JBN new cluster computing system

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A new cluster computing system has been developed to be used primarily for theoretical simulations. The system consists of 16 1U rack mount PC's, mounted on one rack as shown in Fig. 1. Each PC has an Intel Core i7 920 CPU operated at 3.5GHz with 6GB memory. The CPU chips are cooled by water. This CPU has quadrant cores. Each core can be operated by Intel Hyper-Threading technology and the number of virtual cores can be eight (at the expense of a 30% slower process speed.) Therefore the system consists of 128 virtual CPU's. All jobs can be controlled by the Condor operating system in Scientific Linux SL 5.3. Each PC is booted through the network and no hard disk or optical driver is installed. Since the system is made for theoretical model simulations, such as those using the AMD transport model, no high data transfer rate job is supported at present.

In order to evaluate the job process speed, an AMD-V job was submitted and the speed was compared to that of the existing newest PC of our group and that in the Riken Super Computer System. The job submitted was a simulation for central collisions for $^{64}Zn+^{58}Ni$ at 40A MeV. More than 100 events were generated in each case. The CPU process times required are shown in Table I.
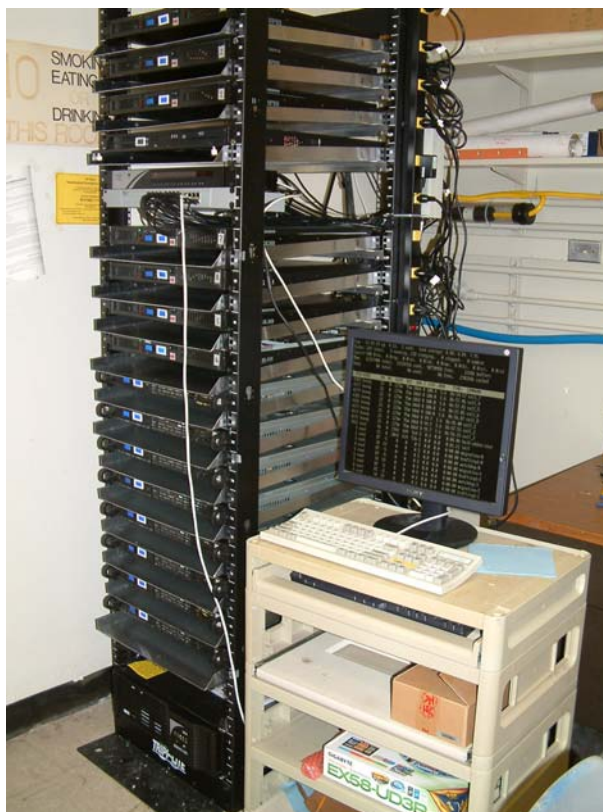

FIG. 1. A new cluster computing system

Table I. Comparison for job process speed. The present Riken system was installed in 2003 and is scheduled to be up graded this summer. CPU times given are at full load, that is, for the new cluster, 8 jobs in each CPU.

	New cluster	JBN Group	Riken
CPU	Core i7 920 @ 3.5GHz	Xeon X5460 @ 3.1GHz	Xeon @ 2.66GHz
CPU time/event	1.5h	1.8h	4.2h