



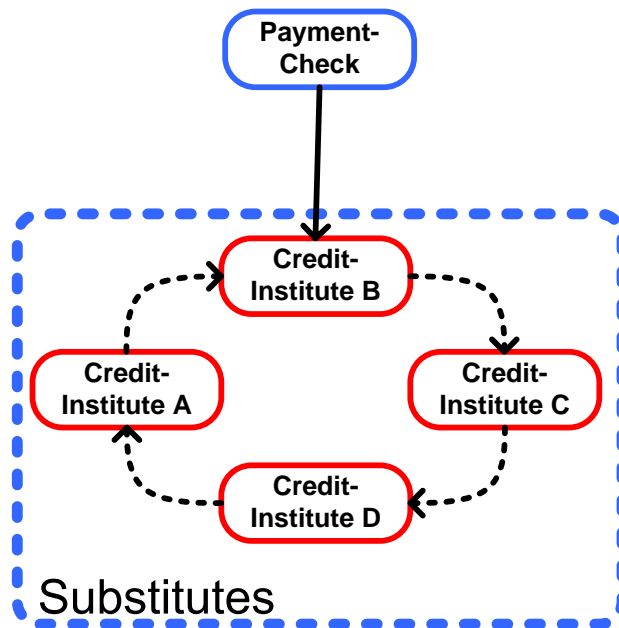
An Ontology for Quality-Aware Service Discovery

Steffen Bleul and Thomas Weise



Quality aware Service Discovery

- Quality aware discovering of substitute services for compositions.
- Enhancing compositions by choosing substitutes with better service levels.



Service level criteria:

- Minor expenses.
- Longer availability.
- Better work load.
- Faster response time.

Service Level Brokering

Current quality aware service discovery:

1. Vendor modelling quality of service document.
2. Composer choosing service with appropriate quality of service.
3. Composer negotiating with service vendor.

=> Cumbersome service integration

Proposed service level brokering:

1. Modelling service level packages and prices using our Ontology
2. Choosing by modelling requesting service level packages

=> Automatic service level brokering by matching requests and offers

Service Level Packages

- Service Level Packages as conjunction between obligated guarantees
- Disjunction between alternative Service Level Packages

Credit- Institute A	Service Offer Credit-Checking-Service		
	Quality- Dimensions	Gold- Guarantees	Silver- Guarantees
	Responsetime	< 200ms	< 400ms
	Transactions	10000	5000
	Contract time	1 month	1 month
	Price	50 €	20 €

Modelling Obligations

- Modelling obligated guarantees as rules using SWRL
- Matching obligated guarantees regarding their strictness

Expression:

Responsetime < 200

Description Logic (SWRL):

hasEffect(ObligatedGuarantee, SWRL_Rule_Lessth
an_200) AND

onDimension(ObligatedGuarantee, Responsetime)

=> hasValue(Responsetime, ?z) AND

swrl:lessThan(?z, 200)

Improving Brokering Flexibility

- Supplementary Service Level Packages are bought additionally
- Supplementary Service Level Packages effect obligated guarantees

Supplementary Packages:

Transactions = Transactions + 10000

Price = Price + 50

Description Logic (SWRL):

boughtSupplementary(moreTransactions) AND
hasValue(ObligatedTransactions, ?z)

=>

PackagePriceAdd(GoldPackage,50) AND
swrl:add(?z, 10000))

