



An OMG® Systems Modeling Publication



# OMG Systems Modeling Language™ (SysML®)

Version 2.0 Beta 1

## Part 2: SysML v1 to SysML v2 Transformation

---

**OMG Document Number:** ptc/2023-06-03

**Date:** June 2023

**Standard document URL:** <https://www.omg.org/spec/SysML/2.0/Transformation/>

**Machine Readable File(s):** <https://www.omg.org/spec/SysML/20230201/>

**Normative:**

<https://www.omg.org/spec/SysML/20230201/SysMLv1Tov2.xmi>

---

Copyright © 2019-2023, 88solutions Corporation  
Copyright © 2019-2023, Airbus  
Copyright © 2019-2023, Aras Corporation  
Copyright © 2019-2023, Association of Universities for Research in Astronomy (AURA)  
Copyright © 2019-2023, BigLever Software  
Copyright © 2019-2023, Boeing  
Copyright © 2022-2023, Budapest University of Technology and Economics  
Copyright © 2021-2023, Commissariat à l'énergie atomique et aux énergies alternatives (CEA)  
Copyright © 2019-2023, Contact Software GmbH  
Copyright © 2019-2023, Dassault Systèmes (No Magic)  
Copyright © 2019-2023, DSC Corporation  
Copyright © 2020-2023, DEKonsult  
Copyright © 2020-2023, Delligatti Associates LLC  
Copyright © 2019-2023, The Charles Stark Draper Laboratory, Inc.  
Copyright © 2020-2023, ESTACA  
Copyright © 2022-2023, Galois, Inc.  
Copyright © 2019-2023, GfSE e.V.  
Copyright © 2019-2023, George Mason University  
Copyright © 2019-2023, IBM  
Copyright © 2019-2023, Idaho National Laboratory  
Copyright © 2019-2023, INCOSE  
Copyright © 2019-2023, Intercax LLC  
Copyright © 2019-2023, Jet Propulsion Laboratory (California Institute of Technology)  
Copyright © 2019-2023, Kenntnis LLC  
Copyright © 2020-2023, Kungliga Tekniska högskolan (KTH)  
Copyright © 2019-2023, LightStreet Consulting LLC  
Copyright © 2019-2023, Lockheed Martin Corporation  
Copyright © 2019-2023, Maplesoft  
Copyright © 2021-2023, MID GmbH  
Copyright © 2020-2023, MITRE  
Copyright © 2019-2023, Model Alchemy Consulting  
Copyright © 2019-2023, Model Driven Solutions, Inc.  
Copyright © 2019-2023, Model Foundry Pty. Ltd.  
Copyright © 2023, Object Management Group, Inc.  
Copyright © 2019-2023, On-Line Application Research Corporation (OAC)  
Copyright © 2019-2023, oose Innovative Informatik eG  
Copyright © 2019-2023, Østfold University College  
Copyright © 2019-2023, PTC  
Copyright © 2020-2023, Qualtech Systems, Inc.  
Copyright © 2019-2023, SAF Consulting  
Copyright © 2019-2023, Simula Research Laboratory AS  
Copyright © 2019-2023, System Strategy, Inc.  
Copyright © 2019-2023, Thematrix Partners, LLC  
Copyright © 2019-2023, Tom Sawyer  
Copyright © 2022-2023, Tucson Embedded Systems, Inc.  
Copyright © 2019-2023, Universidad de Cantabria  
Copyright © 2019-2023, University of Alabama in Huntsville  
Copyright © 2019-2023, University of Detroit Mercy  
Copyright © 2019-2023, University of Kaiserslauten  
Copyright © 2020-2023, Willert Software Tools GmbH (SodiusWillert)

## 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, 109 Highland Avenue, Needham, MA 02494, U.S.A.

## TRADEMARKS

CORBA<sup>®</sup>, CORBA logos<sup>®</sup>, FIBO<sup>®</sup>, Financial Industry Business Ontology<sup>®</sup>, Financial Instrument Global Identifier<sup>®</sup>, IIOP<sup>®</sup>, IMM<sup>®</sup>, Model Driven Architecture<sup>®</sup>, MDA<sup>®</sup>, Object Management Group<sup>®</sup>, OMG<sup>®</sup>, OMG Logo<sup>®</sup>, SoaML<sup>®</sup>, SOAML<sup>®</sup>, SysML<sup>®</sup>, UAF<sup>®</sup>, Unified Modeling Language<sup>™</sup>, UML<sup>®</sup>, UML Cube Logo<sup>®</sup>, VSIPL<sup>®</sup>, and XMI<sup>®</sup> are registered trademarks of the Object Management Group, Inc.

For a complete list of trademarks, see: [https://www.omg.org/legal/tm\\_list.htm](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.

## OMG'S ISSUE REPORTING PROCEDURE

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 Documents, Report a Bug/Issue.



# Table of Contents

0 Preface.....	23
1 Scope.....	1
2 Conformance.....	3
3 Normative References.....	5
4 Terms and Definitions.....	7
5 Symbols.....	9
6 Introduction.....	11
6.1 Mapping Approach.....	11
6.2 Acknowledgements.....	11
7 Mappings.....	13
7.1 Overview.....	13
7.2 Foundations.....	13
7.2.1 Overview.....	13
7.2.2 Foundational class specifications.....	14
7.2.2.1 Factory.....	14
7.2.2.2 Initializer.....	14
7.2.2.3 MainMapping.....	14
7.2.2.4 Mapping.....	14
7.2.2.5 UniqueMapping.....	16
7.3 Mapping Helper and Library.....	16
7.3.1 Helper.....	16
7.3.2 SysML v1 Library.....	22
7.4 Initializers.....	25
7.4.1 Overview.....	25
7.4.2 Mapping Specifications.....	25
7.4.2.1 KerML Initializers.....	25
7.4.2.1.1 AnnotatingElement_Init.....	25
7.4.2.1.2 Annotation_Init.....	25
7.4.2.1.3 Association_Init.....	26
7.4.2.1.4 Behavior_Init.....	26
7.4.2.1.5 Classifier_Init.....	26
7.4.2.1.6 Comment_Init.....	26
7.4.2.1.7 Conjugation_Init.....	27
7.4.2.1.8 Connector_Init.....	27
7.4.2.1.9 Documentation_Init.....	28
7.4.2.1.10 Element_Init.....	28
7.4.2.1.11 EndFeatureMembership_Init.....	29
7.4.2.1.12 Expression_Init.....	29
7.4.2.1.13 Feature_Init.....	29
7.4.2.1.14 FeatureChainExpression_Init.....	30
7.4.2.1.15 FeatureChaining_Init.....	30
7.4.2.1.16 FeatureMembership_Init.....	31
7.4.2.1.17 FeatureReferenceExpression_Init.....	31
7.4.2.1.18 FeatureTyping_Init.....	31
7.4.2.1.19 FeatureValue_Init.....	32
7.4.2.1.20 Function_Init.....	32
7.4.2.1.21 Import_Init.....	33
7.4.2.1.22 Interaction_Init.....	33
7.4.2.1.23 InvocationExpression_Init.....	34
7.4.2.1.24 ItemFlow_Init.....	34
7.4.2.1.25 Membership_Init.....	34

7.4.2.1.26	MembershipImport_Init	35
7.4.2.1.27	Namespace_Init	35
7.4.2.1.28	NamespaceImport_Init	35
7.4.2.1.29	OperatorExpression_Init	36
7.4.2.1.30	OwningMembership_Init	36
7.4.2.1.31	Package_Init	36
7.4.2.1.32	ParameterMembership_Init	37
7.4.2.1.33	Predicate_Init	37
7.4.2.1.34	Redefinition_Init	37
7.4.2.1.35	ReferenceSubsetting_Init	38
7.4.2.1.36	Relationship_Init	38
7.4.2.1.37	ReturnParameterMembership_Init	38
7.4.2.1.38	Specialization_Init	39
7.4.2.1.39	Step_Init	39
7.4.2.1.40	Subclassification_Init	39
7.4.2.1.41	Subsetting_Init	40
7.4.2.1.42	Succession_Init	40
7.4.2.1.43	SuccessionItemFlow_Init	40
7.4.2.1.44	TextualRepresentation_Init	41
7.4.2.1.45	Type_Init	41
7.4.2.1.46	TypeFeaturing_Init	41
7.4.2.2	System Initializers	42
7.4.2.2.1	ActionUsage_Init	42
7.4.2.2.2	ActorMembership_Init	42
7.4.2.2.3	AssignmentActionUsage_Init	42
7.4.2.2.4	ConjugatedPortDefinition_Init	43
7.4.2.2.5	ConjugatedPortTyping_Init	43
7.4.2.2.6	ConnectionUsage_Init	43
7.4.2.2.7	ConstraintDefinition_Init	44
7.4.2.2.8	ConstraintUsage_Init	44
7.4.2.2.9	Definition_Init	44
7.4.2.2.10	EventOccurrenceUsage_Init	44
7.4.2.2.11	ItemDefinition_Init	45
7.4.2.2.12	MetadataUsage_Init	45
7.4.2.2.13	ObjectiveMembership_Init	45
7.4.2.2.14	OccurrenceDefinition_Init	45
7.4.2.2.15	OccurrenceUsage_Init	46
7.4.2.2.16	PartUsage_Init	46
7.4.2.2.17	PortConjugation_Init	46
7.4.2.2.18	PortDefinition_Init	47
7.4.2.2.19	ReferenceUsage_Init	47
7.4.2.2.20	RequirementUsage_Init	47
7.4.2.2.21	StateUsage_Init	48
7.4.2.2.22	SubjectMembership_Init	48
7.4.2.2.23	Usage_Init	48
7.5	Factories	48
7.5.1	Overview	49
7.5.2	Mapping Specifications	49
7.5.2.1	EmptySubject_Factory	49
7.5.2.2	EmptySubjectMembership_Factory	49
7.5.2.3	LiteralBoolean_Factory	49
7.5.2.4	LiteralNull_Factory	50
7.5.2.5	LiteralRational_Factory	50
7.5.2.6	LiteralString_Factory	51



7.5.2.7 ReturnParameterFeature_Factory.....	51
7.5.2.8 ReturnParameterFeatureMembership_Factory .....	51
7.5.2.9 StringParameterFeature_Factory.....	52
7.5.2.10 StringParameterFeatureValue_Factory .....	52
7.5.2.11 StringParameterMembership_Factory .....	53
7.5.2.12 SubjectMembership_Factory .....	53
7.6 Generic Mappings .....	53
7.6.1 Overview .....	54
7.6.2 Common Mappings.....	54
7.6.2.1 CommonAssignmentActionUsage_Mapping.....	54
7.6.2.2 CommonAssignmentActionUsageOwningMembership_Mapping .....	54
7.6.2.3 CommonAssignmentActionUsageReferenceUsage_Mapping .....	55
7.6.2.4 CommonAssignmentActionUsageReferenceUsage2_Mapping .....	56
7.6.2.5 CommonAssignmentActionUsageReplacementParameterMembership_Mapping .....	56
7.6.2.6 CommonAssignmentActionUsageReplacementReferenceUsage_Mapping .....	57
7.6.2.7 CommonAssignmentActionUsageTargetFeatureMembership_Mapping .....	57
7.6.2.8 CommonAssignmentActionUsageTargetParameterMembership_Mapping.....	58
7.6.2.9 CommonAssignmentActionUsageTargetReferenceFeatureMembership_Mapping.....	58
7.6.2.10 CommonAssignmentActionUsageTargetReferenceUsage_Mapping .....	59
7.6.2.11 CommonFeatureReferenceExpression_Mapping.....	60
7.6.2.12 CommonMembership_Mapping .....	60
7.6.2.13 CommonParameterReferenceUsageInMembership_Mapping.....	61
7.6.2.14 CommonParameterReferenceUsageIn_Mapping.....	62
7.6.2.15 CommonParameterReferenceUsageInFeatureTyping_Mapping .....	62
7.6.2.16 CommonParameterReferenceUsageInUntyped_Mapping .....	63
7.6.2.17 CommonReturnParameterFeature_Mapping .....	64
7.6.2.18 CommonReturnParameterFeatureTyping_Mapping.....	64
7.6.2.19 CommonReturnParameterFeatureUntyped_Mapping.....	65
7.6.2.20 CommonReturnParameterFeatureMembership_Mapping .....	66
7.6.2.21 CommonReturnParameterReferenceUsageMembership_Mapping .....	66
7.6.2.22 CommonReturnParameterReferenceUsage_Mapping .....	67
7.6.2.23 CommonReturnParameterReferenceUsageFeatureTyping_Mapping.....	68
7.6.2.24 CommonReturnParameterReferenceUsageUntyped_Mapping .....	68
7.6.2.25 CommonReferenceUsageIn_Mapping .....	69
7.6.2.26 CommonReferenceUsageInFeatureMembership_Mapping.....	70
7.6.2.27 CommonReferenceUsageInFeatureTyping_Mapping .....	70
7.6.2.28 CommonReferenceUsageInUntyped_Mapping .....	71
7.6.3 Generic Mappings To KerML.....	72
7.6.3.1 GenericToAnnotatingElement_Mapping.....	72
7.6.3.2 GenericToAnnotation_Mapping .....	72
7.6.3.3 GenericToAssociation_Mapping .....	73
7.6.3.4 GenericToBehavior_Mapping.....	74
7.6.3.5 GenericToClassifier_Mapping.....	74
7.6.3.6 GenericToComment_Mapping.....	74
7.6.3.7 GenericToConjugation_Mapping.....	75
7.6.3.8 GenericToConnector_Mapping.....	76
7.6.3.9 GenericToDocumentation_Mapping.....	76
7.6.3.10 GenericToElement_Mapping .....	77
7.6.3.11 GenericToEndFeatureMembership_Mapping.....	78
7.6.3.12 GenericToExpression_Mapping.....	78
7.6.3.13 GenericToFeature_Mapping .....	78
7.6.3.14 GenericToFeatureChainExpression_Mapping .....	79
7.6.3.15 GenericToFeatureChaining_Mapping.....	80
7.6.3.16 GenericToFeatureMembership_Mapping .....	80

7.6.3.17	GenericToFeatureReferenceExpression_Mapping	81
7.6.3.18	GenericToFeatureTyping_Mapping	82
7.6.3.19	GenericToFeatureValue_Mapping	82
7.6.3.20	GenericToFunction_Mapping	83
7.6.3.21	GenericToImport_Mapping	83
7.6.3.22	GenericToInvocationExpression_Mapping	84
7.6.3.23	GenericToInteraction_Mapping	85
7.6.3.24	GenericToItemFlow_Mapping	85
7.6.3.25	GenericToMembership_Mapping	85
7.6.3.26	GenericToMembershipImport_Mapping	86
7.6.3.27	GenericToNamespace_Mapping	87
7.6.3.28	GenericToNamespaceImport_Mapping	87
7.6.3.29	GenericToOperatorExpression_Mapping	88
7.6.3.30	GenericToOwningMembership_Mapping	88
7.6.3.31	GenericToPackage_Mapping	89
7.6.3.32	GenericToParameterMembership_Mapping	90
7.6.3.33	GenericToPredicate_Mapping	90
7.6.3.34	GenericToRedefinition_Mapping	91
7.6.3.35	GenericToReferenceSubsetting_Mapping	91
7.6.3.36	GenericToRelationship_Mapping	92
7.6.3.37	GenericToReturnParameterMembership_Mapping	93
7.6.3.38	GenericToSpecialization_Mapping	93
7.6.3.39	GenericToStep_Mapping	94
7.6.3.40	GenericToSubclassification_Mapping	94
7.6.3.41	GenericToSubsetting_Mapping	95
7.6.3.42	GenericToSuccession_Mapping	96
7.6.3.43	GenericToSuccessionItemFlow_Mapping	96
7.6.3.44	GenericToTextualRepresentation_Mapping	97
7.6.3.45	GenericToType_Mapping	97
7.6.3.46	GenericToTypeFeaturing_Mapping	98
7.6.4	Generic Mappings to Systems	99
7.6.4.1	GenericToActionUsage_Mapping	99
7.6.4.2	GenericToActorMembership_Mapping	99
7.6.4.3	GenericToAssignmentActionUsage_Mapping	100
7.6.4.4	GenericToConnectionUsage_Mapping	100
7.6.4.5	GenericToConjugatedPortDefinition_Mapping	100
7.6.4.6	GenericToConjugatedPortTyping_Mapping	101
7.6.4.7	GenericToConstraintDefinition_Mapping	101
7.6.4.8	GenericToConstraintUsage_Mapping	102
7.6.4.9	GenericToDefinition_Mapping	102
7.6.4.10	GenericToEventOccurrenceUsage_Mapping	103
7.6.4.11	GenericToItemDefinition_Mapping	103
7.6.4.12	GenericToMetadataUsage_Mapping	104
7.6.4.13	GenericToObjectiveMembership_Mapping	104
7.6.4.14	GenericToOccurrenceDefinition_Mapping	104
7.6.4.15	GenericToOccurrenceUsage_Mapping	105
7.6.4.16	GenericToPartUsage_Mapping	106
7.6.4.17	GenericToPortConjugation_Mapping	106
7.6.4.18	GenericToPortDefinition_Mapping	107
7.6.4.19	GenericToReferenceUsage_Mapping	107
7.6.4.20	GenericToRequirementUsage_Mapping	108
7.6.4.21	GenericToStateUsage_Mapping	108
7.6.4.22	GenericToSubjectMembership_Mapping	108
7.6.4.23	GenericToUsage_Mapping	109

7.7 Mappings from UML4SysML metaclasses .....	109
7.7.1 Overview .....	109
7.7.2 Actions .....	110
7.7.2.1 Overview .....	110
7.7.2.2 UML4SysML::Actions elements not mapped.....	112
7.7.2.3 Mapping Specifications .....	112
7.7.2.3.1 Accept Event Actions .....	113
7.7.2.3.1.1 AcceptCallAction_Mapping.....	113
7.7.2.3.1.2 AcceptEventAction_Mapping.....	113
7.7.2.3.1.3 AEChangeExpressionMembership_Mapping .....	114
7.7.2.3.1.4 AEChangeParameter_Mapping .....	115
7.7.2.3.1.5 AEChangeParameterFeatureValue_Mapping .....	115
7.7.2.3.1.6 AEChangeParameterTrigger_Mapping .....	116
7.7.2.3.1.7 AEChangeParameterTriggerExpression_Mapping .....	117
7.7.2.3.1.8 AEChangeParameterResultExpressionMembership_Mapping.....	117
7.7.2.3.1.9 AEChangeParameterFeatureChainExpression_Mapping.....	118
7.7.2.3.1.10 AEChangeParameterFeature_Mapping .....	119
7.7.2.3.1.11 AEChangeParameterExpressionFeatureValue_Mapping.....	119
7.7.2.3.1.12 AEChangeParameterFeatureReferenceExpression_Mapping .....	120
7.7.2.3.1.13 AEChangeParameterMembership_Mapping.....	120
7.7.2.3.1.14 AEChangeParameterParameterMembership_Mapping.....	121
7.7.2.3.1.15 AEReceiverParameter_Mapping .....	122
7.7.2.3.1.16 AEReceiverParameterMembership_Mapping.....	122
7.7.2.3.1.17 AEReceiverFeatureValue_Mapping.....	123
7.7.2.3.1.18 AESignalParameter_Mapping.....	124
7.7.2.3.1.19 AESignalParameterFeatureTyping_Mapping .....	124
7.7.2.3.1.20 AEParameterMembership_Mapping .....	125
7.7.2.3.1.21 AEReceiverFeatureReferenceExpression_Mapping .....	126
7.7.2.3.1.22 AEReceiverFeatureReferenceExpressionMembership_Mapping .....	126
7.7.2.3.1.23 ReplyAction_Mapping .....	127
7.7.2.3.1.24 UnmarshallAction_Mapping.....	128
7.7.2.3.2 Actions.....	128
7.7.2.3.2.1 CommonAction_Mapping .....	128
7.7.2.3.2.2 InputPin_Mapping .....	129
7.7.2.3.2.3 InputPinUntyped_Mapping.....	129
7.7.2.3.2.4 OpaqueAction_Mapping .....	130
7.7.2.3.2.5 OABody_Mapping .....	131
7.7.2.3.2.6 OABodyMembership_Mapping .....	131
7.7.2.3.2.7 OutputPin_Mapping .....	132
7.7.2.3.2.8 OutputPinUntyped_Mapping .....	133
7.7.2.3.2.9 Pin_Mapping .....	133
7.7.2.3.2.10 PinFeatureTyping_Mapping.....	134
7.7.2.3.2.11 UntypedPin_Mapping.....	134
7.7.2.3.2.12 ValuePin_Mapping.....	135
7.7.2.3.2.13 ValuePinFeatureValue_Mapping .....	136
7.7.2.3.2.14 ValuePinUntyped_Mapping.....	137
7.7.2.3.3 Invocation Actions .....	138
7.7.2.3.3.1 BroadcastSignalAction_Mapping.....	138
7.7.2.3.3.2 CallBehaviorAction_Mapping .....	138
7.7.2.3.3.3 CBAFeatureTyping_Mapping.....	139
7.7.2.3.3.4 CallOperationAction_Mapping .....	140
7.7.2.3.3.5 COAOutputPinFeature_Mapping.....	140
7.7.2.3.3.6 COAOutputPinFeatureChainExpression_Mapping .....	141
7.7.2.3.3.7 COAOutputPinFeatureChainExpressionMembership_Mapping .....	142

7.7.2.3.3.8 COAOutputPinFeatureFeature_Mapping.....	142
7.7.2.3.3.9 COAOutputPinFeatureFeatureMembership_Mapping.....	143
7.7.2.3.3.10 COAOutputPinFeatureFeatureValue_Mapping.....	143
7.7.2.3.3.11 COAOutputPinFeatureMembership_Mapping.....	144
7.7.2.3.3.12 COAOutputPinFeatureReferenceExpression_Mapping.....	145
7.7.2.3.3.13 COAOutputPinFeatureReferenceExpressionMembership_Mapping.....	145
7.7.2.3.3.14 COAOutputPinParameterMembership_Mapping.....	146
7.7.2.3.3.15 COAOutputPinReferenceUsage_Mapping.....	146
7.7.2.3.3.16 COAOutputPinReferenceUsageFeatureValue_Mapping.....	147
7.7.2.3.3.17 COAPerformAction_Mapping.....	148
7.7.2.3.3.18 COAPerformActionFeatureMembership_Mapping.....	148
7.7.2.3.3.19 COAPerformActionReferenceSubsetting_Mapping.....	149
7.7.2.3.3.20 COAPerformActionFeature_Mapping.....	150
7.7.2.3.3.21 COAPerformActionFeatureChainingOperation_Mapping.....	150
7.7.2.3.3.22 COAPerformActionFeatureChainingTarget_Mapping.....	151
7.7.2.3.3.23 SendObjectAction_Mapping.....	151
7.7.2.3.3.24 SendSignalAction_Mapping.....	152
7.7.2.3.3.25 SSAFeatureMembership_Mapping.....	153
7.7.2.3.3.26 SSAParameterMembership_Mapping.....	153
7.7.2.3.3.27 SSAResourceUsage_Mapping.....	154
7.7.2.3.3.28 SSAItemParameterMembership_Mapping.....	155
7.7.2.3.3.29 SSAItemReferenceUsage_Mapping.....	155
7.7.2.3.3.30 SSAItemReferenceUsageFeatureValue_Mapping.....	156
7.7.2.3.3.31 SSAItemReferenceUsageFeatureTyping_Mapping.....	157
7.7.2.3.3.32 SSAItemReferenceUsageInvocationExpression_Mapping.....	157
7.7.2.3.3.33 SSATargetParameterMembership_Mapping.....	158
7.7.2.3.3.34 SSATargetReferenceUsage_Mapping.....	159
7.7.2.3.3.35 SSATargetReferenceUsageFeatureValue_Mapping.....	159
7.7.2.3.3.36 SSATargetReferenceUsageFeatureValueMembership_Mapping.....	160
7.7.2.3.3.37 SSATargetReferenceUsageFeatureValueExpression_Mapping.....	160
7.7.2.3.3.38 SSASendActionUsage_Mapping.....	161
7.7.2.3.3.39 StartClassifierBehaviorAction_Mapping.....	162
7.7.2.3.3.40 StartObjectBehaviorAction_Mapping.....	162
7.7.2.3.4 Link Actions.....	163
7.7.2.3.4.1 ClearAssociationAction_Mapping.....	163
7.7.2.3.4.2 CreateLinkAction_Mapping.....	163
7.7.2.3.4.3 CreateLinkObjectAction_Mapping.....	164
7.7.2.3.4.4 DestroyLinkAction_Mapping.....	164
7.7.2.3.4.5 ReadLinkAction_Mapping.....	165
7.7.2.3.4.6 ReadLinkObjectEndAction_Mapping.....	166
7.7.2.3.4.7 ReadLinkObjectEndQualifierAction_Mapping.....	166
7.7.2.3.5 Object Actions.....	167
7.7.2.3.5.1 CreateObjectAction_Mapping.....	167
7.7.2.3.5.2 COAInvocationExpressionFeatureTyping_Mapping.....	167
7.7.2.3.5.3 COAInvocationExpression_Mapping.....	168
7.7.2.3.5.4 COAPin_Mapping.....	169
7.7.2.3.5.5 COAPinFeatureValue_Mapping.....	169
7.7.2.3.5.6 DestroyObjectAction_Mapping.....	170
7.7.2.3.5.7 DOADestroyActionUsage_Mapping.....	171
7.7.2.3.5.8 DOADestroyActionUsageFeatureMembership_Mapping.....	171
7.7.2.3.5.9 DOADestroyActionUsageFeatureReferenceExpression_Mapping.....	172
7.7.2.3.5.10 DOADestroyActionUsageMembership_Mapping.....	173
7.7.2.3.5.11 DOADestroyActionUsageFeatureTyping_Mapping.....	173
7.7.2.3.5.12 DOADestroyActionUsageFeatureValue_Mapping.....	174

7.7.2.3.5.13 DOADestroyActionUsageReferenceUsage_Mapping .....	175
7.7.2.3.5.14 DOADestroyFeatureMembership_Mapping .....	175
7.7.2.3.5.15 ReadIsClassifiedObjectAction_Mapping .....	176
7.7.2.3.5.16 RICOAFeatureValue_Mapping .....	177
7.7.2.3.5.17 RICOAFeatureValueOperatorExpression_Mapping .....	177
7.7.2.3.5.18 RICOAFeatureValueOperatorExpressionFeature_Mapping .....	178
7.7.2.3.5.19 RICOAFeatureValueOperatorExpressionFeatureValue_Mapping .....	179
7.7.2.3.5.20 RICOAFeatureValueOperatorFeatureReferenceExpression_Mapping .....	179
7.7.2.3.5.21 RICOAFeatureValueOperatorMembership_Mapping .....	180
7.7.2.3.5.22 RICOAFeatureValueOperatorParameterMembership_Mapping .....	180
7.7.2.3.5.23 RICOAOutputPin_Mapping .....	181
7.7.2.3.5.24 ReadExtentAction_Mapping .....	182
7.7.2.3.5.25 REAFeatureValue_Mapping .....	182
7.7.2.3.5.26 REAFeatureValueOperatorExpression_Mapping .....	183
7.7.2.3.5.27 REAFeatureValueOperatorExpressionFeature_Mapping .....	184
7.7.2.3.5.28 REAFeatureValueOperatorExpressionFeatureTyping_Mapping .....	184
7.7.2.3.5.29 REAFeatureValueOperatorExpressionMembership_Mapping .....	185
7.7.2.3.5.30 REAOutputPin_Mapping .....	186
7.7.2.3.5.31 ReadSelfAction_Mapping .....	186
7.7.2.3.5.32 RSAFeatureValue_Mapping .....	187
7.7.2.3.5.33 RSAFeatureValueFeatureReferenceExpression_Mapping .....	188
7.7.2.3.5.34 RSAFeatureValueMembership_Mapping .....	188
7.7.2.3.5.35 RSAOutputPin_Mapping .....	189
7.7.2.3.5.36 ReclassifyObjectAction_Mapping .....	190
7.7.2.3.5.37 TestIdentityAction_Mapping .....	190
7.7.2.3.5.38 TIAOperatorExpression_Mapping .....	191
7.7.2.3.5.39 TIAResultExpressionMembership_Mapping .....	192
7.7.2.3.5.40 ValueSpecificationAction_Mapping .....	192
7.7.2.3.5.41 VSAOutputPin_Mapping .....	193
7.7.2.3.5.42 VSAOutputPinFeatureValue_Mapping .....	194
7.7.2.3.6 Other Actions .....	195
7.7.2.3.6.1 RaiseExceptionAction_Mapping .....	195
7.7.2.3.6.2 ReduceAction_Mapping .....	195
7.7.2.3.7 Structural Feature Actions .....	196
7.7.2.3.7.1 AddStructuralFeatureValueAction_Mapping .....	196
7.7.2.3.7.2 ASFVAFeatureTyping_Mapping .....	197
7.7.2.3.7.3 ASFVATargetFeatureMembership_Mapping .....	197
7.7.2.3.7.4 ASFVATargetReferenceUsage_Mapping .....	198
7.7.2.3.7.5 ASFVATargetAssignmentActionUsage_Mapping .....	199
7.7.2.3.7.6 ASFVATargetActionParameterMembership_Mapping .....	199
7.7.2.3.7.7 ASFVATargetActionReferenceUsage_Mapping .....	200
7.7.2.3.7.8 ASFVATargetActionReferenceUsageReferenceUsage_Mapping .....	200
7.7.2.3.7.9 ASFVATargetActionReferenceUsageFeatureMembership_Mapping .....	201
7.7.2.3.7.10 ASFVATargetActionFeatureMembership_Mapping .....	202
7.7.2.3.7.11 ASFVATargetActionReferenceUsageFeature_Mapping .....	202
7.7.2.3.7.12 ASFVATargetParameterExpressionFeature_Mapping .....	203
7.7.2.3.7.13 ASFVATargetFeatureValue_Mapping .....	203
7.7.2.3.7.14 ASFVATargetFeatureChainExpression_Mapping .....	204
7.7.2.3.7.15 ASFVATargetOwningMembership_Mapping .....	205
7.7.2.3.7.16 ASFVATargetParameterFeature_Mapping .....	205
7.7.2.3.7.17 ASFVATargetParameterExpressionFeatureMembership_Mapping .....	206
7.7.2.3.7.18 ASFVATargetParameterFeatureValue_Mapping .....	207
7.7.2.3.7.19 ASFVATargetParameterFeatureReferenceExpression_Mapping .....	207
7.7.2.3.7.20 ASFVATargetParameterExpressionMembership_Mapping .....	208

7.7.2.3.7.21 ASFVATargetParameterFeatureExpressionMembership_Mapping	209
7.7.2.3.7.22 ASFVATargetParameterMembership_Mapping	209
7.7.2.3.7.23 ClearStructuralFeatureAction_Mapping	210
7.7.2.3.7.24 RSFReferenceUsage_Mapping	210
7.7.2.3.7.25 RSFReferenceUsageFeatureMembership_Mapping	211
7.7.2.3.7.26 RSFReferenceUsageFeatureValue_Mapping	212
7.7.2.3.7.27 RSFReferenceUsageFeatureChainExpression_Mapping	212
7.7.2.3.7.28 RSFReferenceUsageExpressionFeature_Mapping	213
7.7.2.3.7.29 RSFReferenceUsageFeatureChainExpressionFeature_Mapping	214
7.7.2.3.7.30 RSFReferenceUsageExpressionFeatureMembership_Mapping	214
7.7.2.3.7.31 RSFReferenceUsageExpressionFeatureValue_Mapping	215
7.7.2.3.7.32 RSFReferenceUsageExpressionFeatureReferenceExpression_Mapping	215
7.7.2.3.7.33 RSFReferenceUsageMembership_Mapping	216
7.7.2.3.7.34 RSFReferenceUsageFeatureChainExpressionMembership_Mapping	216
7.7.2.3.7.35 RSFReferenceUsageParameterMembership_Mapping	217
7.7.2.3.7.36 ReadStructuralFeatureAction_Mapping	218
7.7.2.3.7.37 RemoveStructuralFeatureValueAction_Mapping	219
7.7.2.3.8 Structured Actions	219
7.7.2.3.8.1 LoopNode_Mapping	219
7.7.2.3.8.2 SequenceNode_Mapping	219
7.7.2.3.8.3 StructuredActivityNode_Mapping	220
7.7.2.3.9 Variable Actions	221
7.7.2.3.9.1 AddVariableValueAction_Mapping	221
7.7.2.3.9.2 AVVAFeatureTyping_Mapping	222
7.7.2.3.9.3 AVVAVariable_Mapping	223
7.7.2.3.9.4 AVVAVariableFeatureMembership_Mapping	223
7.7.2.3.9.5 AVVARedefinition_Mapping	224
7.7.2.3.9.6 AVVAFeatureValue_Mapping	224
7.7.2.3.9.7 AVVAValueFeatureReferenceExpression_Mapping	225
7.7.2.3.9.8 AVVAValueExpressionMembership_Mapping	226
7.7.2.3.9.9 ClearVariableAction_Mapping	226
7.7.2.3.9.10 CVAFeatureMembership_Mapping	227
7.7.2.3.9.11 CVAReferenceUsage_Mapping	228
7.7.2.3.9.12 CVAReferenceUsageFeatureValue_Mapping	228
7.7.2.3.9.13 ReadVariableAction_Mapping	229
7.7.2.3.9.14 RVAFeatureMembership_Mapping	230
7.7.2.3.9.15 RVAReferenceUsage_Mapping	231
7.7.2.3.9.16 RVAReferenceUsageFeatureTyping_Mapping	231
7.7.2.3.9.17 RVAReferenceUsageFeatureValue_Mapping	232
7.7.2.3.9.18 RVAReferenceUsageFeatureReferenceExpression_Mapping	232
7.7.2.3.9.19 RVAReferenceUsageExpressionMembership_Mapping	233
7.7.2.3.9.20 RemoveVariableValueAction_Mapping	234
7.7.2.3.9.21 RVVAVariableFeatureMembership_Mapping	235
7.7.2.3.9.22 RVVAVariableFeatureReferenceExpression_Mapping	235
7.7.2.3.9.23 RVVAVariableExpressionMembership_Mapping	236
7.7.2.3.9.24 RVVAVariableFeatureValue_Mapping	236
7.7.2.3.9.25 RVVAVariable_Mapping	237
7.7.2.3.9.26 RVVAVariableRedefinition_Mapping	238
7.7.2.3.9.27 RVVAFeatureTyping_Mapping	238
7.7.3 Activities	239
7.7.3.1 Overview	239
7.7.3.2 UML4SysML::Activities elements not mapped	240
7.7.3.3 Mapping Specifications	240
7.7.3.3.1 ActivityAsDefinition_Mapping	240

7.7.3.3.2 ActivityAsUsage_Mapping.....	241
7.7.3.3.3 ActivityEdgeInitialNodeFeatureMembership_Mapping.....	242
7.7.3.3.4 ActivityEdgeMetadata_Mapping.....	243
7.7.3.3.5 ActivityEdgeMetadataFeatureMembership_Mapping.....	243
7.7.3.3.6 ActivityEdgeMetadataFeatureTyping_Mapping.....	244
7.7.3.3.7 ActivityEdgeMetadataFeatureValue_Mapping.....	245
7.7.3.3.8 ActivityEdgeMetadataOwningMembership_Mapping.....	245
7.7.3.3.9 ActivityEdgeMetadataRedefinition_Mapping.....	246
7.7.3.3.10 ActivityEdgeMetadataReferenceUsage_Mapping.....	247
7.7.3.3.11 ActivityEdgeSourceEndFeature_Mapping.....	247
7.7.3.3.12 ActivityEdgeSourceInitialNode_Mapping.....	248
7.7.3.3.13 ActivityEdgeSourceEndFeatureMembership_Mapping.....	249
7.7.3.3.14 ActivityEdgeSourceInitialNodeSubsetting_Mapping.....	249
7.7.3.3.15 ActivityEdgeSourceEndSubsetting_Mapping.....	250
7.7.3.3.16 ActivityEdgeTransitionUsageSourceMembership_Mapping.....	250
7.7.3.3.17 CentralBufferNode_Mapping.....	251
7.7.3.3.18 CommonActivity_Mapping.....	252
7.7.3.3.19 CommonActivityEdgeSuccessionAsUsage_Mapping.....	252
7.7.3.3.20 CommonVariable_Mapping.....	253
7.7.3.3.21 ControlFlowTransitionUsage_Mapping.....	254
7.7.3.3.22 ControlFlowFinalNodeFeatureMembership_Mapping.....	256
7.7.3.3.23 ControlFlowTargetFinalNodeSubsetting_Mapping.....	256
7.7.3.3.24 ControlFlowSuccessionAsUsage_Mapping.....	257
7.7.3.3.25 ControlFlowTargetFinalNode_Mapping.....	258
7.7.3.3.26 ControlFlowTargetEndFeature_Mapping.....	259
7.7.3.3.27 ControlFlowTargetFeatureMembership_Mapping.....	260
7.7.3.3.28 ControlFlowTargetEndSubsetting_Mapping.....	260
7.7.3.3.29 ControlFlowTransitionUsageFeatureMembership_Mapping.....	261
7.7.3.3.30 DataStoreNode_Mapping.....	262
7.7.3.3.31 DecisionNode_Mapping.....	262
7.7.3.3.32 FlowFinalNodeMembership_Mapping.....	263
7.7.3.3.33 ForkNode_Mapping.....	264
7.7.3.3.34 InitialNodeMembership_Mapping.....	265
7.7.3.3.35 JoinNode_Mapping.....	265
7.7.3.3.36 MergeNode_Mapping.....	266
7.7.3.3.37 ObjectFlow_Mapping.....	267
7.7.3.3.38 ObjectFlowFeatureMembership_Mapping.....	268
7.7.3.3.39 ObjectFlowGuardFeatureMembership_Mapping.....	269
7.7.3.3.40 ObjectFlowGuard_Mapping.....	269
7.7.3.3.41 ObjectFlowGuardSuccessionTargetEndFeature_Mapping.....	271
7.7.3.3.42 ObjectFlowGuardSuccessionTargetEndFeatureMembership_Mapping.....	271
7.7.3.3.43 ObjectFlowGuardSuccessionTargetEndSubsetting_Mapping.....	272
7.7.3.3.44 ObjectFlowItemFeature_Mapping.....	273
7.7.3.3.45 ObjectFlowItemFeatureMembership_Mapping.....	273
7.7.3.3.46 ObjectFlowItemFeatureTyping_Mapping.....	274
7.7.3.3.47 ObjectFlowItemFeatureUntyped_Mapping.....	274
7.7.3.3.48 ObjectFlowEndFeatureMembership_Mapping.....	275
7.7.3.3.49 ObjectFlowItemFlowEnd_Mapping.....	275
7.7.3.3.50 ObjectFlowItemFlowFeature_Mapping.....	276
7.7.3.3.51 ObjectFlowItemFlowFeatureMembership_Mapping.....	277
7.7.3.3.52 ObjectFlowItemFlowRedefinition_Mapping.....	277
7.7.3.3.53 ObjectFlowItemFlowSubsetting_Mapping.....	278
7.7.3.3.54 ObjectFlowTransitionUsageFeatureMembership_Mapping.....	279
7.7.3.3.55 VariableAttribute_Mapping.....	279

7.7.3.3.56 VariableFeatureTyping_Mapping .....	280
7.7.3.3.57 VariableItem_Mapping .....	281
7.7.3.3.58 VariableMembership_Mapping.....	281
7.7.4 Classification.....	282
7.7.4.1 Overview .....	282
7.7.4.2 Mapping Specifications .....	283
7.7.4.2.1 BehavioralFeature_Mapping .....	283
7.7.4.2.2 Classifier_Mapping .....	283
7.7.4.2.3 DefaultLowerBound_Mapping .....	284
7.7.4.2.4 DefaultMultiplicityBoundFeatureMembership_Mapping.....	285
7.7.4.2.5 DefaultMultiplicityElement_Mapping .....	285
7.7.4.2.6 DefaultMultiplicityLowerBoundFeatureMembership_Mapping .....	286
7.7.4.2.7 DefaultMultiplicityMembership_Mapping .....	287
7.7.4.2.8 DefaultMultiplicityUpperBoundFeatureMembership_Mapping.....	287
7.7.4.2.9 DefaultUpperBound_Mapping.....	288
7.7.4.2.10 DefaultValue_Mapping .....	289
7.7.4.2.11 ElementFeatureMembership_Mapping .....	290
7.7.4.2.12 Generalization_Mapping .....	290
7.7.4.2.13 InstanceSpecificationLink_Mapping.....	291
7.7.4.2.14 InstanceSpecification_Mapping .....	292
7.7.4.2.15 InstanceSpecificationFeatureTyping_Mapping.....	293
7.7.4.2.16 InstanceValue_Mapping.....	294
7.7.4.2.17 InstanceValueMembership_Mapping .....	295
7.7.4.2.18 LowerBoundValueFeatureMembership_Mapping.....	295
7.7.4.2.19 MultiplicityElement_Mapping .....	296
7.7.4.2.20 MultiplicityLowerBoundOwningMembership_Mapping .....	297
7.7.4.2.21 MultiplicityMembership_Mapping .....	297
7.7.4.2.22 MultiplicityUpperBoundOwningMembership_Mapping.....	298
7.7.4.2.23 Operation_Mapping.....	299
7.7.4.2.24 Parameter_Mapping .....	300
7.7.4.2.25 ParameterDefaultValue_Mapping.....	301
7.7.4.2.26 ParameterMembership_Mapping .....	302
7.7.4.2.27 ParameterSet_Mapping .....	302
7.7.4.2.28 ParameterSetMembership_Mapping.....	304
7.7.4.2.29 ParameterSetParameterFeatureMembership_Mapping.....	304
7.7.4.2.30 ParameterSetParameterReferenceUsage_Mapping .....	305
7.7.4.2.31 ParameterSetParameterReferenceUsageFeatureValue_Mapping .....	305
7.7.4.2.32 ParameterSetParameterReferenceUsageFeatureValueExpression_Mapping .....	306
7.7.4.2.33 ParameterSetParameterReferenceUsageMembership_Mapping.....	307
7.7.4.2.34 ParameterToFeatureTyping_Mapping .....	307
7.7.4.2.35 Property_Mapping.....	308
7.7.4.2.36 PropertyCommon_Mapping .....	309
7.7.4.2.37 PropertySubsetting_Mapping.....	310
7.7.4.2.38 PropertyUntyped_Mapping .....	311
7.7.4.2.39 Realization_Mapping .....	311
7.7.4.2.40 Slot_Mapping .....	312
7.7.4.2.41 SlotMembership_Mapping.....	312
7.7.4.2.42 SlotFeatureTyping_Mapping.....	313
7.7.4.2.43 SlotValue_Mapping.....	314
7.7.4.2.44 StructuralFeature_Mapping.....	314
7.7.4.2.45 StructuralFeatureMembership_Mapping.....	315
7.7.4.2.46 StructuralFeatureToFeatureTyping_Mapping.....	316
7.7.4.2.47 TypedElementFeatureTyping_Mapping .....	317
7.7.4.2.48 UpperBoundValueFeatureMembership_Mapping .....	317



7.7.5 CommonBehavior .....	318
7.7.5.1 Overview .....	318
7.7.5.2 UML4SysML::CommonBehavior elements not mapped .....	319
7.7.5.3 Mapping Specifications .....	319
7.7.5.3.1 Behavior_Mapping .....	319
7.7.5.3.2 ChangeEvent_Mapping .....	320
7.7.5.3.3 CommonOpaqueBehavior_Mapping .....	321
7.7.5.3.4 OpaqueBehaviorAsDefinition_Mapping .....	321
7.7.5.3.5 OpaqueBehaviorAsUsage_Mapping .....	322
7.7.5.3.6 OpaqueBehaviorMembership_Mapping .....	323
7.7.5.3.7 OpaqueBehaviorSpecification_Mapping .....	324
7.7.5.3.8 TimeEvent_Mapping .....	324
7.7.5.3.9 Trigger_Mapping .....	325
7.7.6 CommonStructure .....	325
7.7.6.1 Overview .....	325
7.7.6.2 Mapping Specifications .....	326
7.7.6.2.1 Abstraction_Mapping .....	326
7.7.6.2.2 Comment_Mapping .....	326
7.7.6.2.3 CommentAnnotation_Mapping .....	327
7.7.6.2.4 Constraint_Mapping .....	328
7.7.6.2.5 ConstrainedElementFeatureMembership_Mapping .....	329
7.7.6.2.6 ConstraintUsageFeatureTyping_Mapping .....	330
7.7.6.2.7 ConstraintUsage_Mapping .....	330
7.7.6.2.8 Dependency_Mapping .....	331
7.7.6.2.9 DirectedRelationship_Mapping .....	332
7.7.6.2.10 ElementMain_Mapping .....	333
7.7.6.2.11 ElementMembership_Mapping .....	333
7.7.6.2.12 ElementOwnership_Mapping .....	334
7.7.6.2.13 ElementOwningMembership_Mapping .....	335
7.7.6.2.14 NamedElementMain_Mapping .....	336
7.7.6.2.15 Namespace_Mapping .....	336
7.7.6.2.16 Relationship_Mapping .....	337
7.7.6.2.17 Usage_Mapping .....	338
7.7.7 InformationFlows .....	338
7.7.7.1 Overview .....	338
7.7.7.2 Mapping Specifications .....	338
7.7.7.2.1 InformationFlow_Mapping .....	338
7.7.7.2.2 InformationFlowEndCommonMembership_Mapping .....	339
7.7.7.2.3 InformationFlowSource_Mapping .....	340
7.7.7.2.4 InformationFlowSourceMembership_Mapping .....	341
7.7.7.2.5 InformationFlowSourceFeatureTyping_Mapping .....	341
7.7.7.2.6 InformationFlowTarget_Mapping .....	342
7.7.7.2.7 InformationFlowTargetMembership_Mapping .....	343
7.7.7.2.8 InformationFlowTargetFeatureTyping_Mapping .....	343
7.7.7.2.9 InformationItem_Mapping .....	344
7.7.8 Interactions .....	344
7.7.8.1 Overview .....	345
7.7.8.2 UML4SysML::Interactions elements not mapped .....	345
7.7.8.3 Mapping Specifications .....	346
7.7.8.3.1 ActionExecutionSpecification_Mapping .....	346
7.7.8.3.2 BehaviorExecutionSpecification_Mapping .....	346
7.7.8.3.3 CombinedFragment_Mapping .....	347
7.7.8.3.4 CombinedFragmentMembership_Mapping .....	347
7.7.8.3.5 ExecutionSpecificationMembership_Mapping .....	348

