

Oracle Global Research Strategy Meeting

Bob Jones
Head of CERN openlab



- A science – industry partnership to drive R&D and innovation with over a decade of success
- Evaluate state-of-the-art technologies in a challenging environment and improve them
- Test in a research environment today what will be used in many business sectors tomorrow
- Train next generation of engineers/employees
- Disseminate results and outreach to new audiences

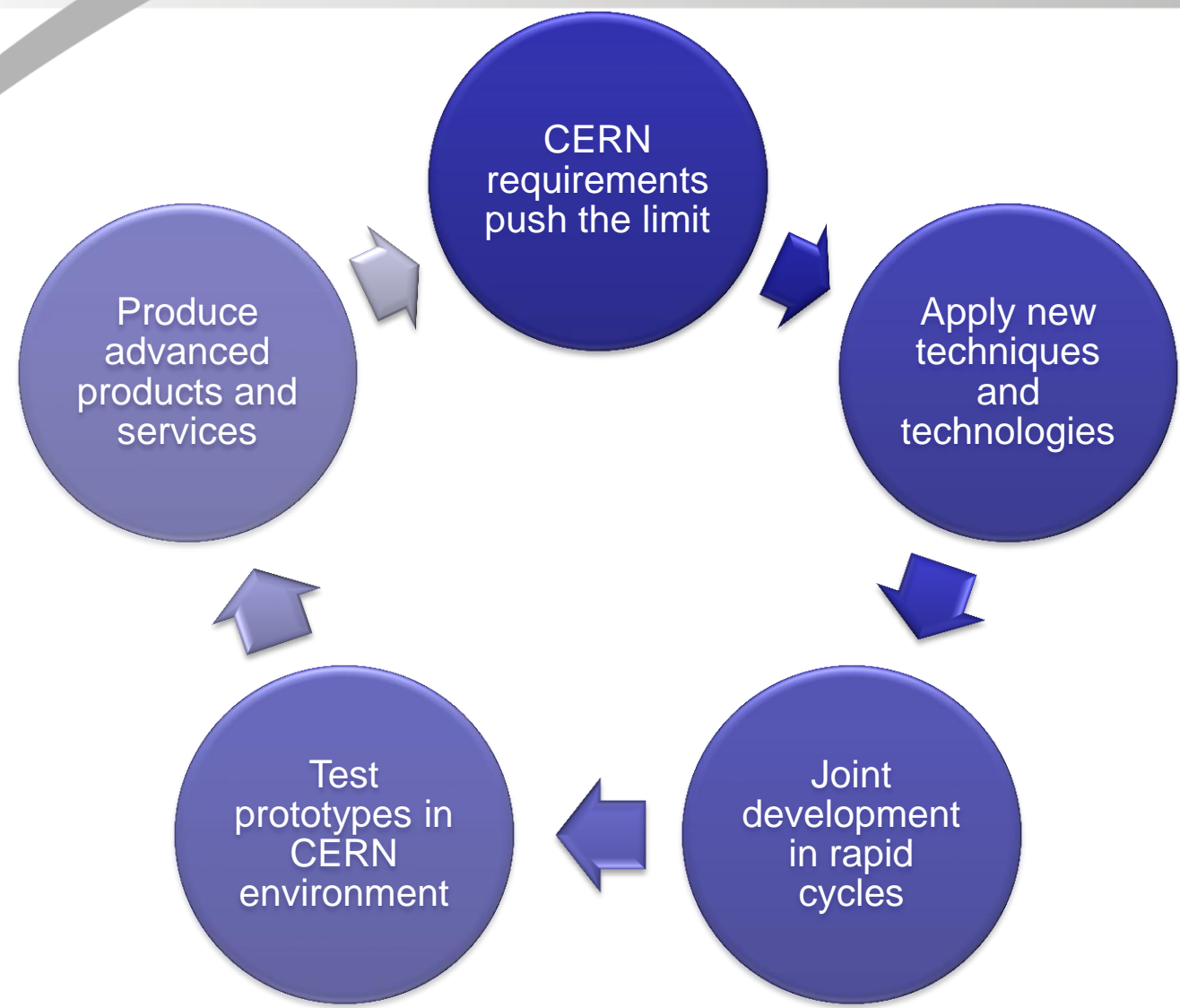


PARTNERS



CONTRIBUTOR (2012)

