

# ISO/IEC 18384-2:2016-06 (E)

## Information technology - Reference Architecture for Service Oriented Architecture (SOA RA) - Part 2: Reference Architecture for SOA Solutions

---

<b>Contents</b>		<b>Page</b>
Foreword .....		viii
Introduction .....		ix
1	Scope .....	1
2	Normative references .....	1
3	Terms, definitions and abbreviated terms .....	1
3.1	Terms and definitions .....	1
3.2	Abbreviated terms .....	1
4	Notations .....	2
5	Conventions .....	3
6	Conformance .....	5
7	Overview .....	5
7.1	Introduction to SOA .....	5
7.2	Introduction to the SOA Reference Architecture .....	6
7.3	Metamodel .....	7
7.4	Capabilities .....	11
7.5	Reference Architecture for SOA Solutions .....	12
7.5.1	Overview of Reference Architecture .....	12
7.5.2	Operational and IT Systems Layer .....	14
7.5.3	Service Component Layer .....	14
7.5.4	Services Layer .....	15
7.5.5	Process Layer .....	16
7.5.6	Consumer Layer .....	16
7.5.7	Integration Aspect .....	17
7.5.8	Management and Security Aspect .....	18
7.5.9	Information Aspect .....	19
7.5.10	Governance Aspect .....	20
7.5.11	Development Aspect .....	20
7.6	Common Services Categories .....	21
7.7	Assumptions and Key Concepts .....	23
7.7.1	General .....	23
7.7.2	Functional and Non-functional .....	23
7.7.3	Requirements .....	23
7.7.4	Services .....	23
7.7.5	Documenting the Layers .....	24
7.7.6	Logical and Physical Elements .....	24
7.7.7	Interactions between Layers .....	25
7.7.8	Understanding ABBs .....	26
7.7.9	Provisioning Services .....	27
7.7.10	Invoking Services .....	27
7.7.11	Registries and Repositories .....	27
7.7.12	Policies and Business Rules .....	27
7.7.13	Events .....	27
7.7.14	Auditing and Logging .....	28

7.7.15	Understanding different logical elements .....	28
8	Operational and IT Systems Layer .....	30
8.1	Overview .....	30
8.1.1	Summary .....	30
8.1.2	Context and Typical Flow .....	31
8.1.3	Capabilities .....	32
8.1.4	Structural Overview of the Layer .....	33
8.2	Details of ABBs and Supported Capabilities .....	34
8.2.1	Service Delivery .....	34
8.2.2	Runtime Environment .....	35
8.2.3	Virtualization and Infrastructure Services .....	36
8.3	Inter-Relationships between the ABBs .....	36
8.4	Significant Intersection Points with other Layers .....	37
8.4.1	General .....	37
8.4.2	Intersection with the rest of the SOA RA .....	37
8.4.3	Interaction with Cross-Cutting Aspects .....	38
8.4.4	Interaction with Horizontal Layers .....	40
8.5	Usage Implications and Guidance .....	40
8.5.1	Options and Design Decisions .....	40
8.5.2	Implementation Considerations .....	41
8.5.3	Runtime and Deployment View of the SOA RA .....	42
9	Service Component Layer .....	43
9.1	Overview .....	43
9.1.1	Summary .....	43
9.1.2	Context and Typical Flow .....	44
9.1.3	Capabilities .....	44
9.1.4	Structural Overview of the Layer .....	45
9.2	Details of ABBs and Supported Capabilities .....	46
9.2.1	Service Realization and Implementation .....	46
9.2.2	Service Publication and Exposure .....	47
9.2.3	Service Deployment .....	47
9.2.4	Service Invocation .....	47
9.2.5	Service Binding .....	47
9.3	Inter-Relationships between the ABBs .....	48
9.4	Significant Intersection Points with other Layers .....	50
9.4.1	General .....	50
9.4.2	Interaction with Cross-Cutting Aspects .....	50
9.4.3	Interaction with Horizontal Layers .....	52
9.4.4	Interaction with the Services Layer .....	53
9.4.5	Interactions with the Operational and IT Systems Layer .....	55
9.5	Usage Implications and Guidance .....	55
9.5.1	Options and Design Decisions .....	55
9.5.2	Implementation Considerations .....	56
10	Service Layer .....	58
10.1	Overview .....	58
10.1.1	Summary .....	58
10.1.2	Context and Typical Flow .....	59
10.1.3	Capabilities .....	59
10.1.4	Structural Overview of the Layer .....	60
10.2	Details of ABBs and Supported Capabilities .....	62
10.2.1	Service Definition .....	62
10.2.2	Service Runtime Enablement .....	62
10.2.3	Policy Management .....	63
10.3	Inter-Relationships between the ABBs .....	63
10.4	Significant Intersection Points with other Layers .....	66
10.4.1	Interaction with Cross-Cutting Aspects .....	66
10.4.2	Interaction with Horizontal Layers .....	67
10.5	Usage Implications and Guidance .....	68

