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Service-layer IOCs and their implementation in Python

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The EPICS system provides a robust process variable distribution system upon which software clients and servers are able to interact. The servers interface to physical inputs and outputs of the machine, while the clients interface to users and operators (humans). During the beamline instrumentation upgrade at the SNS, we faced challenges in reproducing similar levels of instrument control automation present in the previous system while holding to a common set of servers and avoiding extensions in the user interface clients. To overcome these challenges, we introduce the service-layer IOC that acts as both client and server and operates autonomously. Our implementations to date provide such functions as automated 3-axis alignment, nested scan generation and experiment completion estimation, temperature-compensated experiment control and auto-reduction visualization. This talk will describe our implementation using the Python language and its EPICS components.

Author: VACALIUC, Bogdan (Spallation Neutron Source)

Presenter: VACALIUC, Bogdan (Spallation Neutron Source)

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