

Analysis of the Tradeoffs between Energy and Runtime for Multilevel Checkpointing Notes

~ Writing to PFS is expensive!

~ multilevel checkpoint lightens PFS load

I. Local checkpoint

II. Local checkpoint + Partner copy

III. Reed Solomon coding

IV. PFS based checkpoint

~ Model for Runtime

- W - waste/time

W^{ch} Checkpoint overhead/time

W^{rew} rework overhead/time

W^{down} restart/~~past~~
time

τ_j dominated ~~all~~ by τ_i
if $W(\tau_i) \leq W(\tau_j)$
and $E(\tau_i) \leq E(\tau_j)$

- Pareto-optimal - if τ_i is not dominated by any other τ_j

Shed drop in DRAM power \rightarrow Checkpoint level 1

Checkpoints 2 & 3

- └ DRAM power drop when checkpoint data is copied locally
- └ Core power drop when transferring to a partner or encoding

PFS Checkpoint - long drop in power consumption