Power-Efficient Reconfigurable Baseband Processor

The traditional ASIC approach to baseband processing is limited in flexibility and die size usage efficiency for multiple standards. A reconfigurable baseband processor (part of the scalable communication core) promises to reduce size of and increase flexibility for baseband processors running multiple standards.

- Enables development of new protocols in the high-level language (DPL) with a full set of software tools
- Uses reconfigurable engine
- Power efficiency
- Reduced time-to-market for implementation of new protocols
- Reduced footprint over the sum of single protocol ASIC solutions for multi-radio case

Generic DPE architecture

- 4GMul/s* and 6GAdd/s* of performance
- Average power consumption < 100mW*
- Die size 5mm2* at 90nm process
- Easily scalable

*For design running at 266MHz, 1 stream workload with activity factor ~50%, supporting 802.11n/802.16e memory requirements
Programming of reconfigurable data-streaming architecture with coarse-grained parallelism is a challenging problem.

We provide complete technology including:
- Data-Streaming Architecture Programming Model
- Retargetable SW Development Toolkit
- DPL, Data-stream Processing Language
- DPE Architecture Exploration tools

DPL is a *new programming language* for data-streaming systems designed specially to support the generic DPE structure.

**DPE based Solution for Multi-Radio Base-Band Processing**

**Firmware (FW) Development Process:**
- Standards/Specifications analysis
- Algorithms design
- Control/Dataflow partitioning & mapping
- FW implementation in DPL/DAsm and C
- Debugging on DPE Simulator
- Load ready FW into DPE

**Full set of SW Tools for DPE FW Development**

- DPE IDE
- DPL Compiler
- DPE Assembler
- DPE Linker
- DPE Simulator
- DPE Debugger
- HW I/O Driver

**Single Technology - Multiple Solutions**

Tools

- DPE - Soft IP Core: Reconfigurable Architecture & Retargetable Toolkit
- Customization for Selected Applications Class

Multi-Radio Applications
- Multi-Media Applications
- Others Data-streaming Applications

Research at Intel

www.intel.com/research