

Best Effort Scheduling

Cpr E 458 Final

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Project Goals

- ◆ Best Effort Simulation
- ◆ Platform independent
- ◆ Reasonably fast
- ◆ GUI-based
- ◆ Easy to understand output

Schedulers Used

- ◆ HVDF
- ◆ EDF
- ◆ EDF+HVDF with adjustable mixing

HVDF Scheduler

No deadline enforcement

- ◆ Time \geq Ready Time
- ◆ Remaining CPU time > 0
- ◆ Value Density $>$ previous best

HVDF Scheduler

Deadline Enforcement

- ◆ $\text{Time} \geq \text{Ready Time}$
- ◆ $\text{Remaining CPU time} > 0$
- ◆ $\text{Time} < \text{Deadline}$
- ◆ $\text{Value Density} > \text{previous best}$

HVDF Scheduler

Deadline Enforcement + Sanity Check

- ◆ $Time \geq Ready\ Time$
- ◆ $Remaining\ CPU\ time > 0$
- ◆ $Time < Deadline$
- ◆ $Remaining\ CPU\ time + Time \leq Deadline$
- ◆ $Value\ Density > previous\ best$

EDF Scheduler

No deadline enforcement

- ◆ Time \geq Ready Time
- ◆ Remaining CPU time > 0
- ◆ Time till deadline $<$ previous lowest

EDF Scheduler

Deadline Enforcement

- ◆ Time \geq Ready Time
- ◆ Remaining CPU time > 0
- ◆ Time $<$ Deadline
- ◆ Time till deadline $<$ previous lowest

EDF Scheduler

Deadline Enforcement + Sanity Check

- ◆ $\text{Time} \geq \text{Ready Time}$
- ◆ $\text{Remaining CPU time} > 0$
- ◆ $\text{Time} < \text{Deadline}$
- ◆ $\text{Remaining CPU time} + \text{Time} \leq \text{Deadline}$
- ◆ $\text{Time till deadline} < \text{previous lowest}$

EDF+HVDF Scheduler

Deadline Enforcement + Sanity Check

- ◆ $\text{Time} \geq \text{Ready Time}$
- ◆ $\text{Remaining CPU time} > 0$
- ◆ $\text{Time} < \text{Deadline}$
- ◆ $\text{Remaining CPU time} + \text{Time} \leq \text{Deadline}$

EDF+HVDF Scheduler

Deadline Enforcement + Sanity Check

- ◆ EDF+HVDF value is calculated
- ◆ $\text{Time to deadline} - \text{Weight} * \text{Value Density}$
- ◆ EDF+HVDF value < previous lowest

Results

- ◆ Adding deadline enforcement & sanity checks made huge improvements
- ◆ HVDF works quite well
- ◆ EDF+HVDF can equal or outperform all others with the proper weight
- ◆ The proper weight changes for each set

Conclusions

- ◆ If execution time is critical, HVDF with deadline & sanity checking is the best.
- ◆ EDF+HVDF can outperform the best HVDF, but finding the critical weight is important and non-trivial (at least currently).



Created, edited, and presented on a Mac,
using Apple Keynote.

