



UNIVERSITÀ DEGLI STUDI DI TRENTO

# QoS Composition Modeling for Web Services

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# Outline

- ❖ Motivation
- ❖ Literature overview
- ❖ Research questions
- ❖ Methodology
- ❖ Conclusions



# Motivation

- ❖ web service composition to build complex added-value services
- ❖ non-functional properties should be taken into account
- ❖ web service quality composition model **is needed**



# Literature overview

- ❖ XML schemas [Tian et al.] and WSDL extension [Gouscos et al.; Tian et al.]
- ❖ Quality vector [Zeng et al.; Aggarwal et al.]
- ❖ Ontology-based [Maximilien and Singh]
- ❖ Agent-oriented [Aiello and Giorgini]
- ❖ Continuous-time Markov chains [Klingemann]



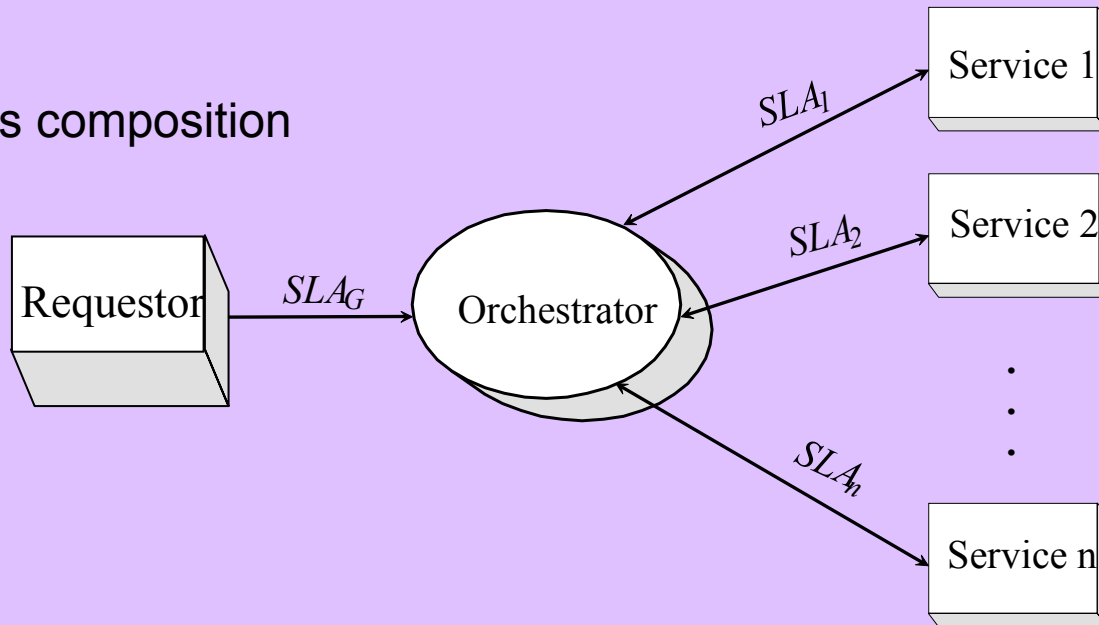
# Research questions [1]

- ❖ **QoS** (**Q**uality of **S**ervice) – non-functional properties of service
- ❖ **SLA** (**S**ervice **L**evel **A**greement) – expectations and obligations about service properties



# Research questions [2]

- ❖ SLAs of service composition negotiation and monitoring to meet  $SLA_{global}$
- ❖ Adding the Protection Level Agreement for negotiation on security parameters
- ❖ Auditing mechanism for SLAs composition





# Methodology

Solving the SLAs of web service composition and monitoring problem by:

- ❖ improving quality of service composition models for web services using optimization techniques;
- ❖ monitoring SLA with the goal of anticipating terms violations

## **What's in an Agreement? An Analysis and an Extension of WS-Agreement**

Marco Aiello, Ganna Frankova, and Daniela Malfatti

*TS3 Security, Exception Handling, and SLAs Session*  
December 13, 2005, 16.00 – 16.30



# Conclusions

- ❖ QoS composition models for web services
- ❖ Research questions
  - SLAs of service composition negotiation and monitoring
  - Negotiation on security parameters
- ❖ Directions to solve the problems





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**Thank you for attention!**