Design of the web Application for improving the management of the data at KOMAC

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The control system and web service for KOMAC

● **Abstract :**

A control system based on Experimental Physics and Industrial Control System (EPICS) has been implemented for the 100 MeV linear proton accelerator at the Korea Multi-purpose Accelerator Complex (KOMAC). Our control system is operated with over 20,000 Process Variables (PVs) and utilizes several services such as Phoebus alarm, Archiver Appliance and, Channel Access gateway, among others. The data, which includes the PVs value and the logs of service, need to be managed to identify the status of system. A web application has been developed using React and Elasticsearch, Logstash, Kibana, and Filebeat (ELK+Filebeat). we introduces the web services for archiving service logs. In addition, the data analysis web application is also introduced that we are developing using React with D3 library.
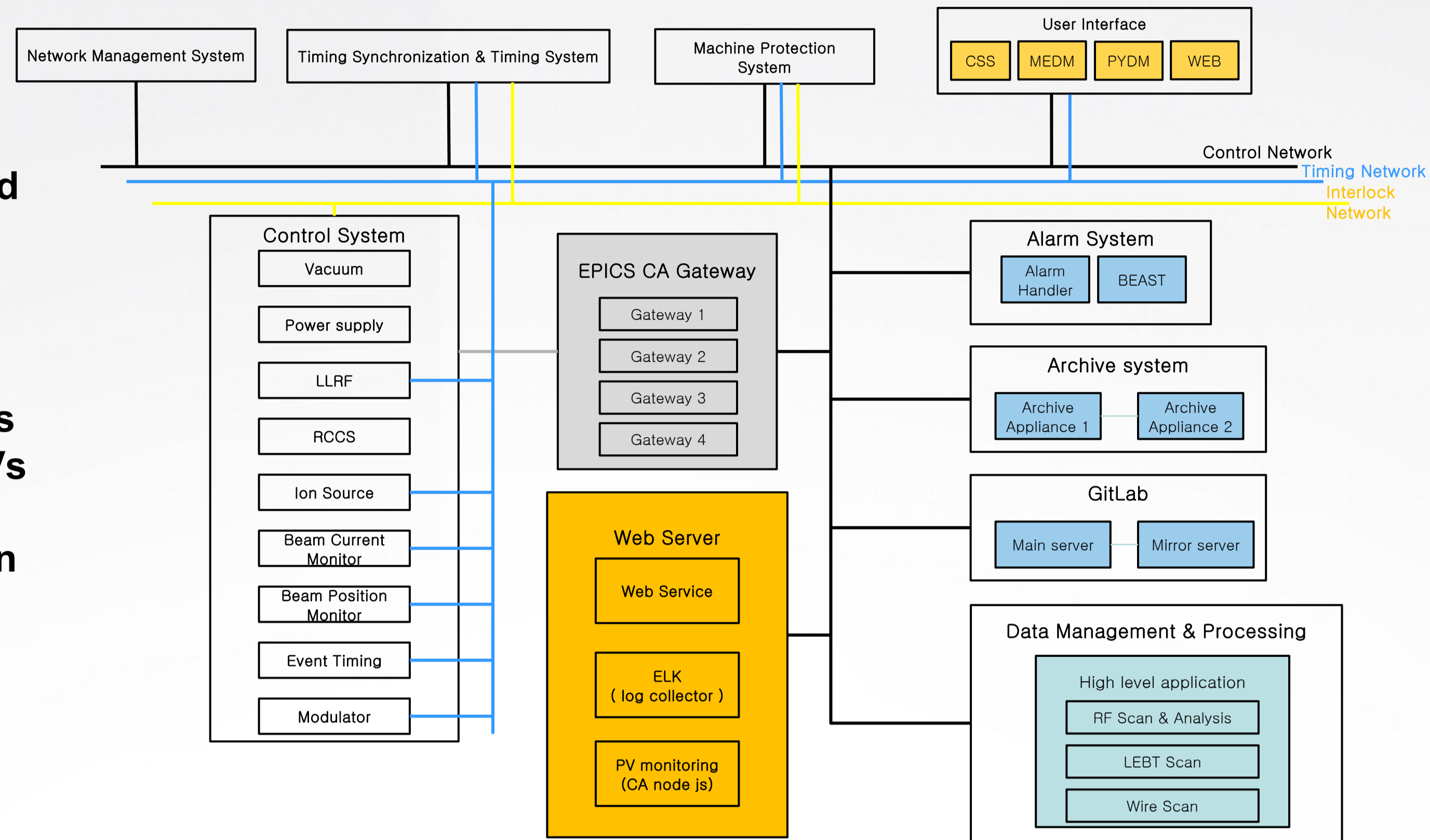
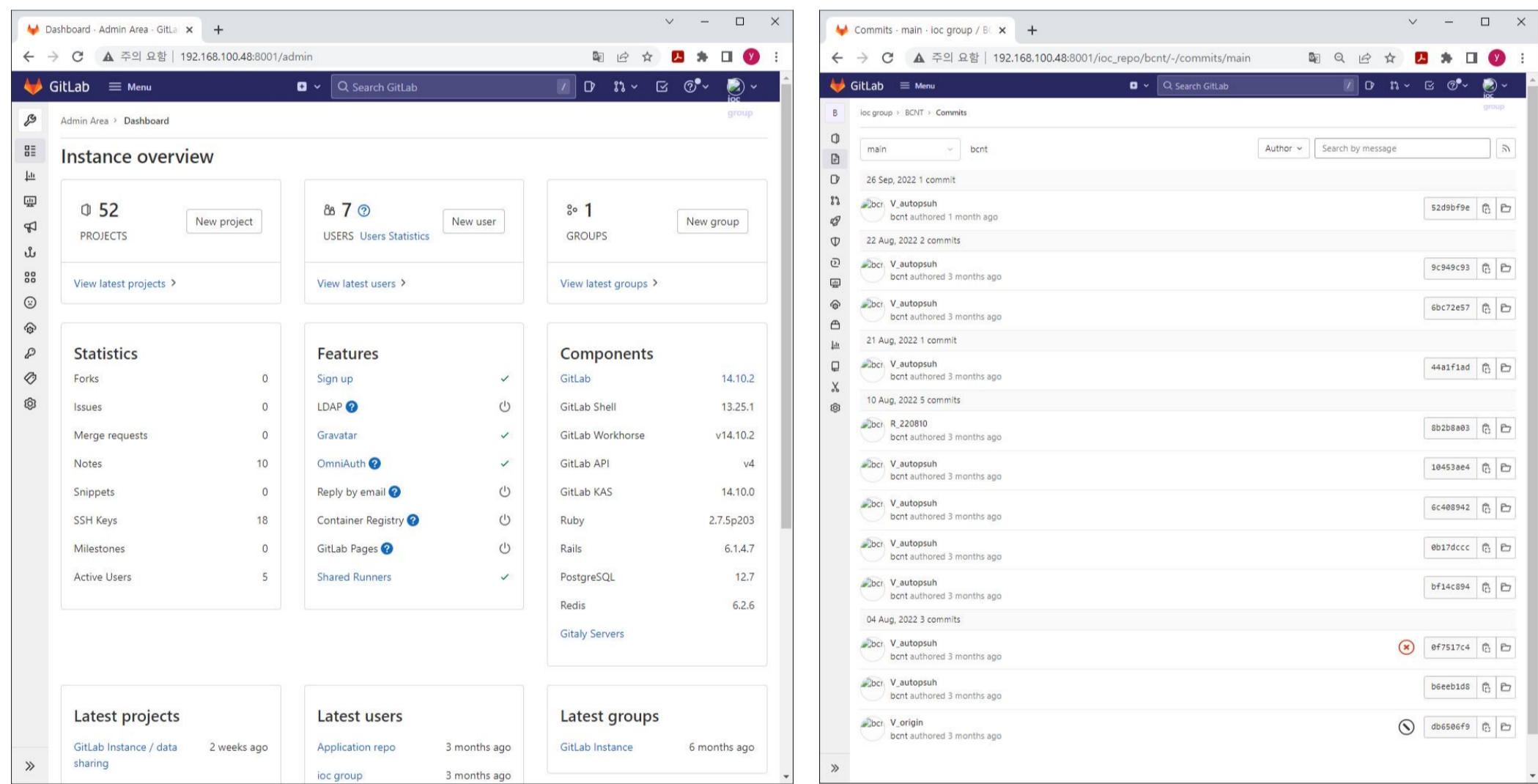The architecture of KOMAC Control System
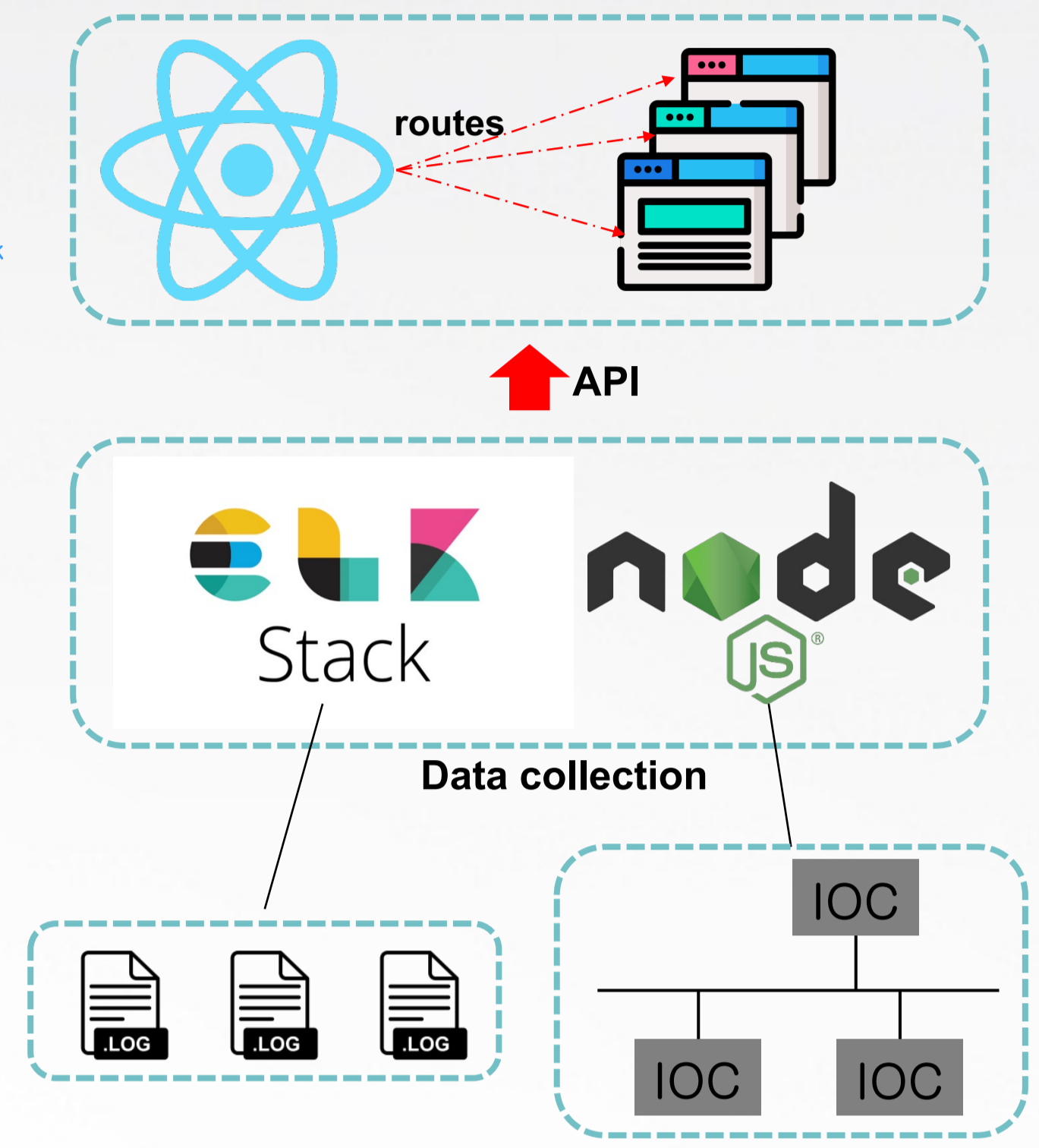
The web architecture for KOMAC
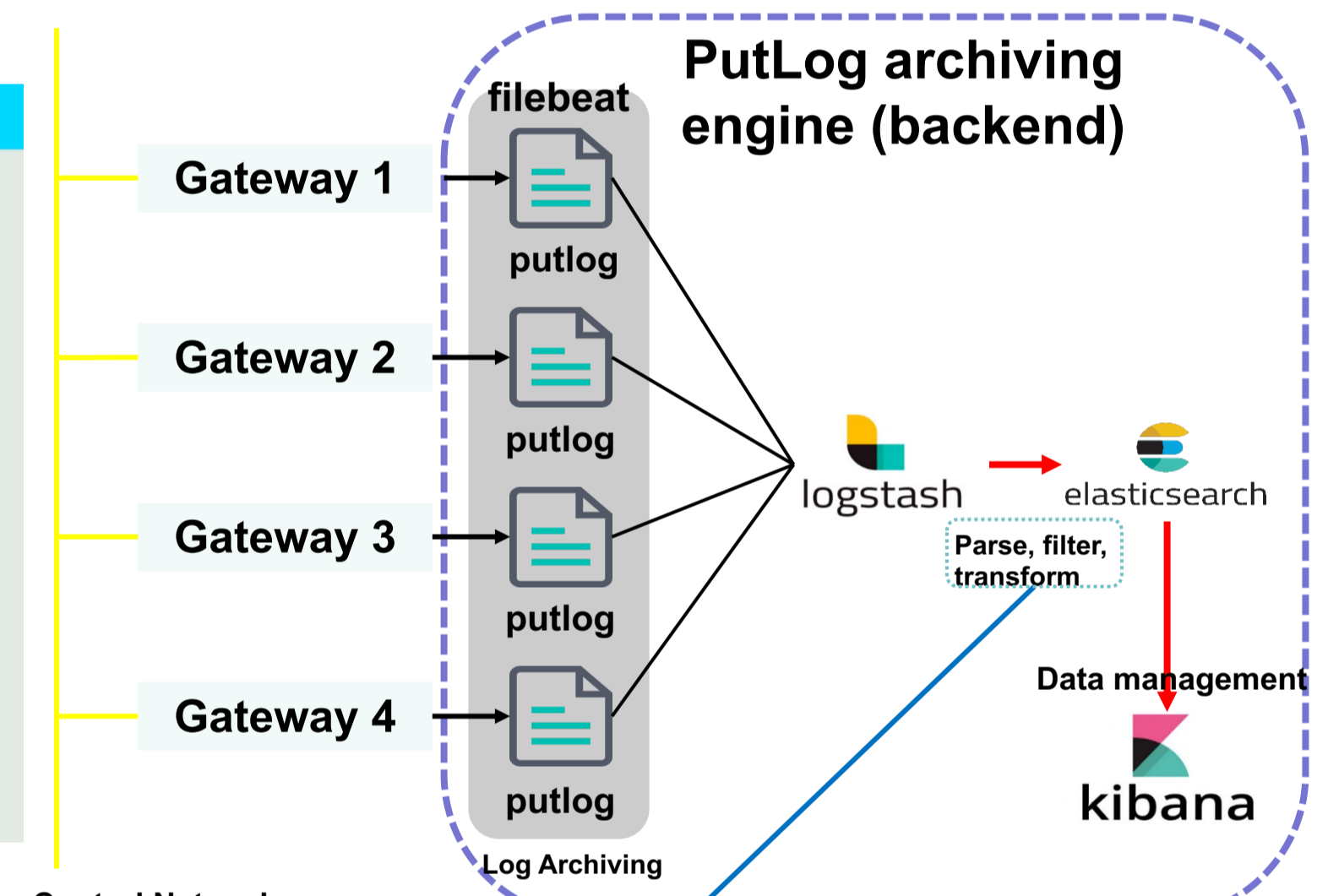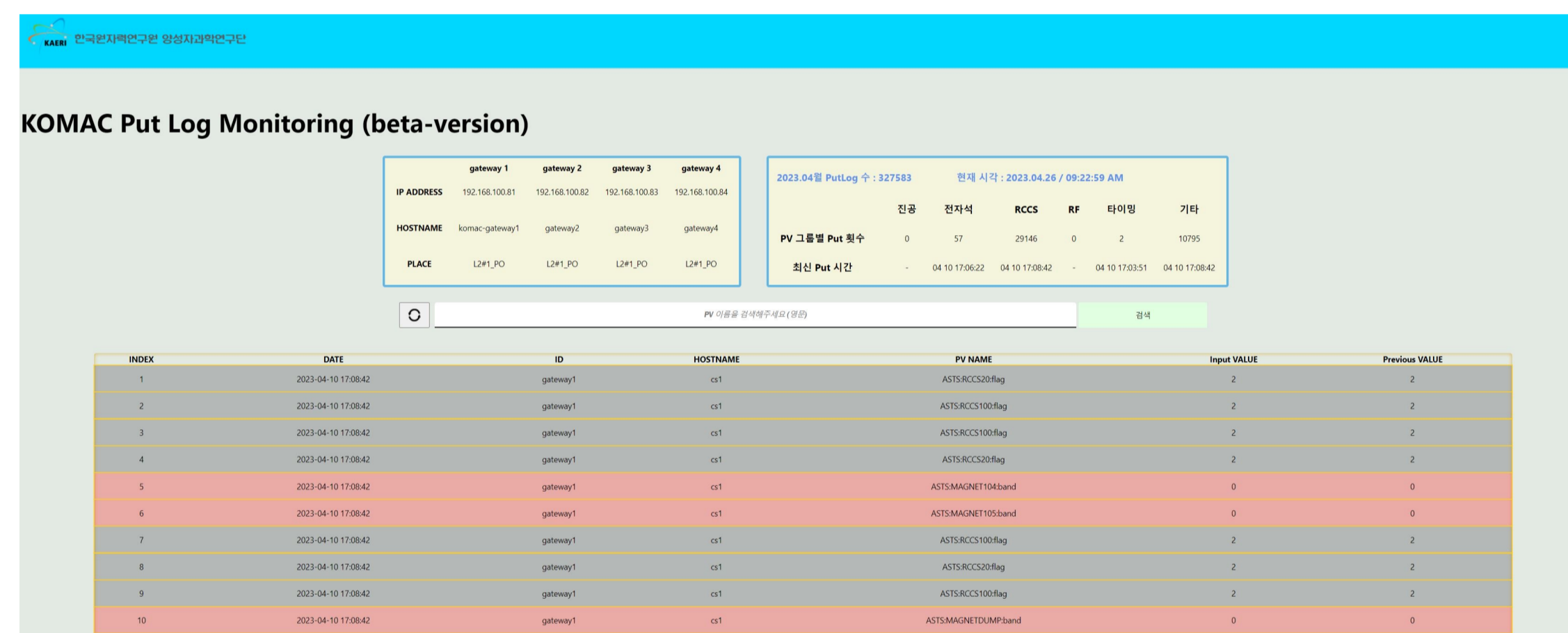
The KOMAC web services

● **The GitLab (auto backup)**
- The Input and Output Controllers (IOCs) are managed and versionized automatically using git.
- When the IOC is started, the local repository is automatically committed and push the information to remote repository.


● **The management service for archiver appliance**
- We have developed a management page using the API provided by the EPICS archiver appliance.
- Users can quickly notice the monitoring status and storage rate.
- The status is differentiated by colors.
- When a user clicks on the PV name, a modal window pops up to display detailed information.

● **The channel access gateway Putlogger**
- We are operating the four CA gateway to providing stable traffic. Each gateway has a log file that's written about input information.
- The system log files can be gathered by ElasticSearch, Logstash, and Kibana (ELK) and the user can search the information on the ElasticSearch through the web service page.
