Local EPICS Data Logger

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The EPICS data logger used at Jefferson Lab is the MySQL Archiver (MYA), created and maintained by the Accelerator Division. The Detector Support Group (DSG) has developed a local data logger that offers more individualized controls for data logging EPICS process variables (PVs). This paper presents DSG's local EPICS data logger.

At Jefferson Lab, MYA provides EPICS PV data logging. To archive EPICS PVs, one fills out a form with the PVs' names, scan rates, and deadbands, and submits the form to the Accelerator Division. Listed PVs' data are scanned at the requisitioned scan rate. Data are archived if and only if the subsequent scan indicates that the PV value was not in the predetermined, proscribed band – the deadband.

Motivations for the creation of a local data logger is predicated on DSG's R&D and support endeavors. DSG investigates several different types of instrumentation and it is crucial for a deeper understanding of such instrumentation that DSG has control over what PVs are being monitored, their scan rates, and their deadbands. For example, for a temperature sensor whose PV value changes by a small level per scan, it is important to note the small changes to determine whether the sensor is working correctly; such an investigation requires the ability to change scan rates and deadbands on the fly.

For the local data logger, a soft IOC program was created with a monitoring program to process EPICS PV data, Fig. 1. The soft IOC uses a list of PVs as an argument; controlling which PVs are monitored is as simple as adding or removing a PV from the list and rebooting the IOC. The data logger can monitor any PV that is available over the connected network. The PVs' monitored data are timestamped and stored directly in a MySQL database on the host machine.

Each database resides on a host machine; host machines are on each of the hall subnets. Data can be accessed directly from the host machine or via a remote connection to the particular database. Query results can be either printed to the terminal or saved to a text file.

In its current avatar, the local data logger is a distributed system. An instance of the data logger has been loaded on Linux machines on each of the hall subnets. As proof of concept, RICH temperature and humidity data, as well as SVT hardware interlock data, are being logged.

Future plans are to create a Windows version of the data logger and to create multiple IOCs to log data. These newer instances of the data logger would have their data sent to different database tables within the local MySQL database.

In conclusion, a local EPICS data logger has been developed for DSG's R&D and support efforts. The local data logger allows control of PVs that are being monitored, their scan rates, and their deadbands.
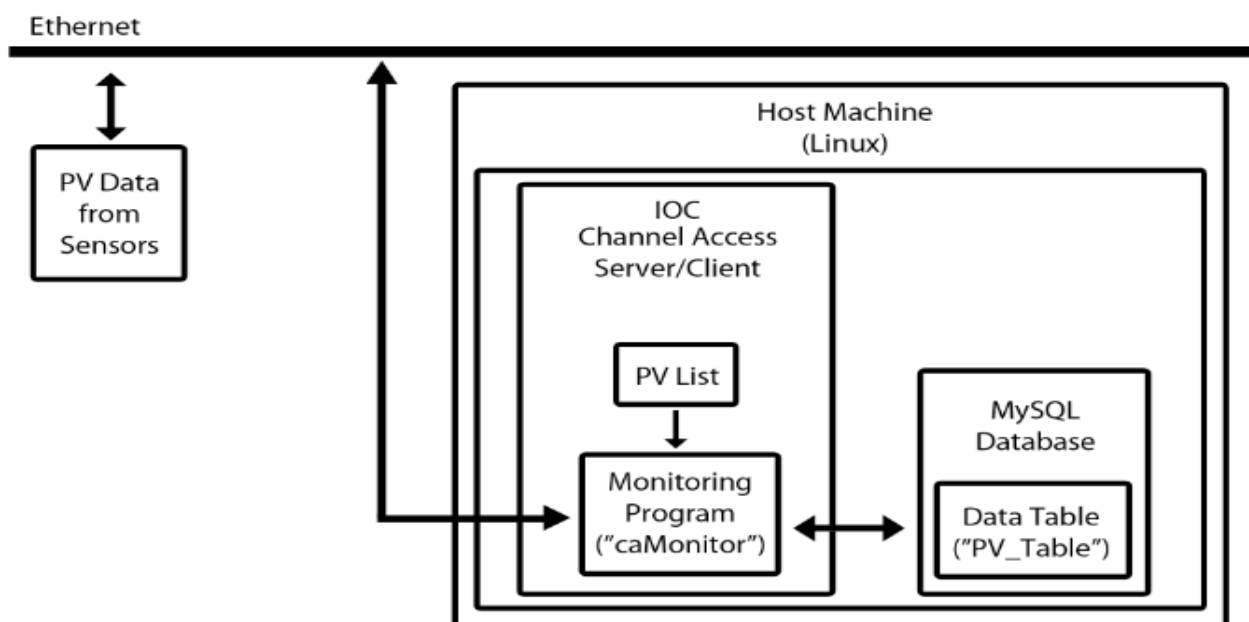

FIG. 1. Structure of the DSG local data logger.