

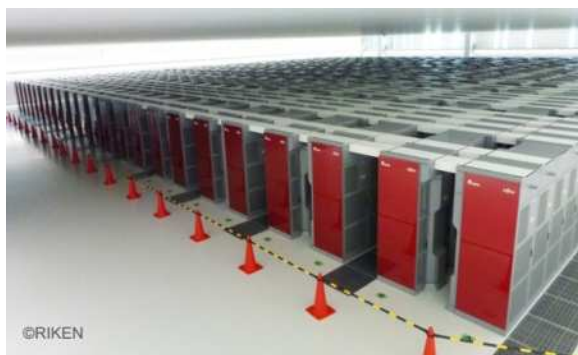
K computer



The K computer - Developed by RIKEN & Fujitsu

■ System Overview

- Super-large-scale system – combining 88,128 processors
- Fujitsu brings together all the advanced technologies
- Development continues with system software tuning for completion in June 2012.



The K computer in its computer room
(as of October 2011)

System	Theoretical calculation speed : 11.28 petaflops LINPACK performance : 10.51petaflops Number of Processors: 88,128 Total memory: 1.4 petabyte
Processor	SPARC64™ VIIIfx (8 cores, 128 gigaflops)
Interconnect	6-dimensional mesh/torus topology (Tofu)

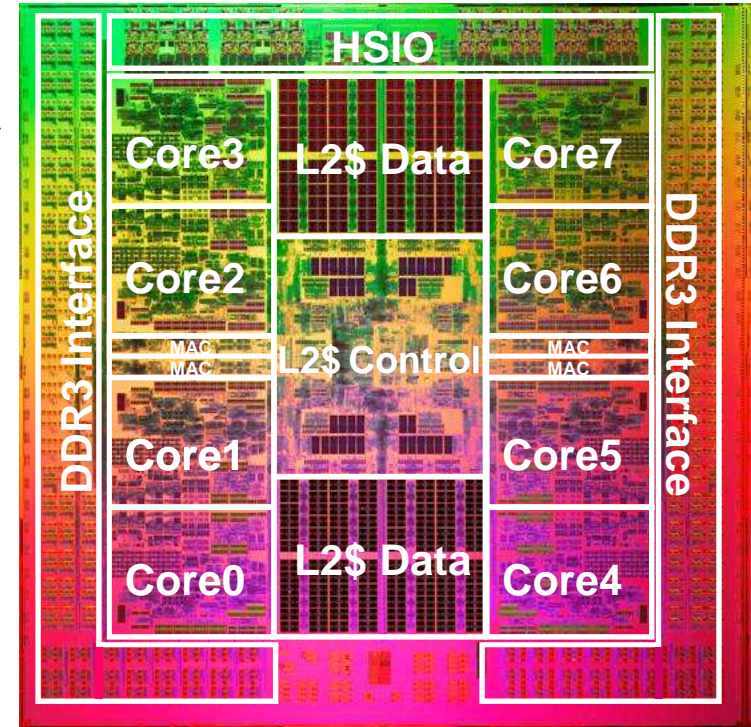
Processor: SPARC64™ VIIIfx



- High-performance and high reliability, with low power consumption necessary for ultra-large-scale systems