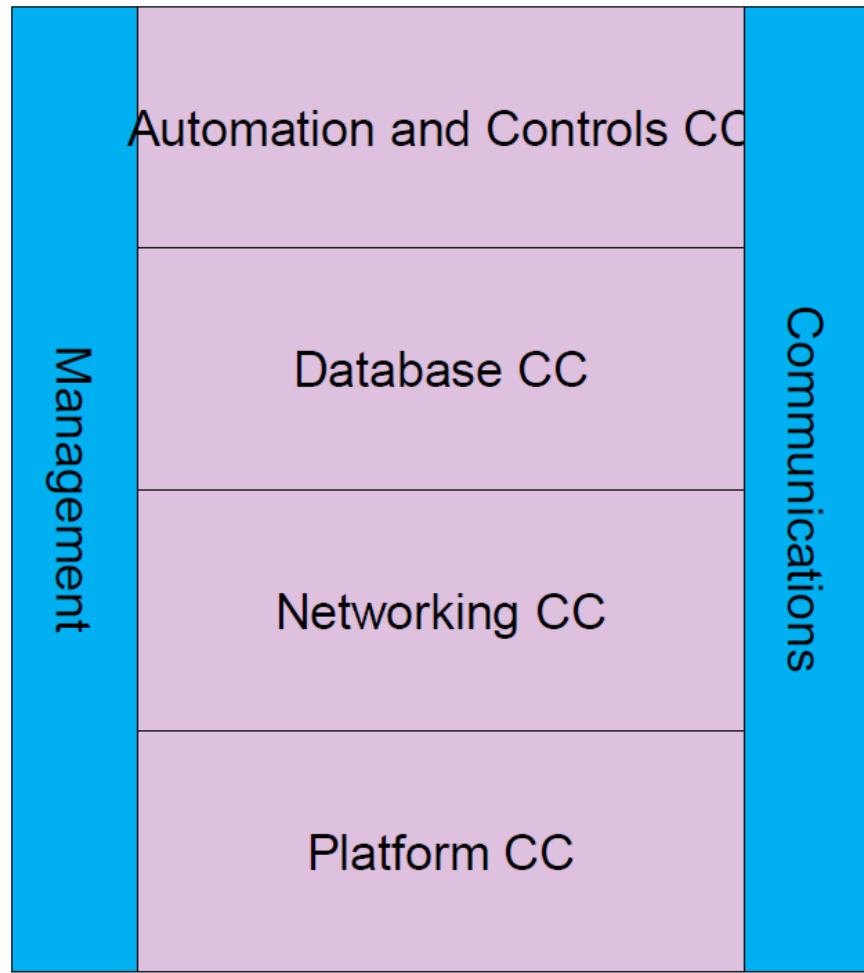




A public-private partnership between the research community and industry



openlab structure

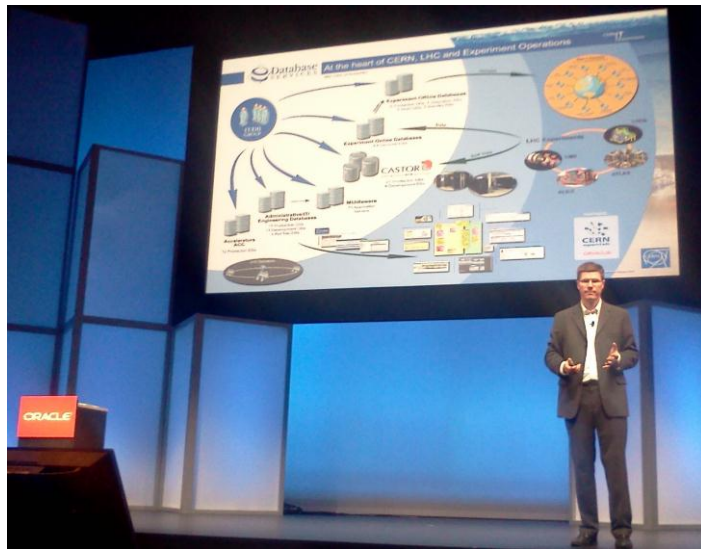




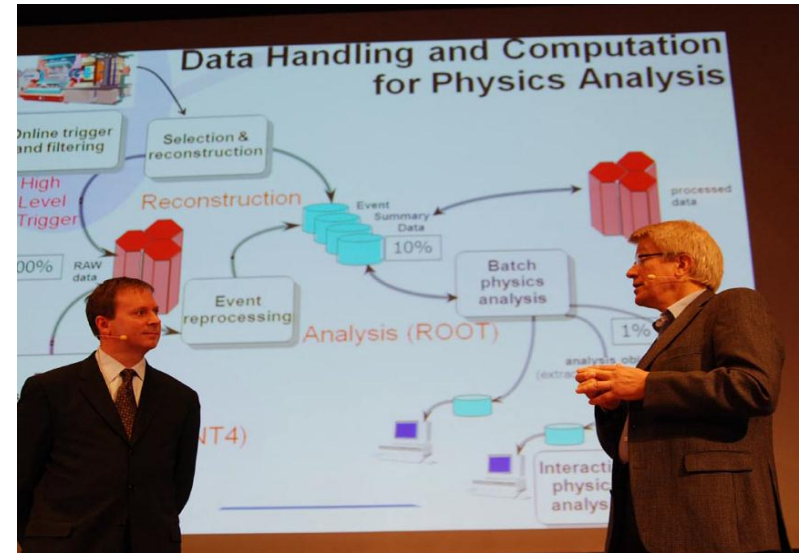
CERN
openlab

Communication

