Motivation
- Modern e-business systems gaining in size and complexity
- A number of competing e-business platforms on the market (e.g., MS.NET vs. J2EE-based application servers, such as BEA WebLogic, IBM WebSphere, Oracle AS 10g, JBoss, Sun ONE, Borland Enterprise Server, Sybase EAServer, etc)
- System architects/deployers faced with questions such as:
  - Which deployment platform would provide the best scalability and cost/performance ratio for a given project?
  - Are there potential hardware or software bottlenecks?
  - How much hardware resources (servers, CPUs, memory, etc) are needed to meet service-level agreements?
  - For a given deployment, what would be the average response time, throughput and utilization under the expected workload?

Roadmap
- Design and develop realistic workloads for performance and scalability analysis of e-business platforms, i.e., benchmarks
- Exploit mathematical performance models for performance prediction and capacity planning

Benchmarking E-Business Platforms
- Active participation in SPEC’s OSG Java Subcommittee:
  - IBM, Borland, Sun, Intel, Sybase, Oracle, BEA, Pramati

Performance Modeling
- Exploit Queueing Network and Queueing Petri Net (OPN) models
- Model analysis through analytical and simulation techniques
- Main contributions:
  - Exploiting Queueing Petri Nets for integration of hardware and software aspects of system behavior into the same model. Modeling of simultaneous resource possession, blocking, synchronization, asynchronous processing and software contention
  - Analysis of Queueing Petri Net models by means of simulation to circumvent the state-space explosion problem (SimQPN)