AN ARCHITECTURE AND A FRAMEWORK FOR THE DESIGN AND IMPLEMENTATION OF LARGE CONTROL SYSTEMS

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Large physics experiments involve several control activities. We think there are big advantages in integrating them by using a common approach. Anintegrated (not monolithic) Experiment Control System could be in charge of the monitoring and control of the operational state of the detector, of the data acquisition and of the associated experimental infrastructures.In order to design and implement such a large system we propose adistributed architecture composed of building blocks organised in a hierarchical structure with as many abstraction levels as necessary to describe the full experiment (like: device, sub-system, sub-detector, detector, etc.).At the lower level are the building blocks that handle real devices. The other levels are composed of blocks containing the description, the model, of a particular component and of its dynamic behaviour. Any other blocks can be inserted at any level for data processing, monitoring and user interfacing.For the implementation of this architecture we propose a framework providing a method for modelling the different components and tools to automatically generate the building blocks, which can run distributed (transparently) across multiple platforms. These building blocks can easily interface to other commercial or "home made" control systems like LabView or EPICS which could be used for the implementation of the lower levels of the hierarchy.This architecture and associated framework are successfully being used in Delphi for the complete Experiment Control System and in BaBar where they interface to EPICS for slow controls.