

The background of the slide features a complex, abstract network diagram. It consists of numerous nodes, represented by small circles, interconnected by thin, grey lines. Some nodes are highlighted with larger, thicker circles. The lines form a dense, web-like structure that spans the entire width of the slide, with a slight curve at the top. The overall aesthetic is technical and modern.

A successful public-private partnership

Alberto Di Meglio
CERN openlab Deputy Head



A long, dimly lit tunnel, likely part of the CERN particle accelerator. The tunnel is filled with complex machinery and pipes. On the left side, a large, cylindrical structure, possibly a superconducting magnet, is visible. The floor is marked with a white line, and the walls are lined with various equipment and cables. The overall atmosphere is industrial and futuristic.

CERN: A UNIQUE ENVIRONMENT TO PUSH TECHNOLOGIES TO THEIR LIMITS

CERN openlab in a nutshell

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



ORACLE

SIEMENS

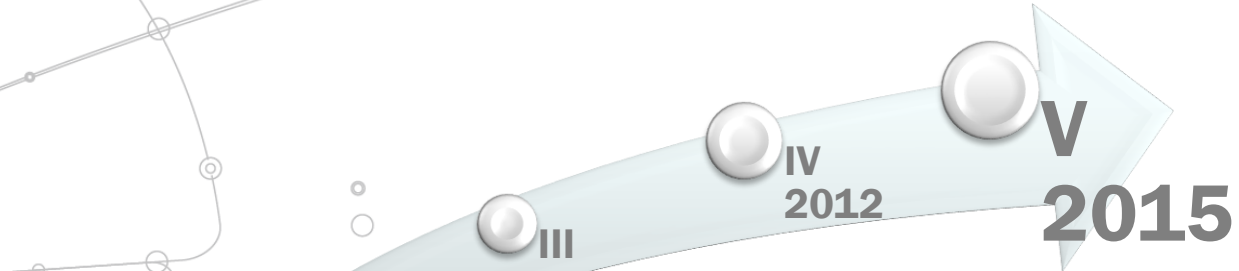
CONTRIBUTOR



ASSOCIATE

Yandex

The history of openlab



Set-up
2001

