Control of RAPL

Energy-efficient HPC through processor-level power caping

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- **Context**
  - Application with compute- and I/O-bounded phases
  - *RAPL:* Running Average Power Limit
- **Objective**
  - max(performance) while min(power)
- **Approach**
  - Control of power cap to meet performance objectives
  - Control theory and feedback loops
    - → + predictive + guarantees + optimality
- **Testbed**
  - ANL's NRM (Node Resource Manager) running on Grid5k
- **Challenges**
  - application agnostic
  - performance definition
  - phases detection and prediction
  - large scale systems
  - application & hardware variability