SPE Challenges in Cloud Computing
Challenges

Quality properties & Trade-offs
- “unlimited resources” → scalability?
- Data consistency vs. scalability vs. costs

Who can optimize what?
- Cloud provider
- Cloud consumer

Where to optimize?
- SaaS, PaaS, IaaS

How to optimize?
- Benchmarks (not representing multi-tenancy?)
- Design-Time analysis (how would models look like?)
Software Challenges

Software

- Runtime Resource Changes
- Development-Time Performance Engineering
Resource Challenges

- Resources
  - Isolation
  - Hardware migration
  - Optimization
    - OS Layer
    - Hardware Layer
    - Virtualization Layer
  - Runtime Performance Management
    - Monitoring
    - Self-Adaptation
      - Transient States
Organization Challenges

- SLOs
- Lack of Transparency
- Description of Communication
  - QoS-Specification
  - Workloads
- Application
  - Resource Properties