Improving SOA Applications Response Time with Service Overload Detection

Valeria Cardellini, Stefano Iannucci
{cardellini, iannucci}@ing.uniroma2.it
Department of Civil Engineering and Computer Science Engineering
University of Rome “Tor Vergata”, Italy

Introduction

- SOA applications are usually built by assembling third-party software services.
- Each service can be characterized by a Service Level Agreement (SLA) stating its Quality of Service (QoS) properties.
- SLA violations could occur, therefore a monitoring policy is needed to detect them.

  - It acts as a QoS-enabled service broker:
    - It stipulates SLA with third-party services;
    - It stipulates SLA with users;
    - It provides a composite service with QoS guarantees.

In this poster we present a monitoring system capable of detecting service state changes through an online adaptive Cumulative sum (Cusum) detector implemented into MOSES, showing a 26% improvement of the SOA application response time.

MOSES Architecture

- Knowledge
- Monitor + Analyze
  - Service Manager
  - QoS Monitor
  - SLA Manager
  - Execution Path Analyzer
- Storage
- Data Access Library
- Plan
  - Optimization Engine
- Execute
  - Composition Manager
  - BPEL Engine
- Adaptation Manager
- Concrete Services
- Service Registry
- BPEL Process
- Users

Experimental Results

- Experimental setup
  - Node 1: Execute + Monitor
  - Node 2: Plan
  - Node 3: Analyze and Marketplace
  - Node 4: Client

- Services in marketplace implement a MDIm/PS queue to simulate CPU load

- 26% response time improvement using monitoring and analysis

REFERENCES
