ServMark: A Framework for Testing Grid Services

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• How to test a large-scale and (grid-)service-based environment?
  • Dynamic environment
  • Heterogeneous environment
  • Large-scale environment

• How to generate realistic workloads for a wide range of testing scenarios?
  • Functionality testing
  • Reliability testing
  • Performance testing

ServMark: testing grid services

ServMark is a framework for testing grid services. Selected features:

• Distributed testing
  - Multi-source testing
  - Test large-scale environments

• Generate realistic workloads
  - "Realism" depends on testing scenario
  - Replay existing grid traces
  - Generate new workloads

• Automated results analysis
  - Provide ready-to-use results to the tester
  - Promote results sharing within the community

Current grid services in practice

• Failure rates
  10-45% CERN LCG, Grid3, etc.

• Functionality problems
  one every three test batteries fails

• Performance problems
  much higher wait times than simulation studies predict

Industry practice: Use testing to...

• Understand how real grid services behave under load
• Assess functionality
• Identify performance bottlenecks
• Perform realistic testing

Problems in grid services testing

• How to test a large-scale and (grid-)service-based environment?
  - Dynamic environment
  - Heterogeneous environment
  - Large-scale environment

• How to generate realistic workloads for a wide range of testing scenarios?
  - Functionality testing
  - Reliability testing
  - Performance testing

Timeline

2006  Aug  Sep  Oct  2007  Mar  Aug  Dec
ServMark idea  ServMark prototype  ServMark in Globus Incubator  ServMark v.1.0  ServMark v.1.5  ServMark v.2.0

ServMark Tester #1

ServMark Tester #2

We have used ServMark

• Functionality testing and system tuning
  Grid3, TeraGrid, DAS, PlanetLab, Condor U.Wisc.-Madison

• Assess the performance of grid middleware
  Globus v.3/4: MDT, GridFTP, WS GRAM, Condor,
  3rd party-tools: Koala, DI-GRUBER, Falkon

You can use ServMark

• Research in grid resource management
  testing your grid services, e.g., scheduler, monitoring system

• Grid maintenance and operation
  daily functionality checks, long-term maintenance, realistic tests,
  stress tests, reliability tests, design adequacy tests etc.

• Grid design, procurement, and performance evaluation
  comparing grid settings, "what if?" scenarios, grid benchmarking

ServMark: “Testing grid services as a service”