Unified Architecture Framework (UAF) Domain Metamodel

Version 1.2

OMG Document Number: formal/22-07-03
Standard document URL: https://www.omg.org/spec/UAF/1.2
USE OF SPECIFICATION - TERMS, CONDITIONS & NOTICES

The material in this document details an Object Management Group specification in accordance with the terms, conditions and notices set forth below. This document does not represent a commitment to implement any portion of this specification in any company's products. The information contained in this document is subject to change without notice.

LICENSES

The companies listed above have granted to the Object Management Group, Inc. (OMG) a nonexclusive, royalty-free, paid up, worldwide license to copy and distribute this document and to modify this document and distribute copies of the modified version. Each of the copyright holders listed above has agreed that no person shall be deemed to have infringed the copyright in the included material of any such copyright holder by reason of having used the specification set forth herein or having conformed any computer software to the specification.

Subject to all of the terms and conditions below, the owners of the copyright in this specification hereby grant you a fully-paid up, non-exclusive, nontransferable, perpetual, worldwide license (without the right to sublicense), to use this specification to create and distribute software and special purpose specifications that are based upon this specification, and to use, copy, and distribute this specification as provided under the Copyright Act; provided that: (1) both the copyright notice identified above and this permission notice appear on any copies of this specification; (2) the use of the specifications is for informational purposes and will not be copied or posted on any network computer or broadcast in any media and will not be otherwise resold or transferred for commercial purposes; and (3) no modifications are made to this specification. This limited permission automatically terminates without notice if you breach any of these terms or conditions. Upon termination, you will destroy immediately any copies of the specifications in your possession or control.

PATENTS

The attention of adopters is directed to the possibility that compliance with or adoption of OMG specifications may require use of an invention covered by patent rights. OMG shall not be responsible for identifying patents for which a license may be required by any OMG specification, or for conducting legal inquiries into the legal validity or scope of those patents that are brought to its attention. OMG specifications are prospective and advisory only. Prospective users are responsible for protecting themselves against liability for infringement of patents.
GENERAL USE RESTRICTIONS

Any unauthorized use of this specification may violate copyright laws, trademark laws, and communications regulations and statutes. This document contains information which is protected by copyright. All Rights Reserved. No part of this work covered by copyright herein may be reproduced or used in any form or by any means--graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems--without permission of the copyright owner.

DISCLAIMER OF WARRANTY

WHILE THIS PUBLICATION IS BELIEVED TO BE ACCURATE, IT IS PROVIDED "AS IS" AND MAY CONTAIN ERRORS OR MISPRINTS. THE OBJECT MANAGEMENT GROUP AND THE COMPANIES LISTED ABOVE MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS PUBLICATION, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF TITLE OR OWNERSHIP, IMPLIED WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR USE. IN NO EVENT SHALL THE OBJECT MANAGEMENT GROUP OR ANY OF THE COMPANIES LISTED ABOVE BE LIABLE FOR ERRORS CONTAINED HEREIN OR FOR DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, RELIANCE OR COVER DAMAGES, INCLUDING LOSS OF PROFITS, REVENUE, DATA OR USE, INCURRED BY ANY USER OR ANY THIRD PARTY IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS MATERIAL, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

The entire risk as to the quality and performance of software developed using this specification is borne by you. This disclaimer of warranty constitutes an essential part of the license granted to you to use this specification.

RESTRICTED RIGHTS LEGEND

Use, duplication or disclosure by the U.S. Government is subject to the restrictions set forth in subparagraph (c) (1) (ii) of The Rights in Technical Data and Computer Software Clause at DFARS 252.227-7013 or in subparagraph (c)(1) and (2) of the Commercial Computer Software - Restricted Rights clauses at 48 C.F.R. 52.227-19 or as specified in 48 C.F.R. 227-7202-2 of the DoD F.A.R. Supplement and its successors, or as specified in 48 C.F.R. 12.212 of the Federal Acquisition Regulations and its successors, as applicable. The specification copyright owners are as indicated above and may be contacted through the Object Management Group, 9C Medway Road, PMB 274, Milford, MA 01757, U.S.A.

TRADEMARKS

CORBA®, CORBA logos®, FIBO®, Financial Industry Business Ontology®, FINANCIAL INSTRUMENT GLOBAL IDENTIFIER®, IIOP®, IMM®, Model Driven Architecture®, MDA®, Object Management Group®, OMG®, OMG Logo®, SoaML®, SOAML®, SysML®, UAF®, Unified Modeling Language®, UML®, UML Cube Logo®, VSIPL®, and XMI® are registered trademarks of the Object Management Group, Inc.

For a complete list of trademarks, see: https://www.omg.org/legal/tm_list.htm. All other products or company names mentioned are used for identification purposes only, and may be trademarks of their respective owners.

COMPLIANCE

The copyright holders listed above acknowledge that the Object Management Group (acting itself or through its designees) is and shall at all times be the sole entity that may authorize developers, suppliers and sellers of computer software to use certification marks, trademarks or other special designations to indicate compliance with these materials.
Software developed under the terms of this license may claim compliance or conformance with this specification if and only if the software compliance is of a nature fully matching the applicable compliance points as stated in the specification. Software developed only partially matching the applicable compliance points may claim only that the software was based on this specification, but may not claim compliance or conformance with this specification. In the event that testing suites are implemented or approved by Object Management Group, Inc., software developed using this specification may claim compliance or conformance with the specification only if the software satisfactorily completes the testing suites.
# Table of Contents

PREFACE .................................................................................................................................................................... 1

1. SCOPE .................................................................................................................................................................... 3
   1.1 INTRODUCTION ................................................................................................................................................ 3
   1.2 UAF BACKGROUND ........................................................................................................................................... 3
   1.3 INTENDED USAGE ............................................................................................................................................ 4
   1.4 RELATED DOCUMENTS ................................................................................................................................... 4

2. CONFORMANCE .......................................................................................................................................................... 5

3. REFERENCES ............................................................................................................................................................ 6
   3.1 NORMATIVE REFERENCES .................................................................................................................................. 6
      3.1.1 OMG Documents (Normative References) ................................................................................................. 6
   3.2 OTHER NORMATIVE REFERENCES ..................................................................................................................... 6
   3.3 INFORMATIVE REFERENCES ................................................................................................................................ 6

4. TERMS AND DEFINITIONS ....................................................................................................................................... 8

5. ACRONYMS ............................................................................................................................................................... 9

6. ADDITIONAL INFORMATION .................................................................................................................................... 11
   6.1 CHANGES TO ADOPTED OMG SPECIFICATIONS .......................................................................................... 11
   6.2 LANGUAGE ARCHITECTURE ............................................................................................................................. 11
   6.3 PHILOSOPHY .................................................................................................................................................... 11
   6.4 CORE PRINCIPLES ............................................................................................................................................. 11

7. UAF GRID ............................................................................................................................................................... 13
   7.1 DESCRIPTIONS OF VIEWPOINTS AND ASPECTS ............................................................................................ 14
   7.2 VIEWPOINT INTERRELATIONSHIPS .................................................................................................................. 16
   7.3 DOMAIN METAMODEL DIAGRAM LEGEND .................................................................................................. 16

8. DOMAIN METAMODEL DIAGRAMS ........................................................................................................................... 19
   8.1 VIEW SPECIFICATIONS ....................................................................................................................................... 19
      8.1.1 View Specifications::Architecture Management .......................................................................................... 19
      8.1.2 View Specifications::Summary & Overview ............................................................................................... 25
      8.1.3 View Specifications::Strategic ................................................................................................................... 26
      8.1.4 View Specifications::Operational ............................................................................................................... 35
      8.1.5 View Specifications::Services .................................................................................................................... 45
      8.1.6 View Specifications::Personnel ................................................................................................................ 55
      8.1.7 View Specifications::Resources ............................................................................................................... 70
      8.1.8 View Specifications::Security .................................................................................................................. 82
      8.1.9 View Specifications::Projects ................................................................................................................ 90
      8.1.10 View Specifications::Standards .................................................................................................................. 96
      8.1.11 View Specifications::Actual Resources ................................................................................................ 99
      8.1.12 View Specifications::Motivation ............................................................................................................. 102
      8.1.13 View Specifications::Information ......................................................................................................... 103
      8.1.14 View Specifications::Parameters ......................................................................................................... 105
      8.1.15 View Specifications::Other .................................................................................................................... 108

9. DOMAIN METAMODEL (DMM) ELEMENTS .................................................................................................................. 113
   9.1 DOMAIN METAMODEL .................................................................................................................................... 113
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1.1</td>
<td>Domain MetaModel::Architecture Management</td>
<td>113</td>
</tr>
<tr>
<td>9.1.2</td>
<td>Domain MetaModel::Summary &amp; Overview</td>
<td>130</td>
</tr>
<tr>
<td>9.1.3</td>
<td>Domain MetaModel::Strategic</td>
<td>134</td>
</tr>
<tr>
<td>9.1.4</td>
<td>Domain MetaModel::Operational</td>
<td>156</td>
</tr>
<tr>
<td>9.1.5</td>
<td>Domain MetaModel::Services</td>
<td>169</td>
</tr>
<tr>
<td>9.1.6</td>
<td>Domain MetaModel::Personnel</td>
<td>180</td>
</tr>
<tr>
<td>9.1.7</td>
<td>Domain MetaModel::Resources</td>
<td>187</td>
</tr>
<tr>
<td>9.1.8</td>
<td>Domain MetaModel::Security</td>
<td>206</td>
</tr>
<tr>
<td>9.1.9</td>
<td>Domain MetaModel::Projects</td>
<td>218</td>
</tr>
<tr>
<td>9.1.10</td>
<td>Domain MetaModel::Standards</td>
<td>224</td>
</tr>
<tr>
<td>9.1.11</td>
<td>Domain MetaModel::Actual Resources</td>
<td>226</td>
</tr>
<tr>
<td>9.1.12</td>
<td>Domain MetaModel::Parameters</td>
<td>233</td>
</tr>
</tbody>
</table>
TABLE OF FIGURES

| Figure 7:1 - UAF Grid | ................................. | 13 |
| Figure 7:2 – Viewpoint Interrelationships | ......................................... | 16 |
| Figure 7:3 - Legend of color codes for element types defined in UAF | ......................................... | 17 |
| Figure 8:1 - Architecture Principles | ......................................... | 19 |
| Figure 8:2 - Architecture Views | ......................................... | 20 |
| Figure 8:3 - Architecture References | ......................................... | 20 |
| Figure 8:4 - Architecture Development Method | ......................................... | 21 |
| Figure 8:5 - Architecture Status | ......................................... | 21 |
| Figure 8:6 - Dictionary | ......................................... | 22 |
| Figure 8:7 - Architecture Parameters | ......................................... | 23 |
| Figure 8:8 - Architecture Constraints | ......................................... | 23 |
| Figure 8:9 - Architecture Roadmap | ......................................... | 24 |
| Figure 8:10 - Architecture Traceability | ......................................... | 24 |
| Figure 8:11 - Summary & Overview | ......................................... | 25 |
| Figure 8:12 - Strategic Motivation | ......................................... | 26 |
| Figure 8:13 - Strategic Taxonomy | ......................................... | 27 |
| Figure 8:14 - Strategic Structure | ......................................... | 28 |
| Figure 8:15 - Strategic Connectivity | ......................................... | 28 |
| Figure 8:16 - Strategic Processes | ......................................... | 29 |
| Figure 8:17 - Strategic States | ......................................... | 30 |
| Figure 8:18 - Strategic Information | ......................................... | 31 |
| Figure 8:19 - Strategic Constraints | ......................................... | 32 |
| Figure 8:20 - Strategic Roadmap: Deployment | ......................................... | 33 |
| Figure 8:21 - Strategic Roadmap: Phasing | ......................................... | 34 |
| Figure 8:22 - Strategic Traceability | ......................................... | 35 |
| Figure 8:23 - Operational Taxonomy | ......................................... | 36 |
| Figure 8:24 - Operational Structure | ......................................... | 37 |
| Figure 8:25 - Operational Connectivity | ......................................... | 38 |
| Figure 8:26 - Operational Processes | ......................................... | 39 |
| Figure 8:27 - Operational Processes BPMN Semantics | ......................................... | 41 |
| Figure 8:28 - Operational States | ......................................... | 42 |
| Figure 8:29 - Operational Sequences | ......................................... | 43 |
| Figure 8:30 - Operational Constraints | ......................................... | 44 |
| Figure 8:31 - Operational Traceability | ......................................... | 45 |
| Figure 8:32 - Services Taxonomy | ......................................... | 46 |
| Figure 8:33 - Services Structure | ......................................... | 47 |
| Figure 8:34 - Services Connectivity | ......................................... | 48 |
| Figure 8:35 - Services Processes | ......................................... | 49 |
| Figure 8:36 - Services Processes BPMN Semantics | ......................................... | 50 |
| Figure 8:37 - Services States | ......................................... | 51 |
| Figure 8:38 - Services Sequences | ......................................... | 52 |
| Figure 8:39 - Services Constraints | ......................................... | 53 |
| Figure 8:40 - Services Roadmap | ......................................... | 54 |
| Figure 8:41 - Services Traceability | ......................................... | 55 |
| Figure 8:42 - Personnel Taxonomy | ......................................... | 56 |
Figure 9:325 - Standard ......................................................................................................... 226
Figure 9:326 - ProtocolLayer ................................................................................................. 226
Figure 9:327 - ActualOrganization ....................................................................................... 227
Figure 9:328 - ActualOrganizationalResource ................................................................. 228
Figure 9:329 - ActualPerson ................................................................................................. 228
Figure 9:330 - ActualPost ..................................................................................................... 229
Figure 9:331 - ActualResource ............................................................................................. 229
Figure 9:332 - ActualResourceRelationship ........................................................................ 230
Figure 9:333 - ActualResponsibility ................................................................................... 230
Figure 9:334 - ActualResponsibleResource ....................................................................... 231
Figure 9:335 - FieldedCapability ........................................................................................ 231
Figure 9:336 - ActualService ............................................................................................... 232
Figure 9:337 - ProvidedServiceLevel ................................................................................... 232
Figure 9:338 - ProvidesCompetence .................................................................................... 232
Figure 9:339 - RequiredServiceLevel .................................................................................. 233
Figure 9:340 - OwnsProcess ............................................................................................... 233
Figure 9:341 - ActualCondition .......................................................................................... 234
Figure 9:342 - ActualEnvironment ...................................................................................... 234
Figure 9:343 - ActualLocation .............................................................................................. 235
Figure 9:344 - ActualMeasurement ..................................................................................... 235
Figure 9:345 - ActualMeasurementSet ................................................................................ 236
Figure 9:346 - ActualPropertySet ........................................................................................ 236
Figure 9:347 - ActualRisk .................................................................................................... 237
Figure 9:348 - AffectableElement ...................................................................................... 237
Figure 9:349 - Affects ........................................................................................................ 238
Figure 9:350 - AffectsInContext ........................................................................................ 238
Figure 9:351 - Condition ..................................................................................................... 238
Figure 9:352 - Environment ............................................................................................... 239
Figure 9:353 - EnvironmentProperty ................................................................................. 239
Figure 9:354 - GeoPoliticalExtentType ............................................................................... 240
Figure 9:355 - Location ...................................................................................................... 240
Figure 9:356 - LocationHolder ........................................................................................... 241
Figure 9:357 - MeasurableElement .................................................................................... 242
Figure 9:358 - Measurement ............................................................................................... 243
Figure 9:359 - MeasurementSet ........................................................................................ 243
Figure 9:360 - Mitigates ...................................................................................................... 244
Figure 9:361 - OwnsRisk ................................................................................................. 244
Figure 9:362 - OwnsRiskInContext .................................................................................... 244
Figure 9:363 - PropertySet ................................................................................................. 245
Figure 9:364 - Risk .............................................................................................................. 246
TABLE OF TABLES

Table 1:1 - Table of Related Documents..............................................Error! Bookmark not defined.
Table 5:1 - Description of acronyms used in this specification.................................................9
Table 7:1 - Definitions for the Viewpoints..............................................................................14
Table 7:2 - Definitions of the Aspects.....................................................................................15
Preface

OMG

Founded in 1989, the Object Management Group, Inc. (OMG) is an open membership, not-for-profit computer industry standards consortium that produces and maintains computer industry specifications for interoperable, portable and reusable enterprise applications in distributed, heterogeneous environments. Membership includes Information Technology vendors, end users, government agencies and academia. OMG member companies write, adopt, and maintain its specifications following a mature, open process. OMG's specifications implement the Model Driven Architecture® (MDA®), maximizing ROI through a full-lifecycle approach to enterprise integration that covers multiple operating systems, programming languages, middleware and networking infrastructures, and software development environments. OMG's specifications include: UML® (Unified Modeling Language™); CORBA® (Common Object Request Broker Architecture); CWM™ (Common Warehouse Metamodel); and industry-specific standards for dozens of vertical markets. More information on the OMG is available at https://www.omg.org/.

OMG Specifications

As noted, OMG specifications address middleware, modeling and vertical domain frameworks. All OMG Specifications are available from this URL: https://www.omg.org/spec

Specifications are organized by the following categories:

Domain Categories

Platform Categories

Other Catagories

All of OMG’s formal specifications may be downloaded without charge from our website. (Products implementing OMG specifications are available from individual suppliers.) Copies of specifications, available in PDF format, may be obtained from the Specifications Catalog cited above or by contacting the Object Management Group, Inc. at:

OMG Headquarters
9C Medway Road, PMB 274
Milford, MA 01757
USA Tel: +1-781-444-0404 Fax: +1-781-444-0320
Email: pubs@omg.org

Certain OMG specifications are also available as ISO standards. Please consult https://www.iso.org
Typographical Conventions

The type styles shown below are used in this document to distinguish programming statements from ordinary English. However, these conventions are not used in tables or section headings where no distinction is necessary.

Times/Times New Roman - 10 pt.: Standard body text

**Helvetica/Arial - 10 pt. Bold:** OMG Interface Definition Language (OMG IDL) and syntax elements.

**Courier - 10 pt. Bold:** Programming language elements.

**Helvetica/Arial - 10 pt:** Exceptions

**Note** – Terms that appear in *italics* may be defined in the glossary. Italic text also represents the name of a document, specification, or other publication.

Issues

All OMG specifications are subject to continuous review and improvement. As part of this process, we encourage readers to report any ambiguities, inconsistencies, or inaccuracies they may find by completing the Issue Reporting Form listed on the main web page https://www.omg.org, under Specifications/Document Help/Report an Issue.
1. Scope

1.1 Introduction

There are two types of text documents in this specification: normative and informative.

The normative parts are:

1. The UAF Domain Metamodel (DMM) (this document dtc/21-12-06) establishes the underlying foundational modeling constructs to be used in modeling an enterprise and major entities within the enterprise. It provides the definition of concepts, relationships, and UAF Grid view specifications. The UAF DMM is the basis for any implementation of UAF including non-UML/SysML implementations.

2. The UAF Modeling Language (UAFML) (document dtc/21-12-07) provides the modeling language specification for implementing the UAF DMM using UML/SysML.

The informative parts are:

3. The UAF Traceability, Appendix A (document dtc/21-12-10), provides the mappings between UAF versions and the frameworks (DoDAF, MODAF, NAF) and languages (SysML, BPMN) that contribute to the UAF.

4. The UAF Sample Problem, Appendix B (document dtc/21-12-12), illustrates a practical usage of UAF using a search and rescue example.

5. The Enterprise Architecture Guide (EAG) for UAF, Appendix C (document dtc/21-12-13), provides a structured approach to construct an EA architecture using the UAFML. The EA Guide is intended to be used in conjunction with the Sample Problem for a Search and Rescue Mission, UAF Sample Problem, Appendix B. The approach defined in this Guide is just one way to approach architectures when using UAF and is intended to be informative only, and not an official OMG-mandated approach.

1.2 UAF Background

UAF evolved from the Unified Profile for DoDAF and MODAF (UPDM), version 2.1. UAF extends the scope of UPDM and generalizes it to make it applicable to commercial as well as military architectures. The intent of UAF is to provide a standard representation for describing enterprise architectures using a Model Based Systems Engineering (MBSE) approach.

The core concepts in the UAF are based upon the DoDAF 2.0.2 Domain Metamodel (DM2) and the MODAF ontological data exchange mechanism (MODEM), Security Views from Canada's Department of National Defense Architecture Framework (DNDAF) and the North Atlantic Treaty Organization (NATO) Architecture Framework (NAF) v 4.

UAF models describe a system1 from a set of stakeholders' concerns such as security or information through a set of predefined viewpoints. Developed models can also reflect custom viewpoints or users can develop more formal extensions for new viewpoints.

The UAFML can be used to develop architectures compliant with:

- Department of Defense Architecture Framework (DoDAF) version 2.02
- Ministry of Defence Architecture Framework (MODAF) version 1.3
- North Atlantic Treaty Organization (NATO) Architecture Framework (NAF) version 3.1
- North Atlantic Treaty Organization (NATO) Architecture Framework (NAF) version 4

---

1 The term system is used from: “Systems and software engineering -- Architecture description,”
https://www.iso.org/iso/catalogue_detail.htm?csnumber=50508
UAF v 1.2 supports the capability to:

- model architectures for a broad range of complex systems, which may include hardware, software, data, personnel, and facility elements;
- model consistent architectures for system-of-systems (SoS) down to lower levels of design and implementation;
- support the analysis, specification, design, and verification of complex systems; and
- improve the ability to exchange architecture information among related tools that are SysML based.

1.3 Intended Usage

The UAF enables the modeling of strategic capabilities, operational scenarios, services, resources, personnel, security, projects, standards, measures, and requirements; which supports best practices through, separation of concerns and abstractions. In addition, the UAF enables the modeling of related architecture concepts such as:

- System of Systems (SoS),
- information exchanges consistent with the National Information Exchange Model (NIEM),
- DoD's doctrine, organization, training material, leadership & education, personnel, and facilities (DOTMLPF)
- UK Ministry of Defence Lines of Development (DLOD) elements,
- Human Computer Interfaces (HCI).

Further, The UAF conforms to terms defined in the ISO/IEC/IEEE 42010 standard for architecture description, where the terms: architecture, architecture description (AD), architecture framework, architecture view, architecture viewpoint, concern, environment, model kind, stakeholder [ISO/IEC/IEEE 42010:2011] form correspondence rules specified as constraints on UAF.

1.4 Related Documents

The specification includes a metamodel and description as separate documents. Other appendices are also provided as separate documents. The table below provides a listing of these documents:

<table>
<thead>
<tr>
<th>Document Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dtc/21-12-06</td>
<td>The UAF Domain MetaModel (DMM)</td>
</tr>
<tr>
<td>dtc/21-12-07</td>
<td>The UAF Modeling Language (UAFML)</td>
</tr>
<tr>
<td>dtc/21-12-10</td>
<td>Appendix A that contains a separate traceability subsection from UAFML to each of the frameworks listed in Section 1.2 of this specification</td>
</tr>
<tr>
<td>dtc/21-12-12</td>
<td>Appendix B: An example of how the language can be used to represent a UAFML architecture</td>
</tr>
<tr>
<td>dtc/21-12-13</td>
<td>Appendix C: An Enterprise Architecture Guide (EAG)</td>
</tr>
<tr>
<td>dtc/21-12-14</td>
<td>UAF XMI file</td>
</tr>
<tr>
<td>dtc/21-12-15</td>
<td>UAF XMI Measurements library</td>
</tr>
</tbody>
</table>
2. Conformance

UAF specifies four types of conformance.

Type 1 Conformance: - UAF View specification conformance. A tool demonstrating view specification conformance shall implement a version of all the view specifications defined in the UAF Grid, with the exception of the view specifications in the Architecture Management Viewpoint. Optionally the tool vendor can implement other donor framework viewpoints, for instance DoDAF, MODAF or NAF based upon the mapping between them and UAF provided in Appendix A (dtc/21-12-10).

