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Fujitsu's Next Endeavor: The Post-K Computer

Fujitsu's HPC Design Concept for Post-K

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- High performance, scalable supercomputer system
- Inherits K computer's strengths
- Co-designed with application developers

Post-K

K computer

PRIMEHPC FX10

PRIMEHPC FX100

Feature Highlights in the Post-K Computer

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- For high performance and easier application porting
  - HPC-optimized CPU designed by Fujitsu
  - Enhanced HPC compilers with context-aware code optimization
- For the productivity of various application developers
  - CPU based on ARM ISA (Instruction Set Architecture)
- For I/O acceleration and scalability
  - Job-dedicated local file system to exploit I/O locality

Fujitsu's ARM ISA-based CPU

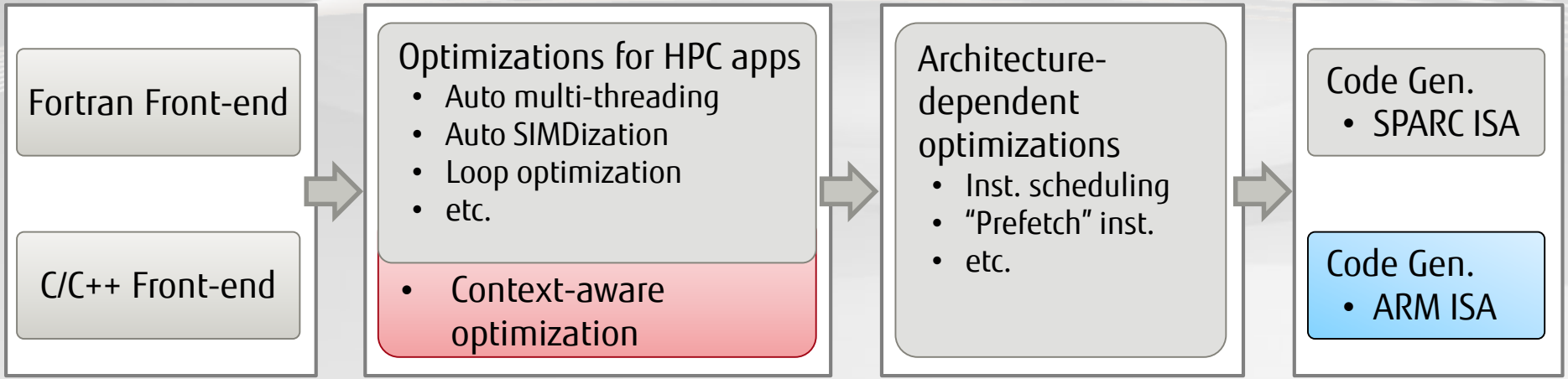
- Fujitsu is entering the ARM community to utilize its power and to contribute
  - Fujitsu adopts ARM ISA for Post-K's CPU
  - Fujitsu is the "Lead Partner" in ARM HPC extension development
  - Fujitsu is designing and implementing its proven HPC-optimized microarchitecture into the ARM ISA-based CPU

HPC apps acceleration	Post-K	FX100	FX10	K computer
FMA: Floating-point multiply and add	✔	✔	✔	✔
Math. acceleration primitives*	✔Enhanced	✔Enhanced	✔	✔
Inter-core barrier	✔	✔	✔	✔
Sector cache	✔Enhanced	✔Enhanced	✔	✔
Hardware "prefetch" assist	✔Enhanced	✔Enhanced	✔	✔

*Mathematical acceleration primitives include trigonometric functions, exponential functions, etc.

Fujitsu's HPC Compilers for ARM ISA

- Fujitsu contributes to the ARM community by providing the compilers with its proven HPC technologies
- Fujitsu's compiler will support ARM ISA and the advanced optimizations