11	Process Layer .....	69
11.1	Overview .....	69
11.1.1	Summary .....	69
11.1.2	Context and Typical Flow .....	69
11.1.3	Capabilities .....	72
11.1.4	Structural Overview of the Layer .....	73
11.2	Details of ABBs and Supported Capabilities .....	75
11.2.1	Process Definition .....	75
11.2.2	Event Handling .....	75
11.2.3	Process Runtime Enablement .....	75
11.2.4	Process Information Management .....	76
11.2.5	Process Integration .....	76
11.2.6	Decision Management .....	76
11.2.7	Process Monitoring and Management .....	77
11.3	Inter-Relationships between the ABBs .....	77
11.4	Significant Intersection Points with other Layers .....	77
11.4.1	Interaction with Cross-Cutting Aspects .....	77
11.4.2	Interaction with Horizontal Layers .....	79
11.5	Usage Implications and Guidance .....	79
12	Consumer Layer .....	80
12.1	Overview .....	80
12.1.1	Summary .....	80
12.1.2	Context and Typical Flow .....	80
12.1.3	Capabilities .....	81
12.1.4	Structural Overview of the Layer .....	82
12.2	Details of ABBs and Supported Capabilities .....	83
12.2.1	Consumer Services .....	83
12.2.2	Presentation Services .....	84
12.2.3	Backend Integration .....	84
12.2.4	Caching and Streaming Content .....	84
12.2.5	Security and Privacy .....	85
12.2.6	Information Access .....	85
12.3	Inter-Relationships between the ABBs .....	85
12.4	Significant Intersection Points with other Layers .....	87
12.4.1	Interaction with Cross-Cutting Aspects .....	87
12.4.2	Interaction with Horizontal Layers .....	88
12.5	Usage Implications and Guidance .....	89
13	Integration Aspect .....	90
13.1	Overview .....	90
13.1.1	Summary .....	90
13.1.2	Context and Typical Flow .....	90
13.1.3	Capabilities .....	91
13.1.4	Structural Overview of the Layer .....	92
13.2	Details of ABBs and Supported Capabilities .....	94
13.2.1	Communication, Service Interaction and Integration .....	94
13.2.2	Message Processing .....	95
13.2.3	Security .....	96
13.3	Inter-Relationships between the ABBs .....	96
13.4	Significant Intersection Points with other Layers .....	98
13.4.1	Interaction with Cross-Cutting Aspects .....	98
13.4.2	Interaction with Horizontal Layers .....	99
13.5	Usage Implications and Guidance .....	101
14	Management and Security (MaS) Aspect .....	101
14.1	Overview .....	101
14.1.1	Summary .....	101
14.1.2	Context and Typical Flow .....	103
14.1.3	Capabilities .....	104
14.1.4	Structural Overview of the Layer .....	108

