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Detector Construction Application for CMS Ph2 Detectors

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During the third long shutdown of the CERN Large Hadron Collider, the CMS Detector will undergo a major upgrade to prepare for Phase-2 of the CMS physics program, starting around 2026. Upgrade projects will replace or improve detector systems to provide the necessary physics performance under the challenging conditions of high luminosity at the HL-LHC. Among other upgrades, the new CMS Silicon-Tracker will substantially increase in the number of channels and will feature an improved spatial resolution. The new Endcap Calorimeter will allow measurement of the 3D topology of energy deposits in particle showers induced by incident electrons, photons and hadrons, as well as precise time-stamping of neutral particles down to low transverse momentum.

Ph2 upgrade project collaborations consist of dozens of institutions, many participating in actual detector design, development, assembly and quality control (QC) testing. In terms of participating institutions and worldwide responsibilities Ph2 HGAL and Outer Tracker projects are unprecedented. This raises a huge challenge for detector parts tracking, assembly and QC information bookkeeping.

Detector Construction Application (DCA) is based on the universal database model which is capable of hosting information about different detectors assembly (construction), parts tracking between institutions and QC information. DCA consists of and maintains a number of tools for data upload (DB Loader), retrieval (Restful API), editing and analysis GUI. In this report we present the design and architecture of DCA which helps physicists and institutions to collaborate worldwide while building the next CMS detector.

Consider for promotion

No

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