WSLA: Web Service Level Agreement

http://www.research.ibm.com/wsla/

WSMO Working Group Presentation
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Presentation Overview

• Introduction
• WSLA Framework
  – WSLA Run-time Architecture
  – WSLA Language
• Conclusions
Introduction

• **WSLA** – provides a framework for service level agreement (SLA) for Web services

• An SLA:
  – specifies agreements between a service provider and a customer
  – specifies the measurements to be taken in case of deviation and failure

• **WSLA is used for monitoring and managing services**
WSLA Framework

• Consists of:
  – A runtime architecture which contains several SLA monitoring services
  – WSLA Language

• Design Goals:
  – flexible, formal language
  – integration with existing Electronic Commerce Systems
  – delegation of monitoring tasks to third parties
  – availability of SLA information to different parties
  – SLA-driven configuration of Managed Resources
WSLA Terminology

- **Resource Metrics** – retrieved directly from the resource residing in the service provider tier
- **Composition Metrics** – composed out of resource or other composed metrics according to a specific algorithm
- **SLA Parameters** – put the metrics available from a service provider in the context of a specific customer
- **Business Metrics** – relate SLAs parameters to financial terms specific to a service customer
WSLA Runtime Architecture

• Contains a set of SLA monitoring services:
  – Establishment & Deployment Service
    • negotiation and authoring
    • deploys the relevant part to different parties
  – Measurement Service
    • measures Resource Metrics and aggregate them in SLA Parameters
  – Condition Evaluation Service
    • compared measured SLA parameters against thresholds defined in the SLA document
    • notifies the parties about the violation of SLA
  – Management Service
    • takes action to correct problems that occurred due to the violation of SLA
WSLA Services and their interaction
WSLA Language

- An XML-based language used by both service providers and consumers
Defining SLA parameters and metrics

Connect the metric with the SLA Parameter

Specify the parties involved

Define the metric: how many values (in %) are over 80%

Collects samples data every 5 minutes and keeps only the last 12
Defining Service Level Objectives and Guarantees

Service Level Objective (SLO) guarantee by the provider

SLO validity

Precondition:
Overload Percentage < 30%

Guarantee:
Average Throughput > 1000

Defines when the expression of SLO should be evaluated

<ServiceLevelObjective name="SLO_for_AvgThroughput">
  <Obliger>ACMEProvider</Obliger>
  <Validity>
    <Start>2001-11-30T14:00:00.000-05:00</Start>
    <End>2001-12-31T14:00:00.000-05:00</End>
  </Validity>
  <Expression>
    <Implies>
      <Expression>
        <Predicate xsi:type="Less">
          <SLAParameter>OverloadPct</SLAParameter>
          <Value>0.3</Value>
        </Predicate>
      </Expression>
    </Implies>
    <Expression>
      <Predicate xsi:type="Greater">
        <SLAParameter>AvgThroughput</SLAParameter>
        <Value>1000</Value>
      </Predicate>
    </Expression>
  </Expression>
  <EvaluationEvent>NewValue</EvaluationEvent>
</ServiceLevelObjective>
Conclusions & Relevance to WSMO/L/X

- **Conclusions**
  - WSLA provides a runtime architecture and a language for SLAs specification for Web services
  - WSLA allows to express: *what* to measure, *how* to measure, *who* does what and *guarantees*
  - Usable during all SLA life-cycle

- **Relevant for:**
  - WSMX: the negotiation component