14.2	Details of ABBs and Supported Capabilities .....	109
14.2.1	Facilities Security Management .....	109
14.2.2	Security Management .....	110
14.2.3	IT Systems Monitoring and Management .....	111
14.2.4	SOA Solution Monitoring and Management .....	112
14.2.5	Business Activity Monitoring and Management .....	113
14.2.6	Event Management .....	114
14.2.7	Policy Monitoring and Enforcement .....	114
14.2.8	Configuration and Change Management .....	115
14.2.9	Registry and Repository .....	115
14.3	Inter-Relationships between the ABBs .....	116
14.4	Significant Intersection Points with other Layers .....	118
14.4.1	Interaction with Cross-Cutting Aspects .....	118
14.4.2	Interaction with Horizontal Layers .....	119
14.5	Usage Implications and Guidance .....	120
15	Information Aspect .....	121
15.1	Overview .....	121
15.1.1	Summary .....	121
15.1.2	Context and Typical Flow .....	122
15.1.3	Capabilities .....	122
15.1.4	Structural Overview of the Layer .....	124
15.2	Details of ABBs and Supported Capabilities .....	125
15.2.1	Information Service .....	125
15.2.2	Information Integration .....	126
15.2.3	Information Security and Protection .....	128
15.2.4	Business Information Management .....	128
15.2.5	Business Analytics .....	129
15.2.6	Information Definition and Modeling .....	130
15.2.7	Information Registry/Repository .....	130
15.3	Inter-Relationships between the ABBs .....	130
15.4	Significant Intersection Points with other Layers .....	133
15.4.1	Interaction with Cross-Cutting Aspects .....	134
15.4.2	Interaction with Horizontal Layers .....	135
15.5	Usage Implications and Guidance .....	135
16	Governance Aspect .....	136
16.1	Overview .....	136
16.1.1	Summary .....	136
16.1.2	Context and Typical Flow .....	137
16.1.3	Capabilities .....	138
16.1.4	Structural Overview of the Layer .....	140
16.2	Supported Capabilities .....	143
16.2.1	Governance Lifecycle .....	143
16.2.2	SOA Metadata Storage and Management .....	143
16.2.3	Rule Definition and Management .....	144
16.2.4	Policy Definition and Management .....	144
16.2.5	Monitoring .....	145
16.2.6	Management .....	145
16.2.7	Workflow .....	145
16.3	Inter-Relationships between the ABBs .....	145
16.4	Significant Intersection Points with other Layers .....	147
16.4.1	Interaction with Cross-Cutting Aspects .....	148
16.4.2	Interaction with Horizontal Layers .....	149
16.5	Usage Implications and Guidance .....	150
16.5.1	Options and Design Decisions .....	150
17	Development Aspect .....	151
17.1	Overview .....	151
17.1.1	Summary .....	151
17.1.2	Context and Typical Flow .....	152
17.1.3	Capabilities .....	157

17.1.4	Structural Overview of the Layer .....	159
17.2	Details of ABBs and Supported Capabilities .....	160
17.2.1	Description Development .....	160
17.2.2	Operations Enablement .....	162
17.2.3	Testing .....	163
17.2.4	Maintenance .....	164
17.2.5	Publication .....	164
17.2.6	Process Development .....	165
17.2.7	Deployment .....	165
17.2.8	Subscription .....	165
17.3	Inter-Relationships between the ABBs .....	166
17.4	Significant Intersection Points with other Layers .....	171
17.4.1	Intersection with the Rest of the SOA RA .....	171
17.4.2	Interaction with Cross-Cutting Aspects .....	171
17.4.3	Interaction with Horizontal layers .....	173
17.5	Usage Implications and Guidance .....	174
17.5.1	Options and Design Decisions .....	174
18	Common Service Categories .....	179
18.1	General .....	179
18.2	Mediation Services .....	180
18.3	Interaction Services .....	181
18.4	Process Services .....	181
18.5	Information Services .....	182
18.6	Access Services .....	182
18.7	Security Services .....	182
18.8	Partner Services .....	183
18.9	Lifecycle Services .....	183
18.10	Asset and Registry/Repository Services .....	184
18.11	Infrastructure Services .....	184
18.12	Management Services .....	184
18.13	Development Services .....	185
18.14	Strategy and Planning Services .....	185
18.15	Business Application Services .....	185
18.16	Business Services .....	186
18.17	Considering Implementations of Common Service Categories using Reference Architecture .....	186
18.18	Summary .....	188
19	Related Work and Usages of the SOA RA .....	188
	Bibliography .....	190