Forum Internacional de Software Livre

Real-Time Linux

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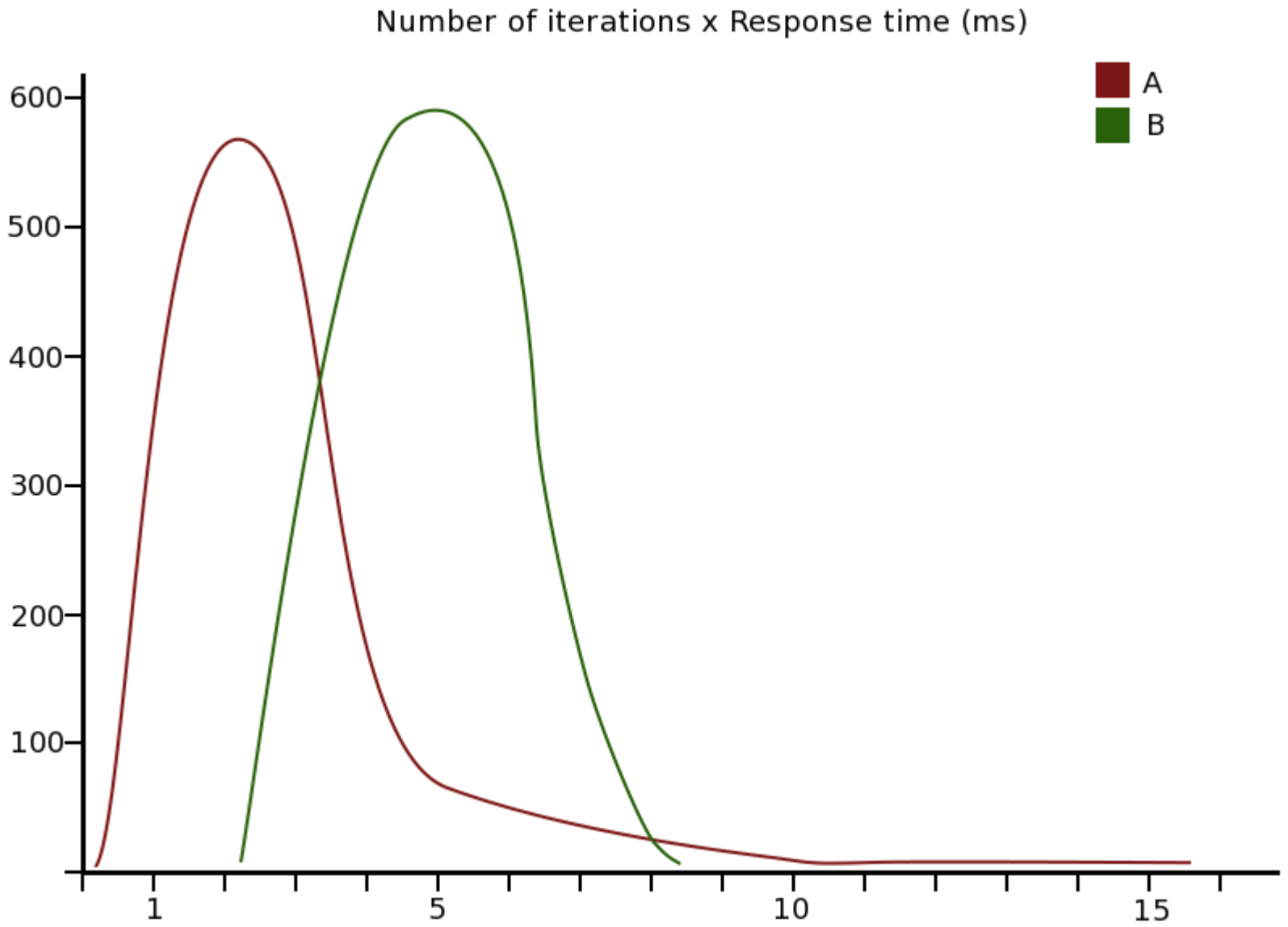
Who I'm and what we will talk about?

What does Real-Time means?

Event -> Response, latency, response time, deadline...