7.7.8.3.6	Interaction_Mapping	349
7.7.8.3.7	InteractionOperand_Mapping	350
7.7.8.3.8	InteractionOperandMembership_Mapping	351
7.7.8.3.9	InteractionUse_Mapping	351
7.7.8.3.10	InteractionUseMembership_Mapping	352
7.7.8.3.11	InteractionUseFeatureTyping_Mapping	353
7.7.8.3.12	LifelineMembership_Mapping	353
7.7.8.3.13	LifelinePartUsage_Mapping	354
7.7.8.3.14	LifelineFeatureTyping_Mapping	355
7.7.8.3.15	Message_Mapping	355
7.7.8.3.16	MessageMembership_Mapping	356
7.7.8.3.17	StateInvariant_Mapping	356
7.7.8.3.18	StateInvariantMembership_Mapping	357
7.7.8.3.19	StateInvariantFeatureTyping_Mapping	358
7.7.9	Packages	358
7.7.9.1	Overview	358
7.7.9.2	UML4SysML::Packages elements not mapped	359
7.7.9.3	Mapping Specifications	359
7.7.9.3.1	ElementImport_Mapping	359
7.7.9.3.2	Model_Mapping	360
7.7.9.3.3	ModelViewpointMetadataUsage_Mapping	361
7.7.9.3.4	ModelViewpointMetadataFeatureMembership_Mapping	361
7.7.9.3.5	ModelViewpointMetadataReferenceUsage_Mapping	362
7.7.9.3.6	ModelViewpointMetadataFeatureTyping_Mapping	362
7.7.9.3.7	ModelViewpointMetadataMembership_Mapping	363
7.7.9.3.8	ModelViewpointMetadataFeatureValue_Mapping	364
7.7.9.3.9	ModelViewpointMetadataRedefinition_Mapping	364
7.7.9.3.10	ModelViewpointValue_Mapping	365
7.7.9.3.11	Package_Mapping	366
7.7.9.3.12	PackageImport_Mapping	367
7.7.9.3.13	PackageURIMetadataUsage_Mapping	367
7.7.9.3.14	PackageURIFeatureMembership_Mapping	368
7.7.9.3.15	PackageURIFeatureTyping_Mapping	369
7.7.9.3.16	PackageURIMetadataReferenceUsage_Mapping	370
7.7.9.3.17	PackageURIMetadataFeatureValue_Mapping	370
7.7.9.3.18	PackageURIMetadataMembership_Mapping	371
7.7.9.3.19	PackageURIRedefinition_Mapping	372
7.7.9.3.20	PackageURIValue_Mapping	372
7.7.9.3.21	Profile_Mapping	373
7.7.9.3.22	ProfileMetadataMembership_Mapping	374
7.7.9.3.23	ProfileMetadataUsage_Mapping	374
7.7.9.3.24	StereotypeMetadataDefinition_Mapping	375
7.7.9.3.25	StereotypeMetadataDefinitionMembership_Mapping	375
7.7.9.3.26	StereotypeOccurrenceUsage_Mapping	376
7.7.9.3.27	StereotypeOccurrenceUsageFeatureTyping_Mapping	376
7.7.9.3.28	StereotypeOccurrenceUsageMembership_Mapping	377
7.7.9.3.29	StereotypeOccurrenceUsageMultiplicityMembership_Mapping	378
7.7.9.3.30	StereotypeOccurrenceUsageMultiplicityRange_Mapping	378
7.7.9.3.31	StereotypeOccurrenceUsageMultiplicityRangeInfinity_Mapping	379
7.7.9.3.32	StereotypeOccurrenceUsageInfinityReturnParameter_Mapping	380
7.7.9.3.33	StereotypeOccurrenceUsageInfinityReturnParameterMembership_Mapping	380
7.7.9.3.34	StereotypeOccurrenceUsageMultiplicityRangeMembership_Mapping	381
7.7.10	SimpleClassifiers	382
7.7.10.1	Overview	382

7.7.10.2 Mapping Specifications.....	382
7.7.10.2.1 Attribute_Mapping.....	382
7.7.10.2.2 AttributeRedefined_Mapping.....	383
7.7.10.2.3 AttributeRedefinedRedefinition_Mapping.....	384
7.7.10.2.4 AttributeRedefinedMembership_Mapping.....	385
7.7.10.2.5 AttributeRedefinedFeatureTyping_Mapping.....	385
7.7.10.2.6 BehavoredClassifier_Mapping.....	386
7.7.10.2.7 BehavoredClassifierFeatureMembership_Mapping.....	387
7.7.10.2.8 BehavoredClassifierFeatureTyping_Mapping.....	388
7.7.10.2.9 BehavoredClassifierActionUsage_Mapping.....	388
7.7.10.2.10 DataType_Mapping.....	389
7.7.10.2.11 Enumeration_Mapping.....	389
7.7.10.2.12 EnumerationLiteral_Mapping.....	390
7.7.10.2.13 EnumerationVariantMembership_Mapping.....	391
7.7.10.2.14 Interface_Mapping.....	392
7.7.10.2.15 InterfaceConjugatedPortDefinition_Mapping.....	393
7.7.10.2.16 InterfaceConjugatedPortDefinitionMembership_Mapping.....	393
7.7.10.2.17 InterfacePortConjugation_Mapping.....	394
7.7.10.2.18 InterfaceRealization_Mapping.....	395
7.7.10.2.19 PrimitiveType_Mapping.....	395
7.7.10.2.20 Reception_Mapping.....	396
7.7.10.2.21 ReceptionFeatureTyping_Mapping.....	396
7.7.10.2.22 Signal_Mapping.....	397
7.7.11 StateMachines.....	397
7.7.11.1 Overview.....	397
7.7.11.2 Mapping Specifications.....	398
7.7.11.2.1 ConnectionPointReference_Mapping.....	398
7.7.11.2.2 FinalState_Mapping.....	399
7.7.11.2.3 PseudoState_Mapping.....	399
7.7.11.2.4 Region_Mapping.....	400
7.7.11.2.5 State_Mapping.....	401
7.7.11.2.6 StateDefinition_Mapping.....	402
7.7.11.2.7 Transition_Mapping.....	403
7.7.11.2.8 TransitionSuccession_Mapping.....	403
7.7.11.2.9 TransitionSourceToSubsetting_Mapping.....	404
7.7.11.2.10 TransitionSuccessionSource_Mapping.....	405
7.7.11.2.11 TransitionSuccessionSourceMembership_Mapping.....	405
7.7.11.2.12 TransitionSuccessionTarget_Mapping.....	406
7.7.11.2.13 TransitionSuccessionTargetMembership_Mapping.....	407
7.7.11.2.14 TransitionTargetToSubsetting_Mapping.....	407
7.7.12 StructuredClassifiers.....	408
7.7.12.1 Overview.....	408
7.7.12.2 Mapping Specifications.....	409
7.7.12.2.1 AssociationClass_Mapping.....	409
7.7.12.2.2 AssociationCommon_Mapping.....	410
7.7.12.2.3 AssociationMetadataUsage_Mapping.....	411
7.7.12.2.4 AssociationMetadataUsageFeatureMembership_Mapping.....	412
7.7.12.2.5 AssociationMetadataUsageFeatureTyping_Mapping.....	412
7.7.12.2.6 AssociationMetadataUsageFeature_Mapping.....	413
7.7.12.2.7 AssociationMetadataUsageFeatureValue_Mapping.....	414
7.7.12.2.8 AssociationMetadataUsageMembership_Mapping.....	414
7.7.12.2.9 AssociationMetadataUsageRedefinition_Mapping.....	415
7.7.12.2.10 Class_Mapping.....	415
7.7.12.2.11 ConnectionEndToSubsetting_Mapping.....	416

7.7.12.2.12 Connector_Mapping.....	417
7.7.12.2.13 ConnectorEndToFeatureCommon_Mapping.....	418
7.7.12.2.14 ConnectorEndToMembership_Mapping.....	419
7.7.12.2.15 ConnectorEndToOwnedFeature_Mapping.....	419
7.7.12.2.16 ConnectorEndToSubsettedFeature_Mapping.....	420
7.7.12.2.17 ConnectorEndToSubsettedFeatureMembership_Mapping.....	421
7.7.12.2.18 ConnectorMultiplicityMembership_Mapping.....	421
7.7.12.2.19 ConnectorType_Mapping.....	422
7.7.12.2.20 ConnectorTypeDerived_Mapping.....	423
7.7.12.2.21 End_Mapping.....	424
7.7.12.2.22 EndMembership_Mapping.....	425
7.7.12.2.23 EndToSubsettedFeature_Mapping.....	425
7.7.12.2.24 EndToSubsettedFeatureChaining_Mapping.....	426
7.7.12.2.25 NonOwnedEndSubsetting_Mapping.....	426
7.7.12.2.26 NonOwnedEndToSubsettedFeatureMembership_Mapping.....	427
7.7.12.2.27 NonOwnedEnd_Mapping.....	428
7.7.12.2.28 NonOwnedEndMembership_Mapping.....	428
7.7.12.2.29 NonOwnedEndSubsettingMembership_Mapping.....	429
7.7.12.2.30 NonOwnedEndFeatureTyping_Mapping.....	430
7.7.12.2.31 OwnedEnd_Mapping.....	430
7.7.12.2.32 OwnedEndMembership_Mapping.....	431
7.7.12.2.33 Port_Mapping.....	432
7.7.12.2.34 PortUntyped_Mapping.....	433
7.7.12.2.35 PropertyToFeatureChaining_Mapping.....	433
7.7.12.2.36 QualifierMembership_Mapping.....	434
7.7.13 UseCases.....	434
7.7.13.1 Overview.....	434
7.7.13.2 UML4SysML::UseCases elements not mapped.....	435
7.7.13.3 Mapping Specifications.....	435
7.7.13.3.1 Actor_Mapping.....	435
7.7.13.3.2 Include_Mapping.....	435
7.7.13.3.3 IncludeFeatureTyping_Mapping.....	436
7.7.13.3.4 UseCase_Mapping.....	437
7.7.13.3.5 UseCaseActor_Mapping.....	438
7.7.13.3.6 UseCaseActorFeatureTyping_Mapping.....	439
7.7.13.3.7 UseCaseActorMembership_Mapping.....	439
7.7.13.3.8 UseCaseEmptySubjectReferenceUsage_Mapping.....	440
7.7.13.3.9 UseCaseObjectiveMembership_Mapping.....	440
7.7.13.3.10 UseCaseObjectiveRequirementUsage_Mapping.....	441
7.7.13.3.11 UseCaseObjectiveSubjectMembership_Mapping.....	442
7.7.13.3.12 UseCaseSubjectFeatureTyping_Mapping.....	442
7.7.13.3.13 UseCaseSubjectMembership_Mapping.....	443
7.7.13.3.14 UseCaseSubjectReferenceUsage_Mapping.....	444
7.7.14 Values.....	444
7.7.14.1 Overview.....	444
7.7.14.2 UML4SysML::Values elements not mapped.....	445
7.7.14.3 Mapping Specifications.....	445
7.7.14.3.1 EqualOperatorExpressionFeature_Mapping.....	446
7.7.14.3.2 EqualOperatorExpressionFeatureValue_Mapping.....	446
7.7.14.3.3 EqualOperatorExpressionOperandParameterMembership_Mapping.....	447
7.7.14.3.4 Expression_Mapping.....	447
7.7.14.3.5 ExpressionElse_Mapping.....	448
7.7.14.3.6 ExpressionElseMembership_Mapping.....	449
7.7.14.3.7 ExpressionElseSpecification_Mapping.....	449

7.7.14.3.8 LiteralBoolean_Mapping.....	450
7.7.14.3.9 LiteralInteger_Mapping.....	451
7.7.14.3.10 LiteralNull_Mapping.....	451
7.7.14.3.11 LiteralReal_Mapping.....	452
7.7.14.3.12 LiteralSpecificationCommon_Mapping.....	452
7.7.14.3.13 LiteralSpecificationFeatureTyping_Mapping.....	453
7.7.14.3.14 LiteralString_Mapping.....	453
7.7.14.3.15 LiteralUnlimitedUnbounded_Mapping.....	454
7.7.14.3.16 LiteralUnlimitedInteger_Mapping.....	455
7.7.14.3.17 OpaqueExpressionAsValue_Mapping.....	455
7.7.14.3.18 OpaqueExpression_Mapping.....	456
7.7.14.3.19 OpaqueExpressionFeature_Mapping.....	457
7.7.14.3.20 OpaqueExpressionFeatureFeature_Mapping.....	457
7.7.14.3.21 OpaqueExpressionFeatureFeatureMembership_Mapping.....	458
7.7.14.3.22 OpaqueExpressionFeatureValue_Mapping.....	458
7.7.14.3.23 OpaqueExpressionFeatureValueExpression_Mapping.....	459
7.7.14.3.24 OpaqueExpressionFeatureValueExpressionMembership_Mapping.....	460
7.7.14.3.25 OpaqueExpressionMembership_Mapping.....	460
7.7.14.3.26 OpaqueExpressionParameterMembership_Mapping.....	461
7.7.14.3.27 OpaqueExpressionReferenceUsageReturnParameterMembership_Mapping.....	461
7.7.14.3.28 OpaqueExpressionReferenceUsage_Mapping.....	462
7.7.14.3.29 OpaqueExpressionReferenceUsageFeatureTyping_Mapping.....	463
7.7.14.3.30 OpaqueExpressionReferenceUsageUntyped_Mapping.....	463
7.7.14.3.31 OpaqueExpressionSpecification_Mapping.....	464
7.7.14.3.32 TimeExpression_Mapping.....	465
7.7.14.3.33 ValueSpecification_Mapping.....	465
7.8 Mappings from SysML v1.7 stereotypes.....	466
7.8.1 Overview.....	466
7.8.2 Activities.....	466
7.8.2.1 Overview.....	466
7.8.2.2 SysML::Activities elements not mapped.....	467
7.8.2.3 Mapping Specifications.....	467
7.8.2.3.1 ProbabilityMetadataUsage_Mapping.....	467
7.8.2.3.2 ProbabilityMetadataUsageFeatureMembership_Mapping.....	468
7.8.2.3.3 ProbabilityMetadataUsageFeatureTyping_Mapping.....	468
7.8.2.3.4 ProbabilityMetadataUsageReferenceUsage_Mapping.....	469
7.8.2.3.5 ProbabilityMetadataUsageReferenceUsageFeatureValue_Mapping.....	470
7.8.2.3.6 ProbabilityMetadataUsageReferenceUsageRedefinition_Mapping.....	471
7.8.2.3.7 ProbabilityOwningMembership_Mapping.....	471
7.8.2.3.8 RateMetadataUsage_Mapping.....	472
7.8.2.3.9 RateMetadataUsageContinuousFeatureMembership_Mapping.....	473
7.8.2.3.10 RateMetadataUsageFeatureValue_Mapping.....	474
7.8.2.3.11 RateMetadataUsageContinuousReferenceUsage_Mapping.....	474
7.8.2.3.12 RateMetadataUsageContinuousReferenceUsageRedefinition_Mapping.....	475
7.8.2.3.13 RateMetadataUsageDiscreteFeatureMembership_Mapping.....	476
7.8.2.3.14 RateMetadataUsageDiscreteReferenceUsage_Mapping.....	476
7.8.2.3.15 RateMetadataUsageDiscreteReferenceUsageRedefinition_Mapping.....	477
7.8.2.3.16 RateMetadataUsageFeatureTyping_Mapping.....	478
7.8.2.3.17 RateOwningMembership_Mapping.....	478
7.8.2.3.18 Model Libraries.....	479
7.8.2.3.18.1 ControlValues.....	479
7.8.2.3.18.1.1 ControlValueKind.....	479
7.8.3 Allocations.....	479
7.8.3.1 Overview.....	479

7.8.3.2 SysML::Allocations elements not mapped .....	480
7.8.3.3 Mapping Specifications .....	480
7.8.3.3.1 AllocationDefinition_Mapping .....	480
7.8.3.3.2 AllocationDefinitionToFeatureMembership_Mapping.....	481
7.8.3.3.3 AllocationDefinitionFromFeatureMembership_Mapping .....	481
7.8.3.3.4 AllocationDefinitionFromFeatureTyping_Mapping .....	482
7.8.3.3.5 AllocationDefinitionFromReferenceUsage_Mapping .....	483
7.8.3.3.6 AllocationDefinitionToFeatureTyping_Mapping .....	483
7.8.3.3.7 AllocationDefinitionToReferenceUsage_Mapping.....	484
7.8.3.3.8 AllocationUsage_Mapping.....	485
7.8.4 Blocks.....	485
7.8.4.1 Overview .....	486
7.8.4.2 SysML::Blocks elements not mapped.....	486
7.8.4.3 Mapping Specifications .....	487
7.8.4.3.1 AssociationBlock_Mapping .....	487
7.8.4.3.2 BindingConnector_Mapping .....	487
7.8.4.3.3 Block_Mapping .....	488
7.8.4.3.4 EncapsulatedBlock_Mapping.....	489
7.8.4.3.5 EncapsulatedBlockMetadataMembership_Mapping.....	490
7.8.4.3.6 EncapsulatedBlockMetadata_Mapping.....	491
7.8.4.3.7 EncapsulatedBlockMetadataFeatureMembership_Mapping.....	492
7.8.4.3.8 EncapsulatedBlockMetadataFeatureTyping_Mapping .....	492
7.8.4.3.9 EncapsulatedBlockMetadataReferenceUsage_Mapping.....	493
7.8.4.3.10 EncapsulatedBlockMetadataFeatureValue_Mapping .....	493
7.8.4.3.11 EncapsulatedBlockMetadataRedefinition_Mapping.....	494
7.8.4.3.12 Part_Mapping .....	495
7.8.4.3.13 Model Libraries .....	496
7.8.4.3.13.1 PrimitiveValueTypes .....	496
7.8.4.3.13.1.1 Boolean.....	496
7.8.4.3.13.1.2 Complex.....	496
7.8.4.3.13.1.3 Integer.....	496
7.8.4.3.13.1.4 Number .....	496
7.8.4.3.13.1.5 Real.....	496
7.8.4.3.13.1.6 String .....	496
7.8.4.3.13.2 UnitAndQuantityKind .....	496
7.8.4.3.13.2.1 QuantityKind .....	496
7.8.4.3.13.2.2 Unit .....	496
7.8.5 ConstraintBlocks .....	496
7.8.5.1 Overview .....	496
7.8.5.2 Mapping Specifications .....	497
7.8.5.2.1 ConstraintBlock_Mapping .....	497
7.8.5.2.2 ConstraintParameter_Mapping.....	498
7.8.6 Model Elements .....	498
7.8.6.1 Overview .....	498
7.8.6.2 SysML::ModelElements elements not mapped.....	499
7.8.6.3 Mapping Specifications .....	499
7.8.6.3.1 ProblemRationaleMetadataFeatureMembership_Mapping.....	499
7.8.6.3.2 ProblemRationaleMetadataFeatureTyping_Mapping .....	500
7.8.6.3.3 ProblemRationaleMetadataReferenceUsage_Mapping.....	500
7.8.6.3.4 ProblemRationaleMetadataFeatureValue_Mapping .....	501
7.8.6.3.5 ProblemRationaleMetadataMembership_Mapping.....	502
7.8.6.3.6 Concern_Mapping .....	502
7.8.6.3.7 ConcernDocumentation_Mapping .....	504
7.8.6.3.8 ConcernOwningMembership_Mapping.....	504

7.8.6.3.9 ConcernStakeholderMembership_Mapping.....	505
7.8.6.3.10 ConcernStakeholderPartUsage_Mapping.....	506
7.8.6.3.11 ConcernStakeholderPartUsageFeatureTyping_Mapping.....	506
7.8.6.3.12 ConcernStakeholderPartUsageOwningMembership_Mapping.....	507
7.8.6.3.13 ConcernStakeholderPartUsageFeature_Mapping.....	508
7.8.6.3.14 ElementGroup_Mapping.....	508
7.8.6.3.15 ElementGroupMetadaMembership_Mapping.....	509
7.8.6.3.16 ElementGroupMetadataFeatureMembership_Mapping.....	510
7.8.6.3.17 ElementGroupMetadataFeatureTyping_Mapping.....	510
7.8.6.3.18 ElementGroupMetadataFeatureValue_Mapping.....	511
7.8.6.3.19 ElementGroupMetadataRedefinition_Mapping.....	512
7.8.6.3.20 ElementGroupMetadataReferenceUsage_Mapping.....	512
7.8.6.3.21 ElementGroupMetadataUsage_Mapping.....	513
7.8.6.3.22 ProblemRationale_Mapping.....	514
7.8.6.3.23 ProblemRationaleMetadataRedefinition_Mapping.....	515
7.8.6.3.24 ProblemRationaleMetadataUsage_Mapping.....	515
7.8.6.3.25 Stakeholder_Mapping.....	516
7.8.6.3.26 StakeholderMetadataUsage_Mapping.....	518
7.8.6.3.27 StakeholderMetadataFeatureMembership_Mapping.....	518
7.8.6.3.28 StakeholderMetadataFeatureTyping_Mapping.....	519
7.8.6.3.29 StakeholderMetadataOwningMembership.....	519
7.8.6.3.30 StakeholderMetadataReferenceUsage_Mapping.....	520
7.8.6.3.31 StakeholderMetadataReferenceUsageFeatureValue_Mapping.....	521
7.8.6.3.32 StakeholderMetadataReferenceUsageRedefinition_Mapping.....	521
7.8.6.3.33 Viewpoint_Mapping.....	522
7.8.6.3.34 ViewpointConcernReferenceSubsetting_Mapping.....	524
7.8.6.3.35 ViewpointConcernUsage_Mapping.....	524
7.8.6.3.36 ViewpointConstraintUsage_Mapping.....	525
7.8.6.3.37 ViewpointConstraintUsageDocumentation_Mapping.....	526
7.8.6.3.38 ViewpointConstraintUsageOwningMembership_Mapping.....	526
7.8.6.3.39 ViewpointFramedConcernMembership_Mapping.....	527
7.8.6.3.40 ViewpointLanguagesMetadataFeatureMembership_Mapping.....	528
7.8.6.3.41 ViewpointLanguagesMetadataFeatureValue_Mapping.....	528
7.8.6.3.42 ViewpointLanguagesMetadataRedefinition_Mapping.....	529
7.8.6.3.43 ViewpointLanguagesMetadataReferenceUsage_Mapping.....	529
7.8.6.3.44 ViewpointMetadataFeatureTyping_Mapping.....	530
7.8.6.3.45 ViewpointLanguagesMetadataOperatorExpression_Mapping.....	531
7.8.6.3.46 ViewpointMetadataOwningMembership_Mapping.....	531
7.8.6.3.47 ViewpointMetadataUsage_Mapping.....	532
7.8.6.3.48 ViewpointPresentationsMetadataFeatureMembership_Mapping.....	533
7.8.6.3.49 ViewpointPresentationsMetadataFeatureValue_Mapping.....	533
7.8.6.3.50 ViewpointPresentationsMetadataOperatorExpression_Mapping.....	534
7.8.6.3.51 ViewpointPresentationsMetadataRedefinition_Mapping.....	535
7.8.6.3.52 ViewpointPresentationsMetadataReferenceUsage_Mapping.....	535
7.8.6.3.53 ViewpointRenderingFeatureMembership_Mapping.....	536
7.8.6.3.54 ViewpointRenderingUsage_Mapping.....	537
7.8.6.3.55 ViewpointRenderingUsageActionUsage_Mapping.....	537
7.8.6.3.56 ViewpointRenderingUsageActionUsageFeatureMembership_Mapping.....	538
7.8.6.3.57 ViewpointRenderingUsageActionUsageFeatureTyping_Mapping.....	538
7.8.6.3.58 ViewpointRequirementConstraintMembership_Mapping.....	539
7.8.6.3.59 ViewpointSatisfyFeatureMembership_Mapping.....	539
7.8.6.3.60 ViewpointSatisfyRequirementUsage_Mapping.....	540
7.8.6.3.61 ViewpointSatisfyRequirementUsageReferenceSubsetting_Mapping.....	541
7.8.6.3.62 ViewpointViewpointUsage_Mapping.....	541

7.8.6.3.63 ViewpointViewpointUsageFeatureMembership_Mapping.....	542
7.8.7 PortsAndFlows.....	543
7.8.7.1 Overview.....	543
7.8.7.2 SysML::Ports&Flows elements not mapped.....	543
7.8.7.3 Mapping Specifications.....	544
7.8.7.3.1 AcceptChangeStructuralFeatureEventAction_Mapping.....	544
7.8.7.3.2 CommonFullPort_Mapping.....	544
7.8.7.3.3 FeatureDirectionKind.....	545
7.8.7.3.4 FlowDirectionKind.....	546
7.8.7.3.5 FullPort_Mapping.....	546
7.8.7.3.6 FullPortMetadata_Mapping.....	547
7.8.7.3.7 FullPortMetadataFeatureMembership_Mapping.....	547
7.8.7.3.8 FullPortMetadataFeatureTyping_Mapping.....	548
7.8.7.3.9 FullPortMetadataOwningMembership_Mapping.....	548
7.8.7.3.10 FullPortMetadataReferenceUsage_Mapping.....	549
7.8.7.3.11 FullPortMetadataReferenceUsageFeatureValue_Mapping.....	550
7.8.7.3.12 FullPortMetadataReferenceUsageRedefinition_Mapping.....	550
7.8.7.3.13 FullPortUntyped_Mapping.....	551
7.8.7.3.14 InterfaceBlock_Mapping.....	552
7.8.7.3.15 ItemFlow_Mapping.....	552
7.8.7.3.16 ItemFlowFeatureMembership_Mapping.....	553
7.8.7.3.17 ItemFlowItemFeature_Mapping.....	554
7.8.7.3.18 ItemFlowItemFeatureTyping_Mapping.....	555
7.8.7.3.19 ItemFlowSourceEndFeatureMembership_Mapping.....	555
7.8.7.3.20 ItemFlowSourceFeature_Mapping.....	556
7.8.7.3.21 ItemFlowSourceFeatureSubsetting_Mapping.....	557
7.8.7.3.22 ItemFlowTargetEndFeatureMembership_Mapping.....	557
7.8.7.3.23 ItemFlowTargetFeature_Mapping.....	558
7.8.7.3.24 ItemFlowTargetFeatureSubsetting_Mapping.....	559
7.8.7.3.25 OperationDirectedFeature_Mapping.....	559
7.8.8 Requirements.....	560
7.8.8.1 Overview.....	560
7.8.8.2 SysML::Requirements elements not mapped.....	561
7.8.8.3 Mapping Specifications.....	561
7.8.8.3.1 DeriveReq_Mapping.....	561
7.8.8.3.2 DeriveReqFeatureTyping_Mapping.....	562
7.8.8.3.3 DeriveReqSourceEndFeatureMembership_Mapping.....	562
7.8.8.3.4 DeriveReqSourceFeature_Mapping.....	563
7.8.8.3.5 DeriveReqSourceFeatureReferenceSubsetting_Mapping.....	564
7.8.8.3.6 DeriveReqTargetEndFeatureMembership_Mapping.....	564
7.8.8.3.7 DeriveReqTargetFeature_Mapping.....	565
7.8.8.3.8 DeriveReqTargetFeatureReferenceSubsetting_Mapping.....	565
7.8.8.3.9 Refine_Mapping.....	566
7.8.8.3.10 RefineAnnotation_Mapping.....	567
7.8.8.3.11 RefineMetadataFeatureMembership_Mapping.....	568
7.8.8.3.12 RefineMetadataReferenceUsage_Mapping.....	568
7.8.8.3.13 RefineMetadataReferenceUsageFeatureValue_Mapping.....	569
7.8.8.3.14 RefineMetadataReferenceUsageRedefinition_Mapping.....	570
7.8.8.3.15 RefineMetadataUsage_Mapping.....	570
7.8.8.3.16 RefineMetadataUsageFeatureTyping_Mapping.....	571
7.8.8.3.17 Requirement_Mapping.....	571
7.8.8.3.18 RequirementDocumentation_Mapping.....	573
7.8.8.3.19 RequirementDocumentationMembership_Mapping.....	573
7.8.8.3.20 RequirementSubject_Mapping.....	574



7.8.8.3.21 RequirementSubjectMembership_Mapping .....	575
7.8.8.3.22 Satisfy_Mapping .....	575
7.8.8.3.23 SatisfyReferenceUsage_Mapping .....	576
7.8.8.3.24 SatisfyReferenceUsageFeatureMembership_Mapping .....	577
7.8.8.3.25 SatisfySubjectReferenceUsage_Mapping .....	578
7.8.8.3.26 SatisfySubjectReferenceUsageValue_Mapping .....	579
7.8.8.3.27 SatisfySubjectReferenceUsageValueFeature_Mapping .....	579
7.8.8.3.28 SatisfySubjectReferenceUsageFeatureChaining_Mapping .....	580
7.8.8.3.29 SatisfySubjectReferenceUsageValueFeatureChainingProperty_Mapping .....	580
7.8.8.3.30 SatisfySubjectReferenceUsageFeatureValue_Mapping .....	581
7.8.8.3.31 SatisfySubjectReferenceUsageValueOwningMembership_Mapping .....	582
7.8.8.3.32 SatisfySubjectSubjectMembership_Mapping .....	582
7.8.8.3.33 SatisfyFeatureTyping_Mapping .....	583
7.8.8.3.34 SatisfyReferenceUsageFeatureTyping_Mapping .....	584
7.8.8.3.35 TestCaseActivity_Mapping .....	584
7.8.8.3.36 TestCaseActivityReturnParameterMembership_Mapping .....	585
7.8.8.3.37 TestCaseVerifyObjectiveMembership_Mapping .....	586
7.8.8.3.38 TestCaseVerifyObjectiveRequirementUsage_Mapping .....	586
7.8.8.3.39 TestCaseVerifyRequirementUsageReferenceSubsetting_Mapping .....	587
7.8.8.3.40 TestCaseVerifyRequirementUsage_Mapping .....	587
7.8.8.3.41 Trace_Mapping .....	588
7.8.8.3.42 TraceAnnotation_Mapping .....	589
7.8.8.3.43 TraceMetadataFeatureMembership_Mapping .....	590
7.8.8.3.44 TraceMetadataReferenceUsage_Mapping .....	590
7.8.8.3.45 TraceMetadataReferenceUsageFeatureValue_Mapping .....	591
7.8.8.3.46 TraceMetadataReferenceUsageRedefinition_Mapping .....	591
7.8.8.3.47 TraceMetadataUsage_Mapping .....	592
7.8.8.3.48 TraceMetadataUsageFeatureTyping_Mapping .....	593
7.8.8.3.49 Verify_Mapping .....	593
7.8.8.3.50 Model Libraries .....	594
7.8.8.3.50.1 Verdicts .....	594
7.8.8.3.50.1.1 VerdictKind .....	594

# List of Tables

1. List of all mappings .....	110
2. List of SysML v1 elements not mapped of this section .....	112
3. List of all mappings .....	239
4. List of SysML v1 elements not mapped of this section .....	240
5. List of all mappings .....	282
6. List of all mappings .....	318
7. List of SysML v1 elements not mapped of this section .....	319
8. List of all mappings .....	325
9. List of all mappings .....	325
10. List of all mappings .....	338
11. List of all mappings .....	345
12. List of SysML v1 elements not mapped of this section .....	345
13. List of all mappings .....	359
14. List of SysML v1 elements not mapped of this section .....	359
15. List of all mappings .....	382
16. List of all mappings .....	398
17. List of all mappings .....	408
18. List of all mappings .....	434
19. List of SysML v1 elements not mapped of this section .....	435
20. List of all mappings .....	444
21. List of SysML v1 elements not mapped of this section .....	445
22. List of all mappings .....	466
23. List of SysML v1 elements not mapped of this section .....	467
24. List of all mappings .....	480
25. List of SysML v1 elements not mapped of this section .....	480
26. List of all mappings .....	486
27. List of SysML v1 elements not mapped of this section .....	486
28. List of all mappings .....	496
29. List of all mappings .....	498
30. List of SysML v1 elements not mapped of this section .....	499
31. List of all mappings .....	543
32. List of SysML v1 elements not mapped of this section .....	543
33. List of all mappings .....	560
34. List of SysML v1 elements not mapped of this section .....	561





# 0 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<sup>®</sup> (MDA<sup>®</sup>), 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<sup>®</sup> (Unified Modeling Language<sup>™</sup>); CORBA<sup>®</sup> (Common Object Request Broker Architecture); CWM<sup>™</sup> (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 the OMG website at: <https://www.omg.org/spec>

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 PostScript and 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](mailto:pubs@omg.org)

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

## 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, Report an Issue.



# 1 Scope

This specification describes a transformation for a semantic translation from SysML v1 [SysMLv1] to SysML v2 [SysMLv2] in a precise way. (In this document, "SysML v1" refers to SysML v1.7, the last version of SysML prior to v2.0, and "SysML v2" refers to SysML v2.0, or whatever version corresponds to the current version of this specification.)

The main intent is to provide the rules on which automated conversions of SysML v1 models to the SysML v2 standard can be developed. In addition, this annex can be considered an educational document that provides useful information for people who would like to compare using SysML v2 and using SysML v1.

More sophisticated applications of this transformation can also be envisaged. For instance, a SysML v1 conformant tool could use this transformation to implement a limited subset of the SysML v2 API that will provide "SysMLv2-like" read-only access to its SysMLv1 models for external applications.





## 2 Conformance

A tool shall demonstrate *conformance* with this specification by meeting all of the following requirements.

1. The tool shall implement the UML4SysML abstract syntax and SysML v1 profile conformant with [SysMLv1]. The tool should, but is not required, to provide the ability to import a SysML v1 model using standard XMI Model Interchange format [XMI].
2. The tool shall implement the SysML v2 abstract syntax conformant with [SysML v2]. The tool should, but is not required, to provide the ability to export a SysML v2 model KerML-standard model interchange project (see [KerML], Clause 10; see also [SysML v2], Clause 2).
3. The tool shall implement a transformation from an abstract syntax representation of an input SysML v1 model to the abstract syntax representation of an output SysML v2, as specified in [Clause 7](#) of this specification.

A tool may claim *partial conformance* with this specification by satisfying the first two requirements above, but only implementing an identified subset of the mappings specified in [7.7](#) and [7.8](#). (Note that care must also be taken that certain mappings depend on other mappings, and so cannot reasonably be implemented separately.)

**Note.** A tool that conforms to [SysMLv2] is not required to necessarily implement a transformation conformant with this specification, or it may implement a SysML v1 to v2 transformation that is not claimed to conform with the transformation defined in this specification.



## 3 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this specification.

[KerML] *Kernel Modeling Language (KerML)*, Version 1.0  
<https://www.omg.org/spec/KerML/1.0>

[MOF] *Meta Object Facility*, Version 2.5.1  
<https://www.omg.org/spec/MOF/2.5.1>

[OCL] *Object Constraint Language*, Version 2.4  
<https://www.omg.org/spec/OCL/2.4>

[SysML v1] *OMG Systems Modeling Language (SysML)*, Version 1.7  
<https://www.omg.org/spec/SysML/1.7>

[SysML v2] *OMG Systems Modeling Language (SysML)*, Version 2.0  
<https://www.omg.org/spec/SysML/2.0>

[UML] *Unified Modeling Language (UML)*, Version 2.5.1  
<https://www.omg.org/spec/UML/2.5.1>

[XMI] *XML Metadata Interchange*, Version 2.5.1  
<https://www.omg.org/spec/XMI/2.5.1>



## 4 Terms and Definitions

Various terms and definitions are specified throughout the body of this specification.



## 5 Symbols

No special symbols are defined in this specification.





# 6 Introduction

## 6.1 Mapping Approach

The SysML v1 to v2 transformation is specified by directional mappings between UML metaclasses or stereotypes that are part of the SysML v1 specification [SysMLv1] (referenced below as the "SysML v1 scope") on the one hand, and the set of the metaclasses defined in the KerML [KerML] and SysMLv2 [SysMLv2] specifications (referenced below as "SysML v2") in the other hand. Some library classes are also involved.

Each mapping is a directed relationship that reifies a semantic link between a concept belonging to the SysML v1 scope on the source side and one concept belonging to SysML v2 (or one conforming library element) on the target side. As a set, those mappings constitute a declarative specification of a formal transformation that describes how the information encoded by the SysML v1 concepts can be reliably represented using constructs of SysML v2 metaclass instances.

In this approach, a mapping is represented by a UML class that has a pair of associations. One provides the `from` end that designates the source SysML v1 concept, while the other provides the `to` end that designates the target SysML v2 metaclass.

In addition to those associations, a mapping class provides a set of operations defining how the values of non-derived properties of the target metaclass instance have to be computed based on property values reachable from the source object. The computation algorithm is provided by the body condition of those operations and expressed using OCL code.

Note that the values assigned to the properties of the target object shall be instances of SysML v2 metaclasses, coming themselves from transformations of SysMLv1 objects to SysMLv2 objects. Since the specification is declarative, the order in which the individual transformations shall happen is not imposed. It is up to a conforming implementation to deal with this. Instead, the `getMapped` static operation is provided for referring to the result of a transformation from within an OCL rule. It returns a (possibly undefined) value, that is typed by the target metaclass of the mapping class from which it is invoked.

Each mapping class enables the transformation of any object that has the type specified by the `from` role to an object of the type specified by the `to` role, as long as it is not overloaded by a more specific mapping definition. In other words, assume a mapping is specified for the class `A` (i.e., it has `A` typing its `from` property), then it applies to any instance of a class `B` if `B` is a subclass of `A` and if there is no specialization of that mapping class specified for `B` (i.e., that has `B` typing its `from` property).

It is possible to restrict the applicability of a mapping specification to a specific subset of objects. This is achieved by the `filter` static operation that is evaluated against each candidate object. Only objects of the appropriate type for which this `filter` operation returns `true` shall be translated according to the specifications of that mapping class. The default `filter` operation always returns `true`.

Some mapping classes have one or more qualifiers for their `to` attribute. In such a case, each of those qualifiers reflects the specific property of the source type (i.e. the type of the `from` attribute) that has the same name and the same type. For those specific mappings, it is expected to get one instance of the target class (as specified by the type of the `to` attribute") for each actual combination of value of those properties for a given instance of object of the source type, assuming they pass the applicability filter as described above.

## 6.2 Acknowledgements

The primary authors of this specification document (and also developers of a proof-of-concept implementation of it) are:

- Yves Bernard, Airbus
- Tim Weilkiens, oose

The specification was formally submitted for standardization by the following organizations:

- 88solutions Corporation
- Dassault Systèmes
- GfSE e.V.
- IBM
- INCOSE
- Intercax LLC
- Lockheed Martin Corporation
- MITRE
- Model Driven Solutions, Inc.
- PTC
- Simula Research Laboratory AS
- Thematrix Partners LLC

However, work on the specification was also supported by over 200 people in over 80 organizations that participated in the SysML v2 Submission Team (SST), by contributing use cases, providing critical review and comment, and validating the language design. The following individuals had leadership roles in the SST:

- Manas Bajaj, Intercax LLC (API and services development lead)
- Yves Bernard, Airbus (v1 to v2 transformation co-lead)
- Bjorn Cole, Lockheed Martin Corporation (metamodel development co-lead)
- Sanford Friedenthal, SAF Consulting (SST co-lead, requirements V&V lead)
- Charles Galey, Lockheed Martin Corporation (metamodel development co-lead)
- Karen Ryan, Siemens (metamodel development co-lead)
- Ed Seidewitz, Model Driven Solutions (SST co-lead, pilot implementation lead)
- Tim Weilkiens, oose (v1 to v2 transformation co-lead)

The specification was prepared using CATIA No Magic modeling tools and the OpenMBEE system for model publication (<http://www.openmbee.org>), with the invaluable support of the following individuals:

- Tyler Anderson, No Magic/Dassault Systèmes
- Christopher Delp, Jet Propulsion Laboratory
- Ivan Gomes, Twingineer
- Doris Lam, Jet Propulsion Laboratory
- Robert Karban, Jet Propulsion Laboratory
- Christopher Klotz, No Magic/Dassault Systèmes
- John Watson, Lightstreet Consulting

# 7 Mappings

## 7.1 Overview

This Clause is organized in order to match the packages that subdivide the model of the transformation. The `Foundations` package gathers the abstract classes that represent the concepts on top of which the mapping approach is built. The next subclause presents a utility class named `Helper` that provides reusable operations that simplify the OCL statements defining the computation rules of target properties and make them more readable. Libraries play an important role in SysML v2, and a specific one has been created in order to represent semantics equivalent to those of UML/SysML concepts, where needed. It is presented in this subclause as well.

The three next subclauses are dedicated to initializers, factories and generic mappings, respectively. They do not specify mappings, strictly speaking. Instead, they factorize more or less advanced OCL code that will be reused by the actual mapping specifications that are contained in the two last subclauses. The first of them is dedicated to UML metaclass from the UML4SYSML scope, while the second deals with SysML stereotypes more specifically.

## 7.2 Foundations

### 7.2.1 Overview

The concepts defined by KerML/SysML v2 are relatively similar to those of UML/SysML v1, but the ways they are built are different. This makes the specification of the global transformation quite complex. In order to keep it manageable, specific kinds of foundational classes are provided. They represent concepts on which classical "model to model" transformation technologies rely:

- The mappings built on top of the abstract class `Mapping` shall be executed only when they are explicitly called. Each call shall produce a new target element, whatever the source element. It specifies a `from` property typed by the `UML::CommonStructure::Element` metaclass that shall be redefined by any of its subclass for specifying the convenient type of source element. Also it specifies a default (neutral) filter and a set of `getMapped` operations for various purposes: regular mapping result, qualified mapping result and mapping result for a collection of elements.
- The mappings built on top of the abstract class `UniqueMapping`, specified as a specialization of the `Mapping` class, shall produce only one target element for a given source element, whatever the number of time they are called.
- The mappings built on top of the abstract class `MainMapping`, specified as a specialization of the `UniqueMapping` class, shall be systematically executed (i.e. implicitly called) for all the elements that match both their source type and filter. There can be at most one main mapping for a given source type and only one target element shall be produced for a given source element.

The corresponding classes are located the the `Foundations` package.

Sometimes, it is necessary to be able to generate elements in the target model without having to provide an explicit link with a source element. In such a case, a mapping class is not appropriate. Instead the mapping framework provides the concept of a `Factory`.

Last, the concept of an `Initializer` allows the factorization of the specification of properties' default values that can be inherited by mappings and factories, as convenient.

In the model of the transformation that is specified here, all of the abstract classes of this `Foundations` package are subject to direct or indirect subclassing. In other words, this specification is built as a set of interrelated initializers, factories, regular, unique and main mappings, where the initializers' operation factorizes the specification of default

values for their target element, wherever possible. Those "default operations" are either used as-is or redefined by mappings or factories that can inherit for a specific initializer, as appropriate.

## 7.2.2 Foundational class specifications

### 7.2.2.1 Factory

#### Description

Similarly to the well-known to the homonyms software design pattern, a Factory can be used for specifying the production of a target element without any link with a source element. Factories have in common with mapping classes the operations that specify how the properties of the target element shall be computed and the "to" property that specifies the type of the target element. However factories do not define source element. Instead, they can have parameters. Those parameters, if any, shall be specified by properties with appropriate types and multiplicities. Factories are expected to provide a "create" operation with parameters matching in type and multiplicity the properties that are intended to specify them.

#### Generalizations

- Initializer (from Foundations)

### 7.2.2.2 Initializer

#### Description

The abstract class Initializer is the common ancestor of Mapping and Factory. It specifies a "to" property typed by the KerML::Root::Element metaclass that shall be redefined by any of its subclass for specifying the convenient type of target element. Initializers are intended to specify reusable properties' computation rules, mainly for initializing them with default values. Those rules will be inherited or redefined by the sub-classes, as appropriate.

#### Attributes

- /inputs [0..\*]

#### Association Ends

- to : Element [1]

### 7.2.2.3 MainMapping

#### Description

The mappings built on top of the abstract class MainMapping are a specific kind of UniqueMappings class that are always implicitly called for any element in the source model that match both their source type (as specified by their "from" property) and their filter condition. If more than one main mapping is specified for a given source type, they shall have filters that specify mutually exclusive conditions. Also, as with any unique mapping, only one target element shall be produced for a given source element.

#### Generalizations

- UniqueMapping (from Foundations)

### 7.2.2.4 Mapping

#### Description

This is the generic abstract class that provides the basic features of any mapping class mapping. The mappings built on top of the abstract class Mapping are intended to be executed only when explicitly called (e.g. by the rule of another mapping class). It specifies a "from" property typed by the UML::CommonStructure::Element metaclass that shall be redefined by any of its subclass for specifying the convenient type of source element. Also it specifies a default (neutral) filter and a set of getMapped operations for various purposes: regular mapping result, qualified mapping result and mapping result for a collection of elements. Each call to the getMapped operation shall produce a new target element, whatever the source element provided. Instances of Mapping class are represent a link between one source element and the target element produced by the transformation specified by that mapping class.

## Generalizations

- Initializer (from Foundations)

## Association Ends

- from : Element [1]

## Operations

- filter (in src : Element) : Boolean [1]  
returns "true" if the element provided as the actual parameter value can have a mapping to an instance of the type specified by the "to" attribute (i.e. can be used as a value for the "from" attribute)

```
true
```

- getMapped (in fromVar : Element) : Element [1]

### postConditions:

```
self.filter(fromVar) and
self.to.allFeatures()->selectByKind(UML::Property)->reject(isDerived)
->forall(p | let ops: Operation = self.allFeatures()
    ->selectByKind(UML::Operation)->any(o | o.name = p.name) in
    p = ops()) and
result = self.to
```

- getMapped (in fromVar : Element, in qual : Element) : Element [1]

### postConditions:

```
self.filter(fromVar) and
self.to.allFeatures()->selectByKind(UML::Property)->reject(isDerived)
->forall(p | let ops: Operation = self.allFeatures()
    ->selectByKind(UML::Operation)->any(o | o.name = p.name) in
    if ops.ownedParameter
        ->select(p | p.direction = UML::ParameterDirectionKind::_'in')
        ->size()=1 then
        p = ops(qual)
    else if ops.ownedParameter
        ->select(p | p.direction = UML::ParameterDirectionKind::_'in')
        ->size()=0 then
        p = ops()
    else
        invalid
```

```

        endif endif) and
result = self.to

```

- `getMappedColl (in fromColl : Element) : Element [0..*]`

**postConditions:**

```

result = fromColl->collect(e | self.getMapped(e))

```

### 7.2.2.5 UniqueMapping

#### Description

The mappings built on top of the abstract class `UniqueMapping` are a specific kind of `Mappings` that are intended to produce only one target element for a given source element, whatever the number of time they are called. If a `getMapped` is called several time with the same source element, the target element returned shall always be the same.

#### Generalizations

- `Mapping` (from Foundations)

## 7.3 Mapping Helper and Library

### 7.3.1 Helper

#### Description

The Helper class contains operations that are used by multiple mapping classes. The specification is in the `bodyCondition`.

