SLOTH: Let the Hardware Do the Work!

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Confessions of a Slothful

Sloth: Let the Hardware Do the Work! (SOSP-WiP 2009)
How It All Began...

- Building embedded OSes as used in automotive industry
- Prevalent OS standard: OSEK OS
  - Event-triggered, priority-driven real-time system
Let the Hardware Do the Work!
**Sloth: Threads as Interrupts**

- Idea: Let interrupt subsystem do the scheduling and dispatching work
- New: All threads are interrupt handlers and have interrupt priorities
- New: `setReady(thread)` is implemented as an IRQ
SLOTH: Design and Example

- **IRQ Source**
  - **Thread A**: prio=1 request
  - **Thread B**: prio=2 request
  - **Thread C**: prio=3 request

- **IRQ Arbitration Unit**

- **CPU**
  - curprio=X

- **IRQ Vector Table**
  - threadA()
  - threadB()
  - threadC()
**Sloth: Advantages**

- Simple
- Small
- Fast (2–20x)
- Cool
**Sloth: One of the Seven Deadly Sins**


Nicolas le Rouge, *Le Grant Kalendrier Des Bergiers* (1496)
1. Talk to me!