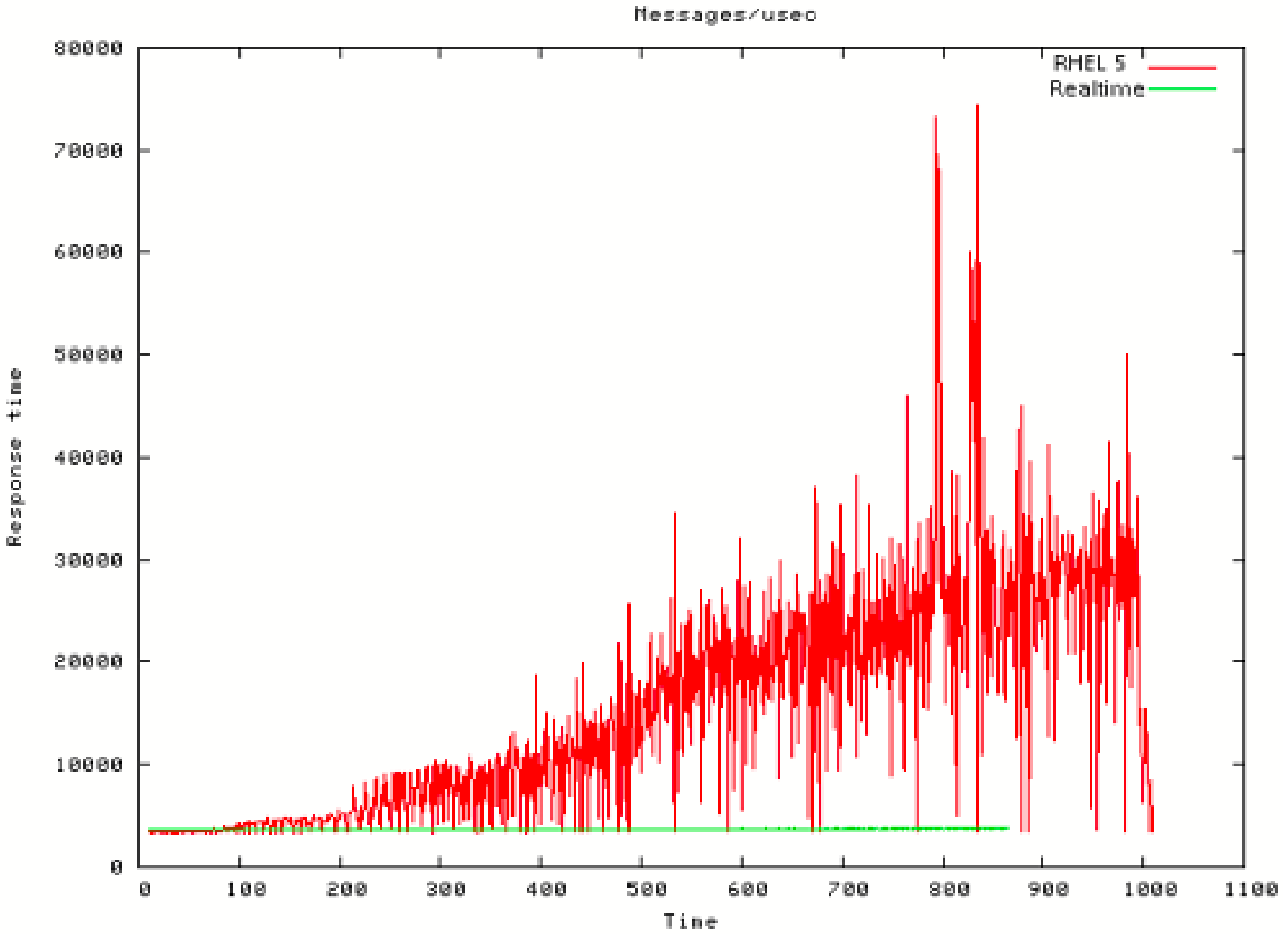
Then Real-Time means fast?

Real Time != FAST!