- Integrated cores, cache and memory I/F

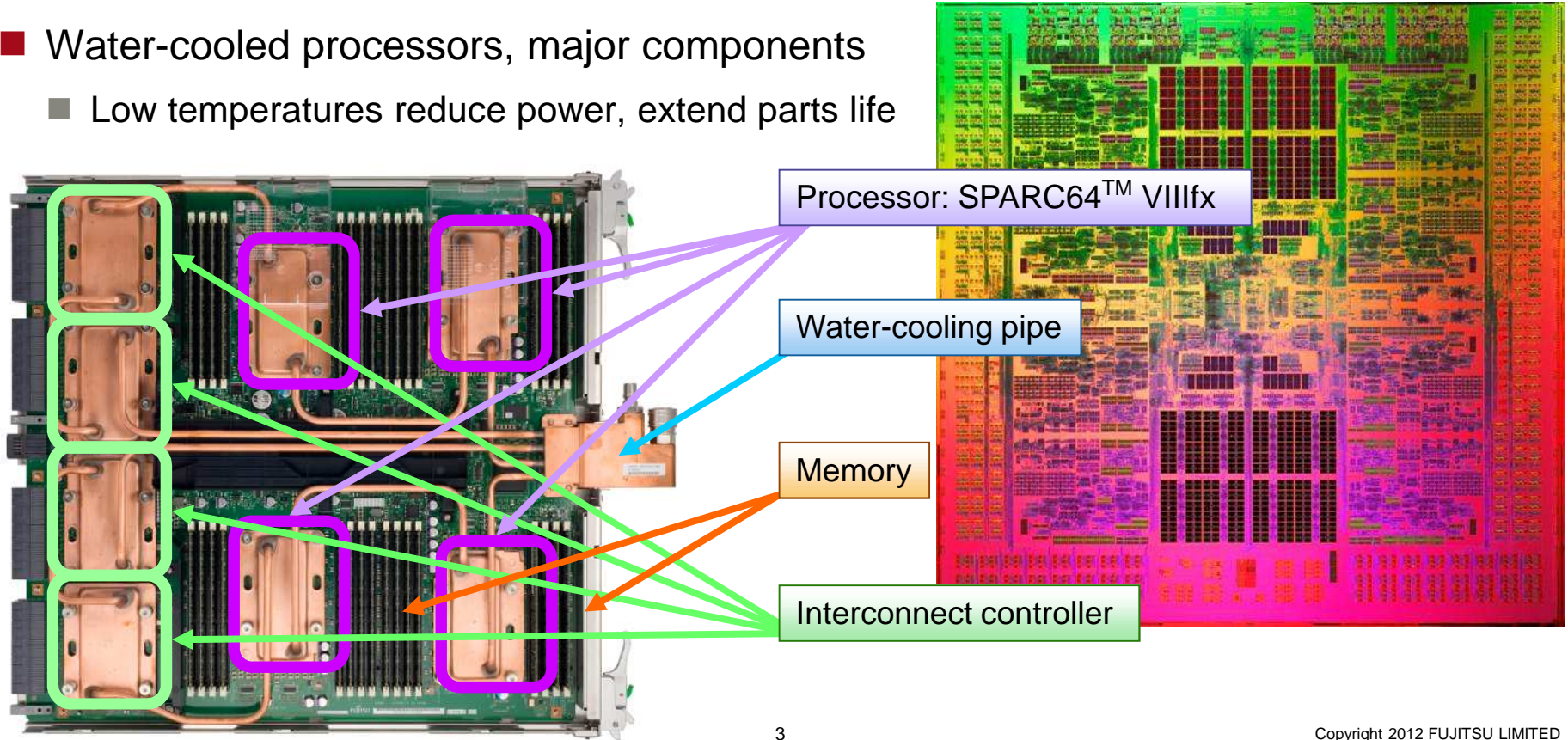
Number of cores		8
Clock		2 GHz
Cache	L1	I: 32 KB/core, D: 32 KB/core
	L2	6 MB (Shared cache)
Peak performance		128 gigaFLOPS
Power consumption		58 W (with water cooling)
Process		45 nm



