Towards a Resiliency Decision Framework for Microservices

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Presenter

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Agenda

Introduction

Motivation & Application Scenario

Resiliency Decision Framework

Metamodel
Suggestion Procedure
Application
Example

Conclusion and Future Work
Introduction
Motivation

- Microservices offer strong **Benefits**: 
  - Independency 
  - Flexibility 
- … but strong **Challenges**: 
  - Distributed system 
  - Many moving parts 
  - Example: AWS Kinesis -> AWS Cognito -> AWS Service Dashboard 

- **Resiliency** is important! 
  - Service failures can’t be prevented 
  - .. but many concepts & pattern are known
Application Scenario

- **Challenge:** Which resiliency concepts are best suited?
Resiliency Decision Framework
Resiliency Decision Framework (RDF) - Basics

- **Analyzes:**
  - Service requirements
  - Resiliency pattern effects

- **Goal:**
  - Sorted list of resiliency pattern

- **General requirements:**
  - Technology independent
  - Flexible and universal

- **Out of Scope:**
  - Evaluation of specific QoS attributes (e.g. QoS Measurement Model)
Resiliency Decision Framework - Metamodel

- Well defined schema for RDF:
  - Basis for suggestion procedure
  - Presents services, concepts and their relationships
Resiliency Decision Framework – Suggestion Procedure

- Determine positive patterns
  - Through attribute matching

- Filter by specific rules or attributes

- Sort by evaluating each pattern against service requirements
Resiliency Decision Framework - Application

- **Develop catalogue:**
  - Focus on context and enhance pattern attributes
- **Define services:**
  - Based on requirements analysis
- **Application:**
  - Using the suggestion procedure
- **Implement patterns:**
  - Analyze technology specific implementations
- **Evaluate services:**
  - By analyzing QoS attributes
Resiliency Decision Framework - Example

• Partner Service requirements:
  • Central service -> high availability
  • Accessed by external customers -> offer minimal latencies

• Possible suggestions
  • Automatic scaling, escalation, monitoring

• … dependencies are analyzed e.g.
  • Automatic scaling needs load balancing
  ➢ Minimal latency through service discovery
Conclusion and Future Work
Conclusion and Future Work

• **Conclusion**
  - Presented well defined Metamodel
  - Shown overview of suggestion procedure
  - Applied it minimal example

• **Future Work**
  - Development of quality tree for software resiliency
  - Development of resiliency pattern catalogue
  - Applying resiliency decision framework to application scenario
Thank You!