

INTERNATIONAL  
STANDARD

ISO/IEC  
19540-1

First edition  
2022-03

---

---

---

**Information technology — Object  
Management Group Unified  
Architecture Framework (OMG  
UAF) —**

**Part 1:  
Domain Metamodel (DMM)**



Reference number  
ISO/IEC 19540-1:2022(E)

This is a preview. Click [here](#) to purchase the full publication.

© ISO/IEC 2022



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
<b>FOREWORD .....</b>	<b>xii</b>
<b>PREFACE.....</b>	<b>xiii</b>
<b>1    SCOPE .....</b>	<b>1</b>
1.1    INTRODUCTION .....	1
1.2    UAF BACKGROUND .....	1
1.3    INTENDED USAGE .....	2
1.4    RELATED DOCUMENTS.....	2
<b>2    CONFORMANCE .....</b>	<b>3</b>
<b>3    REFERENCES .....</b>	<b>4</b>
3.1    NORMATIVE REFERENCES .....	4
3.2    OMG DOCUMENTS (NORMATIVE REFERENCES) .....	4
3.3    OTHER NORMATIVE REFERENCES.....	4
3.4    INFORMATIVE REFERENCES .....	5
<b>4    TERMS AND DEFINITIONS .....</b>	<b>6</b>
<b>5    SYMBOLS.....</b>	<b>7</b>
<b>6    ADDITIONAL INFORMATION .....</b>	<b>9</b>
6.1    CHANGES TO ADOPTED OMG SPECIFICATIONS.....	9
6.2    LANGUAGE ARCHITECTURE .....	9
6.3    PHILOSOPHY .....	9
6.4    CORE PRINCIPLES.....	9
<b>7    UAF GRID .....</b>	<b>11</b>
7.1    DESCRIPTIONS OF DOMAINS AND MODEL KINDS.....	12
7.2    DOMAIN INTERRELATIONSHIPS .....	13
7.3    DOMAIN METAMODEL DIAGRAM LEGEND .....	14
<b>8    DOMAIN METAMODEL DIAGRAMS .....</b>	<b>15</b>
8.1    VIEW SPECIFICATIONS.....	15
8.1.1 <i>View Specifications::Metadata</i> .....	15
8.1.2 <i>View Specifications::Strategic</i> .....	16
8.1.3 <i>View Specifications::Operational</i> .....	24
8.1.4 <i>View Specifications::Services</i> .....	34
8.1.5 <i>View Specifications::Personnel</i> .....	43
8.1.6 <i>View Specifications::Resources</i> .....	56
8.1.7 <i>View Specifications::Security</i> .....	68
8.1.8 <i>View Specifications::Projects</i> .....	76
8.1.9 <i>View Specifications::Standards</i> .....	81
8.1.10 <i>View Specifications::Actual Resources</i> .....	84
8.1.11 <i>View Specifications::Dictionary</i> .....	87
8.1.12 <i>View Specifications::Summary &amp; Overview</i> .....	88
8.1.13 <i>View Specifications::Requirements</i> .....	89
8.1.14 <i>View Specifications::Information</i> .....	90
8.1.15 <i>View Specifications::Parameters</i> .....	90
8.1.16 <i>View Specifications::Other</i> .....	93

<b>9 DOMAIN METAMODEL (DMM) ELEMENTS.....</b>	<b>96</b>
9.1 DOMAIN METAMODEL .....	96
9.1.1 <i>Domain MetaModel::Metadata</i> .....	96
9.1.2 <i>Domain MetaModel::Strategic</i> .....	109
9.1.3 <i>Domain MetaModel::Operational</i> .....	120
9.1.4 <i>Domain MetaModel::Services</i> .....	134
9.1.5 <i>Domain MetaModel::Personnel</i> .....	142
9.1.6 <i>Domain MetaModel::Resources</i> .....	149
9.1.7 <i>Domain MetaModel::Security</i> .....	166
9.1.8 <i>Domain MetaModel::Projects</i> .....	181
9.1.9 <i>Domain MetaModel::Standards</i> .....	188
9.1.10 <i>Domain MetaModel::Actual Resources</i> .....	190
9.1.11 <i>Domain MetaModel::Dictionary</i> .....	196
9.1.12 <i>Domain MetaModel::Summary &amp; Overview</i> .....	198
9.1.13 <i>Domain MetaModel::Information</i> .....	202
9.1.14 <i>Domain MetaModel::Parameters</i> .....	203

