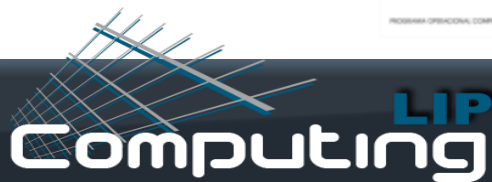
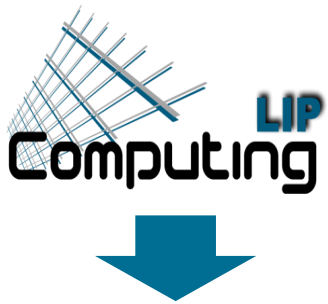


Distributed Computing & Digital Infrastructures

Cofinanciado por:





INCD Infraestrutura Nacional de Computação Distribuída

computing and data services for the academic & research communities

LIP | FCT-FCCN | LNEC

PORTUGUESE ROADMAP OF RESEARCH INFRASTRUCTURES 2010-2020

egi **IBERGRID** **WLCG** **EUROPEAN OPEN SCIENCE CLOUD** **EUDAT** **RNCA** **EuroHPC**

Worldwide LHC Computing Grid REDE NACIONAL DE COMPUTAÇÃO AVANÇADA Joint Undertaking

EOSC-hub **EOSC SYNERGY** **EGI-ACE** **C-SCALE** **BIG-HPC** **EURO** **EOSC Future**

Research & Innovation projects



INCD usage since 2017



62 organizations & research units,
78 PhD thesis, 61 MSc thesis,
724 publications, 86 posters

IT infrastructures

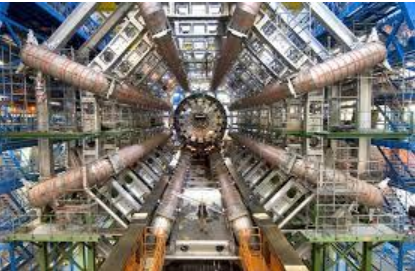
- Sala-Grid datacenter (LIP/INCD)
 - Main computing farm / WLCG Tier-2 / HPC
 - Cloud computing IaaS Openstack
 - Services for LIP and Portuguese research community
- University of Lisbon datacenter (LIP)
 - LIP general IT services
 - LIP-Lisbon IT services
- LIP-Lisbon datacenter at 3Is (LIP)
 - Services for local users
 - Data backups
- University of Coimbra Department of Physics (LIP/INCD)
 - Archival data storage (planning)
- NOS/EDP - Riba de Ave datacenter (INCD)
 - FCT-MACC-INCD Bob HPC cluster
- UTAD datacenter (INCD)
 - Cloud computing (planning)



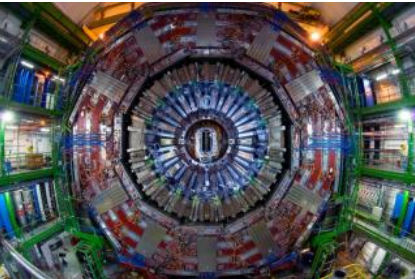
Projects and R&D

- Scientific computing
 - High Performance Computing
 - High Throughput Computing
 - Cloud Computing
 - Distributed Computing
 - Linux containers
- Quality in scientific codes
 - Quality assurance and assessment
 - For software, services, research data
 - Development of QA tools
 - Following DevOps principles and tools for automation
- Research data
 - Data storage and management
 - Repositories for open data
- Research thematic services
 - Development/Integration of services and platforms for specific research areas
 - Simulation and data processing platforms
 - Exploitation of international infrastructures
 - Federated access
- Software and IT management
 - Managing EGI middleware releases at international level
 - Software release processes and repositories

Data Processing and Analysis for the Large Hadron Collider



ATLAS, CMS



42 countries
170 centres
2 million jobs/day
1 million x86 CPUs full time
1 Exabyte of storage
LHCone and LHCOPN nets

Running Jobs: 307153
Active CPU cores: 418074
Transfer rate: 20.80 GiB/sec

dashbord

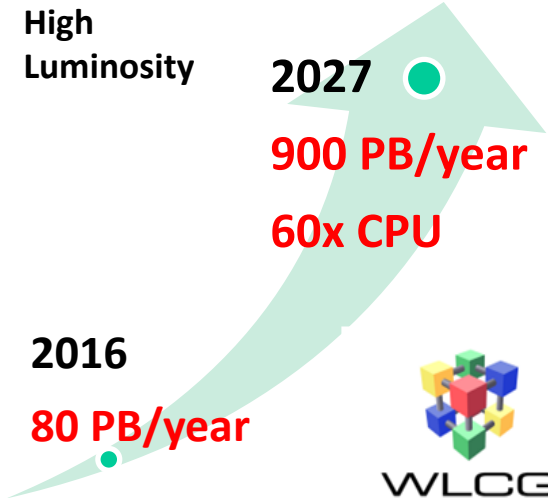
data 920, N/A, U.S. Navy, N/A, SERCO
US Dept of State, Odegrasur
© 2010 Google
Inigo Larriba

google earth

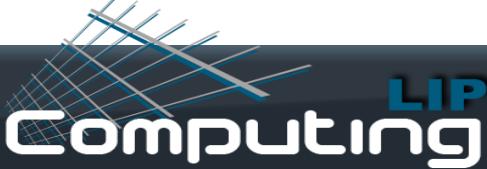
Data, CPU and network intensive

High Luminosity 2027 ●
900 PB/year
60x CPU

2016 ●
80 PB/year



WLCG
Worldwide LHC Computing Grid



National contribution to the global LHC data processing and simulation effort.
Support to national researchers.
Participation in the CERN Worldwide LHC Computing Grid (WLCG)