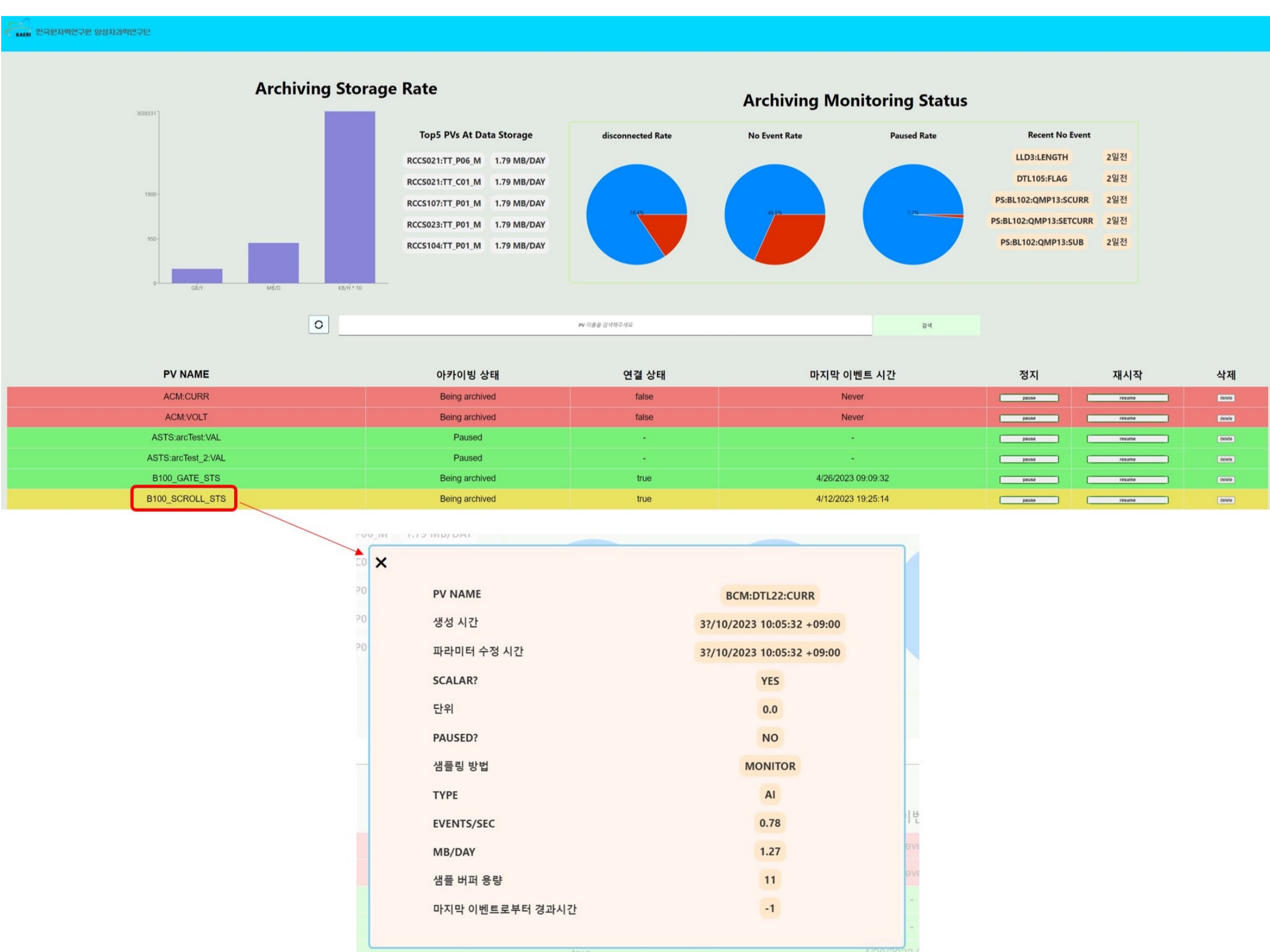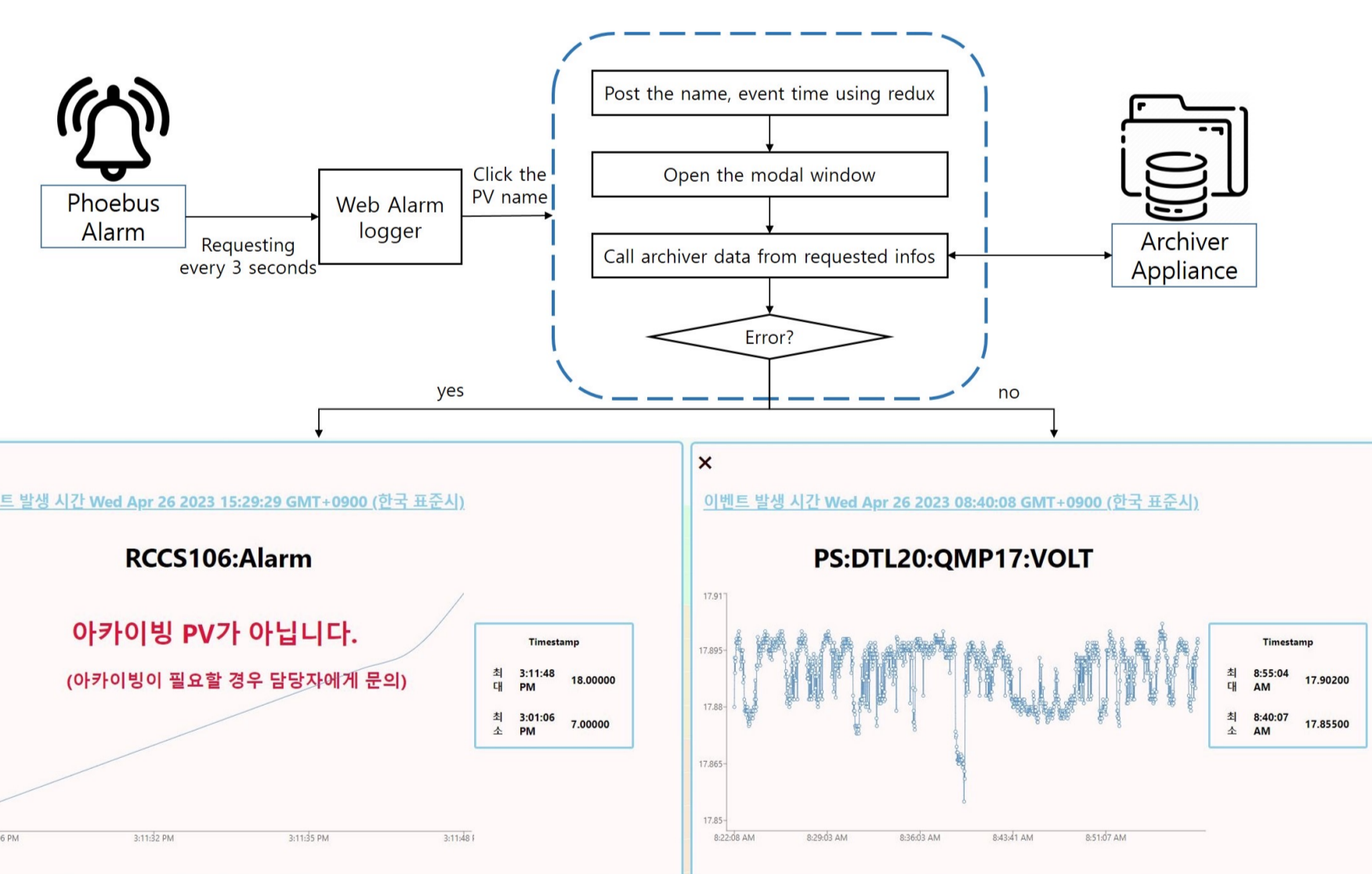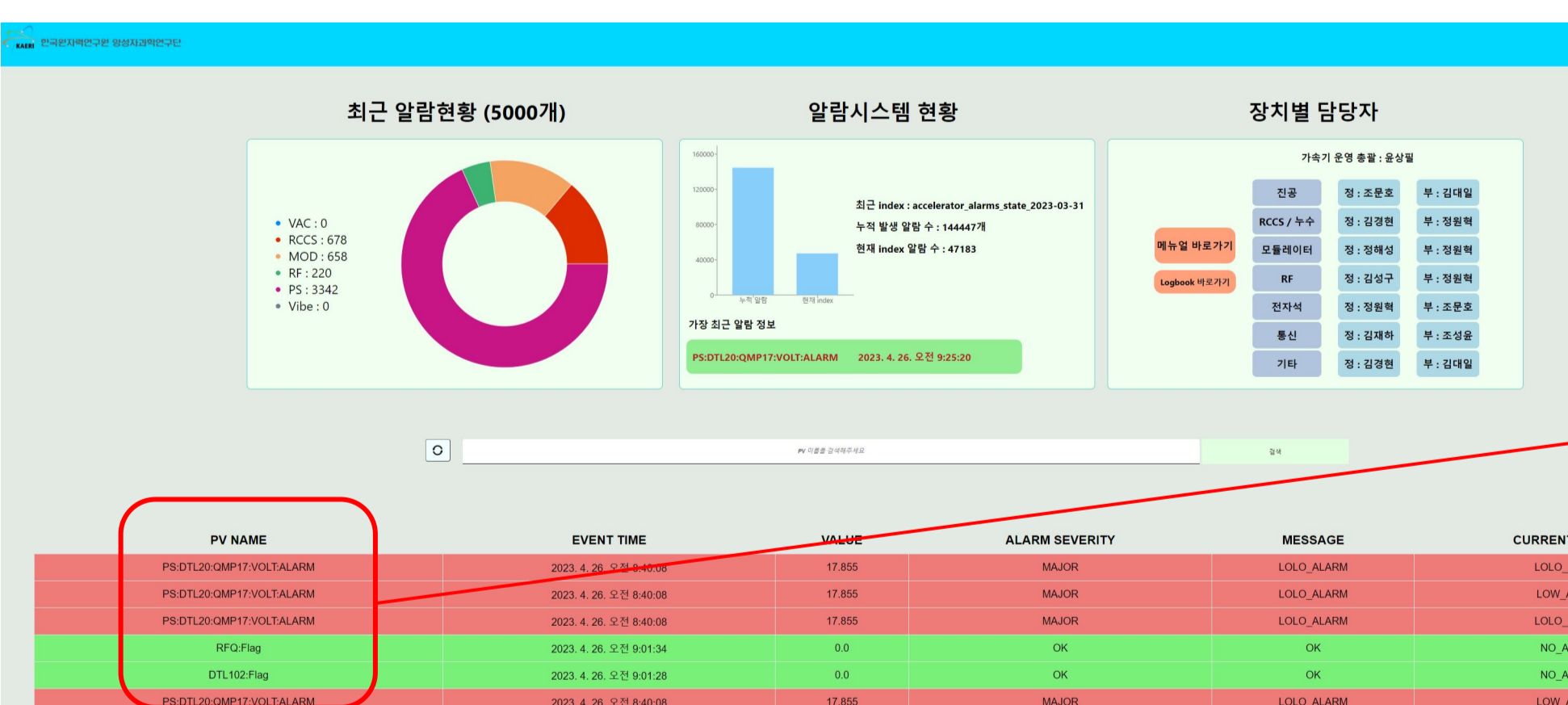

● **The alarm logger on the web**
- The KOMAC alarm system is implemented using the Phoebus alarm system.
- The Phoebus alarm system logs the alarm information using ELK.
- We developed the monitoring page for checking immediately alarm data.
- When the alarm occurs, the operator just click the name and the modal window will be opened with the archiving data from 1 hours.

● **The data analysis service using D3 library (on developing)**
- We are developing the data analysis tool on web using the D3 library.
- It is connected with the EPICS archiver appliance.
- Our goal is to provide this tool with powerful data processing capabilities such as cs-studio, while also offering an intuitive and convenient analysis environment, akin to stock chart analysis tools.
- If the zoom event is detected, the sequence of adjusting sampling starts.
- Users can analyze the system parameters with simple annotation