Intel Developer Forum, San Francisco, Sept. 2011



Oracle Open World, San Francisco, Oct 2011

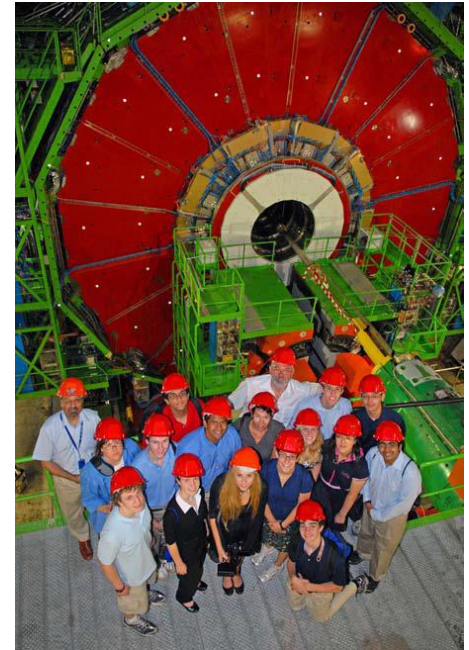


International Super Computing, Hamburg, May 2011

Summer student programme



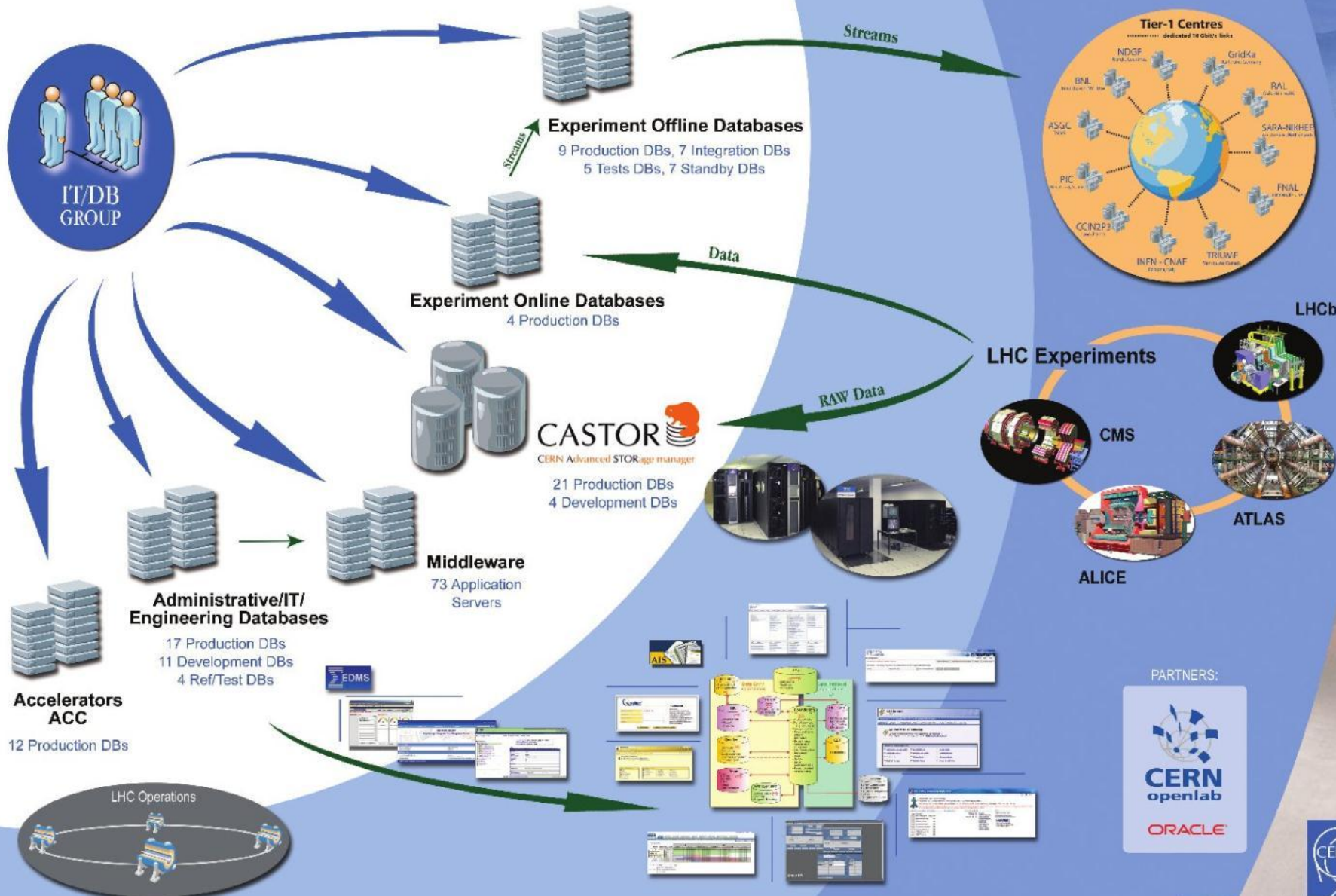
Intel ISEF students
visiting CMS experiment





