News from the "CHIPP LHC Computing Board"

- News in "CHIPP LHC computing", since last board meeting

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Strategic and Operational issues (1) – HPC - LHC

- Challenge for computing resources to LHC experiments – over next 8 years need a factor of ~50 more resources.

- Switzerland started project LHConCRAY in 2016 (initiated at AEC-Bern) to test possibility and economy of LHC workloads on HPCs.
- December 2017: concluded tests successfully.
  - ***Team CSCS+CHIPP succeeded to run ALL LHC job-types on CRAY ! found same job efficiency as PHOENIX, but higher economic value***
  - ***Meeting of "CHIPP LHC computing board" on 7.12.2017, decided to go for using HPC for providing the Swiss T2-resources at CSCS.***
    1) CSCS will provide shared HPC resources for LHC computing, based on same FLAT budget by FLARE/SNF (and ETHZ+Uni contributions)
    2) We will continue to provide the pledges of Switzerland towards WLCG
    3) PHOENIX as a "separate dedicated cluster" will be phased out eventually.
    4) AEC at Bern continues providing additional ATLAS-T2 resources

Strategic and Operational issues (2) - HPC - LHC

- Presentations of the LHConCRAY project in the pre-GDB meetings on HPC at CERN, and at various conferences has caused large interest by the community

- It is recognised as one possible way for future provisioning of resources on alternative architectures

- Is followed up in GDB (full WLCG's grid deployment board)

→ Scheduled presentation by CSCS/CHIPP in GDB on 14.2. @CERN

- Note that worldwide various other initiatives exist along similar lines to exploit alternatives and prepare for the future …

  see eg. https://indico.cern.ch/category/9249

Strategic and Operational issues (3) - Others

- Challenge for providing computing resources over next years exists also for the other communities.

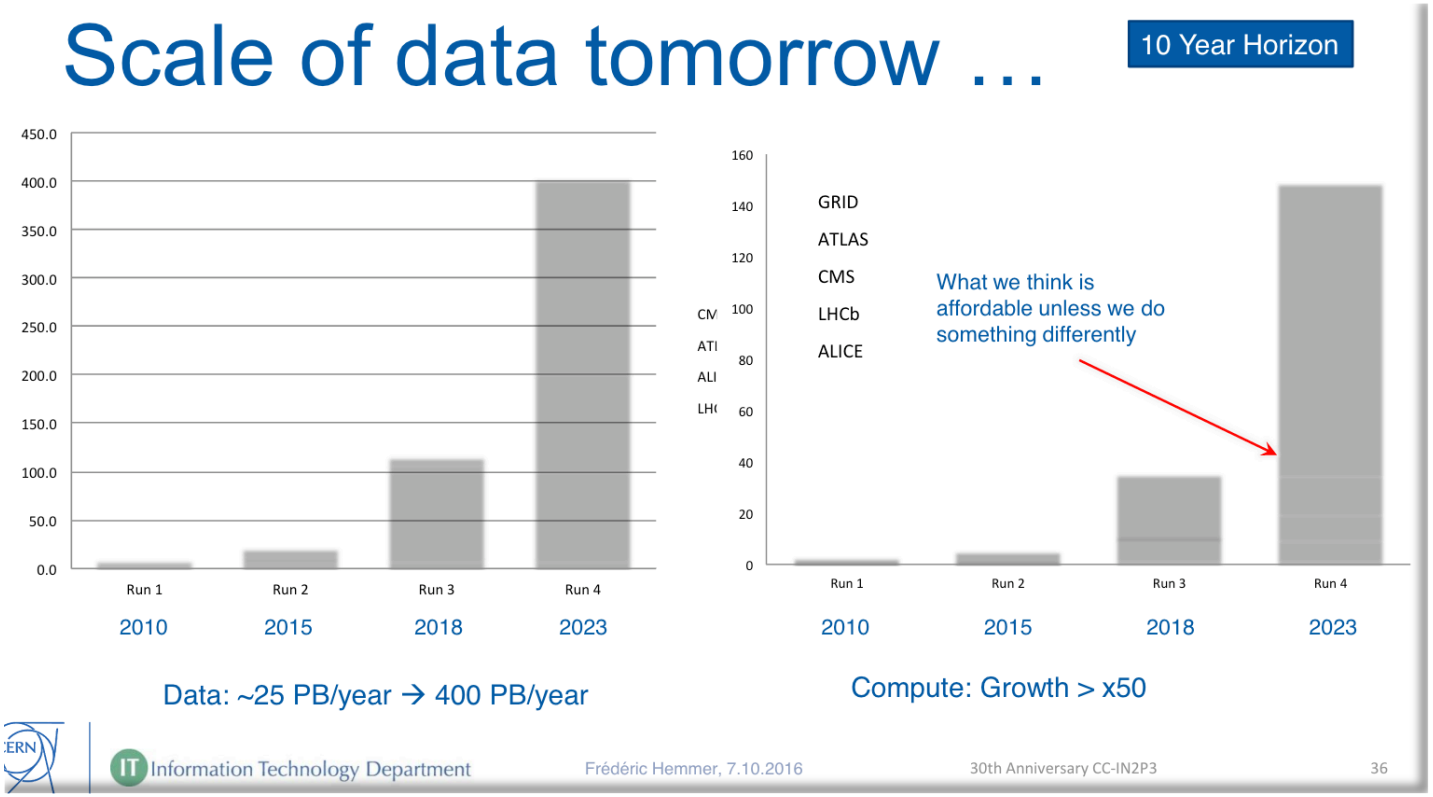
- Plan to discuss the topic of future computing needs and possible strategies among *all CHIPP pillars* (beyond LHC)

