A Linux-Based CAMAC Serial Highway System for JT-60

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JT-60 inter-shot processor based on a unix operating system, UNIX-ISP, provides a functionality of communication with the JT-60 supervisory control system. The UNIX-ISP also provides a functionality to communicate with each individual diagnostic CAMAC subsystem via UNIX-ACM-A to gathering and controlling the system. The UNIX-ACM-A consists of Force CPU-5VT, which is the SPARC-based VME board computer, with Solaris 2.5 operating system and Kinetic 2140 VME driver to access to CAMAC subsystems with the CAMAC serial highway. The maintaining and performance issues of the system with the UNIX-ACM-A are closed up because of the system developed with older technologies, although the UNIX-ACM-A has been used without any problems.
A linux-baesd CAMAC serial highway system has been, therefore, developed as a part of a replaced system for JT-60 data processing system. We have developed the new system which is based on the Intel architecture CPU with a linux operating system. The new UNIX-ACM-A consists of standard personal computer with PCI bus system and Kinetic 2115 driver module to access to CAMAC subsystems with the CAMAC serial highway, because most of CAMAC subsystems are still used in the system and cannot be replaced. The driver software for Kinetic 2115 on RedHat operating system has been developed. The driver software has almost the same functionalities and structures as the old driver software of K2140 on Solaris operating system, so as to replace to the new system easily and smoothly. The CAMAC access library, which has the same functionalities as one on Solaris, has been also developed.
The throughputs as a function of the transferred data size were measured as performances of the new system. The measurements results higher throughputs of the new developed system. The new system has been already implemented and used for the real experiment with JT-60 without any problems and with better performance than the previous system.

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