openlab recipe – key ingredients

- The extreme demands from CERN's scientific programme
- The alignment of goals between partners
- Trust
- Young researchers with their talents, expertise and energy
- Efficient and lightweight structure
- Regular checkpoints/reviews
- Outreach/communications



Some recent openlab highlights

**Wireless Infrastructure
Network Deployment**

**Virtual Services In
Openflow Networks**

**RAC stability and performance
Data Replication
Enterprise/Cloud Management
New Functionality**



Scalable Cloud Storage Solution

**ICS security
PVSS Archiving
Large Systems Management
Remote Control**

**Intel “Knights”-family co-processor
Software Suite: 2012 edition
Xeon EP and EX server evaluations
openlab workshops and teaching**

openlab III (2009-2011)



- Fellows: 4
- Summer Students: 6
- Publications: 37
- Presentations: 41
- Reference Activities: over 15
- Product enhancements: on 8 product lines
- Inter-partner collaborations: 2

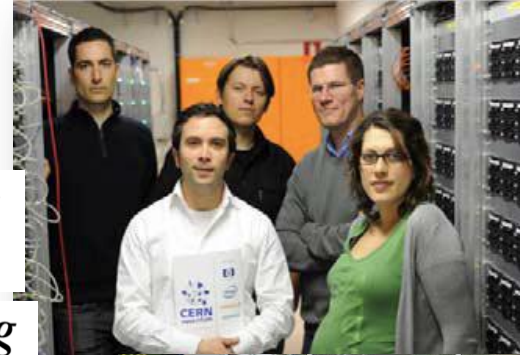
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VM

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FUSION MIDDLEWARE
WEBLOGIC SUITE 11^g

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REAL APPLICATION
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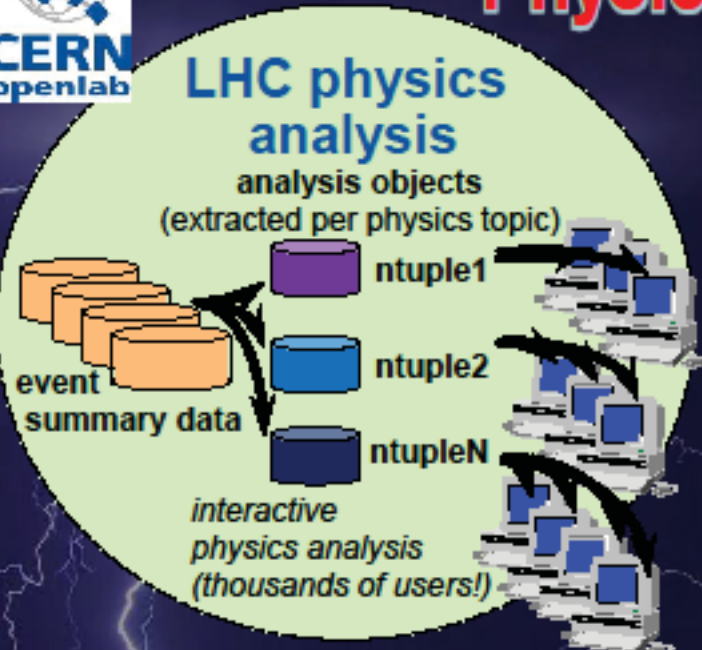


