

Implementation of the electronic logbook application for KOMAC

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1. Introduction

The Korea Multi-purpose Accelerator Complex (KOMAC) has established various subsystems to operate a 100 MeV linear accelerator. A distributed control system based on the EPICS framework was also established to remotely control and monitor the accelerator and its subsystems. However, due to the hardware aging and the termination of service support for the operating system and programs, it is necessary to replace the outdated systems and apply the latest control technologies, hardware, and software. As part of this effort, KOMAC is transitioning from the existing CSS user interface to Phoebus CSS and web user interfaces, and is seeking to establish a data logging system applicable to Phoebus CSS. This paper will describe the implementation for the logbook application based on Phoebus for KOMAC.

2. KOMAC Control System

The distributed control system was planned and implemented, based on the EPICS framework. To enhance the stability of the proton accelerator control system. Figure 1 shows the block diagram of KOMAC control system.

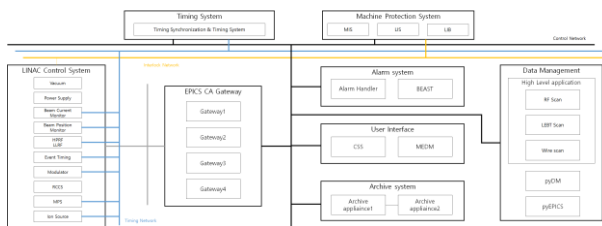


Fig. 1. the block diagram of KOMAC control system.

To enable communication through the EPICS and Channel Access protocol, the user interface for the system was developed using the Control System Studio (CSS), which can work in conjunction with various compatible alarm and data storage systems such as the BEAST Alarm, CSS archiver, and Archiver appliance.

However, hardware obsolescence, service support termination of the operating system and programs, and other related issues have made it necessary to upgrade the accelerator control system to the latest control technology. Therefore, the user interface is being tested with the Phoebus software, which offers advanced features and improved performance compared to CSS.

2. Phoebus

Phoebus is a successor model that upgraded the functionality of CSS and is a powerful software package for building control systems, including user interfaces, data acquisition, and archiving systems. Figure 2 shows the architecture of the Phoebus CSS.

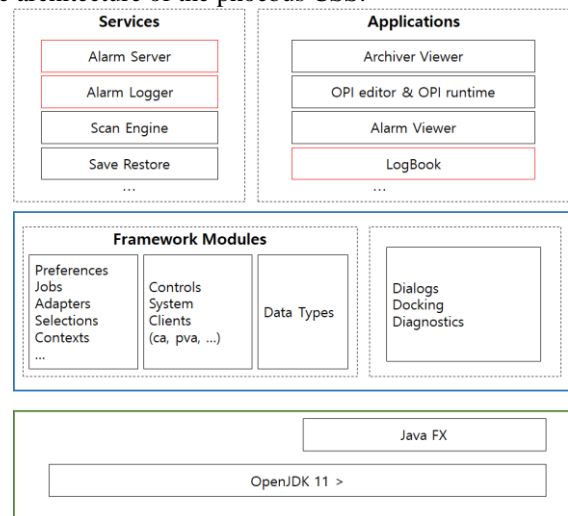


Fig. 2. the architecture of the Phoebus CSS

The Phoebus CSS has adopted JavaFX as a replacement for Eclipse RCP and SWT in CSS. JavaFX is a cutting-edge technology that offers superior capabilities compared to the previous technologies, including enhanced support for contemporary user interface designs, multimedia, and 3D graphics. It also provides better performance, a more user-friendly API, and greater compatibility with newer Java versions. By incorporating JavaFX, Phoebus CSS provides users with an advanced and flexible user interface with improved functionality and performance.

2. Phoebus electronic logbook application

Phoebus Olog is a web-based logging system developed as part of the Phoebus CSS tool kit. It is designed to provide an efficient way of recording and sharing information related to accelerator operations. The system allows users to create and manage logs, assign tags to them, and search for logs based on various criteria such as date, author, and tags. Figure 3 shows the block diagram of the Phoebus olog service.

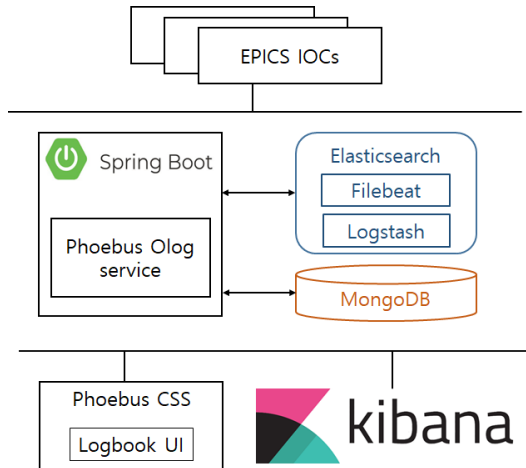


Fig. 3. the block diagram of the phoebus olog service

Elasticsearch is the main data repository for Phoebus olog and provide indexing and search capabilities for the data. Mongo DB is backend database for phoebus olog and archives user information, login credentials, update history etc. Spring Boot provides a REST API to communicate with Phoebus GUI, elasticsearch, and Mongo DB. Data saved in phoebus olog service is visualized through Phoebus GUI and Kibana.

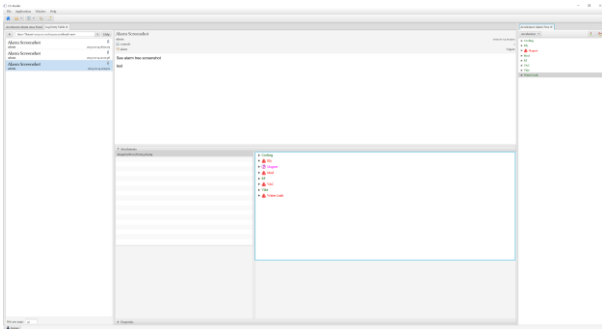


Fig. 4. Logbook table for the logbook in Phoebus CSS

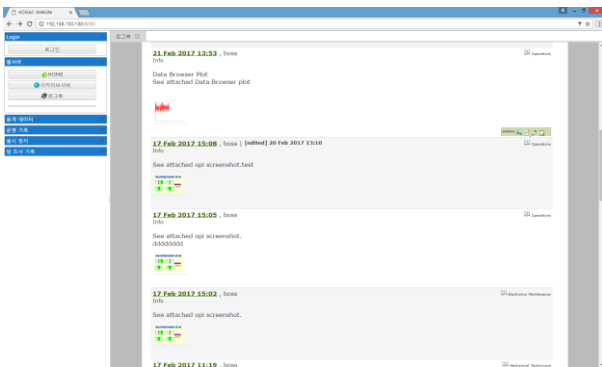


Fig. 5. Web interface of the phoebus olog

3. Conclusions

KOMAC is modernizing the control system by transitioning from a CSS based user interface to phoebus CSS and wet-based user interface. an electronic

logbook application based on Phoebus Olog has been implemented to efficiently record and share information related to accelerator operations. Phoebus Olog is currently undergoing tests and is expected to be applied and operated in the future in the accelerator control system.

REFERENCES

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