Service Level Brokering

Example

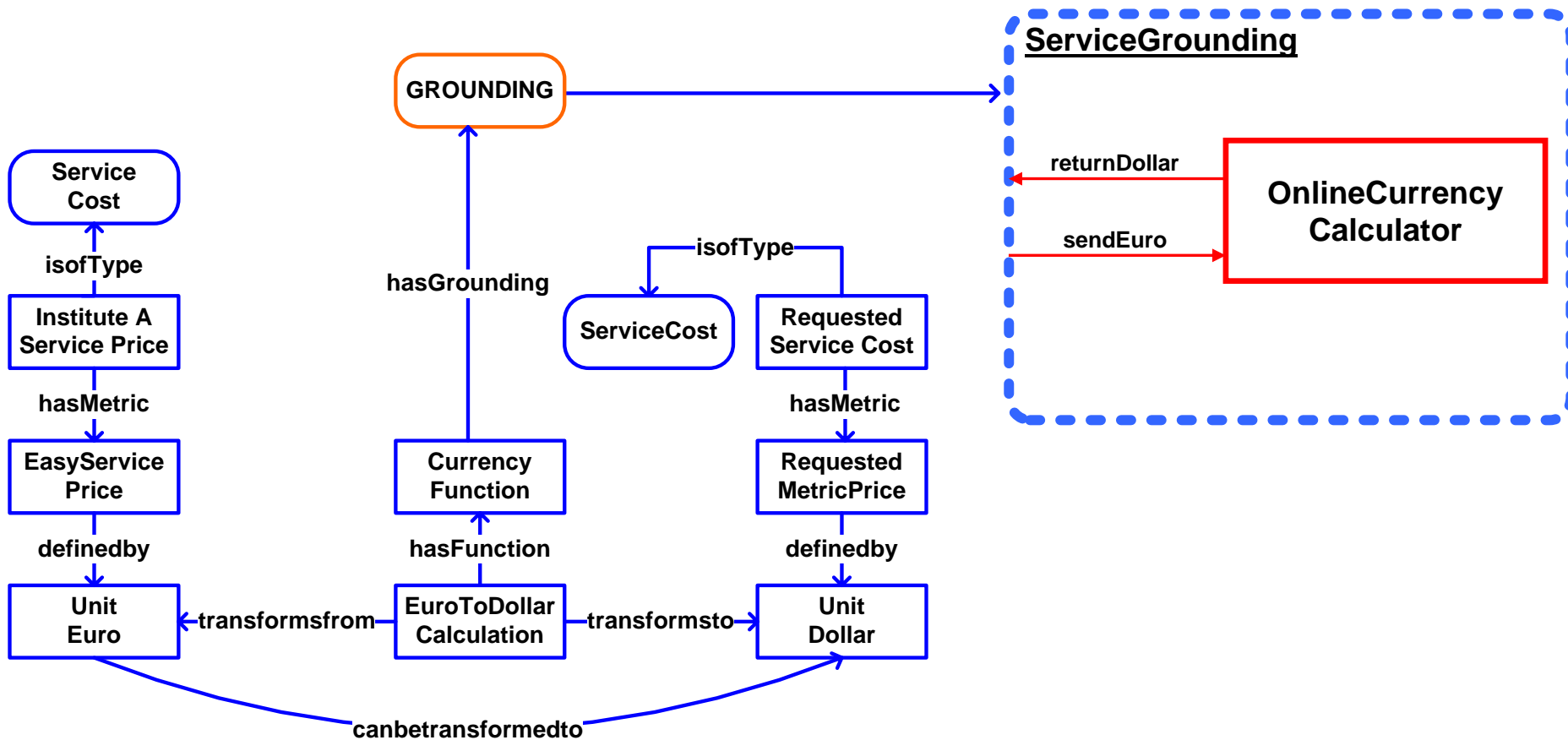
Quality-Dimensions	Service Offer Credit-Checking-Service			Service Request Credit-Checking-Service	
	Gold-Guarantees	Silver-Guarantees	Supplementary-Package	Quality-Dimensions	Requested-Guarantees
Responsetime	< 200ms	< 400ms		Responsetime	< 400 ms
Transactions	10000	5000		Transactions	> 4000
Contract time	1 month	1 month	+1 month	Contract time	1 year
Price	50 €	20 €	5 €		

Service Level Brokering:

Appropriate Service Level: Silver-Guarantees + 11 * (Supplementary-Package)

Matchmaking of Units

Two service level prices but different currencies



Conclusion

Service Level Brokering:

- Specifying Service Level Base Packages
- Specifying Service Level Supplementary Packages
- Matching by combining Base Packages with Supplementary Packages

Matchmaking Dimensions and Units

- Modelling semantic relations between quality dimension
- Modelling transformations between units.

=> Automatic quality aware service discovery and service level brokering.



The End

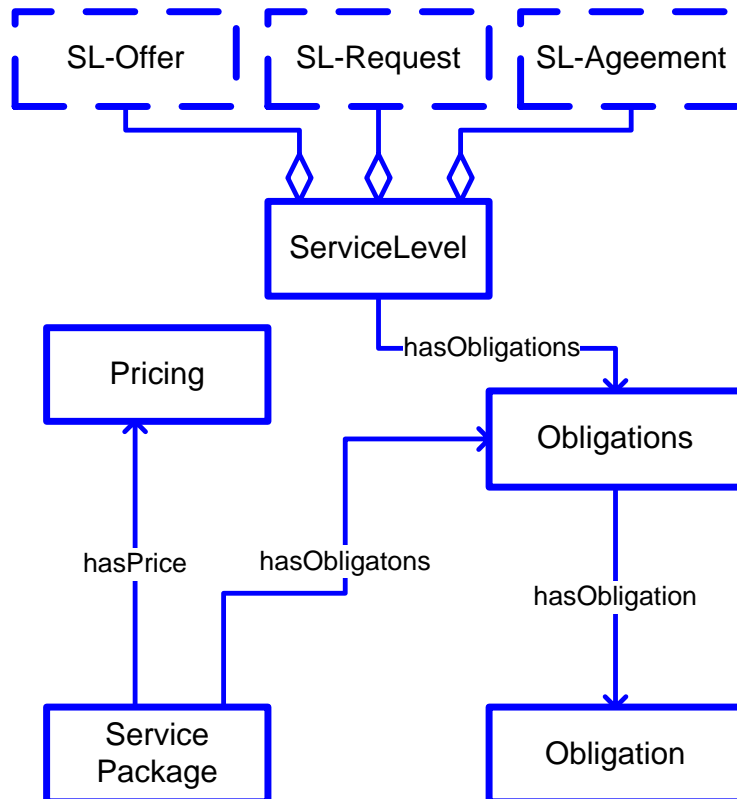
Questions ?



Modelling Service Level Packages

Example

Service Level Package Schema:



Service Level Offer Package Instance:

