

Control System

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Introduction

The construction of control system of the SPring-8 is almost finished[1]. The installation of the control hardware was finished. The developments of the control software are almost finished. The design of the database was finished, and we are implementing the storage ring data.

Hardware

The network and workstation system are working well with few trouble in the FDDI node LANplex 2501. In the central control room, 14 equivalent control desks are installed. They are arranged in ring shape. Totally 13 CRT displays are installed on these desks. Among them, 11 CRT's have almost equivalent function. From any CRT we can access any part of accelerators (linac, synchrotron or storage ring). Other two CRT's are for radiation safety system and for beam line control system. An interlock key system box is also installed on the control desk.

Control Software

We have developed a Message Server (MS) and alarm system with there access libraries(or API). We also have developed examples of Access Server (AS) and Equipment Manager (EM) with there access libraries. The EM is running on the CPU board in VME system[2]. The equipment group, e.g. magnet, rf, vacuum etc., has its own AS and GUI. For fast feedback for rf system, an Equipment Manager Agent (EMA), which is running in a VME computer, is also developed

We have an additional cyclic data-acquisition path to get the status of equipment's. The Poller process running on the VME CPU board sends pre-registered messages to the read-only EM to get the equipment status. The data is stored on a memory by the Poller and taken by the Collector server process on the same board. After collection the data is sent to the Collector client process on the operator console and finally saved in the on-line data base by the database managing system (DBMS).

Database

We introduced a commercial relational database management system (RDBMS), SYBASE SQL server 11 and it's replication server system. The API for SYBASE are also developed. We developed four kinds of database; a parameter database, an on-line database, an archive database, and a replicated database. The parameter database contains static data such as connection table of equipment's, and the access functionnames for the equipment's. The on-line database store the current status/values of devices. The status/values of devices are periodically acquired and stored in on-line database, and after 1 hour these data are stored in archive database., and erased. The replicated database stores automatically the contents of parameter database and archive database. These replicated database can be accessed from user LAN. The previous three database cannot be accessed from user LAN, only accessed from control system LAN.

Reference

- [1]R. Tanaka et al., "Control System of the SPring-8 Storage Ring" Proc. Int. Con. on Accelerator and Large Experimental Physics Control System, Chicago, Oct. - Nov. 3, 1995 (to be published).
- [2] A. Taketani et al., "Equipment Manager of the VME Control System for the SPring-8 Storage Ring", ibd.