#### Operations

- `actionOwnedRelationship (in src : Element) : Relationship [0..*]`  
Reusable mapping rule for owned relationships of a `UML4SysML::Action` mapping.

```

let actionInputPin: Set(UML::Element) =
    src.ownedElement->select(e | e.ocIsTypeOf(UML::ActionInputPin)) in
let triggers: Set(UML::Element) =
    src.ownedElement->select(e | e.ocIsKindOf(UML::Trigger)) in
let toElementFMS: Set(UML::Element) =
    src.ownedElement->select(e | e.ocIsKindOf(UML::Pin)) in
let toElementOMS: Set(UML::Element) =
    (((src.ownedElement - toElementFMS) - actionInputPin) - triggers) in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))

```

- `activityOwnedRelationship (in src : Element) : Relationship [0..*]`  
Reusable mapping rule for owned relationships of a `UML4SysML::Activity` mapping.

```

let initialNodes : Set(UML::Element) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::InitialNode)) in
let finalNodes : Set(UML::Element) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::FinalNode)) in
let elementsFMS : Set(UML::Element) =
  ((src.ownedElement->select(e | e.ocIsKindOf(UML::ControlNode) or
  e.ocIsKindOf(UML::Action) or e.ocIsKindOf(UML::ControlFlow) or
  e.ocIsKindOf(UML::ObjectFlow) or e.ocIsKindOf(UML::Property))
  - initialNodes) - finalNodes) in
let parameters: Set(UML::Parameter) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::Parameter)) in
let ignoreParameterNodes: Set(UML::ActivityParameterNode) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::ActivityParameterNode)) in
let ignoreActivityPartition: Set(UML::ActivityPartition) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::ActivityPartition)) in
let ignoreInterruptibleActivityRegion: Set(UML::InterruptibleActivityRegion) =
  src.ownedElement
  ->select(e | e.ocIsKindOf(UML::InterruptibleActivityRegion)) in
let ownedClassifier: Sequence(UML::Classifier) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::Classifier)) in
let variables: Sequence(UML::Variable) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::Variable)) in
let parameterSets: Set(UML::ParameterSet) =
  src.ownedElement->select(e | e.ocIsKindOf(UML::ParameterSet)) in
let elementsOMS: Set(UML::Element) =
  ((((((((((src.ownedElement-initialNodes)-finalNodes)-elementsFMS)-parameters)-
  ignoreParameterNodes)-ignoreActivityPartition)-
  ignoreInterruptibleActivityRegion)-ownedClassifier)-variables)-
  parameterSets)-Set{from.classifierBehavior}) in
let memberships : Sequence(UML::Element) =
  elementsOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
  ->union(initialNodes->collect(e | InitialNodeMembership_Mapping.getMapped(e)))
  ->union(finalNodes->collect(e | FlowFinalNodeMembership_Mapping.getMapped(e)))
  ->union(elementsFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
  ->union(variables->collect(e | VariableMembership_Mapping.getMapped(e)))
  ->union(parameterSets->collect(e | ParameterSetMembership_Mapping.getMapped(e)))
  ->union(ownedClassifier
  ->collect(e | ElementOwningMembership_Mapping.getMapped(e))) in
if src.classifierBehavior.ocIsUndefined() then
  memberships
else
  memberships
  ->append(ClassifierBehaviorFeatureMembership_Mapping.getMapped(src))
endif

```

- `createUUID () : String [1]`  
Creates a UUID. The specification is implementation-specific and therefore cannot provided here.
- `getAppliedStereotypes (in element : Element) : Stereotype [0..*]`  
Returns the list of applied stereotypes. The specification is implementation-specific and therefore cannot provided here.
- `getEnumerationType (in t : Enumeration) : EnumerationDefinition [1]`  
Maps a given UML4SysM::Enumeration to the appropriate SysML v2 EnumerationDefinition.

```

let enum: SYSML2::EnumerationDefinition =
  Enumeration_Mapping.getMapped(t) in

```

```

if enum.oclIsKindOf(SYSML2::EnumerationDefinition) then
  enum
else if t.name = 'VerdictKind' then
  SYSML2::EnumerationDefinition.allInstances()
  ->any(e | e.qualifiedName = 'VerificationCases::VerdictKind')

  else if t = UML::ParameterDirectionKind then
    KerML::FeatureDirectionKind

    else if t.qualifiedName =
      'SysML::Libraries::ControlValues::ControlValueKind' then
      SYSML2::EnumerationDefinition.allInstances()
      ->any(e | e.qualifiedName =
        'SysMLv1Library::Enumerations::ControlValueKind')

    else
      SYSML2::EnumerationDefinition.allInstances()
      ->any(e | e.qualifiedName =
        'SysMLv1Library::Enumerations::' + t.name)
    endif
  endif
endif
endif
endif

```

- **getFlowDirectionKind (in v : EnumerationLiteral) : FeatureDirectionKind [1]**  
Maps a given SysMLv1 feature direction enumeration literal to a SysML v2 FeatureDirectionKind enumeration literal.

```

if v.enumeration.qualifiedName =
  'SysML::Ports&Flows::FlowDirectionKind' then
  if v = SysML::FlowDirectionKind::_'out' then
    KerML::FeatureDirectionKind::_'out'
  else if (v = SysML::FlowDirectionKind::_'in') then
    KerML::FeatureDirectionKind::_'in'
  else if (v = SysML::FlowDirectionKind::inout) then
    KerML::FeatureDirectionKind::inout
  else
    invalid
  endif endif endif
else
  invalid
endif

```

- **getID (in src : Element) : String [1]**  
Returns the identifier of a UML4SysML::Element. The specification is implementation-specific and therefore cannot be provided here.
- **getKerMLFeatureDirectionKind (in v : EnumerationLiteral) : FeatureDirectionKind [1]**  
Maps a given SysMLv1 feature direction enumeration literal to a SysML v2 FeatureDirectionKind enumeration literal.

```

if v.enumeration.qualifiedName =
  'SysML::Ports&Flows::FeatureDirectionKind' or
  v.enumeration.qualifiedName = 'SysML::Ports&Flows::FeatureDirection' then
  if v = SysML::FeatureDirectionKind::provided then
    KerML::FeatureDirectionKind::_'out'
  endif
endif

```



```

else if (v = SysML::FeatureDirectionKind::required) then
    KerML::FeatureDirectionKind::_in'
else if (v = SysML::FeatureDirectionKind::providedRequired) then
    KerML::FeatureDirectionKind::inout
else
    invalid
endif endif endif
else
    invalid
endif

```

- **getKerMLParameterDirectionKind (in v : ParameterDirectionKind) : FeatureDirectionKind [1]**  
Maps a given SysMLv1 parameter direction enumeration literal to a SysML v2 FeatureDirectionKind enumeration literal.

```

if v = UML::ParameterDirectionKind::_in' then
    KerML::FeatureDirectionKind::_in'
else if (v = UML::ParameterDirectionKind::return) then
    KerML::FeatureDirectionKind::out
else if (v = UML::ParameterDirectionKind::out) then
    KerML::FeatureDirectionKind::out
else if (v = UML::ParameterDirectionKind::inout) then
    KerML::FeatureDirectionKind::inout
else
    invalid
endif endif endif endif

```

- **getKerMLVisibilityKind (in v : VisibilityKind) : VisibilityKind [1]**  
Maps a given UML4SysML::VisibilityKind enumeration literal to a SysML v2 VisibilityKind enumeration literal.

```

if (v = UML::VisibilityKind::public) then
    KerML::VisibilityKind::public
else if (v = UML::VisibilityKind::protected) then
    KerML::VisibilityKind::protected
else if (v = UML::VisibilityKind::private) then
    KerML::VisibilityKind::private
else if (v = UML::VisibilityKind::package) then
    KerML::VisibilityKind::public
else
    invalid
endif endif endif endif

```

- **getMetadataByName (in mdName : String) : AttributeDefinition [1]**  
Returns the metadata attribute definition element for a given metadata name.

```

SYSML2::AttributeDefiniton.allInstances()->any(e | e.name = mdName)

```

- **getRequirementStereotype (in element : NamedElement) : Stereotype [0..1]**  
Returns the requirement stereotype for a given element.

```

let stereotypes: Set(UML::Stereotype) =
    Helper.getAppliedStereotypes(element) in

```

```

stereotypes->any(s | s.general->collect(g | g.qualifiedName)
->includes('SysML::Requirements::AbstractRequirement'))

```

- `getScalarValueType (in t : DataType) : DataType [1]`  
Maps a given SysMLv1 primitive type to a SysMLv2 scalar value type.

```

if t.name = 'UnlimitedNatural' then
  SYSML2::DataType.allInstances()
  ->any(e | e.qualifiedName = 'ScalarValues::Natural')
else
  SYSML2::DataType.allInstances()
  ->any(e | e.qualifiedName = 'ScalarValues::' + t.name)
endif

```

- `getScalarValueTypeByName (in ptName : String) : DataType [1]`  
Maps a given SysMLv1 primitive type name string to a SysMLv2 scalar value type.

```

SYSML2::DataType.allInstances()
->any(e | e.qualifiedName = 'ScalarValues::' + ptName)

```

- `getTagValue (in element : Element, in stereotypeName : String, in tagValueName : String) [1]`  
Returns the value of a stereotype property. The specification is implementation-specific and therefore cannot provided here.
- `getTagValueAsElement (in element : Element, in stereotypeName : String, in tagValueName : String) : Element [1]`  
Returns the value of a stereotype property. The specification is implementation-specific and therefore cannot provided here.
- `getTagValueAsElementColl (in element : Element, in stereotypeName : String, in tagValueName : String) : Element [0..*]`  
Returns the value of a stereotype property as a collection. The specification is implementation-specific and therefore cannot provided here.
- `getTagValueAsString (in element : Element, in stereotypeName : String, in tagValueName : String) : String [1]`  
Returns the value of a stereotype property as a string. The specification is implementation-specific and therefore cannot provided here.
- `getTagValueAsStringColl (in element : Element, in stereotypeName : String, in tagValueName : String) : String [0..*]`  
Returns the value of a stereotype property as a string collection. The specification is implementation-specific and therefore cannot provided here.
- `globalNamespace () : Namespace [1]`

```

KerML::Package.allInstances()->any(p | p.owningNamespace->isEmpty())

```

- `hasMainMapping (in element : Element) : Boolean [1]`
- `hasStereotypeApplied (in element : Element, in stereotypeName : String) : Boolean [1]`  
Returns true if the given stereotype is applied to the element. The specification is implementation-specific

and therefore cannot provided here.

- `isConnectionDef (in association : Association) : Boolean [1]`  
Checks if a UML4SysML::Association is mapped to a SysML v2 ConnectionDefinition.

```
-- Case 1: composite association with
-- multiplicity 1..1 on owner side
let case1: Boolean = association.memberEnd
->exists(e | not e.isComposite and e.lower=1) and
association.memberEnd->exists(e | e.isComposite) in

-- Case 2: association is not composite and
-- there is no owned end with multiplicity 0..*
let case2: Boolean = not association.memberEnd
->exists(e | e.isComposite) and
not association.ownedEnd
->exists(e | e.lower = 0 and e.upper = -1) in

association.oclIsTypeOf(UML::AssociationClass) or
case1 or
case2
```

- `isInScope (in element : Element) : Boolean [1]`  
The `isInScope` operation is intended to define the scope on which the transformation will apply. If the `isInScope` operation return "true" for a given model element, this element shall be consider by the transformation. Especially, main mappings - if any - will apply to it. It shall be ignored otherwise.
- `isRequirement (in element : Element) : Boolean [1]`  
Checks whether the stereotype `AbstractRequirement` is applied to the given element.

```
let stereotypes: Set(UML::Stereotype) =
  Helper.getAppliedStereotypes(element) in
stereotypes->exists(s | s.general->collect(g | g.qualifiedName)
->includes('SysML::Requirements::AbstractRequirement'))
```

- `packageOwnedRelationship (in src : Element) : Relationship [0..*]`  
Reusable mapping rule for owned relationships of a UML4SysML::Package mapping.

```
let useCaseAssociations : Set(UML::Association) =
  src.ownedType->select(e | e.oclIsKindOf(UML::Association))
->select(a | a.memberEnd->exists(e | e.type.oclIsKindOf(UML::UseCase))) in
let unmappedAssociations : Set(UML::Association) =
  src.ownedType->select(e | e.oclIsKindOf(UML::Association))
->reject(a | Helper.isConnectionDef(a)) in
let imports: Set(UML::PackageImport) =
  src.packageImport->select(pi | Helper.isInScope(pi.importedPackage)) in
let relationships: Set(SysMLv2::Relationship) =
  src.ownedComment->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(((src.ownedType-useCaseAssociations)-unmappedAssociations)
->collect(e | ElementOwningMembership_Mapping.getMapped(e)))
->union(imports->collect(i | PackageImport_Mapping.getMapped(i)))
->union(src.ownedElement->select(e | e.oclIsKindOf(UML::Dependency) or
e.oclIsKindOf(UML::Package)
or (e.oclIsKindOf(UML::InstanceSpecification) and
```

```

e.oclcAsType(UML::InstanceSpecification).classifier->notEmpty())
->collect(e | ElementOwningMembership_Mapping.getMapped(e)) in

if src.URI.oclcIsUndefined() or src.URI = '' then
    relationships
else
    relationships->including(PackageURIMetadataMembership_Mapping.getMapped(src))
endif

```

- **stateOwnedRelationship (in src : Element) : Relationship [0..\*]**  
Reusable mapping rule for owned relationships of a UML4SysML::State mapping.

```

let initialState : Set(UML::Element) =
    from.ownedElement->select(e | e.oclcIsKindOf(UML::Pseudostate) and
        e.oclcAsType(UML::Pseudostate).kind = UML::PseudostateKind::initial) in
let toElementOMS : Set(UML::Element) = from.ownedElement - initialState in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(initialState->collect(e | InitialStateMembership_Mapping.getMapped(e)))

```

### 7.3.2 SysML v1 Library

The SysML v1 library is a SysML v2 model library with metadata definitions for annotating some model elements resulting from a transformation from a SysML v1 model using the SysML v1 to SysML v2 transformation.

```

package SysMLv1Library {

    doc /*
        * The SysMLv1Library defines library elements and metadata for
        * SysML elements which cannot mapped to a SysML v2 element.
        */

    // Library elements

    action def AddValueAction {
        in insertAt : ScalarValues::Natural [0..1];
        in value : ScalarValues::Integer;
        in isReplaceAll : ScalarValues::Boolean = false;
        in target;

        if not isReplaceAll {
            if insertAt == * {
                assign target := SequenceFunctions::including(target, value);
            }
            else {
                assign target :=
                    SequenceFunctions::includingAt(target, value, insertAt);
            }
        } else {
            target := value;
        }
    }

    action def AddStructuralFeatureValueAction :> AddValueAction {
        in object;
    }
}

```

```

action def RemoveVariableValueAction :> Actions::AssignmentAction {
    in removeAt: ScalarValues::Natural [0..1];
    in value : ScalarValues::Integer;
    in isRemoveDuplicates : ScalarValues::Boolean = false;
    in variable;

    // isRemoveDuplicates not covered yet

    if removeAt {
        assign variable :=
            SequenceFunctions::excludingAt(variable, value, removeAt);
    } else {
        assign variable := SequenceFunctions::excluding(variable, value);
    }
}

// Metadata

metadata def ActivityEdgeData {
    doc /* Metadata definition for UML::ActivityEdge::weight property */
    attribute weight : ScalarValues::Natural;
}

metadata def AssociationData {
    doc /* Metadata definition for
    * UML::StructuredClassifiers::Association::isDerived property mapping
    */
    attribute isDerived : ScalarValues::Boolean;
}

metadata def BlockData {
    doc /* Metadata definition for
    * SysML::Blocks::Block::isEncapsulated property
    */
    attribute isEncapsulated : ScalarValues::Boolean;
}

metadata def ElementGroupData {
    doc /* Metadata definition for the criterion
    * of a SysML::ModelElements::ElementGroup
    */
    attribute criterion : ScalarValues::String;
}

metadata def ModelData :> PackageData {
    doc /* Metadata definition for the UML::Model::viewpoint property */
    :> annotatedElement : SysML::Package;
    attribute 'viewpoint' : ScalarValues::String;
}

metadata def PackageData {
    doc /* Metadata definition for the UML::Package::URI property */
    :> annotatedElement : SysML::Package;
    attribute URI : ScalarValues::String;
}

metadata def ParameterSetData {
    doc /* Metadata definition for tagging parameters
    * mapped from a UML::ParameterSet

```

```

        */
        attribute isParameterSet : ScalarValues::Boolean;
    }

metadata def PortData {
    doc /* Metadata definition for tagging SysML v2 ports
        * mapped from a SysML::Ports&Flows::FullPort element
        */
    :> annotatedElement : SysML::PartUsage;
    attribute isFullPort : ScalarValues::Boolean;
}

metadata def ProbabilityData {
    doc /* Metadata definition for SysML::Activities::Probability stereotype */
    attribute probability : ScalarValues::Real;
}

metadata def RateData {
    doc /* Metadata definition for SysML::Activities::Rate and
        * specialized Discrete and Continuous stereotypes
        */
    :> annotatedElement : SysML::PartUsage;
    part rate;
    attribute isDiscrete : ScalarValues::Boolean;
    attribute isConcrete : ScalarValues::Boolean;
}

metadata def RefineData {
    doc /* Metadata definition for tagging SysML v2 dependencies
        * mapped from a SysML::Requirements::Refine relationship
        */
    :> annotatedElement : SysML::Dependency;
    attribute isRefine : ScalarValues::Boolean;
}

metadata def StakeholderData {
    doc /* Metadata definition for tagging SysML v2 item definitions
        * mapped from a SysML::ModelElements::Stakeholder element
        */
    :> annotatedElement : SysML::ItemDefinition;
    attribute isStakeholder : ScalarValues::Boolean;
}

metadata def traceData {
    doc /* Metadata definition for tagging SysML v2 dependencies
        * mapped from a SysML::Requirements::Trace relationship
        */
    :> annotatedElement : SysML::Dependency;
    attribute isTrace : ScalarValues::Boolean;
}

metadata def ViewpointData {
    doc /* Metadata definition for SysML::ModelElements::Viewpoint properties */
    attribute languages [0..*] : ScalarValues::String;
    attribute presentations [0..*] : ScalarValues::String;
}

package Enumerations {
    enum def ControlValueKind {
        doc /* The ControlValueKind enumeration is a type for

```

```

        * treating control values as data and for UML control pins.
        */
enum disable;
enum enable;
    }
}
}

```

## 7.4 Initializers

### 7.4.1 Overview

The classes presented in this subclause provide set of rules that provide default values for all non-derived features of their target metaclasses. Intentionally, initializers do not specify any "source" element. This makes them easier to specialize but prevents them from being able to provide a computation algorithm for some target features. In such a case, the operation matching the feature will be specified as abstract.

### 7.4.2 Mapping Specifications

#### 7.4.2.1 KerML Initializers

##### 7.4.2.1.1 AnnotatingElement\_Init

###### Description

Initializes the properties of the SysML v2 element AnnotatingElement.

###### Generalizations

- Element\_Init (from KerMLInitializers)

###### Association Ends

- to : AnnotatingElement [1]  
(redefines: Element\_Init::to)

###### Operations

- annotation () : Annotation [0..\*]

Set {}

##### 7.4.2.1.2 Annotation\_Init

###### Description

Initializes the properties of the SysML v2 element Annotation.

###### Generalizations

- Relationship\_Init (from KerMLInitializers)

###### Attributes

- to : Annotation [1]

## Operations

- annotatedElement () : Element [1] {redefines target, abstract}
- annotatingElement () : AnnotatingElement [1] {redefines source, abstract}
- owningAnnotatedElement () : Element [0..1]

null

### 7.4.2.1.3 Association\_Init

#### Description

Initializes the properties of the SysML v2 element Association.

#### Generalizations

- Classifier\_Init (from KerMLInitializers)
- Relationship\_Init (from KerMLInitializers)

#### Attributes

- to : Association [1]

### 7.4.2.1.4 Behavior\_Init

#### Description

Initializes the properties of the SysML v2 element Behavior.

#### Generalizations

- Classifier\_Init (from KerMLInitializers)

#### Attributes

- to : Behavior [1]

### 7.4.2.1.5 Classifier\_Init

#### Description

Initializes the properties of the SysML v2 element Classifier.

#### Generalizations

- Type\_Init (from KerMLInitializers)

#### Attributes

- to : Classifier [1]

### 7.4.2.1.6 Comment\_Init

#### Description



Initializes the properties of the SysML v2 element Comment.

#### Generalizations

- AnnotatingElement\_Init (from KerMLInitializers)

#### Association Ends

- to : Comment [1]  
(redefines: AnnotatingElement\_Init::to)

#### Operations

- body () : String [1] {abstract}
- locale () : String [1]

null

#### 7.4.2.1.7 Conjugation\_Init

##### Description

Initializes the properties of the SysML v2 element Conjugation.

##### Generalizations

- Relationship\_Init (from KerMLInitializers)

##### Attributes

- to : Conjugation [1]

##### Operations

- conjugatedType () : Type [1] {redefines source, abstract}
- originalType () : Type [1] {redefines target, abstract}

#### 7.4.2.1.8 Connector\_Init

##### Description

Initializes the properties of the SysML v2 element Connector.

##### Generalizations

- Feature\_Init (from KerMLInitializers)
- Relationship\_Init (from KerMLInitializers)

##### Attributes

- to : Connector [1]

## Operations

- `isDirected () : Boolean [1]`

`false`

### 7.4.2.1.9 Documentation\_Init

#### Description

Initializes the properties of the SysML v2 element Documentation.

#### Generalizations

- `Comment_Init` (from `KerMLInitializers`)

#### Attributes

- `to : Documentation [1]`

### 7.4.2.1.10 Element\_Init

#### Description

This is the general abstract class to be used as an ancestor for any class mapping specification.

#### Generalizations

- `Initializer` (from `Foundations`)

#### Association Ends

- `to : Element [1]`  
(redefines: `Initializer::to`)

#### Operations

- `aliasId () : String [0..*]`

`Set {}`

- `declaredName () : String [0..1]`

`null`

- `elementId () : String [1]`

`Helper.createUUID()`

- `ownedRelationship () : Relationship [0..*]`

Set {}

- shortName () : String [0..1]

null

#### 7.4.2.1.11 EndFeatureMembership\_Init

##### Description

Initializes the properties of the SysML v2 element EndFeatureMembership.

##### Generalizations

- FeatureMembership\_Init (from KerMLInitializers)

##### Attributes

- to : EndFeatureMembership [1]

#### 7.4.2.1.12 Expression\_Init

##### Description

Initializes the properties of the SysML v2 element Expression.

##### Generalizations

- Step\_Init (from KerMLInitializers)

##### Attributes

- to : Expression [1]

#### 7.4.2.1.13 Feature\_Init

##### Description

Initializes the properties of the SysML v2 element Feature.

##### Generalizations

- Type\_Init (from KerMLInitializers)

##### Attributes

- to : Feature [1]

##### Operations

- direction () : FeatureDirectionKind [0..1]

null

- isComposite () : Boolean [1]

false

- isDerived () : Boolean [1]

false

- isEnd () : Boolean [1]

false

- isOrdered () : Boolean [1]

false

- isPortion () : Boolean [1]

false

- isReadOnly () : Boolean [1]

false

- isUnique () : Boolean [1]

true

#### 7.4.2.1.14 FeatureChainExpression\_Init

##### Description

Initializes the properties of the SysML v2 element FeatureChainExpression.

##### Generalizations

- OperatorExpression\_Init (from KerMLInitializers)

##### Attributes

- to : FeatureChainExpression [1]

#### 7.4.2.1.15 FeatureChaining\_Init

##### Description

Initializes the properties of the SysML v2 element FeatureChaining.

##### Generalizations

- Relationship\_Init (from KerMLInitializers)

#### Attributes

- to : FeatureChaining [1]

#### Operations

- chainingFeature () : Feature [1] {redefines target, abstract}

### 7.4.2.1.16 FeatureMembership\_Init

#### Description

Initializes the properties of the SysML v2 element FeatureMembership.

#### Generalizations

- OwningMembership\_Init (from KerMLInitializers)
- TypeFeaturing\_Init (from KerMLInitializers)

#### Attributes

- to : FeatureMembership [1]

#### Operations

- ownedMemberFeature () : Feature [1] {redefines ownedMemberElement, abstract}
- ownedRelatedElement () : Element [0..\*] {redefines ownedRelatedElement}

```
Set {self.ownedMemberFeature () }
```

### 7.4.2.1.17 FeatureReferenceExpression\_Init

#### Description

Initializes the properties of the SysML v2 element FeatureReferenceExpression.

#### Generalizations

- Expression\_Init (from KerMLInitializers)

#### Attributes

- to : FeatureReferenceExpression [1]

### 7.4.2.1.18 FeatureTyping\_Init

#### Description

Initializes the properties of the SysML v2 element FeatureTyping.

#### Generalizations

- Specialization\_Init (from KerMLInitializers)

#### Attributes

- to : FeatureTyping [1]

#### Operations

- type () : Type [1] {redefines general, abstract}
- typedFeature () : Feature [1] {redefines specific, abstract}

### 7.4.2.1.19 FeatureValue\_Init

#### Description

Initializes the properties of the SysML v2 element FeatureValue.

#### Generalizations

- OwningMembership\_Init (from KerMLInitializers)

#### Attributes

- to : FeatureValue [1]

#### Operations

- featureWithValue () : Feature [1] {redefines ownedMemberElement, abstract}
- isDefault () : Boolean [1]

`false`

- isInitial () : Boolean [1]

`false`

- ownedRelatedElement () : Element [0..\*] {redefines ownedRelatedElement}

`Set{self.value ()}`

- value () : Expression [1] {redefines ownedMemberElement, abstract}

### 7.4.2.1.20 Function\_Init

#### Description

Initializes the properties of the SysML v2 element Function.

#### Generalizations

- Behavior\_Init (from KerMLInitializers)

## Attributes

- to : Function [1]

### 7.4.2.1.21 Import\_Init

#### Description

Initializes the properties of the SysML v2 element Import.

#### Generalizations

- Relationship\_Init (from KerMLInitializers)

#### Attributes

- to : Import [1]

#### Operations

- importedMemberName () : String [0..1]

null

- isImportAll () : Boolean [1]

false

- isRecursive () : Boolean [1]

false

- source () : Element [1] {redefines source, abstract}
- target () : Element [1] {redefines target, abstract}
- visibility () : VisibilityKind [1]

KerML::VisibilityKind::public

### 7.4.2.1.22 Interaction\_Init

#### Description

Initializes the properties of the SysML v2 element Interaction.

#### Generalizations

- Association\_Init (from KerMLInitializers)
- Behavior\_Init (from KerMLInitializers)

#### Attributes

- to : Interaction [1]

#### 7.4.2.1.23 InvocationExpression\_Init

##### Description

Initializes the properties of the SysML v2 element InvocationExpression.

##### Generalizations

- Expression\_Init (from KerMLInitializers)

##### Attributes

- to : InvocationExpression [1]

#### 7.4.2.1.24 ItemFlow\_Init

##### Description

Initializes the properties of the SysML v2 element ItemFlow.

##### Generalizations

- Connector\_Init (from KerMLInitializers)

##### Attributes

- to : ItemFlow [1]

#### 7.4.2.1.25 Membership\_Init

##### Description

Initializes the properties of the SysML v2 element Membership.

##### Generalizations

- Relationship\_Init (from KerMLInitializers)

##### Attributes

- to : Membership [1]

##### Operations

- memberElement () : Element [1] {redefines target, abstract}
- memberName () : String [0..1]

    null

- memberShortName () : String [0..1]

    null

- membershipOwningNamespace () : Element [0..\*] {redefines source, abstract}



- visibility () : VisibilityKind [1]

`KerML::VisibilityKind::public`

#### 7.4.2.1.26 MembershipImport\_Init

##### Description

Initializes the properties of the SysML v2 element MembershipImport.

##### Generalizations

- Import\_Init (from KerMLInitializers)

##### Attributes

- to : MembershipImport [1]

##### Operations

- importedMembership () : Namespace [1] {redefines target, abstract}

#### 7.4.2.1.27 Namespace\_Init

##### Description

Initializes the properties of the SysML v2 element Namespace.

##### Generalizations

- Element\_Init (from KerMLInitializers)

##### Association Ends

- to : Namespace [1]  
(redefines: Element\_Init::to)

#### 7.4.2.1.28 NamespaceImport\_Init

##### Description

Initializes the properties of the SysML v2 element NamespaceImport.

##### Generalizations

- Import\_Init (from KerMLInitializers)

##### Attributes

- to : NamespaceImport [1]

##### Operations

- importedNamespace () : Namespace [1] {redefines target, abstract}

#### 7.4.2.1.29 OperatorExpression\_Init

##### Description

Initializes the properties of the SysML v2 element OperatorExpression.

##### Generalizations

- Expression\_Init (from KerMLInitializers)

##### Attributes

- to : OperatorExpression [1]

##### Operations

- operator () : String [1]{abstract}

#### 7.4.2.1.30 OwningMembership\_Init

##### Description

Initializes the properties of the SysML v2 element OwningMembership.

##### Generalizations

- Membership\_Init (from KerMLInitializers)

##### Attributes

- to : OwningMembership [1]

##### Operations

- ownedMemberElement () : Element [1] {redefines memberElement, abstract}
- ownedRelatedElement () : Element [0..\*] {redefines ownedRelatedElement}

```
Set { self.ownedMemberElement () }
```

#### 7.4.2.1.31 Package\_Init

##### Description

Initializes the properties of the SysML v2 element Package.

##### Generalizations

- Namespace\_Init (from KerMLInitializers)

##### Attributes

- to : Package [1]

#### 7.4.2.1.32 ParameterMembership\_Init

##### Description

Initializes the properties of the SysML v2 element ParameterMembership.

##### Generalizations

- FeatureMembership\_Init (from KerMLInitializers)

##### Attributes

- to : ParameterMembership [1]

##### Operations

- ownedMemberParameter () : Feature [1] {redefines ownedMemberFeature, abstract}
- ownedRelatedElement () : Element [0..\*] {redefines ownedRelatedElement}

```
Set { self.ownedMemberParameter () }
```

#### 7.4.2.1.33 Predicate\_Init

##### Description

Initializes the properties of the SysML v2 element Predicate.

##### Generalizations

- Function\_Init (from KerMLInitializers)

##### Attributes

- to : Predicate [1]

#### 7.4.2.1.34 Redefinition\_Init

##### Description

Initializes the properties of the SysML v2 element Redefinition.

##### Generalizations

- Subsetting\_Init (from KerMLInitializers)

##### Attributes

- to : Redefinition [1]

##### Operations

- redefinedFeature () : Feature [1] {redefines subsettedFeature, abstract}
- redefiningFeature () : Feature [1] {redefines subsettingFeature, abstract}

#### 7.4.2.1.35 ReferenceSubsetting\_Init

##### Description

Initializes the properties of the SysML v2 element ReferenceSubsetting.

##### Generalizations

- Subsetting\_Init (from KerMLInitializers)

##### Attributes

- to : ReferenceSubsetting [1]

##### Operations

- referencedFeature () : Feature [1] {redefines subsettingFeature, abstract}

#### 7.4.2.1.36 Relationship\_Init

##### Description

Initializes the properties of the SysML v2 element Relationship.

##### Generalizations

- Element\_Init (from KerMLInitializers)

##### Association Ends

- to : Relationship [1]  
(redefines: Element\_Init::to)

##### Operations

- ownedRelatedElement () : Element [0..\*]

Set {}

- source () : Element [0..\*]

Set {}

- target () : Element [0..\*]

Set {}

#### 7.4.2.1.37 ReturnParameterMembership\_Init

##### Description

Initializes the properties of the SysML v2 element ReturnParameterMembership.

## Generalizations

- ParameterMembership\_Init (from KerMLInitializers)

## Attributes

- to : ReturnParameterMembership [1]

## Operations

- isComposite (in src : Element) : Boolean [1]  
returns "true" if the element provided as the actual parameter value can have a mapping to an instance of the type specified by the "to" attribute (i.e. can be used as a value for the "from" attribute)

false

### 7.4.2.1.38 Specialization\_Init

#### Description

Initializes the properties of the SysML v2 element Specialization.

#### Generalizations

- Relationship\_Init (from KerMLInitializers)

#### Attributes

- to : Specialization [1]

#### Operations

- general () : Type [1] {redefines target, abstract}
- specific () : Type [1] {redefines source, abstract}

### 7.4.2.1.39 Step\_Init

#### Description

Initializes the properties of the SysML v2 element Step.

#### Generalizations

- Feature\_Init (from KerMLInitializers)

#### Attributes

- to : Step [1]

### 7.4.2.1.40 Subclassification\_Init

#### Description

Initializes the properties of the SysML v2 element Subclassification.

## Generalizations

- Specialization\_Init (from KerMLInitializers)

## Attributes

- to : Subclassification [1]

## Operations

- subclassifier () : Classifier [1]{abstract}
- superclassifier () : Classifier [1]{abstract}

### 7.4.2.1.41 Subsetting\_Init

#### Description

Initializes the properties of the SysML v2 element Subsetting.

#### Generalizations

- Specialization\_Init (from KerMLInitializers)

#### Attributes

- to : Subsetting [1]

#### Operations

- subsettingFeature () : Feature [1] {redefines general, abstract}
- subsettedFeature () : Feature [1] {redefines specific, abstract}

### 7.4.2.1.42 Succession\_Init

#### Description

Initializes the properties of the SysML v2 element Succession.

#### Generalizations

- Connector\_Init (from KerMLInitializers)

#### Attributes

- to : Succession [1]

### 7.4.2.1.43 SuccessionItemFlow\_Init

#### Description

Initializes the properties of the SysML v2 element SuccessionItemFlow.

#### Generalizations

- ItemFlow\_Init (from KerMLInitializers)

- Succession\_Init (from KerMLInitializers)

#### Attributes

- to : SuccessionItemFlow [1]

#### 7.4.2.1.44 TextualRepresentation\_Init

##### Description

Initializes the properties of the SysML v2 element TextualRepresentation.

##### Generalizations

- AnnotatingElement\_Init (from KerMLInitializers)

#### Attributes

- to : TextualRepresentation [1]

#### Operations

- body () : String [1]{abstract}
- language () : String [1]{abstract}

#### 7.4.2.1.45 Type\_Init

##### Description

Initializes the properties of the SysML v2 element Type.

##### Generalizations

- Namespace\_Init (from KerMLInitializers)

#### Attributes

- to : Type [1]

#### Operations

- isAbstract () : Boolean [1]

false

- isSufficient () : Boolean [1]

false

#### 7.4.2.1.46 TypeFeaturing\_Init

##### Description

Initializes the properties of the SysML v2 element TypeFeaturing.

## Generalizations

- Relationship\_Init (from KerMLInitializers)

## Attributes

- to : TypeFeaturing [1]

## Operations

- featureOfType () : Feature [1] {redefines source, abstract}
- featuringType () : Type [1] {redefines target, abstract}

### 7.4.2.2 System Initializers

#### 7.4.2.2.1 ActionUsage\_Init

##### Description

Initializes the properties of the SysML v2 element ActionUsage.

##### Generalizations

- Step\_Init (from KerMLInitializers)
- Usage\_Init (from SystemInitializers)

##### Attributes

- to : ActionUsage [1]

##### Operations

- isComposite () : Boolean [1] {redefines isComposite}

true

#### 7.4.2.2.2 ActorMembership\_Init

##### Description

Initializes the properties of the SysML v2 element ActorMembership.

##### Generalizations

- ParameterMembership\_Init (from KerMLInitializers)

##### Attributes

- to : ActorMembership [1]

#### 7.4.2.2.3 AssignmentActionUsage\_Init

##### Description

Initializes the properties of the SysML v2 element AssignmentActionUsage.



## Generalizations

- ActionUsage\_Init (from SystemInitializers)

## Attributes

- to : AssignmentActionUsage [1]

### 7.4.2.2.4 ConjugatedPortDefinition\_Init

#### Description

Initializes the properties of the SysML v2 element ConjugatedPortDefinition.

## Generalizations

- PortDefinition\_Init (from SystemInitializers)

## Attributes

- to : ConjugatedPortDefinition [1]

### 7.4.2.2.5 ConjugatedPortTyping\_Init

#### Description

Initializes the properties of the SysML v2 element ConjugatedPortTyping.

## Generalizations

- FeatureTyping\_Init (from KerMLInitializers)

## Attributes

- to : ConjugatedPortTyping [1]

## Operations

- conjugatedPortDefinition () : ConjugatedPortDefinition [1] {redefines type, abstract}
- portDefinition () : PortDefinition [1]{abstract}

### 7.4.2.2.6 ConnectionUsage\_Init

#### Description

Initializes the properties of the SysML v2 element ConnectionUsage.

## Generalizations

- PartUsage\_Init (from SystemInitializers)

## Attributes

- to : ConnectionUsage [1]

#### 7.4.2.2.7 ConstraintDefinition\_Init

##### Description

Initializes the properties of the SysML v2 element ConstraintDefinition.

##### Generalizations

- Definition\_Init (from SystemInitializers)

##### Attributes

- to : ConstraintDefinition [1]

#### 7.4.2.2.8 ConstraintUsage\_Init

##### Description

Initializes the properties of the SysML v2 element ConstraintUsage.

##### Generalizations

- Usage\_Init (from SystemInitializers)

##### Attributes

- to : ConstraintUsage [1]

#### 7.4.2.2.9 Definition\_Init

##### Description

Initializes the properties of the SysML v2 element Definition.

##### Generalizations

- Classifier\_Init (from KerMLInitializers)

##### Attributes

- to : Definition [1]

##### Operations

- isVariation () : Boolean [1]

`false`

#### 7.4.2.2.10 EventOccurrenceUsage\_Init

##### Description

Initializes the properties of the SysML v2 element EventOccurrenceUsage.

## Generalizations

- OccurrenceUsage\_Init (from SystemInitializers)

## Attributes

- to : EventOccurrenceUsage [1]

### 7.4.2.2.11 ItemDefinition\_Init

#### Description

Initializes the properties of the SysML v2 element ItemDefinition.

## Generalizations

- Definition\_Init (from SystemInitializers)

## Attributes

- to : ItemDefinition [1]

### 7.4.2.2.12 MetadataUsage\_Init

#### Description

Initializes the properties of the SysML v2 element MetadataUsage.

## Generalizations

- Usage\_Init (from SystemInitializers)

## Attributes

- to : MetadataUsage [1]

### 7.4.2.2.13 ObjectiveMembership\_Init

#### Description

Initializes the properties of the SysML v2 element ObjectiveMembership.

## Generalizations

- FeatureMembership\_Init (from KerMLInitializers)

## Attributes

- to : ObjectiveMembership [1]

### 7.4.2.2.14 OccurrenceDefinition\_Init

#### Description

Initializes the properties of the SysML v2 element OccurrenceDefinition.

### Generalizations

- Definition\_Init (from SystemInitializers)

### Attributes

- to : OccurrenceDefinition [1]

### Operations

- isIndividual () : Boolean [1]

false

### 7.4.2.2.15 OccurrenceUsage\_Init

#### Description

Initializes the properties of the SysML v2 element OccurrenceUsage.

#### Generalizations

- Usage\_Init (from SystemInitializers)

#### Attributes

- to : OccurrenceUsage [1]

#### Operations

- isIndividual () : Boolean [1]

false

- portionKind () : PortionKind [1]{abstract}

### 7.4.2.2.16 PartUsage\_Init

#### Description

Initializes the properties of the SysML v2 element PartUsage.

#### Generalizations

- Usage\_Init (from SystemInitializers)

#### Attributes

- to : PartUsage [1]

### 7.4.2.2.17 PortConjugation\_Init

#### Description

Initializes the properties of the SysML v2 element PortConjugation.

#### **Generalizations**

- Conjugation\_Init (from KerMLInitializers)

#### **Attributes**

- to : PortConjugation [1]

#### **Operations**

- originalPortDefinition () : PortDefinition [1] {redefines originalType, abstract}

#### **7.4.2.2.18 PortDefinition\_Init**

##### **Description**

Initializes the properties of the SysML v2 element PortDefinition.

#### **Generalizations**

- Definition\_Init (from SystemInitializers)

#### **Attributes**

- to : PortDefinition [1]

#### **7.4.2.2.19 ReferenceUsage\_Init**

##### **Description**

Provides the basic features to map to a ReferenceUsage element.

#### **Generalizations**

- Usage\_Init (from SystemInitializers)

#### **Attributes**

- to : ReferenceUsage [1]

#### **7.4.2.2.20 RequirementUsage\_Init**

##### **Description**

Initializes the properties of the SysML v2 element RequirementUsage.

#### **Generalizations**

- Usage\_Init (from SystemInitializers)

#### **Attributes**

- to : RequirementUsage [1]

#### 7.4.2.2.21 StateUsage\_Init

##### Description

Initializes the properties of the SysML v2 element StateUsage.

##### Generalizations

- ActionUsage\_Init (from SystemInitializers)

##### Attributes

- to : StateUsage [1]

#### 7.4.2.2.22 SubjectMembership\_Init

##### Description

Initializes the properties of the SysML v2 element SubjectMembership.

##### Generalizations

- ParameterMembership\_Init (from KerMLInitializers)

##### Attributes

- to : SubjectMembership [1]

#### 7.4.2.2.23 Usage\_Init

##### Description

Initializes the properties of the SysML v2 element Usage.

##### Generalizations

- Feature\_Init (from KerMLInitializers)

##### Attributes

- to : Usage [1]

##### Operations

- isVariation () : Boolean [1]

false

## 7.5 Factories

## 7.5.1 Overview

The classes presented in this subclause specify facilities for creating elements in the target model form an arbitrary set of zero to many input parameters. After the target element is created, no link between it and an the value of inputs parameter (if any) will be preserved.

## 7.5.2 Mapping Specifications

### 7.5.2.1 EmptySubject\_Factory

#### Description

Factory class to create a reference usage representing a subject without a source in the SysML v1 model.

#### Generalizations

- Factory (from Foundations)
- ReferenceUsage\_Init (from SystemInitializers)

#### Operations

- create () : ReferenceUsage [1]
- direction () : FeatureDirectionKind [0..1] {redefines direction}

```
KerML::FeatureDirectionKind::_'in'
```

### 7.5.2.2 EmptySubjectMembership\_Factory

#### Description

Factory class to create a membership relationship for a reference usage representing a subject without a source in the SysML v1 model.

#### Generalizations

- Factory (from Foundations)
- SubjectMembership\_Init (from SystemInitializers)

#### Operations

- create () : SubjectMembership [1]
- ownedMemberParameter () : Feature [1] {redefines ownedMemberParameter}

```
EmptySubject_Factory.create()
```

### 7.5.2.3 LiteralBoolean\_Factory

#### Description

Factory class to create a LiteralBoolean element.

#### Generalizations

- Expression\_Init (from KerMLInitializers)
- Factory (from Foundations)

#### Association Ends

- boolean : Boolean [1]
- to : LiteralBoolean [1]  
(redefines: Expression\_Init::to)

#### Operations

- create (in boolean : Boolean) : LiteralBoolean [1]
- ownedRelationship () : Relationship [0..\*] {redefines ownedRelationship}

```
Set {ReturnParameterFeatureMembership_Factory.create () }
```

### 7.5.2.4 LiteralNull\_Factory

#### Description

Factory class to create a LiteralNull element.

#### Generalizations

- Expression\_Init (from KerMLInitializers)
- Factory (from Foundations)

#### Association Ends

- to : NullExpression [1]  
(redefines: Expression\_Init::to)

#### Operations

- create () : NullExpression [1]

### 7.5.2.5 LiteralRational\_Factory

#### Description

Factory class to create a LiteralRational element.

#### Generalizations

- Expression\_Init (from KerMLInitializers)
- Factory (from Foundations)

#### Association Ends

- real : Real [1]
- to : LiteralRational [1]  
(redefines: Expression\_Init::to)



## Operations

- create (in real : Real) : LiteralReal [1]
- ownedRelationship () : Relationship [0..\*] {redefines ownedRelationship}

```
Set {ReturnParameterFeatureMembership_Factory.create () }
```

### 7.5.2.6 LiteralString\_Factory

#### Description

Factory class to create a LiteralString element.

#### Generalizations

- Expression\_Init (from KerMLInitializers)
- Factory (from Foundations)

#### Association Ends

- string : String [1]
- to : LiteralString [1]  
(redefines: Expression\_Init::to)

## Operations

- create (in string : String) : LiteralString [1]
- ownedRelationship () : Relationship [0..\*] {redefines ownedRelationship}

```
Set {ReturnParameterFeatureMembership_Factory.create () }
```

### 7.5.2.7 ReturnParameterFeature\_Factory

#### Description

Factory class to create a feature element with direction 'out' representing a return parameter.

#### Generalizations

- Factory (from Foundations)
- Feature\_Init (from KerMLInitializers)

## Operations

- create () : Feature [1]
- direction () : FeatureDirectionKind [0..1] {redefines direction}

```
KerML::FeatureDirectionKind::_out'
```

### 7.5.2.8 ReturnParameterFeatureMembership\_Factory

#### Description

Factory class to create a feature membership relationship for a feature element with direction 'out' representing a return parameter.

### Generalizations

- Factory (from Foundations)
- ReturnParameterMembership\_Init (from KerMLInitializers)

### Operations

- create () : ReturnParameterMembership [1]
- ownedMemberParameter () : Feature [1] {redefines ownedMemberParameter}

```
ReturnParameterFeature_Factory.create()
```

## 7.5.2.9 StringParameterFeature\_Factory

### Description

Factory class to create a feature element representing a string.

### Generalizations

- Factory (from Foundations)
- Feature\_Init (from KerMLInitializers)

### Association Ends

- string : String [1]

### Operations

- create (in string : String) : Feature [1]
- ownedRelationship () : Relationship [0..\*] {redefines ownedRelationship}

```
Set{StringParameterFeatureValue_Factory.create(string)}
```

## 7.5.2.10 StringParameterFeatureValue\_Factory

### Description

Factory class to create a string feature value relationship for a feature element.

### Generalizations

- Factory (from Foundations)
- FeatureValue\_Init (from KerMLInitializers)

### Association Ends

- string : String [1]

## Operations

- create (in string : String) : FeatureValue [1]
- value () : Expression [1] {redefines value}

```
LiteralString_Factory.create(string)
```

### 7.5.2.11 StringParameterMembership\_Factory

#### Description

Factory class to create a parameter membership relationship for a feature element representing a string.

#### Generalizations

- Factory (from Foundations)
- ParameterMembership\_Init (from KerMLInitializers)

#### Association Ends

- string : String [1]

#### Operations

- create (in string : String) : ParameterMembership [1]
- ownedMemberParameter () : Feature [1] {redefines ownedMemberParameter}

```
StringParameterFeature_Factory.create(string)
```

### 7.5.2.12 SubjectMembership\_Factory

#### Description

Factory class to create a subject membership relationship for a given subject.

#### Generalizations

- Factory (from Foundations)
- SubjectMembership\_Init (from SystemInitializers)

#### Association Ends

- subject : Type [1]

#### Operations

- create (in subject : Type) : SubjectMembership [1]
- ownedMemberParameter () : Feature [1] {redefines ownedMemberParameter}

```
subject
```

## 7.6 Generic Mappings

## 7.6.1 Overview

Generic mappings are partial definitions of transformation rules that are intended to factorize reusable algorithms for making the global specification more compact and easier to read and maintain. Basically, they provide a default value for all the non-derived attributes of their target metaclass wherever possible, or declare an abstract operation for them otherwise. They are similar to initializers, except that they have a source element defined. The operations provided by the generic mappings can be redefined by their specialization, as appropriate according to the source type specified by the redefinition of their `from` attribute.

All of these generic mappings are abstract.

## 7.6.2 Common Mappings

### 7.6.2.1 CommonAssignmentActionUsage\_Mapping

#### Description

Common mapping class to create an assignment action usage.

#### General Mappings

GenericToAssignmentActionUsage\_Mapping

#### Mapping Source

Action

#### Mapping Target

AssignmentActionUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `AssignmentActionUsage::ownedRelationship () : Relationship [0..*]`

```
Set { CommonAssignmentActionUsageReplacementParameterMembership_Mapping.getMapped (from) ,  
CommonAssignmentActionUsageTargetParameterMembership_Mapping.getMapped (from) }
```

### 7.6.2.2 CommonAssignmentActionUsageOwningMembership\_Mapping

#### Description

Creates a owning membership relationship for `ownedMemberElement()`.

#### General Mappings

GenericToOwningMembership\_Mapping

**Mapping Source**

Action

**Mapping Target**

OwningMembership

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`CommonAssignmentActionUsage_Mapping.getMapped(from)`

**7.6.2.3 CommonAssignmentActionUsageReferenceUsage\_Mapping**

**Description**

Creates a reference usage.

**General Mappings**

GenericToReferenceUsage\_Mapping

**Mapping Source**

Action

**Mapping Target**

ReferenceUsage

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set { CommonAssignmentActionUsageTargetFeatureMembership_Mapping.getMapped (from) }
```

#### **7.6.2.4 CommonAssignmentActionUsageReferenceUsage2\_Mapping**

##### **Description**

Creates a reference usage.

##### **General Mappings**

GenericToReferenceUsage\_Mapping

##### **Mapping Source**

Action

##### **Mapping Target**

ReferenceUsage

##### **Owned Mappings**

(none)

#### **7.6.2.5 CommonAssignmentActionUsageReplacementParameterMembership\_Mapping**

##### **Description**

Creates a membership relationship for *memberElement()*.

##### **General Mappings**

GenericToParameterMembership\_Mapping

##### **Mapping Source**

Action

##### **Mapping Target**

ParameterMembership

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

`CommonAssignmentActionUsageReplacementReferenceUsage_Mapping.getMapped(from)`

### 7.6.2.6 CommonAssignmentActionUsageReplacementReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Action

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

### 7.6.2.7 CommonAssignmentActionUsageTargetFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Action

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`

`CommonAssignmentActionUsageTargetReferenceUsage_Mapping.getMapped(from)`

### 7.6.2.8 CommonAssignmentActionUsageTargetParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

Action

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ParameterMembership::ownedMemberParameter () : Feature [1]`

`CommonAssignmentActionUsageReferenceUsage_Mapping.getMapped(from)`

### 7.6.2.9 CommonAssignmentActionUsageTargetReferenceFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Action



## Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
CommonAssignmentActionUsageReferenceUsage2_Mapping.getMapped(from)
```

### 7.6.2.10 CommonAssignmentActionUsageTargetReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Action

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set {CommonAssignmentActionUsageReferenceFeatureMembership_Mapping.getMapped(from) }
```

### 7.6.2.11 CommonFeatureReferenceExpression\_Mapping

#### Description

Common mapping class for a feature reference expression.

#### General Mappings

GenericToFeatureReferenceExpression\_Mapping

#### Mapping Source

TypedElement

#### Mapping Target

FeatureReferenceExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]  

```
Set { CommonMembership_Mapping.getMapped (from) ,  
CommonReturnParameterFeatureMembership_Mapping.getMapped (from) }
```

### 7.6.2.12 CommonMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

TypedElement

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

```
from
```

### 7.6.2.13 CommonParameterReferenceUsageInMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

```
if not from.ocIsKindOf(UML::TypedElement) then
  CommonParameterReferenceUsageIn_Mapping.getMapped(from)
else if from.ocIsType(UML::TypedElement).type.ocIsUndefined() then
  CommonParameterReferenceUsageIn_Mapping.getMapped(from)
else
  CommonParameterReferenceUsageInUntyped_Mapping.getMapped(from)
endif
endif
```

#### 7.6.2.14 CommonParameterReferenceUsageIn\_Mapping

##### Description

Common mapping class that creates a parameter reference usage element with direction 'in' and with a type.

##### General Mappings

CommonParameterReferenceUsageInUntyped\_Mapping

##### Mapping Source

Element

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
if from.ocIsKindOf(UML::TypedElement) then
Set{CommonParameterReferenceUsageInFeatureTyping_Mapping.getMapped(from)}
else Set{} endif
```

#### 7.6.2.15 CommonParameterReferenceUsageInFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

Element

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
if from.ocIsKindOf(UML::TypedElement)
then
if from.ocAsType(UML::TypedElement).type.ocIsKindOf(UML::PrimitiveType) then
  Helper.getScalarValueType(from.ocAsType(UML::TypedElement).type)
else
  from.ocAsType(UML::TypedElement).type
endif
else OclUndefined endif
```

## 7.6.2.16 CommonParameterReferenceUsageInUntyped\_Mapping

### Description

Common mapping class that creates a parameter reference usage element with direction 'in' and without a type.

### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

Element

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]

```
KerML::FeatureDirectionKind::_in'
```

### 7.6.2.17 CommonReturnParameterFeature\_Mapping

#### Description

Common mapping class that creates a parameter feature element with a type.

#### General Mappings

CommonReturnParameterFeatureUntyped\_Mapping

#### Mapping Source

Element

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  

```
if from.ocIsKindOf(UML::Property) then
    Set{CommonReturnParameterFeatureTyping_Mapping.getMapped(from)}
else
    Set{}
endif
```

### 7.6.2.18 CommonReturnParameterFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
if from.ocIsKindOf(UML::Property)
then
if from.ocAsType(UML::TypedElement).type.ocIsKindOf(UML::PrimitiveType) then
  Helper.getScalarValueType(from.ocAsType(UML::TypedElement).type)
else
  from.ocAsType(UML::TypedElement).type
endif
else OclUndefined endif
```

### 7.6.2.19 CommonReturnParameterFeatureUntyped\_Mapping

#### Description

Common mapping class that creates a parameter feature element without a type.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

Element

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::direction () : FeatureDirectionKind [0..1]

```
KerML::FeatureDirectionKind::_'out'
```

### 7.6.2.20 CommonReturnParameterFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToReturnParameterMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

ReturnParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReturnParameterMembership::ownedMemberParameter () : Feature [1]

```
if not from.ocIsKindOf(UML::TypedElement) then
  CommonReturnParameterFeatureUntyped_Mapping.getMapped(from)
else if from.ocIsType(UML::TypedElement).type.ocIsUndefined() then
  CommonReturnParameterFeatureUntyped_Mapping.getMapped(from)
else
  CommonReturnParameterFeatureUntyped_Mapping.getMapped(from)
endif
endif
```

### 7.6.2.21 CommonReturnParameterReferenceUsageMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToReturnParameterMembership\_Mapping

#### Mapping Source



Element

### Mapping Target

ReturnParameterMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReturnParameterMembership::ownedMemberParameter () : Feature [0..1]

```
if not from.ocIsKindOf(UML::TypedElement) then
    CommonReturnParameterReferenceUsageUntyped_Mapping.getMapped(from)
else if from.ocIsType(UML::TypedElement).type.ocIsUndefined() then
    CommonReturnParameterReferenceUsageUntyped_Mapping.getMapped(from)
else
    CommonReturnParameterReferenceUsageUntyped_Mapping.getMapped(from)
endif
endif
```

## 7.6.2.22 CommonReturnParameterReferenceUsage\_Mapping

### Description

Creates a reference usage.

### General Mappings

CommonReturnParameterReferenceUsageUntyped\_Mapping

### Mapping Source

Element

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
if from.ocIsKindOf(UML::TypedElement) then
Set{CommonReturnParameterReferenceUsageFeatureTyping_Mapping.getMapped(from)}
else Set{} endif
```

### 7.6.2.23 CommonReturnParameterReferenceUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
if from.ocIsKindOf(UML::TypedElement)
then
if from.ocAsType(UML::TypedElement).type.ocIsKindOf(UML::PrimitiveType) then
Helper.getScalarValueType(from.ocAsType(UML::TypedElement).type)
else
from.ocAsType(UML::TypedElement).type
endif
else OclUndefined endif
```

### 7.6.2.24 CommonReturnParameterReferenceUsageUntyped\_Mapping

#### Description

Creates a reference usage.

### **General Mappings**

GenericToReferenceUsage\_Mapping

### **Mapping Source**

Element

### **Mapping Target**

ReferenceUsage

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]

`KerML::FeatureDirectionKind::_'out'`

## **7.6.2.25 CommonReferenceUsageIn\_Mapping**

### **Description**

Common mapping class that creates a reference usage element with direction 'in'.

### **General Mappings**

CommonReferenceUsageInUntyped\_Mapping

### **Mapping Source**

TypedElement

### **Mapping Target**

ReferenceUsage

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::ownedRelationship () : Relationship [0..*]`

Common mapping class that creates a reference usage element with direction 'in'.

```
Set { CommonReferenceUsageInFeatureTyping_Mapping.getMapped (from) }
```

### 7.6.2.26 CommonReferenceUsageInFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

TypedElement

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`

```
if from.type.oclIsUndefined() then
    CommonReferenceUsageInUntyped_Mapping.getMapped (from)
else
    CommonReferenceUsageIn_Mapping.getMapped (from)
endif
```

### 7.6.2.27 CommonReferenceUsageInFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

## General Mappings

GenericToFeatureTyping\_Mapping

## Mapping Source

TypedElement

## Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
if from.type.ocliIsKindOf(UML::PrimitiveType) then
    Helper.getScalarValueType(from.type)
else
    from.type
endif
```

### 7.6.2.28 CommonReferenceUsageInUntyped\_Mapping

#### Description

Common mapping class that creates an untyped reference usage element with direction 'in'.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

TypedElement

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::declaredName () : String [0..1]  
`from.name`
- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_'in'`

## 7.6.3 Generic Mappings To KerML

### 7.6.3.1 GenericToAnnotatingElement\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *AnnotatingElement*.

#### General Mappings

GenericToElement\_Mapping

#### Mapping Source

Element

#### Mapping Target

AnnotatingElement

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- AnnotatingElement::annotation () : Annotation [0..\*]  
`Set {}`

### 7.6.3.2 GenericToAnnotation\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Annotation*.

### General Mappings

GenericToRelationship\_Mapping

### Mapping Source

Element

### Mapping Target

Annotation

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Annotation::owningAnnotatedElement () : Element [0..1]  
    null
- Annotation::annotatingElement () : AnnotatingElement [1]  
    *abstract rule*
- Annotation::annotatedElement () : Element [1]  
    *abstract rule*

### 7.6.3.3 GenericToAssociation\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Association*.

### General Mappings

GenericToRelationship\_Mapping

GenericToClassifier\_Mapping

### Mapping Source

Element

### Mapping Target

Association

### Owned Mappings

(none)

#### **7.6.3.4 GenericToBehavior\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *Behavior*.

##### **General Mappings**

GenericToClassifier\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

Behavior

##### **Owned Mappings**

(none)

#### **7.6.3.5 GenericToClassifier\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *Classifier*.

##### **General Mappings**

GenericToType\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

Classifier

##### **Owned Mappings**

(none)

#### **7.6.3.6 GenericToComment\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *Comment*.

##### **General Mappings**

GenericToAnnotatingElement\_Mapping



### Mapping Source

Element

### Mapping Target

Comment

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Comment::locale () : String [1]  
    null
- Comment::body () : String [1]  
    *abstract rule*

## 7.6.3.7 GenericToConjugation\_Mapping

### Description

Generic mapping class for mappingsto the SysML v2 element *Conjugation*.

### General Mappings

GenericToRelationship\_Mapping

### Mapping Source

Element

### Mapping Target

Conjugation

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Conjugation::originalType () : Type [1]`  
*abstract rule*
- `Conjugation::conjugatedType () : Type [1]`  
*abstract rule*

### 7.6.3.8 GenericToConnector\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Connector*.

#### General Mappings

GenericToFeature\_Mapping  
GenericToRelationship\_Mapping

#### Mapping Source

Element

#### Mapping Target

Connector

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Connector::isDirected () : Boolean [1]`  
*false*

### 7.6.3.9 GenericToDocumentation\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Documentation*.

#### General Mappings

GenericToComment\_Mapping

#### Mapping Source

Element

### **Mapping Target**

Documentation

### **Owned Mappings**

(none)

## **7.6.3.10 GenericToElement\_Mapping**

### **Description**

This is the general abstract class to be used as an ancestor for any class mapping specification.

### **General Mappings**

Mapping

### **Mapping Source**

Element

### **Mapping Target**

Element

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Element::elementId () : String [1]  
    Helper.createUUID()
- Element::ownedRelationship () : Relationship [0..\*]  
    Set {}
- Element::shortName () : String [0..1]  
    null
- Element::declaredName () : String [0..1]  
    null

- Element::aliasId () : String [0..\*]

Set {}

### 7.6.3.11 GenericToEndFeatureMembership\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *EndFeatureMembership*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

EndFeatureMembership

#### Owned Mappings

(none)

### 7.6.3.12 GenericToExpression\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Expression*.

#### General Mappings

GenericToStep\_Mapping

#### Mapping Source

Element

#### Mapping Target

Expression

#### Owned Mappings

(none)

### 7.6.3.13 GenericToFeature\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Feature*.

#### General Mappings

GenericToType\_Mapping

### Mapping Source

Element

### Mapping Target

Feature

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::isEnd () : Boolean [1]  
false
- Feature::isOrdered () : Boolean [1]  
false
- Feature::isDerived () : Boolean [1]  
false
- Feature::direction () : FeatureDirectionKind [0..1]  
null
- Feature::isComposite () : Boolean [1]  
false
- Feature::isPortion () : Boolean [1]  
false
- Feature::isUnique () : Boolean [1]  
true
- Feature::isReadOnly () : Boolean [1]  
false

#### 7.6.3.14 GenericToFeatureChainExpression\_Mapping

##### Description

Generic mapping class for mappingsto the SysML v2 element *FeatureChainExpression*.

### **General Mappings**

GenericToOperatorExpression\_Mapping

### **Mapping Source**

Element

### **Mapping Target**

FeatureChainExpression

### **Owned Mappings**

(none)

## **7.6.3.15 GenericToFeatureChaining\_Mapping**

### **Description**

Generic mapping class for mappingsto the SysML v2 element *FeatureChaining*.

### **General Mappings**

GenericToRelationship\_Mapping

### **Mapping Source**

Element

### **Mapping Target**

FeatureChaining

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureChaining::chainingFeature () : Feature [1]  
*abstract rule*

## **7.6.3.16 GenericToFeatureMembership\_Mapping**

### **Description**

Generic mapping class for mappingsto the SysML v2 element *FeatureMembership*.

### General Mappings

GenericToOwningMembership\_Mapping  
GenericToTypeFeaturing\_Mapping

### Mapping Source

Element

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
*abstract rule*
- FeatureMembership::ownedRelatedElement () : Element [0..\*]

```
Set {self.ownedMemberFeature () }
```

### 7.6.3.17 GenericToFeatureReferenceExpression\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *FeatureReferenceExpression*.

#### General Mappings

GenericToExpression\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureReferenceExpression

#### Owned Mappings

(none)

### 7.6.3.18 GenericToFeatureTyping\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *FeatureTyping*.

#### General Mappings

GenericToSpecialization\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  
*abstract rule*
- FeatureTyping::typedFeature () : Feature [1]  
*abstract rule*

### 7.6.3.19 GenericToFeatureValue\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *FeatureValue*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureValue

#### Owned Mappings



(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::isInitial () : Boolean [1]  
`false`
- FeatureValue::featureWithValue () : Feature [1]  
*abstract rule*
- FeatureValue::ownedRelatedElement () : Element [0..\*]  
`Set {self.value () }`
- FeatureValue::value () : Expression [1]  
*abstract rule*
- FeatureValue::isDefault () : Boolean [1]  
`false`

### 7.6.3.20 GenericToFunction\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Function*.

#### General Mappings

GenericToBehavior\_Mapping

#### Mapping Source

Element

#### Mapping Target

Function

#### Owned Mappings

(none)

### 7.6.3.21 GenericToImport\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Import*.

#### General Mappings

GenericToRelationship\_Mapping

### Mapping Source

Element

### Mapping Target

Import

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Import::importedMemberName () : String [0..1]  
    null
- Import::visibility () : VisibilityKind [1]  
    KerML::VisibilityKind::public
- Import::isRecursive () : Boolean [1]  
    false
- Import::isImportAll () : Boolean [1]  
    false

### 7.6.3.22 GenericToInvocationExpression\_Mapping

#### Description

Generic mapping class for mapping to the SysML v2 element *InvocationExpression*.

#### General Mappings

GenericToExpression\_Mapping

#### Mapping Source

Element

#### Mapping Target

InvocationExpression

### **Owned Mappings**

(none)

### **7.6.3.23 GenericToInteraction\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *Interaction*.

#### **General Mappings**

GenericToBehavior\_Mapping  
GenericToAssociation\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

Interaction

### **Owned Mappings**

(none)

### **7.6.3.24 GenericToItemFlow\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *ItemFlow*.

#### **General Mappings**

GenericToConnector\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

ItemFlow

### **Owned Mappings**

(none)

### **7.6.3.25 GenericToMembership\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *Membership*.

#### **General Mappings**

GenericToRelationship\_Mapping

### Mapping Source

Element

### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  
*abstract rule*
- Membership::memberShortName () : String [0..1]  
  
    null
- Membership::memberName () : String [0..1]  
  
    null
- Membership::visibility () : VisibilityKind [1]  
  
    KerML::VisibilityKind::public
- Membership::membershipOwningNamespace () : Element [0..\*]  
*abstract rule*

### 7.6.3.26 GenericToMembershipImport\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *MembershipImport*.

#### General Mappings

GenericToImport\_Mapping

#### Mapping Source

Element

#### Mapping Target

MembershipImport

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MembershipImport::importedMembership () : Namespace [1]  
*abstract rule*

### **7.6.3.27 GenericToNamespace\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *Namespace*.

#### **General Mappings**

GenericToElement\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

Namespace

#### **Owned Mappings**

(none)

### **7.6.3.28 GenericToNamespaceImport\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *NamespaceImport*.

#### **General Mappings**

GenericToImport\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

NamespaceImport

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- NamespaceImport::importedNamespace () : Namespace [1]  
*abstract rule*

## 7.6.3.29 GenericToOperatorExpression\_Mapping

### Description

Generic mapping class for mapping to the SysML v2 element *OperatorExpression*.

### General Mappings

GenericToExpression\_Mapping

### Mapping Source

Element

### Mapping Target

OperatorExpression

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OperatorExpression::operator () : String [1]  
*abstract rule*

## 7.6.3.30 GenericToOwningMembership\_Mapping

### Description

Generic mapping class for mappingsto the SysML v2 element *OwningMembership*.

### General Mappings

GenericToMembership\_Mapping

### Mapping Source

Element

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
*abstract rule*
- OwningMembership::ownedRelatedElement () : Element [0..\*]

```
Set { self.ownedMemberElement () }
```

### 7.6.3.31 GenericToPackage\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Package*.

#### General Mappings

GenericToNamespace\_Mapping

#### Mapping Source

Element

#### Mapping Target

Package

#### Owned Mappings

(none)

### 7.6.3.32 GenericToParameterMembership\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *ParameterMembership*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]  
    null
- ParameterMembership::ownedRelatedElement () : Element [0..\*]  
    Set{self.ownedMemberParameter () }

### 7.6.3.33 GenericToPredicate\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Predicate*.

#### General Mappings

GenericToFunction\_Mapping

#### Mapping Source

Element

#### Mapping Target

Predicate



## Owned Mappings

(none)

### 7.6.3.34 GenericToRedefinition\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Redefinition*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

Element

#### Mapping Target

Redefinition

## Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- *Redefinition::redefiningFeature () : Feature [1]*  
*abstract rule*
- *Redefinition::redefinedFeature () : Feature [1]*  
*abstract rule*

### 7.6.3.35 GenericToReferenceSubsetting\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *ReferenceSubsetting*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

Element

#### Mapping Target

ReferenceSubsetting

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceSubsetting::referencedFeature () : Feature [1]  
*abstract rule*

## 7.6.3.36 GenericToRelationship\_Mapping

### Description

Generic mapping class for mappingsto the SysML v2 element *Relationship*.

### General Mappings

GenericToElement\_Mapping

### Mapping Source

Element

### Mapping Target

Relationship

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Relationship::target () : Element [0..\*]  
Set {}
- Relationship::ownedRelatedElement () : Element [0..\*]  
Set {}

- Relationship::source () : Element [0..\*]

Set { }

### 7.6.3.37 GenericToReturnParameterMembership\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *ReturnParameterMembership*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

ReturnParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReturnParameterMembership::isComposite (in src : Element) : Boolean [1]

returns "true" if the element provided as the actual parameter value can have a mapping to an instance of the type specified by the "to" attribute (i.e. can be used as a value for the "from" attribute)

false

### 7.6.3.38 GenericToSpecialization\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Specialization*.

#### General Mappings

GenericToRelationship\_Mapping

#### Mapping Source

Element

### **Mapping Target**

Specialization

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Specialization::general () : Type [1]  
*abstract rule*
- Specialization::specific () : Type [1]  
*abstract rule*

### **7.6.3.39 GenericToStep\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *Step*.

#### **General Mappings**

GenericToFeature\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

Step

#### **Owned Mappings**

(none)

### **7.6.3.40 GenericToSubclassification\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *Subclassification*.

#### **General Mappings**

GenericToSpecialization\_Mapping

#### **Mapping Source**

Element

### Mapping Target

Subclassification

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subclassification::subclassifier () : Classifier [1]  
null
- Subclassification::superclassifier () : Classifier [1]  
null

## 7.6.3.41 GenericToSubsetting\_Mapping

### Description

Generic mapping class for mapping to the SysML v2 element *Subsetting*.

### General Mappings

GenericToSpecialization\_Mapping

### Mapping Source

Element

### Mapping Target

Subsetting

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettingFeature () : Feature [1]  
*abstract rule*
- Subsetting::ownedRelatedElement () : Element [0..\*]  
`Set { }`
- Subsetting::subsettingFeature () : Feature [1]  
`from`

### 7.6.3.42 GenericToSuccession\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Succession*.

#### General Mappings

GenericToConnector\_Mapping

#### Mapping Source

Element

#### Mapping Target

Succession

#### Owned Mappings

(none)

### 7.6.3.43 GenericToSuccessionItemFlow\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *SuccessionItemFlow*.

#### General Mappings

GenericToSuccession\_Mapping

GenericToItemFlow\_Mapping

#### Mapping Source

Element

#### Mapping Target

SuccessionItemFlow

#### Owned Mappings

(none)

#### **7.6.3.44 GenericToTextualRepresentation\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *TextualRepresentation*.

##### **General Mappings**

GenericToAnnotatingElement\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

TextualRepresentation

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TextualRepresentation::language () : String [1]  
*abstract rule*
- TextualRepresentation::body () : String [1]  
*abstract rule*

#### **7.6.3.45 GenericToType\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *Type*.

##### **General Mappings**

GenericToNamespace\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

Type

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Type::isAbstract () : Boolean [1]`  
`false`
- `Type::isSufficient () : Boolean [1]`  
`false`

### 7.6.3.46 GenericToTypeFeaturing\_Mapping

#### Description

Generic mapping class for mapping to the SysML v2 element *TypeFeaturing*.

#### General Mappings

GenericToRelationship\_Mapping

#### Mapping Source

Element

#### Mapping Target

TypeFeaturing

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `TypeFeaturing::featuringType () : Type [1]`  
*abstract rule*
- `TypeFeaturing::featureOfType () : Feature [1]`  
*abstract rule*



## 7.6.4 Generic Mappings to Systems

### 7.6.4.1 GenericToActionUsage\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *ActionUsage*.

#### General Mappings

GenericToUsage\_Mapping

GenericToStep\_Mapping

#### Mapping Source

Element

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::isComposite () : Boolean [1]  
true

### 7.6.4.2 GenericToActorMembership\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *ActorMembership*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

ActorMembership

### **Owned Mappings**

(none)

### **7.6.4.3 GenericToAssignmentActionUsage\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *AssignmentActionUsage*.

#### **General Mappings**

GenericToActionUsage\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

AssignmentActionUsage

### **Owned Mappings**

(none)

### **7.6.4.4 GenericToConnectionUsage\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *ConnectionUsage*.

#### **General Mappings**

GenericToPartUsage\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

ConnectionUsage

### **Owned Mappings**

(none)

### **7.6.4.5 GenericToConjugatedPortDefinition\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *ConjugatedPortDefinition*.

#### **General Mappings**

GenericToPortDefinition\_Mapping

**Mapping Source**

Element

**Mapping Target**

ConjugatedPortDefinition

**Owned Mappings**

(none)

**7.6.4.6 GenericToConjugatedPortTyping\_Mapping**

**Description**

Generic mapping class for mappingsto the SysML v2 element *ConjugatedPortTyping*.

**General Mappings**

GenericToFeatureTyping\_Mapping

**Mapping Source**

Element

**Mapping Target**

ConjugatedPortTyping

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConjugatedPortTyping::conjugatedPortDefinition () : ConjugatedPortDefinition [1]  
*abstract rule*
- ConjugatedPortTyping::portDefinition () : PortDefinition [1]  
*abstract rule*

**7.6.4.7 GenericToConstraintDefinition\_Mapping**

**Description**

Generic mapping class for mappingsto the SysML v2 element *ConstraintDefinition*.

## General Mappings

GenericToDefinition\_Mapping

## Mapping Source

Element

## Mapping Target

ConstraintDefinition

## Owned Mappings

(none)

### 7.6.4.8 GenericToConstraintUsage\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *ConstraintUsage*.

## General Mappings

GenericToUsage\_Mapping

## Mapping Source

Element

## Mapping Target

ConstraintUsage

## Owned Mappings

(none)

### 7.6.4.9 GenericToDefinition\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *Definition*.

## General Mappings

GenericToClassifier\_Mapping

## Mapping Source

Element

## Mapping Target

Definition

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Definition::isVariation () : Boolean [1]

    false

### 7.6.4.10 GenericToEventOccurrenceUsage\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *EventOccurrenceUsage*.

#### General Mappings

GenericToOccurrenceUsage\_Mapping

#### Mapping Source

Element

#### Mapping Target

EventOccurrenceUsage

#### Owned Mappings

(none)

### 7.6.4.11 GenericToItemDefinition\_Mapping

#### Description

Generic mapping class for mappingsto the SysML v2 element *ItemDefinition*.

#### General Mappings

GenericToDefinition\_Mapping

#### Mapping Source

Element

#### Mapping Target

ItemDefinition

### **Owned Mappings**

(none)

### **7.6.4.12 GenericToMetadataUsage\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *MetadataUsage*.

#### **General Mappings**

GenericToUsage\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

MetadataUsage

### **Owned Mappings**

(none)

### **7.6.4.13 GenericToObjectiveMembership\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *ObjectiveMembership*.

#### **General Mappings**

GenericToFeatureMembership\_Mapping

#### **Mapping Source**

Element

#### **Mapping Target**

ObjectiveMembership

### **Owned Mappings**

(none)

### **7.6.4.14 GenericToOccurrenceDefinition\_Mapping**

#### **Description**

Generic mapping class for mappingsto the SysML v2 element *OccurrenceDefinition*.

#### **General Mappings**

GenericToDefinition\_Mapping

**Mapping Source**

Element

**Mapping Target**

OccurrenceDefinition

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OccurrenceDefinition::isIndividual () : Boolean [1]  
false

**7.6.4.15 GenericToOccurrenceUsage\_Mapping**

**Description**

Generic mapping class for mappingsto the SysML v2 element *OccurrenceUsage*.

**General Mappings**

GenericToUsage\_Mapping

**Mapping Source**

Element

**Mapping Target**

OccurrenceUsage

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OccurrenceUsage::portionKind () : PortionKind [1]  
oclUndefined
- OccurrenceUsage::isIndividual () : Boolean [1]  
false

#### **7.6.4.16 GenericToPartUsage\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *PartUsage*.

##### **General Mappings**

GenericToUsage\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

PartUsage

##### **Owned Mappings**

(none)

#### **7.6.4.17 GenericToPortConjugation\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *PortConjugation*.

##### **General Mappings**

GenericToConjugation\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

PortConjugation

##### **Owned Mappings**

(none)

##### **Applicable filters**



(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PortConjugation::originalPortDefinition () : PortDefinition [1]  
*abstract rule*

#### **7.6.4.18 GenericToPortDefinition\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *PortDefinition*.

##### **General Mappings**

GenericToDefinition\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

PortDefinition

##### **Owned Mappings**

(none)

#### **7.6.4.19 GenericToReferenceUsage\_Mapping**

##### **Description**

Provides the basic features to map to a ReferenceUsage element.

##### **General Mappings**

GenericToUsage\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

ReferenceUsage

##### **Owned Mappings**

(none)

#### **7.6.4.20 GenericToRequirementUsage\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *RequirementUsage*.

##### **General Mappings**

GenericToUsage\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

RequirementUsage

##### **Owned Mappings**

(none)

#### **7.6.4.21 GenericToStateUsage\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *StateUsage*.

##### **General Mappings**

GenericToActionUsage\_Mapping

##### **Mapping Source**

Element

##### **Mapping Target**

StateUsage

##### **Owned Mappings**

(none)

#### **7.6.4.22 GenericToSubjectMembership\_Mapping**

##### **Description**

Generic mapping class for mappingsto the SysML v2 element *SubjectMembership*.

##### **General Mappings**

GenericToParameterMembership\_Mapping

##### **Mapping Source**

Element

### Mapping Target

SubjectMembership

### Owned Mappings

(none)

## 7.6.4.23 GenericToUsage\_Mapping

### Description

Generic mapping class for mappingsto the SysML v2 element *Usage*.

### General Mappings

GenericToFeature\_Mapping

### Mapping Source

Element

### Mapping Target

Usage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Usage::isVariation () : Boolean [1]

    false

## 7.7 Mappings from UML4SysML metaclasses

This chapter lists all mapping specifications of UML4SysML model elements.

### 7.7.1 Overview

UML4SysML is the subset of UML containing all model elements that are reused by SysML. The complete list of model elements is defined in [SysMLv1], subclause 4.1.

## 7.7.2 Actions

This chapter lists all mapping specifications of UML4SysML::Actions model elements.

### 7.7.2.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::Actions elements are transformed with which mapping class. The mapping details are in [7.7.2.3](#).

The justifications for the elements without mapping are given in [7.7.2.2](#).

**Table 1. List of all mappings**

SysML v1 Concept	SysML v2 Concept
AcceptCallAction	AcceptActionUsage
AcceptEventAction	AcceptActionUsage AcceptActionUsage AcceptActionUsage
ActionInputPin	
AddStructuralFeatureValueAction	ActionUsage
AddVariableValueAction	ActionUsage
BroadcastSignalAction	ActionUsage
CallBehaviorAction	ActionUsage
CallOperationAction	ActionUsage
Clause	
ClearAssociationAction	ActionUsage
ClearStructuralFeatureAction	ActionUsage
ClearVariableAction	ActionUsage
ConditionalNode	
CreateLinkAction	ActionUsage
CreateLinkObjectAction	ActionUsage
CreateObjectAction	ActionUsage
DestroyLinkAction	ActionUsage
DestroyObjectAction	ActionUsage
InputPin	ReferenceUsage ReferenceUsage
LinkEndCreationData	
LinkEndData	
LinkEndDestructionData	
LoopNode	ActionUsage
OpaqueAction	ActionUsage

SysML v1 Concept	SysML v2 Concept
OutputPin	ReferenceUsage ReferenceUsage ReferenceUsage ReferenceUsage ReferenceUsage ReferenceUsage ReferenceUsage
RaiseExceptionAction	ActionUsage
ReadExtentAction	ActionUsage
ReadIsClassifiedObjectAction	ActionUsage
ReadLinkAction	ActionUsage
ReadLinkObjectEndAction	ActionUsage
ReadSelfAction	ActionUsage
ReadStructuralFeatureAction	ActionUsage
ReadVariableAction	ActionUsage
ReclassifyObjectAction	ActionUsage
ReduceAction	ActionUsage
RemoveStructuralFeatureValueAction	ActionUsage
RemoveVariableValueAction	ActionUsage
ReplyAction	ActionUsage
SendObjectAction	ActionUsage
SendSignalAction	ActionUsage ActionUsage
SequenceNode	ActionUsage
StartClassifierBehaviorAction	ActionUsage
StartObjectBehaviorAction	ActionUsage
StructuredActivityNode	ActionUsage ActionUsage ActionUsage
TestIdentityAction	CalculationUsage
UnmarshallAction	ActionUsage
ValuePin	ReferenceUsage ReferenceUsage
ValueSpecificationAction	ActionUsage

### 7.7.2.2 UML4SysML::Actions elements not mapped

**Table 2. List of SysML v1 elements not mapped of this section**

<b>SysML v1 Concept</b>	<b>Rationale</b>
AcceptCallAction	Since the CallEvent is not supported by SysML v2, the AcceptCallAction is also not covered. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.
ActionInputPin	The UML4SysML::ActionInputPin concept is not covered by SysML v2. The model element is mapped as a input or output pin, but without the special action input pin semantics.
Clause	Mapping is not specified yet.
ConditionalNode	Mapping is not specified yet.
LinkEndCreationData	Mapping is not specified yet.
LinkEndData	Mapping is not specified yet.
LinkEndDestructionData	Mapping is not specified yet.
ReclassifyObjectAction	The UML4SysML::ReclassifyObjectAction is not supported by SysML v2. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.
ReplyAction	The UML4SysML::ReplyAction is only used with UML4SysML::AcceptCallAction. Since we have no mapping of AcceptCallAction to SysML v2, there is also no mapping for ReplyAction. However, it is mapped to an empty action usage to keep the connections within the activity respectively action definition.
StartClassifierBehaviorAction	The UML4SysML::StartClassifierBehaviorAction is not supported by SysML v2. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.
StartObjectBehaviorAction	The UML4SysML::StartObjectBehaviorAction is not supported by SysML v2. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.
UnmarshallAction	Mapping is not specified yet.

### 7.7.2.3 Mapping Specifications

The mapping specifications are divided into sections corresponding to the structure in which the UML 2.5.1 specification groups the actions.

The name of the primary mapping class is "<SysML v1 action name>\_Mapping". The secondary mapping classes for the further mapping structures start with an abbreviation of the SysML v1 action name to reduce the overall length of the names.

### 7.7.2.3.1 Accept Event Actions

#### 7.7.2.3.1.1 AcceptCallAction\_Mapping

##### Description

Since the CallEvent is not supported by SysML v2, the AcceptCallAction is also not covered. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.

##### General Mappings

AcceptEventAction\_Mapping

##### Mapping Source

AcceptCallAction

##### Mapping Target

AcceptActionUsage

##### Owned Mappings

(none)

#### 7.7.2.3.1.2 AcceptEventAction\_Mapping

##### Description

The UML4SysML::AcceptEventAction is mapped to a AcceptActionUsage element.

If the trigger is a signal, it is mapped to an accept parameter typed by the signal.

SysMLv2 does not support more than one trigger. Therefore only the first specified trigger of the action is transformed. All further triggers are ignored.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action acceptEventActionSignalEvent1 accept : SysMLv1Signal via sysMLv1Port;
action acceptEventActionChangeEvent1 accept when when changeExpression.result {
    calc changeExpression {
        return : ScalarValues::Boolean;
        language "OCL"
            /*
             * x > 0
             */
    }
}
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

AcceptEventAction

### Mapping Target

AcceptActionUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- AcceptActionUsage::ownedRelationship () : Relationship [0..\*]

```
let relationships : Set (KerML::Relationship) = Helper.actionOwnedRelationship(from)
->including (AEAPParameterMembership_Mapping.getMapped(from))
->including (AEARReceiverParameterMembership_Mapping.getMapped(from)) in
if from.trigger.get(0).event.oclIsTypeOf(UML::ChangeEvent) then
relationships->including (ElementFeatureMembership_Mapping.getMapped(
    from.trigger.get(0).event.oclAsType(UML::ChangeEvent).changeExpression))
else relationships
endif
```

#### 7.7.2.3.1.3 AEACHangeExpressionMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)



## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`from.trigger.get(0).event.oclassType(UML::ChangeEvent).changeExpression`

### 7.7.2.3.1.4 AEChangeParameter\_Mapping

#### Description

The mapping class transforms the change event specified at the AcceptEventAction.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

AcceptEventAction

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_in'`
- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set{AEChangeParameterFeatureValue_Mapping.getMapped(from)}`

### 7.7.2.3.1.5 AEChangeParameterFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

### **Mapping Source**

AcceptEventAction

### **Mapping Target**

FeatureValue

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`AEChangeParameterTrigger_Mapping.getMapped (from)`

#### **7.7.2.3.1.6 AEChangeParameterTrigger\_Mapping**

##### **Description**

The mapping class creates a TriggerInvocationExpression from the change event specified at the AcceptEventAction.

##### **General Mappings**

GenericToInvocationExpression\_Mapping

##### **Mapping Source**

AcceptEventAction

##### **Mapping Target**

TriggerInvocationExpression

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `TriggerInvocationExpression::ownedRelationship () : Relationship [0..*]`

```
Set { AEChangeParameterFeatureMembership_Mapping.getMapped (from) }
```

#### 7.7.2.3.1.7 AEChangeParameterTriggerExpression\_Mapping

##### Description

The mapping class creates the trigger expression element for the change parameter of the SysML v2 `AcceptActionUsage` element.

##### General Mappings

`GenericToExpression_Mapping`

##### Mapping Source

`AcceptEventAction`

##### Mapping Target

`Expression`

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Expression::ownedRelationship () : Relationship [0..*]`

```
Set { AEChangeParameterResultExpressionMembership_Mapping.getMapped (from) }
```

#### 7.7.2.3.1.8 AEChangeParameterResultExpressionMembership\_Mapping

##### Description

Creates a membership relationship for `memberElement()`.

##### General Mappings

`GenericToFeatureMembership_Mapping`

##### Mapping Source

`AcceptEventAction`

## Mapping Target

ResultExpressionMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ResultExpressionMembership::ownedMemberFeature () : Feature [1]  
`AEChangeParameterFeatureChainExpression_Mapping.getMapped(from)`

### 7.7.2.3.1.9 AEChangeParameterFeatureChainExpression\_Mapping

#### Description

The mapping class creates the feature chain expression element for the change parameter of the SysML v2 AcceptActionUsage element.

#### General Mappings

GenericToInvocationExpression\_Mapping

#### Mapping Source

AcceptEventAction

#### Mapping Target

FeatureChainExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureChainExpression::ownedRelationship () : Relationship [0..\*]  
`Set {AEChangeParameterParameterMembership_Mapping.getMapped(from)}`

#### 7.7.2.3.1.10 AEChangeParameterFeature\_Mapping

##### Description

The mapping class creates the feature for the feature chain expression element for the change parameter of the SysML v2 AcceptActionUsage element.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
Set { AEChangeParameterExpressionFeatureValue_Mapping.getMapped (from) }
```

#### 7.7.2.3.1.11 AEChangeParameterExpressionFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

FeatureValue

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
AEChangeParameterFeatureReferenceExpression_Mapping.getMapped(from)
```

#### 7.7.2.3.1.12 AEChangeParameterFeatureReferenceExpression\_Mapping

##### Description

The mapping class creates the feature reference expression for the feature chain expression element for the change parameter of the SysML v2 AcceptActionUsage element.

##### General Mappings

GenericToFeatureReferenceExpression\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

FeatureReferenceExpression

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set { AEChangeParameterMembership_Mapping.getMapped(from) }
```

#### 7.7.2.3.1.13 AEChangeParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

## General Mappings

GenericToMembership\_Mapping

## Mapping Source

AcceptEventAction

## Mapping Target

Membership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  
`from.trigger.get(0).event.oclassType(UML::ChangeEvent).changeExpression`

### 7.7.2.3.1.14 AEChangeParameterParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

AcceptEventAction

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

```
AEChangeParameterFeature_Mapping.getMapped(from)
```

#### 7.7.2.3.1.15 AEARReceiverParameter\_Mapping

##### Description

The mapping class creates the reference usage element for the receiver parameter of the SysML v2 AcceptActionUsage element.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
if from.trigger.get(0).port->size() > 0
then Set{AEARReceiverFeatureValue_Mapping.getMapped(from)}
else Set{}
endif
```

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]

```
KerML::FeatureDirectionKind::_in'
```

#### 7.7.2.3.1.16 AEARReceiverParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.



## General Mappings

GenericToParameterMembership\_Mapping

## Mapping Source

AcceptEventAction

## Mapping Target

ParameterMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

```
AEARReceiverParameter_Mapping.getMapped(from)
```

### 7.7.2.3.1.17 AEARReceiverFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

AcceptEventAction

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
ACARceiverFeatureReferenceExpression_Mapping.getMapped(from)
```

#### 7.7.2.3.1.18 AEASignalParameter\_Mapping

##### Description

The mapping class creates the reference usage element for the signal parameter of the SysML v2 AcceptActionUsage element.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{AEASignalParameterFeatureTyping_Mapping.getMapped(from) }
```

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]

```
KerML::FeatureDirectionKind::_in'
```

#### 7.7.2.3.1.19 AEASignalParameterFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

### **Mapping Source**

AcceptEventAction

### **Mapping Target**

FeatureTyping

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  

```
let event : UML::Event = from.trigger.get(0).event in
if event.oclIsTypeOf(UML::SignalEvent) then
    event.oclAsType(UML::SignalEvent).signal
else OclUndefined endif
```

#### **7.7.2.3.1.20 AEAPParameterMembership\_Mapping**

##### **Description**

The mapping class creates the parameter membership relationship for the element that can be received by the accept action. The source of the element is the trigger of the UML4SysML::AcceptEventAction.

Currently, more than one trigger is not supported by the transformation.

##### **General Mappings**

GenericToParameterMembership\_Mapping

##### **Mapping Source**

AcceptEventAction

##### **Mapping Target**

ParameterMembership

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

```
if from.trigger.get(0).event.ocIsTypeOf(UML::SignalEvent) then
  AEASignalParameter_Mapping.getMapped(from)
else if from.trigger.get(0).event.ocIsTypeOf(UML::ChangeEvent) then
  AEASignalParameter_Mapping.getMapped(from)
else
  OclUndefined
endif endif
```

#### 7.7.2.3.1.21 AEAReceiverFeatureReferenceExpression\_Mapping

##### Description

The mapping class creates the feature reference expression for the reference usage element for the receiver parameter of the SysML v2 AcceptActionUsage element.

##### General Mappings

GenericToFeatureReferenceExpression\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

FeatureReferenceExpression

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set {AEAReceiverFeatureReferenceExpressionMembership_Mapping.getMapped(from),
ReturnParameterFeatureMembership_Factory.create() }
```

#### 7.7.2.3.1.22 AEAReceiverFeatureReferenceExpressionMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToMembership\_Mapping

### Mapping Source

AcceptEventAction

### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  

```
if from.trigger.get(0).port->size() > 0 then
  from.trigger.get(0).port.get(0)
else
  OclUndefined
endif
```

#### 7.7.2.3.1.23 ReplyAction\_Mapping

##### Description

The UML4SysML::ReplyAction is only used with UML4SysML::AcceptCallAction. Since we have no mapping of AcceptCallAction to SysML v2, there is also no mapping for ReplyAction. However, it is mapped to an empty action usage to keep the connections within the activity respectively action definition.

### General Mappings

CommonAction\_Mapping

### Mapping Source

ReplyAction

### Mapping Target

ActionUsage

### Owned Mappings

(none)

#### **7.7.2.3.1.24 UnmarshallAction\_Mapping**

##### **Description**

The mapping of UML4SysML::UnmarshallAction is not specified yet. It is currently mapped to an empty action usage to keep the connections within the activity respectively action definition.

##### **General Mappings**

CommonAction\_Mapping

##### **Mapping Source**

UnmarshallAction

##### **Mapping Target**

ActionUsage

##### **Owned Mappings**

(none)

#### **7.7.2.3.2 Actions**

##### **7.7.2.3.2.1 CommonAction\_Mapping**

##### **Description**

Base mapping class for model elements of kind UML4SysML::Action. The target element is a SysML v2 ActionUsage.

##### **General Mappings**

GenericToActionUsage\_Mapping

NamedElementMain\_Mapping

##### **Mapping Source**

Action

##### **Mapping Target**

ActionUsage

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::isComposite () : Boolean [1]  
true
- ActionUsage::ownedRelationship () : Relationship [0..\*]  
Helper.actionOwnedRelationship(from)

#### 7.7.2.3.2.2 InputPin\_Mapping

##### Description

A UML4SysML::InputPin is mapped to a SysMLv2 ReferenceUsage with direction 'in'. This mapping class transforms input pins with a specified type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1Action {
  in parIn : SysMLv1Block;
}
part def SysMLv1Block;
```

##### General Mappings

Pin\_Mapping

##### Mapping Source

InputPin

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

#### 7.7.2.3.2.3 InputPinUntyped\_Mapping

##### Description

A UML4SysML::InputPin is mapped to a SysMLv2 ReferenceUsage with direction 'in'. This mapping class transforms input pins without a specified type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1Action {
  in parIn;
}
```

## General Mappings

UntypedPin\_Mapping

## Mapping Source

InputPin

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

### 7.7.2.3.2.4 OpaqueAction\_Mapping

#### Description

The UML4SysML::OpaqueAction is mapped to a SysML v2 ActionUsage with a textual representation.

The following shows an example of the expected SysMLv2 textual syntax of a UML4SysML::OpaqueAction.

```
action thisIsAOpaqueAction {
  in x : ScalarValues::Integer;
  in y : ScalarValues::Integer;
  out result : ScalarValues::Boolean;

  language "OCL"
  /*
   * x = y + 1;
  */
}
```

## General Mappings

CommonAction\_Mapping

## Mapping Source

OpaqueAction

## Mapping Target

ActionUsage

## Owned Mappings

(none)

## Applicable filters

(none)



## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ActionUsage::ownedRelationship () : Relationship [0..*]`

```
if from.body->size() > 0 then
  Helper.actionOwnedRelationship (from) ->append (OABodyMembership_Mapping.getMapped (from))
else
  Helper.actionOwnedRelationship (from)
endif
```

### 7.7.2.3.2.5 OABody\_Mapping

#### Description

The languages and bodies of a `UML4SysML::OpaqueAction` are mapped to `SysMLv2 TextualRepresentations`.

#### General Mappings

`GenericToAnnotatingElement_Mapping`

#### Mapping Source

`OpaqueAction`

#### Mapping Target

`TextualRepresentation`

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `TextualRepresentation::body () : String [1]`

```
if from.body.notEmpty() then from.body.first() else OclUndefined endif
```

- `TextualRepresentation::language () : String [1]`

```
if from.language.notEmpty() then from.language.first() else OclUndefined endif
```

### 7.7.2.3.2.6 OABodyMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToOwningMembership\_Mapping

### Mapping Source

OpaqueAction

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

```
OABody_Mapping.getMapped(from)
```

#### 7.7.2.3.2.7 OutputPin\_Mapping

##### Description

A UML4SysML::OutputPin is mapped to a SysMLv2 ReferenceUsage with direction 'out'. This mapping class transforms output pins with a specified type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1Action {
  out parIn : SysMLv1Block;
}
part def SysMLv1Block;
```

### General Mappings

Pin\_Mapping

### Mapping Source

OutputPin

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

#### 7.7.2.3.2.8 OutputPinUntyped\_Mapping

##### Description

A UML4SysML::OutputPin is mapped to a SysMLv2 ReferenceUsage with direction 'in'. This mapping class transforms output pins without a specified type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1Action {  
  out parIn;  
}
```

### General Mappings

UntypedPin\_Mapping

### Mapping Source

OutputPin

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

#### 7.7.2.3.2.9 Pin\_Mapping

##### Description

Base mapping class for model elements of kind UML4SysML::Pin with a type. The target element is a SysMLv2 ReferenceUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {  
  action sysMLv1Action {  
    in sysMLv1TypedPin : ScalarValues::Integer;  
  }  
}
```

### General Mappings

UntypedPin\_Mapping

### Mapping Source

Pin

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.type.oclIsUndefined()
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  

```
Set{PinFeatureTyping_Mapping.getMapped(from),  
MultiplicityMembership_Mapping.getMapped(from)}
```

#### 7.7.2.3.2.10 PinFeatureTyping\_Mapping

##### Description

Creates the feature typing for the UML4SysML::Pin target ReferenceUsage.

##### General Mappings

TypedElementFeatureTyping\_Mapping

##### Mapping Source

Pin

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

#### 7.7.2.3.2.11 UntypedPin\_Mapping

##### Description

Base mapping class for model elements of kind UML4SysML::Pin without a type. The target element is a SysMLv2 ReferenceUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    action sysMLv1Action {
        in sysMLv1UntypedPin;
    }
}
```

## General Mappings

GenericToReferenceUsage\_Mapping  
NamedElementMain\_Mapping

## Mapping Source

Pin

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.type.oclIsUndefined()
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]

```
if from.oclIsTypeOf(UML::InputPin) then
    KerML::FeatureDirectionKind::_in'
else if from.oclIsTypeOf(UML::OutputPin) then
    KerML::FeatureDirectionKind::_out'
else
    OclUndefined
endif endif
```

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
ElementOwnership_Mapping.getMappedColl(from.ownedComment)
->including(MultiplicityMembership_Mapping.getMapped(from))
```

### 7.7.2.3.2.12 ValuePin\_Mapping

#### Description

A UML4SysML::ValuePin is mapped to a SysML v2 ReferenceUsage with assigned value.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1Action {
    in sysMLv1ValuePin1 : ScalarValues::Integer = 42;
    in sysMLv1ValuePin2 = {
        return result;
        language "English"
        /*
         * this is a opaque expression
         */
    }.result;
}
```

## General Mappings

Pin\_Mapping

### Mapping Source

ValuePin

### Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{PinFeatureTyping_Mapping.getMapped(from),
ValuePinFeatureValue_Mapping.getMapped(from),
MultiplicityMembership_Mapping.getMapped(from)}
```

### 7.7.2.3.2.13 ValuePinFeatureValue\_Mapping

#### Description

The mapping class creates the value expression for the reference usage element.

## General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

ValuePin

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  

```
if from.value.oclIsUndefined() then OclUndefined else from.value endif
```

### 7.7.2.3.2.14 ValuePinUntyped\_Mapping

#### Description

Same as ValuePin\_Mapping, but for UML4SysML::ValuePins without a specified type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1Action {  
    in sysMLv1ValuePin1 = 42;  
}
```

## General Mappings

UntypedPin\_Mapping

## Mapping Source

ValuePin

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  

```
Set { ValuePinFeatureValue_Mapping.getMapped (from) ,  
MultiplicityMembership_Mapping.getMapped (from) }
```

### 7.7.2.3.3 Invocation Actions

#### 7.7.2.3.3.1 BroadcastSignalAction\_Mapping

##### Description

The UML4SysML::BroadcastSignalAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

BroadcastSignalAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

#### 7.7.2.3.3.2 CallBehaviorAction\_Mapping

##### Description

A UML4SysML::CallBehaviorAction is mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity1 {  
    action sysMLv1CallBehaviorAction : SysMLv1Activity2;  
}  
action def SysMLv1Activity2;
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source



CallBehaviorAction

### Mapping Target

ActionUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]  

```
Helper.actionOwnedRelationship (from)  
->append (CBAFeatureTyping_Mapping.getMapped (from))
```

#### 7.7.2.3.3.3 CBAFeatureTyping\_Mapping

### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

CallBehaviorAction

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
from.behavior
```

#### 7.7.2.3.3.4 CallOperationAction\_Mapping

##### Description

A UML4SysML::CallOperationAction is mapped to a SysML v2 ActionUsage which calls the operation.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1CallOperationAction {
  in paramIn;
  in target : ThisIsABlock;
  out paramReturn = target.sysMLv1Operation;
}
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

CallOperationAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
Helper.actionOwnedRelationship(from)
->including(COAPerformActionFeatureMembership_Mapping.getMapped(from))
```

#### 7.7.2.3.3.5 COAOutputPinFeature\_Mapping

##### Description

The mapping class creates the feature element for the output parameter.