RT means Determinism, know WCET, Reliable results, repeatability

How Red Hat shows your Real-Time Linux



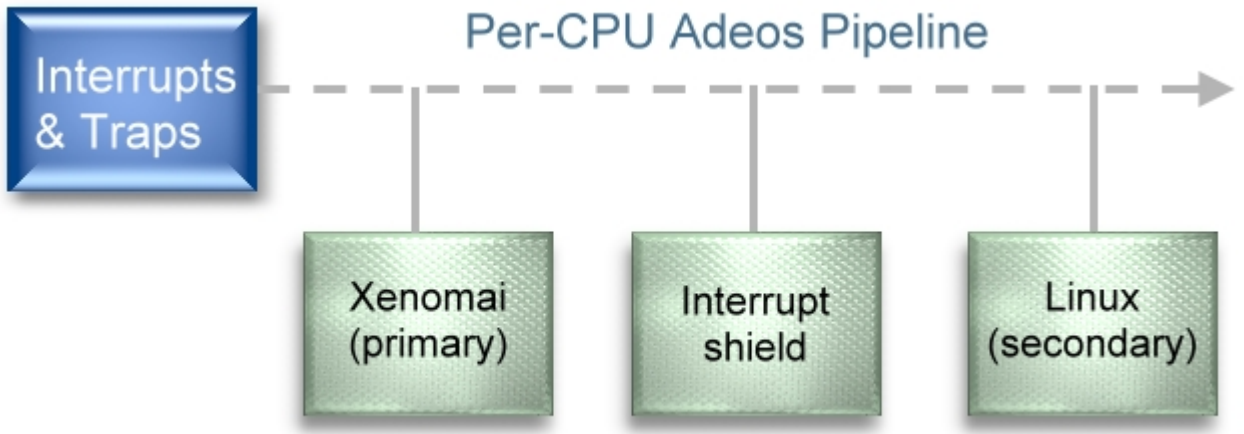
What is a Real-Time Operating System?

Real-Time Operating System Examples

Why Linux is not a RTOS?

Real-Time Linux: Past, Present, Possible Futures...

RTAI and Xenomai


Per-CPU Adeos Pipeline
Interrupts & Traps
Xenomai (primary)
Interrupt shield
Linux (secondary)

RT Task on Xenomai + Non-RT on Linux...

):) <- this is a bipolar emoticon

PREEMPT-RT

The right way to think on Real-Time Linux

PREEMPT-RT Features

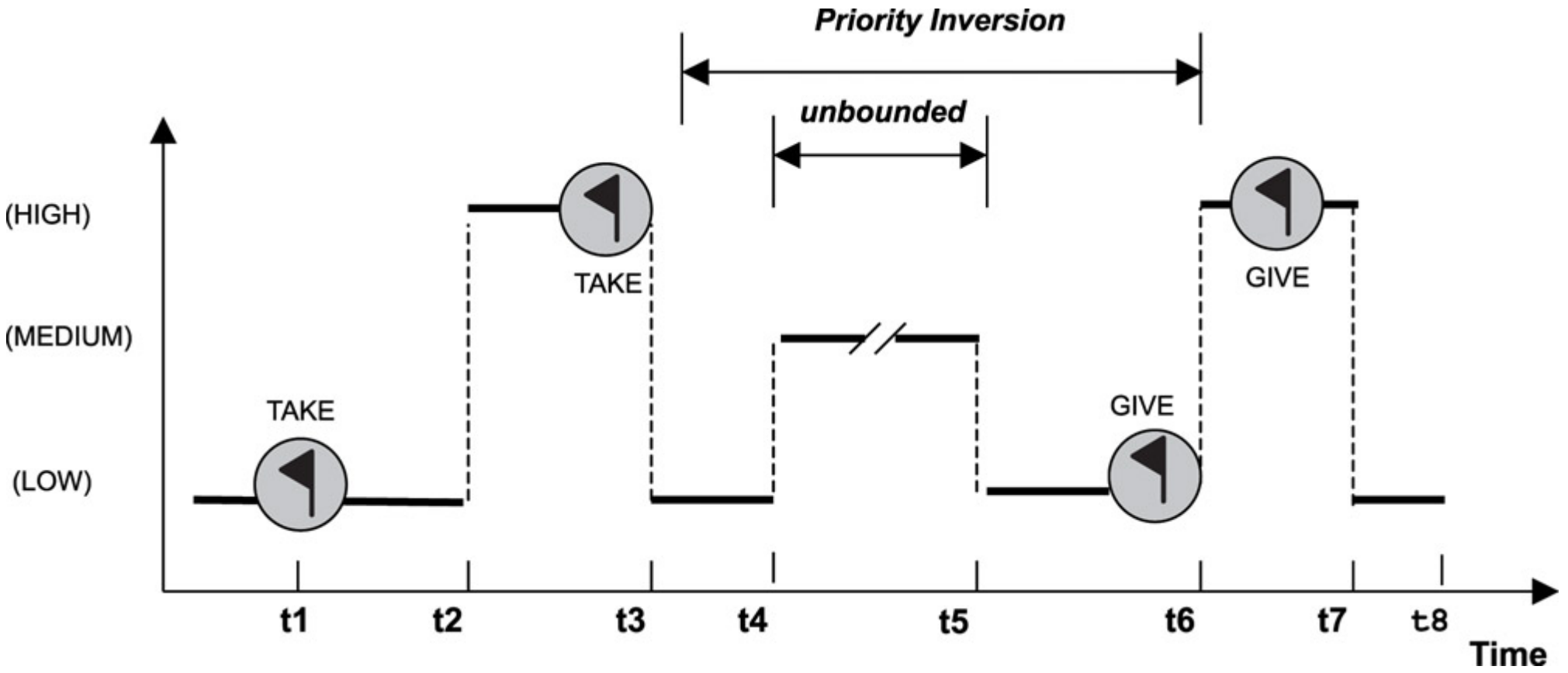
Many of which are already in the vanilla kernel