Context-aware Code Optimization

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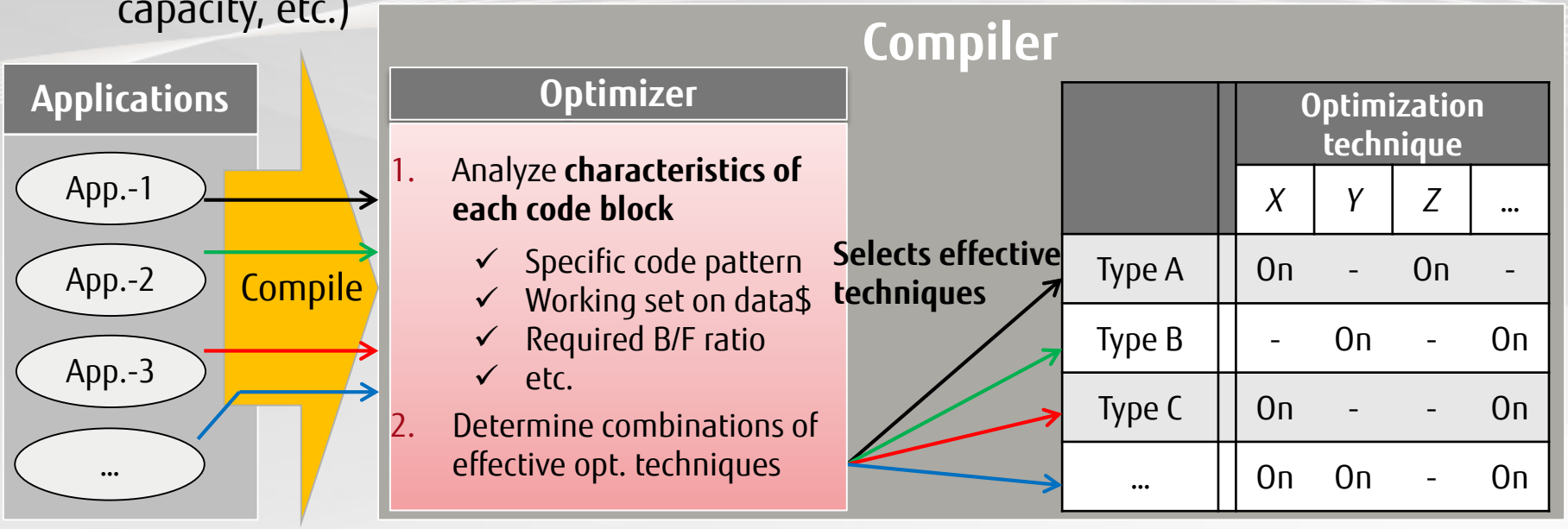
- Automates code optimizations to wider range of applications
  - Determines and applies the most effective optimization techniques w/o directives
  - Reduces the burden of the code rewriting using machine characteristics (cache capacity, etc.)



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Job-dedicated Local File System

Job-dedicated, Scalable Local File System

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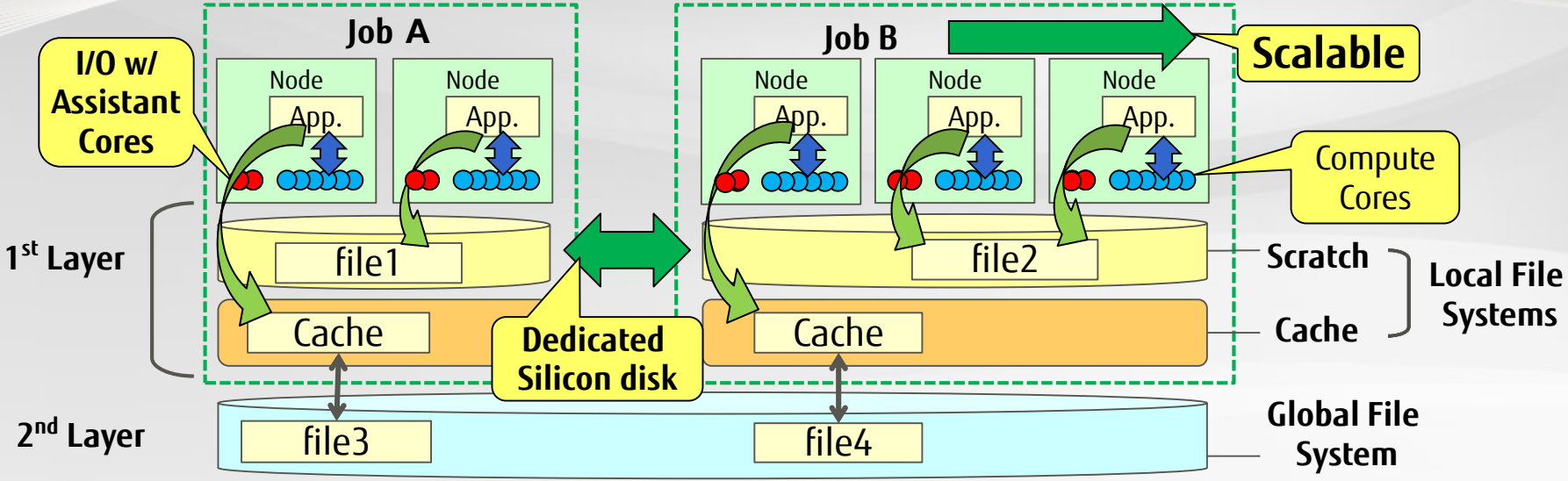
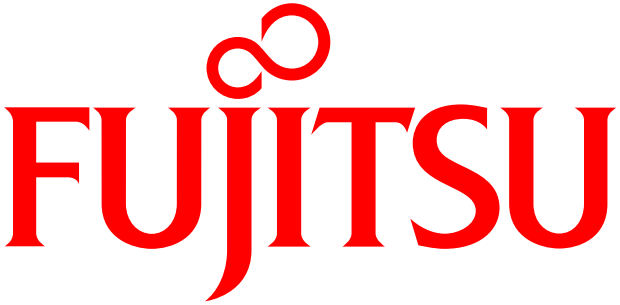
- New local file system for accelerating I/O processing
  - Dedicated, silicon disk-based 1st layer file system allocated for each job
  - Simultaneous computation and file access by offloading I/O with assistant cores
  - Scalable performance according to job size(> 10,000 nodes)





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