##### General Mappings

GenericToFeature\_Mapping

## Mapping Source

OutputPin

## Mapping Target

Feature

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  

```
Set { COAOutputPinFeatureFeatureValue_Mapping.getMapped (from) ,  
COAOutputPinFeatureFeatureMembership_Mapping.getMapped (from) }
```
- Feature::direction () : FeatureDirectionKind [0..1]  

```
KerML::FeatureDirectionKind::_'in'
```

### 7.7.2.3.3.6 COAOutputPinFeatureChainExpression\_Mapping

#### Description

The mapping class creates the feature chain expression for the output parameter feature value.

#### General Mappings

GenericToInvocationExpression\_Mapping

#### Mapping Source

OutputPin

#### Mapping Target

FeatureChainExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureChainExpression::ownedRelationship () : Relationship [0..*]`  

```
Set { COAOutputPinParameterMembership_Mapping.getMapped (from) ,  
COAOutputPinFeatureChainExpressionMembership_Mapping.getMapped (from) ,  
ReturnParameterFeatureMembership_Factory.create () }
```

### 7.7.2.3.3.7 COAOutputPinFeatureChainExpressionMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

OutputPin

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`  

```
from.owner.oclAsType (UML::CallOperationAction).operation
```

### 7.7.2.3.3.8 COAOutputPinFeatureFeature\_Mapping

#### Description

Creates a feature element for the UML4SysML::CallOperationAction mapping.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

OutputPin

### Mapping Target

Feature

### Owned Mappings

(none)

#### 7.7.2.3.3.9 COAOutputPinFeatureFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

OutputPin

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`COAOutputPinFeatureFeature_Mapping.getMapped(from)`

#### 7.7.2.3.3.10 COAOutputPinFeatureFeatureValue\_Mapping

### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

### Mapping Source

OutputPin

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`COAOutputPinFeatureReferenceExpression_Mapping.getMapped(from)`

#### 7.7.2.3.3.11 COAOutputPinFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

OutputPin

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
COAOutputPinReferenceUsage_Mapping.getMapped(from)
```

#### 7.7.2.3.3.12 COAOutputPinFeatureReferenceExpression\_Mapping

##### Description

The mapping class creates the feature reference expression for the output parameter.

##### General Mappings

GenericToFeatureReferenceExpression\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

FeatureReferenceExpression

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set { COAOutputPinFeatureReferenceExpressionMembership_Mapping.getMapped(from),  
ReturnParameterFeatureMembership_Factory.create() }
```

#### 7.7.2.3.3.13 COAOutputPinFeatureReferenceExpressionMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

Membership

##### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  
`from.owner.oclAsType(UML::CallOperationAction).target`

#### 7.7.2.3.3.14 COAOutputPinParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToParameterMembership\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

ParameterMembership

##### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]  
`COAOutputPinFeature_Mapping.getMapped(from)`
- ParameterMembership::visibility () : VisibilityKind [1]  
`KerML::VisibilityKind::private`

#### 7.7.2.3.3.15 COAOutputPinReferenceUsage\_Mapping

##### Description



Creates a reference usage.

### **General Mappings**

GenericToReferenceUsage\_Mapping

### **Mapping Source**

OutputPin

### **Mapping Target**

ReferenceUsage

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{COAOutputPinReferenceUsageFeatureValue_Mapping.getMapped(from)}
```

### **7.7.2.3.3.16 COAOutputPinReferenceUsageFeatureValue\_Mapping**

#### **Description**

Creates a feature value relationship.

#### **General Mappings**

GenericToFeatureValue\_Mapping

#### **Mapping Source**

OutputPin

#### **Mapping Target**

FeatureValue

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

`COAOutputPinFeatureChainExpression_Mapping.getMapped(from)`

### 7.7.2.3.3.17 COAPerformAction\_Mapping

#### Description

The mapping class creates the PerformActionUsage element.

#### General Mappings

GenericToActionUsage\_Mapping

#### Mapping Source

CallOperationAction

#### Mapping Target

PerformActionUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PerformActionUsage::ownedRelationship () : Relationship [0..\*]

`Set{COAPerformActionReferenceSubsetting_Mapping.getMapped(from)}`

### 7.7.2.3.3.18 COAPerformActionFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

CallOperationAction

## Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`COAPerformAction_Mapping.getMapped(from)`

### 7.7.2.3.3.19 COAPerformActionReferenceSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

#### General Mappings

GenericToReferenceSubsetting\_Mapping

#### Mapping Source

CallOperationAction

#### Mapping Target

ReferenceSubsetting

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceSubsetting::ownedRelatedElement () : Element [0..\*]  
`Set{COAPerformActionFeature_Mapping.getMapped(from)}`

#### 7.7.2.3.3.20 COAPerformActionFeature\_Mapping

##### Description

The mapping class creates the feature element for the perform action usage.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

CallOperationAction

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
Set { COAPerformActionFeatureChainingTarget_Mapping.getMapped (from) ,  
      COAPerformActionFeatureChainingOperation_Mapping.getMapped (from) }
```

#### 7.7.2.3.3.21 COAPerformActionFeatureChainingOperation\_Mapping

##### Description

The mapping class creates the feature chaining element for the operation of the perform action usage.

##### General Mappings

GenericToFeatureChaining\_Mapping

##### Mapping Source

CallOperationAction

##### Mapping Target

FeatureChaining

##### Owned Mappings

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureChaining::chainingFeature () : Feature [1]  
`from.operation`

#### **7.7.2.3.3.22 COAPerformActionFeatureChainingTarget\_Mapping**

##### **Description**

The mapping class creates the feature chaining element for the target element of the perform action usage.

##### **General Mappings**

GenericToFeatureChaining\_Mapping

##### **Mapping Source**

CallOperationAction

##### **Mapping Target**

FeatureChaining

##### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureChaining::chainingFeature () : Feature [1]  
`from.target`

#### **7.7.2.3.3.23 SendObjectAction\_Mapping**

##### **Description**

A UML4SysML::SendObjectAction is mapped to a SysMLv2 ActionUsage that includes a SendActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1SendObjectAction {
    in target : SysMLv1Block;
    send SysMLv1Object1() to target;
}
part def SysMLv1Block;
item def SysMLv1Object;
```

### **General Mappings**

SendSignalAction\_Mapping

### **Mapping Source**

SendObjectAction

### **Mapping Target**

ActionUsage

### **Owned Mappings**

(none)

#### **7.7.2.3.3.24 SendSignalAction\_Mapping**

### **Description**

A UML4SysML::SendSignalAction is mapped to a SysMLv2 ActionUsage that includes a SendActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1SendSignalAction {
    in target : SysMLv1Block;
    send SysMLv1Signal() to target;
}
part def SysMLv1Block;
item def SysMLv1Signal;
```

### **General Mappings**

CommonAction\_Mapping

### **Mapping Source**

SendSignalAction

### **Mapping Target**

ActionUsage

### **Owned Mappings**

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]  
`Helper.actionOwnedRelationship (from)`  
`->including (SSAFeatureMembership_Mapping.getMapped (from))`

#### 7.7.2.3.3.25 SSAFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

InvocationAction

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`SSASendActionUsage_Mapping.getMapped (from)`

#### 7.7.2.3.3.26 SSAParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

## General Mappings

GenericToParameterMembership\_Mapping

## Mapping Source

InvocationAction

## Mapping Target

ParameterMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

```
SSAReferenceUsage_Mapping.getMapped(from)
```

### 7.7.2.3.3.27 SSAReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

InvocationAction

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules



In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]

`KerML::FeatureDirectionKind::_in'`

#### 7.7.2.3.3.28 SSAItemParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToParameterMembership\_Mapping

##### Mapping Source

InvocationAction

##### Mapping Target

ParameterMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

`SSAItemReferenceUsage_Mapping.getMapped(from)`

#### 7.7.2.3.3.29 SSAItemReferenceUsage\_Mapping

##### Description

Creates a reference usage.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

InvocationAction

##### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set { SSAItemReferenceUsageFeatureValue_Mapping.getMapped (from) }`
- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_'in'`

#### 7.7.2.3.30 SSAItemReferenceUsageFeatureValue\_Mapping

### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

### Mapping Source

InvocationAction

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
SSAItemReferenceUsageInvocationExpression_Mapping.getMapped(from)
```

#### 7.7.2.3.3.31 SSAItemReferenceUsageFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

InvocationAction

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
if from.oclIsTypeOf(UML::SendSignalAction) then
    from.signal
else if from.oclIsTypeOf(UML::SendObjectAction) then
    from.request
else
    OclUndefined
endif endif
```

#### 7.7.2.3.3.32 SSAItemReferenceUsageInvocationExpression\_Mapping

##### Description

The mapping class creates the invocation expression for the SysML v2 SendActionUsage.

##### General Mappings

GenericToInvocationExpression\_Mapping

##### Mapping Source

InvocationAction

## Mapping Target

InvocationExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- InvocationExpression::ownedRelationship () : Relationship [0..\*]  

```
Set { SSAItemReferenceUsageFeatureTyping_Mapping.getMapped(from) ,  
ReturnParameterFeatureMembership_Factory.create() }
```

### 7.7.2.3.33 SSATargetParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

InvocationAction

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]  

```
SSATargetReferenceUsage_Mapping.getMapped(from)
```

#### 7.7.2.3.34 SSATargetReferenceUsage\_Mapping

##### Description

Creates a reference usage.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

InvocationAction

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_in'`
- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set { SSATargetReferenceUsageFeatureValue_Mapping.getMapped (from) }`

#### 7.7.2.3.35 SSATargetReferenceUsageFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

InvocationAction

##### Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureValue::value () : Expression [1]`

`SSATargetReferenceUsageFeatureValueExpression_Mapping.getMapped (from)`

### 7.7.2.3.36 SSATargetReferenceUsageFeatureValueMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

InvocationAction

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`

`from.target`

### 7.7.2.3.37 SSATargetReferenceUsageFeatureValueExpression\_Mapping

#### Description

The mapping class creates the feature reference expression for the target reference usage element of the SysML v2 SendActionUsage.

### General Mappings

GenericToFeatureReferenceExpression\_Mapping

### Mapping Source

InvocationAction

### Mapping Target

FeatureReferenceExpression

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]  

```
Set { SSATargetReferenceUsageFeatureValueMembership_Mapping.getMapped (from) ,  
ReturnParameterFeatureMembership_Factory.create () }
```

### 7.7.2.3.38 SSASendActionUsage\_Mapping

#### Description

The mapping class creates the SysML v2 element SendActionUsage for the UML4SysML::SendSignalAction mapping.

### General Mappings

GenericToActionUsage\_Mapping

### Mapping Source

InvocationAction

### Mapping Target

SendActionUsage

### Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `SendActionUsage::ownedRelationship () : Relationship [0..*]`  

```
Set { SSAItemParameterMembership_Mapping.getMapped(from),  
SSAParameterMembership_Mapping.getMapped(from),  
SSATargetParameterMembership_Mapping.getMapped(from) }
```

### 7.7.2.3.39 StartClassifierBehaviorAction\_Mapping

#### Description

The UML4SysML::StartClassifierBehaviorAction is not supported by SysML v2. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.

#### General Mappings

CommonAction\_Mapping

#### Mapping Source

StartClassifierBehaviorAction

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

### 7.7.2.3.40 StartObjectBehaviorAction\_Mapping

#### Description

The UML4SysML::StartObjectBehaviorAction is not supported by SysML v2. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.

#### General Mappings

CommonAction\_Mapping

#### Mapping Source

StartObjectBehaviorAction

#### Mapping Target

ActionUsage



## **Owned Mappings**

(none)

### **7.7.2.3.4 Link Actions**

#### **7.7.2.3.4.1 ClearAssociationAction\_Mapping**

##### **Description**

The UML4SysML::ClearAssociationAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### **General Mappings**

CommonAction\_Mapping

##### **Mapping Source**

ClearAssociationAction

##### **Mapping Target**

ActionUsage

##### **Owned Mappings**

(none)

#### **7.7.2.3.4.2 CreateLinkAction\_Mapping**

##### **Description**

The UML4SysML::CreateLinkAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not completely defined yet.

##### **General Mappings**

CommonAction\_Mapping

##### **Mapping Source**

CreateLinkAction

##### **Mapping Target**

ActionUsage

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
let linkEndCreationData : Set(UML::Element) =
  from.ownedElement->select(e | e.ocliIsTypeOf(UML::LinkEndCreationData)) in
let actionInputPin: Set(UML::Element) =
  from.ownedElement->select(e | e.ocliIsTypeOf(UML::ActionInputPin)) in
let triggers: Set(UML::Element) =
  from.ownedElement->select(e | e.ocliIsKindOf(UML::Trigger)) in
let toElementFMS: Set(UML::Element) =
  from.ownedElement->select(e | e.ocliIsKindOf(UML::Pin)) in
let toElementOMS: Set(UML::Element) =
  (((from.ownedElement - toElementFMS) - actionInputPin)
   - triggers) - linkEndCreationData) in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
```

### 7.7.2.3.4.3 CreateLinkObjectAction\_Mapping

#### Description

A UML4SysML::CreateLinkObjectAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

#### General Mappings

CommonAction\_Mapping

#### Mapping Source

CreateLinkObjectAction

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

### 7.7.2.3.4.4 DestroyLinkAction\_Mapping

#### Description

The UML4SysML::DestroyLinkAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not completely defined yet.

#### General Mappings

CommonAction\_Mapping

#### Mapping Source

DestroyLinkAction

### Mapping Target

ActionUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
let actionInputPin: Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsTypeOf(UML::ActionInputPin)) in
let triggers: Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Trigger)) in
let linkData: Set(UML::Element) =
  from.ownedElement->select( e | e.ocIsKindOf(UML::LinkEndData) or
  e.ocIsKindOf(UML::LinkEndDestructionData)) in
let toElementFMS: Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Pin)) in
let toElementOMS: Set(UML::Element) =
  (((from.ownedElement - toElementFMS) - actionInputPin)
  - triggers) - linkData) in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
```

#### 7.7.2.3.4.5 ReadLinkAction\_Mapping

##### Description

The UML4SysML::ReadLinkAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not completely defined yet.

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

ReadLinkAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
let actionInputPin: Set(UML::Element) =
    from.ownedElement->select(e | e.oclcIsTypeOf(UML::ActionInputPin)) in
let triggers: Set(UML::Element) =
    from.ownedElement->select(e | e.oclcIsKindOf(UML::Trigger)) in
let linkData: Set(UML::Element) =
    from.ownedElement->select(e | e.oclcIsKindOf(UML::LinkEndData)) in
let toElementFMS: Set(UML::Element) =
    from.ownedElement->select(e | e.oclcIsKindOf(UML::Pin)) in
let toElementOMS: Set(UML::Element) =
    (((from.ownedElement - toElementFMS) - actionInputPin)
     - triggers) - linkData in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
```

#### 7.7.2.3.4.6 ReadLinkObjectEndAction\_Mapping

##### Description

The UML4SysML::ReadLinkObjectEndAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

ReadLinkObjectEndAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

#### 7.7.2.3.4.7 ReadLinkObjectEndQualifierAction\_Mapping

##### Description

The UML4SysML::ReadLinkObjectEndQualifierAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

## General Mappings

CommonAction\_Mapping

## Mapping Source

ReadLinkObjectEndQualifierAction

## Mapping Target

ActionUsage

## Owned Mappings

(none)

### 7.7.2.3.5 Object Actions

#### 7.7.2.3.5.1 CreateObjectAction\_Mapping

##### Description

A UML4SysML::CreateObjectAction is mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    action sysMLv1CreateObjectAction {
        out result : SysMLv1Block = SysMLv1Block();
    }
}
part def SysMLv1Block;
```

## General Mappings

CommonAction\_Mapping

## Mapping Source

CreateObjectAction

## Mapping Target

ActionUsage

## Owned Mappings

(none)

#### 7.7.2.3.5.2 COAInvocationExpressionFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

## General Mappings

GenericToFeatureTyping\_Mapping

## Mapping Source

CreateObjectAction

## Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
from.classifier
```

### 7.7.2.3.5.3 COAInvocationExpression\_Mapping

#### Description

The mapping class creates the invocation expression to create the object.

#### General Mappings

GenericToInvocationExpression\_Mapping

#### Mapping Source

CreateObjectAction

#### Mapping Target

InvocationExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- InvocationExpression::ownedRelationship () : Relationship [0..\*]

```
Set { COAInvocationExpressionFeatureTyping_Mapping.getMapped (from) ,  
CommonReturnParameterFeatureMembership_Mapping.getMapped (from.result) }
```

#### 7.7.2.3.5.4 COAPin\_Mapping

##### Description

The mapping class creates the output parameter of the ActionUsage for the mapping of UML4SysML::CreateObjectAction.

##### General Mappings

Pin\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsTypeOf (UML::CreateObjectAction)
```

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set { PinFeatureTyping_Mapping.getMapped (from) ,  
COAPinFeatureValue_Mapping.getMapped (from) }
```

#### 7.7.2.3.5.5 COAPinFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

##### General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

OutputPin

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`COAInvocationExpression_Mapping.getMapped(from.owner)`

### 7.7.2.3.5.6 DestroyObjectAction\_Mapping

#### Description

The UML4SysML::DestroyObjectAction is conceptually mapped to the SysML v2 library function OccurrenceFunctions::destroy.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    action sysMLv1DestroyObjectAction {
        in target : SysMLv1Block;
        action : OccurrenceFunctions::destroy {
            in occ = target;
        }
    }
}
part def SysMLv1Block;
```

#### General Mappings

CommonAction\_Mapping

#### Mapping Source

DestroyObjectAction

#### Mapping Target

ActionUsage



## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]  

```
Helper.actionOwnedRelationship (from)  
->including (DOADestroyFeatureMembership_Mapping.getMapped (from))
```

### 7.7.2.3.5.7 DOADestroyActionUsage\_Mapping

#### Description

The mapping class creates the action usage for the destroy function.

#### General Mappings

GenericToActionUsage\_Mapping

#### Mapping Source

DestroyObjectAction

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]  

```
Set { DOADestroyActionUsageFeatureTyping_Mapping.getMapped (from) ,  
DOADestroyActionUsageFeatureMembership_Mapping.getMapped (from) }
```

### 7.7.2.3.5.8 DOADestroyActionUsageFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

DestroyObjectAction

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`DOADestroyActionUsageReferenceUsage_Mapping.getMapped(from)`

#### 7.7.2.3.5.9 DOADestroyActionUsageFeatureReferenceExpression\_Mapping

### Description

The mapping class creates the feature reference expression for the UML4SysML::DestroyObjectAction mapping.

### General Mappings

GenericToFeatureReferenceExpression\_Mapping

### Mapping Source

DestroyObjectAction

### Mapping Target

FeatureReferenceExpression

### Owned Mappings

(none)

### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureReferenceExpression::ownedRelationship () : Relationship [0..*]`  
`Set { DOADestroyActionUsageMembership_Mapping.getMapped (from) ,`  
`ReturnParameterFeatureMembership_Factory.create () }`

### 7.7.2.3.5.10 DOADestroyActionUsageMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

DestroyObjectAction

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`  
`from.target`

### 7.7.2.3.5.11 DOADestroyActionUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

DestroyObjectAction

### **Mapping Target**

FeatureTyping

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  

```
    SysMLv2::Function.allInstances(  
    )->any(e | e.qualifiedName = 'OccurrenceFunctions::destroy')
```

## **7.7.2.3.5.12 DOADestroyActionUsageFeatureValue\_Mapping**

### **Description**

Creates a feature value relationship.

### **General Mappings**

GenericToFeatureValue\_Mapping

### **Mapping Source**

DestroyObjectAction

### **Mapping Target**

FeatureValue

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

`DOADestroyActionUsageFeatureReferenceExpression_Mapping.getMapped(from)`

#### 7.7.2.3.5.13 DOADestroyActionUsageReferenceUsage\_Mapping

##### Description

Creates a reference usage.

##### General Mappings

`GenericToReferenceUsage_Mapping`

##### Mapping Source

`DestroyObjectAction`

##### Mapping Target

`ReferenceUsage`

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::ownedRelationship () : Relationship [0..*]`

`Set { DOADestroyActionUsageFeatureValue_Mapping.getMapped(from) }`

#### 7.7.2.3.5.14 DOADestroyFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for `ownedMemberFeature()`.

##### General Mappings

`GenericToFeatureMembership_Mapping`

##### Mapping Source

`DestroyObjectAction`

##### Mapping Target

`FeatureMembership`

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
DOADestroyActionUsage\_Mapping.getMapped(from)

#### 7.7.2.3.5.15 ReadIsClassifiedObjectAction\_Mapping

##### Description

The UML4SysML::ReadIsClassifiedObjectAction is conceptually mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
  action sysMLv1ReadIsClassifiedObjectActionDirect {
    in object;
    out result : ScalarValues::Boolean =
      object istype ThisIsABlock;
  }

  action sysMLv1ReadIsClassifiedObjectActionNonDirect {
    in object;
    out result : ScalarValues::Boolean =
      object hastype ThisIsABlock;
  }
}
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

ReadIsClassifiedObjectAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

#### 7.7.2.3.5.16 RICOAFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

ReadIsClassifiedObjectAction

##### Mapping Target

FeatureValue

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
RICOAFeatureValueOperatorExpression_Mapping.getMapped(from)
```

#### 7.7.2.3.5.17 RICOAFeatureValueOperatorExpression\_Mapping

##### Description

The mapping class creates the operator expression for the UML4SysML::ReadIsClassifiedObjectAction mapping.

##### General Mappings

GenericToOperatorExpression\_Mapping

##### Mapping Source

ReadIsClassifiedObjectAction

##### Mapping Target

OperatorExpression

##### Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OperatorExpression::operator () : String [1]  

```
if from.isDirect then 'istype' else 'hastype' endif
```
- OperatorExpression::ownedRelationship () : Relationship [0..\*]  

```
Set {RICOAFeatureValueOperatorParameterMembership_Mapping.getMapped (from) }
```

### 7.7.2.3.5.18 RICOAFeatureValueOperatorExpressionFeature\_Mapping

#### Description

The mapping class creates the feature for the operator expression of the UML4SysML::ReadIsClassifiedObjectAction mapping.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

ReadIsClassifiedObjectAction

#### Mapping Target

Feature

#### Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::direction () : FeatureDirectionKind [0..1]  

```
KerML::FeatureDirectionKind::_'in'
```
- Feature::ownedRelationship () : Relationship [0..\*]  

```
Set {RICOAFeatureValueOperatorExpressionFeatureValue_Mapping.getMapped (from) }
```



### 7.7.2.3.5.19 RICOAFeatureValueOperatorExpressionFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

ReadIsClassifiedObjectAction

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
RICOAFeatureValueOperatorFeatureReferenceExpression_Mapping.getMapped(from)
```

### 7.7.2.3.5.20 RICOAFeatureValueOperatorFeatureReferenceExpression\_Mapping

#### Description

The mapping class creates the feature reference expression for the UML4SysML::ReadIsClassifiedObjectAction mapping.

#### General Mappings

GenericToFeatureReferenceExpression\_Mapping

#### Mapping Source

ReadIsClassifiedObjectAction

#### Mapping Target

FeatureReferenceExpression

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureReferenceExpression::ownedRelationship () : Relationship [0..*]`

```
Set {RICOAFeatureValueOperatorMembership_Mapping.getMapped(from) ,  
CommonReturnParameterFeatureMembership_Mapping.getMapped(from) }
```

#### 7.7.2.3.5.21 RICOAFeatureValueOperatorMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

ReadIsClassifiedObjectAction

##### Mapping Target

Membership

##### Owned Mappings

(none)

#### 7.7.2.3.5.22 RICOAFeatureValueOperatorParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToParameterMembership\_Mapping

##### Mapping Source

ReadIsClassifiedObjectAction

##### Mapping Target

ParameterMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::visibility () : VisibilityKind [1]  
`KerML::VisibilityKind::private`
- ParameterMembership::ownedMemberParameter () : Feature [1]  
`RICOAFeatureValueOperatorExpressionFeature_Mapping.getMapped(from)`

### 7.7.2.3.5.23 RICOAOutputPin\_Mapping

#### Description

The mapping class creates the output parameter of the ActionUsage element for the UML4SysML::ReadIsClassifiedObjectAction mapping.

#### General Mappings

Pin\_Mapping

#### Mapping Source

OutputPin

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsTypeOf(UML::ReadIsClassifiedObjectAction)
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{PinFeatureTyping_Mapping.getMapped(from),
RICOAFeatureValue_Mapping.getMapped(from.owner),
MultiplicityMembership_Mapping.getMapped(from)}
```

#### 7.7.2.3.5.24 ReadExtentAction\_Mapping

##### Description

A UML4SysML::ReadExtentAction is mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    action sysMLv1ReadExtentAction {
        out thisIsTheOutputPin : SysMLv1Block =
            all SysMLv1Block;
    }
}
part def SysMLv1Block;
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

ReadExtentAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
Helper.actionOwnedRelationship(from)
```

#### 7.7.2.3.5.25 REAFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

## General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

OutputPin

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
REAFeatureValueOperatorExpression_Mapping.getMapped(from)
```

### 7.7.2.3.5.26 REAFeatureValueOperatorExpression\_Mapping

#### Description

The mapping class creates the operator expression for the UML4SysML::ReadExtentAction mapping.

#### General Mappings

GenericToOperatorExpression\_Mapping

#### Mapping Source

OutputPin

#### Mapping Target

OperatorExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OperatorExpression::operator () : String [1]  
`'all'`
- OperatorExpression::ownedRelationship () : Relationship [0..\*]  
`Set { REAFeatureValueOperatorExpressionMembership_Mapping.getMapped(from),  
CommonReturnParameterFeatureMembership_Mapping.getMapped(from) }`

#### 7.7.2.3.5.27 REAFeatureValueOperatorExpressionFeature\_Mapping

##### Description

The mapping class creates the feature for the operator expression for the UML4SysML::ReadExtentAction mapping.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  
`Set { REAFeatureValueOperatorExpressionFeatureTyping_Mapping.getMapped(from) }`

#### 7.7.2.3.5.28 REAFeatureValueOperatorExpressionFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

OutputPin

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  
`from.owner.classifier`

#### 7.7.2.3.5.29 REAFeatureValueOperatorExpressionMembership\_Mapping

### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

OutputPin

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
REAFeatureValueOperatorExpressionFeature_Mapping.getMapped(from)
```

#### 7.7.2.3.5.30 REAOutputPin\_Mapping

##### Description

The mapping class creates the output parameter of the ActionUsage for the mapping of UML4SysML::ReadExtentAction.

##### General Mappings

Pin\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsTypeOf(UML::ReadExtentAction)
```

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set { PinFeatureTyping_Mapping.getMapped(from) ,  
      REAFeatureValue_Mapping.getMapped(from) ,  
      MultiplicityMembership_Mapping.getMapped(from) }
```

#### 7.7.2.3.5.31 ReadSelfAction\_Mapping

##### Description

A UML4SysML::ReadSelfAction is mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.



```

action def SysMLv1Activity {
    action sysMLv1ReadSelfAction {
        out : Base::Anything = this;
    }
}

```

### General Mappings

CommonAction\_Mapping

### Mapping Source

ReadSelfAction

### Mapping Target

ActionUsage

### Owned Mappings

(none)

### 7.7.2.3.5.32 RSAFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

### Mapping Source

OutputPin

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
RSAFeatureValueFeatureReferenceExpression_Mapping.getMapped(from)
```

#### 7.7.2.3.5.33 RSAFeatureValueFeatureReferenceExpression\_Mapping

##### Description

The mapping class creates the feature reference expression for the mapping of UML4SysML::ReadSelfAction.

##### General Mappings

GenericToFeatureReferenceExpression\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

FeatureReferenceExpression

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set { RSAFeatureValueMembership_Mapping.getMapped(from) ,  
CommonReturnParameterFeatureMembership_Mapping.getMapped(from) }
```

#### 7.7.2.3.5.34 RSAFeatureValueMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

OutputPin

##### Mapping Target

Membership

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

```
SYSML2::Feature.allInstances()  
->any(e | e.qualifiedName = 'Occurrences::Occurrence::this')
```

#### 7.7.2.3.5.35 RSAOutputPin\_Mapping

### Description

The mapping class creates the output parameter of the ActionUsage for the mapping of UML4SysML::ReadSelfAction.

### General Mappings

Pin\_Mapping

### Mapping Source

OutputPin

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsKindOf(UML::ReadSelfAction)
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::isAbstract () : Boolean [1]

```
true
```

- ReferenceUsage::isUnique () : Boolean [1]

```
false
```

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set { PinFeatureTyping_Mapping.getMapped(from),
      RSAFeatureValue_Mapping.getMapped(from),
      MultiplicityMembership_Mapping.getMapped(from) }
```

#### 7.7.2.3.5.36 ReclassifyObjectAction\_Mapping

##### Description

The UML4SysML::ReclassifyObjectAction is not supported by SysML v2. It is mapped to an empty action usage to keep the connections within the activity respectively action definition.

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

ReclassifyObjectAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

#### 7.7.2.3.5.37 TestIdentityAction\_Mapping

##### Description

A UML4SysML::TestIdentityAction is mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    action sysMLv1TestIdentityAction {
        in firstParameter;
        in secondParameter;
        out result : ScalarValues::Boolean =
            firstParameter == secondParameter;
    }
}
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

TestIdentityAction

##### Mapping Target

CalculationUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- CalculationUsage::ownedRelationship () : Relationship [0..\*]

```
Helper.actionOwnedRelationship (from)  
->including (TIAResultExpressionMembership_Mapping.getMapped (from))
```

#### 7.7.2.3.5.38 TIAOperatorExpression\_Mapping

### Description

The mapping class creates the operator expression for the UML4SysML::TestIdentityAction mapping.

### General Mappings

GenericToOperatorExpression\_Mapping

### Mapping Source

TestIdentityAction

### Mapping Target

OperatorExpression

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OperatorExpression::operator () : String [1]

```
'=='
```

- OperatorExpression::ownedRelationship () : Relationship [0..\*]

```

    Set {EqualOperatorExpressionOperandParameterMembership_Mapping.getMapped(from.first),
    EqualOperatorExpressionOperand_Mapping.getMapped(from.second),
    CommonReturnParameterFeatureMembership_Mapping.getMapped(from.result) }

```

### 7.7.2.3.5.39 TIAResultExpressionMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

TestIdentityAction

#### Mapping Target

ResultExpressionMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ResultExpressionMembership::ownedMemberFeature () : Feature [0..1]

```

    TIAOperatorExpression_Mapping.getMapped(from)

```

### 7.7.2.3.5.40 ValueSpecificationAction\_Mapping

#### Description

A UML4SysML::ValueSpecificationAction is mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

action def SysMLv1Acticity {
    action sysMLv1ValueSpecificationAction1 {
        out result : ScalarValues::Integer = 42;
    }

    action sysMLv1ValueSpecificationAction2 {
        out result = sysMLv1OpaqueExpression.result;
        calc sysMLv1OpaqueExpression {
            language "Math"
        }
    }
}

```

```

        }
    }
}

```

## General Mappings

CommonAction\_Mapping

### Mapping Source

ValueSpecificationAction

### Mapping Target

ActionUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```

let toElementFMS: Set(UML::Element) =
    from.ownedElement->select(e | e.oclIsKindOf(UML::Pin)) in
let toElementOMS: Set(UML::Element) =
    (from.ownedElement - toElementFMS) - Set{from.value} in
toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e))
->union(toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e)))

```

#### 7.7.2.3.5.41 VSAOutputPin\_Mapping

##### Description

The mapping class creates the output parameter of the ActionUsage for the mapping of UML4SysML::ValueSpecification.

## General Mappings

Pin\_Mapping

### Mapping Source

OutputPin

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsKindOf(UML::ValueSpecificationAction)
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  

```
Set{PinFeatureTyping_Mapping.getMapped(from),  
VSAOutputPinFeatureValue_Mapping.getMapped(from),  
MultiplicityMembership_Mapping.getMapped(from)}
```

#### 7.7.2.3.5.42 VSAOutputPinFeatureValue\_Mapping

### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

### Mapping Source

OutputPin

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules



In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
if from.owner.value.oclIsTypeOf(UML::OpaqueExpression) then
  OpaqueExpressionAsValue_Mapping.getMapped(from.owner.value)
else
  from.owner.value
endif
```

### 7.7.2.3.6 Other Actions

#### 7.7.2.3.6.1 RaiseExceptionAction\_Mapping

##### Description

The UML4SysML::RaiseExceptionAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

RaiseExceptionAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

#### 7.7.2.3.6.2 ReduceAction\_Mapping

##### Description

The UML4SysML::ReduceAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

ReduceAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

### 7.7.2.3.7 Structural Feature Actions

#### 7.7.2.3.7.1 AddStructuralFeatureValueAction\_Mapping

##### Description

A UML4SysML::AddStructuralFeatureValueAction is mapped to a SysML v2 ActionUsage defined by the SysML v1 library action definition SysMLv1Library::AddStructuralFeatureValueAction.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action sysMLv1AddStructuralFeatureValueAction :
    SysMLv1Library::AddStructuralFeatureValueAction {
        in insertAt;
        in value;
        in target := object.sysMLv1Property;
        in object : SysMLv1Block;
        in isReplaceAll := true;
    }
part def SysMLv1Block {
    attribute sysMLv1Property;
}
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
    Helper.actionOwnedRelationship(from)
->including(ASFVAFeatureTyping_Mapping.getMapped(from))
->including(ASFVATargetFeatureMembership_Mapping.getMapped(from))
```

#### 7.7.2.3.7.2 ASFVAFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SysML2::ActionDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::AddStructuralFeatureValueAction')
```

#### 7.7.2.3.7.3 ASFVATargetFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ASFVATargetReferenceUsage_Mapping.getMapped (from)`

#### 7.7.2.3.7.4 ASFVATargetReferenceUsage\_Mapping

### Description

Creates a reference usage.

### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

AddStructuralFeatureValueAction

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::declaredName () : String [0..1]  
`'target'`
- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set {ASFVATargetFeatureValue_Mapping.getMapped (from) ,  
ASFVATargetOwningMembership_Mapping.getMapped (from) }`

#### 7.7.2.3.7.5 ASFVATargetAssignmentActionUsage\_Mapping

##### Description

The mapping class creates the assignment action for the UML4SysML::AddStructuralFeatureValueAction mapping.

##### General Mappings

GenericToAssignmentActionUsage\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

AssignmentActionUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- AssignmentActionUsage::ownedRelationship () : Relationship [0..\*]  
`Set{ASFVATargetActionParameterMembership_Mapping.getMapped(from)}`

#### 7.7.2.3.7.6 ASFVATargetActionParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToParameterMembership\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

ParameterMembership

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]  
`ASFVATargetActionReferenceUsage_Mapping.getMapped(from)`

#### 7.7.2.3.7.7 ASFVATargetActionReferenceUsage\_Mapping

##### Description

The mapping class creates the reference usage element for the target element of the UML4SysML::AddStructuralFeatureValueAction mapping.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_in'`
- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set {ASFVATargetActionFeatureMembership_Mapping.getMapped(from) }`

#### 7.7.2.3.7.8 ASFVATargetActionReferenceUsageReferenceUsage\_Mapping

##### Description

Creates a reference usage.

### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

AddStructuralFeatureValueAction

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set {ASFVATargetActionReferenceUsageFeatureMembership_Mapping.getMapped (from) }
```

#### 7.7.2.3.7.9 ASFVATargetActionReferenceUsageFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

AddStructuralFeatureValueAction

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
ASFVATargetActionReferenceUsageFeature_Mapping.getMapped(from)
```

### 7.7.2.3.7.10 ASFVATargetActionFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

AddStructuralFeatureValueAction

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
ASFVATargetActionReferenceUsageReferenceUsage_Mapping.getMapped(from)
```

### 7.7.2.3.7.11 ASFVATargetActionReferenceUsageFeature\_Mapping

#### Description

The mapping class creates the reference usage element for the target action of the UML4SysML::AddStructuralFeatureValueAction mapping.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source



AddStructuralFeatureValueAction

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

#### 7.7.2.3.7.12 ASFVATargetParameterExpressionFeature\_Mapping

### Description

The mapping class creates the feature element of the feature reference expression for the target element of the UML4SysML::AddStructuralFeatureValueAction mapping.

### General Mappings

GenericToFeature\_Mapping

### Mapping Source

AddStructuralFeatureValueAction

### Mapping Target

Feature

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  
`Set { ASFVATargetParameterFeatureExpressionMembership_Mapping.getMapped (from) }`

#### 7.7.2.3.7.13 ASFVATargetFeatureValue\_Mapping

### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

AddStructuralFeatureValueAction

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::isInitial () : Boolean [1]  
`true`
- FeatureValue::value () : Expression [1]  
`ASFVATargetFeatureChainExpression_Mapping.getMapped (from)`

### 7.7.2.3.7.14 ASFVATargetFeatureChainExpression\_Mapping

#### Description

The mapping class creates the feature chain expression element for the target element of the UML4SysML::AddStructuralFeatureValueAction mapping.

#### General Mappings

GenericToFeatureChainExpression\_Mapping

#### Mapping Source

AddStructuralFeatureValueAction

#### Mapping Target

FeatureChainExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureChainExpression::ownedRelationship () : Relationship [0..*]`  

```
Set {ASFVATargetParameterMembership_Mapping.getMapped (from) ,  
ASFVATargetFeatureValueExpressionMembership_Mapping.getMapped (from) ,  
ReturnParameterFeatureMembership_Factory.create () }
```

### 7.7.2.3.7.15 ASFVATargetOwningMembership\_Mapping

#### Description

Creates a owning membership relationship for *ownedMemberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

AddStructuralFeatureValueAction

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  

```
ASFVATargetAssignmentActionUsage_Mapping.getMapped (from)
```

### 7.7.2.3.7.16 ASFVATargetParameterFeature\_Mapping

#### Description

The mapping class creates the feature element for the target element of the UML4SysML::AddStructuralFeatureValueAction mapping.

#### General Mappings

GenericToFeature\_Mapping

## Mapping Source

AddStructuralFeatureValueAction

## Mapping Target

Feature

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  

```
Set {ASFVATargetParameterFeatureValue_Mapping.getMapped (from) ,  
ASFVATargetParameterExpressionFeatureMembership_Mapping.getMapped (from) }
```
- Feature::direction () : FeatureDirectionKind [0..1]  

```
KerML::FeatureDirectionKind::_'in'
```

### 7.7.2.3.7.17 ASFVATargetParameterExpressionFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

AddStructuralFeatureValueAction

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

`ASFVATargetParameterExpressionFeature_Mapping.getMapped(from)`

### 7.7.2.3.7.18 ASFVATargetParameterFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

AddStructuralFeatureValueAction

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

`ASFVATargetParameterFeatureReferenceExpression_Mapping.getMapped(from)`

### 7.7.2.3.7.19 ASFVATargetParameterFeatureReferenceExpression\_Mapping

#### Description

The mapping class creates the feature reference expression element for the target element of the UML4SysML::AddStructuralFeatureValueAction mapping.

#### General Mappings

GenericToFeatureReferenceExpression\_Mapping

#### Mapping Source

AddStructuralFeatureValueAction

### Mapping Target

FeatureReferenceExpression

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set {ASFVATargetParameterExpressionMembership_Mapping.getMapped(from),  
ReturnParameterFeatureMembership_Factory.create() }
```

#### 7.7.2.3.7.20 ASFVATargetParameterExpressionMembership\_Mapping

### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToMembership\_Mapping

### Mapping Source

AddStructuralFeatureValueAction

### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

`from.object`

#### 7.7.2.3.7.21 ASFVATargetParameterFeatureExpressionMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

Membership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

`from.structuralFeature`

#### 7.7.2.3.7.22 ASFVATargetParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToParameterMembership\_Mapping

##### Mapping Source

AddStructuralFeatureValueAction

##### Mapping Target

ParameterMembership

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::visibility () : VisibilityKind [1]  
`KerML::VisibilityKind::private`
- ParameterMembership::ownedMemberParameter () : Feature [1]  
`ASFVATargetParameterFeature_Mapping.getMapped(from)`

#### 7.7.2.3.7.23 ClearStructuralFeatureAction\_Mapping

##### Description

The UML4SysML::ClearStructuralFeatureAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

ClearStructuralFeatureAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

#### 7.7.2.3.7.24 RSFAReferenceUsage\_Mapping

##### Description

Creates a reference usage.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

ReadStructuralFeatureAction

##### Mapping Target



ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set {RSFAReferenceUsageFeatureValue_Mapping.getMapped (from) }`
- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_'out'`

#### 7.7.2.3.7.25 RSFAReferenceUsageFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

ReadStructuralFeatureAction

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

`ReadStructuralFeatureActionReferenceUsage_Mapping.getMapped(from)`

#### **7.7.2.3.7.26 RSFAReferenceUsageFeatureValue\_Mapping**

##### **Description**

Creates a feature value relationship.

##### **General Mappings**

GenericToFeatureValue\_Mapping

##### **Mapping Source**

ReadStructuralFeatureAction

##### **Mapping Target**

FeatureValue

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

`RSFAReferenceUsageFeatureChainExpression_Mapping.getMapped(from)`

#### **7.7.2.3.7.27 RSFAReferenceUsageFeatureChainExpression\_Mapping**

##### **Description**

The mapping class creates the feature chain expression element for the reference usage of the UML4SysML::ReadStructuralFeatureValueAction mapping.

##### **General Mappings**

GenericToFeatureChainExpression\_Mapping

##### **Mapping Source**

ReadStructuralFeatureAction

##### **Mapping Target**

FeatureChainExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureChainExpression::ownedRelationship () : Relationship [0..\*]

```
Set {RSFAReferenceUsageParameterMembership_Mapping.getMapped(from),  
RSFAReferenceUsageMembership_Mapping.getMapped(from),  
ReturnParameterFeatureMembership_Factory.create() }
```

### 7.7.2.3.7.28 RSFAReferenceUsageExpressionFeature\_Mapping

#### Description

The mapping class creates the feature of the feature chain expression for the reference usage of the UML4SysML::ReadStructuralFeatureValueAction mapping.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

ReadStructuralFeatureAction

#### Mapping Target

Feature

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
Set {RSFAReferenceUsageExpressionFeatureValue_Mapping.getMapped(from),  
RSFAReferenceUsageExpressionFeatureMembership_Mapping.getMapped(from) }
```

#### 7.7.2.3.7.29 RSFAReferenceUsageFeatureChainExpressionFeature\_Mapping

##### Description

The mapping class creates the feature element for the feature chain expression for the UML4SysML::RemoveStructuralFeatureValueAction mapping.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

ReadStructuralFeatureAction

##### Mapping Target

Feature

##### Owned Mappings

(none)

#### 7.7.2.3.7.30 RSFAReferenceUsageExpressionFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

ReadStructuralFeatureAction

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

`RSFAReferenceUsageFeatureChainExpressionFeature_Mapping.getMapped(from)`

#### **7.7.2.3.7.31 RSFAReferenceUsageExpressionFeatureValue\_Mapping**

##### **Description**

Creates a feature value relationship.

##### **General Mappings**

GenericToFeatureValue\_Mapping

##### **Mapping Source**

ReadStructuralFeatureAction

##### **Mapping Target**

FeatureValue

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureValue::value () : Expression [1]`

`RSFAReferenceUsageExpressionFeatureReferenceExpression_Mapping.getMapped(from)`

#### **7.7.2.3.7.32 RSFAReferenceUsageExpressionFeatureReferenceExpression\_Mapping**

##### **Description**

The mapping class creates the feature reference expression element for the `UML4SysML::RemoveStructuralFeatureValueAction` mapping.

##### **General Mappings**

GenericToFeatureReferenceExpression\_Mapping

##### **Mapping Source**

ReadStructuralFeatureAction

##### **Mapping Target**

FeatureReferenceExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureReferenceExpression::ownedRelationship () : Relationship [0..*]`  
`Set {RSFAReferenceUsageExpressionFeatureMembership_Mapping.getMapped(from),`  
`ReturnParameterFeatureMembership_Factory.create() }`

### 7.7.2.3.7.33 RSFAReferenceUsageMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

ReadStructuralFeatureAction

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`  
`from.object`

### 7.7.2.3.7.34 RSFAReferenceUsageFeatureChainExpressionMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToMembership\_Mapping

### Mapping Source

ReadStructuralFeatureAction

### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

```
from.structuralFeature
```

### 7.7.2.3.7.35 RSFAReferenceUsageParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

ReadStructuralFeatureAction

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]

```
RSFAReferenceUsageExpressionFeature_Mapping.getMapped(from)
```

### 7.7.2.3.7.36 ReadStructuralFeatureAction\_Mapping

#### Description

A UML4SysML::ReadStructuralFeatureAction is mapped to a SysML v2 ActionUsage that returns the value of the specified structural feature of the given object.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    action sysMLv1ReadStructuralFeatureAction {
        in object : SysMLv1Block;
        out result = object.sysMLv1Property;
    }
}
part def SysMLv1Block {
    attribute sysMLv1Property;
}
```

#### General Mappings

CommonAction\_Mapping

#### Mapping Source

ReadStructuralFeatureAction

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]



```
Helper.actionOwnedRelationship(from)
->including(RSFReferenceUsageFeatureMembership_Mapping.getMapped(from))
```

#### **7.7.2.3.7.37 RemoveStructuralFeatureValueAction\_Mapping**

##### **Description**

The UML4SysML::RemoveStructuralFeatureValueAction is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### **General Mappings**

CommonAction\_Mapping

##### **Mapping Source**

RemoveStructuralFeatureValueAction

##### **Mapping Target**

ActionUsage

##### **Owned Mappings**

(none)

#### **7.7.2.3.8 Structured Actions**

##### **7.7.2.3.8.1 LoopNode\_Mapping**

##### **Description**

The UML4SysML::LoopNode is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

##### **General Mappings**

StructuredActivityNode\_Mapping

##### **Mapping Source**

LoopNode

##### **Mapping Target**

ActionUsage

##### **Owned Mappings**

(none)

##### **7.7.2.3.8.2 SequenceNode\_Mapping**

##### **Description**

The UML4SysML::SequenceNode is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

## General Mappings

CommonAction\_Mapping  
StructuredActivityNode\_Mapping

## Mapping Source

SequenceNode

## Mapping Target

ActionUsage

## Owned Mappings

(none)

### 7.7.2.3.8.3 StructuredActivityNode\_Mapping

#### Description

The UML4SysML::StructuredActivityNode is mapped to a SysML v2 ActionUsage. The details of the mapping are not defined yet.