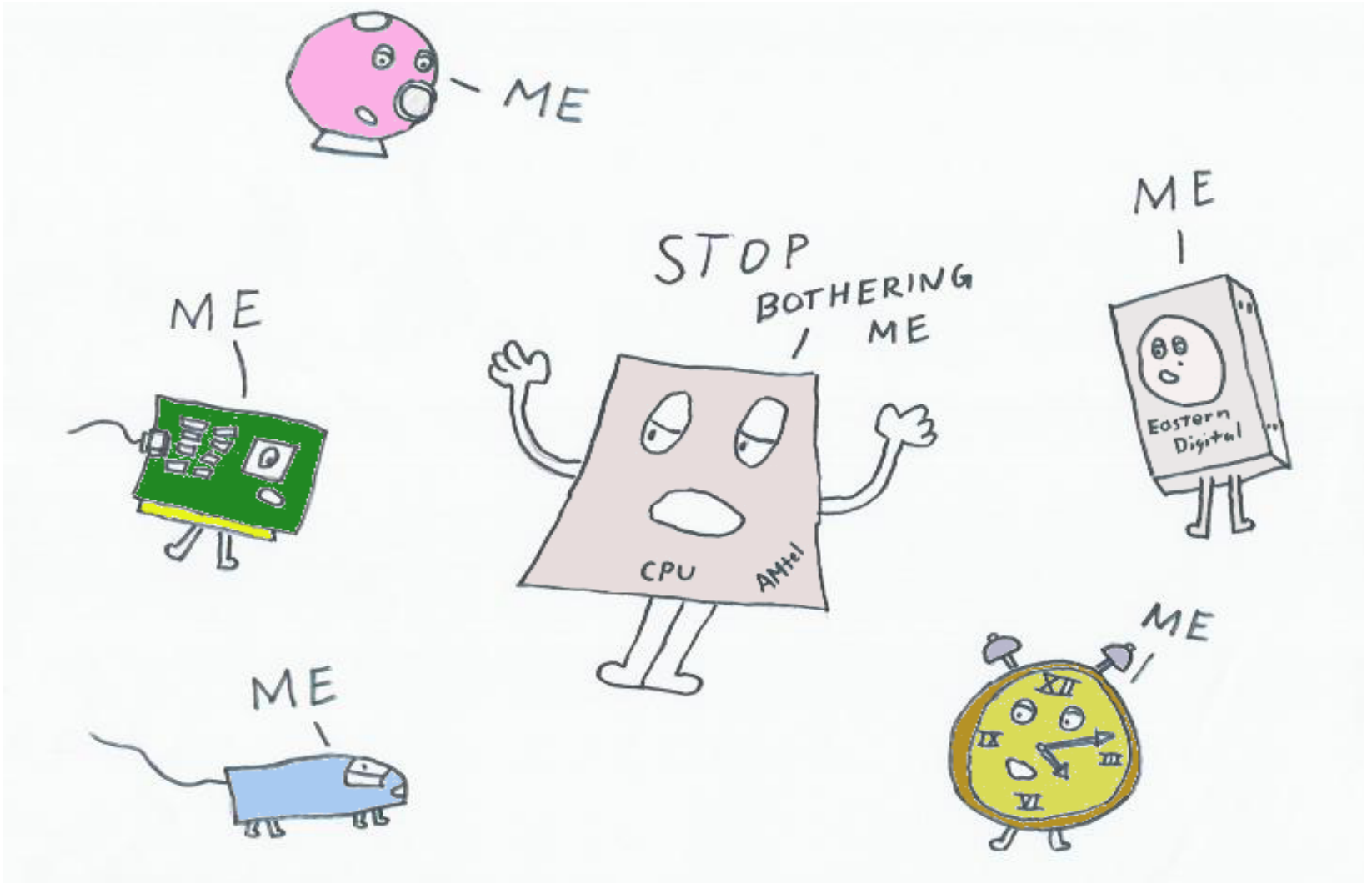
High Resolution Timers

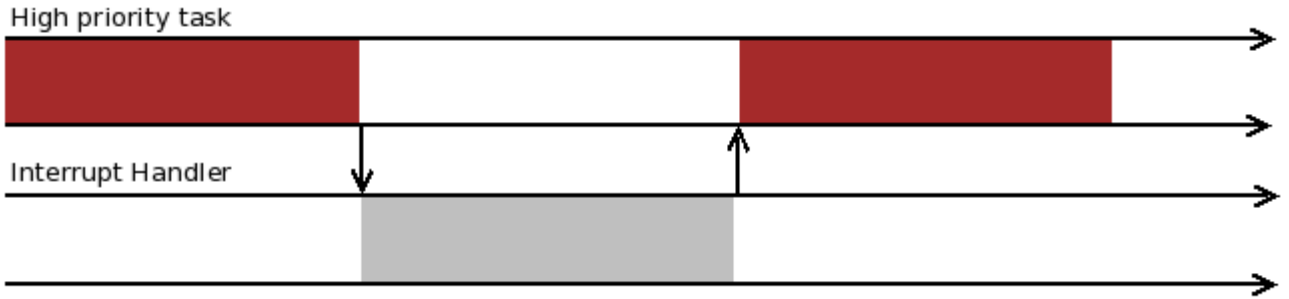
Preemptive lock

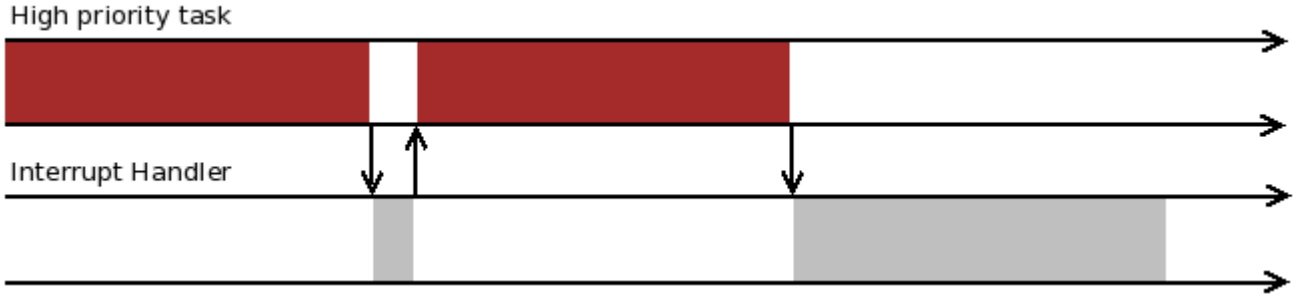
Priority inversion

problems...


Priority Inversion
unbounded
(HIGH)
(MEDIUM)
(LOW)
TAKE
TAKE
GIVE
GIVE
t1
t2
t3
t4
t5
t6
t7
t8
Time