Type 2 Conformance: - UAF Conceptual Syntax Conformance. A tool demonstrating conceptual syntax conformance is consistent with the concepts, relationships and constraints defined in the UAF DMM (this document). UAF Conceptual Syntax Conformance implies Type 1 Conformance.

Type 3 Conformance: - UAF Formal Syntax Conformance. A tool demonstrating formal syntax conformance:
- Enables instances of concrete UAFML stereotypes defined in the UAFML (dtc/21-12-07)
- Complies with the constraints defined in the UAFML (dtc/21-12-07)
- Complies with the SysML version 1.6 Concrete Syntax Conformance (formal/19-11-01)
- UAF Formal Syntax Conformance implies Type 2 Conformance

Type 4 Conformance: - UAF Model interchange conformance. A tool demonstrating model interchange conformance can import and export conformant XMI for all valid UAFML models. Model interchange conformance implies Type 3 Conformance.
3. References

3.1 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

3.1.1 OMG Documents (Normative References)

- Diagram Definition (DD), 1.1, June 2015, [https://www.omg.org/spec/DD](https://www.omg.org/spec/DD)
- XML Metadata Interchange, 2.5.1, June 2015, [https://www.omg.org/spec/XML/2.5.1/About-XMI](https://www.omg.org/spec/XML/2.5.1/About-XMI)

3.2 Other Normative References

- Ministry of Defence Architecture Framework (MODAF), [https://www.gov.uk/mod-architecture-framework](https://www.gov.uk/mod-architecture-framework)
- MODAF Ontological Data Exchange Mechanism (MODEM)

3.3 Informative References

• Object Management Group (OMG), Metamodel Extension Facility, Initial submission, ad/12-02-01,
  https://www.omg.org/cgi-bin/doc?ad/12-02-01 (Requires OMG Member Access)
• OASIS SOA-RAF, Reference Architecture Foundation for Service Oriented Architecture Version 1.0, OASIS
  SOA Reference Model TC, 04 December 2012. https://docs.oasis-open.org/soa-rm/soa-ra/v1.0/cs01/soa-ra-
  v1.0-cs01.pdf (Authoritative)
• Object Management Group (OMG), Semantics of Business Vocabulary and Business Rules (SBVR), Version
• International Council On Systems Engineering (INCOSE), Systems Engineering Handbook V4, 2015,
  http://www.incose.org/ProductsPublications/sehandbook
• Unified Profile for DoDAF and MODAF (UPDM), 2.1, August 2013, https://www.omg.org/spec/UPDM
• Ontology Definition Metamodel (ODM), 1.1, September 2014, https://www.omg.org/spec/ODM
4. Terms and Definitions

No new terms and definitions have been required to create this specification. All terms are available in the normative references or bibliographic citations for detailed explanation. The modeling concepts specified in this standard e.g., MetaModel Elements, Viewpoints, Aspects, View Specifications, etc. are defined in the appropriate section for that concept. Additional terms are defined in Appendix C: Enterprise Architecture Guide (EAG).
5. Acronyms

For the purposes of this specification, the following List of acronyms used in this specification.

Table 5.0-2 - Description of acronyms used in this specification

<table>
<thead>
<tr>
<th>AcV.*²</th>
<th>Acquisition View</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD</td>
<td>Architecture Description</td>
</tr>
<tr>
<td>AV-*</td>
<td>All View</td>
</tr>
<tr>
<td>BMM</td>
<td>Business Motivation Model</td>
</tr>
<tr>
<td>BPMM</td>
<td>Business Process Modeling Notation</td>
</tr>
<tr>
<td>C4ISR</td>
<td>Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance</td>
</tr>
<tr>
<td>CaT</td>
<td>Capability Team</td>
</tr>
<tr>
<td>COI</td>
<td>Communities of Interest</td>
</tr>
<tr>
<td>CV-*</td>
<td>Capability View</td>
</tr>
<tr>
<td>DIV-*</td>
<td>Data and Information Views</td>
</tr>
<tr>
<td>DLOD</td>
<td>Defence Lines of Development</td>
</tr>
<tr>
<td>DM2</td>
<td>DoDAF Meta Model</td>
</tr>
<tr>
<td>DMM</td>
<td>Domain Meta Model</td>
</tr>
<tr>
<td>DNDAF</td>
<td>Department National Defence and Canadian Forces (DND/ CF) Architecture Framework</td>
</tr>
<tr>
<td>DoD</td>
<td>United States Department of Defense</td>
</tr>
<tr>
<td>DoDAF</td>
<td>Department of Defense Architecture Framework</td>
</tr>
<tr>
<td>DOTMLP</td>
<td>Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities</td>
</tr>
<tr>
<td>EIE</td>
<td>Enterprise Information Environment</td>
</tr>
<tr>
<td>IDEAS</td>
<td>International Defense Enterprise Architecture Specification for Exchange</td>
</tr>
<tr>
<td>IDEF</td>
<td>Integrated DEFinition Methods</td>
</tr>
<tr>
<td>INCOSE</td>
<td>International Council Of Systems Engineering</td>
</tr>
<tr>
<td>JCIDS</td>
<td>Joint Capabilities Integration and Development System</td>
</tr>
<tr>
<td>MISIG</td>
<td>Model Interchange Special Interest Group</td>
</tr>
<tr>
<td>MOD</td>
<td>United Kingdom Ministry of Defence</td>
</tr>
<tr>
<td>MODAF</td>
<td>Ministry of Defence Architecture Framework</td>
</tr>
<tr>
<td>MODEM</td>
<td>MODAF Ontological Data Exchange Mechanism</td>
</tr>
<tr>
<td>NAF</td>
<td>NATO Architecture Framework</td>
</tr>
<tr>
<td>OASIS</td>
<td>Organization for the Advancement of Structured Information Standards</td>
</tr>
<tr>
<td>OSLC</td>
<td>Open Services for Lifecycle Collaboration</td>
</tr>
<tr>
<td>OV-*</td>
<td>Operational View</td>
</tr>
<tr>
<td>PES</td>
<td>DoDAF Physical Exchange Specification</td>
</tr>
<tr>
<td>POC</td>
<td>Proof of Concept</td>
</tr>
<tr>
<td>PV-*</td>
<td>Project View</td>
</tr>
<tr>
<td>RDF</td>
<td>Resource Description Framework</td>
</tr>
<tr>
<td>SoaML</td>
<td>Service orientated architecture Modeling Language</td>
</tr>
<tr>
<td>SoS</td>
<td>System of Systems</td>
</tr>
</tbody>
</table>

² * denotes a wildcard
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV-*</td>
<td>Service Oriented View</td>
</tr>
<tr>
<td>StdV-*</td>
<td>Standards View in DoDAF 2.02 compare TV-* in UAF</td>
</tr>
<tr>
<td>STV-*</td>
<td>Strategic View</td>
</tr>
<tr>
<td>SV-*</td>
<td>System View</td>
</tr>
<tr>
<td>SvcV-*</td>
<td>Service View</td>
</tr>
<tr>
<td>TEPID</td>
<td>Training, Equipment, Personnel, Information, Concepts and Doctrine, Organisation, Infrastructure, Logistics</td>
</tr>
<tr>
<td>OIL</td>
<td></td>
</tr>
<tr>
<td>TOGAF</td>
<td>The Open Group Architectural Framework©</td>
</tr>
<tr>
<td>TPPU</td>
<td>Task, Post, Process, and Use</td>
</tr>
<tr>
<td>TV-*</td>
<td>Technical View</td>
</tr>
<tr>
<td>UAF</td>
<td>Unified Architecture Framework</td>
</tr>
<tr>
<td>UAFML</td>
<td>Unified Architecture Framework Modeling Language</td>
</tr>
<tr>
<td>UPDM</td>
<td>Unified Profile for DoDAF/MODAF</td>
</tr>
</tbody>
</table>
6. Additional Information

6.1 Changes to Adopted OMG Specifications

This specification completely replaces Unified Architecture Framework (UAF), version 1.1
https://www.omg.org/spec/UAF/About-UAF/

6.2 Language Architecture

The UAF specification reuses a subset of UML 2.5.1 and SysML 1.6 and provides additional extensions needed to address requirements in the UPDM 3.0 RFP Mandatory Requirements. Those requirements form the basis for this specification. This specification documents the language architecture in terms of UML 2.5.1 and SysML 1.6 and specifies how to implement UAF. This clause explains design principles and how they are applied to define the UAF language architecture.

6.3 Philosophy

The UAF development uses a model-driven approach. A simple description of the work process is:
A Domain Metamodel (DMM) uses UML Class models to represent individuals, types and tuples that maps the concepts defined in DoDAF, MODEM, NAF, and other frameworks.
The aligned and renamed viewpoints from the various frameworks provide a common generic name for each viewpoint. It should be noted that the term viewpoint is in the context of ISO 42010 where a viewpoint is the specification of a view. The UAF viewpoints are mapped to the corresponding viewpoint in the relevant contributing framework. It is the viewpoints described in the DMM that provides the basis for the Unified Architecture Framework (UAF).
The UAF provides an abstraction layer that separates the underlying UAF metamodel from the presentation layer.
The results of this mapping are given in Appendix A (see document dtc/21-12-10) and an overview of the viewpoints in a grid format are given in this document.
The intent of the UAF is to provide a Domain MetaModel usable by non-UML/SysML tool vendors who may wish to implement the UAF within their own tool and metalanguage.
The Unified Architecture Framework Modeling Language (UAFML) is the standard implementation of the UAF DMM. It was created by mapping the UAF concepts and relationships to corresponding stereotypes in the UAFML Profile.
The UAFML analysis and refactoring reflects language architecture, tool implementation, and reuse considerations.
The specification is generated from the UML model used to describe the UAF DMM and UAFML. This approach allows the team to concentrate on architecture issues rather than documentation production. The UML tool automatically maintains consistency. The UML tool improves maintenance and enables traceability between the UAF and the UAFML where every stereotype is linkable to the UAF element using UML Abstraction relationship.

6.4 Core Principles

The fundamental design principles for UAF DMM are:
Requirements-driven: UAF is intended to satisfy the requirements of the UPDM 3.0 RFP Mandatory Requirements.
Influence from donor Frameworks: The DMM was based upon an aggregation of concepts and relationships from the donor frameworks.
IDEAS Ontology driven: The DMM was based upon a simplified version of the IDEAS ontology, see chapter 8.
DMM Notation: The DMM was expressed using UML class diagram notation.
Reusability of UML Metamodel concepts: The UAF DMM reuses a number of concepts from the UML Metamodel, such as Statemachines, Activities and Interactions. The explicit relationship to these concepts enables the UAF DMM to reuse UML semantics instead of reinventing its own semantics.
**Reusability of BPMN concepts:** The UAF DMM reuses a number of concepts from BPMN, such as processes. The explicit relationship to these concepts enables the UAF DMM to reuse BPMN semantics instead of reinventing its own semantics.
7. UAF Grid

Due to the complexity of managing the multiple viewpoints with overlapping concerns and metamodels, the standard viewpoints are refactored as described in the donor frameworks into a more manageable format. This decision led to the development of the UAF grid which is described below.

The grid is a way of showing how the various view specifications (cells) correspond to viewpoints (prev. known as domains) (horizontal rows) and the aspects (prev. known as model kinds) (the columns) that describe the view specification. The intent of the grid is not to be complete, but to capture the information that is present in the frameworks that contributes to the UAF, consequently, some gaps are evident.

![UAF Grid Diagram]

Figure 7:1- UAF Grid

Notes related to suffixes in the grid:

a. The view specifications in the Architecture Management viewpoint are architectural artifacts that contribute to the success in defining and developing an architecture.

b. To be able to evaluate architecture behavior and constraints (i.e., non-functional requirements) it is necessary to define actual instances of the architectural elements. The expectation is that tool vendors intending to implement the UAF have capabilities native to their tools to enable behavioral simulation and the evaluation of measures and constraints through parametric diagrams or a proprietary equivalent.

c. The information model is an aspect across the domains and can be defined in any of its forms, i.e., Conceptual, Logical or Physical. The expectation is that most developers of the information model will use the Conceptual or Logical forms of the data model when using an abstract modeling tool.

d. The parameters column captures the measures, environments, and risks across the architecture in the different viewpoints.

e. The Architecture Extensions view specification provides a means to extend the framework to other domains. The detailed mapping between the view specifications of the UAF shown in the grid and the viewpoints from the donor frameworks is described in dtc/21-12-10. A definition for each view specification in the grid is described in the following chapters.
## 7.1 Descriptions of Viewpoints and Aspects

Table 7.1 - Definitions for the Viewpoints

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture Management</td>
<td>Am</td>
<td>Identifies the metadata and views required to develop a suitable architecture that is fit for its purpose.</td>
</tr>
<tr>
<td>Strategic</td>
<td>St</td>
<td>Capability management process. Describes the capability taxonomy, composition, dependencies, and evolution.</td>
</tr>
<tr>
<td>Operational</td>
<td>Op</td>
<td>Illustrates the Logical Architecture of the enterprise. Describes the requirements, operational behavior, structure, and exchanges required to support (exhibit) capabilities. Defines all operational elements in an implementation/solution independent manner.</td>
</tr>
<tr>
<td>Services</td>
<td>Sv</td>
<td>The Service-Orientated View (SOV) is a description of services needed to directly support the operational domain as described in the Operational View. A service within MODAF is understood in its broadest sense, as a unit of work through which a provider provides a useful result to a consumer. DoDAF: The Service Views within the Services Viewpoint describe the design for service-based solutions to support operational development processes (JCIDS) and Defense Acquisition System or capability development within the Joint Capability Areas.</td>
</tr>
<tr>
<td>Personnel</td>
<td>Ps</td>
<td>Defines and explores organizational resource types. Shows the taxonomy of types of organizational resources as well as connections, interaction, and growth over time.</td>
</tr>
<tr>
<td>Resources</td>
<td>Rs</td>
<td>Captures a solution architecture consisting of resources, e.g., organizational, software, artifacts, capability configurations, and natural resources that implement the operational requirements. Further design of a resource is typically detailed in SysML or UML.</td>
</tr>
<tr>
<td>Security</td>
<td>Sc</td>
<td>Security assets and security enclaves. Defines the hierarchy of security assets and asset owners, security constraints (policy, laws, and guidance) and details where they are located (security enclaves).</td>
</tr>
<tr>
<td>Projects</td>
<td>Pj</td>
<td>Describes projects and project milestones, how those projects deliver capabilities, the organizations contributing to the projects and dependencies between projects.</td>
</tr>
<tr>
<td>Standards</td>
<td>Sd</td>
<td>MODAF: Technical Standards Views are extended from the core DoDAF views to include non-technical standards such as operational doctrine, industry process standards, etc. DoDAF: The Standards Views within the Standards Viewpoint are the set of rules governing the arrangement, interaction, and interdependence of solution parts or elements.</td>
</tr>
<tr>
<td>Actual Resources</td>
<td>Ar</td>
<td>The analysis, e.g., evaluation of different alternatives, what-if, trade-offs, V&amp;V on the actual resource configurations. Illustrates the expected or achieved actual resource configurations.</td>
</tr>
<tr>
<td>Aspect</td>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Motivation</td>
<td>Mv</td>
<td>Captures motivational elements e.g., challenges, opportunities, and concerns, that pertain to enterprise transformation efforts, and different types of requirements, e.g., operational, services, personnel, resources, or security controls.</td>
</tr>
<tr>
<td>Taxonomy</td>
<td>Tx</td>
<td>Presents all the elements as a standalone structure. Presents all the elements as a specialization hierarchy, provides a text definition for each one and references the source of the element</td>
</tr>
<tr>
<td>Structure</td>
<td>Sr</td>
<td>Describes the breakdown of structural elements e.g., logical performers, systems, projects, etc. into their smaller parts</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Cn</td>
<td>Describes the connections, relationships, and interactions between the different elements.</td>
</tr>
<tr>
<td>Processes</td>
<td>Pr</td>
<td>Captures activity-based behavior and flows. It describes activities, their Inputs/Outputs, activity actions and flows between them.</td>
</tr>
<tr>
<td>States</td>
<td>St</td>
<td>Captures state-based behavior of an element. It is a graphical representation of states of a structural element and how it responds to various events and actions.</td>
</tr>
<tr>
<td>Sequences</td>
<td>Sq</td>
<td>Expresses a time ordered examination of the exchanges as a result of a particular scenario. Provides a time-ordered examination of the exchanges between participating elements as a result of a particular scenario.</td>
</tr>
<tr>
<td>Information</td>
<td>If</td>
<td>Address the information perspective on operational, service, and resource architectures. Allows analysis of an architecture’s information and data definition aspect, without consideration of implementation specific issues.</td>
</tr>
<tr>
<td>Constraints</td>
<td>Ct</td>
<td>Details the measurements that set performance requirements constraining capabilities. Also defines the rules governing behavior and structure.</td>
</tr>
<tr>
<td>Roadmap</td>
<td>Rm</td>
<td>Addresses how elements in the architecture change over time.</td>
</tr>
<tr>
<td>Traceability</td>
<td>Tr</td>
<td>Describes the mapping between elements in the architecture. This can be between different viewpoints within domains as well as between domains. It can also be between structure and behaviors.</td>
</tr>
</tbody>
</table>
7.2 **Viewpoint Interrelationships**

Although the grid is the primary means of expressing the relationship between the Viewpoints, Aspects and View Specifications, because of its two-dimensional nature it is not adequate to explain the abstract interrelationships that exist between the viewpoints. The following diagram is an indication of the how the viewpoints are interrelated.

![Viewpoint Interrelationships Diagram](image)

**Figure 7:2 – Viewpoint Interrelationships**

Where a Viewpoint is shown vertically the intent is to show that the Viewpoint is a cross cutting concern that goes across the levels of abstraction in the architecture.

Where a Viewpoint is shown horizontally the intent is to show that the Viewpoint exists in a layer of abstraction between the Viewpoints above and below it and there is an interrelationship with the Viewpoints either side of it.

7.3 **Domain Metamodel Diagram Legend**

Note that the diagrams rely on color to aid the reader in understanding the model. Please refer to the legend below to understand the diagrams.

The following is the legend of element colors used in the DMM and what they denote.
The meaning of the element types in the UAF are based upon concepts put forth in the International Defence Enterprise Architecture Specification (IDEAS).

- An Individual denotes a single instance of an element
- A Type denotes a set of Individuals
- A Tuple denotes a relationship that exists between elements
- An Abstract denotes that the element has no direct use but is a means of construction
- An Enumeration is a complete, ordered listing of all the items in a collection
- An External Type is an element that exists outside of the core DMM but is referenceable by elements in the DMM
8. Domain Metamodel Diagrams

Note that the diagrams rely on color to aid the reader in understanding the model. Please refer to the legend in the various diagrams to understand the specific definitions.

8.1 View Specifications

This section documents each of the view specifications of UAF.

8.1.1 View Specifications::Architecture Management

Stakeholders: Enterprise Architects, people who want to discover the architecture, Technical Managers.
Concerns: Captures meta-data relevant to the entire architecture
Definition: Provide information pertinent to the entire architecture. Present supporting information rather than architectural models.

View Specifications::Architecture Management::Motivation
Contains the diagrams that document the Architecture Management Motivation View Specification.

View Specifications::Architecture Management::Motivation::Architecture Principles
Stakeholders: Enterprise Architects, Enterprise Systems Engineers, Model Managers, System Architects.
Concerns: alignment of architecture with architecture heuristics, guidelines, and principles.
Definition: identifies relevant architectural principles and other guidelines to be used in architecture development and evaluation.
Recommended Implementation: SysML Block Diagram, tabular format

![Figure 8:1 - Architecture Principles](image)

Elements
- **Driver**

View Specifications::Architecture Management::Structure
Contains the diagrams that document the Architecture Management Structure View Specification.

View Specifications::Architecture Management::Structure::Architecture Views
Stakeholders: Enterprise Architects, Model Managers, Modelers, Technical Managers.
Concerns: domains, viewpoints, aspects, model kinds, and view specifications that are used to describe the architecture.
Definition: (i) lists predefined and custom domains, model kinds, viewpoints, aspects and view specifications (ii) and identify the key stakeholders and their perspectives and concerns.
Recommended Implementation: SysML Block Definition Diagram, SysML Package Diagram.
Figure 8:2 - Architecture Views

Elements
- ActualOrganizationalResource
- ArchitecturalDescription
- Concern
- OrganizationalResource
- Stakeholder
- View
- Viewpoint

View Specifications::Architecture Management::Connectivity
Contains the diagrams that document the Architecture Management Connectivity View Specification.

View Specifications::Architecture Management::Connectivity::Architecture References
Stakeholders: Enterprise Architects, people who want to understand relationships to related architectural descriptions, Technical Managers.
Concerns: high-level dependencies between architectural descriptions.
Definition: depicts and analyzes all relevant dependencies between architectural descriptions, e.g., reference architectures, as-is to to-be architectures, enterprise architecture to system architectures.
Recommended Implementation: SysML Block Definition Diagram, SysML Package Diagram, matrix format.

Figure 8:3 - Architecture References
Elements
- ArchitecturalDescription
- ArchitecturalReference

View Specifications::Architecture Management::Processes
Contains the diagrams that document the Architecture Management Processes View Specification.

View Specifications::Architecture Management::Processes::Architecture Development Method
Stakeholders: Enterprise Architects, Model Managers, Modelers, Enterprise Systems Engineers.
Concerns: development sequence of models and views and how they are related to each other.
Definition: defines workflow or process steps used in managing the architecture development.
Recommended Implementation: SysML Activity Diagram, text.

Figure 8:4 - Architecture Development Method
Elements
- ArchitecturalDescription

View Specifications::Architecture Management::States
Contains the diagrams that document the Architecture Management States View Specification.

View Specifications::Architecture Management::States::Architecture Status
Stakeholders: Enterprise Architects, people who want to understand the architecture governance, Technical Managers.
Concerns: architecture status.
Definition: captures version number and approval workflow of the architecture. Recommended Implementation: SysML State Machine Diagram, state table, text.

Figure 8:5 - Architecture Status
Elements
- ArchitecturalDescription

View Specifications::Architecture Management::Information
Contains the diagrams that document the Architecture Management Information View Specification.

View Specifications::Architecture Management::Information::Dictionary
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: provides a central reference for a given architecture’s data and metadata. It enables the set of architecture description to stand alone, with minimal reference to outside resources.

Definition: contains definitions of terms used in the given architecture. It consists of textual definitions in the form of a glossary, their taxonomies, and their metadata (i.e., data about architecture data), including metadata for any custom-tailored views. Architects should use standard terms where possible (i.e., terms from existing, approved dictionaries, glossaries, and lexicons).

Recommended Implementation: text, table format.

Figure 8:6 – Dictionary

Elements
- **Alias**
- **Definition**
- **Information**
- **SameAs**
- **UAFEElement**

**View Specifications::Architecture Management::Parameters**
Contains the diagrams that document the Architecture Management Parameters View Specification.

**View Specifications::Architecture Management::Parameters::Architecture Parameters**
Stakeholders: Enterprise Architects, Enterprise Systems Engineers, Model Managers, System Architects.
Concerns: architecture parameters.
Definition: depicts and analyzes measures and measurements that are applicable to management of the architecture.
Recommended Implementation: SysML Block Definition Diagram, tabular format.
Figure 8:7 - Architecture Parameters

Elements
- ActualMeasurementSet
- ArchitecturalDescription
- MeasurableElement
- MeasurementSet

View Specifications::Architecture Management::Constraints
Contains the diagrams that document the Architecture Management Constraints View Specification.

View Specifications::Architecture Management::Constraints::Architecture Constraints
Stakeholders: Enterprise Architects, people who want to understand the architecture constraints, Technical Managers.
Concerns: architecture assumptions and constraints.
Definition: depicts and analyzes assumptions, constraints, rules, policy and guidance that are applicable to aspects of the
architecture.
Recommended Implementation: SysML Package Diagram, tabular format.

Figure 8:8 - Architecture Constraints

Elements
- ArchitecturalDescription

View Specifications::Architecture Management::Roadmap
Contains the diagrams that document the Architecture Management Roadmap View Specification.

View Specifications::Architecture Management::Roadmap::Architecture Roadmap
Stakeholders: Enterprise Architects, people who want to understand the architecture development plan, Technical
Managers.
Concerns: architecture release schedule.
Definition: captures project timeline for the architecture. Recommended Implementation: timeline, text.
Figure 8:9 - Architecture Roadmap

Elements
- ArchitecturalDescription

View Specifications::Architecture Management::Traceability
Contains the diagrams that document the Architecture Management Traceability View Specification.

View Specifications::Architecture Management::Traceability::Architecture Traceability
Stakeholders: Enterprise Architects, people who want to understand impact of change across the architecture supporting assets, Technical Managers.
Concerns: reuse of architectures.
Definition: shows references to operational, services, and resource architectures, asset libraries, legacy architectures, and external sources, e.g., documents. Recommended Implementation: SysML Block Definition Diagram, SysML Package Diagram, tabular format

Figure 8:10 - Architecture Traceability

Elements
- ActualEnterprisePhase
- ActualStrategicPhase
- ArchitecturalDescription
- Architecture
- EnterpriseMission
- Implements
- OperationalArchitecture
- ResourceArchitecture
- ServiceArchitecture
- WholeLifeEnterprise
8.1.2 View Specifications::Summary & Overview

Stakeholders: Executives, PMs, Enterprise Architects.
Concerns: executive-level summary information in a consistent form.
Definition: provides executive-level summary information in a consistent form that allows quick reference and comparison between architectural descriptions. Includes assumptions, constraints, and limitations that may affect high-level decisions relating to an architecture-based work programme.

View Specifications::Summary & Overview::Summary & Overview

Stakeholders: Decision makers, Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: quick overview of an architecture description and summary of analysis. In the initial phases of architecture development, it serves as a planning guide. Upon completion of an architecture, it provides a summary of findings, and any conducted analysis.
Definition: provides executive-level summary information in a consistent form that allows quick reference and comparison among architectures. The Summary and Overview includes assumptions, constraints, and limitations that may affect high-level decision processes involving the architecture.
Recommended Implementation: text, free form diagram, table format.

Figure 8:11 - Summary & Overview

Elements

- ActualEnterprisePhase
- ActualOrganizationalResource
- ActualStrategicPhase
- ArchitecturalDescription
- ArchitecturalReference
- Architecture
- ArchitectureMetadata
- Challenge
- Concern
- EnterpriseMission
- ImpactedBy
- Implements
- Metadata
- MotivatedBy
8.1.3 View Specifications::Strategic
Stakeholders: Capability Portfolio Managers.
Concerns: capability management process.
Definition: describe capability taxonomy, composition, dependencies and evolution.

View Specifications::Strategic::Motivation
Contains the diagrams that document the Strategic Motivation View Specification.

View Specifications::Strategic::Motivation::Strategic Motivation
Stakeholders: Enterprise Architects, Portfolio Managers, Enterprise Systems Engineers, Program Managers.
Concerns: architecture drivers, challenges, opportunities, capabilities that address opportunities, phases and architectures that address challenges.
Definition: identifies and defines the drivers, challenges, and opportunities that are applicable to the architecture. defines the desired outcomes, goals and objectives that are motivated by the drivers, and the opportunities that enable the goals and objectives.
Recommended Implementation: SysML Block Definition Diagram, SysML Package Diagram, tabular format.

Figure 8:12 - Strategic Motivation
Elements
- ActualEnduringTask
- ActualOutcome
- ActualStrategicPhase
View Specifications::Strategic::Taxonomy
Contains the diagrams that document the Strategic Taxonomy View Specification.

View Specifications::Strategic::Taxonomy::Strategic Taxonomy
Stakeholders: PMs, Enterprise Architects, Executives.
Concerns: capability needs.
Definition: shows the taxonomy of capabilities.
Recommended Implementation: SysML Block Definition Diagram.

Figure 8:13 - Strategic Taxonomy

Elements
- Capability
- CapabilityGeneralization

View Specifications::Strategic::Structure
Contains the diagrams that document the Strategic Structure View Specification.

View Specifications::Strategic::Structure::Strategic Structure
Stakeholders: PMs, Enterprise Architects, Executives.
Concerns: capability needs.
Definition: shows the relationship between EnterprisePhases and the Capabilities that are intended to be developed during the enterprise phases, and the organizations involved in the enterprise.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:14 - Strategic Structure

Elements
- Capability
- CapabilityRole

View Specifications::Strategic::Connectivity
Contains the diagrams that document the Strategic Connectivity View Specification.

View Specifications::Strategic::Connectivity::Strategic Connectivity
Stakeholders: PMs, Executives, Enterprise Architects.
Concerns: capability dependencies.
Definition: describes the dependencies between planned capabilities.
Recommended Implementation: SysML Block Definition Diagram. SysML Internal Block Diagram.

Figure 8:15 - Strategic Connectivity

Elements
- Capability
- CapabilityDependency
- CapabilityRole
- CapabilityRoleDependency

View Specifications::Strategic::Processes
Contains the diagrams that document the Strategic Processes View Specification.

View Specifications::Strategic::Processes::Strategic Processes
Stakeholders: Program/Project Managers, Portfolio Managers, Enterprise Architects, Executives.
Concerns: capability phasing.
Definition: shows the relationship between strategic phases and the Capabilities that are intended to be developed during the strategic phases, and the actual organizations involved.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8.16 - Strategic Processes

Elements

- ActualEnduringTask
- ActualEnterprisePhase
- ActualOrganization
- ActualPropertySet
- ActualState
- ActualStrategicPhase
- Capability
- Concern
- Creates
- EnterpriseGoal
- EnterpriseMission
- EnterpriseVision
- GeoPoliticalExtentType
- Opportunity
- OrganizationInPhase
- PhaseableElement
- Phases
- ResourcePerformer
- Sequence
- StrategicAsset
- StrategicExchange
- StrategicExchangeItem
- StrategicInformation
- StrategicPhase
- StructuralPart
- TemporalPart
- Valueltem
- ValueStream
- WholeLifeEnterprise
**View Specifications::Strategic::States**

Contains the diagrams that document the Strategic States View Specification.

**View Specifications::Strategic::States::Strategic States**

Stakeholders: PMs, Enterprise Architects.
Concerns: effects that the implementation(s) of capabilities are expected to deliver.
Definition: captures the relationships between capability(ies) and desired effect(s) that implementation(s) of capability(ies) should achieve.

Recommended Implementation: SysML Block Definition Diagram.

**Figure 8:17 - Strategic States**

Elements

- **Achiever**
- **Achieves**
- **ActualEffect**
- **ActualOrganization**
- **ActualOrganizationalResource**
- **ActualOutcome**
- **ActualPerson**
- **ActualPost**
- **ActualPropertySet**
- **ActualResource**
- **ActualResponsibleResource**
- **ActualState**
- **Capability**
- **ActualEffect**
- **Desirer**
- **Desires**
- **Effect**
- **EnterpriseGoal**
• FieldedCapability
• ImpactedBy
• NaturalResource
• OperationalAgent
• OperationalPerformer
• Organization
• OrganizationalResource
• Person
• PhysicalResource
• Post
• Project
• ResourceArchitecture
• ResourceArtifact
• ResourceMitigation
• ResourcePerformer
• Software
• Technology

View Specifications::Strategic::Information
Contains the diagrams that document the Strategic Information View Specification.

View Specifications::Strategic::Information::Strategic Information
Concerns: information that can be considered to be an enterprise strategic asset that can influence achievement of enterprise goals.
Definition: identifies and defines strategic information elements and their relationships that are applicable to the architecture.
Recommended Implementation: SysML Block Definition Diagram, tabular format.

Figure 8:18 - Strategic Information

Elements
• EnterpriseGoal
• InformationModel
• MapsToGoal
• StrategicAsset
**View Specifications::Strategic::Constraints**

Contains the diagrams that document the Strategic Constraints View Specification.

**View Specifications::Strategic::Constraints::Strategic Constraints**

Stakeholders: PMs, Enterprise Architects. Concerns: capability constraints. Definition: details the measurements that set performance requirements constraining capabilities. Recommended Implementation: tabular format, SysML Block Definition Diagram.

**Figure 8:19 - Strategic Constraints**

Elements
- **Capability**
- **StrategicConstraint**
- **SubjectOfStrategicConstraint**

**View Specifications::Strategic::Roadmap**

Contains the diagrams that document the Strategic Roadmap View Specification.

**View Specifications::Strategic::Roadmap::Deployment::Strategic Roadmap: Deployment**

Stakeholders: PMs, Executives, Enterprise Architects.
Concerns: capability deployment to organizations over time.
Definition: addresses the deployment of capability(ies) to actual organizations over time.
Recommended Implementation: timeline, tabular format, SysML Block Definition Diagram.
Figure 8:20 - Strategic Roadmap: Deployment

Elements
- ActualEnterprisePhase
- ActualOrganization
- ActualPerson
- ActualPost
- ActualProject
- ActualProjectMilestone
- ActualResource
- ActualResponsibleResource
- ActualStrategicPhase
- Capability
- CapabilityConfiguration
- CapableElement
- Exhibits
- FieldedCapability
- PhaseableElement
- Phases
- ResourceArchitecture
- ResourcePerformer
- ResponsibleFor
- VersionedElement

View Specifications::Strategic::Roadmap::Phasing::Strategic Roadmap: Phasing

Stakeholders: PMs, Executives, Enterprise Architects.
Concerns: capability(ies) achievement over time.
Definition: the planned achievement of capability(ies) at different points in time or during specific periods of time.
Recommended Implementation: timeline, tabular format, SysML Block Definition Diagram.

Figure 8:21 - Strategic Roadmap: Phasing

Elements
- ActualProject
- ActualProjectMilestone
- ActualResource
- Capability
- CapabilityConfiguration
- CapableElement
- Exhibits
- FieldedCapability
- Project
- ResourceArchitecture
- ResourcePerformer
- VersionedElement

View Specifications::Strategic::Traceability
Contains the diagrams that document the Strategic Traceability View Specification.

View Specifications::Strategic::Traceability::Strategic Traceability
Stakeholders: PMs, Enterprise Architects, Business Architects.
Concerns: traceability between capabilities and operational activities.
Definition: describes the mapping between the capabilities required by an Enterprise and the supporting operational activities.
Recommended Implementation: matrix format, SysML Block Definition Diagram.
8.1.4 View Specifications::Operational

Stakeholders: Business Architects, Executives.
Concerns: illustrate the Logical Architecture of the enterprise.
Definition: describe the requirements, operational behavior, structure, and exchanges required to support (exhibit) capabilities. Defines all operational elements in an implementation/solution independent manner.

View Specifications::Operational::Taxonomy

Contains the diagrams that document the Operational Taxonomy View Specification.

View Specifications::Operational::Taxonomy::Operational Taxonomy

Stakeholders: Business Architects, Systems Engineers, Enterprise Architects, Owners responsible for Operational Agents.
Concerns: OperationalAgent types.
Definition: shows the taxonomy of types of OperationalAgents.
Recommended Implementation: SysML Block Definition Diagram, SysML Internal Block Diagram.
Figure 8:23 - Operational Taxonomy

Elements
- ArbitraryConnector
- Asset
- CapabilityConfiguration
- ConceptItem
- HighLevelOperationalConcept
- Location
- NaturalResource
- OperationalAgent
- OperationalAsset
- OperationalPerformer
- Organization
- OrganizationalResource
- PhysicalResource
- Post
- ResourceArchitecture
- ResourceArtifact
- ResourceAsset
- ResourcePerformer
- Software

View Specifications::Operational::Structure
Contains the diagrams that document the Operational Structure View Specification.

View Specifications::Operational::Structure::Operational Structure
Stakeholders: Business Architects, Systems Engineers, Enterprise Architects, Owners responsible for Operational Agents.
Concerns: identifies the operational exchange requirements between nodes.
Definition: defines operational architecture and exchange requirements necessary to support a specific set of Capability(ies).
Recommended Implementation: SysML Block Definition Diagram, SysML Internal Block Diagram.

Figure 8:24 - Operational Structure

Elements

- **ActualEnvironment**
- **ActualLocation**
- **Asset**
- **Capability**
- **CapableElement**
- **Exhibits**
- **IsCapableToPerform**
- **KnownResource**
- **LocationHolder**
- **OperationalActivity**
- **OperationalAgent**
- **OperationalPerformer**
- **OperationalRole**
- **ProblemDomain**
- **OperationalAsset**

**View Specifications::Operational::Connectivity**
Contains the diagrams that document the Operational Connectivity View Specification.

**View Specifications::Operational::Connectivity::Operational Connectivity**
Stakeholders: Systems Engineers, Architects, Solution Providers.
Concerns: capture the interfaces between OperationalPerformers.
Definition: summarizes logical exchanges between OperationalPerformers of information, systems, personnel, energy etc. and the logical activities that produce and consume them. Measurements can optionally be included.

Recommended Implementation: SysML Internal Block Diagram, tabular format.

Figure 8:25 - Operational Connectivity

Elements

- CapabilityConfiguration
- Exchange
- GeoPoliticalExtentType
- IsCapableToPerform
- MeasurableElement
- MeasurementSet
- NaturalResource
- OperationalActivity
- OperationalActivityAction
- OperationalActivityEdge
- OperationalAgent
- OperationalConnector
- OperationalExchange
- OperationalExchangeItem
- OperationalInformation
- OperationalInterface
- OperationalPerformer
- OperationalPort
- OperationalRole
- OperationalSignal
- OrganizationalResource
- PhysicalResource
- ResourceArchitecture
- ResourceArtifact
**View Specifications::Operational::Processes**

Contains the diagrams that document the Operational Processes View Specification.

**View Specifications::Operational::Processes::Operational Processes**

**Stakeholders:** Business Architect, Systems Engineers, Enterprise Architects

**Concerns:** captures activity based behavior and flows.

**Definition:** describes the activities that are normally conducted in the course of achieving business goals that support a capability. It describes operational activities, their Inputs/Outputs, operational activity actions and flows between them.

**Recommended Implementation:** SysML Activity Diagram, SysML Block Definition Diagram.

---

**Figure 8:26 - Operational Processes**

**Elements**

- ActivityPerformableUnderCondition
- ActualCondition
- ActualMeasurementSet
- ActualService
- IsCapableToPerform
- MeasurableElement
- OperationalActivity
- OperationalActivityAction
• **OperationalActivityEdge**
• **OperationalAgent**
• **OperationalExchange**
• **OperationalExchangeItem**
• **OperationalMethod**
• **OperationalParameter**
• **OperationalPerformer**
• **OperationalRole**
• **PerformsInContext**
• **Process**
• **ProcessEdge**
• **ProcessOperation**
• **ProcessParameter**
• **ProcessUsage**
• **RequiredServiceLevel**
• **Service**
• **StandardOperationalActivity**
• **UML2.5Metamodel::Activity**
• **UML2.5Metamodel::ActivityEdge**
• **UML2.5Metamodel::CallBehaviorAction**
• **UML2.5Metamodel::Operation**
• **UML2.5Metamodel::Parameter**

**View Specifications::Operational::Processes::Operational Processes BPMN Semantics**

Stakeholders: Business Architect, Enterprise Architects.

Concerns: captures activity-based behavior and flows using BPMN notation.

Definition: describes the BPMN processes that are normally conducted in the course of achieving business goals that support a capability. It describes operational activities, their Inputs/Outputs, operational activity actions and flows between them using BPMN notation.

Recommended Implementation: BPMN Process Diagram.
Figure 8:27 - Operational Processes BPMN Semantics

Elements
- ActivityPerformableUnderCondition
- ActualCondition
- ActualEnduringTask
- ActualMeasurementSet
- ActualService
- AssetRole
- BPMN2Metamodel::BPMNMessage
- BPMN2Metamodel::CallActivity
- BPMN2Metamodel::MessageFlow
- BPMN2Metamodel::Process
- BPMN2Metamodel::ResourceRole
- BPMN2Metamodel::SequenceFlow
- Exchange
- ExchangeItem
- Implements
- IsCapableToPerform
- MeasurableElement
- OperationalActivity
- OperationalActivityAction
- OperationalActivityEdge
View Specifications::Operational::States
Contains the diagrams that document the Operational States View Specification.

View Specifications::Operational::States::Operational States
Stakeholders: Systems Engineers, Software Engineers.
Concerns: capture state-based behavior of an operational OperationalPerformer.
Definition: it is a graphical representation of states of an operational OperationalPerformer and how that operational OperationalPerformer responds to various events and actions.
Recommended Implementation: SysML State Machine Diagram.

![UML State Machine Diagram]

Figure 8:28 - Operational States

Elements
- OperationalAgent
- OperationalStateDescription
- StateDescription
- OperationalStateDescription
- OperationalPerformer
- OperationalExchange
- OperationalExchangeItem
- OperationalMethod
- OperationalParameter
- OperationalPerformer
- OperationalRole
- PerformsInContext
- Process
- ProcessEdge
- ProcessUsage
- RequiredServiceLevel
- Service
- StandardOperationalActivity

View Specifications::Operational::Sequences
Contains the diagrams that document the Operational Sequences View Specification.

View Specifications::Operational::Sequences::Operational Sequences
Stakeholders: Systems Engineers, Business Architects.
Concerns: express a time ordered examination of the operational exchanges as a result of a particular operational scenario.

Definition: provides a time-ordered examination of the operational exchanges between participating nodes (OperationalPerformer roles) as a result of a particular operational scenario.

Recommended Implementation: SysML Sequence Diagram, BPMN Collaboration Diagram.

**Figure 8:29 - Operational Sequences**

Elements
- `InteractionMessage`
- `InteractionRole`
- `InteractionScenario`
- `OperationalActivity`
- `OperationalAgent`
- `OperationalExchange`
- `OperationalInteractionScenario`
- `OperationalMessage`
- `OperationalMethod`
- `OperationalPerformer`
- `OperationalRole`
- `UML2.5Metamodel::Interaction`
- `UML2.5Metamodel::Message`
- `UML2.5Metamodel::Lifeline`

**View Specifications::Operational::Constraints**

Contains the diagrams that document the Operational Constraints View Specification.
**View Specifications::Operational::Constraints::Operational Constraints**

Stakeholders: Systems Engineers, Architects, Program Sponsors

Concerns: define operational limitations, constraints and performance parameters for the enterprise.

Definition: specifies traditional textual operational or business rules that are constraints on the way that business is done in the enterprise. The addition of SysML parametrics provides a computational means of defining operational constraints across the enterprise or within a specific operational context.

Recommended Implementation: tabular format, SysML Block Definition Diagram, SysML Parametric Diagram.

---

**Figure 8:30 - Operational Constraints**

Elements
- InformationModel
- OperationalActivity
- OperationalAgent
- OperationalConstraint
- OperationalExchange
- OperationalInformation
- OperationalPerformer
- Rule
- SubjectOfOperationalConstraint

**View Specifications::Operational::Traceability**

Contains the diagrams that document the Operational Traceability View Specification.

**View Specifications::Operational::Traceability::Operational Traceability**

Stakeholders: PMs, Enterprise Architects, Business Architects.

Concerns: traceability between capabilities and operational activities and capabilities and operational agents.

Definition: describes the mapping between the capabilities required by an Enterprise and the supporting operational activities and operational agents.

Recommended Implementation: matrix format, SysML Block Definition Diagram.
8.1.5 View Specifications::Services

Concerns: specifications of services required to exhibit a Capability.
Definition: shows Service Specifications and required and provided service levels of these specifications required to exhibit a Capability or to support an Operational Activity.

View Specifications::Services::Taxonomy
Contains the diagrams that document the Services Taxonomy View Specification.

View Specifications::Services::Taxonomy::Services Taxonomy
Concerns: service specification types and required and provided service levels of these types.
Definition: shows the taxonomy of types of services and the level of service that they are expected to provide or are required to meet through the display of ActualMeasurements associated with the Provided and Required Service Level.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:32 - Services Taxonomy

Elements
- ActualMeasurement
- ActualMeasurementSet
- ActualPropertySet
- ActualService
- Measurement
- PropertySet
- ProvidedServiceLevel
- RequiredServiceLevel
- Service
- ServiceArchitecture
- ServiceGeneralization
- ServicePolicy

View Specifications::Services::Structure
Contains the diagrams that document the Services Structure View Specification.

View Specifications::Services::Structure::Services Structure
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: combination of services required to exhibit a capability.
Definition: shows the composition of services and how services are combined into a higher-level service required to exhibit a capability or support an operational activity.
Recommended Implementation: SysML Block Definition Diagram, SysML Internal Block Diagram.
Figure 8:33 - Services Structure

Elements
- Implement
- Measurement
- OperationalInformation
- PropertySet
- ResourceInterface
- Service
- ServiceArchitecture
- ServiceConnector
- ServiceExchangeItem
- ServiceInterface
- ServiceMethod
- ServiceParameter
- ServicePort
- ServiceRole

View Specifications::Services::Connectivity
Contains the diagrams that document the Services Connectivity View Specification.

View Specifications::Services::Connectivity::Services Connectivity
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: interoperability among services.
Definition: specifies service interfaces, e.g., provided and required service operations, to ensure compatibility and reusability of services.
Recommended Implementation: SysML Block Definition Diagram, SysML Internal Block Diagram, tabular format.

Figure 8:34 - Services Connectivity

Elements
- Exchange
- IsCapableToPerform
- KnownResource
- MeasurableElement
- MeasurementSet
- NaturalResource
- OperationalInformation
- OrganizationalResource
- PhysicalResource
- ResourceArchitecture
- ResourceArtifact
- ResourcePerformer
- Service
- ServiceConnector
- ServiceExchange
- ServiceExchangeItem
- ServiceFunction
- ServiceFunctionAction
- ServiceFunctionEdge
- ServiceInterface
- ServiceMethod

*Figures should be included here.*
View Specifications::Services::Processes
Contains the diagrams that document the Services Processes View Specification.

View Specifications::Services::Processes::Services Processes
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: the behavior of a service in terms of the operational activities it is expected to support.
Definition: provides detailed information regarding the allocation of service functions to service specifications, and data flows between service functions.
Recommended Implementation: SysML Activity Diagram, SysML Block Definition Diagram.

Figure 8:35 - Services Processes

Elements
- ActivityPerformableUnderCondition
- ActualCondition
- Implements
- IsCapableToPerform
- OperationalActivity
- OperationalInformation
- PerformsInContext
- Process
- ProcessEdge
- ProcessOperation
- ProcessParameter
- ProcessUsage
View Specifications::Services::Processes::Services Processes BPMN Semantics

Stakeholders: Solution Providers, Software Architects, Business Architects.

Concerns: the behavior of a service in terms of the operational activities it is expected to support.

Definition: provides detailed information regarding the allocation of service functions to service specifications, and data flows between service functions using BPMN.

Recommended Implementation: BPMN Process Diagram, SysML Block Definition Diagram.

Figure 8:36 - Services Processes BPMN Semantics

Elements

- ActivityPerformableUnderCondition
- ActualCondition
- BPMN2Metamodel::CallActivity
- BPMN2Metamodel::Process
- BPMN2Metamodel::ResourceRole
View Specifications::Services::States
Contains the diagrams that document the Services States View Specification.

View Specifications::Services::States::Services States
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: the behavior of a service specification in terms of states and events causing transitions between states.
Definition: specifies the possible states a service specification may have, and the possible transitions between those states.
Recommended Implementation: SysML State Machine Diagram.

Figure 8:37 - Services States
Elements
- **Service**
- **ServiceStateDescription**
- **StateDescription**
- **UML2.5Metamodel::StateMachine**

**View Specifications::Services::Sequences**
Contains the diagrams that document the Services Sequences View Specification.

**View Specifications::Services::Sequences::Services Sequences**
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: the behavior of a service specification in terms of expected time-ordered examination of the interactions between service roles.
Definition: specifies how a service roles interact with each other, service providers and consumers, and the sequence and dependencies of those interactions.
Recommended Implementation: SysML Sequence Diagram.

Figure 8:38 - Services Sequences

Elements
- **InteractionMessage**
- **InteractionRole**
- **InteractionScenario**
- **Service**
- **ServiceExchange**
- **ServiceFunction**
- **ServiceInteractionScenario**
- **ServiceMessage**
- **ServiceMethod**
- **ServiceRole**
- **UML2.5Metamodel::Interaction**
- **UML2.5Metamodel::Lifeline**
- **UML2.5Metamodel::Message**
View Specifications::Services::Constraints
Contains the diagrams that document the Services Constraints View Specification.

View Specifications::Services::Constraints::Services Constraints
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: service policies that apply to implementations of service specifications.
Definition: specifies traditional textual service policies that are constraints on the way that service specifications are implemented within resources. The addition of SysML parametrics provide a computational means of defining service policies across the enterprise or within a specific service configuration.
Recommended Implementation: tabular format, SysML Parametric Diagram.

Figure 8:39 - Services Constraints

Elements
- OperationalConnector
- Rule
- Service
- ServiceContract
- ServicePolicy

View Specifications::Services::Roadmap
Contains the diagrams that document the Services Roadmap View Specification.

View Specifications::Services::Roadmap::Services Roadmap
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: service specification changes over time.
Definition: provides an overview of how a service specification changes over time. It shows the combination of several service specifications mapped against a timeline.
Recommended Implementation: timeline, SysML Block Definition Diagram, SysML Internal Block Diagram.
Figure 8:40 - Services Roadmap

Elements
- ActualProject
- ActualProjectMilestone
- MilestoneDependency
- Service
- VersionedElement
- VersionOfConfiguration
- VersionSuccession
- WholeLifeConfiguration

View Specifications::Services::Traceability
Contains the diagrams that document the Services Traceability View Specification.

View Specifications::Services::Traceability::Services Traceability
Stakeholders: Solution Providers, Systems Engineers, Software Architects, Business Architects.
Concerns: traceability between operational activities and service specifications that support them.
Definition: depicts the mapping of service specifications to operational activities and how service specifications contribute to the achievement of a capability.
Recommended Implementation: tabular or matrix format.
8.1.6 View Specifications::Personnel
Stakeholders: Human resources, Solution Providers, PMs.
Concerns: human factors.
Definition: aims to clarify the role of Human Factors (HF) when creating architectures in order to facilitate both Human Factors Integration (HFI) and systems engineering (SE).

View Specifications::Personnel::Taxonomy
Contains the diagrams that document the Personnel Taxonomy View Specification.

View Specifications::Personnel::Taxonomy::Personnel Taxonomy
Stakeholders: Human resources, Solution Providers, PMs.
Concerns: organizational resource types.
Definition: shows the taxonomy of types of organizational resources.
Recommended Implementation: SysML Block Definition Diagram.
**Figure 8:42 - Personnel Taxonomy**

**Elements**
- **Organization**
- **OrganizationalResource**
- **Person**
- **PhysicalResource**
- **Post**
- **ResourcePerformer**
- **Responsibility**

**View Specifications::Personnel::Structure**
Contains the diagrams that document the Personnel Structure View Specification.

**View Specifications::Personnel::Structure::Personnel Structure**
Stakeholders: Human resources, Solution Providers, PMs.
Concerns: typical organizational structure used to support a capability(ies).
Definition: shows organizational structures and possible interactions between organizational resources.
Recommended Implementation: SysML Block Definition Diagram, SysML Internal Block Diagram.
**Elements**

- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
- PostRole
- ResourcePerformer
- ResourceRole
- Responsibility
- SubOrganization

**View Specifications::Personnel::Connectivity**

Contains the diagrams that document the Personnel Connectivity View Specification.

**View Specifications::Personnel::Connectivity::Personnel Connectivity**

Stakeholders: Solution providers.
Concerns: interaction of organizational resources.
Definition: captures the possible interactions between organizational resources, including command and control relationships. Interactions typically illustrate the fundamental roles and management responsibilities.
Recommended Implementation: tabular format.
Figure 8:44 - Personnel Connectivity

Elements

- **Command**
- **Control**
- **Environment**
- **Exchange**
- **Function**
- **IsCapableToPerform**
- **MeasurableElement**
- **Measurement**
- **MeasurementSet**
- **Organization**
- **OrganizationalResource**
- **Person**
- **PhysicalResource**
- **Post**
- **PropertySet**
- **Resource**
- **ResourceConnector**
- **ResourceExchange**
- **ResourceExchangeItem**
- **ResourceInformation**
- **ResourceInterface**
- **ResourcePerformer**
- **ResourcePort**
- **ResourceRole**
- **Responsibility**
**View Specifications::Personnel::Processes**

Contains the diagrams that document the Personnel Processes View Specification.

**View Specifications::Personnel::Processes::Personnel Processes**

Stakeholders: Systems engineers, Solution providers.

Concerns: functions that have to be carried out by organizational resources.

Definition: specifies organizational resource functions in relation to resource definitions.

Recommended Implementation: SysML Activity Diagram, SysML Block Definition Diagram, BPMN Process Diagram as described in the Resources Processes section.

**Figure 8:45 - Personnel Processes**

Elements

- [ActivityPerformableUnderCondition](#)
- [ActualCondition](#)
- [Function](#)
- [FunctionAction](#)
- [FunctionEdge](#)
- [IsCapableToPerform](#)
- [Organization](#)
- [OrganizationalResource](#)
- [PerformsInContext](#)
- [PhysicalResource](#)
View Specifications::Personnel::States
Contains the diagrams that document the Personnel States View Specification

View Specifications::Personnel::States::Personnel States
Stakeholders: Systems Engineers, Software Engineers.
Concerns: capture state-based behavior of an organizational resource.
Definition: it is a graphical representation of states of an organizational resource and how that organizational resource responds to various events and actions.
Recommended Implementation: SysML State Machine Diagram.

Figure 8:46 - Personnel States
Elements
- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
- ResourcePerformer
- ResourceStateDescription
- Responsibility
- StateDescription
- UML2.5Metamodel::StateMachine

**View Specifications::Personnel::Sequences**
Contains the diagrams that document the Personnel Sequences View Specification.

**View Specifications::Personnel::Sequences::Personnel Sequences**
Stakeholders: Software Engineers, Systems Engineers.
Concerns: interactions between organizational resources (roles).
Definition: provides a time-ordered examination of the interactions between organizational resources.
Recommended Implementation: SysML Sequence Diagram, BPMN Collaboration Diagram.

![Diagram]

**Figure 8:47 - Personnel Sequences**

Elements
- Function
- InteractionMessage
- InteractionRole
- InteractionScenario
- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
• Process
• ResourceExchange
• ResourceExchangeItem
• ResourceInformation
• ResourceInteractionScenario
• ResourceMessage
• ResourceMethod
• ResourcePerformer
• ResourceRole
• Responsibility
• UML2.5Metamodel::Interaction
• UML2.5Metamodel::Lifeline
• UML2.5Metamodel::Message

View Specifications::Personnel::Constraints
Contains the diagrams that document the Personnel Constraints View Specification.

View Specifications::Personnel::Constraints::Personnel Constraints: Competence
Stakeholders: Systems engineers, Solution providers.
Concerns: allocation of competencies to actual posts.
Definition: specifies requirements for actual organizational resources – by linking competencies and actual posts.
Recommended Implementation: SysML Block Definition Diagram.

Figure 8:48 - Personnel Constraints: Competence

Elements
• ActualOrganization
• ActualOrganizationalResource
• ActualPerson
• ActualPost
- ActualResponsibility
- ActualResponsibleResource
- Competence
- CompetenceForRole
- CompetenceToConduct
- Function
- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
- ProvidesCompetence
- RequiresCompetence
- ResourcePerformer
- ResourceRole
- Responsibility

**View Specifications::Personnel::Constraints::Personnel Constraints: Drivers**

Stakeholders: Systems engineers, Solution providers, Human resources.

Concerns: optimization of organizational resource behavior.

Definition: captures the factors that affect, constrain and characterize organizational resource behavior as the basis for performance predictions at the level of actual persons and actual organizations. It creates a bridge between static architectural definitions and behavior predictions through executable models.

Recommended Implementation: tabular format, SysML Parametric Diagram, SysML Block Definition Diagram.

**Figure 8:49 - Personnel Constraints: Drivers**

Elements
View Specifications::Personnel::Constraints::Personnel Constraints: Performance

Stakeholders: Human resources, solution providers.
Concerns: how well an actual organizational resource matches the needs of the actual organization.
Definition: provides a repository for human-related measures (i.e. quality objectives and performance criteria (HFI values)), targets and competences.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:50 - Personnel Constraints: Performance

Elements

- ActivityPerformableUnderCondition
- ActualCondition
- ActualMeasurement
- ActualMeasurementSet
- ActualOrganizationalResource
- ActualPerson
- ActualPost
- ActualPropertySet
- ActualResource
- ActualResponsibleResource
- ActualState
- Desirer
- Desires
- Function
- IsCapableToPerform
- MeasurableElement
- Measurement
- MeasurementSet
- Organization
- OrganizationalResource
- Person
**View Specifications::Personnel::Roadmap**

Contains the diagrams that document the Personnel Roadmap View Specification.

**View Specifications::Personnel::Roadmap::Personnel Roadmap: Availability**


Concerns: the staffing and training of resources.

Definition: defines the requirements and functions to ensure that actual persons with the right competencies, and in the right numbers, are available to fulfill actual posts.

Recommended Implementation: Timeline, SysML Block Definition Diagram.

---

**Figure 8:51 - Personnel Roadmap: Availability**
Elements

- ActualMeasurement
- ActualOrganizationalResource
- ActualPerson
- ActualPost
- ActualProject
- ActualProjectMilestone
- ActualPropertySet
- ActualResource
- ActualResponsibleResource
- ActualState
- Asset
- FillsPost
- Measurement
- OrganizationalResource
- Person
- PhysicalResource
- Post
- Project
- ProjectMilestone
- PropertySet
- ResourceAsset
- ResourcePerformer

View Specifications::Personnel::Roadmap::Personnel Roadmap: Evolution

Stakeholders: Human resources, Solution Providers.
Concerns: organizational structure changes over time.
Definition: provides an overview of how an organizational structure changes over time. It shows the structure of several organizational structures mapped against a timeline.
Recommended Implementation: timeline, SysML Block Definition Diagram, SysML Internal Block Diagram.
Figure 8:52 - Personnel Roadmap: Evolution

Elements
- ActualProject
- ActualProjectMilestone
- MilestoneDependency
- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
- ResourcePerformer
- Responsibility
- VersionedElement
- VersionOfConfiguration
- VersionSuccession
- WholeLifeConfiguration

View Specifications::Personnel::Roadmap::Personnel Roadmap: Forecast

Stakeholders: Human resources, Logisticians, Solution Providers.
Concerns: competencies and skills forecast.
Definition: defines the underlying current and expected supporting competencies and skills of organizational resources.
Recommended Implementation: timeline, tabular format, SysML Block Definition Diagram.
Figure 8:53 - Personnel Roadmap: Forecast

Elements
- ActualStrategicPhase
- ActualPropertySet
- ActualState
- Asset
- Competence
- Forecast
- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
- ResourcePerformer
- Responsibility
- SubjectOfForecast

View Specifications::Personnel::Traceability
Contains the diagrams that document the Personnel Traceability View Specification.

View Specifications::Personnel::Traceability::Personnel Traceability
Concerns: traceability between operational activities and functions that implements them.
Definition: depicts the mapping of functions (performed by organizational resources) to operational activities and thus identifies the transformation of an operational need into a purposeful function performed by an organizational resource or solution.
Recommended Implementation: Matrix format, SysML Block Definition Diagram.
8.1.7 View Specifications::Resources

Concerns: definition of solution architectures to implement operational requirements.
Definition: captures a solution architecture consisting of resources, e.g. organizational, software, artifacts, capability configurations, natural resources that implement the operational requirements. Further design of a resource is typically detailed in SysML or UML.

View Specifications::Resources::Taxonomy
Contains the diagrams that document the Resources Taxonomy View Specification.

View Specifications::Resources::Taxonomy::Resources Taxonomy
Stakeholders: Solution Providers, Systems Engineers, IT Architects, Implementers.
Concerns: resource types.
Definition: shows the taxonomy of types of resources.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:55 - Resources Taxonomy

Elements

- Asset
- CapabilityConfiguration
- Implements
- Measurement
- NaturalResource
- OperationalAgent
- OperationalPerformer
- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
- PropertySet
- PropertySetGeneralization
- ResourceArchitecture
- ResourceArtifact
- ResourceAsset
- ResourceExchange
- ResourceMitigation
- ResourcePerformer
- ResourceRole
- ResourceService
- Responsibility
- Post
- Software
- System
View Specifications::Resources::Structure
Contains the diagrams that document the Resources Structure View Specification.

View Specifications::Resources::Structure::Resources Structure
Concerns: reference the resource structure, connectors and interfaces in a specific context.
Definition: defines the physical resources, e.g. capability configuration(s)/system(s) and interactions necessary to implement a specific set of OperationalPerformer(s). Can be used to represent communications networks and pathways that link communications resources and provides details regarding their configuration.
Recommended Implementation: SysML Internal Block Diagram, SysML Bock Definition Diagram.

Figure 8:56 - Resources Structure

Elements
- **Asset**
- **CapabilityConfiguration**
- **Function**
- **IsCapableToPerform**
- **Measurement**
- **NaturalResource**
- **PhysicalResource**
- **PropertySet**
- **Protocol**
- **ProtocolImplementation**
- **ResourceArchitecture**
- **ResourceArtifact**
- **ResourceAsset**
- **ResourceConnector**
- **ResourceExchange**
- **ResourceInterface**
- **ResourceMitigation**
- **ResourcePerformer**
- **ResourceRole**
- **Software**
- ResourcePerformer
- ResourcePort
- ResourceRole
- ResourceService
- Software

**View Specifications::Resources::Connectivity**
Contains the diagrams that document the Resources Connectivity View Specification.

**View Specifications::Resources::Connectivity::Resources Connectivity**
Stakeholders: Systems Engineers, IT Architects, Solution Providers, Implementers.
Concerns: capture the interactions between resources.
Definition: summarizes interactions between resources of information, systems, personnel, natural resources etc. and the functions that produce and consume them. Measurements can optionally be included.
Recommended Implementation: SysML Internal Block Diagram, tabular format.

![Diagram of Resources Connectivity](image)

**Figure 8:57 - Resources Connectivity**

Elements
- CapabilityConfiguration
- Exchange
- Function
- FunctionAction
- FunctionEdge
**View Specifications::Resources::Processes**
Contains the diagrams that document the Resources Processes View Specification.

**View Specifications::Resources::Processes::Resources Processes**
Stakeholders: Solution Providers, Systems Engineers, IT Architects.
Concerns: captures activity-based behavior and flows.
Definition: describes the functions that are normally conducted in the course of implementing operational activity(ies) in support of capability(ies). It describes the functions, their Inputs/Outputs, function actions and flows between them.
Recommended Implementation: SysML Activity Diagram, SysML Block Definition Diagram.
Figure 8:58 - Resources Processes

Elements

- `ActivityPerformableUnderCondition`
- `ActualCondition`
- `Function`
- `FunctionAction`
- `FunctionEdge`
- `Implements`
- `OperationalActivity`
- `PerformsInContext`
- `PhysicalResource`
- `Process`
- `ProcessEdge`
- `ProcessParameter`
- `ProcessUsage`
- `ResourceArchitecture`
- `ResourceExchange`
- `ResourceExchangeItem`
- `ResourceInformation`
- `ResourceParameter`
- `ResourcePerformer`
- `ResourceRole`
- `ResourceService`
- `UML2.5Metamodel::Activity`
- `UML2.5Metamodel::ActivityEdge`
- `UML2.5Metamodel::CallBehaviorAction`
- `UML2.5Metamodel::Parameter`
View Specifications::Resources::Processes::Resources Processes BPMN Semantics

Stakeholders: Solution Providers, IT Architects.
Concerns: captures activity-based behavior and flows using BPMN.
Definition: describes the functions that are normally conducted in the course of implementing operational activity(ies) in support of capability(ies). It describes the functions, their Inputs/Outputs, function actions and flows between them using BPMN.
Recommended Implementation: BPMN Process Diagram.

Elements
- ActivityPerformableUnderCondition
- AssetRole
- BPMN2Metamodel::BPMNMessage
- BPMN2Metamodel::CallActivity
- BPMN2Metamodel::MessageFlow
- BPMN2Metamodel::Process
- BPMN2Metamodel::ResourceRole
- BPMN2Metamodel::SequenceFlow
- Exchange
- ExchangeItem
- Function

Figure 8:59 - Resources Processes BPMN Semantics
- FunctionAction
- FunctionEdge
- Implements
- OperationalActivity
- PerformsInContext
- PhysicalResource
- Process
- ProcessEdge
- ProcessUsage
- ResourceArchitecture
- ResourceExchange
- ResourceExchangeItem
- ResourceInformation
- ResourceParameter
- ResourcePerformer
- ResourceRole

View Specifications::Resources::States
Contains the diagrams that document the Resources States View Specification.

View Specifications::Resources::States::Resources States
Stakeholders: Systems Engineers, Software Engineers.
Concerns: capture state-based behavior of a resource.
Definition: it is a graphical representation of states of a resource and how that resource responds to various events and actions.
Recommended Implementation: SysML State Machine Diagram.

![State Machine Diagram](image)

Figure 8:60 - Resources States

Elements
- ResourcePerformer
- ResourceStateDescription
- StateDescription
- UML2.5Metamodel::StateMachine

View Specifications::Resources::Sequences
Contains the diagrams that document the Resources Sequences View Specification.
**View Specifications::Resources::Sequences::Resources Sequences**

Stakeholders: Software Engineers, Systems Engineers.
Concerns: interactions between resources (roles).
Definition: provides a time-ordered examination of the interactions between resources.
Recommended Implementation: SysML Sequence Diagram.

**Figure 8:61 - Resources Sequences**

Elements
- Function
- InteractionMessage
- InteractionRole
- InteractionScenario
- ResourceExchange
- ResourceInteractionScenario
- ResourceMessage
- ResourcePerformer
- ResourceRole
- UML2.5Metamodel::Interaction
- UML2.5Metamodel::Lifeline
- UML2.5Metamodel::Message

**View Specifications::Resources::Constraints**

Contains the diagrams that document the Resources Constraints View Specification.

**View Specifications::Resources::Constraints::Resources Constraints**

Stakeholders: Systems Engineers, IT Architects, Solution Providers, Implementers.
Concerns: define limitations, constraints and performance parameters for resources, their interactions, performed functions, and data.
Definition: specifies traditional textual rules/non-functional requirements that are constraints on resources, their interactions, performed functions, and data. The addition of SysML parametrics provide a computational means of defining resource constraints within a specific context.

Recommended Implementation: tabular format, SysML Block Definition Diagram, SysML Parametric Diagram, OCL.

Figure 8:62 - Resources Constraints

Elements
- ActualResource
- CapabilityConfiguration
- Function
- NaturalResource
- Organization
- OrganizationalResource
- Person
- PhysicalResource
- Post
- ResourceArchitecture
- ResourceArtifact
- ResourceConstraint
- ResourceInformation
- ResourcePerformer
- ResourceRole
- ResourceService
- Responsibility
- Rule
- SubjectOfResourceConstraint
View Specifications::Resources::Roadmap
Contains the diagrams that document the Resources Roadmap View Specification.

View Specifications::Resources::Roadmap::Resources Roadmap: Evolution
Stakeholders: Systems Engineers, IT Architects, Solution Providers, Implements.
Concerns: resource structure changes over time.
Definition: provides an overview of how a resource structure changes over time. It shows the structure of several resources mapped against a timeline.
Recommended Implementation: timeline, SysML Block Definition Diagram, SysML Internal Block Diagram.

Figure 8:63 - Resources Roadmap: Evolution

Elements
- ActualProject
- ActualProjectMilestone
- MilestoneDependency
- ResourcePerformer
- VersionedElement
- VersionOfConfiguration
- WholeLifeConfiguration

View Specifications::Resources::Roadmap::Resources Roadmap: Forecast
Stakeholders: Solution Providers, Systems Engineers, IT Architects.
Concerns: technology forecast.
Definition: defines the underlying current and expected supporting technologies. Expected supporting technologies are those that can be reasonably forecast given the current state of technology, and expected improvements / trends.
Recommended Implementation: timeline, tabular format, SysML Block Definition Diagram.

**Figure 8:64 - Resources Roadmap: Forecast**

Elements
- `ActualEnterprisePhase`
- `ActualStrategicPhase`
- `CapabilityConfiguration`
- `Competence`
- `Forecast`
- `NaturalResource`
- `PhysicalResource`
- `ResourceArchitecture`
- `ResourceArtifact`
- `ResourceMitigation`
- `ResourcePerformer`
- `ResourceService`
- `Software`
- `Technology`
- `Standard`
- `SubjectOfForecast`

**View Specifications::Resources::Traceability**
Contains the diagrams that document the Resources Traceability View Specification.

**View Specifications::Resources::Traceability::Resources Traceability**
Concerns: traceability between operational activities and functions that implements them.
Definition: depicts the mapping of functions to operational activities and thus identifies the transformation of an operational need into a purposeful function performed by a resource or solution.
Recommended Implementation: Matrix format, SysML Block Definition Diagram.
Figure 8:65 - Resources Traceability

Elements

- Capability
- CapableElement
- Exhibits
- Function
- Implements
- IsCapableToPerform
- OperationalActivity
- OperationalAgent
- ResourcePerformer
- ResourceService
- Service
- ServiceFunction

8.1.8 View Specifications::Security


Concerns: addresses the security constraints and information assurance attributes that exist on exchanges between resources and OperationalPerformers.

Definition: illustrates the security assets, security constraints, security controls, families, and measures required to address specific security concerns.

View Specifications::Security::Motivation

Contains the diagrams that document the Security Motivation View Specification.

View Specifications::Security::Motivation::Security Controls


Concerns: security controls, security control families, and overlays.

Definition: identifies security controls to mitigate against the security risks.

Recommended Implementation: tabular or Matrix format, SysML Block Definition Diagram.
Figure 8:66 - Security Controls

Elements

- ActualResource
- Asset
- AssetRole
- EnhancedSecurityControl
- Enhances
- MeasurableElement
- Mitigates
- OperationalAgent
- OperationalArchitecture
- OperationalAsset
- OperationalMitigation
- Protects
- ProtectsInContext
- Requirement
- ResourceArchitecture
- ResourceAsset
- ResourceMitigation
- ResourcePerformer
- Risk
- Satisfy
- SecurityControl
- SecurityControlFamily
- Service
- StrategicAsset
- UAFElemet
**View Specifications::Security::Taxonomy**
Contains the diagrams that document the Security Taxonomy View Specification.

**View Specifications::Security::Taxonomy::Security Taxonomy**
Stakeholders: Security Architects, Security Engineers.
Concerns: Security assets and security enclaves.
Definition: Defines the hierarchy of security assets and asset owners that are available to implement security, security constraints (policy, guidance, laws and regulations) and details where they are located (security enclaves).
Recommended Implementation: tabular format, SysML Block Definition Diagram.