**TABLE OF FIGURES**

Figure 7:1 - UAF Grid .....	11
Figure 7:2 - Domain Interrelationships .....	13
Figure 7:3 - Legend of color codes for element types defined in UAF .....	14
Figure 8:2 - Strategic Structure .....	18
Figure 8:3 - Strategic Connectivity .....	19
Figure 8:4 - Strategic States .....	20
Figure 8:5 - Strategic Constraints .....	21
Figure 8:6 - Strategic Roadmap: Deployment .....	22
Figure 8:7 - Strategic Roadmap: Phasing .....	23
Figure 8:8 - Strategic Traceability .....	24
Figure 8:9 - Operational Taxonomy .....	25
Figure 8:10 - Operational Structure .....	26
Figure 8:11 - Operational Connectivity .....	27
Figure 8:12 - Operational Processes .....	28
Figure 8:13 - Operational Processes BPMN Semantics .....	29
Figure 8:14 - Operational States .....	31
Figure 8:15 - Operational Interaction Scenarios .....	32
Figure 8:16 - Operational Constraints .....	33
Figure 8:17 - Operational Traceability .....	34
Figure 8:18 - Services Taxonomy .....	35
Figure 8:19 - Services Structure .....	36
Figure 8:20 - Services Connectivity .....	37
Figure 8:21 - Services Processes .....	38
Figure 8:22 - Services Processes BPMN Semantics .....	39
Figure 8:23 - Services States .....	40
Figure 8:24 - Services Interaction Scenarios .....	41
Figure 8:25 - Services Constraints .....	42
Figure 8:26 - Services Roadmap .....	42
Figure 8:27 - Services Traceability .....	43
Figure 8:28 - Personnel Taxonomy .....	44
Figure 8:29 - Personnel Structure .....	45
Figure 8:30 - Personnel Connectivity .....	46
Figure 8:31 - Personnel Processes .....	47
Figure 8:32 - Personnel States .....	48
Figure 8:33 - Personnel Interaction Scenarios .....	49
Figure 8:34 - Personnel Constraints: Competence .....	50
Figure 8:35 - Personnel Constraints: Drivers .....	51
Figure 8:36 - Personnel Constraints: Performance .....	52
Figure 8:37 - Personnel Roadmap: Availability .....	53
Figure 8:38 - Personnel Roadmap: Evolution .....	54
Figure 8:39 - Personnel Roadmap: Forecast .....	55
Figure 8:40 - Personnel Traceability .....	56
Figure 8:41 - Resources Taxonomy .....	57
Figure 8:42 - Resources Structure .....	58
Figure 8:43 - Resources Connectivity .....	59
Figure 8:44 - Resources Processes .....	60
Figure 8:45 - Resources Processes BPMN Semantics .....	62
Figure 8:46 - Resources States .....	63
Figure 8:47 - Resources Interaction Scenarios .....	64
Figure 8:48 - Resources Constraints .....	65
Figure 8:49 - Resources Roadmap: Evolution .....	66
Figure 8:50 - Resources Roadmap: Forecast .....	67
Figure 8:51 - Resources Traceability .....	68
Figure 8:52 - Security Taxonomy .....	69
Figure 8:53 - Security Structure .....	70
Figure 8:54 - Security Connectivity .....	71
Figure 8:55 - Security Processes .....	72
Figure 8:56 - Security Constraints .....	74
Figure 8:57 - Security Traceability .....	75

