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FUJITSU Supercomputer PRIMEHPC FX700

A high-performance Arm server featuring the A64FX CPU, the same CPU used in the supercomputer Fugaku. Air-cooled and based on standard technology, making it easy to set up.

The FUJITSU Supercomputer PRIMEHPC FX700 is a PRIMEHPC series air-cooled model based on standard technology that features the A64FX CPU for use in the supercomputer Fugaku developed together with RIKEN and the PRIMEHPC FX1000. It is the perfect system for customers that wish to easily take advantage of the high performance of the A64FX. It has a minimum hardware configuration of 2 nodes in Japan and 128 nodes overseas.

A64FX, the newly developed Arm CPU
The A64FX, developed by Fujitsu, is the world's first CPU to implement a Scalable Vector Extension (SVE), an extension of the Armv8.2-A instruction set architecture for supercomputers. Manufactured using the state-of-the-art 7nm process, the A64FX has 48 computing cores, can provide a theoretical peak double-precision floating-point operations performance of 2.7648 TFLOPS or 3.072 TFLOPS. Furthermore, it is capable of high-throughput single-precision/half-precision computation and 8bit/16bit integer operations using its 512-bit wide SIMD units. This calculation performance shines in processing applications such as AI.

Each node consists of one processor, and uses HBM2 (High Bandwidth Memory 2), a world first for a general-purpose CPU. Each node has a tremendous 1,024 GB/s of memory bandwidth.

Microarchitecture with high processing performance
The A64FX's microarchitecture was developed using technologies that Fujitsu has refined through its experience with supercomputers, mainframes, and UNIX servers. The A64FX carries on from the CMG (Core Memory Group) of the PRIMEHPC series, which enables scalable performance improvement when using multiple cores, as well as VISIMPACT (Virtual Single Processor by Integrated Multi-core Parallel Architecture), which realizes highly efficient hybrid parallel processing. It also enhances functions such as SIMD functions.

Easy-deployment form factor and air cooled design
The PRIMEHPC FX700 has a 2U chassis that can be mounted in standard 19-inch racks and can hold up to four blades. Each blade contains two nodes, and each unit can consist of up to eight nodes. It is air cooled, making it easy to deploy high-performance Arm servers in environments without specialized water-cooling equipment.

Industry-standard interconnect and OS
The interconnect among compute nodes is the industry-standard InfiniBand. InfiniBand is widely used as an interconnect in PC clusters, and can be used to construct equivalent topologies. The FUJITSU Supercomputer PRIMEHPC FX700 uses the Red Hat Enterprise Linux OS, offering a high level of software migratability.

Development environment that leverages the performance of the A64FX
Development environments such as compilers are supplied by Fujitsu, providing powerful support for the development and optimization of applications for the A64FX CPU.

HPC software support
Bright Computing's Bright Cluster Manager, a cluster management software, and Altair's Altair PBS Professional, a job scheduler are supported. Operation verification is planned for OpenHPC, an open-source HPC software stack. Fujitsu also plans to provide support services for OpenHPC.

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FUJITSU Supercomputer PRIMEHPC FX700 Specifications

CPU	Name		A64FX™
	Instruction set architecture		Armv8.2-A SVE
	Number of cores		48 cores
	Clock		1.8 GHz or 2.0 GHz
	Theoretical peak performance		2.7648 TFLOPS or 3.072 TFLOPS (double precision)
Node	Architecture		1 CPU/node
	Memory capacity		32 GiB (HBM2, 4 stacks)
	Memory bandwidth		1,024 GB/s
	Interconnect		InfiniBand EDR / HDR100 [*1] [*1] EDR and HDR100 cannot be mixed
Main unit	Form factor		2U rack-mount chassis
	Maximum number of nodes		8 nodes/chassis
	Cooling method		Air cooling
Software	OS		Red Hat Enterprise Linux 8
	HPC middleware		• FUJITSU Software Compiler Package • FUJITSU Software Technical Computing Suite [*2] [*2] Only distributed file system (FEFS) is supported • Bright Cluster Manager (Bright Computing) • Altair PBS Professional (Altair) • OpenHPC (open source software)

Inquiries

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