The Belle II Silicon Vertex Detector (SVD) is the outer sub-system of the Belle II vertex detector (VXD). It is made from 4 layers of double-sided silicon strip detectors (DSSDs), each having 5 by 20 strips, divided into 5 heavy- and 5 light-weight ladders, except for the top layer, which only has one. Each layer has 18 ladders (axial and slanted section) with readout electronics (APD25) attached. The detectors are operated in the range of 20°C to 120°C.

As shown in the diagram, the SVD IOCs use two kind of state machines (SM): for environmental monitoring systems a rather simple SM with only two stable states (Idle, Running) and two transitional states (Configuring, Aborting), while the more complex state machine with the three stable states Idle, Ready and Running. The transition between the states is again of an error condition, the state machine goes into error state, from which it has to be recovered by an abort request. The SM enters a transitional state, in which it performs a sequence of tasks, e.g. configuring the readout electronics or data quality monitoring (SVD:QM). As shown in the diagram, the SVD IOCs use two kind of state machines (SM). For environmental monitoring systems a rather simple SM with only two stable states (Idle, Running) and two transitional states (Configuring, Aborting), while the more complex state machine with the three stable states Idle, Ready and Running. The transition between the states is again of an error condition, the state machine goes into error state, from which it has to be recovered by an abort request.

The SVD run and slow control system is implemented in EPICS (https://epics.anl.gov), a framework to build large-scale control systems. In EPICS, information exchange between subsystems is realized via process variables, broadcasted on an Ethernet network. All hardware components are interfaced by dedicated input/output controllers (IOCs). In the SVD slow and run control system, all IOCs run on two separate EPICS servers (1) run control (SVD:CTRL) server and (2) EPICS services like the archiver appliance, alarm system, message logger, gateway, etc. The architecture includes: 1) The EPICS services server, which contains all EPICS services like the archiver appliance, alarm system, message logger, gateway, etc. 2) A further server is used to host EPICS services like the archiver appliance, a data logger and the alarm system. The operator PC is located in the control room and only hosts the graphical user interfaces. This server/client concept allows multiple connections to the system at the same time, e.g. local and remote operators can run their own instances of OPNs.

The Belle II Silicon Vertex Detector (SVD) has been installed recently and is now preparing for physics run at SuperKEKB factory, Tsukuba, Japan. For a reliable operation and data taking of the SVD a sophisticated and robust run and slow control system has been implemented, which utilizes the Experimental Physics and Industrial Control System (EPICS) framework. EPICS uses client/server and publish/subscribe techniques to communicate between the various sub-systems and computers. The information exchange between the different pieces of software and computers is done by process variables (PVs). These PVs are provided by input/output controllers (IOCs), which communicate and interface with the hardware components. The Belle II SVD slow and run control comprises of five groups of subsystems, which are SVD DAQ controller, Flash ADC controller, environmental monitors and interlocks, power supplies and EPICS infrastructure services.

In this presentation we describe tasks and implementation of the individual sub-systems, the interaction between them and the global Belle II run and slow control as well as first experiences from commissioning and initial operation of the SuperKEKB accelerator.

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