Figure 8:58 - Project Taxonomy.....	76
Figure 8:59 - Project Structure .....	77
Figure 8:60 - Project Connectivity .....	78
Figure 8:61 - Project Processes.....	79
Figure 8:62 - Project Roadmap.....	80
Figure 8:63 - Project Traceability.....	81
Figure 8:64 - Standards Taxonomy .....	82
Figure 8:65 - Standards Structure .....	83
Figure 8:66 - Standards Roadmap .....	83
Figure 8:67 - Standards Traceability .....	84
Figure 8:68 - Actual Resources Structure.....	85
Figure 8:69 - Actual Resources Connectivity.....	86
Figure 8:70 - Actual Resources Traceability .....	86
Figure 8:71 - Dictionary .....	87
Figure 8:72 - Summary & Overview .....	88
Figure 8:73 - Requirements .....	89
Figure 8:74 - Information Model .....	90
Figure 8:75 - Parameters: Environment.....	91
Figure 8:76 - Parameters: Measurements .....	92
Figure 8:77 - BPMN.....	93
Figure 8:78 - IEPPV .....	94
Figure 8:79 - NIEM .....	95
Figure 9:1 - ArchitectureMetadata.....	96
Figure 9:2 - InteractionScenarioGeneralization.....	97
Figure 9:3 - Metadata .....	97
Figure 9:4 - ProcessGeneralization.....	98
Figure 9:5 - PropertySetGeneralization .....	98
Figure 9:6 - StateDescriptionGeneralization .....	99
Figure 9:7 - EnvironmentProperty .....	99
Figure 9:8 - Exchange.....	100
Figure 9:9 - ExchangeItem .....	100
Figure 9:10 - Resource .....	101
Figure 9:11 - ActivityPerformableUnderCondition .....	101
Figure 9:12 - IsCapableToPerform .....	102
Figure 9:13 - PerformsInContext .....	102
Figure 9:14 - Process .....	103
Figure 9:15 - Process .....	103
Figure 9:16 - ProcessEdge .....	104
Figure 9:17 - ProcessOperation .....	104
Figure 9:18 - ProcessParameter .....	104
Figure 9:19 - ProcessUsage .....	105
Figure 9:20 - StateDescription.....	105
Figure 9:21 - InteractionRole .....	106
Figure 9:22 - InteractionScenario .....	107
Figure 9:23 - Information .....	107
Figure 9:24 - Rule.....	108
Figure 9:25 - ArchitecturalReference .....	108
Figure 9:26 - Implements .....	109
Figure 9:27 - Capability.....	110
Figure 9:28 - CapabilityGeneralization .....	110
Figure 9:29 - ActualEnduringTask .....	111
Figure 9:30 - ActualEnterprisePhase .....	111
Figure 9:31 - CapabilityRole .....	112
Figure 9:32 - EnduringTask .....	112
Figure 9:33 - EnterpriseGoal .....	112
Figure 9:34 - EnterprisePhase.....	113
Figure 9:35 - EnterpriseVision .....	113
Figure 9:36 - StructuralPart .....	114
Figure 9:37 - TemporalPart .....	114
Figure 9:38 - VisionStatement .....	114
Figure 9:39 - WholeLifeEnterprise .....	115

Figure 9:40 - CapabilityDependency .....	115
Figure 9:41 - CapabilityRoleDependency .....	116
Figure 9:42 - AchievedEffect .....	116
Figure 9:43 - Achiever .....	117
Figure 9:44 - DesiredEffect .....	117
Figure 9:45 - Desirer .....	118
Figure 9:46 - CapabilityForTask .....	118
Figure 9:47 - CapableElement .....	119
Figure 9:48 - Exhibits .....	119
Figure 9:49 - MapsToCapability .....	120
Figure 9:50 - OrganizationInEnterprise .....	120
Figure 9:51 - ArbitraryConnector .....	121
Figure 9:52 - ConceptItem .....	121
Figure 9:53 - HighLevelOperationalConcept .....	122
Figure 9:54 - KnownResource .....	122
Figure 9:55 - OperationalAgent .....	123
Figure 9:56 - OperationalArchitecture .....	123
Figure 9:57 - OperationalMethod .....	124
Figure 9:58 - OperationalParameter .....	124
Figure 9:59 - OperationalPerformer .....	125
Figure 9:60 - OperationalRole .....	125
Figure 9:61 - ProblemDomain .....	126
Figure 9:62 - OperationalConnector .....	126
Figure 9:63 - OperationalExchange .....	127
Figure 9:64 - OperationalExchangeItem .....	127
Figure 9:65 - OperationalInterface .....	128
Figure 9:66 - OperationalPort .....	128
Figure 9:67 - OperationalSignal .....	129
Figure 9:68 - OperationalActivity .....	129
Figure 9:69 - OperationalActivityAction .....	130
Figure 9:70 - OperationalActivityEdge .....	130
Figure 9:71 - StandardOperationalActivity .....	131
Figure 9:72 - OperationalStateDescription .....	131
Figure 9:73 - OperationalInteractionScenario .....	132
Figure 9:74 - OperationalMessage .....	132
Figure 9:75 - InformationElement .....	133
Figure 9:76 - OperationalConstraint .....	133
Figure 9:77 - SubjectOfOperationalConstraint .....	134
Figure 9:78 - ServiceSpecification .....	134
Figure 9:79 - ServiceSpecificationGeneralization .....	135
Figure 9:80 - ServiceConnector .....	135
Figure 9:81 - ServiceMethod .....	136
Figure 9:82 - ServiceParameter .....	136
Figure 9:83 - ServiceSpecificationRole .....	137
Figure 9:84 - ServiceInterface .....	137
Figure 9:85 - ServicePort .....	138
Figure 9:86 - ServiceFunction .....	138
Figure 9:87 - ServiceFunctionAction .....	139
Figure 9:88 - ServiceFunctionEdge .....	139
Figure 9:89 - ServiceStateDescription .....	140
Figure 9:90 - ServiceInteractionScenario .....	140
Figure 9:91 - ServiceMessage .....	141
Figure 9:92 - ServicePolicy .....	141
Figure 9:93 - Consumes .....	142
Figure 9:94 - Organization .....	142
Figure 9:95 - OrganizationalResource .....	143
Figure 9:96 - Person .....	143
Figure 9:97 - Post .....	144
Figure 9:98 - Responsibility .....	144
Figure 9:99 - PostRole .....	145
Figure 9:100 - SubOrganization .....	145