I
2003

II
2006

III
2009

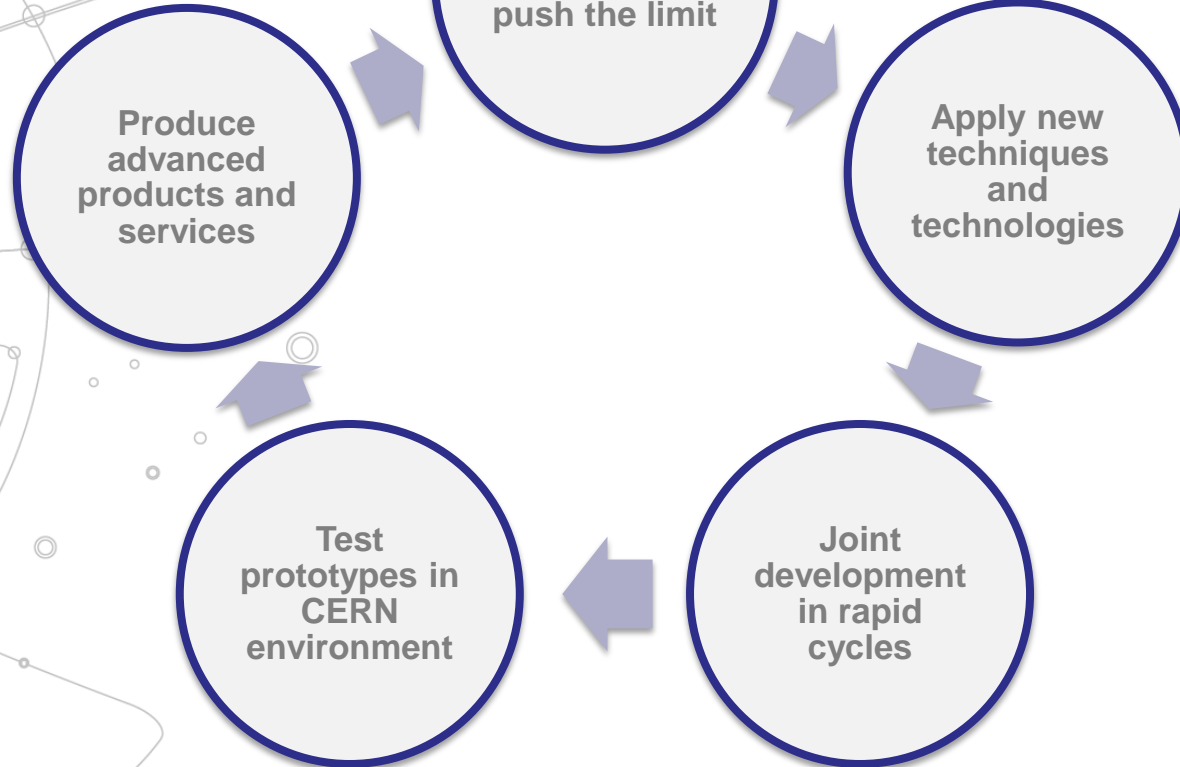
IV
2012

V
2015

CERN openlab Board of Sponsor 2013



Virtuous Cycle



A public-private partnership between the research community and industry

The Large Hadron Collider (LHC)



LHC Schedule

2009 2010 2011 2011 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 ... 2030?



LHC startup
900 GeV

Phase-0 Upgrade

Phase-1 Upgrade

Phase-2 Upgrade

50 times more data than today in the next 10 years
50 PB/s out of the detectors
5 PB/day to be stored

Bunch spacing = 50 ns

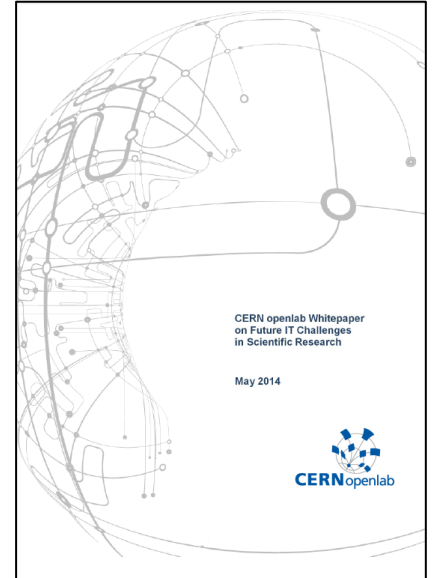
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Bunch spacing = 25 ns

Spacing = 12.5 ns

Phase V Preparation

- IT Challenges Whitepaper
 - Workshops, discussions, presentations
 - Printed this week, announcement on Mon 12th
- Internal discussions, workshops, initial use cases definitions
- Now defining specific openlab V projects



Information Technology Research Areas



Data acquisition and filtering



Computing platforms, data analysis, simulation



Data storage and long-term data preservation



Compute provisioning (cloud)



