

USING WWW IN SRRC CONTROL SYSTEM

J.S. Chen

Synchrotron Radiation Research Center

No.1 R&D Road VI, Hsinchu Science-Based Industrial Park, Hsinchu, Taiwan

Abstract

The SRRC (Synchrotron Radiation Research Center - in Taiwan) control system is built in DEC VMS and DEC OSF/1 UNIX system. Considering that there are many other computer systems in our lab (like SUN and IBM PC....), and all of these can not directly connected to the control system, so a hardware platform and OS independent system is necessary. The WWW is one of the choice to solve the problem.

The SRRC light source WWW site (<http://www-icg.srrc.gov.tw>) is built with Microsoft IIS2.0 on Windows NT 4.0 . All of the program is written with JAVA to support runtime interactive ability. Using WWW browser, the user can monitor and control every individual storage ring devices. This paper describes the detail of the hardware and software structure.

1 HARDWARE STRUCTURE

The hardware structure is shown in figure 1. WWW server in a PC base computer (Intel Pentium 133) runs on Microsoft Windows NT4.0 . The database server is a DEC Alpha computer, running on OSF/1 Unix. At the bottom, several ILCs (VME base controller) directly connected to hardware device (eg. RF, BPM...).

2 SOFTWARE STRUCTURE

The software structure is sketched in figure 2. WWW browser side program is written with JAVA Applet. It can, and only can, communicate with www server , and the www server side program is also written with JAVA language. The advantage of server side program written with JAVA is its portability. It can be easily transferred to other platform (e.g. from IBM PC to Sun workstation) and do not need to change even a single line of the program. The disadvantage is the slower speed. Because the JAVA application is slower than C or C++. However, this is the limitation of every www applications, so the slow speed factor is acceptable.

There are three service modules in WWW server. The broadcast service module reads some of the most important machine parameters (beam current, beam lifetime, BPM reading, ...) into www server and store it in computer's RAM. When any browser request these data, www server can directly transmit it to browser. In this way, the network traffic is decrease. Because when many browsers request data at the same time , the www

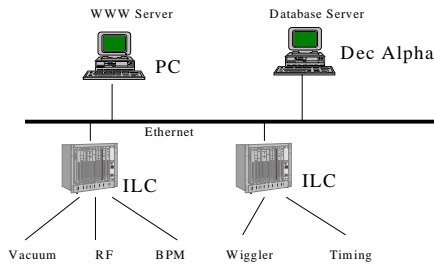


Figure 1

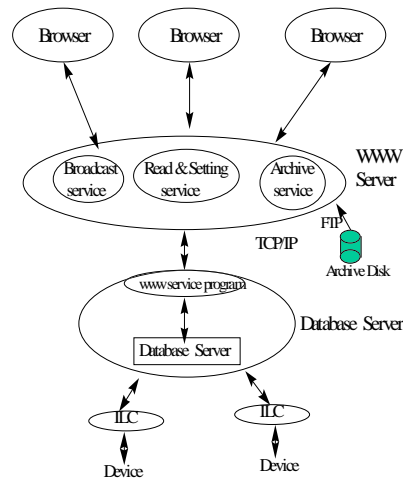


Figure 2

server just need to read once from database server. This broadcast service program is set to read these machine parameters every 10 seconds.

The second module is reading and setting service module. This module can accept the browser read and setting commands. By using this service the browser can not only to read the machine parameter but also to control every devices of the machine. Of course, there are several security protect for this function. Only when the machine operator open the privilege to a specify user , and the user is allowed to control particular devices .

The third module is archive service module. Since our history archive data is stored in DEC VAX system, so this module use FTP to connect the archive disk , getting data and transmitting it to browser side program.

The Database server side WWW service program is written with C, and running in background, it can be connected to database. Since this database is a port of SRRC control system , so through this path the program in www browser can fully control the device (reading and setting).

3 JAVA PROGRAM IN WWW BROWSER

There are three groups programs in www browser. All these programs are write with JAVA . The first group is realtime broadcast monitor programs. These include beam current and beam lifetime curve display program , (as shown in figure 3) , BPM bar chart display program , vacuum bar chart display program . All these programs will automatically update the screen every 10 seconds. The user in WWW browser can received the newest machine status on line .

The second group is monitor and monitor & setting program. The monitoring program is using the graphic like interface, as illustrated in figure 4 to present the machine status. All the SRRC machine status (e.g. every power supply, every insertion device ...) can be see in the WWW browser. The monitoring and setting program is equipped with setting function onto the monitoring program. Using this program, the WWW browser user can control several particularly device, if the machine operator open the privilege for this user. Considering the network traffic, the monitor process running on WWW browser updates the screen every 5 seconds.

The third program is history archive display program. This program allows WWW browser user to select the device and read the data archive . Typical example is given in figure 5 in which two power supplies archive data is displayed for 97/4/25 to 97/4/27 duration.

4 CONCLUSION

Using the technique of WWW and JAVA, we have supported an easy way to monitor and control our accelerator system. Although the speed is slower than the original control program developed in workstation. However, in some of the important application cases , it is shown to be very useful.

REFERENCE

- [1] F.Momal, C.Pinto-Pereira "Using World-Wide-Web for Control System "AT Division CERN, 1211 Geneva 23
- [2] JAVA SDK page, <http://www.sunsoft.com>
- [3] IIS 2.0 www server page, <http://www.microsoft.com>

[4] Netscape's Home page, <http://home.netscape.com>

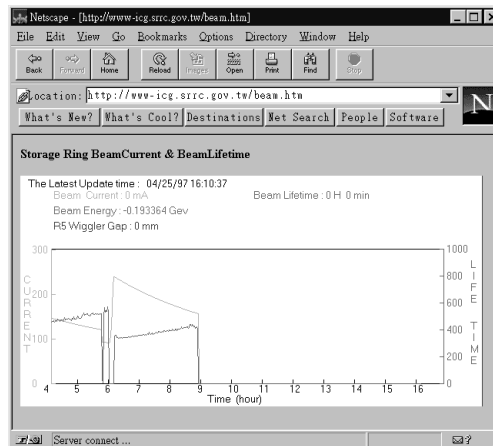


Figure 3

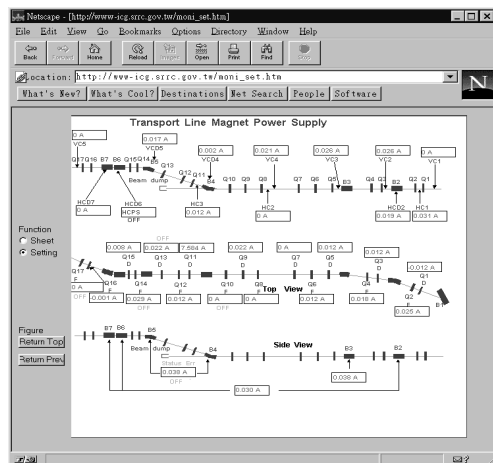


Figure 4

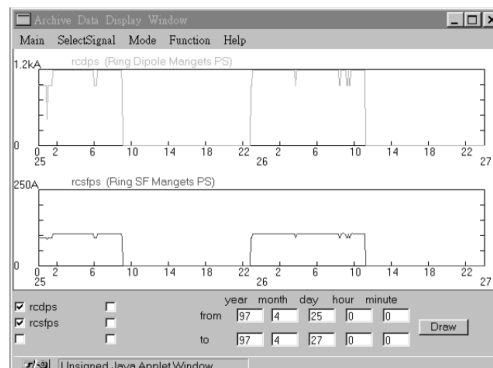


Figure 5