![Security Taxonomy Diagram](image)

**Figure 8:67 - Security Taxonomy**

Elements
- ActualLocation
- Asset
- LocationHolder
- Measurement
- MeasurementSet
- OperationalAgent
- OperationalArchitecture
- OperationalAsset
- OperationalInformation
- OperationalMitigation
- OperationalPerformer
- PropertySet
- ResourceArchitecture
- ResourceAsset
- ResourceInformation

---

Unified Architecture Framework (UAF) Domain Metamodel, v1.2
- **ResourceMitigation**
- **ResourcePerformer**
- **Risk**
- **SecurityAvailability**
- **SecurityCategory**
- **SecurityClassification**
- **SecurityClassificationKind**
- **SecurityEnclave**
- **SecurityIntegrity**
- **SecurityMeasurement**

**View Specifications::Security::Structure**
Contains the diagrams that document the Security Structure View Specification.

**View Specifications::Security::Structure::Security Structure**
Stakeholders: Security Architects, Security Engineers.
Concerns: The structure of security information and where it is used at the operational and resource level.
Definition: Captures the allocation of assets (operational and resource, information and data) across the security enclaves, shows applicable security controls necessary to protect organizations, systems and information during processing, while in storage (bdd), and during transmission (flows on an ibd). This view also captures Asset Aggregation and allocates the usage of the aggregated information at a location through the use of the SecurityProperty.
Recommended Implementation: SysML Internal Block Diagram, SysML Block Definition Diagram.

**Figure 8:68 - Security Structure**

Elements
- **Asset**
- **OperationalAgent**
- **OperationalAsset**
- **OperationalConnector**
- **OperationalExchange**
View Specifications::Security::Connectivity
Contains the diagrams that document the Security Connectivity View Specification.

View Specifications::Security::Connectivity::Security Connectivity
Stakeholders: Security Architects, Security Engineers.
Concerns: Addresses the security constraints and information assurance attributes that exist on exchanges across resources and across performers.
Definition: Lists security exchanges across security assets; the applicable security controls; and the security enclaves that house the producers and consumers of the exchanges. Measurements can optionally be included.
Recommended Implementation: SysML Internal Block Diagram, tabular format.

Figure 8:69 - Security Connectivity
Elements

- Caveat
- MeasurableElement
- MeasurementSet
- OperationalAgent
- OperationalConnector
- OperationalExchange
- OperationalExchangeItem
- OperationalInterface
- OperationalPerformer
- OperationalPort
- OperationalRole
- ResourceConnector
- ResourceExchange
- ResourceExchangeItem
- ResourceInterface
- ResourcePerformer
- ResourcePort
- ResourceRole
- SecurityConstraint
- SubjectOfSecurityConstraint

View Specifications::Security::Processes
Contains the diagrams that document the Security Processes View Specification.

View Specifications::Security::Processes::Security Processes
Stakeholders: Security Architects, Security Engineers.
Concerns: The specification of the Security Control families, security controls, and measures required to address a specific security baseline.
Definition: Provides a set of Security Controls and any possible enhancements as applicable to assets. The activity diagram describes operational or resource level processes that apply (operational level) or implement (resource level) security controls/enhancements to assets located in enclaves and across enclaves. This Security Process view can be instantiated either as a variant of an activity/flow diagram or as a hierarchical work breakdown structure.
Recommended Implementation: SysML Activity Diagram, SysML Block Definition Diagram, BPMN Process Diagram as described in Operational Processes and Resources Processes sections.
Figure 8.70 - Security Processes

Elements
- **Function**
- **FunctionAction**
- **Implements**
- **IsCapableToPerform**
- **MeasurableElement**
- **Measurement**
- **MeasurementSet**
- **OperationalActivity**
- **OperationalActivityAction**
- **OperationalAgent**
- **OperationalRole**
- **PerformsInContext**
- **Process**
- **PropertySet**
- **ResourcePerformer**
- **ResourceRole**
- **SecurityProcess**
- **SecurityProcessAction**

**View Specifications::Security::Constraints**
Contains the diagrams that document the Security Constraints View Specification.

**View Specifications::Security::Constraints::Security Constraints**
Concerns: (i) Security-related policy, guidance, laws and regulations as applicable to assets, (ii) threats, vulnerabilities, and risk assessments as applicable to assets.

Definition: (i) Specifies textual rules/non-functional requirements that are security constraints on resources, information, and data (e.g., security-related in the form of rules (e.g., access control policy). A common way of representing access control policy is through the use of XACML (eXtensible Access Control Markup Language), it is expected that implementations of UAF allow users to link security constraints to external files represented in XACML. (ii) Identifies risks, specifies risk likelihood, impact, asset criticality, other measurements and enables risk assessment.

Recommended Implementation: tabular or Matrix format, SysML Block Definition Diagram, SysML Parametric Diagram, or OCL.

Figure 8:71 - Security Constraints

Elements
- Asset
- AssetRole
- OperationalAgent
- OperationalAsset
- OperationalConnector
- OperationalInformation
- OperationalInformationRole
- OperationalRole
- ResourceAsset
- ResourceConnector
- ResourceInformation
- ResourceInformationRole
- ResourcePerformer
- ResourcePerformer
- ResourceRole
- SecurityConstraint
- SecurityProcess
- ServiceConnector
- StrategicAsset
- StrategicInformation
- SubjectOfSecurityConstraint
- ValueItem
**View Specifications::Security::Traceability**
Contains the diagrams that document the Security Traceability View Specification.

**View Specifications::Security::Traceability::Security Traceability**
Concerns: traceability between risk and risk owner, risk mitigations, and affected asset roles.
Definition: depicts the mapping of a risk to each of the following: risk owner, risk mitigations, and affected asset roles.
Recommended Implementation: Matrix format, SysML Block Definition Diagram.

![Security Traceability Diagram](image)

**Figure 8:72 - Security Traceability**

Elements
- **Affects**
- **AffectsInContext**
- **Asset**
- **AssetRole**
- **Mitigates**
- **OperationalInformationRole**
- **OperationalRole**
- **OwnsRiskInContext**
- **Protects**
- **ProtectsInContext**
- **ResourceInformationRole**
- **ResourceRole**
- **Risk**
- **Satisfy**
- **SecurityControl**

**8.1.9 View Specifications::Projects**
Stakeholders: PMs, Project Portfolio Managers, Enterprise Architects.
Concerns: project portfolio, projects and project milestones.
Definition: describes projects and project milestones, how those projects deliver capabilities, the organizations contributing to the projects and dependencies between projects.

**View Specifications::Projects::Taxonomy**
Contains the diagrams that document the Project Taxonomy View Specification.

**View Specifications::Projects::Taxonomy::Project Taxonomy**
Stakeholders: PMs, Project Portfolio Managers, Enterprise Architects. Concerns: types of projects and project milestones. Definition: shows the taxonomy of types of projects and project milestones. Recommended Implementation: SysML Block Definition Diagram.

![Diagram](image)

**Figure 8:73 - Project Taxonomy**
Elements
- ActualProject
- ActualProjectMilestone
- MilestoneDependency
- ProjectSequence
- ProjectMilestoneRole
- ProjectMilestone

**View Specifications::Projects::Structure**
Contains the diagrams that document the Project Structure View Specification.

**View Specifications::Projects::Structure::Project Structure**
Stakeholders: PMs.
Concerns: relationships between types of projects and project milestones.
Definition: provides a template for an actual project(s) road map(s) to be implemented.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:74 - Project Structure

Elements
- ActualOrganization
- ActualPost
- ActualProject
- ActualPropertySet
- ActualResponsibleResource
- ActualState
- Project
- ProjectMilestone
- ProjectMilestoneRole
- ProjectTheme
- ResourceRole
- ResponsibleFor
- StatusIndicators

View Specifications::Projects::Connectivity
Contains the diagrams that document the Project Connectivity View Specification.

View Specifications::Projects::Connectivity::Project Connectivity
Stakeholders: PMs.
Concerns: relationships between projects and project milestones.
Definition: shows how projects and project milestones are related in sequence.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:75 - Project Connectivity

Elements
- **Project**
- **ProjectMilestone**
- **ProjectMilestoneRole**
- **ResourcePerformer**

**View Specifications::Projects::Processes**
Contains the diagrams that document the Project Processes View Specification.

**View Specifications::Projects::Processes::Project Processes**
Stakeholders: PMs.
Concerns: captures project tasks (ProjectActivities) and flows between them.
Definition: describes the ProjectActivities that are normally conducted in the course of projects to support capability(ies) and implement resources. It describes the ProjectActivities, their Inputs/Outputs, ProjectActivityActions and flows between them.
Recommended Implementation: SysML Activity Diagram, SysML Block Definition Diagram, BPMN Process Diagram as described in Resources Processes section.
**Figure 8:76 - Project Processes**

**Elements**
- **ActualProject**
- **Function**
- **FunctionAction**
- **FunctionEdge**
- **GeoPoliticalExtentType**
- **IsCapableToPerform**
- **Organization**
- **OrganizationalResource**
- **PerformsInContext**
- **PhysicalResource**
- **Post**
- **Project**
- **ProjectActivity**
- **ProjectActivityAction**
- **ResourceExchange**
- **ResourceExchangeItem**
- **ResourceInformation**
- **ResourcePerformer**
- **ResourceRole**
- **ResourceSignal**

**View Specifications::Projects::Roadmap**
Contains the diagrams that document the Project Roadmap View Specification.

**View Specifications::Projects::Roadmap::Project Roadmap**
Stakeholders: PMs, Capability Owners, Solution Providers, Enterprise Architects.
Concerns: the product portfolio management; a planning of capability delivery.
Definition: provides a timeline perspective on programs or projects
Recommended Implementation: timeline, tabular format, SysML Block Definition Diagram.

Figure 8:77 - Project Roadmap

Elements
- ActualProject
- ActualProjectMilestone
- ActualProjectMilestoneRole
- ActualPropertySet
- ActualResource
- ActualState
- CapabilityConfiguration
- FieldedCapability
- MilestoneDependency
- Project
- ProjectMilestone
- ProjectMilestoneRole
- ProjectSequence
- ProjectStatus
- ProjectTheme
- ResourceArchitecture
- ResourcePerformer
- StatusIndicators

View Specifications::Projects::Traceability
Contains the diagrams that document the Project Traceability View Specification.

View Specifications::Projects::Traceability::Project Traceability
Stakeholders: PMs, Project Portfolio Managers, Enterprise Architects.
Concerns: traceability between capabilities and projects that deliver them.
Definition: depicts the mapping of projects to capabilities and thus identifies the transformation of a capability(ies) into a purposeful implementation via projects.
Recommended Implementation: Matrix format, SysML Block Definition Diagram.

Figure 8:78 - Project Traceability

Elements
- ActualProject
- ActualProjectMilestone
- ActualResource
- Capability
- CapableElement
- Exhibits
- ResourcePerformer

8.1.10 View Specifications::Standards
Concerns: technical and non-technical Standards applicable to the architecture.
Definition: shows the technical, operational, and business Standards applicable to the architecture. Defines the underlying current and expected Standards.

View Specifications::Standards::Taxonomy
Contains the diagrams that document the Standards Taxonomy View Specification.

View Specifications::Standards::Taxonomy::Standards Taxonomy
Concerns: technical and non-technical standards, guidance and policy applicable to the architecture.
Definition: shows the taxonomy of types of technical, operational, and business standards, guidance and policy applicable to the architecture.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8.79 - Standards Taxonomy

Elements
- ActualOrganization
- CapabilityConfiguration
- Protocol
- ProtocolStack
- ResourceArchitecture
- ResourcePerformer
- Standard
- StandardOperationalActivity
- UAFEElement

View Specifications::Standards::Structure
Contains the diagrams that document the Standards Structure View Specification.

**View Specifications::Standards::Structure::Standards Structure**
Concerns: the specification of the protocol stack used in the architecture.
Definition: shows the composition of standards required to achieve the architecture's objectives.
Recommended Implementation: SysML Internal Block Diagram.
Figure 8:80 - Standards Structure

Elements
• Protocol
• ProtocolLayer
• ProtocolStack
• Standard

View Specifications::Standards::Roadmap

Contains the diagrams that document the Standards Roadmap View Specification.

View Specifications::Standards::Roadmap::Standards Roadmap

Concerns: expected changes in technology-related standards and conventions, operational standards, or business standards and conventions.
Definition: defines the underlying current and expected standards. Expected standards are those that can be reasonably forecast given the current state of technology, and expected improvements / trends.
Recommended Implementation: timeline, tabular format, SysML Block Definition Diagram.

Figure 8:81 - Standards Roadmap

Elements
• ActualEnterprisePhase
• ActualStrategicPhase
• Forecast
• Protocol
• Standard
• SubjectOfForecast
View Specifications::Standards::Traceability
Contains the diagrams that document the Standards Traceability View Specification.

View Specifications::Standards::Traceability::Standards Traceability
Concerns: standards that need to be taken in account to ensure the interoperability of the implementation of architectural elements.
Definition: shows the applicability of standards to specific elements in the architecture.
Recommended Implementation: tabular format, matrix format, SysML Block Definition Diagram.

Figure 8:82 - Standards Traceability
Elements
- Protocol
- Standard
- UAFEElement

8.1.11 View Specifications::Actual Resources
Stakeholders: Solution Providers, Systems Engineers, Business Architects, Human Resources.
Concerns: the analysis, e.g., evaluation of different alternatives, what-if, trade-offs, V&V on the actual resource configurations.
Definition: illustrates the expected or achieved actual resource configurations and actual relationships between them.

View Specifications::Actual Resources::Structure
Contains the diagrams that document the Actual Resources Structure View Specification.

View Specifications::Actual Resources::Structure::Actual Resources Structure
Stakeholders: Solution Providers, Systems Engineers, Business Architects.
Concerns: the analysis, e.g., evaluation of different alternatives, what-if, trade-offs, V&V on the actual resource configurations as it provides a means to capture different solution architectures. The detailed analysis (trade-off, what-if etc.) is carried out using the Resource Constraints view.
Definition: illustrates the expected or achieved actual resource configurations required to meet an operational need.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:83 - Actual Resources Structure

Elements
- ActualOrganization
- ActualOrganizationalResource
- ActualPerson
- ActualPost
- ActualResource
- ActualResponsibility
- ActualResponsibleResource
- CapabilityConfiguration
- FieldedCapability
- Organization
- Person
- Post
- ResourcePerformer
- Responsibility

View Specifications::Actual Resources::Connectivity
Contains the diagrams that document the Actual Resources Connectivity View Specification.

View Specifications::Actual Resources::Connectivity::Actual Resources Connectivity
Stakeholders: Solution Providers, Systems Engineers, Business Architects.
Concerns: the communication of actual resource.
Definition: illustrates the actual resource configurations and actual relationships between them.
Recommended Implementation: tabular format, SysML Block Definition Diagram, SysML Internal Block Diagram, SysML Sequence Diagram.
Figure 8:84 - Actual Resources Connectivity

Elements
- ActualOrganization
- ActualOrganizationalResource
- ActualPerson
- ActualPost
- ActualResource
- ActualResourceRelationship
- ActualResponsibility
- ActualResponsibleResource
- FieldedCapability

View Specifications::Actual Resources::Traceability
Contains the diagrams that document the Actual Resources Traceability View Specification.

View Specifications::Actual Resources::Traceability::Actual Resources Traceability
Concerns: traceability between operational activities and functions that implements them.
Definition: depicts the mapping of functions to operational activities and thus identifies the transformation of an operational need into a purposeful function performed by a resource or solution.
Recommended Implementation: Matrix format, SysML Block Definition Diagram.
8.1.12 View Specifications::Motivation


Concerns: (i) architecture drivers, challenges, opportunities, capabilities that address opportunities, phases and architectures that address challenges; (ii) requirements, their relationship (via traceability) to more detailed requirements and the solution described by the architecture that will meet those requirements; (iii) security controls, security control families, and overlays.

Definition: Identifies and defines motivational elements e.g., challenges, opportunities, and concerns, that pertain to enterprise transformation efforts, and different types of requirements, e.g., operational, services, personnel, resources, or security controls.

Recommended Implementation: SysML Block Definition Diagram, SysML Package Diagram, tabular format.

View Specifications::Motivation::Motivation: Requirements


Concerns: provides a central reference for a set of stakeholder needs expressed as requirements, their relationship (via traceability) to more detailed requirements and the solution described by the architecture that will meet those requirements.

Definition: used to represent requirements, their properties, and relationships (trace, verify, satisfy, refine) between each other and to UAF architectural elements.

Recommended Implementation: SysML Requirement Diagram, tabular format, matrix format.
8.1.13 View Specifications::Information

Stakeholders: Data Modelers, Software Engineers, Systems Engineers
Concerns: address the information perspective on operational, service, and resource architectures.
Definition: allows analysis of an architecture’s information and data definition aspect, without consideration of implementation specific issues.
Recommended Implementation: SysML Block Definition Diagram.

**View Specifications::Information::Information: Operational Information**

Stakeholders: Data Modelers, Software Engineers, Systems Engineers, Operators and Users, Service Managers and Providers
Concerns: address the information perspective on operational and service architectures.
Definition: allows analysis of an architecture’s information and data definition aspect, without consideration of implementation specific issues.
Recommended Implementation: SysML Block Definition Diagram.
Figure 8:87 - Information: Operational Information

Elements
- Implements
- InformationModel
- OperationalAsset
- OperationalInformation
- OperationalInformationRole
- ResourceInformation

View Specifications::Information::Information: Resources Information

Stakeholders: Data Modelers, Software Engineers, Systems Engineers
Concerns: address the information perspective on operational, service, and resource architectures.
Definition: allows analysis of an architecture's information and data definition aspect, without consideration of implementation specific issues.
Recommended Implementation: SysML Block Definition Diagram.
8.1.14 View Specifications::Parameters

Stakeholders: Capability owners, Systems Engineers, Solution Providers.

Concerns: identifies measurable properties that can be used to support engineering analysis and environment for the Capabilities

Definition: Shows the measurable properties of something in the physical world and elements and relationships that are involved in defining the environments applicable to capability, operational concept or set of systems.

View Specifications::Parameters::Parameters: Environment

Stakeholders: Capability owners, Systems Engineers, Solution Providers.

Concerns: defines the environment for the capabilities.

Definition: shows the elements and relationships that are involved in defining the environments applicable to capability, operational concept or set of systems.

Recommended Implementation: SysML Block Definition Diagram.

Figure 8:89 - Parameters: Environment

Elements
- **ActivityPerformableUnderCondition**
- **ActualCondition**
- **ActualEnvironment**
**View Specifications::Parameters::Parameters: Measurements**

Stakeholders: Capability owners, Systems Engineers, Solution Providers.

Concerns: identifies measurable properties that can be used to support analysis such as KPIs, MoEs, TPIs etc.

Definition: Shows the measurable properties of something in the physical world, expressed in amounts of a unit of measure that can be associated with any element in the architecture.

Recommended Implementation: SysML Block Definition Diagram.

---

**Figure 8:90 - Parameters: Measurements**
Elements

- ActualMeasurement
- ActualMeasurementSet
- ActualPropertySet
- ActualService
- ActualState
- Capability
- Competence
- Condition
- MeasurableElement
- Measurement
- MeasurementSet
- PropertySet
- ProvidedServiceLevel
- RequiredServiceLevel
- Resource
- Service
- ServiceInterface
- StrategicPhase

View Specifications::Parameters::Parameters: Risk

Stakeholders: Capability Owners, Systems Engineers, Solution Providers, Program Managers.

Concerns: identifies potential adverse conditions and situations that can inhibit achievement of goals.

Definition: Shows the relevant risks along with associated measures like likelihood of occurrence and potential negative consequences.

Recommended Implementation: SysML Block Definition Diagram, matrix format.

![Figure 8:91 - Parameters: Risk](image)

Elements

- ActualPropertySet
- ActualResource
- ActualResponsibleResource
- ActualRisk
- AffectableElement
8.1.15 View Specifications::Other
Contains the diagrams that document the use of BPMN, NIEM, IEPPV in the context of UAF.

View Specifications::Other::BPMN
Stakeholders: Business Architects, Enterprise Architects
Concerns: captures activity-based behavior and flows.
Definition: describes the activities that are normally conducted in the course of achieving business goals that support a capability. It describes operational activities, their Inputs/Outputs, operational activity actions and flows between them using BPMN.
Recommended Implementation: BPMN Process Diagram.
Figure 8.92 – BPMN

Elements
- AssetRole
- BPMN2Metamodel::BPMNMessage
- BPMN2Metamodel::CallActivity
- BPMN2Metamodel::MessageFlow
- BPMN2Metamodel::Process
- BPMN2Metamodel::ResourceRole
- BPMN2Metamodel::SequenceFlow
- Exchange
- ExchangeItem
- InteractionMessage
- InteractionRole
- InteractionScenario
- Process
- ProcessEdge
- ProcessUsage

View Specifications::Other::IEPPV

Concerns: information exchanges, information interfaces, information interoperability, information sharing and safeguarding.

Definition: UAFP supports information modeling and traceability to IEPPV model elements using the IEPPV-defined elements: Message, SemanticElement, and FilteredSemanticElement, used to represent data, properties/attributes, structure, format, and relationships. The IEPPV profile enables the specification of the policies, rules and constraints governing the packaging (assembly, transformation, marking, redaction) of data elements conforming to information sharing and safeguarding requirements. The IEPPV profile also governs the processing (parsing, transformation, and marshalling) received information and data element.

Recommended Implementation: UML Class Diagram, SysML Block Diagram.

Figure 8:93 – IEPPV

Elements
- Abstraction
- FilteredSemanticElement
- InformationSpecification
- Message
- OperationalExchange
- OperationalExchangeItem
- OperationalInformation

View Specifications::Other::NIEM


Concerns: information exchanges, information interoperability, data schema.

Definition: A specification representing the structure, semantics, and relationships of data objects that satisfy an information exchange requirement. Used for organizing and packaging Model Package Descriptions (MPDs) and Information Exchange Package Documentation (IEPD) as defined by the National Information Exchange Model (NIEM). An IEPD is a type of MPD. The NIEM MPD defines an Enterprise Information Exchange Model (EIEM) as an MPD that contains NIEM-conforming schemas that define and declare data components to be consistently reused in the IEPPVs of an enterprise. An EIEM is a collection of schemas organized into a collection of subset schemas and one or more extension schemas. An information sharing enterprise creates and maintains an EIEM.

Recommended Implementation: UML Class Diagram, SysML Block Diagram.
Figure 8: NIEM Elements

- Abstraction
- DataObject
- InformationModel
- InformationModel
- OperationalInformation
- ResourceInformation
9. Domain MetaModel (DMM) Elements

9.1 Domain MetaModel

This package contains the elements of the DMM.

9.1.1 Domain MetaModel::Architecture Management

Stakeholders: Enterprise Architects, people who want to discover the architecture, Technical Managers.
Concerns: Captures meta-data relevant to the entire architecture
Definition: Provide information pertinent to the entire architecture. Present supporting information rather than architectural models.

Domain MetaModel::Architecture Management::Taxonomy

ActualState

Package: Parameters
isAbstract: Yes
Generalization: UAFEElement
Description
Abstract element that applies temporal extent to a set of elements realized as Instance Specifications.

Attributes

- endDate : ISO8601DateTime[0..1] End time for all individual elements.
- startDate : ISO8601DateTime[0..1] Start time for all individual elements.

InteractionScenarioGeneralization

Package: Taxonomy
isAbstract: No
Generalization: UML2.5Metamodel::Generalization, MeasurableElement
Description
A InteractionScenarioGeneralization is a taxonomic relationship between a more general InteractionScenario and a more specific InteractionScenario.
ISO8601DateTime

**Package:** Parameters  
isAbstract: No  
**Generalization:** UAFElement  
**Description**  
A date and time specified in the ISO8601 date-time format including timezone designator (TZD): YYYY-MM-DDTh:mm:ssTZD.

---

ProcessGeneralization

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** UML2.5Metamodel::Generalization, MeasurableElement  
**Description**  
A ProcessGeneralization is a taxonomic relationship between a more general Process and a more specific Process.
PropertySetGeneralization

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** UML2.5Metamodel::Generalization, MeasurableElement  
**Description**  
A PropertySetGeneralization is a taxonomic relationship between a more general PropertySet and a more specific PropertySet.

![PropertySetGeneralization Diagram](image)

StateDescriptionGeneralization

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** UML2.5Metamodel::Generalization, MeasurableElement  
**Description**  
A StateDescriptionGeneralization is a taxonomic relationship between a more general StateDescription and a more specific StateDescription.

![StateDescriptionGeneralization Diagram](image)
Domain MetaModel::Architecture Management::Connectivity

**Exchange**

- **Package:** Connectivity
- **isAbstract:** Yes
- **Generalization:** [MeasurableElement], BPMN2Metamodel::MessageFlow, [SubjectOfSecurityConstraint]

**Description**

Abstract tuple, grouping OperationalExchanges and ResourceExchanges that exchange Resources.

![Diagram of Exchange](image)

**Figure 9:101 - Exchange**

**ExchangItem**

- **Package:** Connectivity
- **isAbstract:** Yes
- **Generalization:** BPMN2Metamodel::BPMNMessage

**Description**

An abstract grouping for elements that defines the types of elements that can be exchanged between Assets and conveyed by an Exchange.

![Diagram of ExchangItem](image)

**Figure 9:102 – ExchangItem**
**Resource**

**Package:** Connectivity  
isAbstract: Yes  
**Generalization:** PropertySet  
**Description**  
Abstract type grouping all elements that can be conveyed by an Exchange.

![Resource Diagram](image)

**Domain MetaModel::Architecture Management::Processes**

**ActivityPerformableUnderCondition**

**Package:** Processes  
isAbstract: No  
**Generalization:** MeasurableElement  
**Description**  
The ActualCondition under which an Activity is performed.

![ActivityPerformableUnderCondition Diagram](image)

**CapableElement**

**Package:** Traceability  
isAbstract: Yes  
**Generalization:** UAFAElement
Description
An abstract type that represents a structural element that can exhibit capabilities.

Figure 9:105 – CapableElement

IsCapableToPerform

**Package:** Processes
**isAbstract:** No
**Generalization:** MeasurableElement

Description
A tuple defining the traceability between the structural elements to the Activities that they can perform.

Figure 9:106 – IsCapableToPerform

PerformsInContext

**Package:** Processes
**isAbstract:** No
**Generalization:** MeasurableElement

Description
A tuple that relates an OperationalAction to a OperationalRole, or a FunctionAction to a ResourceRole. It indicates that the action can be carried out by the role when used in a specific context or configuration.
Process

Package: Processes
isAbstract: Yes

Generalization: MeasurableElement, UML2.5Metamodel::Activity, BPMN2Metamodel::Process, AffectableElement

Description
An abstract type that represents a behavior or process (i.e., a Function or OperationalActivity) that can be performed by a Performer.
**ProcessEdge**

**Package:** Processes  
isAbstract: Yes  
**Generalization:** MeasurableElement, UML.5Metamodel::Activity, UML.5Metamodel::ActivityEdge, BPMN2Metamodel::SequenceFlow  
**Description**  
An abstract type that represents a behavior or process (i.e., a Function or OperationalActivity) that can be performed by a Performer.

**ProcessOperation**

**Package:** Processes  
isAbstract: Yes  
**Generalization:** MeasurableElement, UML.5Metamodel::Activity, UML.5Metamodel::Operation  
**Description**  
An abstract type that represents a behavior or process (i.e., a Function or OperationalActivity) that can be performed by a Performer.
**ProcessOperation**

**Package:** Processes  
**isAbstract:** Yes  
**Generalization:** MeasurableElement, UML2.5Metamodel::Activity, UML2.5Metamodel::CallBehaviorAction, UML2.5Metamodel::Parameter  
**Description**  
An abstract type that represents a behavior or process (i.e., a Function or OperationalActivity) that can be performed by a Performer.

**ProcessParameter**

**Package:** Processes  
**isAbstract:** Yes  
**Generalization:** MeasurableElement, UML2.5Metamodel::Activity, UML2.5Metamodel::CallBehaviorAction, UML2.5Metamodel::Parameter  
**Description**  
An abstract type that represents a behavior or process (i.e., a Function or OperationalActivity) that can be performed by a Performer.
Domain MetaModel::Architecture Management::States

StateDescription

Package: States
isAbstract: Yes

Generalization: UML2.5Metamodel::StateMachine

Description
An abstract type that represents a state machine (i.e., an OperationalStateDescription or ResourceStateDescription), depicting how the Asset responds to various events and the actions.

Domain MetaModel::Architecture Management::Sequences

InteractionMessage

Package: Sequences
isAbstract: Yes

Generalization: MeasurableElement, UML2.5Metamodel::Activity, BPMN2Metamodel::Process, UML2.5Metamodel::Interaction, UML2.5Metamodel::Message

Description
An abstract type that groups several types of messages used in the InteractionScenario.
**InteractionRole**

**Package:** Sequences

*isAbstract: Yes*

**Generalization:** BPMN2Metamodel::ResourceRole

**Description**
An abstract type that represents an individual participant in the InteractionScenario.

![InteractionRole Diagram](image)

**Figure 9:115 – InteractionRole**

**InteractionScenario**

**Package:** Sequences

*isAbstract: Yes*

**Generalization:** MeasurableElement, UML2.5Metamodel::Activity, BPMN2Metamodel::Process, UML2.5Metamodel::Interaction

**Description**
An abstract type that specifies interactions between Assets, like ResourcePerformers, and Services.

![InteractionScenario Diagram](image)

**Figure 9:116 – InteractionScenario**
Domain MetaModel::Architecture Management::Information

**Alias**

**Package:** Information  
isAbstract: No  
**Generalization:** MeasurableElement  
**Description**  
A metamodel Artifact used to define an alternative name for an element.

![Diagram of Alias](image)

**Attributes**

- **nameOwner:** Someone or something that uses this alternative name.

**ArchitectureMetadata**

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** Metadata  
**Description**

Information associated with an ArchitecturalDescription, that supplements the standard set of tags used to summarize the Architecture. It states things like what methodology was used, notation, etc.

![Diagram of ArchitectureMetadata](image)

**Figure 9:118 – ArchitectureMetadataDefinition**

**Package:** Information  
isAbstract: No  
**Generalization:** MeasurableElement  
**Description**

A comment containing a description of an element in the architecture.
Figure 9:119 – Definition

Attributes

author: The original or current person (architect) responsible for the Definition.

Information

Package: Information
isAbstract: No
Generalization: MeasurableElement
Description
A comment that describes the state of an item of interest in any medium or form -- and is communicated or received.

Figure 9:120 – Information

InformationModel

Package: Information
isAbstract: No
Generalization: SubjectOfOperationalConstraint, SubjectOfResourceConstraint
Description
A structural specification of data types, showing relationships between them. The type of information captured in the InformationModel is described using the enumeration InformationModelKind (Conceptual, Logical, and Physical).
Metadata

**Package:** Taxonomy

isAbstract: No

**Generalization:** [MeasurableElement](#)

**Description**

A comment that can be applied to any element in the architecture. The attributes associated with this element detail the relationship between the element and its related dublinCoreElement, metaDataScheme, category and name. This allows the element to be referenced using the Semantic Web.

**Attributes**

- **category** : String[0..1]  
  Defines the category of a Metadata element example: http://purl.org/dc/terms/abstract.

- **dublinCoreTag** : String[0..1]  
  A metadata category that is a DublinCore tag.

- **metaDataScheme** : String[0..1]  
  A representation scheme that defines a set of Metadata.

- **name** : String[0..1]  
  The name of the Metadata. The name of the Metadata.

**SameAs**

**Package:** Information

isAbstract: No

**Generalization:** [MeasurableElement](#)
Description
A tuple that asserts that two elements refer to the same real-world thing.

Figure 9:123 – SameAs

Domain MetaModel::Architecture Management::Constraints

Rule

Package: Constraints
isAbstract: Yes
Generalization: MeasurableElement
Description
An abstract type for all types of constraint (i.e., an OperationalConstraint could detail the rules of accountancy best practice).

Figure 9:124 – Rule
**Domain MetaModel::Architecture Management::Traceability**

**ArchitecturalReference**

**Package:** Traceability  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that specifies that one architectural description refers to another.

**Figure 9:125 – ArchitecturalReference**

**ComparesTo**

**Package:** Traceability  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple used to relate the effect that is achieved with the originally expected DesiredEffect. Providing a means of comparison, between the expectation of the desirer and the actual result.

**Figure 9:126 – ComparesTo**

**Implements**

**Package:** Traceability  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that defines how an element in the upper layer of abstraction is implemented by a semantically equivalent element (for example tracing the Functions to the OperationalActivities) in the lower level of abstraction.
**Figure 9: 127 – Implements**

**Sequence**

**Package:** Traceability

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**

A tuple that asserts one Individual's temporal extent is completely before the temporal extent of another.

**Figure 9:128 – Sequence**
**9.1.2 Domain MetaModel::Summary & Overview**

**ArchitecturalDescription**

**Package:** Summary & Overview

**isAbstract:** No

**Generalization:** MeasurableElement

Description

An Architecture Description is a work product used to express the Architecture of some System Of Interest. It provides executive-level summary information about the architecture description in a consistent form to allow quick reference and comparison between architecture descriptions -- It includes assumptions, constraints, and limitations that may affect high-level decisions relating to an architecture-based work program.

![Diagram of ArchitecturalDescription]

**Attributes**

- **approvalAuthority**: String[*] Someone or something that has the authority to approve the ArchitecturalDescription.
- **architect**: String[*] Someone responsible for the creation of ArchitecturalDescription.
- **assumptionAndConstraint**: String[*] Any assumptions, constraints, and limitations contained in the ArchitecturalDescription, including those affecting deployment, communications performance, information assurance environments, etc.
- **creatingOrganization**: String[*] The organization responsible for creating the ArchitecturalDescription.
- **dateCompleted**: String[0..1] Date that the ArchitecturalDescription was completed.
- **methodologyUsed**: String[*] Name of the documented methodology that will be or has been used in describing the architecture.
- **purpose**: String[*] Explains the need for the Architecture, what it will demonstrate, the types of analyses that will be applied to it, who is expected to perform the analyses, what decisions are expected to be made on the basis of each form of analysis, who is expected to make those decisions, and what actions are expected to result.

**Figure 9: 129 – ArchitecturalDescription**
recommendations : String[*] States the recommendations that have been developed based on the architecture effort. Examples include recommended system implementations, and opportunities for technology insertion.

status : String[*] State of the architecture description in terms of its development, baselining, activity (e.g., active or inactive), or some other factor of importance.

summaryOfFindings : String[*] Summarizes the findings that have been developed so far. This may be updated several times during the development of the ArchitecturalDescription.

toBe : Boolean[1] Indicates whether the ArchitecturalDescription represents an Architecture that exists or will exist in the future.

toolsUsed : String[*] Identifies any tools used to develop the ArchitecturalDescription as well as file names and formats if appropriate.

version : String[*] Identifier that indicates the particular edition or revision of the architecture description.

Architecture

Package: Summary & Overview
isAbstract: Yes

Generalization: UAFElement
Description
An abstract type that represents a generic architecture. Subtypes are OperationalArchitecture, Service Architecture, and ResourceArchitecture.

Figure 9:130 – Architecture

Concern

Package: Summary & Overview
isAbstract: No

Generalization: PropertySet, PhaseableElement
Description
A matter of relevance or importance to a stakeholder regarding an entity of interest.
**Phases**

**Package:** Summary & Overview

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**

A tuple that exists between a PhaseableElement and an ActualStrategicPhase that it is assigned to.

**Stakeholder**

**Package:** Summary & Overview

**isAbstract:** Yes

**Generalization:** UAFElement

**Description**

An individual organizational resource, or a type of organizational resource (both internal and external to the enterprise) who has an interest in, or is affected by, outcomes or intermediate effects generated or influenced by the enterprise.
**UAFEElement**

**Package:** Summary & Overview  
isAbstract: Yes  
Description  
Abstract super type for all of the UAF elements. It provides a way for all of the UAF elements to have a common set of properties.

![Diagram of UAFEElement](image)

**Attributes**  
URI : String[0..1]  
Captures Unique identifier for the element.

**View**

**Package:** Summary & Overview  
isAbstract: No  
**Generalization:** PropertySet
Description
An information item, governed by an architecture viewpoint, comprising part of an architecture description that communicates some aspect of an architecture.

**Figure 9:135 – View**

**Viewpoint**

**Package:** Summary & Overview  
isAbstract: No  
**Generalization:** PropertySet  
**Description**  
Conventions for the creation, interpretation and use of an architecture view to frame one or more concerns that governs the creation of views.

**Figure 9:136 – Viewpoint**

**Attributes**

- language : String[*] The languages used to express the Viewpoint.  
- method : String[*] The methods employed in the development of the Viewpoint.  
- purpose : String[0..1] The purpose of the Viewpoint.

### 9.1.3 Domain MetaModel::Strategic

**Domain MetaModel::Strategic::Motivation**

**Challenge**

**Package:** Motivation  
isAbstract: No  
**Generalization:** MotivationalElement  
**Description**  
An existing or potential difficulty, circumstance, or obstacle which will require effort and determination from an enterprise to overcome in achieving its goals.
**Figure 9:137 – Challenge**

**Driver**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** [MotivationalElement](#)  
**Description**  
A factor which will have a significant impact on the activities, and goals of an enterprise

**Figure 9:138 – Driver**

**Enables**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** [MeasurableElement](#)  
**Description**  
A tuple used to denote that an Opportunity provides the means for achieving an EnterpriseGoal or Objective. A dependency relationship denoting that an Opportunity provides the means for achieving an EnterpriseGoal or Objective.
**ImpactedBy**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple used to denote that a Capability is affected by an Opportunity.

**MotivatedBy**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple denoting the reason or reasons one has for acting or behaving in a particular way.
**MotivationalElement**

**Package:** Motivation  
**isAbstract:** Yes  
**Generalization:** PropertySet  

**Description**  
An abstract kind of element in the model that provides the reason or reasons one has for acting or behaving in a particular way.

![Diagram of MotivationalElement](image)

**Figure 9:142 – MotivationalElement**

**Opportunity**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** MotivationalElement, PhaseableElement, AffectableElement  

**Description**  
An existing or potential favorable circumstance or combination of circumstances which can be advantageous for addressing enterprise Challenges.

![Diagram of Opportunity](image)

**Figure 9:143 – Opportunity**

**PresentedBy**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** MeasurableElement
Description
A tuple denoting that a Challenge must be overcome for addressing a Driver.

**Figure 9:144 – PresentedBy**

**Domain MetaModel::Strategic::Taxonomy**

**Capability**

**Package**: Taxonomy
**isAbstract**: No

**Generalization**: PropertySet, Desirer, PhaseableElement, AffectableElement, SubjectOfStrategicConstraint

**Description**
An enterprise's ability to Achieve a desired effect realized through a combination of ways and means (e.g., CapabilityConfigurations) along with specified measures.

**Figure 9:145 – Capability**

**CapabilityGeneralization**

**Package**: Taxonomy
**isAbstract**: No

**Generalization**: PropertySetGeneralization
Description
A CapabilityGeneralization is a taxonomic relationship between a more general Capability and a more specific Capability.

Figure 9:146 – CapabilityGeneralization

EnterpriseGoal

Package: Structure
isAbstract: No
Generalization: PropertySet, PhaseableElement, AffectableElement, Requirement

Description
A statement about a state or condition of the enterprise to be brought about or sustained through appropriate Means. An EnterpriseGoal amplifies an EnterpriseVision that is, it indicates what must be satisfied on a continuing basis to effectively attain the EnterpriseVision. BMM: OMG dtc-13-08-24.
**Figure 9:147 – EnterpriseGoal**

**EnterpriseObjective**

**Package:** Taxonomy  
**isAbstract:** No  

**Generalization:** EnterpriseGoal  

Description  
A statement of an attainable, time-targeted, and measurable target that the enterprise seeks to meet in order to achieve its Goals. https://www.omg.org/spec/BMM/1.3/

**Figure 9:148 – EnterpriseObjective**

**EnterpriseVision**

**Package:** Structure  
**isAbstract:** No  

**Generalization:** PropertySet, PhaseableElement  

Description  
A Vision describes the future state of the enterprise, without regard to how it is to be achieved. BMM: OMG dtc-13-08-24.
**Figure 9:149 – EnterpriseVision**

**OwnsValue**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** MeasurableElement  

**Description**  
An tuple denoting that an ActualOrganizationalResource owns a ValueItem.

**Figure 9:150 – OwnsValue**

**PhaseableElement**

**Package:** Taxonomy  
**isAbstract:** Yes  
**Generalization:** UAFElement  

**Description**  
An abstract element that indicates the types of elements that can be assigned to a specific ActualStrategicPhase.

**Figure 9:151 – PhaseableElement**
**StrategicAsset**

**Package:** Taxonomy  
isAbstract: Yes  
**Generalization:** Asset  
**Description**  
An abstract element that indicates the types of strategic elements that can be affected by Risk.

**StrategicPhase**

**Package:** Structure  
isAbstract: No  
**Generalization:** PropertySet  
**Description**  
A type of a current or future state of the enterprise, mission, ValueStream, or EnduringTask.

**StrategicInformation**

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** MeasurementSet, StrategicAsset  
**Description**  
An ideal, custom, or institution that an enterprise promotes or agrees with. It may be positive or negative, depending on point of view.
**Figure 9:154 – ValueItem**

**VisionStatement**

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** *MeasurableElement*  
**Description**  
A type of comment that describes the future state of the enterprise, without regard to how it is to be achieved. BMM: OMG dtc-13-08-24.

**Figure 9:155 – VisionStatement**

**WholeLifeEnterprise**

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** *ActualEnterprisePhase*  
**Description**  
A WholeLifeEnterprise is a purposeful endeavor of any size involving people, organizations and supporting systems. It is made up of TemporalParts and StructuralParts.
**Domain MetaModel::Strategic::Structure**

**CapabilityRole**

*Package:* Structure  
*isAbstract:* No  
*Generalization:* PropertySet, Desirer, MeasurableElement  
*Description:*  
A high level specification of the enterprise's ability to execute a specified course of action.

**Figure 9:157 – CapabilityRole**

**StructuralPart**

*Package:* Structure  
*isAbstract:* No  
*Generalization:* MeasurableElement  
*Description:*  
Usage of a StrategicPhase in the context of another StrategicPhase. It asserts that one StrategicPhase is a spatial part of another. Creates a whole-part relationship that represents the structure of the StrategicPhase.

**Figure 9:158 – StructuralPart**
**TemporalPart**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
Usage of an StrategicPhase in the context of another StrategicPhase. It asserts that one StrategicPhase is a spatial part of another. Creates a whole-part relationship that represents the temporal structure of the StrategicPhase.

![TemporalPart Diagram](image)

**Domain MetaModel::Strategic::Connectivity**

**CapabilityDependency**

**Package:** Connectivity  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that asserts that one CapabilityDependency is dependent from another.

![CapabilityDependency Diagram](image)

**CapabilityRoleDependency**

**Package:** Connectivity  
**isAbstract:** No  
**Generalization:** MeasurableElement
Figure 9:161 – CapabilityRoleDependency

**StrategicExchange**

**Package:** Connectivity  
**isAbstract:** No  
**Generalization:** [Exchange](#)  
**Description**  
Asserts that a flow can exist between ActualStrategicPhases (i.e., flows of information, people, materiel, or energy).

![Diagram of StrategicExchange](image)

Figure 9:162 – StrategicExchange

**StrategicExchangeItem**

**Package:** Connectivity  
**isAbstract:** Yes  
**Generalization:** [Resource, ExchangeItem](#)  
**Description**  
An abstract grouping for elements that defines the types of elements that can be exchanged between ActualStrategicPhases and conveyed by a StrategicExchange.

**Domain MetaModel::Strategic::Processes**

**ActualEnduringTask**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** [ActualStrategicPhase](#)  
**Description**  
An actual undertaking recognized by an enterprise as being essential to achieving its goals - i.e., a strategic specification of what the enterprise does.
Figure 9:163 – ActualEnduringTask

**ActualEnterprisePhase**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** ActualStrategicPhase  
**Description**  
A time period within which a set of Capabilities are deployed.

Figure 9:164 – ActualEnterprisePhase

**ActualStrategicPhase**

**Package:** Processes  
**isAbstract:** Yes  
**Generalization:** Achiever, ActualPropertySet  
**Description**  
A phase of an actual enterprise, mission, ValueStream or EnduringTask endeavor.
Figure 9:165 – ActualStrategicPhase

**Creates**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple used to denote that an ActualStrategicPhase brings into existence a StrategicAsset.

Figure 9:166 – Creates

**EnterpriseMission**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** ActualEnterprisePhase  
**Description**  
Mission captures at a high level what you will do to realize your vision.
Figure 9:167 – EnterpriseMission

**ValueStream**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** ActualStrategicPhase  
**Description**  
An end-to-end collection of activities that create a result for a customer, who may be the ultimate customer or an internal end-user of the value stream. Value stream nested within another value stream may represent Value Stream Stage - a distinct, identifiable phase or step within a value stream [The Business Architecture Metamodel Guide, 2020]

Figure 9:168 – ValueStream

**Domain MetaModel::Strategic::States**

**Achiever**

**Package:** States  
**isAbstract:** Yes  
**Generalization:** UAFEElement  
**Description**  
An ActualResource, ActualProject or ActualStrategicPhase that can deliver a desired effect.

Figure 9:169 – Achiever
**Achieves**

Package: States  
isAbstract: No  
**Generalization:** MeasurableElement  
Description  
A tuple that exists between an ActualState (e.g., observed/measured during testing) of an element that attempts to achieve a desired effect and an Achiever.

![Diagram of Achieves](image)

**Figure 9:170 – Achieves**

**ActualEffect**

Package: States  
isAbstract: No  
**Generalization:** ActualPropertySet  
Description  
A real-world phenomenon that follows and is caused by some previous phenomenon.

![Diagram of ActualEffect](image)

**Figure 9:171 – ActualEffect**

**ActualOutcome**

Package: States  
isAbstract: No  
**Generalization:** ActualEffect  
Description  
An individual that describes something that happens or is produced as the final consequence or product and is related to one of the goals for the business or enterprise. Outcome is a special kind of effect, one that is usually at the end of a chain of effects, i.e., an "end effect".

![Diagram of ActualOutcome](image)
Figure 9:172 – ActualOutcome

**Desirer**

Package: States  
isAbstract: Yes  
**Generalization:** UAFElement  
Description  
Abstract type used to group architecture elements that might desire a particular effect.

Figure 9:173 – Desirer

**Desires**

Package: States  
isAbstract: No  
**Generalization:** MeasurableElement  
Description  
A tuple relating the Desirer (a Capability or OrganizationalResource) to an ActualState.
Figure 9:174 – Desires

**Effect**

Package: States
isAbstract: No

**Generalization:** MotivationalElement

**Description**
A kind of phenomenon that follows and is caused by some previous phenomenon that could lead to downstream effects or to one or more desired outcomes.

Figure 9:175 – Effect

**Domain MetaModel::Strategic::Information**

**MapsToGoal**

**Package:** Information
isAbstract: No

**Generalization:** MeasurableElement

**Description**
A tuple denoting that some StrategicInformation contributes to achieving an EnterpriseGoal or Objective.
StrategicInformation

Package: Information
isAbstract: No
Generalization: StrategicExchangeItem, StrategicAsset
Description
Knowledge communicated or received concerning a particular fact or circumstance that is strategic in nature that is important or essential in relation to a plan of action

Domain MetaModel::Strategic::Constraints

StrategicConstraint

Package: Constraints
isAbstract: No
Generalization: Rule
Description
A Rule governing a Capability.

