

New Supercomputer System of the Railway Technical Research Institute

Akihiko MATSUOKA

General Manager, Network Systems Management, Information Management Division

RTRI launched a new supercomputer system into operation in May, 2009.

We selected the most suitable system based on comprehensive evaluation of the following factors:

- * Cost performance
- * System security and reliability
- * Perfect portability of existing programs
- * Expandability

Following table shows a comparison between the specifications for the previous system and the new system.

System	Pre System	Cray-XT4	Cray-CX1
System Type	SMP	MPP	PC Cluster
Processor (Number)	Intel Itanium2 1.5GHz Single-core (112)	AMD Opteron 2.3GHz Quad-core (268)	Intel Xeon 3.0GHz Dual-core x2 (6) Intel Xeon 3.0GHz Quad-core (18)
R/Peak(*)	672 GFlops	9.8 TFlops	1.0 TFlops
Main Memory	224 GB	2.0 TB	256 GB
Disk Memory	3.0 TB	21.0 TB	1.5 TB
OS	Linux	Cray Linux Environment	Linux(RedHat + EL5)

(*)R/Peak: Theoretical Peak Performance

While the previous system was configured with a single shared memory parallel computer (SMP: Symmetrical Multi Processor), the new system consists of two different types of computer: XT4 (MPP: Massively Parallel Processor) and CX1 (PC Cluster) from Cray Inc. (USA).

In the new system, we characterize the CX1 system as a platform to operate commercial software for various analytical purposes.

Therefore, we chose the execution environment (Specification) of the CX1 system so that it has a capacity to suit the applications that are currently in use.

However, the CX1 system is a PC cluster configuration system whose performance can be expanded in the future by adding nodes as required.

On the other hand, we treat the XT4 (Fig. 1) as a platform mainly used for the development and running of original user programs.

We consider that the analysis of various complicated railway issues requires large scale computation using a high level simulation technique.

For this purpose, the XT4 system has about 10 times the number of CPU cores and memory capacity, and about 15 times superior theoretical computation performance value compared with the previous system.



Fig. 1 New supercomputer system of RTRI