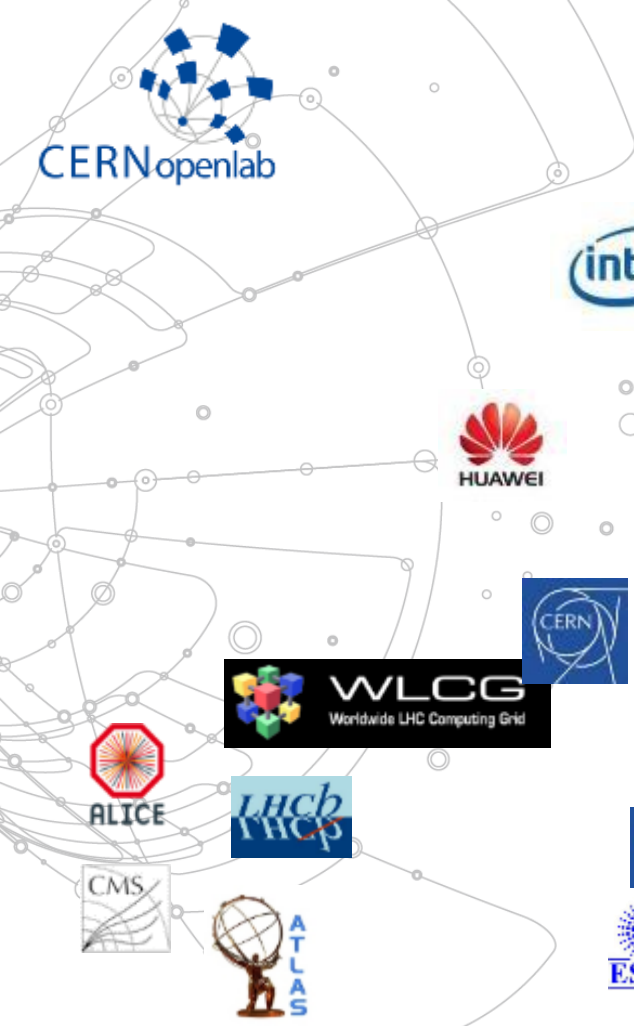
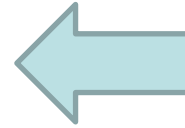
Networks



Data analytics

Who we are involving

New partners



CERNopenlab



ORACLE

SIEMENS



CERNopenlab

Yandex



A Solid Educational Program

> **At CERN**

- Regular workshops
- Special workshops and lectures
- Requirements workshops
- Training courses on hardware platforms,
- Parallel programming, etc.

> **Outside the lab:**

- CERN School of Computing in Nicosia (August 2013)
- Thematic CSC in Split (June 2013)

> **ISEF Winners Program**

> **Summer student program**

> **The ICE-DIP project**



Programs is highly structured, with different tiers and specializations – students, young researchers, professional researchers and experts - including summer student lectures as well as numerous invited talks at CERN

Summer Student Program

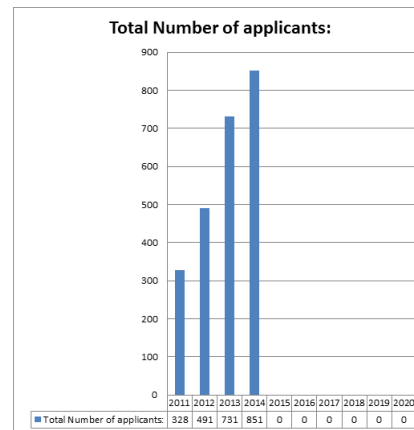
> Summer student program 2013

- 720+ applicants
- 22 selected candidates
- 13 lectures (including new lectures from external labs)
- A new lightning talks session
- 22 technical reports



> Summer student program 2014

- 850+ applicants
- 23 selected candidates
- Lectures and visits program





Started February 2013

Recruited 5 fellows

Model can be extended next year to other areas (e.g. data analytics)

Centre of Excellence?



ICE-DIP 2013-2017:

The Intel-CERN European Doctorate Industrial Program

» A public-private partnership to research solutions for next generation data acquisition networks, offering research training to five Early Stage Researchers in ICT



Research topics:

- ▶ Silicon photonics systems
- ▶ Next generation data acquisition networks
- ▶ High speed configurable logic
- ▶ Computing solutions for high performance data filtering

New professional profiles



Multicore CPU programming, graphical processors (GPU), multithreaded software

Software & Computing Engineers

Data analysis platforms, statistics, mathematics, data visualization, monitoring, security, etc.

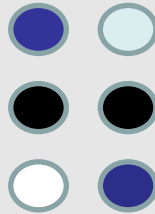
Data Scientists

Applications of physics to medical research (hadron therapy, etc.), simulation software

Multidisciplinary applications

CERN openlab Formal Agreements

CERN openlab Framework Agreement



Agreement signed by each sponsor (research lab, company, etc.) with CERN



Project 1
Project Agreement Signed by all project participants



Project 2



...