## General Mappings

CommonAction\_Mapping

## Mapping Source

StructuredActivityNode

## Mapping Target

ActionUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
let initialNodes : Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::InitialNode)) in
let finalNodes : Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::FinalNode)) in
let objectFlowsWithGuard : Set(UML::ObjectFlow) =
```

```

    from.ownedElement->select(e | e.ocIsKindOf(UML::ObjectFlow)
        and not e.ocIsType(UML::ObjectFlow).guard.ocIsUndefined()) in
let objectFlows : Set(UML::ObjectFlow) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::ObjectFlow)) in
let ignoreInterruptibleActivityRegion: Set(UML::InterruptibleActivityRegion) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::InterruptibleActivityRegion)) in
let elementsFMS : Set(UML::Element) =
    (((from.ownedElement->select(e | e.ocIsKindOf(UML::ControlNode) or
        e.ocIsKindOf(UML::Action) or (e.ocIsKindOf(UML::ControlFlow) or
        e.ocIsKindOf(UML::Pin))) - initialNodes) - finalNodes) in
let elementsOMS: Set(UML::Element) =
    ((((((from.ownedElement-initialNodes)-finalNodes)-objectFlowsWithGuard)
        -objectFlows)-elementsFMS)-ignoreInterruptibleActivityRegion) in
elementsOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(elementsFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
->union(initialNodes->collect(e | InitialNodeMembership_Mapping.getMapped(e)))
->union(finalNodes->collect(e | FlowFinalNodeMembership_Mapping.getMapped(e)))
->union(objectFlowsWithGuard
    ->collect(e | ObjectFlowGuardFeatureMembership_Mapping.getMapped(e)))
->union(objectFlows->collect(e | ObjectFlowFeatureMembership_Mapping.getMapped(e)))

```

### 7.7.2.3.9 Variable Actions

#### 7.7.2.3.9.1 AddVariableValueAction\_Mapping

##### Description

A UML4SysML::AddVariableValueAction is mapped to a SysML v2 ActionUsage defined by the SysML v1 library action definition SysMLv1Library::AddValueAction. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

action def SysMLv1Activity {
    private attribute sysMLv1Variable1 : ScalarValues::Integer;
    private attribute sysMLv1Variable2 [0..*] : ScalarValues::Integer;

    action sysMLv1AddVariableValueAction1 : SysMLv1Library::AddValueAction {
        :>> target := sysMLv1Variable1;
    }

    action sysMLv1AddVariableValueAction1 : SysMLv1Library::AddValueAction {
        :>> target := thisIsAVariable;
        :>> isReplaceAll := true;
    }
}

```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

AddVariableValueAction

##### Mapping Target

ActionUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ActionUsage::ownedRelationship () : Relationship [0..*]`

```
    Helper.actionOwnedRelationship(from)
->including(AVVAFeatureTyping_Mapping.getMapped(from))
->including(AVVAVariableFeatureMembership_Mapping.getMapped(from))
```

### 7.7.2.3.9.2 AVVAFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Action

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
    SYSML2::ActionDefinition.allInstances()
->any(m | m.qualifiedName = 'SysMLv1Library::AddValueAction')
```

### 7.7.2.3.9.3 AVVAVariable\_Mapping

#### Description

The mapping class creates a reference usage element for the UML4SysML::AddVariableValueAction mapping.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Action

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{AVVARedefinition_Mapping.getMapped(from),  
AVVAFeatureValue_Mapping.getMapped(from),  
CommonAssignmentActionUsageOwningMembership_Mapping.getMapped(from)}
```

### 7.7.2.3.9.4 AVVAVariableFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Action

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
AVVAVariable_Mapping.getMapped(from)
```

#### 7.7.2.3.9.5 AVVARedefinition\_Mapping

##### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

##### General Mappings

GenericToRedefinition\_Mapping

##### Mapping Source

Action

##### Mapping Target

Redefinition

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]

```
SYSML2::ReferenceUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::AddValueAction::target')
```

#### 7.7.2.3.9.6 AVVAFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

## General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

Action

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
AddValueActionValueFeatureReferenceExpression_Mapping.getMapped(from)
```

### 7.7.2.3.9.7 AVVAValueFeatureReferenceExpression\_Mapping

#### Description

The mapping class creates the feature reference expression element for the UML4SysML::AddStructuralFeatureValueAction mapping.

## General Mappings

GenericToFeatureReferenceExpression\_Mapping

## Mapping Source

Action

## Mapping Target

FeatureReferenceExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureReferenceExpression::ownedRelationship () : Relationship [0..*]`  

```
Set {AVVAValueExpressionMembership_Mapping.getMapped (from) ,  
ReturnParameterFeatureMembership_Factory.create () }
```

### 7.7.2.3.9.8 AVVAValueExpressionMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

Action

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`  

```
from
```

### 7.7.2.3.9.9 ClearVariableAction\_Mapping

#### Description

The `UML4SysML::ClearVariableAction` is mapped to a SysML v2 `ActionUsage` that sets the attribute usage representing the variable to null.

The expected SysML v2 textual notation of a `SysMLv1::ClearVariableAction` is as follows

```
action def SysMLv1Activity {  
    private attribute sysMLv1Variable : ScalarValues::Integer;
```



```

        action sysMLv1ClearVariableAction {
            sysMLv1Variable := null;
        }
    }
}

```

## General Mappings

CommonAction\_Mapping

### Mapping Source

ClearVariableAction

### Mapping Target

ActionUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]  

```

            Helper.actionOwnedRelationship(from)
            ->including(CVAFeatureMembership_Mapping.getMapped(from))
        
```

#### 7.7.2.3.9.10 CVAFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

ClearVariableAction

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`CVAReferenceUsage_Mapping.getMapped(from)`

#### 7.7.2.3.9.11 CVAReferenceUsage\_Mapping

##### Description

Creates a reference usage.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

ClearVariableAction

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set{CVAReferenceUsageFeatureValue_Mapping.getMapped(from),  
CommonAssignmentActionUsageOwningMembership_Mapping.getMapped(from)}`
- ReferenceUsage::declaredName () : String [0..1]  
`from.variable.name`

#### 7.7.2.3.9.12 CVAReferenceUsageFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

### Mapping Source

ClearVariableAction

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`LiteralNull_Factory.create()`

#### 7.7.2.3.9.13 ReadVariableAction\_Mapping

##### Description

A UML4SysML::ReadVariableValueAction is mapped to a SysML v2 ActionUsage with an out parameter that returns the value of the attribute usage that is the transformation target of the UML4SysML::Variable.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    private attribute sysMLv1Variable : ScalarValues::Integer;

    action sysMLv1ReadVariableAction {
        out result : ScalarValues::Integer = sysMLv1Variable;
    }
}
```

### General Mappings

CommonAction\_Mapping

### Mapping Source

ReadVariableAction

### Mapping Target

ActionUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]  
`Set { RVAFeatureMembership_Mapping.getMapped (from) }`

#### 7.7.2.3.9.14 RVAFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

ReadVariableAction

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
RVReferenceUsage_Mapping.getMapped(from,result)
```

#### 7.7.2.3.9.15 RVReferenceUsage\_Mapping

##### Description

Creates a reference usage.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

Pin

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
let featureTyping : Set(KerML::FeatureTyping) =
  if from.type.oclIsUndefined() then
    Set{}
  else
    Set{RVReferenceUsageFeatureTyping_Mapping.getMapped(from)}
  endif in
featureTyping
->including(RVReferenceUsageFeatureValue_Mapping.getMapped(from))
```

#### 7.7.2.3.9.16 RVReferenceUsageFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

TypedElementFeatureTyping\_Mapping

##### Mapping Source

Pin

## Mapping Target

FeatureTyping

## Owned Mappings

(none)

### 7.7.2.3.9.17 RVAReferenceUsageFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Pin

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

`RVAReferenceUsageFeatureReferenceExpression_Mapping.getMapped(from)`

### 7.7.2.3.9.18 RVAReferenceUsageFeatureReferenceExpression\_Mapping

#### Description

The mapping class creates the feature reference expression element for the UML4SysML::ReadVariableAction mapping.

#### General Mappings

GenericToFeatureReferenceExpression\_Mapping

#### Mapping Source

Pin

### Mapping Target

FeatureReferenceExpression

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set {RVAReferenceUsageExpressionMembership_Mapping.getMapped(from),  
ReturnParameterFeatureMembership_Factory.create() }
```

#### 7.7.2.3.9.19 RVAReferenceUsageExpressionMembership\_Mapping

### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToMembership\_Mapping

### Mapping Source

Pin

### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

```
from.owner.oclAsType(UML::ReadVariableAction).variable
```

#### 7.7.2.3.9.20 RemoveVariableValueAction\_Mapping

##### Description

A UML4SysML::RemoveVariableValueAction is mapped to a SysML v2 ActionUsage defined by the SysML v1 library action definition SysMLv1Library::RemoveVariableValueAction.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    private sysMLv1Variable : ScalarValues::Integer;

    action sysMLv1RemoveVariableValueAction
        : SysMLv1Library::RemoveVariableValueAction {
            :>> variable := sysMLv1Variable;
        }
}
```

##### General Mappings

CommonAction\_Mapping

##### Mapping Source

RemoveVariableValueAction

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]

```
Helper.actionOwnedRelationship(from)
->including(RVVAFeatureTyping_Mapping.getMapped(from))
->including(RVVAVariableFeatureMembership_Mapping.getMapped(from))
```



#### 7.7.2.3.9.21 RVVAVariableFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

RemoveVariableValueAction

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`RVVAVariable_Mapping.getMapped(from)`

#### 7.7.2.3.9.22 RVVAVariableFeatureReferenceExpression\_Mapping

##### Description

The mapping class creates the feature reference expression element for the UML4SysML::RemoveVariableValueAction mapping.

##### General Mappings

GenericToFeatureReferenceExpression\_Mapping

##### Mapping Source

RemoveVariableValueAction

##### Mapping Target

FeatureReferenceExpression

##### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureReferenceExpression::ownedRelationship () : Relationship [0..*]`

```
Set {RVVAVariableExpressionMembership_Mapping.getMapped(from),  
EmptyReturnParameterFeatureMembership_Mapping.getMapped(from)}
```

#### 7.7.2.3.9.23 RVVAVariableExpressionMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

RemoveVariableValueAction

##### Mapping Target

Membership

##### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`

```
from.variable
```

#### 7.7.2.3.9.24 RVVAVariableFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

## General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

RemoveVariableValueAction

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
RVVAVariableFeatureReferenceExpression_Mapping.getMapped(from)
```

### 7.7.2.3.9.25 RVVAVariable\_Mapping

#### Description

The mapping class creates a reference usage element for the UML4SysML::RemoveVariableValueAction mapping.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

RemoveVariableValueAction

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::ownedRelationship () : Relationship [0..*]`

```
Set { RVVAVariableRedefinition_Mapping.getMapped (from) ,  
RVVAVariableFeatureValue_Mapping.getMapped (from) ,  
CommonAssignmentActionUsageOwningMembership_Mapping.getMapped (from) }
```

#### 7.7.2.3.9.26 RVVAVariableRedefinition\_Mapping

##### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

##### General Mappings

GenericToRedefinition\_Mapping

##### Mapping Source

RemoveVariableValueAction

##### Mapping Target

Redefinition

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SYSML2::ReferenceUsage.allInstances ()  
->any (m | m.qualifiedName = 'SysMLv1Library::RemoveVariableValueAction::variable')
```

#### 7.7.2.3.9.27 RVVAFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

RemoveVariableValueAction

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  

```
SysML2::ActionDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::RemoveVariableValueAction')
```

## 7.7.3 Activities

This chapter lists all mapping specifications of UML4SysML::Activities model elements.

### 7.7.3.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::Activities elements are transformed with which mapping class. The mapping details are in [7.7.3.3](#).

The justifications for the elements without mapping are given in [7.7.3.2](#).

**Table 3. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Activity	VerificationCaseDefinition ActionUsage ActionDefinition
ActivityFinalNode	
ActivityParameterNode	
ActivityPartition	
CentralBufferNode	ActionUsage ActionUsage
ControlFlow	TransitionUsage SuccessionAsUsage
DataStoreNode	ActionUsage
DecisionNode	DecisionNode

SysML v1 Concept	SysML v2 Concept
ExceptionHandler	
FlowFinalNode	
ForkNode	ForkNode
InitialNode	
InterruptibleActivityRegion	
JoinNode	JoinNode
MergeNode	MergeNode
ObjectFlow	TransitionUsage SuccessionFlowConnectionUsage
Variable	AttributeUsage ItemUsage

### 7.7.3.2 UML4SysML::Activities elements not mapped

Table 4. List of SysML v1 elements not mapped of this section

SysML v1 Concept	Rationale
ActivityFinalNode	Mapping is not specified yet.
ActivityParameterNode	The parameter of the activity is mapped from SysML v1 to SysML v2. The additional concept of the activity parameter node is necessary for the token semantic of SysML v1 activities, which is not part of SysML v2. Therefore, the additional concept of the activity parameter node is not mapped to SysML v2.
ActivityPartition	Mapping is not specified yet.
ExceptionHandler	Mapping is not specified yet.
InterruptibleActivityRegion	Mapping is not specified yet.

### 7.7.3.3 Mapping Specifications

#### 7.7.3.3.1 ActivityAsDefinition\_Mapping

##### Description

A UML4SysML::Activity is mapped to a SysMLv2 ActionDefinition if the owner of the activity is a UML4SysML::Package.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

action def SysMLv1Activity {
  in parIn : SysMLv1Block;
  out parOut;
  out parReturn;
}

```

## General Mappings

CommonActivity\_Mapping

### Mapping Source

Activity

### Mapping Target

ActionDefinition

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsKindOf(UML::Package)
```

### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

## 7.7.3.3.2 ActivityAsUsage\_Mapping

### Description

A UML4SysML::Activity is mapped to a SysMLv2 ActionUsage if the owner of the activity is not a UML4SysML::Package. To follow the informal naming convention that usage elements start with a lowercase letter, the first letter of the activity's name is converted to a lowercase letter.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block {
  action sysMLv1Activity {
    in parIn : SysMLv1Enumeration;
    out parOut : ScalarValues::Integer;
  }
}
enum def SysMLv1Enumeration;
```

## General Mappings

CommonActivity\_Mapping

### Mapping Source

Activity

### Mapping Target

ActionUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
(not src.owner.oclIsKindOf(UML::Package))
and (not Helper.hasStereotypeApplied(src, 'SysML::Requirements::TestCase'))
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::declaredName () : String [0..1]  

```
if from.name.size() > 1 then
    from.name.substring(1,1).toLowerCase().
        concat(from.name.substring(2, from.name.size()))
else
    from.name
endif
```

### 7.7.3.3 ActivityEdgeInitialNodeFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

InitialNode

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules



In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`ActivityEdgeSourceInitialNode_Mapping.getMapped(from)`

#### 7.7.3.3.4 ActivityEdgeMetadata\_Mapping

##### Description

Adds metadata to the transformation target elements of `UML4SysML::ControlFlow` and `UML::ObjectFlow` to map the `UML4SysML::ActivityEdge::weight` property which has no direct target in SysML v2.

##### General Mappings

`GenericToMetadataUsage_Mapping`

##### Mapping Source

`ActivityEdge`

##### Mapping Target

`MetadataUsage`

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `MetadataUsage::declaredName () : String [0..1]`  
`'weight'`
- `MetadataUsage::ownedRelationship () : Relationship [0..*]`  
`Set{ActivityEdgeMetadataFeatureTyping_Mapping.getMapped(from) ,`  
`ActivityEdgeMetadataFeatureMembership_Mapping.getMapped(from) }`

#### 7.7.3.3.5 ActivityEdgeMetadataFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for `ownedMemberFeature()`.

##### General Mappings

`GenericToFeatureMembership_Mapping`

### Mapping Source

ActivityEdge

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ActivityEdgeMetadataReferenceUsage_Mapping.getMapped(from)`

### 7.7.3.3.6 ActivityEdgeMetadataFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

ActivityEdge

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SYSML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library:ActivityEdgeData')
```

#### 7.7.3.3.7 ActivityEdgeMetadataFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

ActivityEdge

##### Mapping Target

FeatureValue

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
from.weight
```

#### 7.7.3.3.8 ActivityEdgeMetadataOwningMembership\_Mapping

##### Description

Creates a owning membership relationship for *ownedMemberElement()*.

##### General Mappings

GenericToOwningMembership\_Mapping

##### Mapping Source

ActivityEdge

## Mapping Target

OwningMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`ActivityEdgeMetadata_Mapping.getMapped(from)`

### 7.7.3.3.9 ActivityEdgeMetadataRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

ActivityEdge

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]  
`SysML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::ActivityEdgeData::weight')`

### 7.7.3.3.10 ActivityEdgeMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

ActivityEdge

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{ActivityEdgeMetadataRedefinition_Mapping.getMapped(from),  
ActivityEdgeMetadataFeatureValue_Mapping.getMapped(from)}
```

### 7.7.3.3.11 ActivityEdgeSourceEndFeature\_Mapping

#### Description

Creates a SysML v2 feature for the source activity node of the SysML v1 activity edge which subsets the SysML v2 target element of the source activity node.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

ActivityNode

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::isEnd () : Boolean [1]  
`true`
- Feature::ownedRelationship () : Relationship [0..\*]  
`Set{ActivityEdgeSourceEndSubsetting_Mapping.getMapped(from)}`

#### 7.7.3.3.12 ActivityEdgeSourceInitialNode\_Mapping

##### Description

The UML4SysML::InitialNode is mapped to a subsetted feature of the SysML v2 library element Actions::start.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

InitialNode

##### Mapping Target

Feature

##### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::isEnd () : Boolean [1]  
`true`
- Feature::ownedRelationship () : Relationship [0..\*]  
`Set{ActivityEdgeSourceInitialNodeSubsetting_Mapping.getMapped(from)}`

### 7.7.3.3.13 ActivityEdgeSourceEndFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

ActivityNode

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
ActivityEdgeSourceEndFeature\_Mapping.getMapped(from)

### 7.7.3.3.14 ActivityEdgeSourceInitialNodeSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

InitialNode

#### Mapping Target

Subsetting

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettingFeature () : Feature [1]

```
SysML2::ActionUsage.allInstances()  
->any(m | m.qualifiedName = 'Actions::Action::start')
```

### 7.7.3.3.15 ActivityEdgeSourceEndSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettingFeature()*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

ActivityNode

#### Mapping Target

Subsetting

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettingFeature () : Feature [1]

```
from
```

### 7.7.3.3.16 ActivityEdgeTransitionUsageSourceMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings



GenericToMembership\_Mapping

### Mapping Source

ActivityNode

### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

```
    if from.oclIsTypeOf(UML::ActivityParameterNode) then
        from.parameter
    else
        from
    endif
```

### 7.7.3.3.17 CentralBufferNode\_Mapping

#### Description

The mapping of the UML4SysML::CentralBufferNode is not defined in detail yet. It will be an action usage which contains the behavior of a central buffer node.

#### General Mappings

GenericToActionUsage\_Mapping

NamedElementMain\_Mapping

#### Mapping Source

CentralBufferNode

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

### 7.7.3.3.18 CommonActivity\_Mapping

#### Description

Abstract mapping class for UML4SysML::Activity. A UML4SysML::Activity is mapped to a SysMLv2 ActionDefinition or SysMLv2 ActionUsage. See specialized mapping classes for the specific mapping rules.

#### General Mappings

Behavior\_Mapping

#### Mapping Source

Activity

#### Mapping Target

Behavior

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Behavior::ownedRelationship () : Relationship [0..\*]

```
let relationships : Set(KerML::Relationship) =
  Helper.activityOwnedRelationship(from) in
let parameters : Set(UML::Parameter) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Parameter)) in
relationships->union(parameters
  ->collect(p | ParameterMembership_Mapping.getMapped(p))
)
```

### 7.7.3.3.19 CommonActivityEdgeSuccessionAsUsage\_Mapping

#### Description

The mapping class provides a common mapping of a UML4SysML::ActivityEdge to a SysMLv2 SuccessionAsUsage. The mapping is used for UML4SysML::ControlFlows and UML4SysML::ObjectFlows.

#### General Mappings

GenericToConnector\_Mapping

#### Mapping Source

ActivityEdge

## Mapping Target

SuccessionAsUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SuccessionAsUsage::ownedRelationship () : Relationship [0..\*]

```
let relationships : Set(KerML::Relationship) = Set{
if from.source.ocIsKindOf(UML::InitialNode) then
    ActivityEdgeInitialNodeFeatureMembership_Mapping.getMapped(from.source)
else
    ActivityEdgeSourceEndFeatureMembership_Mapping.getMapped(from.source)
endif,
if from.ocIsKindOf(UML::ObjectFlow) then
    ObjectFlowGuardSuccessionTargetEndFeatureMembership_Mapping.getMapped(from)
else if from.target.ocIsKindOf(UML::FinalNode) then
    ControlFlowFinalNodeFeatureMembership_Mapping.getMapped(from.target)
else
    ControlFlowTargetFeatureMembership_Mapping.getMapped(from.target)
endif
endif} in
if from.guard.ocIsUndefined() then
    relationships
else
    relationships
    ->including(ElementFeatureMembership_Mapping.getMapped(from.guard))
endif
```

### 7.7.3.3.20 CommonVariable\_Mapping

#### Description

Abstract mapping class for UML4SysML::Variable which is defined in the context of UML4SysML::Activity. A UML4SysML::Variable is mapped to a SysMLv2 AttributeUsage or SysMLv2 ItemUsage. See specialized mapping classes for the specific mapping rules.

#### General Mappings

PropertyCommon\_Mapping

#### Mapping Source

Variable

#### Mapping Target

Feature

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
let typing: KerML::FeatureTyping =
  VariableFeatureTyping_Mapping.getMapped(from) in
if typing.oclIsUndefined() then
  Set{MultiplicityMembership_Mapping.getMapped(from)}
else
  Set{MultiplicityMembership_Mapping.getMapped(from), typing}
endif
```

- Feature::isDerived () : Boolean [1]

```
false
```

- Feature::isComposite () : Boolean [1]

```
false
```

- Feature::isEnd () : Boolean [1]

```
false
```

#### 7.7.3.3.21 ControlFlowTransitionUsage\_Mapping

##### Description

A UML4SysML::ControlFlow with a guard condition is mapped to a SysMLv2 TransitionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
  action sysMLv1Action1;
  succession sysMLv1ControlFlow first sysMLv1Action1
    if guardCondition.result then sysMLv1Action2 {
      calc guardCondition {
        return : ScalarValues::Boolean;
        language "English"
      }
      /*
       * thisIsAGuard
       */
    }
  }
}
```

```

    }
    action sysMLv1Action2;
}

```

## General Mappings

GenericToUsage\_Mapping  
NamedElementMain\_Mapping

## Mapping Source

ControlFlow

## Mapping Target

TransitionUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.guard.oclIsUndefined()
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TransitionUsage::isComposite () : Boolean [1]

```
true
```

- TransitionUsage::ownedRelationship () : Relationship [0..\*]

```

let relationships : Set(KerML::Relationship) =
Set{ActivityEdgeTransitionUsageSourceMembership_Mapping.getMapped(from.source)}
->including(CommonParameterReferenceUsageInMembership_Mapping.getMapped(from.source))
->including(ControlFlowTransitionUsageFeatureMembership_Mapping.getMapped(from))
->including(CommonActivityEdgeSuccessionAsUsage_Mapping.getMapped(from))
->including(CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from)) in
let relationshipsWithGuard : Set(KerML::Relationship) =
if from.guard.oclIsTypeOf(UML::OpaqueExpression) then
relationships
->including(ElementFeatureMembership_Mapping.getMapped(from.guard))
else
relationships
endif in
let relationshipsConsideringWeight : Set(KerML::Relationship) =
if from.weight.oclIsUndefined() then
relationshipsWithGuard
else
relationshipsWithGuard

```

```

->including (ActivityEdgeMetadataOwningMembership_Mapping.getMapped(from))
endif in
if Helper.hasStereotypeApplied(from, 'SysML::Activities::Probability') then
relationshipsConsideringWeight
->including (ProbabilityOwningMembership_Mapping.getMapped(from))
else
relationshipsConsideringWeight
endif

```

### 7.7.3.3.22 ControlFlowFinalNodeFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

ActivityNode

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
ControlFlowTargetFinalNode\_Mapping.getMapped(from)

### 7.7.3.3.23 ControlFlowTargetFinalNodeSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettingFeature()*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

FinalNode

## Mapping Target

Subsetting

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettingFeature () : Feature [1]

```
SysML2::ActionUsage.allInstances()  
->any(m | m.qualifiedName = 'Actions::Action::done')
```

### 7.7.3.3.24 ControlFlowSuccessionAsUsage\_Mapping

#### Description

A UML4SysML::ControlFlow without a guard condition is mapped to a SysMLv2 SuccessionAsUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {  
    action sysMLv1Action1;  
    succession sysMLv1ControlFlow  
        first sysMLv1Action1 then sysMLv1Action2;  
    action sysMLv1Action2;  
}
```

#### General Mappings

NamedElementMain\_Mapping

CommonActivityEdgeSuccessionAsUsage\_Mapping

#### Mapping Source

ControlFlow

#### Mapping Target

SuccessionAsUsage

#### Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.guard.oclIsUndefined()
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SuccessionAsUsage::ownedRelationship () : Relationship [0..\*]

```
let relationships : Set(KerML::Relationship) = Set{
if from.source.oclIsKindOf(UML::InitialNode) then
    ActivityEdgeInitialNodeSourceEndFeatureMembership_Mapping.getMapped(from.source)
else
    ActivityEdgeSourceEndFeatureMembership_Mapping.getMapped(from.source)
endif,
if from.oclIsKindOf(UML::ObjectFlow) then
    ObjectFlowGuardSuccessionTargetEndFeatureMembership_Mapping.getMapped(from)
else if from.target.oclIsKindOf(UML::FinalNode) then
    ControlFlowFinalNodeTargetEndFeatureMembership_Mapping.getMapped(from.target)
    else
        ControlFlowTargetEndFeatureMembership_Mapping.getMapped(from.target)
    endif
endif} in
let relationshipsWithGuard : Set(KerML::Relationship) =
if from.guard.oclIsUndefined() then
    relationships
else
    relationships
    ->including(ElementFeatureMembership_Mapping.getMapped(from.guard))
endif in
let relationshipsConsideringWeight : Set(KerML::Relationship) =
if from.weight.oclIsUndefined() then
    relationshipsWithGuard
else
    relationshipsWithGuard
    ->including(ActivityEdgeMetadataOwningMembership_Mapping.getMapped(from))
endif in

if Helper.hasStereotypeApplied(from, 'SysML::Activities::Probability') then
    relationshipsConsideringWeight
    ->including(ProbabilityOwningMembership_Mapping.getMapped(from))
else
    relationshipsConsideringWeight
endif
```

### 7.7.3.3.25 ControlFlowTargetFinalNode\_Mapping

#### Description

The mapping class maps a UML4SysML::FinalNode to a Feature which will be subsetted by Actions::Action::done. The subsetting is created by the mapping class ControlFlowTargetFinalNodeSubsetting\_Mapping.

#### General Mappings



GenericToFeature\_Mapping

### Mapping Source

FinalNode

### Mapping Target

Feature

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::isEnd () : Boolean [1]  
`true`
- Feature::ownedRelationship () : Relationship [0..\*]  
`Set {ControlFlowTargetFinalNodeSubsetting_Mapping.getMapped (from) }`

### 7.7.3.3.26 ControlFlowTargetEndFeature\_Mapping

#### Description

The mapping class maps the UML4SysML::ActivityNode to a Feature which is subsetted by the mapping target of the UML4SysML::ActivityNode. The subsetting is created by the mapping class ControlFlowTargetEndSubsetting\_Mapping.

#### General Mappings

GenericToFeature\_Mapping

### Mapping Source

ActivityNode

### Mapping Target

Feature

### Owned Mappings

- controlFlowTargetEndSubsetting : ControlFlowTargetEndSubsetting\_Mapping

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Feature::isEnd () : Boolean [1]`  
`true`
- `Feature::ownedRelationship () : Relationship [0..*]`  
`Set{controlFlowTargetEndSubsetting.to}`

### 7.7.3.3.27 ControlFlowTargetFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

ActivityNode

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`ControlFlowTargetEndFeature_Mapping.getMapped(from)`

### 7.7.3.3.28 ControlFlowTargetEndSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettingFeature()*.

#### General Mappings

GenericToSubsetting\_Mapping

### Mapping Source

ActivityNode

### Mapping Target

Subsetting

### Owned Mappings

- controlFlowTargetEndFeature : ControlFlowTargetEndFeature\_Mapping

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettingFeature () : Feature [1]  
controlFlowTargetEndFeature.to
- Subsetting::subsettingFeature () : Feature [1]  
from

## 7.7.3.3.29 ControlFlowTransitionUsageFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

ControlFlow

### Mapping Target

TransitionFeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TransitionFeatureMembership::ownedMemberFeature () : Feature [1]  

```
    if from.guard.oclIsKindOf(UML::OpaqueExpression) then
      OpaqueExpressionAsValue_Mapping.getMapped(from.guard)
    else
      from.guard
    endif
```
- TransitionFeatureMembership::kind () : TransitionFeatureKind [1]  

```
    KerML::TransitionFeatureKind::guard
```

### 7.7.3.3.30 DataStoreNode\_Mapping

#### Description

The mapping of the UML4SysML::DataStoreNode is not defined in detail yet. It will be an action usage which contains the behavior of a data store node.

#### General Mappings

CentralBufferNode\_Mapping

#### Mapping Source

DataStoreNode

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

### 7.7.3.3.31 DecisionNode\_Mapping

#### Description

The UML4SysML::DecisionNode is mapped to a SysMLv2 DecisionNode.

There is no suitable element in SysML v2 for the else condition of an outgoing UML4SysML::ActivityEdge. Therefore, it is mapped to a TextualRepresentation with language "SysML v1" and body "else" (see ExpressionElse\_Mapping class).

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
  action sysMLv1Action1;
  succession sysMLv1ControlFlow1 first sysMLv1Action1 then sysMLv1DecisionNode;
  decide sysMLv1DecisionNode;
```

```

    succession sysMLv1ControlFlow2 first sysMLv1DecisionNode if {
        return : ScalarValues::Boolean;
        // guard expression, for example, opaque expression
    }.result then sysMLv1Action2;
    succession flow2 first sysMLv1DecisionNode if {
        return : ScalarValues::Boolean;
        language "SysMLv1"
        /*
         * else
         */
    }.result then sysMLv1Action2;
    action sysMLv1Action2;
}

```

## General Mappings

GenericToUsage\_Mapping  
NamedElementMain\_Mapping

## Mapping Source

DecisionNode

## Mapping Target

DecisionNode

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- DecisionNode::isComposite () : Boolean [1]

true

### 7.7.3.3.32 FlowFinalNodeMembership\_Mapping

#### Description

The mapping class creates a membership relationship to the action usage library element Actions::Action::done.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

FlowFinalNode

### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  

```
    SysMLv2::ActionUsage.allInstances()  
    ->any(e | e.qualifiedName = 'Actions::Action::done')
```

### 7.7.3.33 ForkNode\_Mapping

#### Description

The UML4SysML::ForkNode is mapped to a SysMLv2 ForkNode.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {  
    first start;  
    action sysMLv1Action1;  
  
    then fork sysMLv1ForkNode;  
  
    then sysMLv1Action2;  
    then sysMLv1Action3;  
    action sysMLv1Action2;  
    then sysMLv1JoinNode;  
    action sysMLv1Action3;  
    then sysMLv1JoinNode;  
  
    join sysMLv1JoinNode;  
  
    then done;  
}
```

### General Mappings

GenericToUsage\_Mapping  
NamedElementMain\_Mapping

### Mapping Source

ForkNode

### Mapping Target

ForkNode

### Owned Mappings

(none)

#### 7.7.3.3.34 InitialNodeMembership\_Mapping

##### Description

The mapping class creates a membership relationship to the action usage library element Actions::Action::start.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

InitialNode

##### Mapping Target

Membership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  

```
    SysMLv2::ActionUsage.allInstances()  
    ->any(e | e.qualifiedName = 'Actions::Action::start')
```
- Membership::memberName () : String [0..1]  

```
    if from.name = '' then null else from.name endif
```

#### 7.7.3.3.35 JoinNode\_Mapping

##### Description

The UML4SysML::JoinNode is mapped to a SysMLv2JoinNode.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    first start;
    action sysMLv1Action1;

    then fork sysMLv1ForkNode;

    then sysMLv1Action2;
    then sysMLv1Action3;
    action sysMLv1Action2;
    then sysMLv1JoinNode;
    action sysMLv1Action3;
    then sysMLv1JoinNode;

    join sysMLv1JoinNode;

    then done;
}
```

### General Mappings

GenericToUsage\_Mapping  
NamedElementMain\_Mapping

#### Mapping Source

JoinNode

#### Mapping Target

JoinNode

#### Owned Mappings

(none)

### 7.7.3.3.36 MergeNode\_Mapping

#### Description

The UML4SysML::MergeNode is mapped to a SysMLv2 MergeNode.

### General Mappings

GenericToUsage\_Mapping  
NamedElementMain\_Mapping

#### Mapping Source

MergeNode



## Mapping Target

MergeNode

## Owned Mappings

(none)

### 7.7.3.3.37 ObjectFlow\_Mapping

#### Description

A UML4SysML::ObjectFlowFlow without a guard condition is mapped to a SysMLv2SuccessionFlowConnectionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Acticity {
    action sysMLv1Action1 {
        out outputValue;
    }
    succession flow sysMLv1ObjectFlow of ScalarValues::String
        from sysMLv1Action1.outputValue to sysMLv1Action1.inputValue;
    action sysMLv1Action2 {
        out inputValue;
    }
}
```

#### General Mappings

GenericToConnector\_Mapping  
NamedElementMain\_Mapping

#### Mapping Source

ObjectFlow

#### Mapping Target

SuccessionFlowConnectionUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.guard.oclIsUndefined()
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- **SuccessionFlowConnectionUsage::ownedRelationship () : Relationship [0..\*]**

```

let relationships : Set(KerML::Relationship) =
if from.source.oclIsKindOf(UML::ObjectNode) then
    Set{ObjectFlowItemFeatureMembership_Mapping.getMapped(from),
        ObjectFlowEndFeatureMembership_Mapping.getMapped(from.source),
        ObjectFlowEndFeatureMembership_Mapping.getMapped(from.target)}
else
    Set{ObjectFlowEndFeatureMembership_Mapping.getMapped(from.source),
        ObjectFlowEndFeatureMembership_Mapping.getMapped(from.target)}
endif in
let relationshipsConsideringWeight : Set(KerML::Relationship) =
if from.weight.oclIsUndefined() then
    relationships
else
    relationships
    ->including (ActivityEdgeMetadataOwningMembership_Mapping.getMapped(from))
endif in
let relationshipsConsideringRate : Set(KerML::Relationship) =
if (Helper.hasStereotypeApplied(from, 'SysML::Activities::Rate') or
    Helper.hasStereotypeApplied(from, 'SysML::Activities::Discrete') or
    Helper.hasStereotypeApplied(from, 'SysML::Activities::Continuous')) then

    relationshipsConsideringWeight
    ->including (RateOwningMembership_Mapping.getMapped(from))
else
    relationshipsConsideringWeight
endif in

if Helper.hasStereotypeApplied(from, 'SysML::Activities::Probability') then
    relationshipsConsideringRate
    ->including (ProbabilityOwningMembership_Mapping.getMapped(from))
else
    relationshipsConsideringRate
endif

```

### 7.7.3.3.38 ObjectFlowFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

ObjectFlow

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ObjectFlow_Mapping.getMapped(from)`

### 7.7.3.3.39 ObjectFlowGuardFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

ObjectFlow

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ObjectFlowGuard_Mapping.getMapped(from)`

### 7.7.3.3.40 ObjectFlowGuard\_Mapping

#### Description

A UML4SysML::ObjectFlowFlow with a guard condition is mapped to a combined SysMLv2 TransitionUsage and SysMLv2 SuccessionFlowConnectionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
  action sysMLv1Action1 {
    out outputValue;
  }

  first sysMLv1Action1 if guardCondition.result then sysMLv1ObjectFlow {
    calc guardCondition {
      return : ScalarValues::Boolean;
      language "English"
      /*
       * guard says ok
       */
    }
  }
  succession flow sysMLv1ObjectFlow of SysMLv1Block from
    sysMLv1Action1.outputValue to sysMLv1Action2.inputValue;

  action sysMLv1Action2 {
    out inputValue;
  }
}
```

## General Mappings

GenericToUsage\_Mapping  
NamedElementMain\_Mapping

## Mapping Source

ObjectFlow

## Mapping Target

TransitionUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.guard.oclIsUndefined()
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TransitionUsage::ownedRelationship () : Relationship [0..\*]

```

    Set{
    ActivityEdgeTransitionUsageSourceMembership_Mapping.getMapped(from.source),
    CommonParameterReferenceUsageInMembership_Mapping.getMapped(from.source),
    ObjectFlowTransitionUsageFeatureMembership_Mapping.getMapped(from),
    ObjectFlowGuardSuccessionTargetEndFeatureMembership_Mapping.getMapped(from),
    CommonActivityEdgeSuccessionAsUsage_Mapping.getMapped(from),
    CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from)
    }

```

### 7.7.3.3.41 ObjectFlowGuardSuccessionTargetEndFeature\_Mapping

#### Description

Creates a feature element for the UML4SysML::ObjectFlow mapping.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

ObjectFlow

#### Mapping Target

Feature

#### Owned Mappings

- objectFlowGuardSuccessionTargetEndSubsetting :  
ObjectFlowGuardSuccessionTargetEndSubsetting\_Mapping

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  

```

Set{objectFlowGuardSuccessionTargetEndSubsetting.to}

```
- Feature::isEnd () : Boolean [1]  

```

true

```

### 7.7.3.3.42 ObjectFlowGuardSuccessionTargetEndFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

### Mapping Source

ObjectFlow

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ObjectFlowGuardSuccessionTargetEndFeature_Mapping.getMapped (from)`

## 7.7.3.3.43 ObjectFlowGuardSuccessionTargetEndSubsetting\_Mapping

### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

### General Mappings

GenericToSubsetting\_Mapping

### Mapping Source

ObjectFlow

### Mapping Target

Subsetting

### Owned Mappings

- objectFlowGuardSuccessionTargetEndFeature : ObjectFlowGuardSuccessionTargetEndFeature\_Mapping

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Subsetting::subsettingFeature () : Feature [1]`  
`ObjectFlow_Mapping.getMapped (from)`
- `Subsetting::subsettingFeature () : Feature [1]`  
`objectFlowGuardSuccessionTargetEndFeature.to`

#### 7.7.3.3.44 ObjectFlowItemFeature\_Mapping

##### Description

The mapping class maps the source `UML4SysML::ObjectNode` to a `ItemFeature` which is typed by the `UML4SysML::ObjectNode` type.

##### General Mappings

`ObjectFlowItemFeatureUntyped_Mapping`

##### Mapping Source

`ObjectNode`

##### Mapping Target

`ItemFeature`

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ItemFeature::ownedRelationship () : Relationship [0..*]`  
`Set {ObjectFlowItemFeatureTyping_Mapping.getMapped (from) }`

#### 7.7.3.3.45 ObjectFlowItemFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for `ownedMemberFeature()`.

##### General Mappings

`GenericToFeatureMembership_Mapping`

### Mapping Source

ObjectFlow

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
if from.source.type.oclIsUndefined() then
    ObjectFlowItemFeatureUntyped_Mapping.getMapped(from.source)
else
    ObjectFlowItemFeature_Mapping.getMapped(from.source)
endif
```

#### 7.7.3.3.46 ObjectFlowItemFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

TypedElementFeatureTyping\_Mapping

##### Mapping Source

ObjectNode

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

#### 7.7.3.3.47 ObjectFlowItemFeatureUntyped\_Mapping

##### Description

The mapping class maps the source UML4SysML::ObjectNode to a ItemFeature without a type.



## General Mappings

GenericToFeature\_Mapping

## Mapping Source

ObjectNode

## Mapping Target

ItemFeature

## Owned Mappings

(none)

### 7.7.3.3.48 ObjectFlowEndFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

## General Mappings

GenericToEndFeatureMembership\_Mapping

## Mapping Source

ActivityNode

## Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`ObjectFlowItemFlowEnd_Mapping.getMapped(from)`

### 7.7.3.3.49 ObjectFlowItemFlowEnd\_Mapping

#### Description

The mapping class maps a UML4SysML::ActivityNode to a ItemFlowEnd which is subsetted by the transformation target of the UML4SysML::ActivityNode.

### General Mappings

GenericToFeature\_Mapping

### Mapping Source

ActivityNode

### Mapping Target

ItemFlowEnd

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ItemFlowEnd::ownedRelationship () : Relationship [0..\*]  

```
Set{ObjectFlowItemFlowSubsetting_Mapping.getMapped(from),  
ObjectFlowItemFlowFeatureMembership_Mapping.getMapped(from)}
```

### 7.7.3.3.50 ObjectFlowItemFlowFeature\_Mapping

#### Description

Creates a feature element for the UML4SysML::ObjectFlow mapping.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

ActivityNode

#### Mapping Target

ItemFeature

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ItemFeature::ownedRelationship () : Relationship [0..*]`  
`Set {ObjectFlowItemFlowRedefinition_Mapping.getMapped (from) }`

#### 7.7.3.3.51 ObjectFlowItemFlowFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

ActivityNode

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`ObjectFlowItemFlowFeature_Mapping.getMapped (from)`

#### 7.7.3.3.52 ObjectFlowItemFlowRedefinition\_Mapping

##### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

##### General Mappings

GenericToRedefinition\_Mapping

## Mapping Source

ActivityNode

## Mapping Target

Redefinition

## Owned Mappings

(none)

### 7.7.3.3.53 ObjectFlowItemFlowSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

ActivityNode

#### Mapping Target

Subsetting

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettedFeature () : Feature [1]

```
if from.ocIsKindOf(UML::ActivityParameterNode) then
  Parameter_Mapping.getMapped(from.parameter)
else if from.ocIsKindOf(UML::Pin) then
  CommonAction_Mapping.getMapped(from.owner)
else if from.ocIsKindOf(UML::InitialNode) then
  SysMLv2::ActionUsage.allInstances()
  ->any(e | e.qualifiedName = 'Actions::Action::start')
else if from.ocIsKindOf(UML::FinalNode) then
  SysMLv2::ActionUsage.allInstances()
  ->any(e | e.qualifiedName = 'Actions::Action::done')
else
  from
```

```

endif
endif
endif
endif

```

### 7.7.3.3.54 ObjectFlowTransitionUsageFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

ObjectFlow

#### Mapping Target

TransitionFeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TransitionFeatureMembership::kind () : TransitionFeatureKind [1]

```

KerML::TransitionFeatureKind::guard

```
- TransitionFeatureMembership::ownedMemberFeature () : Feature [1]

```

if from.guard.ocIsKindOf(UML::OpaqueExpression) then
  OpaqueExpressionAsValue_Mapping.getMapped(from.guard)
else
  from.guard
endif

```

### 7.7.3.3.55 VariableAttribute\_Mapping

#### Description

A UML4SysML::Variable is mapped to a SysML v2 AttributeUsage if the type of the variable is of kind UML4SysML::DataType.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
  private attribute sysmlv1Variable : ScalarValues::Integer;
}
```

### General Mappings

NamedElementMain\_Mapping  
CommonVariable\_Mapping

### Mapping Source

Variable

### Mapping Target

AttributeUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.type.ocIsKindOf(UML::DataType)
```

### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.7.3.3.56 VariableFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

TypedElementFeatureTyping\_Mapping

#### Mapping Source

Variable

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

### 7.7.3.3.57 VariableItem\_Mapping

#### Description

A UML4SysML::Variable is mapped to a SysML v2 ItemUsage if the type of the variable is not of kind UML4SysML::DataType.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {  
  private item sysmlv1Variable : SysMLv1Block;  
}  
part def SysMLv1Block;
```

#### General Mappings

NamedElementMain\_Mapping  
CommonVariable\_Mapping

#### Mapping Source

Variable

#### Mapping Target

ItemUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.type.oclIsKindOf(UML::DataType)
```

#### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.7.3.3.58 VariableMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

ElementFeatureMembership\_Mapping

#### Mapping Source

Variable

## Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::visibility () : VisibilityKind [1]

`KerML::VisibilityKind::private`

## 7.7.4 Classification

### 7.7.4.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::Classification elements are transformed with which mapping class. The mapping details are in [7.7.4.2](#).

The justifications for the elements without mapping are given in [view link does not exist](#).

**Table 5. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Generalization	Subclassification
GeneralizationSet	
InstanceSpecification	PartUsage ConnectionUsage EnumerationUsage
InstanceValue	FeatureReferenceExpression
Operation	PerformActionUsage PerformActionUsage
Parameter	ReferenceUsage
ParameterSet	



SysML v1 Concept	SysML v2 Concept
Property	PartUsage PortUsage ReferenceUsage PortUsage AttributeUsage Feature PartUsage AttributeUsage Feature ItemUsage PartUsage AttributeUsage
Slot	Feature
Substitution	

### 7.7.4.2 Mapping Specifications

#### 7.7.4.2.1 BehavioralFeature\_Mapping

##### Description

The mapping class is the abstract base class for UML4SysML::BehavioralFeature mappings.

##### General Mappings

GenericToUsage\_Mapping  
Namespace\_Mapping

##### Mapping Source

BehavioralFeature

##### Mapping Target

Usage

##### Owned Mappings

(none)

#### 7.7.4.2.2 Classifier\_Mapping

##### Description

The mapping class is the abstract base class for all mapping classes that map specializations of UML4SysML::Classifier elements.

##### General Mappings

GenericToClassifier\_Mapping  
Namespace\_Mapping

##### Mapping Source

Classifier

### Mapping Target

Classifier

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Classifier::ownedRelationship () : Relationship [0..\*]

```
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Generalization)) in
let toElementFMS: Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Feature)) in
let toElementOMS: Set(UML::Element) =
    (from.ownedElement - toElementFMS) - generalizations in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
```

- Classifier::isAbstract () : Boolean [1]

```
from.isAbstract
```

### 7.7.4.2.3 DefaultLowerBound\_Mapping

#### Description

The mapping class creates the default lower bound of a multiplicity element.

#### General Mappings

GenericToExpression\_Mapping

#### Mapping Source

Element

#### Mapping Target

LiteralInteger

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralInteger::value () : Integer [1]  
1
- LiteralInteger::ownedRelationship () : Relationship [0..\*]  
`Set {CommonReturnParameterFeatureMembership_Mapping.getMapped (from) }`

#### 7.7.4.2.4 DefaultMultiplicityBoundFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Element

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::isComposite () : Boolean [1]  
true

#### 7.7.4.2.5 DefaultMultiplicityElement\_Mapping

##### Description

The mapping class creates a feature element representing the default multiplicity.

