

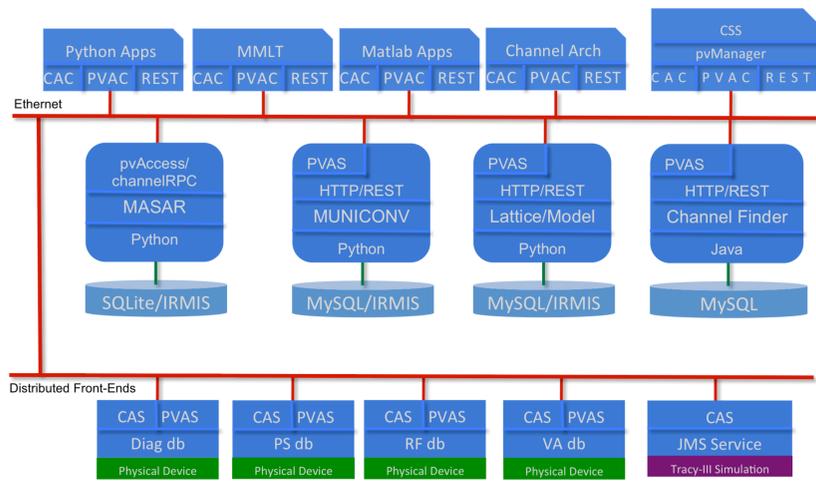
Abstract

A service-oriented architecture has been designed. It will be used for commissioning and daily operation of the NSLS II project. Middle layer services are being developed, and some have been deployed into NSLS II control network to support our beam commissioning. The services are primarily based on 2 technologies: web-service/RESTful and EPICS V4. The services provide functions to take machine status snapshot, convert magnet setting between different unit systems, and provide lattice information and simulation results. This paper presents the latest status of services, and our future development plan.

System Architecture

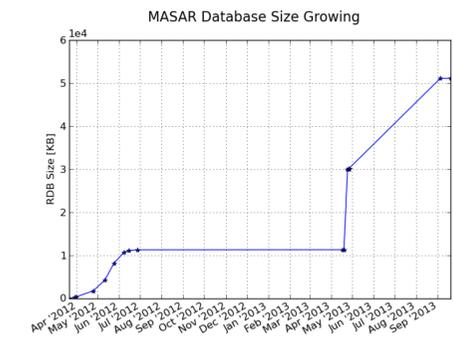
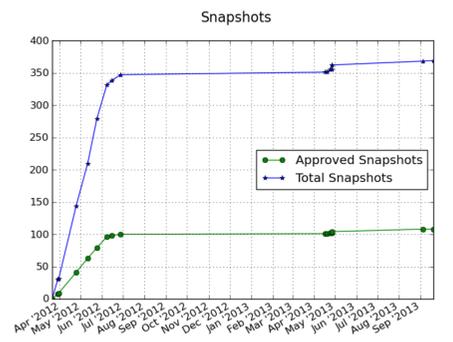
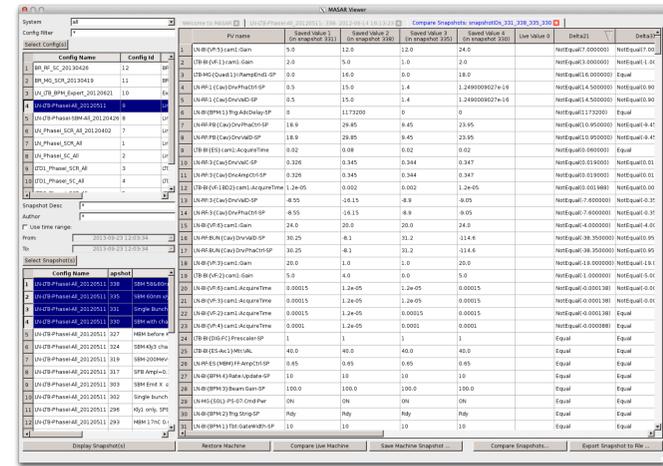
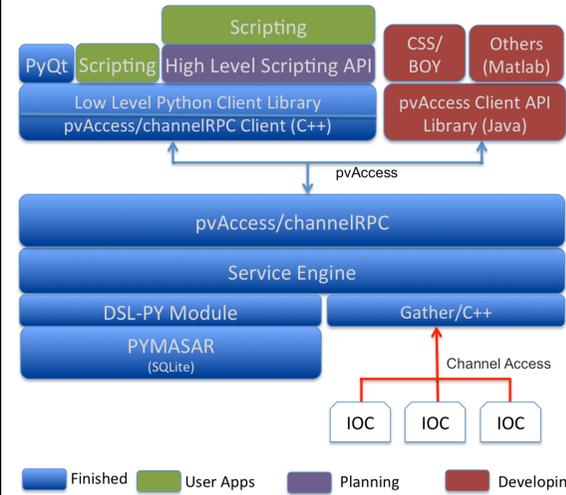
3-tier's architecture

