

Performance Visualisation in Real Time Monitoring of Web Service Applications

Marian Bubak^{1,2}, Włodzimierz Funika¹, Dominik Dziok¹, Marcin Koch¹, Allen D. Malony³, Marcin Smętek¹ and Roland Wismüller⁴

¹Institute of Computer Science AGH, Kraków, Poland

²ACC CYFRONET AGH, Poland

³Department of Computer and Information Science, Univ. Oregon, Eugene, USA

⁴Fachgruppe BVS, Universität Siegen, Siegen, Germany

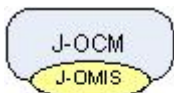
Web services

- Available on different software and hardware platforms
- Access through well defined, web based interface
- Easy to develop
- Since Web services are becoming more popular in distributed computing, developers must focus more on its performance issues, so performance monitoring and analysis tools are essential.

Goals

- | | |
|--------------------------------|--------------------------------|
| On-the-fly monitoring | Extendability of functionality |
| No source code instrumentation | Low level overhead |
| Real time 3D visualization | Distributed architecture |

Components



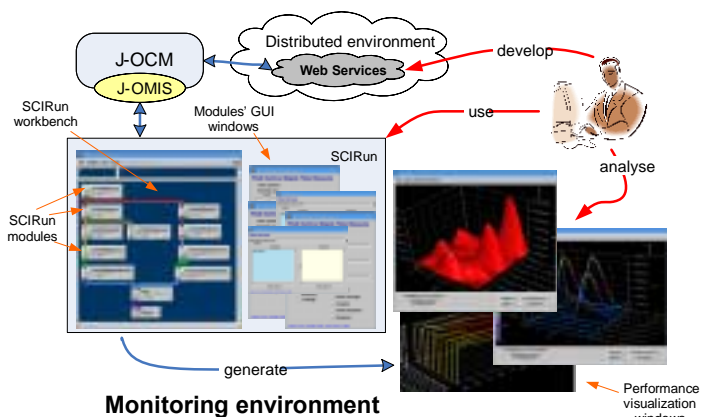
• **J-OCM** – monitoring system for Java applications with support of Web service monitoring. Based on J-OMIS interface.



• **TAU/Paravis** – a set of modules for SCIRun providing: real-time 3D performance visualisation

• **SCIRun** – Environment for solving scientific problems. Provides a framework for constructing modular applications, GUI. Also manages data flow communication between modules.

How it works?



The J-OCM monitoring system is used to gather monitoring data on a distributed application.

The modules written in compliance with the SCIRun environment carry out performance analysis.

The visualisation modules present a report to the user in graphical form.

Tests of the system

Characteristics

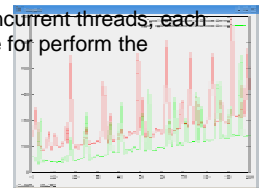
Distributed environment with several homogeneous host machines

Tomcat web server with Axis (web services support)

Web services which implement common operations on strings and 2-dimensional matrices

The client application executes many concurrent threads, each thread requesting a selected web service for perform the computation.

- Normally, the influence on the application's performance is low
- In some case it depends on the implementation of specific web services



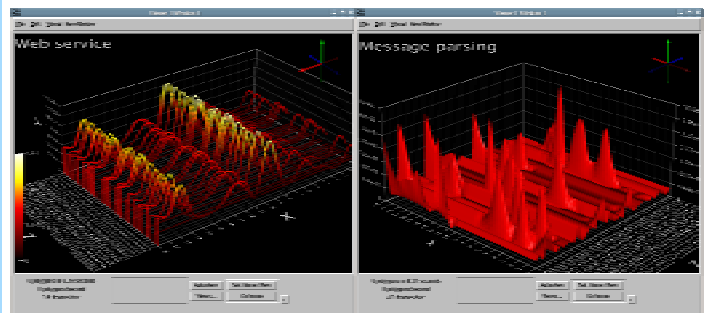
Performance metrics

- The duration of: web service activity, request/response, SOAP message parsing, operation code execution
- Size of incoming SOAP messages
- Multiple levels of data aggregation: momentary, summary, average
- Metrics related to Java Virtual Machine: garbage collector activity time, memory usage, thread states, method invocation time

Performance visualization

Waterfall

Terrain



References

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3. <http://software.sci.utah.edu/scirun.html> - SCIRun home page
4. <http://www.cs.uoregon.edu/research/paracomp/tau/tauprofile/dist/p-aravis/> - TAU's 3-D Profile Visualizer - ParaVis