SubjectOfStrategicConstraint

Package: Constraints
isAbstract: Yes
Generalization: UAFElement
Description
An abstract grouping of elements that can be the subject of a StrategicConstraint.

Figure 9:178 – SubjectOfStrategicConstraint

Domain MetaModel::Strategic::Traceability

EvokedBy
-Packag__Traceability
-isAbstract: No
-Generalization: MeasurableElement
-Description
A tuple used to denote that a Risk is drawn out by an Opportunity.

Figure 9:179 – EvokedBy

Exhibits
-Packag__Traceability
-isAbstract: No
-Generalization: MeasurableElement
-Description
A tuple that exists between a CapableElement and a Capability that it meets under specific environmental conditions.
MapsToCapability

**Package:** Traceability

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**
A tuple denoting that an Activity contributes to providing a Capability.

OrganizationInPhase

**Package:** Traceability

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**
An abstraction relationship relating an ActualOrganization to an ActualStrategicPhase to denote that the ActualOrganization plays a role or is a stakeholder in an ActualStrategicPhase.
9.1.4 Domain MetaModel::Operational

Domain MetaModel::Operational::Taxonomy

**ArbitraryConnector**

**Package:** Taxonomy

**isAbstract:** No

**Generalization:** [MeasurableElement](#)

**Description**

Represents a visual indication of a connection used in high level operational concept diagrams.

**ConceptItem**

**Package:** Taxonomy

**isAbstract:** Yes

**Generalization:** [UAElement](#)

**Description**

An abstract type which represents some part played by an asset or location in a HighLevelOperationalConcept.
**HighLevelOperationalConcept**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** PropertySet  
**Description**
Describes the Resources and Locations required to meet an operational scenario from an integrated systems point of view. It is used to communicate overall quantitative and qualitative system characteristics to stakeholders.

**Domain MetaModel::Operational::Structure**

**KnownResource**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** OperationalPerformer, ResourcePerformer  
**Description**
Asserts that a known ResourcePerformer constrains the implementation of the OperationalPerformer that plays the role in the OperationalArchitecture.
**OperationalAgent**

**Package:** Structure  
**isAbstract:** Yes  
**Generalization:** SubjectOfOperationalConstraint, CapableElement, OperationalAsset, Desirer  
**Description**  
An abstract type grouping OperationalArchitecture and OperationalPerformer.

**OperationalArchitecture**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** OperationalAgent, Architecture  
**Description**  
A type used to denote a model of the Architecture, described from the Operational perspective.
**OperationalMethod**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** ProcessOperation  
**Description**  
A behavioral feature of an OperationalAgent whose behavior is specified in an OperationalActivity.

**OperationalParameter**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** ProcessParameter  
**Description**  
A type that represents inputs and outputs of an OperationalActivity. It is typed by an OperationalExchangeItem.
**OperationalPerformer**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** OperationalAgent  
**Description**  
A logical entity that IsCapableToPerform OperationalActivities which produce, consume and process Resources.

**OperationalRole**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** LocationHolder, AssetRole, InteractionRole  
**Description**  
Usage of a OperationalPerformer or OperationalArchitecture in the context of another OperationalPerformer or OperationalArchitecture. Creates a whole-part relationship.
ProblemDomain

**Package:** Structure

**isAbstract:** No

**Generalization:** OperationalRole

**Description**
A property associated with an OperationalArchitecture, used to specify the scope of the problem.

Domain MetaModel::Operational::Connectivity

**OperationalConnector**

**Package:** Connectivity

**isAbstract:** No

**Generalization:** AssetRole

**Description**
A Connector that goes between OperationalRoles representing a need to exchange Resources. It can carry a number of OperationalExchanges.
OperationalExchange

**Package:** Connectivity

**isAbstract:** No

**Generalization:** Exchange, SubjectOfOperationalConstraint

**Description**

Asserts that a flow can exist between OperationalPerformers (i.e., flows of information, people, materiel, or energy).

**Attributes**

- **trustLevel : Real[0..1]** Captures the directional arbitrary level of trust related to an OperationalExchange between two OperationalPerformers.

OperationalExchangeItem

**Package:** Connectivity

**isAbstract:** Yes

**Generalization:** Resource, SubjectOfSecurityConstraint, ExchangeItem

**Description**

An abstract grouping for elements that defines the types of elements that can be exchanged between OperationalPerformers and conveyed by an OperationalExchange.
**OperationalExchangeItem**

*Package*: Connectivity  
*isAbstract*: No  
*Generalization*: PropertySet  
*Description*: A declaration that specifies a contract between the OperationalPerformer it is related to, and any other OperationalPerformers it can interact with.

**OperationalInterface**

*Package*: Connectivity  
*isAbstract*: No  
*Generalization*: MeasurableElement  
*Description*: An interaction point for an OperationalAgent through which it can interact with the outside environment, and which is defined by an OperationalInterface.
Figure 9:198 – OperationalPort

**OperationalSignal**

**Package:** Connectivity  
isAbstract: No  
**Generalization:** SubjectOfOperationalConstraint, OperationalExchangeItem  
**Description**  
An item of information that flows between OperationalPerformers and is produced and consumed by the OperationalActivities that the OperationalPerformers are capable of performing (see IsCapableToPerform).

Figure 9:199 – OperationalSignal

**Domain MetaModel::Operational::Processes**

**OperationalActivity**

**Package:** Processes  
isAbstract: No  
**Generalization:** SubjectOfOperationalConstraint, Process  
**Description**  
An Activity that captures a logical process, specified independently of how the process is carried out.
Figure 9:200 – OperationalActivity

**OperationalActivityAction**

**Package:** Processes

*isAbstract:* No

**Generalization:** [ProcessUsage, MeasurableElement]

**Description**

A call of an OperationalActivity in the context of another OperationalActivity.

Figure 9:201 – OperationalActivityAction

**OperationalActivityEdge**

**Package:** Processes

*isAbstract:* Yes

**Generalization:** [ProcessEdge]

**Description**

A tuple that shows the flow of Resources (objects/information) between OperationalActivityActions.
StandardOperationalActivity

Package: Processes
isAbstract: No
Generalization: OperationalActivity
Description
A sub-type of OperationalActivity that is a standard operating procedure.

Domain MetaModel::Operational::States

OperationalStateDescription

Package: States
isAbstract: No
Generalization: MeasurableElement, StateDescription
Description
A state machine describing the behavior of a OperationalPerformer, depicting how the OperationalPerformer responds to various events and the actions.
Domain MetaModel::Operational::Sequences

OperationalInteractionScenario

Package: Sequences
isAbstract: No
Generalization: InteractionScenario
Description
A specification of the interactions between OperationalPerformers in an OperationalArchitecture.

Figure 9:205 – OperationalInteractionScenario

OperationalMessage

Package: Sequences
isAbstract: No
Generalization: InteractionMessage
Description
Message for use in an OperationalInteractionScenario which carries any of the subtypes of OperationalExchange.

Figure 9:206 – OperationalMessage
Domain MetaModel::Operational::Information

OperationalInformation

Package: Information
isAbstract: No
Generalization: SubjectOfOperationalConstraint, OperationalAsset, OperationalExchangeItem, ServiceExchangeItem
Description
An item of information that flows between OperationalPerformers and is produced and consumed by the OperationalActivities that the OperationalPerformers are capable to perform (see IsCapableToPerform).

Figure 9:207 – OperationalInformation

Domain MetaModel::Operational::Constraints

OperationalConstraint

Package: Constraints
isAbstract: No
Generalization: Rule
Description
A Rule governing an operational architecture element i.e. OperationalPerformer, OperationalActivity, OperationalInformation etc.

Figure 9:208 – OperationalConstraint

SubjectOfOperationalConstraint

Package: Constraints
isAbstract: Yes
Generalization: UAFEElement
Description
An abstract type grouping elements that can be the subject of an OperationalConstraint.
9.1.5 Domain MetaModel::Services

**Stakeholders:** Enterprise Architects, Solution Providers, Systems Engineers, Software Architects, Business Architects.

**Concerns:** specifications of services required to exhibit a Capability.

**Definition:** shows Services and required and provided service levels of these services needed to exhibit a Capability or to support an Operational Activity.

### Domain MetaModel::Services::Taxonomy

**Service**

**Package:** Taxonomy

isAbstract: No

**Generalization:** PropertySet, VersionedElement, CapableElement, Asset

**Description**

A mechanism to enable access to one or more capabilities, where the access is provided using a prescribed service interface and is exercised consistent with service constraints and policies.
**Figure 9:210 – Service Architecture**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** Service, Architecture  
**Description**  
An element used to denote a model of the Architecture, described from the Services perspective.

**Figure 9:211 – ServiceArchitecture**

**ServiceGeneralization**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** PropertySetGeneralization  
**Description**  
A ServiceGeneralization is a taxonomic relationship between a more general Service and a more specific Service.
Domain MetaModel::Services::Structure

ServiceMethod

Package: Structure
isAbstract: No
Generalization: ProcessOperation
Description
A behavioral feature of a Service whose behavior is specified in a ServiceFunction.

ServiceParameter

Package: Structure
isAbstract: No
Generalization: ProcessParameter
Description
A type that represents inputs and outputs of a ServiceFunction, represents inputs and outputs of a Service.
Figure 9:214 – ServiceParameter

**ServiceRole**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** MeasurableElement, InteractionRole  
Description  
A behavioral feature of a Service whose behavior is specified in a ServiceFunction.

Figure 9:215 – ServiceRole

**Domain MetaModel::Services::Connectivity**

**ServiceConnector**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** AssetRole  
Description  
A channel for exchange between two Service. Where one acts as the consumer of the other.
Figure 9:216 – ServiceConnector

**ServiceExchange**

**Package:** Connectivity  
**isAbstract:** No  
**Generalization:** [Exchange](#)  
**Description**  
Asserts that a flow can exist between Services (i.e., flows of information, people, materiel, or energy).

Figure 9:217 – ServiceExchange

**ServiceExchangeItem**

**Package:** Connectivity  
**isAbstract:** Yes  
**Generalization:** [Resource, ExchangeItem](#)  
**Description**  
An abstract grouping for elements that defines the types of elements that can be exchanged between Services and conveyed by a ServiceExchange.
**Figure 9:218 – ServiceExchangeItem**

**ServiceInterface**

**Package:** Connectivity  
isAbstract: No  
**Generalization:** PropertySet  
**Description**  
A contract that defines the ServiceMethods and ServiceSignals that the Service realizes.

**Figure 9:219 – ServiceInterface**

**ServicePort**

**Package:** Connectivity  
isAbstract: No  
**Generalization:** MeasurableElement  
**Description**  
An interaction point for a Service through which it can interact with the outside environment, and which is defined by a ServiceInterface.
ServiceSignal

Package: Connectivity
isAbstract: No
Generalization: ServiceExchangeItem
Description
A specification of a kind of communication between Services in which a reaction is asynchronously triggered in the receiver without a reply.

Domain MetaModel::Services::Processes

ServiceFunction

Package: Processes
isAbstract: No
Generalization: Process
Description
An Activity that describes the abstract behavior of Service, regardless of the actual implementation.
Figure 9:222 – ServiceFunction

**ServiceFunctionAction**

**Package:** Processes  
isAbstract: No  

**Generalization:** ProcessUsage  
**Description**  
A call of a ServiceFunction in the context of another ServiceFunction.

Figure 9:223 – ServiceFunctionAction

**ServiceFunctionEdge**

**Package:** Processes  
isAbstract: Yes  

**Generalization:** ProcessEdge  
**Description**  
A tuple that shows the flow of Resources (objects/information) between OperationalActivityActions.
Domain MetaModel::Services::States

ServiceStateDescription

Package: States
isAbstract: No

Generalization: MeasurableElement, StateDescription

Description
A state machine describing the behavior of a Service, depicting how the Service responds to various events and the actions.

Domain MetaModel::Services::Sequences

ServiceInteractionScenario

Package: Sequences
isAbstract: No

Generalization: InteractionScenario

Description
A specification of the interactions between Service.
**ServiceMessage**

**Package:** Sequences  
isAbstract: No  
**Generalization:** InteractionMessage  
**Description**  
Message for use in a services interaction scenario which carries any of the subtypes of ServiceExchange.

![Diagram of ServiceMessage](image)

**Domain MetaModel::Services::Constraints**

**ServiceContract**

**Package:** Constraints  
isAbstract: No  
**Generalization:** Rule  
**Description**  
A constraint governing the use of one or more Services.

![Diagram of ServiceContract](image)
**ServicePolicy**

**Package:** Constraints  
isAbstract: No  
**Generalization:** Rule  
**Description**  
A constraint governing the use of one or more Service.

![Diagram of ServicePolicy]

**Domain MetaModel::Services::Traceability**

**GovernedBy**

**Package:** Traceability  
isAbstract: No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that exists between the ServiceContract and the Service that it governs.

![Diagram of GovernedBy]

**Supports**

**Package:** Traceability  
isAbstract: No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that asserts that a service in some way contributes or assists in the execution of an OperationalActivity.
9.1.6 Domain MetaModel::Personnel

**Stakeholders:** Human resources, Solution Providers, PMs.

**Concerns:** human factors.

**Definition:** aims to clarify the role of Human Factors (HF) when creating architectures in order to facilitate both Human Factors Integration (HFI) and systems engineering (SE).

**Domain MetaModel::Personnel::Taxonomy**

**Organization**

- **Package:** Taxonomy

**isAbstract:** No

**Generalization:** OrganizationalResource

**Description**

A group of OrganizationalResources (Persons, Posts, Organizations and Responsibilities) associated for a particular purpose.
**OrganizationalResource**

**Package:** Taxonomy  
isAbstract: Yes  

**Generalization:** [PhysicalResource](#), [Stakeholder](#)  

**Description**  
An abstract type for Organization, Person, Post and Responsibility.

![OrganizationalResource Diagram](#)

**Figure 9:233 – OrganizationalResource**

**Person**

**Package:** Taxonomy  
isAbstract: No  

**Generalization:** [OrganizationalResource](#)  

**Description**  
A type of a human being used to define the characteristics that need to be described for ActualPersons (e.g., properties such as address, telephone number, nationality, etc).

![Person Diagram](#)

**Figure 9:234 – Person**

**Post**

**Package:** Taxonomy  
isAbstract: No  

**Generalization:** [OrganizationalResource](#)  

**Description**
A type of job title or position that a person can fill (e.g., Lawyer, Solution Architect, Machine Operator or Chief Executive Officer).

Figure 9:235 – Post

**Responsibility**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** OrganizationalResource  
**Description**  
The type of duty required of a Person or Organization.

Figure 9:236 – Responsibility

**Domain MetaModel::Personnel::Structure**

**PostRole**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** OrganizationalResource, ResourceRole  
**Description**  
A usage of a post in the context of another OrganizationalResource. Creates a whole-part relationship.
Figure 9.237 – PostRole

SubOrganization

**Package:** Structure

isAbstract: No

**Generalization:** OrganizationalResource, ResourceRole

**Description**

A type of a human being used to define the characteristics that need to be described for ActualPersons (e.g., properties such as address, telephone number, nationality, etc).

Figure 9.238 – SubOrganization

DomainMetaModel::Personnel::Connectivity

**Command**

**Package:** Connectivity

isAbstract: No

**Generalization:** ResourceExchange

**Description**

A type of ResourceExchange that asserts that one OrganizationalResource commands another.
Control

Package: Connectivity
isAbstract: No

Generalization: ResourceExchange

Description
A type of ResourceExchange that asserts that one PhysicalResource controls another PhysicalResource (i.e., the driver of a vehicle controlling the vehicle speed or direction).

Domain MetaModel::Personnel::Sequences

ResourceInteractionScenario

Package: Sequences
isAbstract: No

Generalization: InteractionScenario

Description
A specification of the interactions between ResourcePerformers in a ResourceArchitecture.
**Domain MetaModel::Personnel::Constraints**

### Competence

**Package:** Constraints

**isAbstract:** No

**Generalization:** PropertySet, SubjectOfForecast

**Description**
A specific set of abilities defined by knowledge, skills and aptitude.

### CompetenceForRole

**Package:** Constraints

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**
A tuple used to associate an organizational role with a specific set of required competencies.
**RequiresCompetence**

**Package:** Constraints  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that asserts that an ActualOrganizationalResource is required to have a specific set of Competencies.

**Domain MetaModel::Personnel::Roadmap**

**FillsPost**

**Package:** Roadmap  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that asserts that an ActualPerson fills an ActualPost.
Attributes

endDate : End time for all individual elements.
startDate : Start time for all individual elements.

**Domain MetaModel::Personnel::Traceability**

**CompetenceToConduct**

**Package:** Traceability

isAbstract: No

**Generalization:** MeasurableElement

**Description**

A tuple used to associate a Function with a specific set of Competencies needed to conduct the Function.

![Diagram of CompetenceToConduct](image)

*Figure 9:246 – CompetenceToConduct*

### 9.1.7 Domain MetaModel::Resources

**Domain MetaModel::Resources::Taxonomy**

**CapabilityConfiguration**

**Package:** Taxonomy

isAbstract: No

**Generalization:** ResourceArchitecture

**Description**

A composite structure representing the physical and human resources (and their interactions) in an enterprise, assembled to meet a capability.

![Diagram of CapabilityConfiguration](image)

*Figure 9:247 – CapabilityConfiguration*

**NaturalResource**

**Package:** Taxonomy

isAbstract: No

**Generalization:** PhysicalResource
Description
Type of physical resource that occurs in nature such as oil, water, gas or coal.

PhysicalResource

Package: Taxonomy
isAbstract: Yes
Generalization: ResourcePerformer
Description
An abstract type defining physical resources (i.e., OrganizationalResource, ResourceArtifact and NaturalResource).

Figure 9:249 – PhysicalResource

ResourceArchitecture

Package: Taxonomy
isAbstract: No
Generalization: ResourcePerformer, Architecture
Description
A type used to denote a model of the Architecture, described from the ResourcePerformer perspective.
ResourceArtifact

**Package:** Taxonomy

isAbstract: No

**Generalization:** PhysicalResource

**Description**
A type of man-made object that contains no human beings (i.e. satellite, radio, petrol, gasoline, etc.).

ResourcePerformer

**Package:** Taxonomy

isAbstract: Yes

**Generalization:** ResourceArtifact, CapabilityConfiguration, ResourceExchangeItem, SubjectOfResourceConstraint, OperationalExchangeItem, SubjectOfForecast, CapableElement, Desirer, VersionedElement, ResourceAsset, ServiceExchangeItem, StrategicExchangeItem

**Description**
An abstract grouping of elements that can perform Functions.
Attributes
isStandardConfiguration : Boolean[] Indicates if the ResourcePerformer is StandardConfiguration, default=false.

ResourceService

Package: Taxonomy
isAbstract: No
Generalization: ResourcePerformer
Description
A services that a ResourcePerformer provides to support higher level Services or OperationalActivities. Employee provisioning, backup and recovery, storage, self-service help desk are examples of ResourceServices.

Figure 9:253 – ResourceService
Software

Package: Taxonomy
isAbstract: No
Generalization: ResourceArtifact
Description
A sub-type of ResourceArtifact that specifies an executable computer program.

Figure 9:254 – Software

System

Package: Taxonomy
isAbstract: No
Generalization: ResourceArchitecture
Description
An integrated set of elements, subsystems, or assemblies that accomplish a defined objective. These elements include products (hardware, software, firmware), processes, people, information, techniques, facilities, services, and other support elements (INCOSE SE Handbook V4, 2015).

Figure 9:255 – System

Domain MetaModel::Resources::Structure

ResourceMethod

Package: Structure
isAbstract: No
Generalization: ProcessOperation
Description
A behavioral feature of a ResourcePerformer whose behavior is specified in a Function.
**ResourceParameter**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** [ProcessParameter](#)  
**Description**  
A type that represents inputs and outputs of a Function. It is typed by a ResourceInteractionItem.

**ResourcePort**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** [ProtocolImplementation](#), [MeasurableElement](#)  
**Description**  
An interaction point for a ResourcePerformer through which it can interact with the outside environment, and which is defined by a ResourceInterface.
Figure 9: ResourcePort

ResourceRole

**Package:** Structure  
isAbstract: No  
**Generalization:** SubjectOfResourceConstraint, LocationHolder, AssetRole, InteractionRole  
Description  
Figure 9:259 – ResourceRole

Domain MetaModel::Resources::Connectivity

ResourceConnector

**Package:** Connectivity

isAbstract: No

**Generalization:** ProtocolImplementation, AssetRole

Description

A channel for exchange between two ResourceRoles.
**ResourceExchange**

**Package:** Connectivity  
**isAbstract:** No  
**Generalization:** Exchange  
**Description**  
Asserts that a flow can exist between ResourcePerformers (i.e., flows of data, people, material, or energy).

Figure 9:260 – ResourceConnector

**ResourceExchange**

**Package:** Connectivity  
**isAbstract:** No  
**Generalization:** Exchange  
**Description**  
Asserts that a flow can exist between ResourcePerformers (i.e., flows of data, people, material, or energy).

Figure 9:261 – ResourceExchange

**ResourceExchangeItem**

**Package:** Connectivity  
**isAbstract:** Yes  
**Generalization:** Resource, SubjectOfSecurityConstraint, ExchangeItem
Description
An abstract type grouping elements that defines the types of elements that can be exchanged between ResourcePerformers and conveyed by a ResourceExchange.

Figure 9:262 – ResourceExchangeItem

ResourceInterface

Package: Connectivity
isAbstract: No
Generalization: PropertySet
Description
A declaration that specifies a contract between the ResourcePerformers it is related to and any other ResourcePerformers it can interact with. It is also intended to be an implementation of a specification of an Interface in the Business and/or Service layer.
Figure 9:263 – ResourceInterface

**ResourceServiceInterface**

**Package**: Structure  
**isAbstract**: No  
**Generalization**: ResourceInterface  
**Description**  
A contract that defines the ResourceMethods and ResourceSignal receptions that the ResourceServices realize.

Figure 9:264 – ResourceServiceInterface

**ResourceSignal**

**Package**: Connectivity  
**isAbstract**: No  
**Generalization**: ResourceExchangeItem  
**Description**  
A property of an element representing something in the physical world, expressed in amounts of a unit of measure.
Domain MetaModel::Resources::Processes

Function

Package: Processes
isAbstract: No
Generalization: SubjectOfResourceConstraint, Process
Description
An Activity which is specified in the context to the ResourcePerformer (human or machine) that IsCapableToPerform it.

FunctionAction

Package: Processes
isAbstract: No
Generalization: ProcessUsage
Description
A call of a Function indicating that the Function is performed by a ResourceRole in a specific context.
**FunctionAction**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** ProcessEdge  

**Description**  
A tuple that shows the flow of Resources (objects/data) between FunctionActions.

---

**FunctionEdge**

**Domain MetaModel::Resources::States**

**ResourceStateDescription**

**Package:** States  
**isAbstract:** No  
**Generalization:** MeasurableElement, StateDescription  

**Description**  
A state machine describing the behavior of a ResourcePerformer, depicting how the ResourcePerformer responds to various events and the actions.
**Domain MetaModel::Resources::Sequences**

**ResourceMessage**

**Package:** Sequences  
**isAbstract:** No  
**Generalization:** InteractionMessage

Description

Message for use in a Resource Event-Trace which carries any of the subtypes of ResourceExchange.

---

**Domain MetaModel::Resources::Information**

**ResourceInformation**

**Package:** Information  
**isAbstract:** No  
**Generalization:** SubjectOfResourceConstraint, ResourceAsset, ResourceExchangeItem
Description
A formalized representation of information that is managed by or exchanged between systems.