- Distributed front-end layer. This layer talks directly with physical device.
- Middle layer server layer. The middle layer service collects data from front-ends, and relational database such as IRMIS, organizes the data, publish to its upper layer.
- Application layer. Client application developed locates in this layer.



MASAR Service

- Take a machine snapshot with pre-configuration, archives a snapshot, and retrieves data back for post analysis, and/or to restore machine to a particular state.
- An EPICS V4 service



Client API

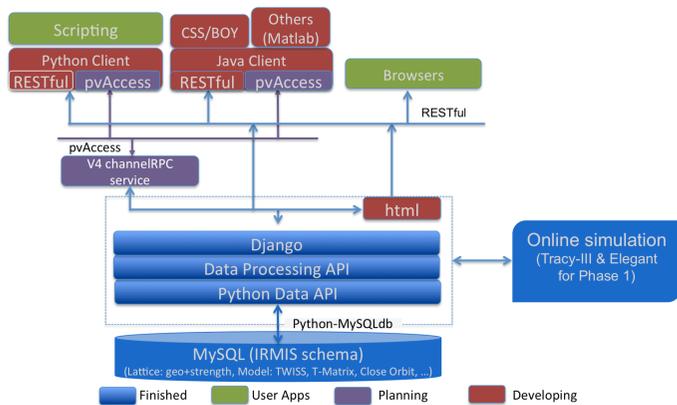
API	Description
retrieveSystemList	Retrieve a list of system
retrieveServiceConfigs	Retrieve a list of configuration
retrieveServiceEvents	Retrieve snapshot list w/o data
retrieveSnapshot	Retrieve one snapshot with data
saveSnapshot	Save/take a snapshot
updateSnapshotEvent	Update/Approve snapshot
getLiveMachine	Get machine live data

Experience at NSLS II

Lattice/Model Service

A RESTful Django web service, consists of 2 parts:

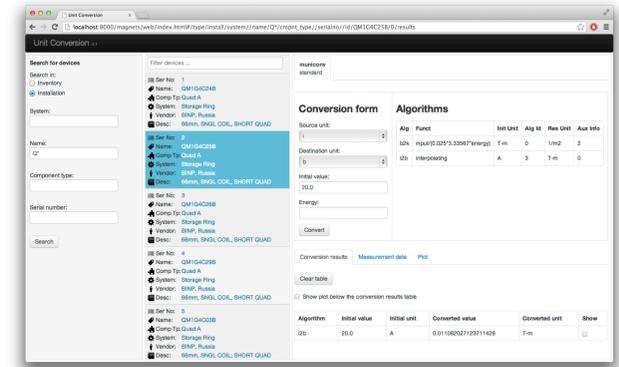
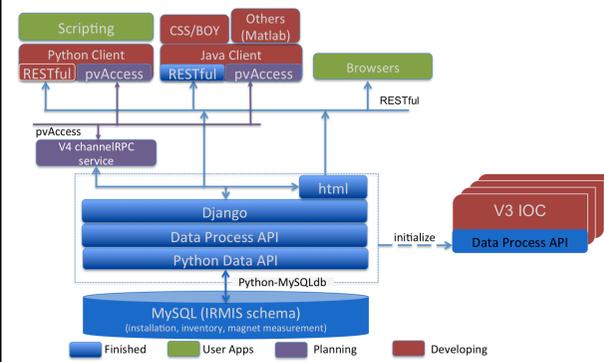
- Lattice: element geometric information (layout with misalignment), and magnetic strength of each element
- Model: beam parameters (twiss parameters, closed orbit, and transfer matrix) for each element, and global parameters like tune, beam energy, chromaticity (up to 2nd order)



MUNICONV Service

Multiple purpose unit conversion

- A RESTful Django web service;
- First implementation supports magnet conversion (i, b, k).



Conclusions

Middle layer services are being developed at NSLS II. Implementation details and status of the MASAR, MUNICONV, Lattice/Model, have been discussed. Experience using those services has been summarized. Future development plan has been discussed.

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