Figure 9:101 - Command.....	146
Figure 9:102 - Control.....	146
Figure 9:103 - ResourceInteractionScenario .....	147
Figure 9:104 - Competence .....	147
Figure 9:105 - CompetenceForRole .....	148
Figure 9:106 - RequiresCompetence .....	148
Figure 9:107 - FillsPost .....	149
Figure 9:108 - CompetenceToConduct.....	149
Figure 9:109 - CapabilityConfiguration .....	150
Figure 9:110 - NaturalResource.....	150
Figure 9:111 - PhysicalResource.....	150
Figure 9:112 - ResourceArchitecture.....	151
Figure 9:113 - ResourceArtifact .....	151
Figure 9:114 - ResourcePerformer .....	152
Figure 9:115 - Software.....	152
Figure 9:116 - System.....	153
Figure 9:117 - ResourceMethod .....	153
Figure 9:118 - ResourceParameter .....	154
Figure 9:119 - ResourcePort.....	154
Figure 9:120 - ResourceRole .....	155
Figure 9:121 - ResourceConnector .....	156
Figure 9:122 - ResourceExchange.....	156
Figure 9:123 - ResourceExchangeItem.....	157
Figure 9:124 - ResourceInterface .....	158
Figure 9:125 - ResourceSignal .....	158
Figure 9:126 - Function .....	159
Figure 9:127 - FunctionAction .....	159
Figure 9:128 - FunctionEdge .....	160
Figure 9:129 - ResourceStateDescription .....	160
Figure 9:130 - ResourceMessage.....	161
Figure 9:131 - DataElement .....	161
Figure 9:132 - DataRole .....	162
Figure 9:133 - ResourceConstraint .....	162
Figure 9:134 - SubjectOfResourceConstraint.....	162
Figure 9:135 - Forecast.....	163
Figure 9:136 - SubjectOfForecast.....	163
Figure 9:137 - Technology .....	164
Figure 9:138 - VersionedElement.....	164
Figure 9:139 - VersionOfConfiguration .....	165
Figure 9:140 - VersionSuccession .....	165
Figure 9:141 - WholeLifeConfiguration.....	166
Figure 9:142 - ProtocolImplementation .....	166
Figure 9:143 - Asset .....	167
Figure 9:144 - OperationalAsset .....	167
Figure 9:145 - OperationalMitigation .....	168
Figure 9:146 - ResourceAsset.....	168
Figure 9:147 - ResourceMitigation .....	168
Figure 9:148 - SecurityEnclave .....	169
Figure 9:149 - AssetRole .....	169
Figure 9:150 - InformationRole .....	170
Figure 9:151 - EnhancedSecurityControl .....	170
Figure 9:152 - Enhances .....	171
Figure 9:153 - Protects .....	171
Figure 9:154 - ProtectsInContext .....	172
Figure 9:155 - SecurityProcess .....	172
Figure 9:156 - SecurityProcessAction .....	173
Figure 9:157 - ActualRisk .....	173
Figure 9:158 - Caveat .....	174
Figure 9:159 - Risk .....	174
Figure 9:160 - SecurityAvailability .....	174
Figure 9:161 - SecurityCategory .....	175