- Initiate in a separate computing session at the CHIPP strategy meeting in April 6th:
  1) Presentation of the various needs
  2) initiate first contacts and discussions, look at possible synergies…
  3) to be followed up up by a new more general "CHIPP computing board"

Backup …

Challenging and strategic issues (1)

- Challenge for LHC computing for the HL-LHC era in the 2025+ :
  - Present LHC compute models do not scale beyond ~2025,
    computing needs are expected to go up ~50 x in around 8-10 years;
    technology advance alone will accommodate a factor ~5
    → need roughly another order of magnitude



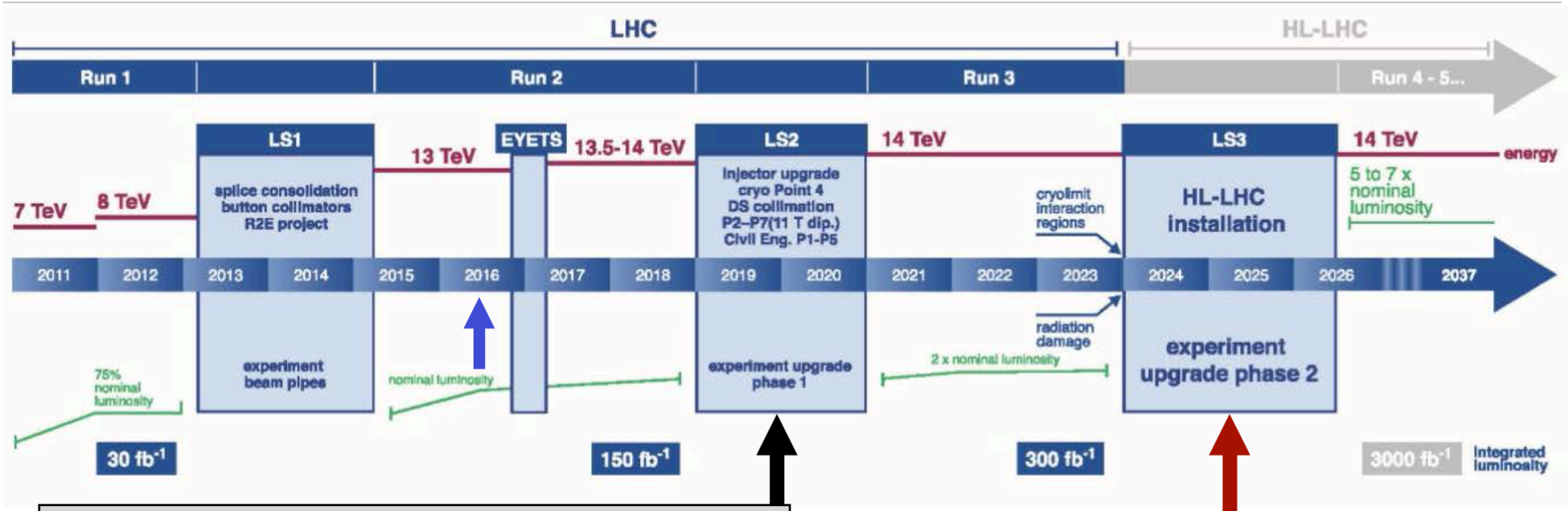
Resource Concept of LHConCRAY

- The growth growth of resources (e.g. yearly compute ~25% and storage ~15%) will be provided using shared resources at CSCS
- Move from "HW investment mode" to "paying for services"
  - Compute
    - Dedicated number of nodes, allocated to CHIPP
    - Resources are charged whether being used or not, including downtimes
  - Storage
    - Allocation of disk space via the SAN (as today)

- CHIPP funding will be used to pay provisioning and operational costs (HW investments, maintenance and personnel).

- Costs for electricity & cooling, and part of personnel are covered by ETH (re-negotiations initiated for >2018)

LHC schedule



LS2 (2019-2020):

- ❑ LHC Injectors Upgrade (LIU)
- ❑ Civil engineering for HL-LHC equipment P1,P5
- ❑ First 11 T dipoles P7; cryogenics in P4
- ❑ Phase-1 upgrade of LHC experiments

LS3 (2024-2026):

- ❑ **HL-LHC installation**
- ❑ Phase-2 upgrade of ATLAS and CMS

Schedule driven by radiation damage to inner triplet (eol: 2023)