Software Roadmap

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Roadmap

- Agreement on schedule and priorities of software developments
- Better monitoring and communication of software activities

- Presented to Technical Board and Software+Physics groups, discussed with management
- To be endorsed by Executive Board on Jan. 20th

- Preceded by text explaining the software status
- Categories: **F**ramework, **D**atabase, **G**enerators, Detector (**X**), Trigger (**Y**), **T**racking, **A**lignment&Calibration, **P**hysics

Roadmap: 2015-11 → release-00-06

- F: beam background overlay prototype
- D: DB prototype
- X: raw data packers/unpackers for most detectors
- X: VXD misalignment
- T: MC free reconstruction
- (T: New CDC tracking)
- A: calibration framework prototype
- YP: L1 emulation
- YP: trigger menu

- 2016-01: BEAST Phase I => Geometry and simulation provided by Igal Jaegle

- 2016-02: Combined CDC-TOP data taking run
  => Geometry implemented, reconstruction to be checked

Roadmap: 2016-05 → release-00-07

- F: beam background overlay scheme → Marko Staric
- D: tested and stable database implementation and interface → DB group
- FX: geometry construction from database → Martin Ritter, detector groups
- G: EvtGen Signal model validation → Todd Pedlar, physics group conveners
- G: DECAY.DEC and evt.pdl consistency validation → Umberto Tamponi
- G: PYTHIA8 implementation validation and continuum MC production via KKMC → Ami Rostomyan, Umberto Tamponi, continuum suppression experts
- X: raw data format fixed for all detectors → detector groups
- X: raw data unpackers (and packers for consistency checks) for all detectors → detector groups (in particular ECL)
- X: mature ECL simulation and reconstruction: reasonable resolution, no bias, background tolerance → ECL software group
- XT: 3D magnetic field as default → Maiko Takahashi, tracking group
- XP: improved ECL PID (more variables) → Guglielmo de Nardo
- T: VXD track finder refactoring (VXDTF v2) to ensure code maintainability → Jakob Lettenbichler, Eugenio Paoloni
- A: calibration framework → Tadeas Bilka

Roadmap: release-00-07

- 2016-05: B2TIP
- 2016-06: Completion of Belle II outer detector installation => Raw data unpackers needed to verify operation of detectors and readout
- 2016-10: Global cosmics run => Cosmics generator, simulation and reconstruction (of cosmics) without VXD
- 2016-10: B2TIP

- Computing groups plans 1.5 month MC production starting in May
- ⇥ *Shift of release-00-07-00 to April under discussion*
  - ⇥ 3D magnetic field a desired feature

Roadmap: 2016-11 → release-00-08

- F: scheme for running HLT with old software version → TK
- D: production database system (for distributed computing)
  → DB group, distributed computing group
- DX: online - offline database integration → DB group, DAQ group
- G: PYTHIA8 tuning first iteration with Belle data
  → Ami Rostomyan, Umberto Tamponi, Torben Ferber
- G: ee, gg, mumu and tautau generator validation → physics and generator group
- X: displaced geometry for all detectors → Doris Kim, detector groups
- X: all constants in database (no gearbox) → detector groups
- X: combined KLM/ECL KL ID → Timofey Uglov, Kirill Chilikin, ECL software group
- XT: T0 estimation by TOP and tracking detectors
  → Vladimir Savinov, tracking group
- XP: improved (low-momentum) muon ID → ?
- Y: L1 (fast) simulation → trigger group
- T: track fit hypotheses, including electron track fit
  → Markus Prim, tracking group
- T: converted photons → tracking group

Roadmap: 2017-05 → release-01-00

- GP: all generators validated → physics and generator group
- X: reconstruction with calibration constants for all detectors → detector groups
- X: beam background overlay for all detectors → detector groups
- X: calibration procedures and monitoring for all detectors → detector groups
- T: cross detector finders → tracking group
- A: IP profile determination → (candidate exists)
- XTP: rough estimates of systematic errors
  → detector groups, tracking group, physics groups

- 2017-05: BEAST Phase II
  => Alignment and calibration of outer detectors

- 2017-10: BEAST Phase II physics running
  => Generators for Upsilon(nS) verified, all software components ready for physics analysis

Roadmap: 2017-11 → release-01-01

- A: Integration of online calibration in express reconstruction

- 2018-04: VXD installed
  => VXD raw data unpackers
- 2018-07: Cosmics run
  => Simulation and reconstruction (of cosmics) with VXD

Roadmap: 2018-10 → release-02-00

- XTP: methods for systematic error determination of
  → detector groups, tracking group, physics groups
    - tracking efficiency, fake rate, and resolution

    - charged PID performance for dE/dx in VXD and CDC, TOP, ARICH, ECL, KLM, and combination

    - photon efficiency, fake rate, and energy/momentum resolution

    - K_L efficiency and fake rate

- 2018-10: Physics running
  => Everything ready for physics analysis

Roadmap: 2019 → release-02-0X

- *XT: tuning of algorithms to conditions*
  → detector groups, tracking group
- *code optimization → all*

Further Important Dates

- Feb 1-5: B2GM

- Feb 7-9: BPAC, only 45 minutes for software

- May 16-20: Software and computing workshop @ PNNL

- June 20-24: B2GM

- Probably after B2GM in June:
  Dedicated software/computing BPAC review