SPARC64™ VIIIfx Chip Layout

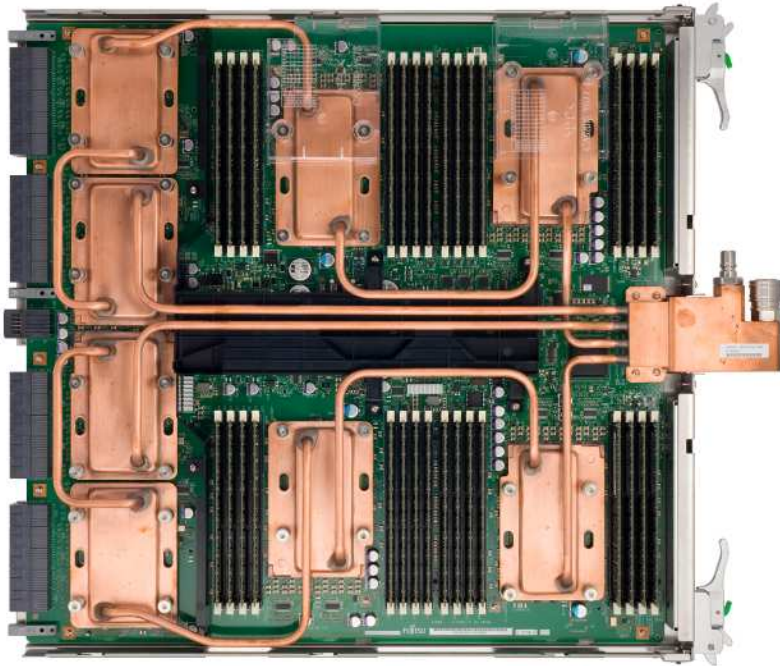
System Board

- Water-cooled processors, major components
 - Low temperatures reduce power, extend parts life



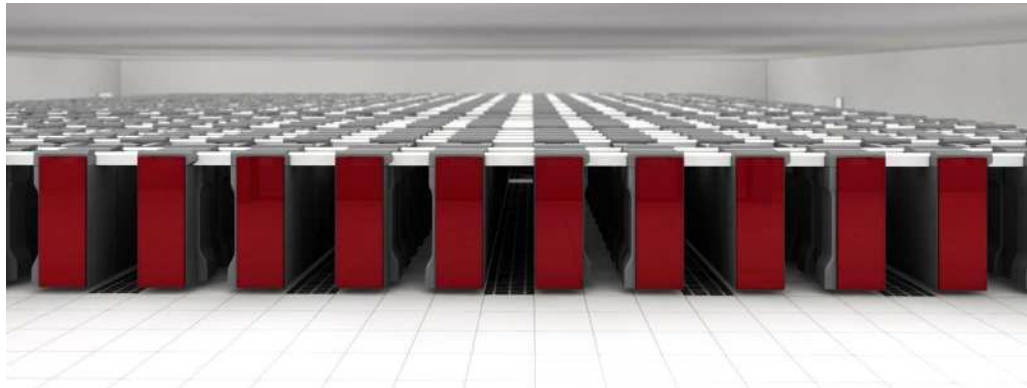
System Rack

- Some 100 processors per system rack
 - 3 cabinets are comparable to the original Earth Simulator (320 cabinets)



Installation Image

- Ultra-large system with 88,128 processors
 - Innovative 6 dimensional mesh/torus interconnect (Tofu)
 - System software also provided by Fujitsu



The K computer in its computer room (image)



Official Launch in September, 2012



- RIKEN Advanced Institute for Computational Science located in Kobe, Japan



The K computer facility



The K computer in its computer room (as of October 2011)

Recognition of the K computer performance



■ Consecutive No. 1 in TOP500 list (June and November 2011)

- Achieved world's best LINPACK benchmark performance of 10.51 petaflops with compute efficiency ratio of 93.2%, using 864 computer racks (88,128 processors).

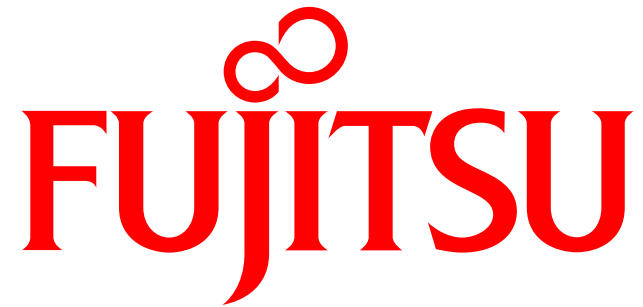
■ No. 1 in Four Benchmarks at HPC Challenge Awards

- Evaluated very highly in all-around performance as a general-purpose supercomputer

■ Research Results Awarded ACM Gordon Bell Prize

- The Peak-Performance Prize is given for research that shows high real-world performance in a practical application, and underscores both the practical value of this research and the K computer's real-world effectiveness.





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