Reconfigurable Computing in Embedded Systems

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Motivation
- Reconfigurable
- Low Power
- Easily Programmable
- Simple Hardware Integration

EKG Premise

Overview of reconfiguration process

Reconfigurable Programming Paradigm:
- Library of functions
- General code template
- Real-time compilation
- Reconfigurable intelligence
- Transmission Cleanup

Update/Deployment:
- Applications can be updated as well as deployed remotely or directly
- Reconfigurable
- Low Power
- Easily Programmable
- Simple Hardware Integration

Motivation
EKG Premise

Reconfigurable Nature

Hardware Architecture

Sample reading from EKG

Sample anomaly: Arrhythmia

SunSPOT Hardware Components:
- ARM920T 180 MHz, 32-bit
- 512K RAM/4M Flash
- ChipCon CC2420 802.15.4 radio (ZigBee)
- 3.7V rechargeable 750 mAh battery
- Attached Sensor Board:
  - Atmega88 Microcontroller
  - 10-bit ADC with temperature sensor

ADC is able to sample more than 1000 samples/sec

Software Architecture

Sample anomaly: Arrhythmia

Low Power Processing

Sponsored by Sun Microsystems