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Time source callback and attribute plugin for areaDetector

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Timestamp tagging to data and aligning data to individual beam pulse are important part of data acquisition system for pulse machine. We have utilized Beam Synchronous Acquisition (BSA) for LCLS, FACET and other accelerator facilities in SLAC. BSA provides a common interface for the timestamp tagging and aligning data to beam pulse. Unfortunately, we could not get benefit from the BSA for camera image data due to the image is an array data and it should be stored as image file format. BSA only supports scalar type epics PV. Our timing system in SLAC has 360Hz granularity. Most of image processing and acquiring cycles are non-deterministic in time domain and spend longer time than the 360Hz timestamp update period. These bring difficulty of timestamp tagging for image data.

We have discussed with Mark Rivers, author for the areaDetector module, about time source callback to implement the driver level timestamp tagging with user defined function. The driver level timestamp tagging gives more deterministic and real-time behavior. The timestamp is stored as a part of meta-data of the image and can be utilized by downstream plugins such as file plugin which saves the timestamp into image file format. We also discussed to extend attribute plugin to post out the timestamp related data to epics PVs. He reflected our requirements for the time source callback in the latest areaDetector module and the attribute plugin also. We are going to describe the details about the time source callback and attribute plugin.

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