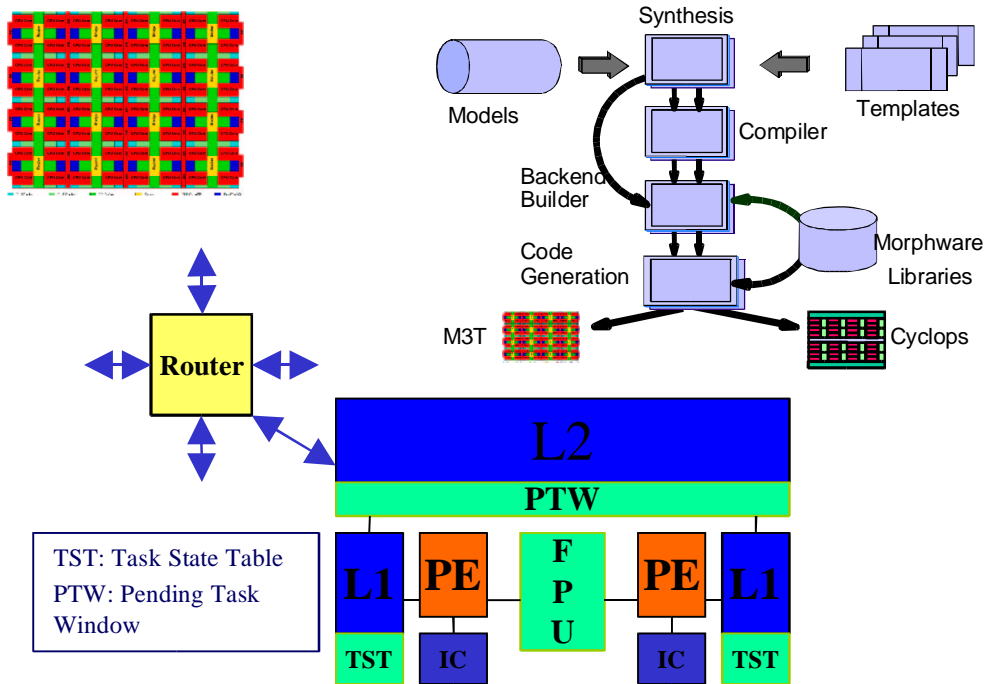


M3T: Morphable Multithreaded Memory Tiles



New Ideas

- Chip reconfigures into VLIW, MIMD, Streaming, and TaskScalar morphs on demand within application
- Polymorphism at every stage of the system: synthesis tools, compiler, backend builder, and morphware
- Novel hardware to enhance programmer productivity in parallelizing and debugging code

Impact

- M3T polymorphous hardware included in Blue Gene/C (Cyclops) chip
- M3T speeds up Sphinx speech processing about 2.5x times through polymorphism
- Estimated: 60x reduction in size, weight, and power per speech channel; 20x reduction in cost per speech channel
- M3T debugs data races 100x faster than current state of the art

Schedule

- Dec 2002:** Evaluation of the HW and SW support for Streaming in M3T
- Dec 2002:** Integration of the tools, which include synthesis, compiler, backend, code gen, and simulators
- Feb 2003:** Full evaluation of the TaskScalar compiler and morph
- Apr 2004:** Implementation of the full soft-core for the Blue Gene/C (Cyclops) chip