Attachment:
Primary features of the SX-Aurora TSUBASA product line

1. The "Vector Engine" (VE), a complete vector system with one of the world's highest performance levels per core, implemented into a PCIe-based versatile card

> The vector CPU inside the VE uses a CoWoS technology (Chip-on-Waver-on-Substrate) to connect six HBM2 modules (High Bandwidth Memory). This emphasizes NEC's focus on memory bandwidth, 150 GByte/s per core. With 307 GFlops, the performance of such a core amounts to about five times the performance of a core in NEC's previous generation of vector computers, the SX-ACE. The CPU has eight high-performance cores, totaling 2.45 TFlops performance and an aggregate memory bandwidth of 1.2 TByte/s.

2. Easier to use through integration with open environments and expanded usage range

> The system architecture of the new product is highly innovative, combining an x86 host server, "Vector Host" (VH), running LINUX with a vector system in a hybrid configuration. The host server acts as a frontend to the VE, offloading a wide range of activities which do not directly contribute to scientific calculations. The VH can also run scalar applications, or – by utilizing a hybrid Message Passing Interface (MPI) -parallelization – run scalar processes that are applied in scientific applications, such as IO-processes. Unlike the GPU computing paradigm, the VE will execute complete applications, thereby significantly reducing the communication overhead between the vector host and the vector engine.

> To fully support code developers and software analysts, NEC provides an extensive software development framework, including compilers which provide automatic vectorization and parallelization. In addition, the "NEC MPI" provides distributed memory parallelization, which also supports hybrid MPI, and NEC's own distributed parallel file-system, the "NEC Scalable Technology File-System" (ScaTeFS), and NEC's feature-rich job scheduler, the "NEC Network Queuing System V" (NQSV), for stable and highly sophisticated workloads and workflows.

3. The optimal configuration for every budget, from tower-type servers to large-scale high-end systems

Thanks to the card-type VE, the new product be configured to address a wide range of requirements, from servers with 1, 2, 4 or 8 VEs, to multi-vector-engine systems based on racks with 64 VEs, which provides an aggregate performance of 156 TFlops and a memory bandwidth of 76.8TByte/s. Moreover, users can basically connect to an unlimited number of such systems, thereby enabling extremely large configurations.

SX-Aurora TSUBASA

Vector Engine

■SX-Aurora TSUBASA
Tower Model

■SX-Aurora TSUBASA
Rack Mount Model

A100-1 (Number of VEs: 1)   A300-2 (Number of VEs: 2)   A300-8 (Number of VEs: 8)

A500-64 Supercomputer Model
(Number of VEs: 64)