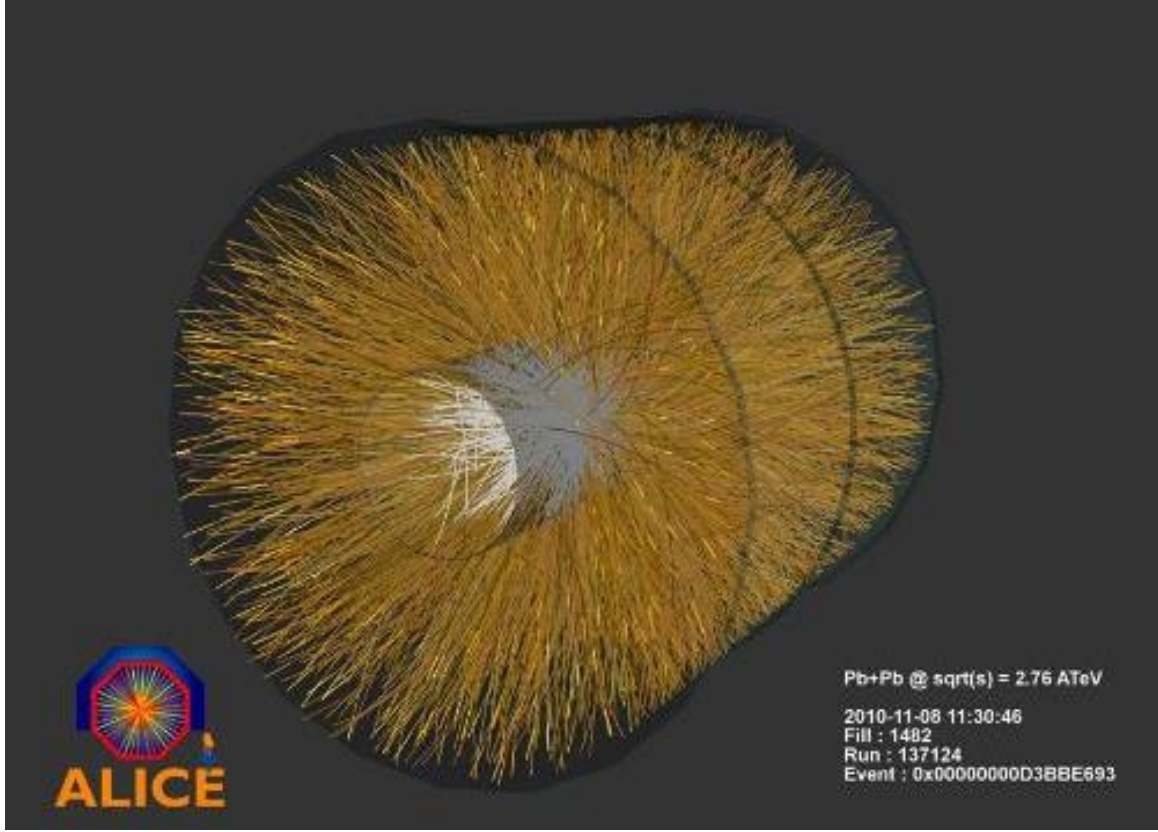
1 Billion Collisions/s



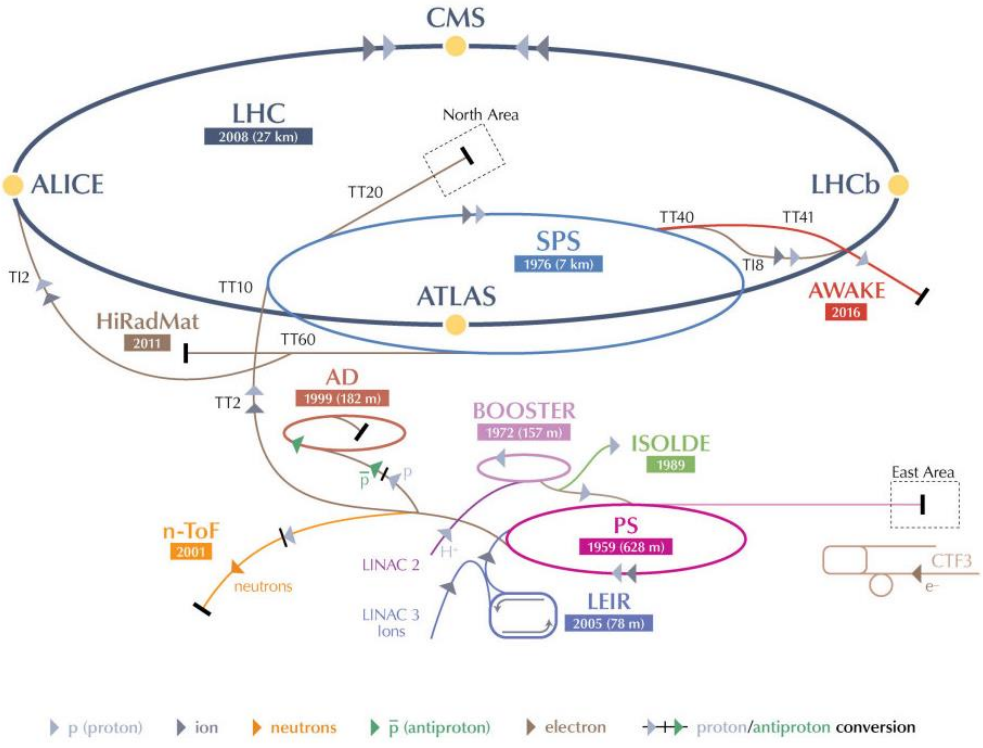








CERN's Accelerator Complex

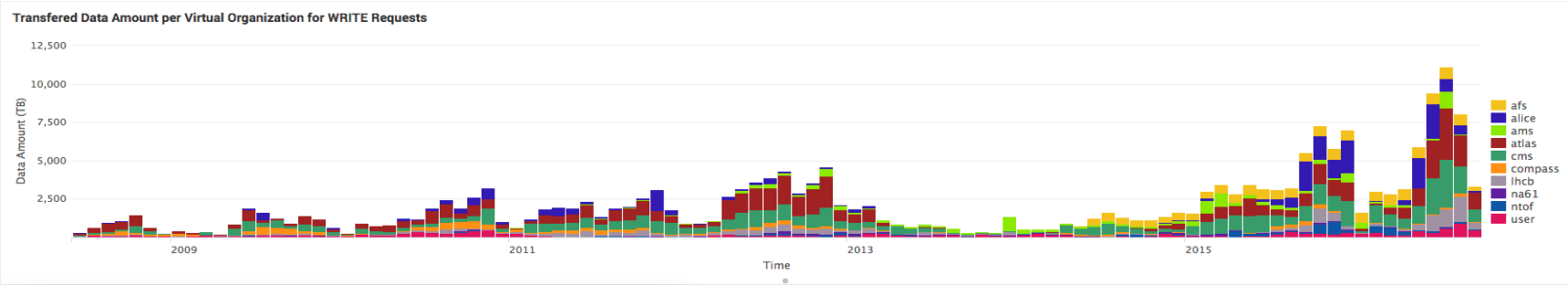