ORACLE®

- Focus on solving problems and not technology
 - Physics analysis with Oracle technologies
 - Data Mining for LHC and monitoring
- Using a wide set of Oracle technologies
 - “clouds” and virtualisation
 - Active Data Guard
 - Replication with Active DG, GoldenGate, grids of databases
 - Enterprise Manager
 - Security for authentication to the database
 - 12c: Real Application Testing, pluggable database, RAC transaction failover, etc.



Physics Analysis in an ORACLE Database



Physics Analysis at LHC is currently done by analyzing information stored in centrally produced ROOT-ntuples (ROOT: a dedicated C++ analysis framework)

Each physics group determines their ntuple-content based on physics objects and level of detail needed for their analysis (thousands of variables stored per event)

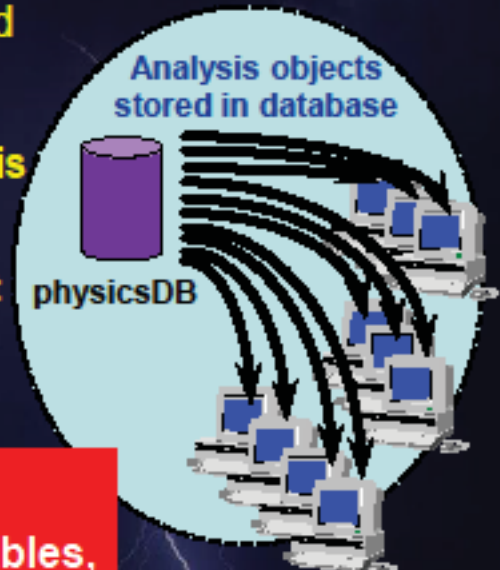
~1000 physics events per ntuple-file, many files need to be processed for each physics analysis, users store files locally or send ROOT-macro to grid

Physics Analysis DB: radically different approach to file-based analysis

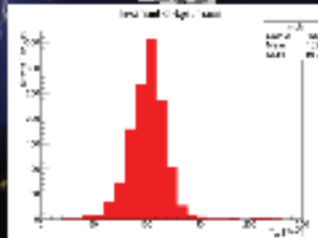
Separate tables by physics object type (jets, muons, electrons etc.)