ME
STOP
BOTHERING
ME
ME
ME
CPU
AMtel
Eastern
Digital
ME
ME


High priority task
Interrupt Handler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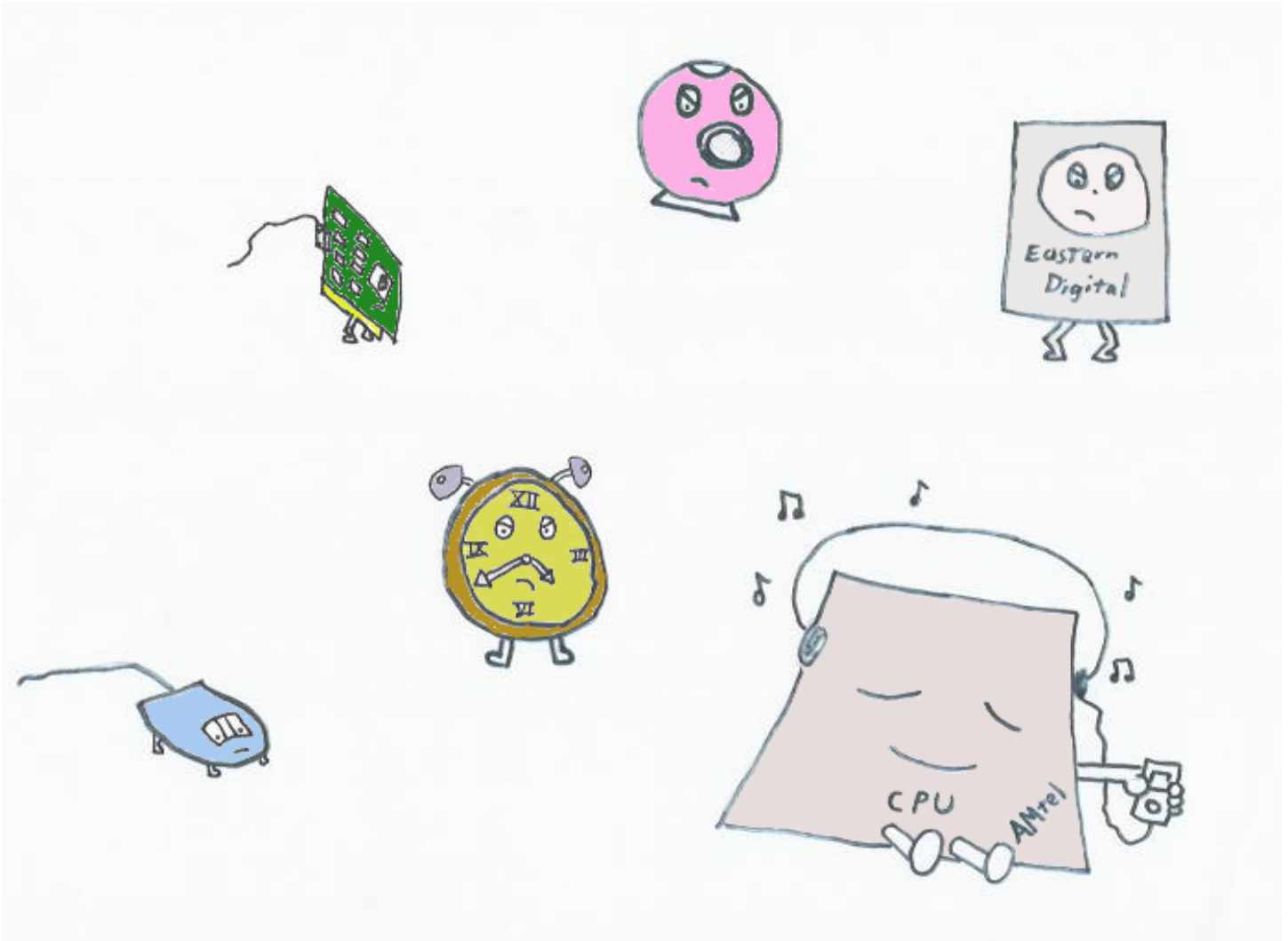
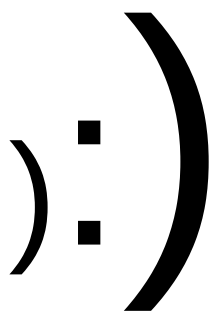

Eastern
Digital
CPU
AMtel

Than... PREMPT-RT IS

WONDERFULL! Let's use everywhere!!!



This is another bipolar emoticon, but more happy than another...

How expensive is PREEMP-RT?

Possible futures...

Make kernel more preemptive...
No BKL (already), subsystems lock, Preemptive mm... and so on...

IRMOS and SCHED_DEDLINE

Is this the future (??)

LITMUS^RT

The right way to put academia and Linux together

Aleatory tips space...

Questions?

Thank you all!

I (L) Porto Alegre!