

Final Architecture Proposal

Our system is going to be two NEC SX-Aurora Tsubasa A300-8 nodes, each of which will contain the following hardware:

CPU	2 Intel Xeon Gold 6126
RAM	192 GB
Accelerators	8x NEC Aurora Tsubasa Vector Engine (Type 10B)
Interconnect	IB EDR
Discs	1 x 2TB only the headnode, 1 x 80 GB for the second node, 16 GB non-volatile memory (NVM)

The team chose the Xeon Gold CPUs because they have the advantage of six memory channels. Compared to the older versions with only four channels it can access memory faster.

To reduce the power overhead of many nodes, the team wanted as many VEs in one Node as possible, which leads to eight VEs in each Node. The Type 10B version of the VE has a higher bandwidth. The Vector Engine Processor has the world's first implementation of one processor with six HBM2 memory modules.

Due to the six modules in the vector engine processor, one NEC Vector Engine is capable of a 1.2 TB/s memory bandwidth.

As far as software is concerned, the team plans to go with software that has worked for other teams in the past. This includes using:

- CentOS as free RedHat-compatible operating system
- Ansible to manage packages and operating system configuration on the cluster nodes
- HPE's CMU and iLO for the cluster and node Management
- SLURM as batch scheduling system to handle supplication workflow
- The Module system, with SPACK as the package management tool, to manage different software versions, such as different versions of the Intel and GNU C compilers and different MPI runtime environments
- git for version management