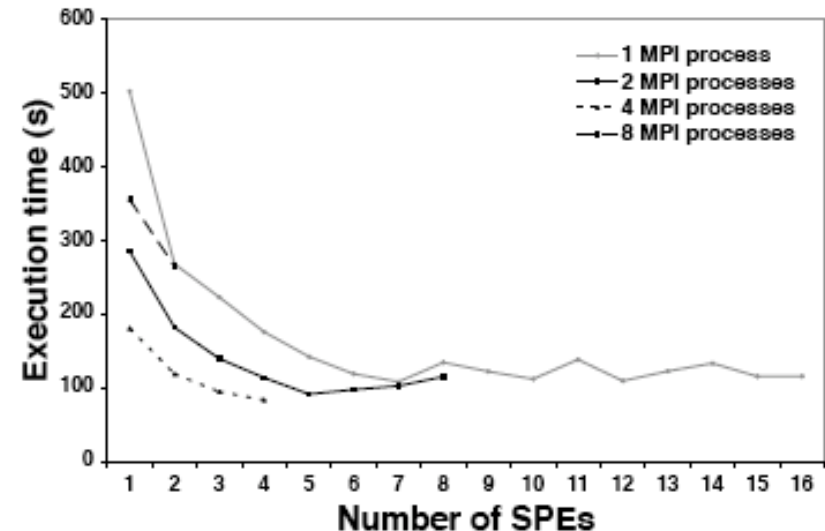


# Unifying Layered Parallelism on the Cell BE

- **Managing layered parallelism**
  - Host processor (PPE) serves as front-end
    - Work distribution
    - Communication with the outside world
  - Need balance of computation supply and demand
    - PPE, SPEs, intra-SPE (SIMD), inter-SPE, inter-PPE
- **Contributions**
  - Event-driven, split-task scheduling framework
    - Unified user-kernel scheduler for PPE/SPE tasks
    - Dynamic space-sharing
  - MMGP
    - Hierarchical model of layered parallelism
    - Optimal layered program decomposition and scheduling
  - Ongoing work: compiler automation
- **Results (see papers at PPoPP'07, IPDPS'07, HiPEAC'08, Parallel Computing)**
  - 2.7x over Linux+MPI+SDK on BladeCenter, PS3
  - Modeling error < 0.05 across four layers of parallelism

## PBPI results



	EDTLP	Linux
1 worker, 20,000 gen.	265s	263.5
2 workers, 20,000 gen.	136.1s	145
3 workers, 20,000 gen.	102.3	187.2
4 workers, 20,000 gen.	72.5	134.9
5 workers, 20,000 gen.	74.5	186.3
6 workers, 20,000 gen.	56.2	146.3
7 workers, 20,000 gen.	60.1	157.8
8 workers, 20,000 gen.	57.6	158.3