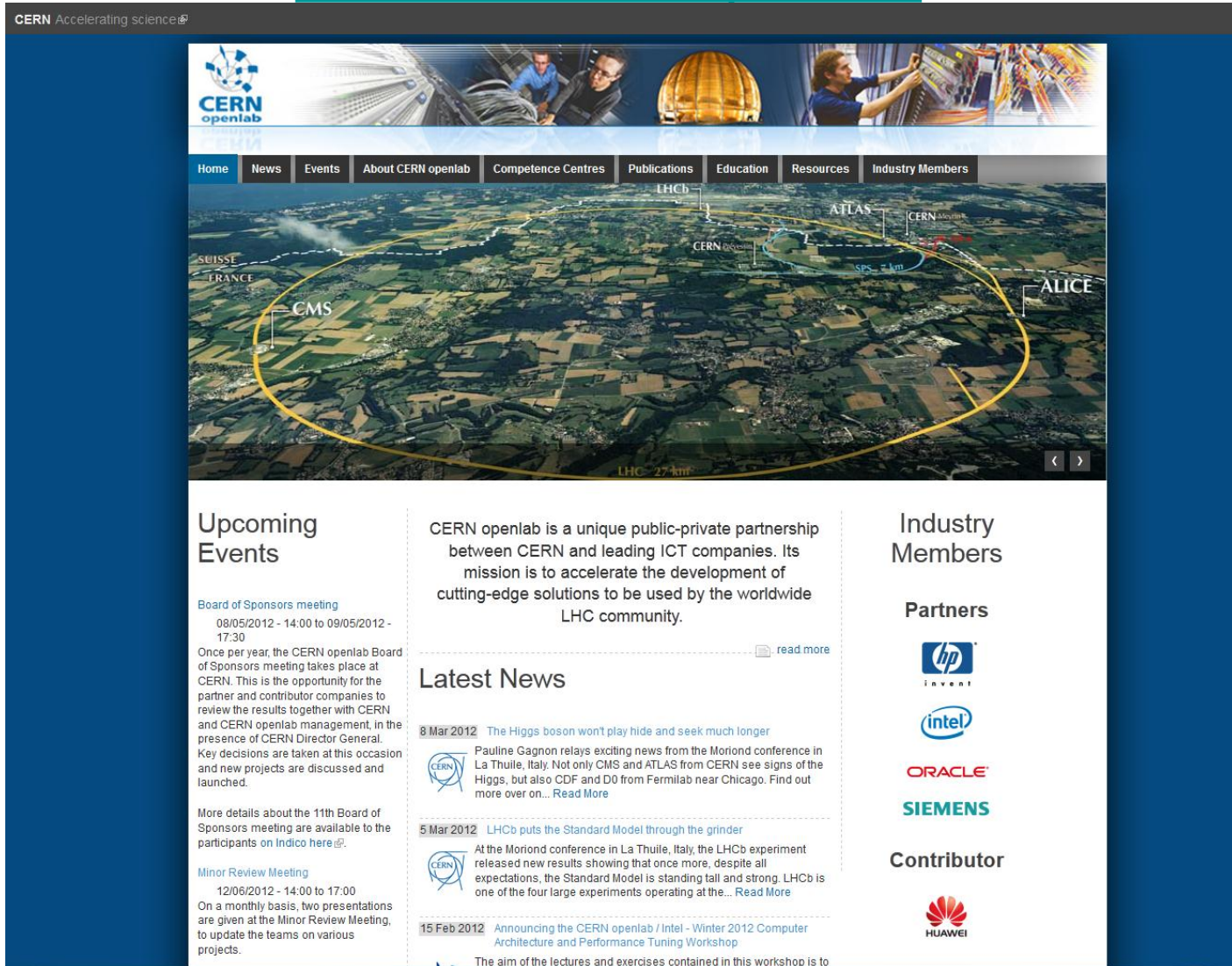
Can decide for each physics topic which tables/columns are relevant

Each user can send their own SQL-query to the physicsDB using PL/SQL functions for specific analysis tasks



A true BIG DATA challenge:
Billions of events, thousands of physics variables, interactive physics analysis by thousands of users
Opportunity to test database tools for optimizing the performance of storing and analyzing complex data





CERN Accelerating science

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SUISSE FRANCE SUISSE FRANCE

LHCb ATLAS CMS ALICE

LHC - 27 km SPS - 7 km

Upcoming Events

Board of Sponsors meeting
08/05/2012 - 14:00 to 09/05/2012 - 17:30

Once per year, the CERN openlab Board of Sponsors meeting takes place at CERN. This is the opportunity for the partner and contributor companies to review the results together with CERN and CERN openlab management, in the presence of CERN Director General. Key decisions are taken at this occasion and new projects are discussed and launched.

More details about the 11th Board of Sponsors meeting are available to the participants [on Indico here](#).

Minor Review Meeting
12/06/2012 - 14:00 to 17:00

On a monthly basis, two presentations are given at the Minor Review Meeting, to update the teams on various projects.

CERN openlab is a unique public-private partnership between CERN and leading ICT companies. Its mission is to accelerate the development of cutting-edge solutions to be used by the worldwide LHC community.

[read more](#)

Latest News

8 Mar 2012 The Higgs boson won't play hide and seek much longer

Pauline Gagnon relays exciting news from the Moriond conference in La Thuile, Italy. Not only CMS and ATLAS from CERN see signs of the Higgs, but also CDF and D0 from Fermilab near Chicago. Find out more over on... [Read More](#)

5 Mar 2012 LHCb puts the Standard Model through the grinder

At the Moriond conference in La Thuile, Italy, the LHCb experiment released new results showing that once more, despite all expectations, the Standard Model is standing tall and strong. LHCb is one of the four large experiments operating at the... [Read More](#)

15 Feb 2012 Announcing the CERN openlab / Intel - Winter 2012 Computer Architecture and Performance Tuning Workshop

The aim of the lectures and exercises contained in this workshop is to

Industry Members

Partners

hp
invent

intel

ORACLE

SIEMENS

Contributor

HUAWEI