

Contents

1	The Human-Provided Services Framework	1
	Daniel Schall, Hong-Linh Truong, and Schahram Dustdar	
1.1	Introduction	1
1.1.1	Approach	2
1.1.2	Contributions	3
1.2	Related Work	3
1.3	Interaction Models	4
1.3.1	HPS Interactions	5
1.4	HPS Framework	6
1.4.1	Middleware Platform	6
1.4.2	Data Collections	7
1.5	Implementation	8
1.6	Using the HPS Framework in Ad-Hoc Collaborations	10
1.6.1	Defining Service Interfaces	11
1.6.2	XML Collections of Services	13
1.6.3	Personal Services	13
1.7	Conclusion and Future Work	14
2	Unifying Human and Software Services	
	in Web-Scale Collaborations	17
	Daniel Schall, Hong-Linh Truong, and Schahram Dustdar	
2.1	Introduction	17
2.2	Web 2.0's Collaboration Landscape	18
2.3	Motivating Use Cases	19
2.3.1	Ad Hoc Contribution Requests	19
2.3.2	User-Defined Processes	20
2.3.3	Interactions with Formalized Processes	20
2.4	HPS in Web-Scale Collaborations	20
2.4.1	The Framework	21
2.4.2	Ad Hoc Collaboration Example	25
2.4.3	Process-Centric Collaboration Example	25
2.5	Future Work	26
		vii

3	Modeling and Mining of Dynamic Trust in Complex Service-Oriented Systems	29
	Florian Skopik, Daniel Schall, and Schahram Dustdar	
3.1	Introduction	30
3.2	Service-Oriented Collaborations	31
3.3	Communication, Coordination, and Composition	33
3.3.1	Social Trust in Collaborations	33
3.3.2	The Cycle of Trust	34
3.4	From Interactions to Social Trust	35
3.4.1	Interaction Layer	36
3.4.2	Personalized Trust Inference	39
3.4.3	Trust Projection Layer	40
3.5	Fuzzy Set Theory for Trust Inference	41
3.6	Trust Model Definitions	43
3.6.1	Fundamental Trust Model	44
3.6.2	Temporal Evaluation	46
3.6.3	Trust Projection	48
3.7	Towards Flexible Compositions	50
3.7.1	Community Balancing Models	51
3.7.2	Request Delegation Patterns	52
3.8	Architecture and Implementation	54
3.8.1	Interaction Monitoring	54
3.8.2	Activity Management	55
3.8.3	Trust Model Administration	55
3.8.4	Personal Trust Rules Management	55
3.8.5	Social Network Management and Provisioning	55
3.8.6	VieTECore	56
3.8.7	Human Provided Services in the Expert Web	56
3.8.8	Interaction Monitoring and Logging	57
3.8.9	Metric Calculation	58
3.8.10	Trust Provisioning	59
3.9	Evaluation and Discussion	61
3.9.1	Computational Complexity of Trust Management	61
3.9.2	Interaction Balancing in Large-Scale Networks	67
3.10	Background and Related Work	70
3.10.1	Flexible and Context-aware Collaborations	70
3.10.2	Interactions in Mixed Systems	71
3.10.3	Behavioral and Social Trust Models for SOA	71
3.11	Conclusion and Further Work	72
4	Script-Based Generation of Dynamic Testbeds for SOA	77
	Lukasz Juszczuk and Schahram Dustdar	
4.1	Introduction	77
4.2	SOA Testbeds	78
4.2.1	Related Research on SOA Testing	79
4.2.2	Evolution of Genesis	80

4.3	The Genesis2 Testbed Generator	81
4.3.1	Basic Concepts and Architecture	82
4.3.2	Extensible Generation of Testbed Instances	84
4.3.3	Exploitation of Groovy Features	86
4.3.4	Multicast Testbed Control	87
4.4	QoS Testbed Scenario	88
4.5	Discussion and Future Work	91
4.6	Conclusion	92
5	Behavior Monitoring in Self-Healing Service-Oriented Systems	95
	Harald Psailer, Florian Skopik, Daniel Schall, and Schahram Dustdar	
5.1	Introduction	95
5.1.1	Self-Healing Principles	96
5.1.2	Contributions	97
5.2	Flexible Interactions and Compositions	98
5.2.1	Scenario	98
5.2.2	Delegation Behavior	100
5.3	Architecture Overview	101
5.3.1	Mixed SOA Environment	101
5.3.2	Monitoring and Adaptation Layer	102
5.4	VieCure Framework	103
5.4.1	Interaction Monitoring	104
5.4.2	Event Trigger, Diagnosis, and Recovery Actions	105
5.5	Regulation of Behavior	107
5.5.1	Trigger	107
5.5.2	Diagnosis	107
5.5.3	Recovery Actions	107
5.5.4	Sink Behavior	109
5.5.5	Factory Behavior	109
5.5.6	Transient Behavior	110
5.6	Simulation and Evaluation	110
5.6.1	Simulation Setup	110
5.6.2	Results and Discussion	111
5.7	Related Work	113
5.8	Conclusion and Outlook	114
6	Runtime Behavior Monitoring and Self-Adaptation in Service-Oriented Systems	117
	Harald Psailer, Lukasz Juszczuk, Florian Skopik, Daniel Schall, and Schahram Dustdar	
6.1	Introduction	118
6.2	On Self-Adaptation in Collaborative SOA	119
6.3	Profile Similarity and Dynamic Trust	121
6.3.1	Interest Profile Creation	121
6.3.2	The Interplay of Interest Similarity and Trust	122

6.4	Design and Architecture	123
6.4.1	Genesis2 Testbed Generator Framework	124
6.4.2	Adaptation Framework	126
6.5	Behavior Monitoring and Self-Adaptation	127
6.6	Experiments	130
6.6.1	Scenario Overview	130
6.6.2	Experiment Setup	131
6.6.3	Result Description	133
6.7	Related Work	135
6.8	Conclusion and Outlook	136
Index	139

Socially Enhanced Services Computing

Modern Models and Algorithms for Distributed Systems

Dustdar, S.; Schall, D.; Skopik, F.; Juszczak, L.; Psailer, H.

(Eds.)

2011, XII, 141 p., Hardcover

ISBN: 978-3-7091-0812-3