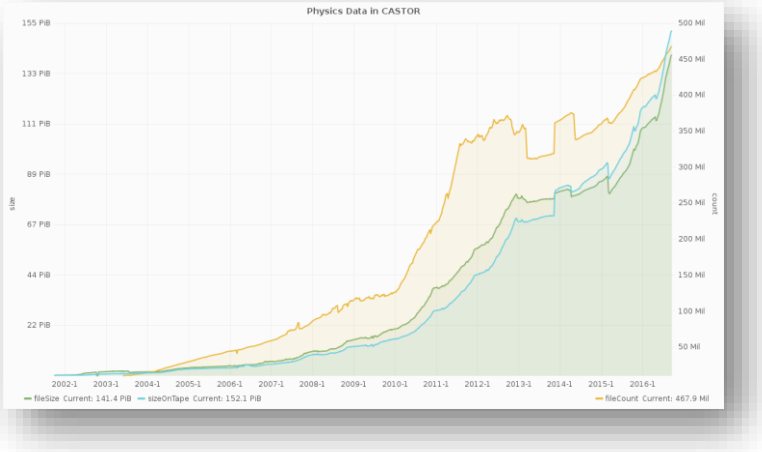
LHC Large Hadron Collider SPS Super Proton Synchrotron PS Proton Synchrotron

AD Antiproton Decelerator CTF3 Clic Test Facility AWAKE Advanced WAKefield Experiment ISOLDE Isotope Separator OnLine DE

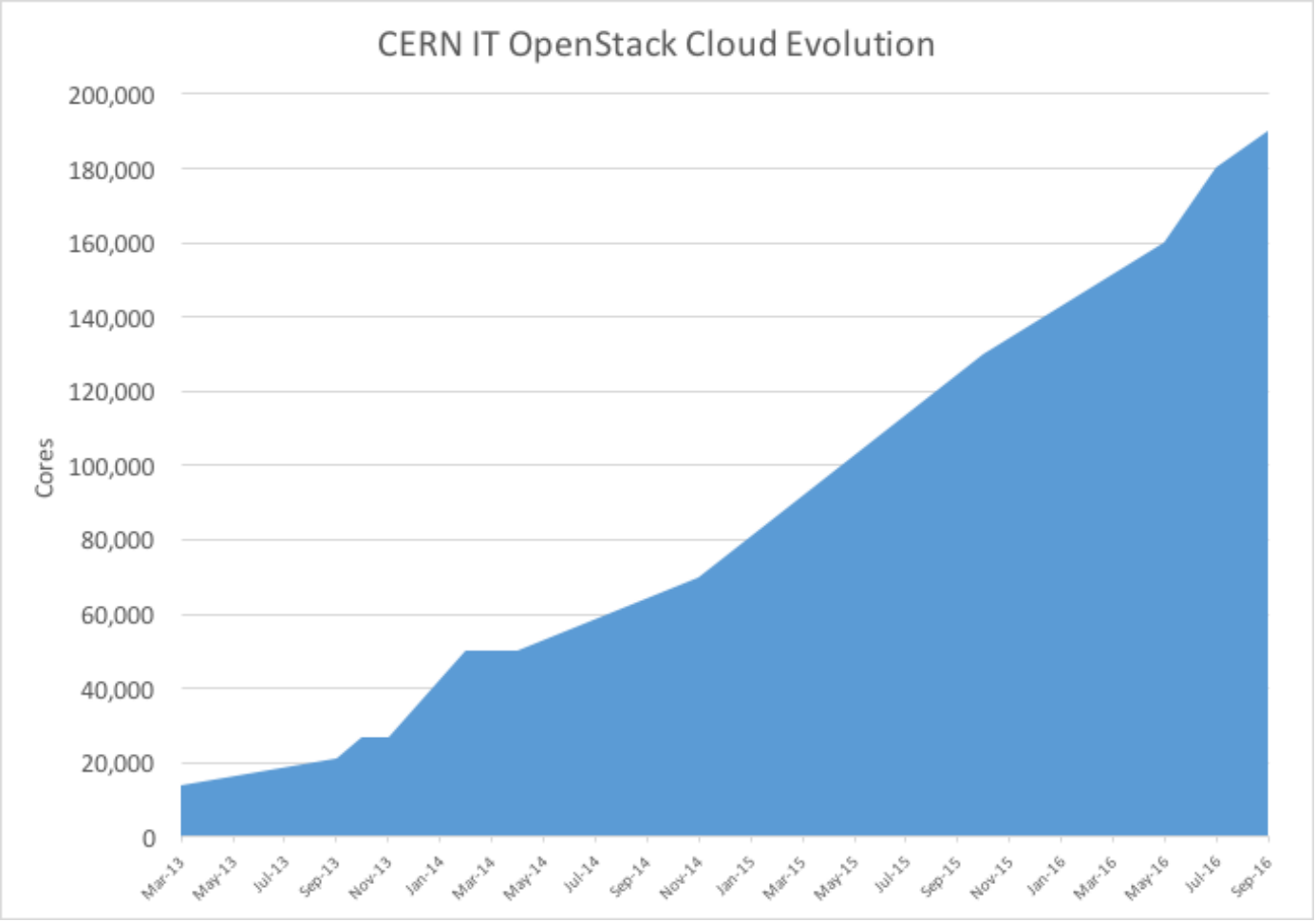
LEIR Low Energy Ion Ring LINAC LINear ACcelerator n-ToF Neutrons Time Of Flight HiRadMat High-Radiation to Materials

2016 : A lot of physics





- ~160 PB stored on tape at CERN
- June-Aug 2016 recorded >0.5 PB / day
- Outlook is for 60x compute increase by 2023 but the budget outlook for servers and people is flat



- >190K cores in production under OpenStack
- >90% of CERN compute resources are virtualised
- >5,000 VMs migrated from old hardware in 2016
- >100K cores to be added in the next 6 months

Containers on Clouds

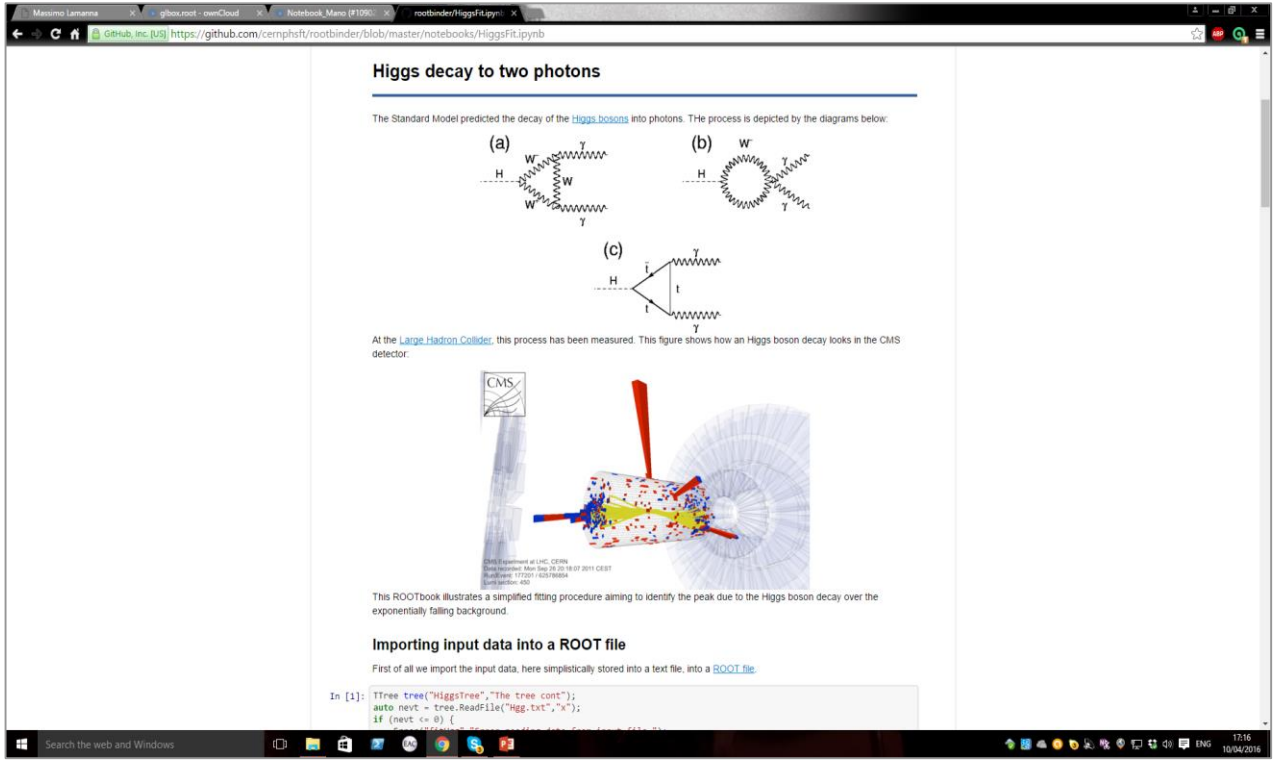
For the user

- Interactive
- Dynamic

For IT - Magnum

- Secure
- Managed
- Integrated
- Scalable

There will be many disruptive technologies within this framework



Hybrid Clouds for Science

- LHC workloads on public clouds?

HELIX NEBULA
THESCIENCECLOUD

SOFTLAYER
an IBM Company

Microsoft Azure

DARZ
