

Transformer Core: Next-Generation Many-Core Architecture

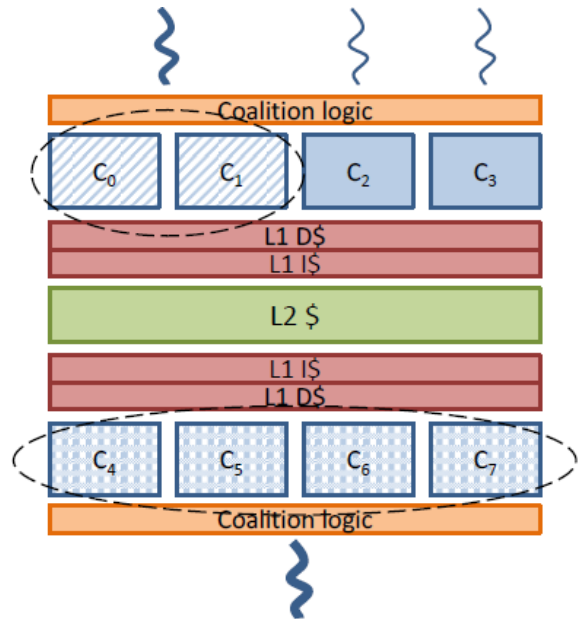
The processor is the heart of any computing system from the servers to the PCs and the smartphones. It determines the performance, the energy-efficiency, and the programmability of the entire system.

SoC's Transformer Core is a next-generation many-core processor architecture that can morph itself under software control to match the computing workload. The architecture is fabricated as a collection of many simple processor cores on a single chip. For application code fragments with high degree of parallelism exposed by the programmer, Transformer Core deploys the simple cores in parallel just like conventional many-core architectures. The main benefit of Transformer Core is for legacy sequential applications or applications with substantial sequential component. Transformer Core can dynamically build complex cores through coalition of multiple simple cores that can automatically extract parallelism from the sequential code fragments without programmer intervention.



Features

- Automated adaptation of the architecture to match the application
- Fabricated as a homogeneous many-core architecture but can transform itself into different heterogeneous many-core architectures under software directive
- Hardware-software cooperative solution
- Fully automated scheduling of workload on the architecture



Transformer Core Architecture



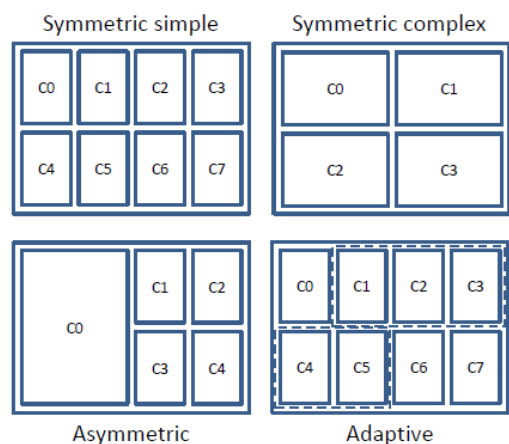
Applications

- From servers in data centers and cloud to PCs and embedded systems



Benefits

- High-performance at low-energy
- Completely transparent to the programmer
- An architecture that can universally accelerate both parallel and sequential code



Dynamic Transformation of the same chip into different heterogeneous architectures under software control