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Experience with Real Time Event Reconstruction Farm for Belle Experiment

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A sizeable increase in the machine luminosity of KEKB accelerator is expected in coming years. This may result in a shortage in the data storage resource for the Belle experiment in the near future and it is desired to reduce the data flow as much as possible before writing the data to the storage device.

For this purpose, a realtime event reconstruction farm has been installed in the Belle DAQ system. The farm consists of 60 linux-operated PC servers with dual CPUs. Every event from the event builder is distributed to one of the servers through a socket connection. A full event reconstruction is done on each server so that a sophisticated event selection can be performed to reduce the data flow. The same event reconstruction program as that used in the offline DST production runs on each farm server. Selected events are collected through socket connections and written to a fast disk array.

The farm has been being operated in the beam runs from the beginning of this year and processing the data at an average L1 trigger rate of 450Hz. The experience of the operation is reported at the conference. In particular, the performance of the full event reconstruction and selection is discussed in detail. A scheme to monitor the quality of processed data in real time is also described.

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