WEB-BASED AGENT-ORIENTED SYSTEM FOR DAQ CONTROL AND MONITORING IN LHD

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Abstract

In LHD (Large Helical Device) fusion plasma experiments, 72 DAQ PCs were working for the same numbers of fusion plasma diagnostics in 2008. To establish more intelligent and autonomous operation among them, a new web-based DAQ control and monitoring system has been developed, based on the "agent-oriented" architecture. The agent on each DAQ governs the relating processes adapted to its digitizer type and OS, and on the other hand accepts/reports the commands/states from/to the monitoring service on the web server. Their communications are done on light-weight IP multicast protocols to sustain high flexibility for further extensions. A Java applet GUI can issue individual or lump-sum commands for DAQ operations and show their states in real-time, through the communications with the monitoring service. It is very advantageous in recovering from accidental DAQ unit failures so that, in typical cases of failures, the MTTR roughly becomes one third than before. The consequent reliability in the whole DAQ system, i.e. its successful operation rate, has been improved from 99.x to 99.9x in percentage.

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