

## Implementation of the Save and Restoration application for KOMAC operation

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### 1. Introduction

KOMAC has been operating a 100 MeV proton linear Accelerator. There are about 10,000 PVs for operating the 100 MeV proton linac. It is important to archive the operating parameters for operating beam lines and machine study. The parameters are reported manually and with screenshot. There not fixed reporting type so it is difficult to compare archived data. And we input data manually to make equivalent experiment environment with seeing written data. To improve and compensate the reporting system, a Save and Restoration application, which is based on JAVA has been implemented and connected with KOMAC Control system based on EPICS with JCA library. The operating data are saved in Save and Restoration Server in file type, and are restored to the required values using the saved files. This paper presents Implementation of the Save and Restoration application and its function.

### 2. Save and Restoration application

The purpose of Save and Restoration application is to manage operating parameters and reported data. The application saves name and value of operating parameters in file type and restores value archived in file. The application is connected with KOMAC Control system to monitor operating parameters.

#### 2.1 KOMAC Control system

KOMAC has implemented Control system based on Experimental Physics and Industrial Control System [1]. The Structure of KOMAC Control System is presented in Fig. 1.

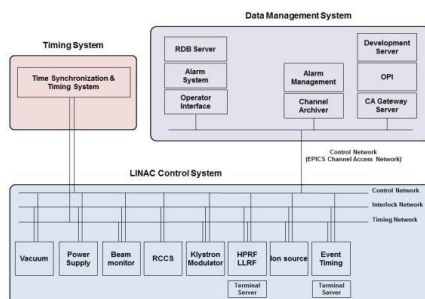


Fig. 1. The Structure of KOMAC Control System

The control system consists of subsystems which are implemented by EPICS Input Output Controllers (IOCs). There are about 70 IOCs and 10,000 Process variables to control the 100 MeV proton linac. CSS tool that

communicate with EPICS IOC using Channel Access (CA) protocol is adopted for KOMAC user interface. To provide various function and convenience to clients KOMAC has been developing high level application [2]. Save and Restoration application that save current data and restore value of PVs form a saved file has been developed and tested.

#### 2.2 Save and Restoration application

Save and Restoration application consists of a database and Save and Restoration server. DB server and Save and Restoration server are connected with the KOMAC control system network. The DB server that is made by a MariaDB [3], save a group information, PV list and save directory list that are input by a config page of Save and Restoration application. The application has been implemented using a jdk1.8 and an eclipse-mar tool [4, 5]. To communicate with KOMAC Control System based on EPICS, JCA library is used. The layout of Save and Restoration application is presented in Fig.2.

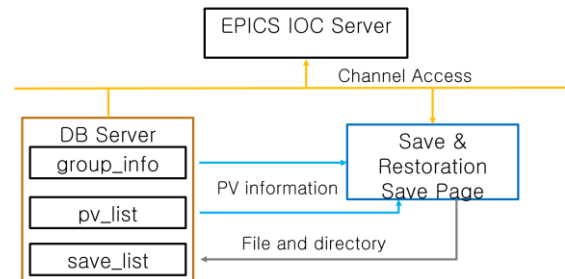


Fig. 2. The Structure of KOMAC Control System

Information of PVs and Group is input on the config page of the application and are saved in the database server using a MYSQL connector library.

In the save page, the application take group information and PV list in group\_info table form the database server. Fig. 2 shows the save page of the Save and Restoration application.

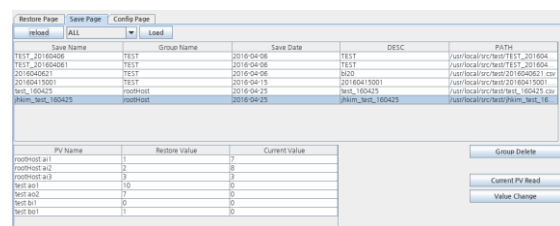


Fig. 3. The save page of the application

The application takes current value of PVs in pv\_list tables from the EPICS IOCs and show the value in save page by clicking the current PV Read button. The value change button make the value input in the restore value table and saved in the designated directory. Save files are archived in save and restore server not in clients PC that the application is installed.

Clients restore the value that clients want using restore function in restore page. The restore page of the Save and Restore application is presented in Fig.4.

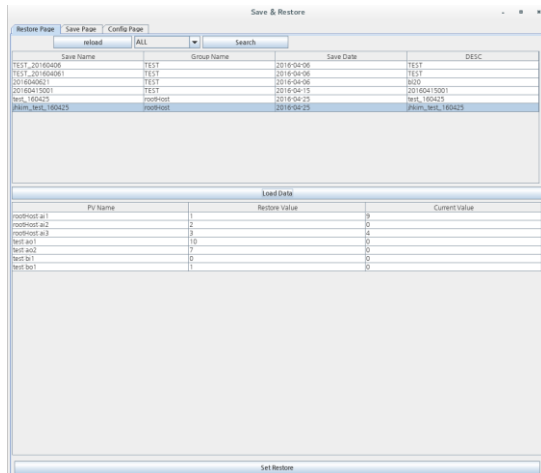


Fig. 4. The restoration page of Save and Restoration application

The group list is shown in restore page using reload button. The saved value of the PVs in group is shown as selecting a group which clients require and current values are appeared beside the restore value table to compare with saved data. The set restore button input the values in restore value table to each PV.

### 3. Conclusions

The Save and Restore application save and restore the value of the PVs that clients require. The application is installed in client PC but data are archived in save and restore server in file format. Clients and operator manage experiment data and environment efficiently.

### REFERENCES

- [1] Experimental Physics and Industrial Control System (EPICS), URL: <http://www.aps.anl.gov/epics>
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- [4] JAVA, URL : <http://www.oracle.com/>
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