Cloud Applications Mashup and Adaptive Orchestration of Services

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Cloud Application Mashup

**Technique by which a web/cloud application aggregates data, presentation or functionality from two or more sources to create a new service/application**

**MOTIVATION**
WHAT?: creating a new service/application freely mixing existing services
WHY?: pushing for reuse, cheap development, surpassing monolithic solutions
HOW?: aggregating data, presentation and processes from multiple providers

**THE CONTRIBUTION**
Mashups automatically emerge via Self-Configuration
Mashups satisfy contextual and dynamic user needs and preferred Mashups autonomously perceive and adapt to the environment

Self-Configuration

**Ability of a system to configure and reconfigure itself under varying and unpredictable conditions**

ENTITY @ RUN.TIME
- Goals
- Capabilities / Cloud Services
- Concrete Workflow

MUSA IS BUILT ON AGENTS AND HOLONS
- Agents provide autonomy and social interactions
- Holons provide a flexible and scalable architecture for distributing the orchestration, sharing the knowledge and granting robustness
- Adaptation triggers from perceptions

MUSA PROVIDES LANGUAGES FOR GOALS AND CAPABILITIES
- GoalSPEC is a structured English language to facilitate the specification of goals
- Capabilities exploit a first-order logic based language to provide service semantics

Self-Adaptation

**Ability to recover from potential problems and continue to function smoothly**

**TWO FEEDBACK LOOP**
- The inner loop is based on a MAPE-K model (monitor-analyze-plan-execute)
- A strategic loop is based on self-configuration for re-organizing a new solution when changes are substantial (new requirements to be satisfied)

MUSA (a Middleware for User-driven Service Adaptation)

Adaptive Scenarios
- Maritime Emergency Procedure Merging
- Document Management System
- B2B Cloud Mashup
- Smart Travel
- Smart Home
- Smart Exhibition Center

References