Daten sind wertvoller als Geld

CloUData

rackspace
the #1 managed cloud company

INNOVO CLOUD

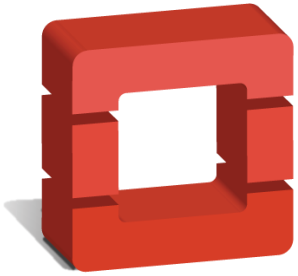
CLOUD&HEAT

ULTIMUM
TECHNOLOGIES

T-Systems

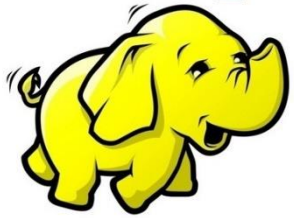
Atos

Thanks for your help!



openstack™
CLOUD SOFTWARE

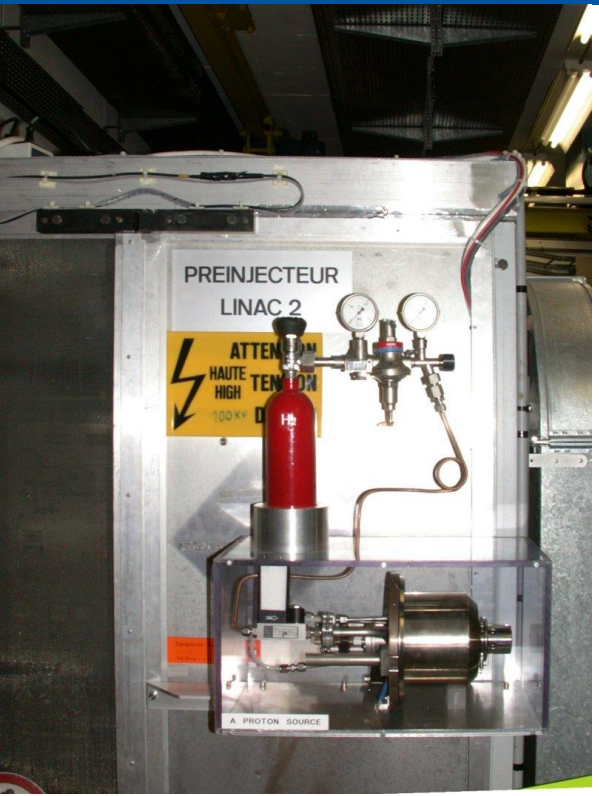
elasticsearch.



FOREMAN

Jenkins

For Further Information



CERN home page is at http://home.cern/

Technical details on the CERN cloud at http://openstack-in-production.blogspot.fr

Custom CERN code is at https://github.com/cernops

Scientific Working Group at https://wiki.openstack.org/wiki/Scientific_working_group

CERN OpenStack story from OpenStack Paris 2014 at https://www.youtube.com/watch?v=7k3VnWXOjP4

Helix Nebula details at http://www.helix-nebula.eu/