Figure 9:162 - SecurityClassification.....	175
Figure 9:163 - SecurityClassificationKind.....	176
Figure 9:164 - SecurityConstraint.....	176
Figure 9:165 - SecurityControl .....	177
Figure 9:166 - SecurityControlFamily .....	177
Figure 9:167 - SecurityIntegrity .....	178
Figure 9:168 - SecurityMeasurement .....	178
Figure 9:169 - SubjectOfSecurityConstraint.....	179
Figure 9:170 - Affects .....	179
Figure 9:171 - AffectsInContext .....	179
Figure 9:172 - Mitigates.....	180
Figure 9:173 - OwnsRisk .....	180
Figure 9:174 - OwnsRiskInContext .....	181
Figure 9:175 - Project .....	181
Figure 9:176 - ProjectMilestone.....	182
Figure 9:177 - ActualProjectMilestoneRole.....	182
Figure 9:178 - ProjectMilestoneRole .....	183
Figure 9:179 - ProjectStatus.....	183
Figure 9:180 - ProjectTheme .....	184
Figure 9:181 - StatusIndicators .....	184
Figure 9:182 - MilestoneDependency .....	185
Figure 9:183 - ProjectActivity .....	185
Figure 9:184 - ProjectActivityAction.....	185
Figure 9:185 - ProjectSequence .....	186
Figure 9:186 - ActualProject.....	186
Figure 9:187 - ActualProjectMilestone .....	187
Figure 9:188 - ResponsibleFor.....	187
Figure 9:189 - Protocol .....	188
Figure 9:190 - ProtocolStack .....	188
Figure 9:191 - Standard.....	189
Figure 9:192 - ProtocolLayer .....	189
Figure 9:193 - ActualOrganization .....	190
Figure 9:194 - ActualOrganizationalResource.....	191
Figure 9:195 - ActualPerson .....	191
Figure 9:196 - ActualPost .....	192
Figure 9:197 - ActualResource .....	192
Figure 9:198 - ActualResourceRelationship .....	193
Figure 9:199 - ActualResponsibility .....	193
Figure 9:200 - ActualResponsibleResource.....	194
Figure 9:201 - FieldedCapability .....	194
Figure 9:202 - ActualService .....	195
Figure 9:203 - ProvidedServiceLevel .....	195
Figure 9:204 - ProvidesCompetence .....	195
Figure 9:205 - RequiredServiceLevel .....	196
Figure 9:206 - Alias .....	196
Figure 9:207 - Definition .....	197
Figure 9:208 - SameAs .....	197
Figure 9:209 - ArchitecturalDescription .....	198
Figure 9:210 - Architecture .....	199
Figure 9:211 - Concern .....	199
Figure 9:212 - Stakeholder.....	200
Figure 9:213 - UAFEElement.....	201
Figure 9:214 - View .....	201
Figure 9:215 - Viewpoint.....	202
Figure 9:216 - DataModel.....	202
Figure 9:217 - ActualCondition .....	203
Figure 9:218 - ActualEnvironment .....	203
Figure 9:219 - ActualLocation .....	204
Figure 9:220 - ActualMeasurement.....	205
Figure 9:221 - ActualMeasurementSet .....	205
Figure 9:222 - ActualPropertySet .....	206

Figure 9:223 - ActualState.....	206
Figure 9:224 - Condition .....	207
Figure 9:225 - Environment .....	207
Figure 9:226 - GeoPoliticalExtentType.....	208
Figure 9:227 - ISO8601DateTime .....	208
Figure 9:228 - Location .....	209
Figure 9:229 - LocationHolder .....	209
Figure 9:230 - MeasurableElement .....	210
Figure 9:231 - Measurement.....	211
Figure 9:232 - MeasurementSet.....	211
Figure 9:233 - PropertySet .....	212

**TABLE OF TABLES**

Table 1:1 - Table of Related Documents .....	2
Table 5:1 - Description of acronyms used in this specification .....	7
Table 7:1 - Definitions for the Domains .....	12
Table 7:2 - Definitions of the Model Kinds .....	13