High Performance Computing (HPC)

■ The Fujitsu HPC Platform

Fujitsu offers both products and in-house support for all the necessary components of HPC systems, including interconnects, OS, middleware, and compilers. By leveraging the advanced support know-how we have cultivated through more than 30 years of experience, we are able to harness the full benefits of HPC systems for our customers.

Category	HPC Clusters[1]					Supercomputer
Product	**FUJITSU Server PRIMERGY RX200 PRIMERGY RX300 PRIMERGY RX2540**	**FUJITSU Server PRIMERGY RX350 PRIMERGY TX300**	**FUJITSU Server PRIMERGY BX900**	**FUJITSU Server PRIMERGY CX400**	**FUJITSU HX2560**	**FUJITSU Supercomputer PRIMEHPC FX10**
Features	Low-profile rack-mount servers (1U/2U) with up to two of the latest Xeon processors	Servers with up to two Xeon processors, also up to two Xeon Phi coprocessors/ GPGPUs for increased performance with low cost, low power consumption	A high-density, large-scale blade server with up to 18 Xeon server blades in a 10U chassis	A high-density, multi-node server that achieves double the density of a 1U rack server. Supports up to four Xeon servers in a 2U chassis	A low-profile rack-mount (2U) server with up to two Xeon processors, also up to four Xeon Phi coprocessors/ GPGUs for increased performance with low cost, low power consumption.	A supercomputer that improves upon technology employed by the K computer. Achieves peak performance from 2.5 TFLOPS to 23.2 PFLOPS
OSs	Linux, Windows Server					Linux
CPUs	Intel Xeon processors, others.					SPARC64™ IXfx
Development	Fujitsu Limited together with Fujitsu Technology Solutions (Holding) B.V. (Germany)				Fujitsu Limited	Fujitsu Limited
Manufacturing	Fujitsu Technology Solutions (Holding) B.V. (Augsburg, Germany), Fujitsu Isotec Limited (Fukushima, Japan)				Fujitsu Isotec Limited (Fukushima, Japan)	Fujitsu IT Products Limited (Ishikawa, Japan)

Low-end/Mid-range → High-end

*1: An HPC cluster connects many standard PC servers – which individually offer excellent cost/performance – over a high-speed network, resulting in a system with excellent cost performance and high-speed parallel processing.

■ TC Cloud: Cloud Services for Analytical Simulations

With the TC Cloud collection of simulation-specialized cloud services, users simply connect to the Internet to access environments for conducting simulations in a wide variety of fields. The lineup, which includes everything from computational platforms to applications, lets customers use what they need when they need it, making it possible for users to take care of large-scale or unexpected analyses projects without having to worry about securing high-capacity computing equipment. As an affordable solution for taking on large-scale simulation projects, TC Cloud helps toughen the competitiveness of the Japanese manufacturing industry.

Features

High-performance computation environment
A high-performance cloud service designed specifically for analysis work; enables users to perform the types of large-scale analysis that are normally too demanding to handle

High on-demand availability
Available from 300 yen per node per hour (20 cores per node); helps save on costs by allowing users to use the service only when needed

Exceptionally user friendly
Enables intuitive operations with an easy-to-use job entry portal and virtual desktop that help eliminate hurdles for novices

Wealth of application
Runs over 50 applications; regularly used applications can be run in the cloud

■ Computer-based Simulations

Computer simulations, which compute and reproduce various phenomena, have come to be regarded as the "third pillar of science" alongside theory and experimentation. Computer simulation has become an indispensable R&D tool across all fields, from basic research to manufacturing.

High performance computing (HPC) was developed to process the large-scale computations required for running these simulations at high speeds, and is largely represented by the utilization of supercomputing technology.

HPC has widespread applications in various fields such as manufacturing technology, nanotechnology/material sciences, disaster mitigation, life sciences, aerospace, information technology, the environment, and energy. By offering advanced HPC solutions, Fujitsu is helping to address a range of challenges facing humanity.

