Contribution ID: **544**   Type: **Poster**

The Double Chooz Online System

Thursday 24 May 2012 13:30 (4h 45m)

The Double Chooz experiment searches for reactor neutrino oscillations at the Chooz nuclear power plant. A client/server model is used to coordinate actions among several online systems over TCP/IP sockets. A central run control server synchronizes data-taking among two independent data acquisition (DAQ) systems via a common communication protocol and state machine definition. Calibration subsystems are controlled by a calibration server which establishes a connection to one the DAQs. The data are written to buffer disks in the experimental hall and diagnostic information is generated using fast reconstructions. An automatic data transfer system tracks and manages the relocation of the data files to permanent, offsite storage. Various hardware-level and environmental information are monitored by a slow-control system. The DAQ, slow control, and data transfer systems send information to a centralized monitoring server from which diagnostic information can be visualized via a java-based graphical user interface. Since access to the experimental site is restricted, all systems have been designed to operate remotely and employ robust exception-handling techniques.

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Session Classification: Poster Session

Track Classification: Online Computing (track 1)