Fig. 3 The real-time running information.

Based on experiment results, filtering effect is satisfactory and filtering algorithm can be applied to different kinds of noise. Under the condition of higher signal-to-noise ratio, statistical property of sampling data remains largely unchanged. So, the new software system can meet need for design and usage.

6 - 41 Design and Implementation of Power Supply Control Program

Ma Tao, Wang Yongping, Gou Shizhe, Ma Yuan, Yue Min and Yuan Chao

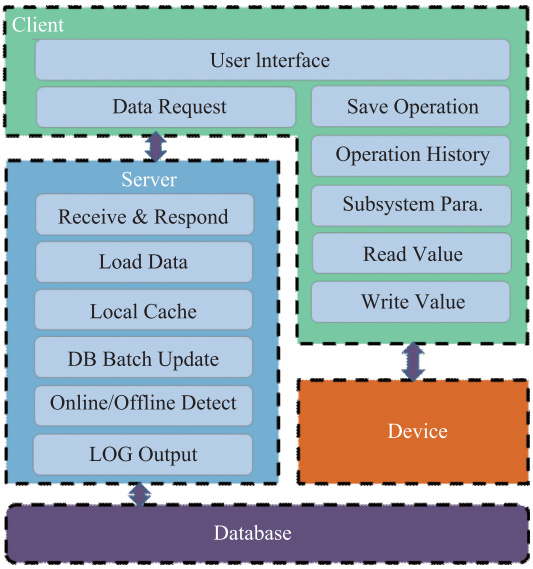

Fig. 1 (color online) Overall architecture of power supply control program.

Power Supply Control Program provides an integrated interface for operators in central control room. The program implemented major functions like reading power supply device's value and status parameters, writing and adjusting device value, saving both the read/write data and operation history to corresponding relational database, detecting and display device online/offline state, generating log files on server side to track the running condition of the Control Program[1].

The overall architecture of the Power Supply Control Program is shown in Fig. 1. The system is developed based on B/S structure, which saves the trouble of configuring all kinds of running environment on client PC, meanwhile the user interface can be opened in any PC in the control room with control network access. This design also separates front-end UI from back-end server, thus the client end program mainly focus on display and device control, leave the data processing and storage work to server end program.

Server side program continuously listens for client requests on a specific port. According to a pre-defined request and response format, the server determines to load requested data from oracle database and send it back to client or save the newly received value to database. To reduce frequent database connections, server maintains a local cache to update the newly received value, periodically update the cached data to database in a batch operation[2]. The server program also provide device online/offline detection function, so every power supply device's connection to control network can be noticed on the user interface, this function will also avoid time consuming for reconnection and wait timeout when an offline device is operate on, thus improves user experience on the user interface. A log file will be generated daily on the server side to track the running condition of the server program as an evidence to recovery from any unpredictable crashes.

The database is redesigned to adapt to new functions, each element strictly obey the HIRFL database naming conventions. Table view, index and triggers are also updated to improve performance.

The client program provides graphic user interface and power supply device control function. User interface of power supply control program is shown in Fig. 2. Each device belongs to a subsystem list, and all devices in the

current subsystem are shown in the right side of the page. Except the current and voltage value, the sequential waveform and the status parameters of the selected device are shown in the middle of the page.

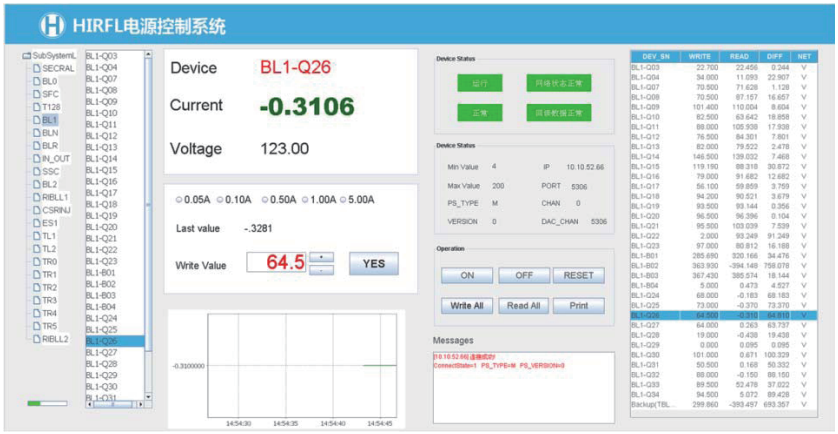

Fig. 2 (color online) User interface of power supply control program.

The layout of the user interface has been modified several times according to the feedback of operators in central control room. Up to now, all functions and modules of the power supply control program have been running steadily and reliably.

References

[1] Koranne, Sandeep. "Boost C++ Libraries." (2011).

[2] Chiu, Lawrence Y, et al. "Management of server cache storage space." (2016).

6 - 42 Design and Implementation of EMAIL and IP Management System

Yuan Chao, Wang Yongping, Gou Shizhe, Ma Yuan, Yue Min and Ma Tao

As the number of students and staff in our institute has expanded year by year, it will bring great pressure to the daily management. The traditional office mode has low working efficiency and is unable to meet the needs of the management at present. In order to improve its working efficiency and simplify the management flow-sheet, it is necessary to use the existing resources to develop EMAIL and IP management system based on network conditions.

We select ThinkPHP framework based on B/S to develop the management system. The LAMP technology is used to complete the function in the project The MVC design pattern is widely used in the design of system which can simplify developing process[1], quicken developing speed and improve quality and maintainability of the software. The PHP is selected as the main design language combined with JavaScript language and CSS+DIV technology in order to accomplish the website foreground and management background[2]. The user groups of this system are primarily staff and students in our institute.

Fig. 1 shows the general view of the user interface. The platform's features include: user registration, users log on, users modify data, upload pictures, email and IP application, reset the password and cancellation The administrator interface is shown in Fig. 2. System administrator can proceed user management, authority setup, information release, parameter setup, and database maintain, *etc.*

The system has been put into use for one year. With the change of customer demands and running environment, the system function has been continuously improved and perfected, it can work stably and the expected goal is achieved.