■ The History of Fujitsu's HPC Solutions
Consistently leading the industry with over 30 years' experience in the HPC field

Fujitsu developed Japan's first supercomputer in 1977, and has for over 30 years been committed to continuing R&D, as well as the delivery of new products.
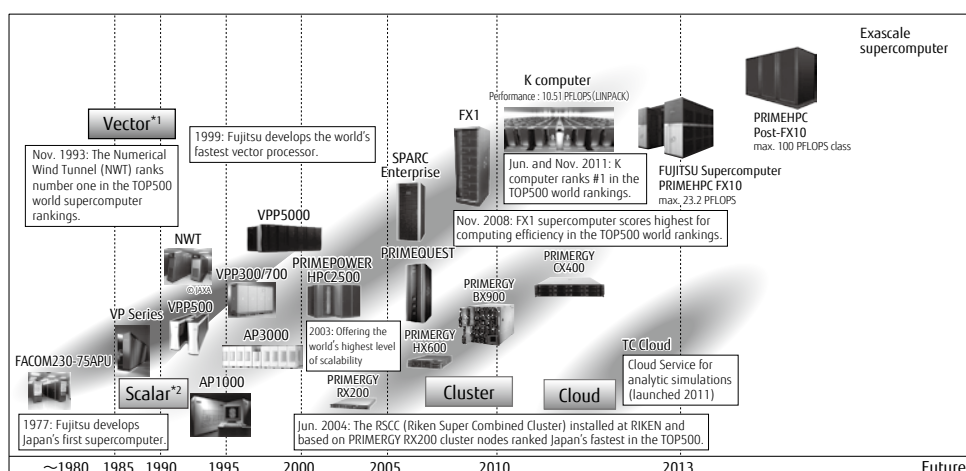
*1: Vector Supercomputers: Since multiple data sets can be processed in an "assembly-line" fashion, vector supercomputers demonstrate considerable processing power in performing similar calculations on huge amounts of data.
*2: Scalar Supercomputers: Scalar supercomputers are equipped with general purpose microprocessors, and are able to use those used in servers.

■ Toward World-class Supercomputers

Countries across the world are in an intense race to develop supercomputers as platforms for scientific technology and improved industrial competitiveness. Japan has also joined the competitive fray, aiming to create a world-class supercomputer, the post-K computer, sometime around 2020.

By applying its 100-petaflop system currently in development and participating in basic design for Japan's post-K computer project, Fujitsu will use its consistently cutting-edge technologies to develop and provide supercomputers that deliver world-leading computing performance.

■ Recent Deployments

Customer	System	Peak Performance
RIKEN AICS (Advanced Institute for Computational Science)	Supercomputer (K computer)	11.28 PFLOPS
Information Technology Center, Nagoya University	x86 Cluster (PRIMERGY CX400), Supercomputer (PRIMEHPC FX10)	561.4 TFLOPS
JAXA (Japan Aerospace Exploration Agency)	x86 Cluster (PRIMERGY RX350), Supercomputer (PRIMEHPC Post-FX10)	3.4 PFLOPS [*4]
Australia's NCI (National Computational Infrastructure)	x86 Cluster (PRIMERGY CX400), Supercomputer (PRIMEHPC FX10)	1.22 PFLOPS
Information Technology Center, The University of Tokyo	Supercomputer (PRIMEHPC FX10)	1.13 PFLOPS
Taiwan Central Weather Bureau (CWB)	Supercomputer (PRIMEHPC FX10)	Exceeds 1 PFLOPS [*4]
Research Institute for Information Technology, Kyushu University	x86 Cluster (PRIMERGY CX400), Supercomputer (PRIMEHPC FX10)	993.7 TFLOPS
High Performance Computing (HPC) Wales	X86 Cluster (PRIMERGY BX900)	Exceeds 300 TFLOPS
King Abdulaziz University	x86 Cluster (PRIMERGY CX250, etc.)	230 TFLOPS [*4]
The Institute for Solid State Physics (ISSP), The University of Tokyo	Supercomputer (PRIMEHPC FX10)	90.8 TFLOPS
RIKEN SPring-8 Center	Supercomputer (PRIMEHPC FX10)	90.8 TFLOPS
Canon Inc.	Supercomputer (PRIMEHPC FX10)	20.2 TFLOPS
Kobe University	Supercomputer (PRIMEHPC FX10)	20.2 TFLOPS
Shinshu University	x86 Cluster(PRIMERGY RX200), Supercomputer (PRIMEHPC FX10)	9.3 TFLOPS
Kinki University	Supercomputer (PRIMEHPC FX10)	2.5 TFLOPS

*4 : Peak planned performance upon development

* The products mentioned here are listed for reference purposes only. Availability may vary by country.