**Figure 9:271 – ResourceInformation**

**Domain MetaModel::Resources::Constraints**

**ResourceConstraint**

**Package**: Constraints
isAbstract: No

**Generalization**: Rule

**Description**
A rule governing the structural or functional aspects of an implementation.

**Figure 9:272 – ResourceConstraint**

**SubjectOfResourceConstraint**

**Package**: Constraints
isAbstract: Yes

**Generalization**: UAFElement

**Description**
An abstract type grouping elements that can be the subject of a ResourceConstraint.
Domain MetaModel::Resources::Roadmap

Forecast

Package: Roadmap
isAbstract: No
Generalization: MeasurableElement
Description
A tuple that specifies a transition from one Resource Performer, Standard, Competence to another future one. It is related to an ActualStrategicPhase to give it a temporal context.

SubjectOfForecast

Package: Roadmap
isAbstract: Yes
Generalization: UAFEleme
Description
An abstract type grouping elements that can be the subject of a Forecast.
Figure 9:275 – SubjectOfForecast

Technology

**Package:** Roadmap  
**isAbstract:** No  
**Generalization:** ResourceArtifact  
**Description**  
A sub type of ResourceArtifact that indicates a technology domain, i.e., nuclear, mechanical, electronic, mobile telephony etc.

Figure 9:276 - Technology

VersionedElement

**Package:** Roadmap  
**isAbstract:** Yes  
**Generalization:** UAFEElement  
**Description**  
An abstract type grouping ResourcePerformer and Service that allows VersionOfConfiguration to be related to ActualProjectMilestones.
### VersionOfConfiguration

**Package:** Roadmap  
**isAbstract:** No  
**Generalization:** MeasurableElement  

**Description**  
A property of a WholeLifeConfiguration, used in version control of a VersionedElement. It asserts that a VersionedElement is a version of a WholeLifeConfiguration.

### VersionSuccession

**Package:** Roadmap  
**isAbstract:** No  
**Generalization:** MeasurableElement  

**Description**  
A tuple between two VersionOfConfigurations that denotes that one VersionOfConfiguration follows from another.
WholeLifeConfiguration

**Package:** Roadmap

**isAbstract:** No

**Generalization:** PropertySet

**Description**
A set of VersionedElements, e.g., Services for a service provider or ResourcePerformers deployed for implementation.

Domain MetaModel::Resources::Traceability

**ProtocolImplementation**

**Package:** Traceability

**isAbstract:** Yes

**Generalization:** UAFEElement

**Description**
An abstract type grouping architectural elements that can implement Protocols.
9.1.8 Domain MetaModel::Security


Concerns: addresses the security constraints and information assurance attributes that exist on exchanges between resources and Operational Performers.

Definition: illustrates the security assets, security constraints, security controls, families, and measures required to address specific security concerns.

Domain MetaModel::Security::Motivation

EnhancedSecurityControl

Package: Motivation

isAbstract: No

Generalization: SecurityControl

Description

Statement of security capability to: (i) build in additional but related, functionality to a basic control; and/or (ii) increase the strength of a basic control.

Enhances

Package: Motivation

isAbstract: No

Generalization: MeasurableElement

Description

A tuple relating the EnhancedSecurityControl to a SecurityControl.
Figure 9:283 – Enhances

**Protects**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that asserts that a SecurityControl is required to protect an Asset.

Figure 9:284 – Protects

**ProtectsInContext**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** MeasurableElement  
**Description**  
A tuple that relates a SecurityControlAction to a OperationalRole, or a ResourceRole. It indicates that SecurityControl is required to protect an Asset in a specific context or configuration.
SecurityControl

**Package:** Motivation

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**

The management, operational, and technical control (i.e., safeguard or countermeasure) prescribed for an information system to protect the confidentiality, integrity, and availability of the system and its information [NIST SP 800-53].

**Figure 9:286 – SecurityControl**

---

Figure 9:285 – ProtectsInContext

**Description**

The management, operational, and technical control (i.e., safeguard or countermeasure) prescribed for an information system to protect the confidentiality, integrity, and availability of the system and its information [NIST SP 800-53].

**Figure 9:285 – ProtectsInContext**
**SecurityControlFamily**

**Package:** Motivation  
**isAbstract:** No  
**Generalization:** SecurityControl  
**Description**  
An element that organizes security controls into a family. Each Security Control Family contains security controls related to the general security topic of the family.

![SecurityControlFamily Diagram](image)

**Figure 9:287 – SecurityControlFamily**

**Domain MetaModel::Security::Taxonomy**

**Asset**

**Package:** Taxonomy  
**isAbstract:** Yes  
**Generalization:** SubjectOfForecast, ConceptItem, LocationHolder, PropertySet, SubjectOfSecurityConstraint, AffectableElement  
**Description**  
An abstract element that indicates the types of elements that can be affected by Risk. Asset as applied to Security views is an abstract element that indicates the types of elements that can be considered as a subject for security analysis.

![Asset Diagram](image)

**Figure 9:288 – Asset**
**OperationalAsset**

**Package:** Taxonomy  
isAbstract: Yes  
**Generalization:** Asset  
**Description**  
An abstract element used to group the elements of OperationalAgent and OperationalInformation allowing them to own OperationalInformationRoles.

![OperationalAsset Diagram](image)

**Figure 9:289 – OperationalAsset**

**OperationalMitigation**

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** OperationalArchitecture  
**Description**  
A set of OperationalPerformers intended to address against specific operational risks.

![OperationalMitigation Diagram](image)

**Figure 9:290 – OperationalMitigation**

**ResourceAsset**

**Package:** Taxonomy  
isAbstract: Yes  
**Generalization:** Asset  
**Description**  
An abstract element used to group the elements of ResourcePerformer and ResourceInformation allowing them to own ResourceInformationRoles
**ResourceMitigation**

Package: Taxonomy  
isAbstract: No  
Generalization: ResourceArchitecture  
Description  
A set of ResourcePerformers intended to address against specific risks.

**SecurityEnclave**

Package: Taxonomy  
isAbstract: No  
Generalization: ResourceArchitecture  
Description  
Collection of information systems connected by one or more internal networks under the control of a single authority and security policy. The systems may be structured by physical proximity or by function, independent of location.
**Domain MetaModel::Security::Structure**

**AssetRole**

**Package:** Structure  
**isAbstract:** Yes  
**Generalization:** BPMN2Metamodel::ResourceRole, SubjectOfSecurityConstraint, MeasurableElement

**Description**
An abstract element that indicates the types of elements that can be affected by Risk in the particular context. AssetRole as applied to Security views, is an abstract element that indicates the type of elements that can be considered as a subject for security analysis in the particular context.

![AssetRole Diagram](image)

**Figure 9:294 – AssetRole**

**OperationalInformationRole**

**Package:** Structure  
**isAbstract:** No  
**Generalization:** AssetRole

**Description**
A usage of OperationalInformation that exists in the context of an OperationalAsset. It also allows the representation of the whole-part aggregation of OperationalInformation.

![OperationalInformationRole Diagram](image)

**Figure 9:295 – OperationalInformationRole**
**ResourceInformationRole**

**Package:** Information  
**isAbstract:** No  
**Generalization:** AssetRole  
**Description**  
A usage of ResourceInformation that exists in the context of a ResourceAsset. It also allows the representation of the whole-part aggregation of ResourceInformation elements.

![ResourceInformationRole diagram](image)

**Domain MetaModel::Security::Processes**

**SecurityProcess**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** OperationalActivity, Function, SubjectOfSecurityConstraint  
**Description**  
The security-related procedure that satisfies the security control requirement.

![SecurityProcess diagram](image)

**SecurityProcessAction**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** OperationalActivityAction, FunctionAction  
**Description**  
Domain MetaModel::Security::Constraints

Caveat

Package: Constraints
isAbstract: No
Generalization: SecurityConstraint
Description
A statement that details alternate conditions under which the rule is not valid.

SecurityAvailability

Package: Constraints
isAbstract: No
Generalization: SecurityMeasurement
Description
Details the potential impact on organization or individuals if the information is not available to those who need to access it.

Figure 9:298 – SecurityProcessAction

Figure 9:299 – Caveat

Figure 9:300 – SecurityAvailability
SecurityCategory

Package: Constraints  
isAbstract: No  
Generalization: MeasurementSet  
Description
The security categories that have been determined for each type of information processed, stored, or transmitted by those information systems. The generalized format for expressing the security category (SC) of an information system is: SC information system = {(confidentiality, impact), (integrity, impact), (availability, impact)}.

SecurityClassification

Package: Constraints  
isAbstract: No  
Generalization: SecurityMeasurement  
Description
Details a classification for the exchange.

SecurityClassificationKind

Package: Constraints  
isAbstract: No  
Generalization: MeasurableElement  
Description
A type that defines acceptable values for the security category (SC) of an information system, where the acceptable values for potential impact are low, moderate, or high.
SecurityConstraint

**Package:** Constraints  
**isAbstract:** No  
**Generalization:** Rule  
**Description**  
A type of rule that captures a formal statement to define access control policy language.

SecurityIntegrity

**Package:** Constraints  
**isAbstract:** No  
**Generalization:** SecurityMeasurement  
**Description**  
Details the potential impact on organization or individuals due to modification or destruction of information, and includes ensuring information non-repudiation and authenticity.
SecurityMeasurement

**Package:** Constraints
isAbstract: Yes
**Generalization:** Measurement

Description
An abstract type grouping all types of security measurements (e.g. SecurityIntegrity, SecurityAvailability).

![SecurityMeasurement Diagram](image)

**Figure 9:306 – SecurityMeasurement**

SecurityRisk

**Package:** Constraints
isAbstract: No
**Generalization:** Risk

Description
The level of impact on enterprise operations, assets, or individuals resulting from the operation of an information system given the potential impact of a threat and the likelihood of that threat occurring [NIST SP 800-65].

![SecurityRisk Diagram](image)

**Figure 9:307 – SecurityRisk**

SubjectOfSecurityConstraint

**Package:** Constraints
isAbstract: Yes
**Generalization:** UAFElement

Description
An abstract type grouping elements that can be the subject of a SecurityConstraint.
9.1.9 Domain MetaModel::Projects

Domain MetaModel::Projects::Taxonomy

Project

Package: Taxonomy
isAbstract: No
Generalization: OrganizationalResource
Description
A type that represents a planned endeavor executed by an ActualOrganization responsible for developing, deploying or decommissioning ResourcePerformers in accordance with ActualProjectMilestones.

ProjectMilestone

Package: Taxonomy
isAbstract: No
Generalization: PropertySet
Description
A type of event in a Project by which progress is measured.
Figure 9:310 – ProjectMilestone

Domain MetaModel::Projects::Structure

ActualProjectMilestoneRole

Package: Structure
isAbstract: No
Generalization: ActualState
Description
An ActualProjectMilestone that is applied to a ProjectMilestoneRole.

Figure 9:311 – ActualProjectMilestoneRole

ProjectMilestoneRole

Package: Structure
isAbstract: No
Generalization: MeasurableElement
Description
The role played by a ProjectMilestone in the context of a Project.
ProjectStatus

Package: Structure
isAbstract: No
Generalization: ActualState
Description
The status (i.e., level of progress) of a ProjectTheme for an ActualProject at the time of the ActualProjectMilestone.

ProjectTheme

Package: Structure
isAbstract: No
Generalization: MeasurableElement
Description
A property of a ProjectMilestone that captures an aspect by which the progress of ActualProjects may be measured.
Figure 9:314 – ProjectTheme

**StatusIndicators**

**Package:** Structure  
isAbstract: No  
**Generalization:** MeasurableElement  
**Description**  
An enumerated type that specifies a status for a ProjectTheme.

**Domain MetaModel::Projects::Connectivity**

**MilestoneDependency**

**Package:** Connectivity  
isAbstract: No  
**Generalization:** Sequence  
**Description**  
A tuple between two ActualProjectMilestones that denotes one ActualProjectMilestone follows from another.
**ProjectSequence**

**Package:** Connectivity  
**isAbstract:** No  
**Generalization:** Sequence  
**Description**  
A tuple between two ActualProjects that denotes one ActualProject cannot start before the previous ActualProject is finished.

**Domain MetaModel::Projects::Processes**

**ProjectActivity**

**Package:** Processes  
**isAbstract:** No  
**Generalization:** Function, Process  
**Description**  
An activity carried out during a project.
ProjectActivityAction

**Package:** Processes
isAbstract: No
Generalization: FunctionAction
Description
The ProjectActivityAction is defined as a call behavior action that invokes the activity that needs to be performed.

![Diagram of ProjectActivityAction](image)

**Figure 9:319 – ProjectActivityAction**

Domain MetaModel::Projects::Roadmap

ActualProject

**Package:** Roadmap
isAbstract: No
Generalization: ActualOrganizationalResource, Achiever
Description
A time-limited planned endeavor executed by an ActualOrganization responsible for developing, deploying or decommissioning ResourcePerformers in accordance with ActualProjectMilestones.

![Diagram of ActualProject](image)

**Figure 9:320 – ActualProject**

ActualProjectMilestone

**Package:** Roadmap
isAbstract: No
Generalization: ActualPropertySet
Description
An event with a start date in a ActualProject from which progress is measured.
Figure 9:321 – ActualProjectMilestone
Constraints
[1] unnamed1 startTime=endTime

Domain MetaModel::Projects::Traceability

ResponsibleFor

Package: Traceability
isAbstract: No
Generalization: MeasurableElement
Description
A tuple between an ActualResponsibleResource and an ActualResponsibility or ActualProject. It defines the duties that the ActualResponsibleResource is ResponsibleFor.

Figure 9:322 – ResponsibleFor

9.1.10 Domain MetaModel::Standards

Concerns: technical and non-technical Standards applicable to the architecture.
Definition: shows the technical, operational, and business Standards applicable to the architecture. Defines the underlying current and expected Standards.
Domain MetaModel::Standards::Taxonomy

Protocol

Package: Taxonomy
isAbstract: No
Generalization: Standard
Description
A Standard for communication over a network. Protocols may be composite, represented as a ProtocolStack made up of ProtocolLayers.

ProtocolStack

Package: Taxonomy
isAbstract: No
Generalization: Protocol
Description
A sub type of Protocol that contains the ProtocolLayers, defining a complete stack.

Standard

Package: Taxonomy
isAbstract: No
Generalization: SubjectOfForecast, PropertySet
Description
A ratified and peer-reviewed specification that is used to guide or constrain the architecture. A Standard may be applied to any element in the architecture.

Figure 9:325 – Standard
Attributes
mandatedDate: The date when this version of the Standard was published.
retiredDate: The date when this version of the Standard was retired.

Domain MetaModel:: Standards:: Structure

ProtocolLayer

Package: Structure
isAbstract: No
Generalization: MeasurableElement

Description

Figure 9:326 – ProtocolLayer

9.1.11 Domain MetaModel:: Actual Resources

Stakeholders: Solution Providers, Systems Engineers, Business Architects, Human Resources.
Concerns: the analysis, e.g., evaluation of different alternatives, what-if, trade-offs, V&V on the actual resource configurations.
Definition: illustrates the expected or achieved actual resource configurations and actual relationships between them.
Domain MetaModel::Actual Resources::Taxonomy

ActualOrganization

**Package:** Taxonomy  
isAbstract: No  
**Generalization:** [ActualResponsibleResource]

Description  
An actual formal or informal organizational unit, e.g., "Driving and Vehicle Licensing Agency", "UAF team Alpha".

![ActualOrganization Diagram](image)

Figure 9:327 – ActualOrganization

Attributes  
- serviceType: Service office code or symbol  
- shortName: String providing a simplified means of identifying an ActualOrganization, i.e. SoftWareGroup could use SWG as the shortName.

ActualOrganizationalResource

**Package:** Taxonomy  
isAbstract: Yes  
**Generalization:** [ActualResource, Stakeholder]

Description  
Abstract element for an ActualOrganization, ActualPerson or ActualPost.
Figure 9:328 – ActualOrganizationalResource

**ActualPerson**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** ActualResponsiveResource  
**Description**  
An individual human being.

Figure 9:329 – ActualPerson

**ActualPost**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** ActualResponsiveResource  
**Description**  
An actual, specific post, an instance of a Post "type" - e.g., "President of the United States of America." where the Post would be president.
**Figure 9:330 – ActualPost**

**ActualResource**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** ActualPropertySet, SubjectOfResourceConstraint, Achiever, CapableElement  
**Description**  
An instance of a ResourcePerformer in the real world.

**Figure 9:331 – ActualResource**

**ActualResourceRelationship**

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** UAFEElement  
**Description**  
An abstract element that details the ActualOrganizationalResources that are able to carry out an ActualResponsibility.
### ActualResourceRelationship

**Package:** Taxonomy  
**isAbstract:** No  
**Generalization:** ActualOrganizationalResource  
**Description**  
An actual duty required of a Person or Organization.

### ActualResponsibleResource

**Package:** Taxonomy  
**isAbstract:** Yes  
**Generalization:** ActualOrganizationalResource  
**Description**  
An abstract type grouping responsible OrganizationalResources.
FieldedCapability

**Package:** Taxonomy

**isAbstract:** No

**Generalization:** ActualResource

**Description**

An individual, fully-realized capability.

---

Domain MetaModel::Actual Resources::Constraints

ActualService

**Package:** Constraints

**isAbstract:** Yes

**Generalization:** ActualMeasurementSet, CapableElement

**Description**

An individual Service.
ProvidedServiceLevel

**Package:** Constraints
isAbstract: No

**Generalization:** ActualService

**Description**
A sub type of ActualService that details a specific service level delivered by the provider.

ProvidesCompetence

**Package:** Constraints
isAbstract: No

**Generalization:** MeasurableElement

**Description**
A tuple that asserts that an ActualOrganizationalResource provides a specific set of Competencies.
RequiredServiceLevel

**Package:** Constraints
isAbstract: No
**Generalization:** ActualService
**Description**
A sub type of ActualService that details a specific service level required of the provider.

![Diagram of RequiredServiceLevel](image)

Figure 9:339 – RequiredServiceLevel

Domain MetaModel::Actual Resources::Traceability

**OwnsProcess**

**Package:** Traceability
isAbstract: No
**Generalization:** MeasurableElement
**Description**
A tuple denoting that an ActualOrganizationResource owns an OperationalActivity.

![Diagram of OwnsProcess](image)

Figure 9:340 – OwnsProcess

9.1.12 Domain MetaModel::Parameters

**ActualCondition**

**Package:** Parameters
isAbstract: No
**Generalization:** ActualPropertySet
**Description**
An individual describing an actual situation with respect to circumstances under which an OperationalActivity, Function or ServiceFunction can be performed.
Figure 9:341 – ActualCondition

**ActualEnvironment**

**Package:** Parameters  
isAbstract: No  
**Generalization:** ActualCondition  
**Description**  
An individual that describes the circumstances of an Environment.

Figure 9:342 – ActualEnvironment

**ActualLocation**

**Package:** Parameters  
isAbstract: No  
**Generalization:** ActualCondition  
**Description**  
An individual that describes a physical location, for example using text to provide an address, Geo-coordinates, etc.
**ActualLocation**

**Attributes**
- `address`: String describing the address of the ActualLocation, i.e. "1600 Pennsylvania avenue", "The White House"
- `customKind`: String describing a location kind that is not in the LocationKind enumerated list
- `locationNamedByAddress`: Boolean that indicates if the ActualLocation address is embedded in the ActualLocation name. By default = false.

---

**ActualMeasurement**

**Package**: Parameters

**isAbstract**: No

**Generalization**: [ActualState](#)

**Description**

An actual value that is applied to a Measurement.

---

**Figure 9:343 – ActualLocation**

**Figure 9:344 – ActualMeasurement**
**ActualMeasurementSet**

**Package:** Parameters  
**isAbstract:** No  
**Generalization:** [ActualPropertySet](#)  
**Description**  
A set of ActualMeasurements.

**Figure 9:345 – ActualMeasurementSet**

**ActualPropertySet**

**Package:** Parameters  
**isAbstract:** No  
**Generalization:** [ActualState](#)  
**Description**  
A set or collection of Actual properties.

**Figure 9:346 – ActualPropertySet**

---

236 Unified Architecture Framework (UAF) Domain Metamodel, v1.2
ActualRisk

**Package:** Parameters
isAbstract: No
**Generalization:** ActualPropertySet
Description

Figure 9:347 – ActualRisk

AffectableElement

**Package:** Parameters
isAbstract: Yes
**Generalization:** UAFElement
Description
An abstract grouping of elements that can be affected by Risk.

Figure 9:348 – AffectableElement

Affects

**Package:** Parameters
isAbstract: No
**Generalization:** MeasurableElement
Description
A tuple that asserts that a Risk is applicable to an Asset.
Figure 9:349 – Affects

### AffectsInContext

**Package:** Parameters

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**

A tuple that asserts that a Risk is applicable to an AssetRole in the specific context or configuration.

Figure 9:350 – AffectsInContext

### Condition

**Package:** Parameters

**isAbstract:** No

**Generalization:** PropertySet

**Description**

A type that defines the Location, Environment and/or GeoPoliticalExtent.

Figure 9:351 – Condition
**Environment**

**Package:** Parameters  
isAbstract: No  
**Generalization:** Condition  
Description  
A definition of the environmental factors in which something exists or functions. The definition of an Environment element can be further defined using EnvironmentKind.

**EnvironmentProperty**

**Package:** Structure  
isAbstract: No  
**Generalization:** MeasurableElement  
Description  
A property of an Environment that is typed by a Condition. The kinds of Condition that can be represented are Location, GeoPoliticalExtentType and Environment.

**GeoPoliticalExtentType**

**Package:** Parameters  
isAbstract: No  
**Generalization:** Condition, OperationalExchangeItem, ResourceExchangeItem, StrategicExchangeItem  
Description  
A type of geospatial extent whose boundaries are defined by declaration or agreement by political parties.
Figure 9:354 – GeoPoliticalExtentType
Attributes
  customKind: Captures the kind of GeoPoliticalExtentType.

Location

Package: Parameters
isAbstract: No
Generalization: ConceptItem, Condition
Description
A specification of the generic area in which a LocationHolder is required to be located.

Figure 9:355 – Location
Attributes
  customKind: Captures the kind of Location if the LocationTypeKind has been set to "OtherType".

**LocationHolder**

**Package**: Parameters
**isAbstract**: Yes
**Generalization**: UAFElement

**Description**
Abstract type, used to group elements that are allowed to be associated with a Location.

![Figure 9:356 – LocationHolder](image)

**MeasurableElement**

**Package**: Parameters
**isAbstract**: Yes
**Generalization**: UAFElement

**Description**
Abstract type, grouping elements that can be measured by applying MeasurementSets to them.
Figure 9.357 – MeasurableElement

Measurement

**Package:** Parameters

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**

A property of an element representing something in the physical world, expressed in amounts of a unit of measure.
MeasurementSet

**Package:** Parameters
**isAbstract:** No
**Generalization:** PropertySet

Description
A collection of Measurements.

Mitigates

**Package:** Parameters
**isAbstract:** No
**Generalization:** MeasurableElement

Description
A tuple relating a Security Control to a Risk. Mitigation is established to manage risk and could be represented as an overall strategy or through techniques (mitigation configurations) and procedures (SecurityProcesses).
OwnsRisk

**Package:** Parameters

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**
A tuple relating a Risk to an organizational resource that is responsible for executing the risk mitigation.

OwnsRiskInContext

**Package:** Parameters

**isAbstract:** No

**Generalization:** MeasurableElement

**Description**
A tuple relating a Risk to an organizational role that is responsible for executing the risk mitigation in the specific context or configuration.
**PropertySet**

**Package:** Parameters  
isAbstract: Yes  
**Generalization:** UAFElement  
**Description**  
An abstract type grouping architectural elements that can own Measurements.

**Risk**

**Package:** Parameters  
isAbstract: No  
**Generalization:** PropertySet  
**Description**  
A type that represents a situation involving exposure to danger of AffectableElements (e.g., Assets, Processes, Capabilities, Opportunities, or Enterprise Goals) where the effects of such exposure can be characterized in terms of the likelihood of occurrence of a given threat and the potential adverse consequences of that threat's occurrence.
Figure 9:364 – Risk