IEEE Cluster2008 Excursion:
Site Visit to CCS, University of Tsukuba
17:00-18:15 Sept. 29th, 2008

Welcome to **Center for Computational Sciences (CCS)**, University of Tsukuba !

CCS is a dedicated research center for computational science and computer science with various large scale HPC resources for collaborative research in wide area of advanced scientific research. The application research area includes Particle Physics, Astrophysics, Material Science, Geo Science, Bioinformatics, etc. in three research divisions. On the other hand, there are two research divisions on High Performance Computing and Informatics. The researchers in both application fields and system fields are co-working together to solve the state-of-the-art scientific problems with powerful computation resources here.

In the special excursion program for all attendees of IEEE Cluster2008 in Tsukuba, you can visit three of large scale PC clusters with different features and purposes:

- T2K-Tsukuba: The latest and largest PC cluster in CCS which provides 95TFLOPS of peak performance provided by 2592 sockets of AMD Barcelona quad-core Opteron. There are 648 of computation nodes (Appro XtremeServer-X3) with 4 sockets Barcelona, 32GB of memory and quad-rail of Mellanox ConnectX Infiniband. All these nodes are connected with 4-way full-bisection bandwidth FatTree network to provide 5.2 TByte/sec of communication bandwidth to support wide area of large scale scientific applications. Attached shared file server provides 800TByte of user available space with RAID-6 file server and Luster file system. T2K-Tsukuba has just started its operation from June 2008 and ranked at 20th in the world on June-2008 TOP500 list.

- PACS-CS: A specially designed PC cluster under the concept of “bandwidth-aware MPP-like cluster”, which provides 14.4 TFLOPS of peak performance with 2560 computation nodes. Each node consists of only single-socket Intel Low-Voltage Xeon

with single core, to provide the best balance between CPU FLOPS and memory bandwidth as well as network bandwidth. The parallel processing network consists of 6-way trunked Gigabit Ethernet in very unique 3-D HyperCrossbar topology.

- FIRST: A Hybrid PC cluster with 512 of Intel Xeon on 256 computation nodes, which are equipped with 256 of Blade-GRAPE acceleration engines for gravity calculation. The peak performance is 3.5 TFLOPS by general purpose CPUs and 35 TFLOPS by Blade-GRAPE engines. This cluster is specially dedicated for computational astrophysics research on "Finding the First Object in the Universe", which requires the complex calculation of multiple phenomena such as gravity, radiation transfer and hydrodynamics.

The site visit is scheduled as follows.

- 17:00 Departing Conference Venue (Epocal-Tsukuba) by chartered bus splitting into two groups (G-1 and G-2)
- 17:20 G-1: CCS main computer room (for PACS-CS cluster and FIRST cluster)
  G-2: CCS second computer room (for T2K-Tsukuba cluster)
- 17:35 G-1: Moving to CCS second computer room by walk (5min.)
  G-2: Moving to CCS main computer room by walk (5min.)
- 17:40 G-1: CCS second computer room (for T2K-Tsukuba)
  G-2: CCS main computer room (for PACS-CS cluster and FIRST cluster)
- 18:00 Both groups: Departing CCS computer rooms by chartered bus
- 18:15 Dismissed at Epocal-Tsukuba