## General Mappings

GenericToFeature\_Mapping

## Mapping Source

Element

## Mapping Target

MultiplicityRange

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MultiplicityRange::declaredName () : String [0..1]  
`'defaultMultiplicity'`
- MultiplicityRange::isUnique () : Boolean [1]  
`true`
- MultiplicityRange::ownedRelationship () : Relationship [0..\*]  
`OrderedSet { DefaultMultiplicityLowerBoundFeatureMembership_Mapping.getMapped (from) ,  
DefaultMultiplicityUpperBoundFeatureMembership_Mapping.getMapped (from) }`

### 7.7.4.2.6 DefaultMultiplicityLowerBoundFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

DefaultMultiplicityBoundFeatureMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : MultiplicityRange [1]`

`DefaultLowerBound_Mapping.getMapped(from)`

### 7.7.4.2.7 DefaultMultiplicityMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`

`DefaultMultiplicityElement_Mapping.getMapped(from)`

### 7.7.4.2.8 DefaultMultiplicityUpperBoundFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

DefaultMultiplicityBoundFeatureMembership\_Mapping

### Mapping Source

Element

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : MultiplicityRange [1]  
DefaultUpperBound\_Mapping.getMapped(from)

## 7.7.4.2.9 DefaultUpperBound\_Mapping

### Description

The mapping class creates the default upper bound of a multiplicity element.

### General Mappings

GenericToExpression\_Mapping

### Mapping Source

Element

### Mapping Target

LiteralInteger

### Owned Mappings

(none)

### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `LiteralInteger::value () : Integer [1]`

`1`

- `LiteralInteger::ownedRelationship () : Relationship [0..*]`

`Set { CommonReturnParameterFeatureMembership_Mapping.getMapped (from) }`

### 7.7.4.2.10 DefaultValue\_Mapping

#### Description

The expected SysML v2 textual syntax of a mapped SysML v2 default value is as follows:

```
attribute sysMLv1Property : ScalarValues::String default := "default value";
```

#### General Mappings

`GenericToFeatureValue_Mapping`

#### Mapping Source

`Property`

#### Mapping Target

`FeatureValue`

#### Owned Mappings

`(none)`

#### Applicable filters

`(none)`

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureValue::isDefault () : Boolean [1]`

`true`

- `FeatureValue::value () : Expression [1]`

`from.defaultValue`

#### 7.7.4.2.11 ElementFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Element

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`NamedElementMain_Mapping.getMapped(from)`
- FeatureMembership::visibility () : VisibilityKind [1]  
`if from.ocIsKindOf(UML::NamedElement) then  
Helper.getKerMLVisibilityKind(from.ocAsType(UML::NamedElement).visibility)  
else KerML::VisibilityKind::public endif`

#### 7.7.4.2.12 Generalization\_Mapping

##### Description

A UML4SysML::Generalization relationship is mapped to a SysML v2 Subclassification.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1BlockGeneral;  
part def SysMLv1BlockSpecial :> SysMLv1BlockGeneral;
```

##### General Mappings



GenericToSpecialization\_Mapping  
ElementMain\_Mapping

### Mapping Source

Generalization

### Mapping Target

Subclassification

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subclassification::superclassifier () : Classifier [1]  

```
if from.general.oclIsTypeOf(UML::PrimitiveType)
    and not (Helper.getScalarValueType(from.general)
            = OclUndefined) then
    Helper.getScalarValueType(from.general)
else
    Classifier_Mapping.getMapped(from.general)
endif
```
- Subclassification::subclassifier () : Classifier [1]  

```
Classifier_Mapping.getMapped(from.specific)
```

#### 7.7.4.2.13 InstanceSpecificationLink\_Mapping

##### Description

The UML4SysML::InstanceSpecification that is a link is mapped to a SysMLv2 ConnectionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block1;
part def SysMLv1Block2;
connection def SysMLv1Association {
    end : SysMLv1Block1[1];
    end : SysMLv1Block2[1];
}
part sysMLv1InstanceSpecification1 : SysMLv1Block1;
part sysMLv1InstanceSpecification2 : SysMLv1Block2;
connection sysMLv1Link : SysMLv1Association
    connect sysMLv1InstanceSpecification1 to sysMLv1InstanceSpecification2;
```

## General Mappings

NamedElementMain\_Mapping  
GenericToConnectionUsage\_Mapping

## Mapping Source

InstanceSpecification

## Mapping Target

ConnectionUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.classifier->select( c | c.ocIsTypeOf(UML::Association))->size() > 0
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConnectionUsage::ownedRelationship () : Relationship [0..\*]

```
ElementOwnership_Mapping.getMappedColl(from.ownedComment)  
->union(SlotMembership_Mapping.getMappedColl(from.slot))  
->union(from.classifier  
    ->collect(g | InstanceSpecificationFeatureTyping_Mapping.getMapped(from, g))  
    ->asSet())
```

### 7.7.4.2.14 InstanceSpecification\_Mapping

#### Description

The UML4SysML::InstanceSpecification that is not a link is mapped to a SysMLv2 PartDefinition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block {  
    attribute sysMLv1ValueProperty : ScalarValues::String;  
}  
  
part sysMLv1InstanceSpecification : SysMLv1Block {  
    redefines sysMLv1ValueProperty = "Hello InstanceSpecification";  
}
```

## General Mappings

NamedElementMain\_Mapping  
GenericToPartUsage\_Mapping

### Mapping Source

InstanceSpecification

### Mapping Target

PartUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.classifier->select( c | c.ocIsTypeOf(UML::Association))->size() = 0
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PartUsage::ownedRelationship () : Relationship [0..\*]

```
SlotMembership_Mapping.getMappedColl(from.slot)  
->union(from.classifier  
->collect(g | InstanceSpecificationFeatureTyping_Mapping.getMapped(from, g))  
->asSet())
```

- PartUsage::ownedFeatureMembership () : FeatureMembership [0..\*]

```
from.classifier  
->collect(c | InstanceSpecificationToGeneralization_Mapping.getMapped(from, c))
```

## 7.7.4.2.15 InstanceSpecificationFeatureTyping\_Mapping

### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

InstanceSpecification

### Mapping Target

FeatureTyping with qualifier: classifier:Classifier

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type (in classifier : Classifier) : Type [1]  
`Classifier_Mapping.getMapped(classifier)`

### 7.7.4.2.16 InstanceValue\_Mapping

#### Description

The UML4SysML::InstanceValue is mapped to a SysMLv2 FeatureReferenceExpression.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block1;
part sysMLv1InstanceSpecification : SysMLv1Block1;
part def SysMLv1Block2 {
    part sysMLv1PartProperty : SysMLv1Block1
        = sysMLv1InstanceSpecification;
}
```

#### General Mappings

ValueSpecification\_Mapping

#### Mapping Source

InstanceValue

#### Mapping Target

FeatureReferenceExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureReferenceExpression::ownedRelationship () : Relationship [0..*]`

```
ElementOwnership_Mapping.getMappedColl(from.ownedComment)
->including(InstanceValueMembership_Mapping.getMapped(from.instance))
->including(ReturnParameterFeatureMembership_Factory.create())
```

#### 7.7.4.2.17 InstanceValueMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

InstanceSpecification

##### Mapping Target

Membership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`

```
from
```

#### 7.7.4.2.18 LowerBoundValueFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

MultiplicityElement

### **Mapping Target**

FeatureMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]  
`LiteralInteger_Mapping.getMapped(from.lowerValue)`

## **7.7.4.2.19 MultiplicityElement\_Mapping**

### **Description**

A UML4SysML::MultiplicityElement is mapped to a SysML v2 MultiplicityRange.

### **General Mappings**

GenericToFeature\_Mapping

### **Mapping Source**

MultiplicityElement

### **Mapping Target**

MultiplicityRange

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MultiplicityRange::isUnique () : Boolean [1]

```
from.isUnique
```

- MultiplicityRange::ownedRelationship () : Relationship [0..\*]

```
OrderedSet{MultiplicityLowerBoundOwningMembership_Mapping.getMapped(from),  
MultiplicityUpperBoundOwningMembership_Mapping.getMapped(from)}
```

- MultiplicityRange::declaredName () : String [0..1]

```
'multiplicity'
```

#### 7.7.4.2.20 MultiplicityLowerBoundOwningMembership\_Mapping

##### Description

Creates a owning membership relationship for *ownedMemberElement()*.

##### General Mappings

GenericToOwningMembership\_Mapping

##### Mapping Source

MultiplicityElement

##### Mapping Target

OwningMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

```
if from.lowerValue.oclIsUndefined() then  
    DefaultLowerBound_Mapping.getMapped(from)  
else  
    from.lowerValue  
endif
```

- OwningMembership::memberName () : String [0..1]

```
'lowerBound'
```

#### 7.7.4.2.21 MultiplicityMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToOwningMembership\_Mapping

### Mapping Source

MultiplicityElement

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`MultiplicityElement_Mapping.getMapped(from)`

## 7.7.4.2.22 MultiplicityUpperBoundOwningMembership\_Mapping

### Description

Creates a owning membership relationship for *ownedMemberElement()*.

### General Mappings

GenericToOwningMembership\_Mapping

### Mapping Source

MultiplicityElement

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)



## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::memberName () : String [0..1]`  
`'upperBound'`
- `OwningMembership::ownedMemberElement () : Element [1]`  

```
if from.upperValue.oclIsUndefined() then
  DefaultUpperBound_Mapping.getMapped(from)
else
  from.upperValue
endif
```

### 7.7.4.2.23 Operation\_Mapping

#### Description

A `UML4SysML::Operation` is mapped to a `SysML v2 PerformActionUsage`.

The following shows an example of what the textual `SysML v2` syntax of the result of the transformation may look like.

```
part def SysMLv1Block {
    perform action sysMLv1Operation {
        in parIn : ScalarValues::Boolean;
        out result : ScalarValues::Integer;
    }
}
```

#### General Mappings

BehavioralFeature\_Mapping  
GenericToActionUsage\_Mapping

#### Mapping Source

Operation

#### Mapping Target

PerformActionUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `PerformActionUsage::ownedRelationship () : Relationship [0..*]`

```
let parameters: Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Parameter)) in
let parameterSets: Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::ParameterSet)) in
ElementOwnership_Mapping.getMappedColl(from.ownedComment)
->union(parameters->collect(e | ParameterMembership_Mapping.getMapped(e)))
->union(parameterSets->collect(e | ParameterSetMembership_Mapping.getMapped(e)))
```

#### 7.7.4.2.24 Parameter\_Mapping

##### Description

A `UML4SysML::Parameter` is mapped to a SysML v2 `ReferenceUsage`.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {
    in parIn : ScalarValues::Boolean;
}
```

##### General Mappings

GenericToReferenceUsage\_Mapping  
NamedElementMain\_Mapping

##### Mapping Source

Parameter

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::direction () : FeatureDirectionKind [0..1]`

```
Helper.getKerMLParameterDirectionKind(from.direction)
```

- ReferenceUsage::declaredName () : String [0..1]

```
if from.direction = UML::ParameterDirectionKind::return then 'result' else from.name endif
```

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
let typings: Set(KerML::FeatureTyping) =
  if from.type.oclIsUndefined() then
    Set{}
  else
    Set{ParameterToFeatureTyping_Mapping.getMapped(from)}
  endif in
let multiplicities: Set(KerML::Relationship) =
  Set{MultiplicityMembership_Mapping.getMapped(from)} in
let defaultValues: Set(KerML::Relationship) =
  if from.defaultValue.oclIsUndefined() then
    Set{}
  else
    Set{ParameterDefaultValue_Mapping.getMapped(from)}
  endif in
ElementOwnership_Mapping.getMappedColl(from.ownedComment)->asSet()
->union(typings)
->union(multiplicities)
->union(defaultValues)
```

#### 7.7.4.2.25 ParameterDefaultValue\_Mapping

##### Description

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
attribute value : ScalarValues::String default := "default value";
```

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

Parameter

##### Mapping Target

FeatureValue

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`from.defaultValue`
- FeatureValue::isDefault () : Boolean [1]  
`true`

#### 7.7.4.2.26 ParameterMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToParameterMembership\_Mapping

##### Mapping Source

Parameter

##### Mapping Target

ParameterMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]  
`Parameter_Mapping.getMapped(from)`

#### 7.7.4.2.27 ParameterSet\_Mapping

##### Description

A UML4SysML::ParameterSet is mapped to a SysML v2 ReferenceUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity {  
    in parIn [0..1];
```

```

inout parInOut [0..1];
out parOut [0..1];
out parReturn [0..1];

sysMLv1ParameterSet1 [1] {
    ref parIn = SysMLv1Activity::parIn;
    assert constraint sysMLv1ParameterSet1Condition {
        language "English"
        /*
         * opaque expression parameter set 1
         */
    }
}
sysMLv1ParameterSet2 [1] {
    ref parInOut = SysMLv1Activity::parInOut;
    ref parOut = SysMLv1Activity::parOut;
    ref parReturn = SysMLv1Activity::parReturn;
}
}

```

## General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

ParameterSet

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```

from.parameter
->collect(p | ParameterSetParameterFeatureMembership_Mapping.getMapped(from, p))
->asSet()

```

- ReferenceUsage::declaredName () : String [0..1]

```

from.name

```

#### 7.7.4.2.28 ParameterSetMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

ParameterSet

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
ParameterSet\_Mapping.getMapped (from)

#### 7.7.4.2.29 ParameterSetParameterFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

ParameterSet

##### Mapping Target

FeatureMembership with qualifier: parameter:Parameter

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature (in parameter : Parameter) : Feature [1]  
`ParameterSetParameterReferenceUsage_Mapping.getMapped(parameter)`

#### 7.7.4.2.30 ParameterSetParameterReferenceUsage\_Mapping

##### Description

The mapping class creates the reference usage element for the UML4SysML::ParameterSet mapping.

##### General Mappings

GenericToReferenceUsage\_Mapping

##### Mapping Source

Parameter

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set { ParameterSetParameterReferenceUsageFeatureValue_Mapping.getMapped(from), MultiplicityMembership_Mapping.getMapped(from) }`

#### 7.7.4.2.31 ParameterSetParameterReferenceUsageFeatureValue\_Mapping

##### Description

The mapping class creates the feature reference expression for the reference usage element of the UML4SysML::ParameterSet mapping.

## General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

Parameter

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
ParameterSetParameterReferenceUsageFeatureValueExpression_Mapping.getMapped(from)
```

### 7.7.4.2.32 ParameterSetParameterReferenceUsageFeatureValueExpression\_Mapping

#### Description

The mapping class creates the feature reference expression for the UML4SysML::ParameterSet mapping.

## General Mappings

GenericToFeatureReferenceExpression\_Mapping

## Mapping Source

Parameter

## Mapping Target

FeatureReferenceExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules



In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureReferenceExpression::ownedRelationship () : Relationship [0..*]`

```
Set { ParameterSetParameterReferenceUsageMembership_Mapping.getMapped(from) ,  
CommonReturnParameterFeatureMembership_Mapping.getMapped(from) }
```

#### 7.7.4.2.33 ParameterSetParameterReferenceUsageMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

Parameter

##### Mapping Target

Membership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Membership::memberElement () : Element [1]`

```
from
```

#### 7.7.4.2.34 ParameterToFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

TypedElementFeatureTyping\_Mapping

##### Mapping Source

Parameter

## Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::typedFeature () : Feature [1]

```
parameter.to
```

### 7.7.4.2.35 Property\_Mapping

#### Description

A UML4SysML::Property is mapped to a SysML v2 Feature. The mapping class maps properties with a type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block {  
    attribute sysMLv1Property [0..1] : ScalarValues::Integer;  
}
```

#### General Mappings

PropertyCommon\_Mapping  
NamedElementMain\_Mapping

#### Mapping Source

Property

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```

if src.ocIsKindOf(UML::Property) and not
    Helper.hasStereotypeApplied(src.owner, 'SysML::ConstraintBlocks::ConstraintBlock') then

    let p: UML::Property = src.ocAsType(UML::Property) in
    if p.type.ocIsUndefined() then
        false
    else
        not p.type.ocIsKindOf(UML::DataType) and
        not (p.name.indexOf('base_') > 0) and
        (p.association.ocIsUndefined() or p.association.ownedEnd->excludes(p))
    endif
endif
else
    false
endif

```

### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

#### 7.7.4.2.36 PropertyCommon\_Mapping

##### Description

The mapping class is the abstract base class for UML4SysML::Property mappings.

##### General Mappings

StructuralFeature\_Mapping

##### Mapping Source

Property

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::isDerived () : Boolean [1]  

```
from.isDerived
```
- Feature::ownedRelationship () : Relationship [0..\*]

```

let typings: Set(KerML::FeatureTyping) = if from.type.oclIsUndefined() then
    Set{}
else
    Set{StructuralFeatureToFeatureTyping_Mapping.getMapped(from)}
endif in
let subsettings: Set(KerML::Subsetting) = from.subsettedProperty
->collect(p | PropertySubsetting_Mapping.getMapped(from, p))->asSet() in
let defaultValue: Set(KerML::OwningMembership) =
    if from.defaultValue.oclIsUndefined() then
        Set{}
    else
        Set{DefaultValue_Mapping.getMapped(from)}
    endif in
typings->union(subsettings)->union(defaultValue)
->including(MultiplicityMembership_Mapping.getMapped(from))->asSet()

```

- Feature::isComposite () : Boolean [1]

```

from.isComposite

```

- Feature::isEnd () : Boolean [1]

```

if from.association.oclIsUndefined() then
    false
else
    from.association.ownedEnd->includes(from)
endif

```

#### 7.7.4.2.37 PropertySubsetting\_Mapping

##### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

##### General Mappings

GenericToSubsetting\_Mapping

##### Mapping Source

Property

##### Mapping Target

Subsetting with qualifier: subsettedProperty:Property

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Subsetting::subsettingFeature (in subsettingProperty : Property) : Feature [1]`

```
Property_Mapping.getMapped(subsettingProperty)
```

- `Subsetting::subsettingFeature () : Feature [1]`

```
Property_Mapping.getMapped(from)
```

#### 7.7.4.2.38 PropertyUntyped\_Mapping

##### Description

A `UML4SysML::Property` is mapped to a SysML v2 Feature. The mapping class maps properties without a type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block {  
    attribute sysMLv1Property;  
}
```

##### General Mappings

PropertyCommon\_Mapping  
GenericToReferenceUsage\_Mapping  
NamedElementMain\_Mapping

##### Mapping Source

Property

##### Mapping Target

ReferenceUsage

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.type.oclIsUndefined() and not  
Helper.hasStereotypeApplied(src.owner, 'SysML::ConstraintBlocks::ConstraintBlock')
```

##### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

#### 7.7.4.2.39 Realization\_Mapping

##### Description

A UML4SysML::Realization relationship is mapped to a SysML v2 Dependency.

### **General Mappings**

Abstraction\_Mapping

### **Mapping Source**

Realization

### **Mapping Target**

Dependency

### **Owned Mappings**

(none)

### **7.7.4.2.40 Slot\_Mapping**

#### **Description**

A UML4SysML::Slot is mapped to a SysML v2 Feature.

### **General Mappings**

GenericToFeature\_Mapping

ElementMain\_Mapping

### **Mapping Source**

Slot

### **Mapping Target**

Feature

### **Owned Mappings**

(none)

### **7.7.4.2.41 SlotMembership\_Mapping**

#### **Description**

Creates a membership relationship for *memberElement()*.

### **General Mappings**

GenericToFeatureMembership\_Mapping

### **Mapping Source**

Slot

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::isReadOnly () : Boolean [1]  
`from.isReadOnly`
- FeatureMembership::memberName () : String [0..1]  
`from.definingFeature.name`
- FeatureMembership::ownedMemberFeature () : Feature [1]  
`from`

#### 7.7.4.2.42 SlotFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

Slot

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
ElementMain_Mapping.getMapped(from)
```

#### 7.7.4.2.43 SlotValue\_Mapping

##### Description

Issue here since a KerML feature cannot have more than one FeatureValue while a UML4SysML::Slot can. How to manage collection of values?

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

ValueSpecification

##### Mapping Target

FeatureValue

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsKindOf(UML::Slot)
```

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureValue::value () : Expression [1]`

```
from
```

- `FeatureValue::featureWithValue () : Feature [1]`

```
Slot_Mapping.getMapped(from.owner)
```

#### 7.7.4.2.44 StructuralFeature\_Mapping

##### Description

The mapping class is the abstract base class for all UML4SysML::StructuralFeature mappings.

##### General Mappings



GenericToFeature\_Mapping

### Mapping Source

StructuralFeature

### Mapping Target

Feature

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::isReadOnly () : Boolean [1]  
*abstract rule*
- Feature::isAbstract () : Boolean [1]  
  
false
- Feature::isUnique () : Boolean [1]  
  
from.isUnique
- Feature::ownedRelationship () : Relationship [0..\*]  
  
let typing: KerML::FeatureTyping =  
  StructuralFeatureToFeatureTyping\_Mapping.getMapped(from) in  
if typing.oclIsUndefined() then  
  Set{MultiplicityMembership\_Mapping.getMapped(from)}  
else  
  Set{MultiplicityMembership\_Mapping.getMapped(from), typing}  
endif
- Feature::isOrdered () : Boolean [1]  
  
from.isOrdered

#### 7.7.4.2.45 StructuralFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

StructuralFeature

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]  
`NamedElementMain_Mapping.getMapped(from)`
- FeatureMembership::visibility () : VisibilityKind [1]  

```
if (from.ocIsKindOf(UML::NamedElement)) then
    Helper.getKerMLVisibilityKind(from.ocAsType(UML::NamedElement).visibility)
else
    KerML::VisibilityKind::public
endif
```

#### 7.7.4.2.46 StructuralFeatureToFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

TypedElementFeatureTyping\_Mapping

##### Mapping Source

StructuralFeature

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

#### 7.7.4.2.47 TypedElementFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

TypedElement

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.type.oclIsUndefined()
```

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
if from.type.oclIsKindOf(UML::PrimitiveType) then
  Helper.getScalarValueType(from.type)
else if from.type.oclIsKindOf(UML::Enumeration) then
  Helper.getEnumerationType(from.type)
else
  Classifier_Mapping.getMapped(from.type)
endif endif
```

#### 7.7.4.2.48 UpperBoundValueFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

MultiplicityElement

## Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]

```
if from.upper <> -1 then
    LiteralUnlimitedToInteger_Mapping.getMapped(from.upperValue)
else
    LiteralUnlimitedToUnbounded_Mapping.getMapped(from.upperValue)
endif
```

## 7.7.5 CommonBehavior

### 7.7.5.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::CommonBehavior elements are transformed with which mapping class. The mapping details are in [7.7.5.3](#).

The justifications for the elements without mapping are given in [7.7.5.2](#).

**Table 6. List of all mappings**

SysML v1 Concept	SysML v2 Concept
AnyReceiveEvent	
CallEvent	
ChangeEvent	TextualRepresentation
FunctionBehavior	
OpaqueBehavior	ActionDefinition ActionUsage
SignalEvent	
TimeEvent	TextualRepresentation
Trigger	AcceptActionUsage

## 7.7.5.2 UML4SysML::CommonBehavior elements not mapped

Table 7. List of SysML v1 elements not mapped of this section

SysML v1 Concept	Rationale
CallEvent	The concept of a CallEvent is not supported by SysML v2.

## 7.7.5.3 Mapping Specifications

### 7.7.5.3.1 Behavior\_Mapping

#### Description

The mapping class is the abstract base class for all UML4SysML::Behavior mappings.

#### General Mappings

GenericToBehavior\_Mapping  
Class\_Mapping

#### Mapping Source

Behavior

#### Mapping Target

Behavior

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
true
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Behavior::ownedRelationship () : Relationship [0..\*]

```
let parameters: Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Parameter)) in
let parameterSets: Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::ParameterSet)) in
let features: Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Property)) in
let elementsOMS: Set(UML::Element) =
  (((from.ownedElement - parameters) parameterSets) - features) in
elementsOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(features->collect(e | PropertyMembership_Mapping.getMapped(e)))
```

```
->union(parameters->collect(e | ParameterMembership_Mapping.getMapped(e)))
->union(parameterSets->collect(e | ParameterSetMembership_Mapping.getMapped(e)))
```

### 7.7.5.3.2 ChangeEvent\_Mapping

#### Description

T#3 meeting, 2022-12-14: Do not use automatic rules! Events are not single elements in SysML v2. Consider it in the transformation for AcceptEventAction, Transition

#### General Mappings

GenericToTextualRepresentation\_Mapping  
NamedElementMain\_Mapping

#### Mapping Source

ChangeEvent

#### Mapping Target

TextualRepresentation

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TextualRepresentation::body () : String [1]

```
if from.changeExpression.oclIsKindOf(UML::OpaqueExpression) then
  if from.changeExpression.
    oclAsType(UML::OpaqueExpression).body.oclIsUndefined() then
    OclUndefined
  else
    from.changeExpression.oclAsType(UML::OpaqueExpression).body.get(0)
  endif
else
  OclUndefined
endif
```

- TextualRepresentation::language () : String [1]

```
if from.changeExpression.oclIsKindOf(UML::OpaqueExpression) then
  if from.changeExpression.
    oclAsType(UML::OpaqueExpression).language->size() = 0 then
    OclUndefined
  else
    from.changeExpression.oclAsType(UML::OpaqueExpression).language.get(0)
  endif
endif
```

```

        endif
    else
        OclUndefined
    endif

```

### 7.7.5.3.3 CommonOpaqueBehavior\_Mapping

#### Description

The mapping class is the abstract base class for UML4SysML::OpaqueBehavior mappings.

#### General Mappings

Behavior\_Mapping

#### Mapping Source

OpaqueBehavior

#### Mapping Target

Behavior

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Behavior::ownedRelationship () : Relationship [0..\*]

```

let parameters : Set(UML::Parameter) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Parameter)) in
let parameterSets : Set(UML::ParameterSet) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::ParameterSet)) in
let features : Set(UML::Property) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Property)) in
let elementsOMS: Set(UML::Element) =
    (((from.ownedElement - parameters) - parameterSets) - features) in
elementsOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(features->collect(e | PropertyMembership_Mapping.getMapped(e)))
->union(parameters->collect(e | ParameterMembership_Mapping.getMapped(e)))
->union(parameterSets->collect(e | ParameterSetMembership_Mapping.getMapped(e)))
->union(from.language
    ->collect(1 | OpaqueBehaviorMembership_Mapping.getMapped(from, 1)))

```

### 7.7.5.3.4 OpaqueBehaviorAsDefinition\_Mapping

#### Description

A UML4SysML::OpaqueBehavior that is owned by a package is mapped to a SysML v2 ActionDefinition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1OpaqueBehavior {
    language "Built-in Math"
    /*
     * result = 42 + 23;
     */
}
```

## General Mappings

GenericToDefinition\_Mapping

CommonOpaqueBehavior\_Mapping

### Mapping Source

OpaqueBehavior

### Mapping Target

ActionDefinition

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.oclIsKindOf(UML::Package)
```

### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

## 7.7.5.3.5 OpaqueBehaviorAsUsage\_Mapping

### Description

A UML4SysML::OpaqueBehavior that is not owned by a package is mapped to a SysML v2 ActionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block {
    action sysMLv1OpaqueBehavior {
        language "Built-in Math"
        /*
         * result = 42 + 23;
         */
    }
}
```



## General Mappings

CommonOpaqueBehavior\_Mapping  
GenericToActionUsage\_Mapping

## Mapping Source

OpaqueBehavior

## Mapping Target

ActionUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.owner.oclIsKindOf(UML::Package)
```

## Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.7.5.3.6 OpaqueBehaviorMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

OpaqueBehavior

#### Mapping Target

OwningMembership with qualifier: language:String

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement (in language : String) : Element [1]`

```
OpaqueBehaviorSpecification_Mapping.getMapped(from, language)
```

### 7.7.5.3.7 OpaqueBehaviorSpecification\_Mapping

#### Description

The mapping class creates the SysML v2 `TextualRepresentation` elements from the languages and bodies properties of the given `UML4SysML::OpaqueBehavior`.

#### General Mappings

`GenericToTextualRepresentation_Mapping`

#### Mapping Source

`OpaqueBehavior`

#### Mapping Target

`TextualRepresentation` with qualifier: `language:String`

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `TextualRepresentation::language () : String [1]`

```
language
```

- `TextualRepresentation::body () : String [1]`

```
let index:Integer = from.language->indexOf(language) in  
from._'body'->at(index)
```

### 7.7.5.3.8 TimeEvent\_Mapping

#### Description

T#3 meeting, 2022-12-14: Do not use automatic rules! Events are not single elements in SysML v2. Consider it in the transformation for `AcceptEventAction`, `Transition`

#### General Mappings

NamedElementMain\_Mapping  
 GenericToTextualRepresentation\_Mapping

**Mapping Source**

TimeEvent

**Mapping Target**

TextualRepresentation

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TextualRepresentation::body () : String [1]  
     'tbd timeevent'

**7.7.5.3.9 Trigger\_Mapping**

**7.7.6 CommonStructure**

**7.7.6.1 Overview**

The following table gives an overview of which SysML v2 elements the UML4SysML::CommonStructure elements are transformed with which mapping class. The mapping details are in [7.7.6.2](#).

**Table 9. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Abstraction	Dependency Dependency Dependency SatisfyRequirementUsage AllocationUsage AllocationDefinition Dependency ConnectionUsage
Comment	Comment Package ConcernUsage Comment
Constraint	ConstraintDefinition

SysML v1 Concept	SysML v2 Concept
Dependency	Dependency Dependency Dependency Dependency SatisfyRequirementUsage AllocationUsage AllocationDefinition Dependency ConnectionUsage Dependency
ElementImport	MembershipImport
PackageImport	NamespaceImport
Realization	Dependency
Usage	Dependency

## 7.7.6.2 Mapping Specifications

### 7.7.6.2.1 Abstraction\_Mapping

#### Description

A UML4SysML::Abstraction relationship is mapped to a SysML v2 Dependency relationship.

#### General Mappings

Dependency\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

Dependency

#### Owned Mappings

(none)

### 7.7.6.2.2 Comment\_Mapping

#### Description

A UML4SysML::Comment is mapped to a SysML v2 Comment.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block1;
part def SysMLv1Block2;
action def SysMLv1Activitiy {
```

```

        comment about SysMLv1Activity, SysMLv1Block1
            /* comment body */
    }
    comment about SysMLv1Block1, SysMLv1Block /* comment body */

```

## General Mappings

ElementMain\_Mapping  
GenericToAnnotatingElement\_Mapping

## Mapping Source

Comment

## Mapping Target

Comment

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not Helper.hasStereotypeApplied(src, 'SysML::ModelElements::ElementGroup')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Comment::body () : String [1]
 

```
if from.body->isEmpty() then '' else from.body endif
```
- Comment::annotation () : Annotation [0..\*]
 

```
from.annotatedElement
->collect(e | CommentAnnotation_Mapping.getMapped(from, e))
```
- Comment::ownedRelationship () : Relationship [0..\*]
 

```
ElementOwnership_Mapping.getMappedColl(from.ownedComment)
->union(self.annotation())
```

### 7.7.6.2.3 CommentAnnotation\_Mapping

#### Description

The mapping class creates the annotation relationship for the UML4SysML::Comment mapping.

## General Mappings

GenericToAnnotation\_Mapping

## Mapping Source

Comment

## Mapping Target

Annotation with qualifier: annotatedElement:Element

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Annotation::annotatedElement (in annotatedElement : Element) : Element [1]  
`ElementMain_Mapping.getMapped(annotatedElement)`
- Annotation::owningAnnotatedElement () : Element [0..1]  
`null`
- Annotation::annotatingElement () : AnnotatingElement [1]  
`Comment_Mapping.getMapped(from)`

### 7.7.6.2.4 Constraint\_Mapping

#### Description

A UML4SysML::Constraint is mapped to a SysML v2 ConstraintDefinition and AssertConstraintUsages for the constrained elements.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block {
  constraint def SysMLv1Constraint {
    calc sysMLv1Constraint {
      language "English"
      /*
       * constraint specification
       */
    }
  }
  assert constraint assert_sysMLv1Constraint : SysMLv1Constraint;
}
```

#### General Mappings

GenericToConstraintDefinition\_Mapping  
NamedElementMain\_Mapping

### Mapping Source

Constraint

### Mapping Target

ConstraintDefinition

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConstraintDefinition::ownedRelationship () : Relationship [0..\*]

```
ElementOwnership_Mapping.getMappedColl(from.ownedComment)->asSet()  
->union(Set{ElementFeatureMembership_Mapping.getMapped(from.specification),  
CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from.specification)})
```

## 7.7.6.2.5 ConstrainedElementFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Constraint

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`

`ConstraintUsage_Mapping.getMapped (from)`

### 7.7.6.2.6 ConstraintUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Constraint

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

`from`

### 7.7.6.2.7 ConstraintUsage\_Mapping

#### Description

The mapping class creates the SysML v2 `AssertConstraintUsage` elements for the constrained elements of the `UML4SysML::Constraint` mapping.

#### General Mappings

GenericToUsage\_Mapping

#### Mapping Source



Constraint

### Mapping Target

AssertConstraintUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- AssertConstraintUsage::declaredName () : String [0..1]  
`'assert_' + from.name`
- AssertConstraintUsage::ownedRelationship () : Relationship [0..\*]  
`ElementOwnership_Mapping.getMappedColl(from.ownedComment)->asSet()  
->union(Set{ConstraintUsageFeatureTyping_Mapping.getMapped(from),  
CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from)})`

## 7.7.6.2.8 Dependency\_Mapping

### Description

A UML4SysML::Dependency relationship is mapped to a SysML v2 Dependency relationship.

### General Mappings

DirectedRelationship\_Mapping

### Mapping Source

Dependency

### Mapping Target

Dependency

### Owned Mappings

(none)

### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Dependency::supplier () : Element [0..*]`  
`from.target->collect (e | ElementMain_Mapping.getMapped (e))`
- `Dependency::client () : Element [0..*]`  
`from.source->collect (e | ElementMain_Mapping.getMapped (e))`
- `Dependency::declaredName () : String [0..1]`  
`from.name`

### 7.7.6.2.9 DirectedRelationship\_Mapping

#### Description

The mapping class is the abstract base class for all `UML4SysML::DirectedRelationship` mappings.

#### General Mappings

Relationship\_Mapping

#### Mapping Source

DirectedRelationship

#### Mapping Target

Relationship

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Relationship::target () : Element [0..*]`  
`from.target->collect (e | ElementMain_Mapping.getMapped (e))`
- `Relationship::source () : Element [0..*]`  
`from.source->collect (e | ElementMain_Mapping.getMapped (e))`

### 7.7.6.2.10 ElementMain\_Mapping

#### Description

This is the general abstract class to be used as an ancestor for any class mapping specification.

#### General Mappings

GenericToElement\_Mapping  
MainMapping

#### Mapping Source

Element

#### Mapping Target

Element

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Element::elementId () : String [1]  
`Helper.getID(from)`
- Element::ownedRelationship () : Relationship [0..\*]  
`ElementOwnership_Mapping.getMappedColl(from.ownedComment)`

### 7.7.6.2.11 ElementMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

Membership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  

```
ElementMain_Mapping.getMapped(from)
```
- Membership::membershipOwningNamespace () : Element [0..\*]  

```
Set{ElementMain_Mapping(from) }  
-- will not be used since corresponding attribute is derived,  
-- but required for redefinition
```
- Membership::visibility () : VisibilityKind [1]  

```
if (from.ocIsKindOf(UML::NamedElement)) then  
    from.ocAsType(UML::NamedElement).visibility  
else  
    KerML::VisibilityKind::public  
endif
```

## 7.7.6.2.12 ElementOwnership\_Mapping

### Description

The mapping class is the abstract base class for mappings that target ownership relationships.

### General Mappings

GenericToRelationship\_Mapping

UniqueMapping

### Mapping Source

Element

### Mapping Target

Relationship

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Relationship::source () : Element [0..\*]  
`OrderedSet{ElementMain_Mapping.getMapped(from.owner)}`
- Relationship::target () : Element [0..\*]  
`OrderedSet{ElementMain_Mapping.getMapped(from)}`
- Relationship::ownedRelatedElement () : Element [0..\*]  
`self.target()`

#### 7.7.6.2.13 ElementOwningMembership\_Mapping

##### Description

Creates a owning membership relationship for *ownedMemberElement()*.

##### General Mappings

ElementMembership\_Mapping  
ElementOwnership\_Mapping

##### Mapping Source

Element

##### Mapping Target

OwningMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`ElementMain_Mapping.getMapped(from)`
- OwningMembership::membershipOwningNamespace () : Element [0..\*]

```
Set{ElementMain_Mapping(from) }  
-- will not be used since corresponding attribute is derived,  
-- but required for redefinition
```

- OwningMembership::ownedRelatedElement () : Element [0..\*]

```
Set{self.ownedMemberElement() }
```

#### 7.7.6.2.14 NamedElementMain\_Mapping

##### Description

The mapping class is the abstract base class for mappings of UML4SysML::NamedElements.

##### General Mappings

ElementMain\_Mapping

##### Mapping Source

NamedElement

##### Mapping Target

Element

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Element::declaredName () : String [0..1]

```
from.name
```

#### 7.7.6.2.15 Namespace\_Mapping

##### Description

The mapping class is the abstract base class for UML4SysML::Namespace mappings.

##### General Mappings

GenericToNamespace\_Mapping

NamedElementMain\_Mapping

##### Mapping Source

Namespace

## Mapping Target

Namespace

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Namespace::ownedImport () : Import [0..\*]  
Set { }

### 7.7.6.2.16 Relationship\_Mapping

#### Description

This mapping class is the abstract base class for UML4SysML::Relationship mappings.

#### General Mappings

GenericToRelationship\_Mapping  
ElementMain\_Mapping

#### Mapping Source

Relationship

#### Mapping Target

Relationship

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Relationship::ownedRelatedElement () : Element [0..\*]

```

    from.relatedElement->select(e | from.ownedElement->includes(e))
->collect(e | ElementMain_Mapping.getMapped(e))

```

- Relationship::owningRelatedElement() : Element [0..1]

```

    ElementMain_Mapping.getMapped(from.owner)

```

### 7.7.6.2.17 Usage\_Mapping

#### Description

A UML4SysML::Usage relationship is mapped to a SysML v2 Dependency relationship.

#### General Mappings

Dependency\_Mapping

#### Mapping Source

Usage

#### Mapping Target

Dependency

#### Owned Mappings

(none)

## 7.7.7 InformationFlows

### 7.7.7.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::InformationFlows elements are transformed with which mapping class. The mapping details are in [7.7.7.2](#).

**Table 10. List of all mappings**

SysML v1 Concept	SysML v2 Concept
InformationFlow	FlowConnectionUsage FlowConnectionDefinition
InformationItem	ItemDefinition

### 7.7.7.2 Mapping Specifications

#### 7.7.7.2.1 InformationFlow\_Mapping

##### Description

A UML4SysML::InformationFlow is mapped to a SysML v2 FlowConnectionDefinition.

##### General Mappings

Relationship\_Mapping



## Mapping Source

InformationFlow

## Mapping Target

FlowConnectionDefinition

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FlowConnectionDefinition::ownedRelationship () : Relationship [0..\*]

```
from.source
  ->collect(s | InformationFlowSourceMembership_Mapping.getMapped(from, s))
->union(from.target
  ->collect(t | InformationFlowTargetMembership_Mapping.getMapped(from, t)))
->asOrderedSet()
```

### 7.7.7.2.2 InformationFlowEndCommonMembership\_Mapping

#### Description

The mapping class is the abstract base class for the concrete mapping classes for the source and the target membership relationships of the FlowConnectionDefinition for the UML4SysML::InformationFlow mapping.

#### General Mappings

GenericToElement\_Mapping

#### Mapping Source

InformationFlow

#### Mapping Target

Element

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Element::ownedMemberFeature (in end : NamedElement) : Feature [1]  
*abstract rule*
- Element::memberShortName () : String [0..1]  
null
- Element::visibility () : VisibilityKind [1]  
KerML::VisibilityKind::public
- Element::ownedRelatedElement () : Element [0..\*]  
Set {self.ownedMemberFeature () }
- Element::memberName () : String [0..1]  
null

### 7.7.7.2.3 InformationFlowSource\_Mapping

#### Description

The mapping class creates the source feature of the FlowConnectionDefinition for the mapping of UML4SysML::InformationFlow.

#### General Mappings

GenericToElement\_Mapping

#### Mapping Source

InformationFlow

#### Mapping Target

Feature with qualifier: source:NamedElement

#### Owned Mappings

- informationFlowSourceFeatureTyping : InformationFlowSourceFeatureTyping\_Mapping

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::name (in source : NamedElement) : String [0..1]

```
'source'
```

- Feature::ownedRelationship () : Relationship [0..\*]  
`Set {informationFlowSourceFeatureTyping.to}`
- Feature::isEnd () : Boolean [1]  
`true`

#### 7.7.7.2.4 InformationFlowSourceMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

InformationFlowEndCommonMembership\_Mapping

##### Mapping Source

InformationFlow

##### Mapping Target

FeatureMembership with qualifier: source:NamedElement

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature (in source : NamedElement) : Feature [1]  
`InformationFlowSource_Mapping.getMapped(from, source)`

#### 7.7.7.2.5 InformationFlowSourceFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToElement\_Mapping

##### Mapping Source

InformationFlow

### Mapping Target

FeatureTyping with qualifier: source:NamedElement

### Owned Mappings

- informationFlowSource : InformationFlowSource\_Mapping

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type (in source : NamedElement) : Type [1]  
`ElementMain_Mapping.getMapped(source)`
- FeatureTyping::typedFeature (in source : NamedElement) : Feature [1]  
`InformationFlowSource_Mapping.getMapped(from, source)`

#### 7.7.7.2.6 InformationFlowTarget\_Mapping

### Description

The mapping class creates the target feature of the FlowConnectionDefinition for the mapping of UML4SysML::InformationFlow.

### General Mappings

GenericToElement\_Mapping

### Mapping Source

InformationFlow

### Mapping Target

Feature with qualifier: target:NamedElement

### Owned Mappings

- informationFlowTargetFeatureTyping : InformationFlowTargetFeatureTyping\_Mapping

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Feature::ownedRelationship () : Relationship [0..*]`  
`Set {informationFlowTargetFeatureTyping.to}`
- `Feature::isEnd () : Boolean [1]`  
`true`
- `Feature::name (in target : NamedElement) : String [0..1]`  
`'target_'+target.name`

#### 7.7.7.2.7 InformationFlowTargetMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

InformationFlowEndCommonMembership\_Mapping

##### Mapping Source

InformationFlow

##### Mapping Target

FeatureMembership with qualifier: target:NamedElement

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature (in target : NamedElement) : Feature [1]`  
`InformationFlowTarget_Mapping.getMapped(from, target)`

#### 7.7.7.2.8 InformationFlowTargetFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToElement\_Mapping

### Mapping Source

InformationFlow

### Mapping Target

FeatureTyping with qualifier: target:NamedElement

### Owned Mappings

- informationTarget : InformationFlowTarget\_Mapping

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::typedFeature (in target : NamedElement) : Feature [1]  
`InformationFlowTarget_Mapping.getMapped(from, target)`
- FeatureTyping::type (in target : NamedElement) : Type [1]  
`ElementMain_Mapping.getMapped(target)`

## 7.7.7.2.9 InformationItem\_Mapping

### Description

A UML4SysML::InformationItem is mapped to a SysML v2 ItemDefinition.

### General Mappings

Classifier\_Mapping

### Mapping Source

InformationItem

### Mapping Target

ItemDefinition

### Owned Mappings

(none)

## 7.7.8 Interactions

### 7.7.8.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::Interactions elements are transformed with which mapping class. The mapping details are in [7.7.8.3](#).

The justifications for the elements without mapping are given in [7.7.8.2](#).

**Table 11. List of all mappings**

SysML v1 Concept	SysML v2 Concept
ActionExecutionSpecification	ActionUsage
BehaviorExecutionSpecification	ActionUsage
CombinedFragment	Interaction
ConsiderIgnoreFragment	
Continuation	
DestructionOccurrenceSpecification	
ExecutionOccurrenceSpecification	
Gate	
GeneralOrdering	
Interaction	Interaction
InteractionConstraint	
InteractionOperand	Interaction
InteractionUse	Step
Lifeline	PartUsage
Message	ItemFlow
MessageOccurrenceSpecification	
OccurrenceSpecification	
PartDecomposition	
StateInvariant	Invariant

### 7.7.8.2 UML4SysML::Interactions elements not mapped

**Table 12. List of SysML v1 elements not mapped of this section**

SysML v1 Concept	Rationale
ConsiderIgnoreFragment	Mapping is not specified yet.
Continuation	Mapping is not specified yet.
DestructionOccurrenceSpecification	Mapping is not specified yet.
ExecutionOccurrenceSpecification	Mapping is not specified yet.
Gate	Mapping is not specified yet.
GeneralOrdering	Mapping is not specified yet.

SysML v1 Concept	Rationale
InteractionConstraint	Mapping is not specified yet.
MessageOccurrenceSpecification	Mapping is not specified yet.
OccurrenceSpecification	Mapping is not specified yet.
PartDecomposition	Mapping is not specified yet.

### 7.7.8.3 Mapping Specifications

#### 7.7.8.3.1 ActionExecutionSpecification\_Mapping

##### Description

A UML4SysML::ActionExecutionSpecification is mapped to a SysML v2 ActionUsage.

##### General Mappings

GenericToActionUsage\_Mapping  
NamedElementMain\_Mapping

##### Mapping Source

ActionExecutionSpecification

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)

#### 7.7.8.3.2 BehaviorExecutionSpecification\_Mapping

##### Description

A UML4SysML::BehaviorExecutionSpecification is mapped to a SysML v2 ActionUsage.

##### General Mappings

GenericToActionUsage\_Mapping  
NamedElementMain\_Mapping

##### Mapping Source

BehaviorExecutionSpecification

##### Mapping Target

ActionUsage

##### Owned Mappings

(none)



### 7.7.8.3.3 CombinedFragment\_Mapping

#### Description

A UML4SysML::CombinedFragment is mapped to a SysMLv2 Interaction.

#### General Mappings

NamedElementMain\_Mapping  
GenericToInteraction\_Mapping

#### Mapping Source

CombinedFragment

#### Mapping Target

Interaction

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Interaction::ownedRelationship () : Relationship [0..\*]

```
let operands: Set(UML::Element) =
    from.ownedElement->select(e | e.oclIsKindOf(UML::InteractionOperand)) in
let occurrencesSpecs: Set(UML::Element) =
    from.ownedElement->select(e | e.oclIsKindOf(UML::OccurrenceSpecification)) in
let elements: Set(UML::Element) =
    (from.ownedElement - operands) - occurrencesSpecs in
elements->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(operands->collect(e | InteractionOperandMembership_Mapping.getMapped(e)))
```

### 7.7.8.3.4 CombinedFragmentMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

CombinedFragment

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]  
`self.memberFeature()`
- FeatureMembership::memberFeature () : Feature [1]  
`ElementMain_Mapping.getMapped(from)`

### 7.7.8.3.5 ExecutionSpecificationMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

ExecutionSpecification

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]

```
self.memberFeature()
```

- FeatureMembership::memberFeature () : Feature [1]

```
ElementMain_Mapping.getMapped(from)
```

### 7.7.8.3.6 Interaction\_Mapping

#### Description

A UML4SysML::Interaction is mapped to a SysMLv2 Interaction.

