8051 Working Group

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D I K U

Motivation

- Old school
  - 8051 developed in 1980 by Intel
  - Simple harvard(-ish) architecture
  - Many odities
- Widespread
  - 20+ manufacturers
  - Large span of applications from home automation to breath analyzer
  - Cheap
  - Now coming out as SoC
- What is it good for?
  - Implement TinyOS and experiment
- Issues:
  - How will TinyOS cope with the simple architecture?
  - No gcc: how to build tool chain?

Progress

- TinyOS 1.x
  - Basic port for nRF24E1 (March 2006)
    - TEP121
- TinyOS 2.x
  - Basic port for CC2430 (May 2007)
    - (come see demo outside)
  - TEP on new platform in progress
- Tool chain
  - Script to rewrite code to Keil (mangeAppC)
    - More elaborate
- Working group
  - Small DIKU centered
  - Independent projects, not coordinated

Tool chain

- Keil vs. GCC
  - Different dialects ie.
    - __attribute, #warning, [] != [0], etc.
  - Size of variables ie. unsigned int = ?
  - No inline
- 8051 oddities
  - Non ANSI-C
    - Memory locations sfr, xdata, code, etc.
    - Bit addressable locations
- Hack: mangleAppC.pl

T2 CC2430 platform

- Lives in “contrib”
  - Make system allows compiling apps from Core eg. “Blink”
- Variants of chip
  - inherit from “mcs51” meta-chip
- Subsystems
  - Timers, UART, ADC
  - Radio
    - SimpleMac
    - CC2420 stack
      - in progress

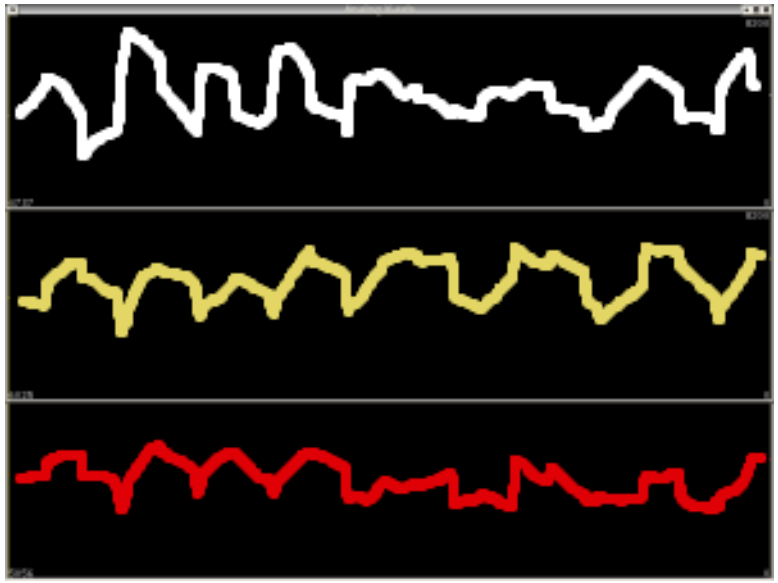
```
Contrib Tree
   mcs51
      tos/chips
         mcs51
         nRF24E1
         cc2430
            radio
            timers
            adc
      tos/platforms
         nano
         cc2430eb
         nRF24E1_EVKIT
```

Next steps

- Tool chain
  - Solve inline problem
  - Integrate Keil support in NesC
    - multi compiler support is generally interesting
- Working group
  - Define scope of group
  - Encourage participation
    - Organize collaboration/competition
    - Collect feedback, in particular from industry
- Platforms
  - Port nRF24E1 to TinyOS 2
  - Expand CC2430 port

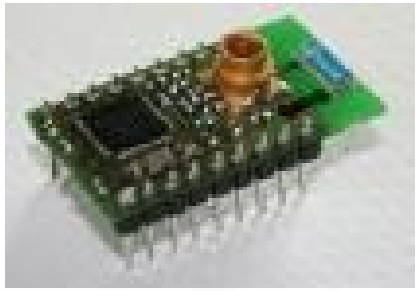
Demo

- Sample and send
  - Accelerometer input
  - PC as base station



Nano

- cc2430 / cc2431 (w. location engine)
- 25x15 mm
- Available 2007 60 € ~ 75 $



http://www.sensinode.com