Project N



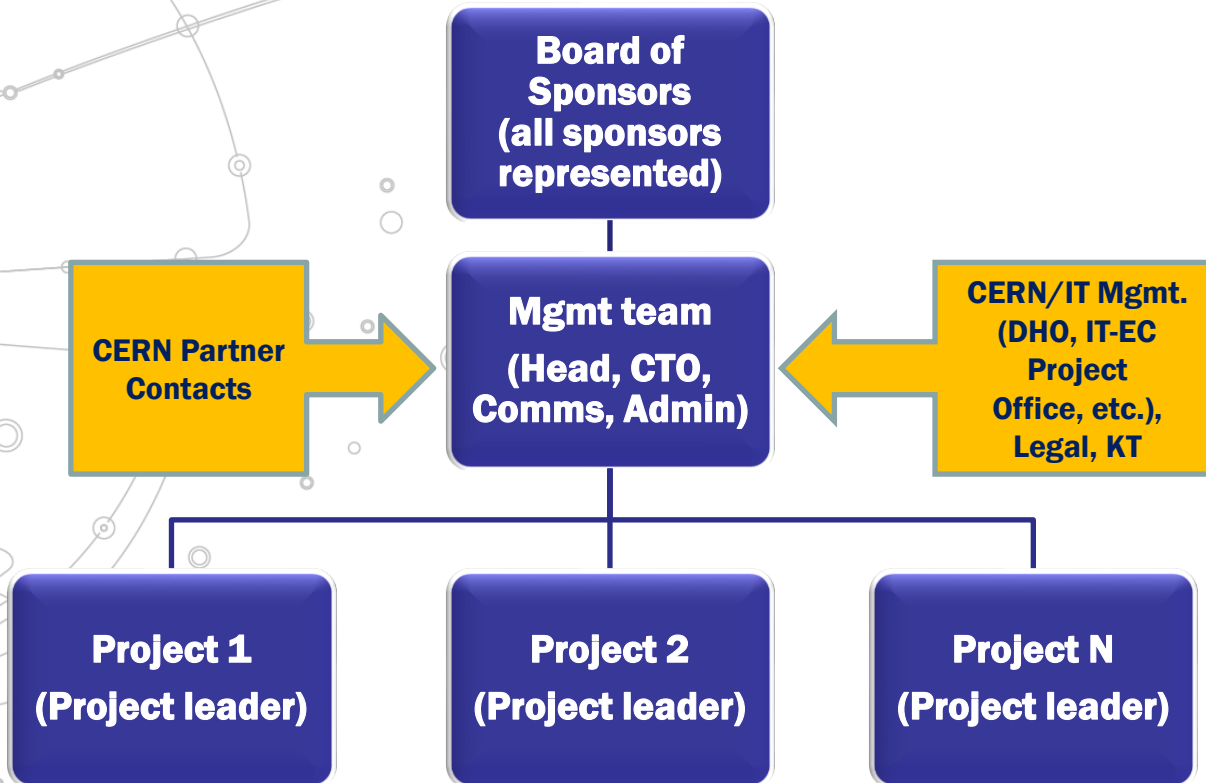
CERN openlab Framework

■ Each CERN openlab sponsor must

- Sign the CERN openlab framework agreement
- Commit according to the role of their organisation:
 - › Companies:
 - Pay 25,000 CHF/year
 - Contribute to summer student programme
 - › Research partners:
 - Host CERN openlab project-based events
 - Contribute to summer student programme
 - Contribute to dissemination/outreach activities within their communities
- Every project within CERN openlab will be individually resourced in addition to the commitments shown above

Management Structure

CERNopenlab





Annual CERN openlab Event

- High-visibility public event to promote the activities and results of CERN openlab and its projects

- Press is invited and the event can be broadcast



Globe @ CERN
Capacity ~200

- Each sponsor is be allocated a number of seats according to their sponsorship level

- Sponsors can invite their partners/customers within the limit of their allocated seats
- Visits to CERN installations (LHC etc.) will be organised for participants





GET IN TOUCH www.cern.ch/openlab

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