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Moving Forward: the Next Step in Fujitsu Supercomputing

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Past, PRIMEHPC FX100, and "Roadmap for Exascale"

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2011	2012	2013	2014	2015	2016	2017	2018	2019	2020

K computer

PRIMEHPC FX10 PRIMEHPC FX100

- 236.5GF, 16-core/CPU
- 4SIMD, 1TF~, 32+2-core/CPU
- Tofu2 integrated, HMC

Technical Computing Suite (TCS)

- Handles millions of parallel jobs
- FEFS: super scalable file system
- MPI: Ultra scalable collective communication libraries
- OS: Lower OS jitter w/ assistant core

Japan's National Projects

Development

Operation of K computer

Post-K

HPCI strategic apps program

App. review

FS projects

Post-K computer development

K computer and PRIMEHPC FX10 in Operation

Many applications are currently running and being developed for science and various industries

PRIMEHPC FX100 in Operation

The CPU and interconnect inherit the K computer architectural concept, featuring state-of-the-art technologies

System software TCS supports the FX100 with newly-developed technologies

Towards Exascale

RIKEN and Fujitsu are working together for developing the Post-K computer

Post-K: Fujitsu HPC CPU to Support ARM v8

ARM FUJITSU

Post-K fully utilizes Fujitsu's proven supercomputer microarchitecture

Fujitsu, as a "lead partner" of ARM HPC extension development, is working to realize an ARM Powered® supercomputer w/ high application performance

ARM v8 brings out the real strength of Fujitsu's microarchitecture

HPC apps acceleration feature	Post-K	FX100	FX10	K computer
FMA: Floating Multiply and Add	✔	✔	✔	✔
Math. acceleration primitives*	✔Enhanced	✔Enhanced	✔	✔
Inter core barrier	✔	✔	✔	✔
Sector cache	✔Enhanced	✔Enhanced	✔	✔
Hardware prefetch assist	✔Enhanced	✔Enhanced	✔	✔
Tofu interconnect	✔Integrated	✔Integrated	✔	✔

* Mathematical acceleration primitives include trigonometric functions, sine & cosines, and exponential function

Fujitsu High-end Supercomputers

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Fujitsu-designed high performance CPU

Dedicated, high performance interconnect "Tofu"

Application compatibility throughout generations

PRIMEHPC Series

Post-K

K computer

VISIMPACT
SIMD extension HPC-ACE
Direct network Tofu

CY2010~
128GF, 8-core/CPU

FX10

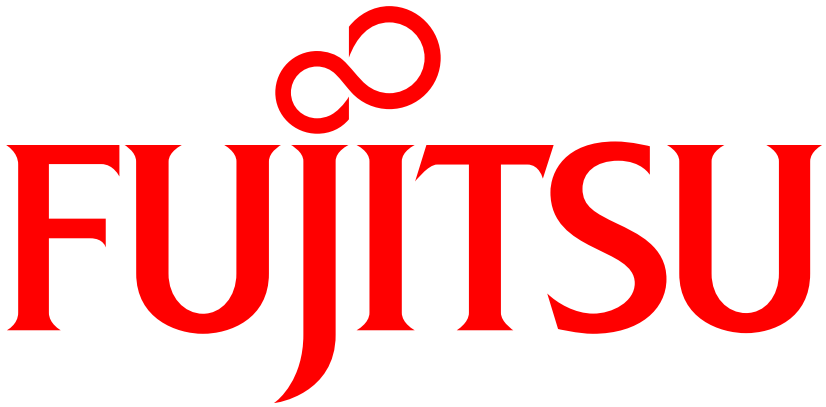
VISIMPACT
HPC-ACE
Direct network Tofu

CY2012~
236.5GF, 16-core/CPU

FX100

VISIMPACT+CMG
Tofu interconnect 2
HMC & Optical connections

CY2015~
1TF~, 32-core/CPU



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