#### General Mappings

Namespace\_Mapping

GenericToInteraction\_Mapping

#### Mapping Source

Interaction

#### Mapping Target

Interaction

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Interaction::ownedRelationship () : Relationship [0..\*]

```
let lifelines: Set(UML::Element) = from.lifeline in
let messageOccurrences: Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::MessageOccurrenceSpecification)) in
let executionOccurrences: Set(UML::Element) =
    from.fragment->select(e | e.ocIsKindOf(UML::ExecutionSpecification)) in
let occurrencesSpecs: Set(UML::Element) =
    from.fragment->select(e | e.ocIsKindOf(UML::OccurrenceSpecification)) in
let messages: Set(UML::Element) = from.message in
let invariants: Set(UML::Element) =
    from.fragment->select(e | e.ocIsKindOf(UML::StateInvariant)) in
let interactionUsages: Set(UML::Element) =
```

```

    from.fragment->select(e | e.ocliIsKindOf(UML::InteractionUse)) in
let combinedFragments: Set(UML::Element) =
    from.ownedElement->select(e | e.ocliIsKindOf(UML::CombinedFragment)) in
let continuations: Set(UML::Element) =
    from.ownedElement->select(e | e.ocliIsKindOf(UML::Continuation)) in
let elements: Set(UML::Element) =
    (((((((from.ownedElement - lifelines) - messageOccurrences)
    - executionOccurrences) - occurrencesSpecs) - messages) -
    combinedFragments) - invariants) -
    interactionUsages) - continuations in
elements->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(lifelines->collect(e | LifelineMembership_Mapping.getMapped(e)))
->union(executionOccurrences
    ->collect(e | ExecutionSpecificationMembership_Mapping.getMapped(e)))
->union(messages->collect(e | MessageMembership_Mapping.getMapped(e)))
->union(combinedFragments
    ->collect(e | CombinedFragmentMembership_Mapping.getMapped(e)))
->union(invariants
    ->collect(e | StateInvariantMembership_Mapping.getMapped(e)))
->union(interactionUsages
    ->collect(e | InteractionUseMembership_Mapping.getMapped(e)))

```

### 7.7.8.3.7 InteractionOperand\_Mapping

#### Description

A UML4SysML::InteractionOperand is mapped to a SysML v2 Interaction.

#### General Mappings

NamedElementMain\_Mapping  
GenericToInteraction\_Mapping

#### Mapping Source

InteractionOperand

#### Mapping Target

Interaction

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Interaction::ownedRelationship () : Relationship [0..\*]

```

let executionOccurrences: Set(UML::Element) =
    from.ownedElement->select(e | e.ocliIsKindOf(UML::ExecutionSpecification)) in
let occurrencesSpecs: Set(UML::Element) =
    from.ownedElement->select(e | e.ocliIsKindOf(UML::OccurrenceSpecification)) in
let continuations: Set(UML::Element) =
    from.ownedElement->select(e | e.ocliIsKindOf(UML::Continuation)) in
let elements: Set(UML::Element) =
    ((from.ownedElement - executionOccurrences) - occurrencesSpecs) -
    continuations in
elements->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(executionOccurrences
->collect(e | ExecutionSpecificationMembership_Mapping.getMapped(e)))

```

### 7.7.8.3.8 InteractionOperandMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

InteractionOperand

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]

```

self.memberFeature ()

```
- FeatureMembership::memberFeature () : Feature [1]

```

ElementMain_Mapping.getMapped (from)

```

### 7.7.8.3.9 InteractionUse\_Mapping

#### Description

A UML4SysML::InteractionUse is mapped to a SysML v2 Step.

### General Mappings

GenericToStep\_Mapping  
Namespace\_Mapping

### Mapping Source

InteractionUse

### Mapping Target

Step

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Step::ownedRelationship () : Relationship [0..\*]  
`Set { InteractionUseFeatureTyping_Mapping.getMapped (from) }`

### 7.7.8.3.10 InteractionUseMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

InteractionUse

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [0..1]`

```
self.memberFeature ()
```

- `FeatureMembership::memberFeature () : Feature [1]`

```
ElementMain_Mapping.getMapped (from)
```

### 7.7.8.3.11 InteractionUseFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

InteractionUse

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
ElementMain_Mapping.getMapped (from.refersTo)
```

### 7.7.8.3.12 LifelineMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Lifeline

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]  
`self.memberFeature ()`
- FeatureMembership::memberFeature () : Feature [1]  
`ElementMain_Mapping.getMapped (from)`

## 7.7.8.3.13 LifelinePartUsage\_Mapping

### Description

A UML4SysML::Lifeline is mapped to a SysML v2 PartUsage.

### General Mappings

GenericToPartUsage\_Mapping  
NamedElementMain\_Mapping

### Mapping Source

Lifeline

### Mapping Target

PartUsage

### Owned Mappings

(none)

### Applicable filters



(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `PartUsage::ownedRelationship () : Relationship [0..*]`  
`Set { LifelineFeatureTyping_Mapping.getMapped (from) }`

#### 7.7.8.3.14 LifelineFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

Lifeline

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`  
`ElementMain_Mapping.getMapped (from.represents.type)`

#### 7.7.8.3.15 Message\_Mapping

##### Description

A `UML4SysML::Message` is mapped to a SysML v2 `ItemFlow`.

##### General Mappings

GenericToItemFlow\_Mapping  
NamedElementMain\_Mapping

### Mapping Source

Message

### Mapping Target

ItemFlow

### Owned Mappings

(none)

## 7.7.8.3.16 MessageMembership\_Mapping

### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Message

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]  
`self.memberFeature ()`
- FeatureMembership::memberFeature () : Feature [1]  
`ElementMain_Mapping.getMapped (from)`

## 7.7.8.3.17 StateInvariant\_Mapping

### Description

A UML4SysML::StateInvariant is mapped to a SysML v2 Invariant.

## General Mappings

GenericToExpression\_Mapping  
Namespace\_Mapping

## Mapping Source

StateInvariant

## Mapping Target

Invariant

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Invariant::ownedRelationship () : Relationship [0..\*]  
`Set { StateInvariantFeatureTyping_Mapping.getMapped (from) }`

### 7.7.8.3.18 StateInvariantMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

StateInvariant

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::memberFeature () : Feature [1]  
`ElementMain_Mapping.getMapped(from)`
- FeatureMembership::ownedMemberFeature () : Feature [0..1]  
`self.memberFeature()`

### 7.7.8.3.19 StateInvariantFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

StateInvariant

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  
`ElementMain_Mapping.getMapped(from.invariant)`

## 7.7.9 Packages

### 7.7.9.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::Packages elements are transformed with which mapping class. The mapping details are in [7.7.9.3](#).

The justifications for the elements without mapping are given in [7.7.9.2](#).

**Table 13. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Extension	
ExtensionEnd	
Image	
Model	Package
Package	Package Package Package
PackageMerge	
Profile	Package
ProfileApplication	
Stereotype	MetadataDefinition

### 7.7.9.2 UML4SysML::Packages elements not mapped

**Table 14. List of SysML v1 elements not mapped of this section**

SysML v1 Concept	Rationale
Extension	The mapping of the extension relationship is performed in the context of Stereotype_Mapping.
ExtensionEnd	The mapping of the extension end property is performed in the context of Stereotype_Mapping.
Image	Mapping is not specified yet.
PackageMerge	The concept of the PackageMerge relationship is not supported by SysML v2.

### 7.7.9.3 Mapping Specifications

#### 7.7.9.3.1 ElementImport\_Mapping

##### Description

A UML4SysML::ElementImport is mapped to a SysMLv2 MembershipImport. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

package SysMLv1Package1 {
    import SysMLv1Package2::SysMLv1Block;
    import SysMLv1Package2::SysMLv1ValueType;
}
package SysMLv1Package2 {
    part def SysMLv1Block;
    attribute def SysMLv1ValueType;
}

```

##### General Mappings

GenericToMembershipImport\_Mapping  
NamedElementMain\_Mapping

### Mapping Source

ElementImport

### Mapping Target

MembershipImport

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
if src.oclIsKindOf(UML::ElementImport) then
    Helper.hasMainMapping(src.oclAsType(UML::ElementImport).importedElement)
else
    false
endif
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MembershipImport::importedMemberName () : String [0..1]  
`from.alias`
- MembershipImport::importedMembership () : Namespace [1]  
`ElementOwningMembership_Mapping.getMapped(from.importedElement)`
- MembershipImport::visibility () : VisibilityKind [1]  
`Helper.getKerMLVisibilityKind(from.visibility)`

### 7.7.9.3.2 Model\_Mapping

#### Description

SysMLv2 has no explicit model element for a model. The UML4SysML::Model element is mapped to a SysMLv2 Package. The property "viewpoint" is mapped to a metadata defined in the SysML v1 library. The expected SysML v2 textual notation of a UML4SysML::Model with URI and viewpoint is as follows. If URI or viewpoint are not set in the source model, the metadata is not generated.

```
package SysMLv1Model {
    @SysMLv1Library::PackageData {URI="https://omg.org";}
    @SysMLv1Library::ModelData {'viewpoint'="The viewpoint of the model element.";}
}
```

## General Mappings

Package\_Mapping

## Mapping Source

Model

## Mapping Target

Package

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Package::ownedRelationship () : Relationship [0..\*]

```
let relationships : Set(KerML::Relationship) =
  Helper.packageOwnedRelationship(from) in
if from.viewpoint.ocllsUndefined() or from.viewpoint = '' then
  relationships
else
  relationships
  ->including (ModelViewpointMetadataMembership_Mapping.getMapped(from))
endif
```

### 7.7.9.3.3 ModelViewpointMetadataUsage\_Mapping

### 7.7.9.3.4 ModelViewpointMetadataFeatureMembership\_Mapping

#### Description

The mapping class creates the feature membership relationship for the metadata feature to store the UML4SysML::Model::viewpoint property.

## General Mappings

GenericToFeatureMembership\_Mapping

## Mapping Source

Model

## Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [0..1]`  
`ModelViewpointMetadataReferenceUsage_Mapping.getMapped(from)`

### 7.7.9.3.5 ModelViewpointMetadataReferenceUsage\_Mapping

#### Description

The mapping class creates the MetadataFeature for the mapping of the property `UML4SysML::Model::viewpoint`.

#### General Mappings

`GenericToReferenceUsage_Mapping`

#### Mapping Source

`Model`

#### Mapping Target

`ReferenceUsage`

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::ownedRelationship () : Relationship [0..*]`  
`Set {ModelViewpointMetadataRedefinition_Mapping.getMapped(from) ,`  
`ModelViewpointMetadataFeatureValue_Mapping.getMapped(from) }`

### 7.7.9.3.6 ModelViewpointMetadataFeatureTyping\_Mapping

#### Description



The mapping class creates the FeatureTyping relationship for the AnnotatingFeature for the metadata to store the UML4SysML::Model::viewpoint property.

### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

Model

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SysMLv2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::ModelData')
```

### 7.7.9.3.7 ModelViewpointMetadataMembership\_Mapping

#### Description

The mapping class creates a membership relationship for the metadata feature value for the UML4SysML::Model::viewpoint property.

### General Mappings

GenericToOwningMembership\_Mapping

### Mapping Source

Model

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  
`ModelViewpointMetadataUsage_Mapping.getMapped(from)`

### 7.7.9.3.8 ModelViewpointMetadataFeatureValue\_Mapping

#### Description

The mapping class maps the value of the property `UML4SysML::Model::viewpoint`.

#### General Mappings

`GenericToFeatureValue_Mapping`

#### Mapping Source

`Model`

#### Mapping Target

`FeatureValue`

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureValue::value () : Expression [1]`  
`ModelViewpointValue_Mapping.getMapped(from)`

### 7.7.9.3.9 ModelViewpointMetadataRedefinition\_Mapping

#### Description

The mapping class creates the redefinition of the attribute for the metadata `UML4SysML::Model::viewpoint`.

#### General Mappings

GenericToRedefinition\_Mapping

### Mapping Source

Model

### Mapping Target

Redefinition

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]

```
let m : SYSML2::Membership =
  SYSML2::AttributeUsage.allInstances()
  ->collect(dt | dt.owningRelationship)
  ->select(r | r.ocIsKindOf(SYSML2::Membership))
  ->any(m | m.memberName = 'viewpoint') in
if (m.ocIsUndefined()) then
  OclUndefined
else
  m.memberElement
endif
```

#### 7.7.9.3.10 ModelViewpointValue\_Mapping

### Description

The mapping class maps the value expression of the property UML4SysML::Model::viewpoint.

### General Mappings

GenericToExpression\_Mapping

### Mapping Source

Model

### Mapping Target

LiteralString

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `LiteralString::value () : String [1]`

```
LiteralString_Factory.create(from.viewpoint)
```

### 7.7.9.3.11 Package\_Mapping

#### Description

A `UML4SysML::Package` is mapped to a SysML v2 Package. The property "URI" is mapped to a metadata if it has a value. The expected SysML v2 textual notation of a `UML4SysML::Package` is as follows:

```
package ThisIsAPackageWithURI {  
  metadata SysMLv1Library::PackageData {URI="https://omg.org";} }  
}
```

#### General Mappings

Namespace\_Mapping

#### Mapping Source

Package

#### Mapping Target

Package

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Package::ownedRelationship () : Relationship [0..*]`

```
Helper.packageOwnedRelationship(from)
```

### 7.7.9.3.12 PackageImport\_Mapping

#### Description

A UML4SysML::PackageImport is mapped to a SysML v2 NamespaceImport. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
import SysMLv1Package::*;
```

#### General Mappings

GenericToNamespaceImport\_Mapping  
ElementMain\_Mapping

#### Mapping Source

PackageImport

#### Mapping Target

NamespaceImport

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
if src.oclIsKindOf(UML::PackageImport) then
    Helper.isInScope(src.oclAsType(UML::PackageImport).importedPackage)
else
    false
endif
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- NamespaceImport::visibility () : VisibilityKind [0..1]  
`Helper.getKerMLVisibilityKind(from.visibility)`
- NamespaceImport::importedNamespace () : Namespace [1]  
`Namespace_Mapping.getMapped(from.importedPackage)`

### 7.7.9.3.13 PackageURIMetadataUsage\_Mapping

#### Description

The mapping class creates the annotating feature to annotate the generated Package element with metadata to store the UML4SysML::Package::URI property.

## General Mappings

GenericToMetadataUsage\_Mapping

## Mapping Source

Package

## Mapping Target

MetadataUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]  

```
Set { PackageURIFeatureTyping_Mapping.getMapped (from) ,  
PackageURIFeatureMembership_Mapping.getMapped (from) }
```
- MetadataUsage::declaredName () : String [0..1]  

```
'URI '
```

### 7.7.9.3.14 PackageURIFeatureMembership\_Mapping

#### Description

The mapping class creates the feature membership relationship for the metadata feature to store the UML4SysML::Package::URI property.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Package

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`PackageURIMetadataReferenceUsage_Mapping.getMapped (from)`

### 7.7.9.3.15 PackageURIFeatureTyping\_Mapping

#### Description

The mapping class creates the FeatureTyping relationship for the AnnotatingFeature for the metadata to store the UML4SysML::Package::URI property.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Package

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  

```
let m: SysMLv2::Membership = SysMLv2::AttributeDefinition.allInstances()
->collect(dt | dt.owningRelationship)
->select(r | r.oclIsKindOf(SysMLv2::Membership))
->any(m | m.memberName = 'PackageData' ) in

if (m.oclIsUndefined()) then
    invalid
else
    m.memberElement
endif
```

### 7.7.9.3.16 PackageURIMetadataReferenceUsage\_Mapping

#### Description

The mapping class creates the MetadataFeature for the mapping of the property UML4SysML::Package::URI.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Package

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set { PackageURIRedefinition_Mapping.getMapped (from) ,  
      PackageURIMetadataFeatureValue_Mapping.getMapped (from) }
```

### 7.7.9.3.17 PackageURIMetadataFeatureValue\_Mapping

#### Description

The mapping class maps the value of the property UML4SysML::Package::URI.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Package

#### Mapping Target

FeatureValue

#### Owned Mappings



(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::featureWithValue () : Feature [1]  
`packageURIMetadataReferenceUsage.to`
- FeatureValue::value () : Expression [1]  
`PackageURIValue_Mapping.getMapped (from)`

### 7.7.9.3.18 PackageURIMetadataMembership\_Mapping

#### Description

The mapping class creates a membership relationship for the metadata feature value for the UML4SysML::Package::URI property.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Package

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`PackageURIMetadataUsage_Mapping.getMapped (from)`

### 7.7.9.3.19 PackageURIRedefinition\_Mapping

#### Description

The mapping class creates the redefinition of the attribute for the metadata UML4SysML::Package::URI.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Package

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]

```
let m : SysMLv2::Membership =
  SysMLv2::AttributeUsage.allInstances()
  ->collect(dt | dt.owningRelationship)
  ->select(r | r.oclIsKindOf(SYSML2::Membership))
  ->any(m | m.memberName = 'URI') in
if (m.oclIsUndefined()) then
  invalid
else
  m.memberElement
endif
```

### 7.7.9.3.20 PackageURIValue\_Mapping

#### Description

The mapping class maps the value expression of the property UML4SysML::Package::URI.

#### General Mappings

GenericToExpression\_Mapping

#### Mapping Source

Package

### Mapping Target

LiteralString

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralString::value () : String [1]

```
from.URI
```

### 7.7.9.3.21 Profile\_Mapping

#### Description

A UML4SysML::Profile is mapped to a SysML v2 Package.

#### General Mappings

Package\_Mapping

#### Mapping Source

Profile

#### Mapping Target

Package

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Package::ownedRelationship () : Relationship [0..\*]

```
Helper.packageOwnedRelationship (from)  
->including (ProfileMetadataMembership_Mapping.getMapped (from))
```

### 7.7.9.3.22 ProfileMetadataMembership\_Mapping

#### Description

The mapping class creates a membership relationship for the metadata feature value for the UML4SysML::Model::viewpoint property.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Profile

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

```
ProfileMetadataUsage_Mapping.getMapped(from)
```

### 7.7.9.3.23 ProfileMetadataUsage\_Mapping

#### Description

The mapping class creates the annotating feature to annotate the generated Package element with metadata to store the UML4SysML::Model::viewpoint property.

#### General Mappings

GenericToMetadataUsage\_Mapping

#### Mapping Source

Profile

#### Mapping Target

MetadataUsage

#### Owned Mappings

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::declaredName () : String [0..1]  
    'Profile'

### **7.7.9.3.24 StereotypeMetadataDefinition\_Mapping**

#### **Description**

A UML4SysML::Stereotype is mapped to a SysML v2 MetadataDefinition.

#### **General Mappings**

Class\_Mapping

#### **Mapping Source**

Stereotype

#### **Mapping Target**

MetadataDefinition

#### **Owned Mappings**

(none)

### **7.7.9.3.25 StereotypeMetadataDefinitionMembership\_Mapping**

#### **Description**

Creates a membership relationship for *memberElement()*.

#### **General Mappings**

ElementOwningMembership\_Mapping

#### **Mapping Source**

Stereotype

#### **Mapping Target**

OwningMembership

#### **Owned Mappings**

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [0..1]`

```
ElementMain_Mapping.getMapped(from)
```

### 7.7.9.3.26 StereotypeOccurrenceUsage\_Mapping

#### Description

The mapping class maps the usage of a stereotype to a SysML v2 OccurrenceUsage.

#### General Mappings

GenericToOccurrenceUsage\_Mapping

#### Mapping Source

Stereotype

#### Mapping Target

OccurrenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OccurrenceUsage::ownedRelationship () : Relationship [0..*]`

```
Set { StereotypeOccurrenceUsageFeatureTyping_Mapping.getMapped(from),  
StereotypeOccurrenceUsageMultiplicityMembership_Mapping.getMapped(from) }
```

### 7.7.9.3.27 StereotypeOccurrenceUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

## General Mappings

GenericToFeatureTyping\_Mapping

## Mapping Source

Stereotype

## Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  
`StereotypeOccurrenceDefinition_Mapping.getMapped(from)`

### 7.7.9.3.28 StereotypeOccurrenceUsageMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

Stereotype

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  
`StereotypeOccurenceUsage_Mapping.getMapped(from)`

### 7.7.9.3.29 StereotypeOccurenceUsageMultiplicityMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

Stereotype

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]  
`self.ownedMemberElement ()`
- Membership::ownedMemberElement () : Element [0..1]  
`StereotypeOccurenceUsageMultiplicityRange_Mapping.getMapped(from)`

### 7.7.9.3.30 StereotypeOccurenceUsageMultiplicityRange\_Mapping

#### Description

The mapping class creates the multiplicity range element for the UML4SysML::Stereotype mapping.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source



Stereotype

### Mapping Target

MultiplicityRange

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MultiplicityRange::ownedRelationship () : Relationship [0..\*]

```
Set { StereotypeOccurrenceUsageMultiplicityRangeMembership_Mapping.getMapped (from) }
```

### 7.7.9.3.31 StereotypeOccurrenceUsageMultiplicityRangeInfinity\_Mapping

#### Description

The mapping class creates the literal infinity element for the multiplicity range element for the UML4SysML::Stereotype mapping.

#### General Mappings

GenericToExpression\_Mapping

#### Mapping Source

Stereotype

#### Mapping Target

LiteralInfinity

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralInfinity::ownedRelationship () : Relationship [0..\*]

```
Set{StereotypeOccurenceUsageInfinityReturnParameterMembership_Mapping.getMapped(from)}
```

### 7.7.9.3.32 StereotypeOccurenceUsagelInfinityReturnParameter\_Mapping

#### Description

The mapping class creates the return parameter relationship for the literal infinity element for the multiplicity range element for the UML4SysML::Stereotype mapping.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

Stereotype

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::direction () : FeatureDirectionKind [0..1]

```
SysMLv2::FeatureDirectionKind::out
```

### 7.7.9.3.33 StereotypeOccurenceUsagelInfinityReturnParameterMembership\_Mapping

#### Description

#### General Mappings

GenericToReturnParameterMembership\_Mapping

#### Mapping Source

Stereotype

#### Mapping Target

ReturnParameterMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReturnParameterMembership::ownedMemberParameter () : Feature [0..1]  

```
StereotypeOccurrenceUsageInfinityReturnParameter_Mapping.getMapped(from)
```
- ReturnParameterMembership::memberParameter () : Feature [1]  

```
self.ownedMemberParameter()
```
- ReturnParameterMembership::ownedRelatedElement () : Element [0..\*]  

```
let member: KerML::Element = self.ownedMemberParameter() in
if member.ocIsUndefined() then
  Set{}
else
  Set{self.ownedMemberParameter()}
endif
```

### 7.7.9.3.34 StereotypeOccurrenceUsageMultiplicityRangeMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToMembership\_Mapping

#### Mapping Source

Stereotype

#### Mapping Target

Membership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::ownedMemberElement () : Element [0..1]  
`StereotypeOccurrenceUsageMultiplicityRangeInfinity_Mapping.getMapped(from)`
- Membership::memberElement () : Element [1]  
`self.ownedMemberElement ()`

## 7.7.10 SimpleClassifiers

### 7.7.10.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::SimpleClassifiers elements are transformed with which mapping class. The mapping details are in [7.7.10.2](#).

**Table 15. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Data Type	EnumerationDefinition AttributeDefinition AttributeDefinition
Enumeration	EnumerationDefinition
EnumerationLiteral	EnumerationUsage
Interface	PortDefinition
InterfaceRealization	
PrimitiveType	AttributeDefinition
Reception	ItemUsage
Signal	ItemDefinition

### 7.7.10.2 Mapping Specifications

#### 7.7.10.2.1 Attribute\_Mapping

##### Description

An UML4SysML::Property is mapped to a SysMLv2 AttributeUsage.

##### General Mappings

PropertyCommon\_Mapping  
NamedElementMain\_Mapping

##### Mapping Source

Property

##### Mapping Target

AttributeUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
if src.oclIsKindOf(UML::Property) and not
    Helper.hasStereotypeApplied(src.owner,
        'SysML::ConstraintBlocks::ConstraintBlock') then
    let p: UML::Property = src.oclAsType(UML::Property) in
    if p.type.oclIsUndefined() then
        false
    else
        p.type.oclIsKindOf(UML::DataType) and
        (p.association.oclIsUndefined() or p.association.ownedEnd->excludes(p))
    endif
else
    false
endif
```

## Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.7.10.2.2 AttributeRedefined\_Mapping

#### Description

An UML4SysML::SimpleClassifiers::Property is mapped to a SysML v2 AttributeUsage.

#### General Mappings

PropertyCommon\_Mapping

#### Mapping Source

Property

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
let typing: KerML::FeatureTyping =
  AssociationToFeatureTyping_Mapping.getMapped(from) in
let subsetting: Set(KerML::Subsetting) =
  from.subsettedProperty
  ->collect(p | PropertySubsetting_Mapping.getMapped(from, p))->asSet() in
let subsettingMultiplicityTyping: Set(KerML::Relationship) =
  subsetting
  ->union(Set{AttributeRedefinedRedefinition_Mapping.getMapped(from)})->union(
    if typing.oclIsUndefined() then
      Set{MultiplicityMembership_Mapping.getMapped(from)}
    else
      Set{MultiplicityMembership_Mapping.getMapped(from), typing}
    endif)->asSet() in
if from.defaultValue.oclIsUndefined() then
  subsettingMultiplicityTyping
else
  subsettingMultiplicityTyping
  ->including(PropertyDefaultValue_Mapping.getMapped(from))
endif
```

### 7.7.10.2.3 AttributeRedefinedRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Property

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
from.redefinedProperty.get(0)
```

#### 7.7.10.2.4 AttributeRedefinedMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

ElementFeatureMembership\_Mapping

##### Mapping Source

Element

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.ocIsKindOf(UML::Property)
and (src.ocAsType(UML::Property).redefinedElement->size() > 0)
```

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [0..1]`

```
AttributeRedefined_Mapping.getMapped(from)
```

#### 7.7.10.2.5 AttributeRedefinedFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

StructuralFeatureToFeatureTyping\_Mapping

##### Mapping Source

StructuralFeature

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

## 7.7.10.2.6 BehavioredClassifier\_Mapping

### Description

The abstract mapping class maps the abstract metaclass UML4SysML::BehavioredClassifiers to a SysMLv2 Classifier. The mapping class is used by concrete mapping classes, for example, Block\_Mapping.

### General Mappings

Classifier\_Mapping

### Mapping Source

BehavioredClassifier

### Mapping Target

Classifier

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Classifier::ownedRelationship () : Relationship [0..\*]

```
let toElementFMS: Set(UML::Element) =
    from.ownedElement->select(e | (e.ocIsKindOf(UML::Property) and
        (e.ocAsType(UML::Property).redefinedProperty->size() = 0)) or
        e.ocIsKindOf(UML::Operation)) in
let redefinedAttributes: Set(UML::Element) =
    from.ownedElement->select(e | from.ocIsKindOf(UML::DataType) and
        (e.ocAsType(UML::Property).redefinedProperty->size() > 0)) in
let generalizations : Set(UML::Generalization) =
    from.ownedElement
    ->select(e | e.ocIsKindOf(UML::Generalization)) in
let constraints : Set(UML::Constraint) =
    UML::Constraint.allInstances()
```



```

->select( c | c.constrainedElement->includes(from)) in
let toElementOMS: Set(UML::Element) =
  (((from.ownedElement - toElementFMS) - redefinedAttributes) -
  generalizations) in
let relationships: Sequence(KerML::Relationship) =
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e |
  ElementFeatureMembership_Mapping.getMapped(e)))
->union(constraints->collect(e |
  ConstrainedElementFeatureMembership_Mapping.getMapped(e)))
->union(redefinedAttributes->collect(e |
  AttributeRedefinedMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e |
  Generalization_Mapping.getMapped(e))) in
if from.classifierBehavior.ocIsUndefined() then
  relationships
else
  relationships
  ->append(BehavioredClassifierFeatureMembership_Mapping.getMapped(from))
endif

```

### 7.7.10.2.7 BehavioredClassifierFeatureMembership\_Mapping

#### Description

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

BehavioredClassifier

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]
 

```
BehavioredClassifierActionUsage_Mapping.getMapped(from)
```

### 7.7.10.2.8 BehavoredClassifierFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

BehavoredClassifier

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

from

### 7.7.10.2.9 BehavoredClassifierActionUsage\_Mapping

#### Description

The BehavoredClassifierToPerformActionUsage\_Mapping class creates a PerformActionUsage element to call the transformed SysML v1 classifier behavior.

#### General Mappings

GenericToActionUsage\_Mapping

#### Mapping Source

BehavoredClassifier

#### Mapping Target

ActionUsage

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActionUsage::ownedRelationship () : Relationship [0..\*]  
`Set{BehavioredClassifierFeatureTyping_Mapping.getMapped(from)}`
- ActionUsage::declaredName () : String [0..1]  
`'classifierBehavior'`

#### 7.7.10.2.10 DataType\_Mapping

##### Description

A UML4SysML::SimpleClassifiers::DataType is mapped to a SysML v2 AttributeDefinition. The mapping also cover the transformation of UML4SysML::PrimitiveType elements.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block {  
    attribute sysMLv1Property : ScalarValues::Integer;  
}
```

##### General Mappings

Classifier\_Mapping

##### Mapping Source

DataType

##### Mapping Target

AttributeDefinition

##### Owned Mappings

(none)

#### 7.7.10.2.11 Enumeration\_Mapping

##### Description

A UML4SysML::Enumeration is mapped to a SysML v2 EnumerationDefinition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
enum def SysMLv1Enumeration {
    enum sysMLv1Literal1;
    enum sysMLv1Literal2;
}
```

## General Mappings

DataType\_Mapping

## Mapping Source

Enumeration

## Mapping Target

EnumerationDefinition

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- EnumerationDefinition::isVariation () : Boolean [1]

```
    true
```

- EnumerationDefinition::ownedRelationship () : Relationship [0..\*]

```
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Generalization)) in
let toElementFMS: Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Property)) in
let literals: Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::EnumerationLiteral)) in
let toElementOMS: Set(UML::Element) =
    (((from.ownedElement - toElementFMS) - generalizations) - literals) in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
->union(literals->collect(e | EnumerationVariantMembership_Mapping.getMapped(e)))
```

### 7.7.10.2.12 EnumerationLiteral\_Mapping

#### Description

A UML4SysML::EnumerationLiteral is mapped to a SysML v2 EnumerationUsage.

### **General Mappings**

GenericToFeature\_Mapping  
InstanceSpecification\_Mapping

### **Mapping Source**

EnumerationLiteral

### **Mapping Target**

EnumerationUsage

### **Owned Mappings**

(none)

## **7.7.10.2.13 EnumerationVariantMembership\_Mapping**

### **Description**

The EnumerationVariantMembership\_Mapping class creates the variant membership relationship between the enumeration definition and a enumeration usage.

### **General Mappings**

GenericToOwningMembership\_Mapping

### **Mapping Source**

EnumerationLiteral

### **Mapping Target**

VariantMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- VariantMembership::ownedMemberElement () : Element [1]  
from

### 7.7.10.2.14 Interface\_Mapping

#### Description

A UML4SysML::Interface is mapped to a SysMLv2 PortDefinition. The mapping also includes the generation of an appropriate ConjugatedPortDefinition. That mappings is performed by the mapping classes InterfaceConjugatedPortDefinitionMembership\_Mapping, InterfacePortConjugation\_Mapping, and InterfaceConjugatedPortDefinition\_Mapping.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
port def SysMLv1Interface {
    attribute sysMLv1Property;
}
```

#### General Mappings

GenericToPortDefinition\_Mapping  
Classifier\_Mapping

#### Mapping Source

Interface

#### Mapping Target

PortDefinition

#### Owned Mappings

- conjugatedPortDefinitionMembership : InterfaceConjugatedPortDefinitionMembership\_Mapping

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PortDefinition::ownedRelationship () : Relationship [0..\*]

```
let properties: Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Property)) in
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Generalization)) in
let elements: Set(UML::Element) =
    (from.ownedElement - generalizations in
elements->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(properties->collect(e | PropertyMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
->append(conjugatedPortDefinitionMembership)
```

### 7.7.10.2.15 InterfaceConjugatedPortDefinition\_Mapping

#### Description

As part of the mapping from a UML4SysML::Interface to a SysMLv2 PortDefinition, this mapping class is used to create the appropriate ConjugatedPortDefinition.

#### General Mappings

GenericToPortDefinition\_Mapping

#### Mapping Source

Interface

#### Mapping Target

ConjugatedPortDefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConjugatedPortDefinition::declaredName () : String [0..1]  
`'~'+from.name`
- ConjugatedPortDefinition::ownedRelationship () : Relationship [0..\*]  
`Set { InterfacePortConjugation_Mapping.getMapped (from) }`

### 7.7.10.2.16 InterfaceConjugatedPortDefinitionMembership\_Mapping

#### Description

As part of the mapping from a UML4SysML::Interface to a SysML v2 PortDefinition, this mapping class is used to create the membership relationship for the ConjugatedPortDefinition.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Interface

#### Mapping Target

OwningMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

`InterfaceConjugatedPortDefinition_Mapping.getMapped(from)`

## **7.7.10.2.17 InterfacePortConjugation\_Mapping**

### **Description**

As part of the mapping from a UML4SysML::Interface to a SysML v2 PortDefinition, this mapping class is used to create the appropriate PortConjugation relationship.

### **General Mappings**

GenericToRelationship\_Mapping

### **Mapping Source**

Interface

### **Mapping Target**

PortConjugation

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PortConjugation::originalPortDefinition () : PortDefinition [1]

`from`

- PortConjugation::conjugatedType () : Type [1]



```

SysMLv2::ConjugatedPortDefinition.allInstances()
->collect(cpd | cpd.owningRelationship)
->select(r | r.oclIsKindOf(SysMLv2::Membership))
->any(m | m.memberName = from.name)

```

### 7.7.10.2.18 InterfaceRealization\_Mapping

#### Description

A UML4SysML::InterfaceRealization is mapped to a SysMLv2 Subclassification relationship.

#### General Mappings

GenericToSpecialization\_Mapping

#### Mapping Source

InterfaceRealization

#### Mapping Target

Subclassification

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subclassification::subclassifier () : Type [1]  
Classifier\_Mapping.getMapped(from.specific)
- Subclassification::superclassifier () : Type [1]  
Classifier\_Mapping.getMapped(from.general)

### 7.7.10.2.19 PrimitiveType\_Mapping

#### Description

The PrimitiveType\_Mapping class maps a UML4SysML::PrimitiveType to a SysML v2 AttributeDefinition.

#### General Mappings

DataType\_Mapping

#### Mapping Source

PrimitiveType

## Mapping Target

AttributeDefinition

## Owned Mappings

(none)

### 7.7.10.2.20 Reception\_Mapping

#### Description

A UML4SysML::Reception is mapped to a SysML v2 AttributeUsage with feature direction "in".

#### General Mappings

BehavioralFeature\_Mapping

#### Mapping Source

Reception

#### Mapping Target

ItemUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ItemUsage::ownedRelationship () : Relationship [0..\*]  
`Set {ReceptionFeatureTyping_Mapping.getMapped (from) }`
- ItemUsage::direction () : FeatureDirectionKind [0..1]  
`SysMLv2::FeatureDirectionKind::in`

### 7.7.10.2.21 ReceptionFeatureTyping\_Mapping

#### Description

A UML4SysML::Reception is mapped to SysML v2 AttributeUsage. The ReceptionToFeatureTyping\_Mapping class creates the type of the AttributeUsage which is the Signal of the Reception.

#### General Mappings

TypedElementFeatureTyping\_Mapping

### Mapping Source

Reception

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  
`Classifier_Mapping.getMapped(from.signal)`

## 7.7.10.2.22 Signal\_Mapping

### Description

A UML4SysML::Signal is mapped to a SysML v2 AttributeDefinition.

### General Mappings

Classifier\_Mapping

### Mapping Source

Signal

### Mapping Target

ItemDefinition

### Owned Mappings

(none)

## 7.7.11 StateMachines

### 7.7.11.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::StateMachines elements are transformed with which mapping class. The mapping details are in [7.7.11.2](#).

The justifications for the elements without mapping are given in view link does not exist .

**Table 16. List of all mappings**

<b>SysML v1 Concept</b>	<b>SysML v2 Concept</b>
ConnectionPointReference	StateUsage
FinalState	StateUsage
Pseudostate	StateUsage
Region	StateUsage
State	StateUsage StateUsage
StateMachine	StateDefinition
Transition	TransitionUsage

### 7.7.11.2 Mapping Specifications

#### 7.7.11.2.1 ConnectionPointReference\_Mapping

##### Description

A UML4SysML::ConnectionPointReference element is mapped to a SysML v2 StateUsage.

##### General Mappings

Namespace\_Mapping  
GenericToStateUsage\_Mapping

##### Mapping Source

ConnectionPointReference

##### Mapping Target

StateUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- StateUsage::isComposite () : Boolean [1]

false

- StateUsage::ownedRelationship () : Relationship [0..\*]

```
let toFeatureMS : Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Region)) in
let toElementOMS : Set(UML::Element) =
  from.ownedElement - toFeatureMS in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toFeatureMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
```

### 7.7.11.2.2 FinalState\_Mapping

#### Description

A UML4SysML::FinalState is mapped to a SysML v2 StateUsage. The details of the mapping are not defined yet.

#### General Mappings

State\_Mapping

#### Mapping Source

FinalState

#### Mapping Target

StateUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.ocIsTypeOf(UML::FinalState)
```

#### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.7.11.2.3 PseudoState\_Mapping

#### Description

A UML4SysML::PseudoState is mapped to a SysML v2 StateUsage.

#### General Mappings

Namespace\_Mapping

GenericToStateUsage\_Mapping

#### Mapping Source

Pseudostate

#### Mapping Target

StateUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- StateUsage::ownedRelationship () : Relationship [0..\*]

```
let toFeatureMS : Set(UML::Element) =
    from.ownedElement->select(e | e.oclIsKindOf(UML::Region)) in
let toElementOMS : Set(UML::Element) =
    from.ownedElement - toFeatureMS in
toElementOMS
->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toFeatureMS
->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
```

#### 7.7.11.2.4 Region\_Mapping

##### Description

A UML4SysML::Region is mapped to SysML v2 StateUsage.

##### General Mappings

Namespace\_Mapping

GenericToStateUsage\_Mapping

##### Mapping Source

Region

##### Mapping Target

StateUsage

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- StateUsage::ownedRelationship () : Relationship [0..\*]

```
let toFeatureMS : Set(UML::Element) =
    from.ownedElement
    ->select(e | e.ocIsKindOf(UML::State) or e.ocIsKindOf(UML::Transition)) in
let toElementOMS : Set(UML::Element) =
    from.ownedElement - toFeatureMS in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toFeatureMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
```

### 7.7.11.2.5 State\_Mapping

#### Description

A UML4SysML::State is mapped to a SysML v2 StateUsage.

#### General Mappings

Namespace\_Mapping

GenericToStateUsage\_Mapping

#### Mapping Source

State

#### Mapping Target

StateUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- StateUsage::ownedRelationship () : Relationship [0..\*]

```
let toFeatureMS : Set(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Region)) in
let toElementOMS : Set(UML::Element) =
    from.ownedElement - toFeatureMS in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toFeatureMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
```

### 7.7.11.2.6 StateDefinition\_Mapping

#### Description

A UML4SysML::StateMachine is mapped to a SysML v2 StateDefinition.

#### General Mappings

Behavior\_Mapping

#### Mapping Source

StateMachine

#### Mapping Target

StateDefinition

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.owner.ocIsKindOf(UML::Package)
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- StateDefinition::isParallel () : Boolean [1]

```
from.region->size() > 1
```

- StateDefinition::ownedRelationship () : Relationship [0..\*]

```
let initialState : Set(UML::Element) =
  from.ownedElement
  ->select(e | e.ocIsKindOf(UML::Pseudostate) and
  e.ocIsType(UML::Pseudostate).kind = UML::PseudostateKind::initial) in
let toParameterMS : Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Parameter)) in
let parameterSets: Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::ParameterSet)) in
let toFeatureMS : Set(UML::Element) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Region)) in
let toElementOMS : Set(UML::Element) =
  ((from.ownedElement - toFeatureMS) - toParameterMS) - initialState in
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toFeatureMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
->union(toParameterMS->collect(e | ParameterMembership_Mapping.getMapped(e)))
->union(parameterSets->collect(e | ParameterSetMembership_Mapping.getMapped(e)))
->union(initialState->collect(e | InitialStateMembership_Mapping.getMapped(e)))
```



### 7.7.11.2.7 Transition\_Mapping

#### Description

A UML4SysML::Transition is mapped to a SysML v2 TransitionUsage.

#### General Mappings

Namespace\_Mapping

#### Mapping Source

Transition

#### Mapping Target

TransitionUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TransitionUsage::ownedRelationship () : Relationship [0..\*]  

```
from.ownedElement->collect(e | ElementOwningMembership_Mapping.getMapped(e))  
->including(TransitionSuccession_Mapping.getMapped(from))
```
- TransitionUsage::target () : ActionUsage [1]  

```
from.target
```
- TransitionUsage::source () : ActionUsage [1]  

```
from.source
```

### 7.7.11.2.8 TransitionSuccession\_Mapping

#### Description

The mapping class creates the source Feature element of the Succession that is part of the TransitionUsage that is the target element of the UML4SysML::Transition mapping.

#### General Mappings

GenericToConnector\_Mapping

GenericToMembership\_Mapping

#### Mapping Source

Transition

### Mapping Target

Succession

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Succession::ownedRelationship () : Relationship [0..\*]

```
OrderedSet{TransitionSuccessionSourceMembership_Mapping.getMapped(from) ,  
TransitionSuccessionTargetMembership_Mapping.getMapped(from) }
```

#### 7.7.11.2.9 TransitionSourceToSubsetting\_Mapping

### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

### General Mappings

GenericToSubsetting\_Mapping

### Mapping Source

Transition

### Mapping Target

Subsetting

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettedFeature () : Feature [1]

```
ElementMain_Mapping.getMapped(from.source)
```

- Subsetting::subsettingFeature () : Feature [1]

```
TransitionSuccessionSource_Mapping.getMapped(from)
```

#### 7.7.11.2.10 TransitionSuccessionSource\_Mapping

##### Description

The mapping class creates the Succession element that is part of the TransitionUsage that is the target element of the UML4SysML::Transition mapping.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

Transition

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::declaredName () : String [0..1]

```
'source'
```

- Feature::isEnd () : Boolean [1]

```
true
```

- Feature::ownedRelationship () : Relationship [0..\*]

```
Set { TransitionSourceToSubsetting_Mapping.getMapped(from) }
```

#### 7.7.11.2.11 TransitionSuccessionSourceMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToEndFeatureMembership\_Mapping

### **Mapping Source**

Transition

### **Mapping Target**

FeatureMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`TransitionSuccessionSource_Mapping.getMapped(from)`

## **7.7.11.2.12 TransitionSuccessionTarget\_Mapping**

### **Description**

The mapping class creates the target Feature element of the Succession that is part of the TransitionUsage that is the target element of the UML4SysML::Transition mapping.

### **General Mappings**

GenericToFeature\_Mapping

### **Mapping Source**

Transition

### **Mapping Target**

Feature

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  
`Set {TransitionTargetToSubsetting_Mapping.getMapped (from) }`
- Feature::declaredName () : String [0..1]  
`'target'`
- Feature::isEnd () : Boolean [1]  
`true`

#### 7.7.11.2.13 TransitionSuccessionTargetMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToEndFeatureMembership\_Mapping

##### Mapping Source

Transition

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`TransitionSuccessionTarget_Mapping.getMapped (from)`

#### 7.7.11.2.14 TransitionTargetToSubsetting\_Mapping

##### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettingFeature()*.

##### General Mappings

GenericToSubsetting\_Mapping

### Mapping Source

Transition

### Mapping Target

Subsetting

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettingFeature () : Feature [1]  
`TransitionSuccessionTarget_Mapping.getMapped (from)`
- Subsetting::subsettingFeature () : Feature [1]  
`ElementMain_Mapping.getMapped (from.target)`

## 7.7.12 StructuredClassifiers

### 7.7.12.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::StructuredClassifiers elements are transformed with which mapping class. The mapping details are in [7.7.12.2](#).

**Table 17. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Association	ConnectionDefinition ConnectionDefinition ConnectionDefinition ConnectionDefinition
AssociationClass	ConnectionDefinition ConnectionDefinition

SysML v1 Concept	SysML v2 Concept
Class	PartDefinition OccurrenceDefinition ItemDefinition VerificationCaseDefinition ActionUsage PartDefinition ViewDefinition ActionDefinition RequirementUsage PortDefinition ConstraintDefinition ActionDefinition MetadataDefinition ActionUsage StateDefinition
Connector	ConnectionUsage BindingConnectorAsUsage
ConnectorEnd	Feature
Port	PortUsage PortUsage PartUsage PartUsage

## 7.7.12.2 Mapping Specifications

### 7.7.12.2.1 AssociationClass\_Mapping

#### Description

A UML4SysML::AssociationClass is mapped to a SysML v2 ConnectionDefinition. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block1;
part def SysMLv1Block2;
connection def SysMLv1AssociationBlock {
    end : SysMLv1Block1;
    end : SysMLv1Block2;
}
```

#### General Mappings

AssociationCommon\_Mapping

#### Mapping Source

AssociationClass

#### Mapping Target

ConnectionDefinition

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not Helper.hasStereotypeApplied(src, 'SysML::Blocks::Block')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConnectionDefinition::ownedRelationship () : Relationship [0..\*]

```
let nonOwnedEnds: OrderedSet(UML::Property) =
    (from.memberEnd-from.ownedEnd)->asOrderedSet() in
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Generalization)) in
let others: OrderedSet(UML::Element) =
    ((from.ownedElement-from.memberEnd)-generalizations)->asOrderedSet() in
nonOwnedEnds->collect(e | NonOwnedEndMembership_Mapping.getMapped(e))
->union(from.ownedEnd->collect(e | OwnedEndMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
->union(others->collect(e | ElementOwningMembership_Mapping.getMapped(e)))
->asOrderedSet()
```

### 7.7.12.2.2 AssociationCommon\_Mapping

#### Description

A UML4SysML::Association is mapped to a SysML v2 ConnectionDefinition. This is the abstract base class of all concrete association mapping classes.

#### General Mappings

Classifier\_Mapping  
Relationship\_Mapping

#### Mapping Source

Association

#### Mapping Target

Association

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:



```
src.memberEnd->select( m | m.type.oclIsKindOf(UML::UseCase))->isEmpty()
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Association::ownedRelationship () : Relationship [0..\*]

```
let nonOwnedEnds: OrderedSet(UML::Property) =
    (from.memberEnd-from.ownedEnd)->asOrderedSet() in
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.oclIsKindOf(UML::Generalization)) in
let others: OrderedSet(UML::Element) =
    ((from.ownedElement-from.memberEnd)-generalizations)->asOrderedSet() in
nonOwnedEnds->collect(e | NonOwnedEndMembership_Mapping.getMapped(e))
->union(from.ownedEnd->collect(e | OwnedEndMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
->union(others->collect(e | ElementOwningMembership_Mapping.getMapped(e)))
->asOrderedSet()
```

### 7.7.12.2.3 AssociationMetadataUsage\_Mapping

#### Description

The mapping class creates the MetadataUsage element to annotate a ConnectionDefinition that its mapping source element is a derived association.

#### General Mappings

GenericToMetadataUsage\_Mapping

#### Mapping Source

Association

#### Mapping Target

MetadataUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
Set { AssociationToFeatureTyping_Mapping.getMapped (from) ,  
AssociationMetadataUsageFeatureMembership_Mapping.getMapped (from) }
```

#### 7.7.12.2.4 AssociationMetadataUsageFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Association

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
AssociationMetadataUsageFeature_Mapping.getMapped (from)
```

#### 7.7.12.2.5 AssociationMetadataUsageFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

Association

##### Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SYSML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::AssociationData')
```

### 7.7.12.2.6 AssociationMetadataUsageFeature\_Mapping

#### Description

The mapping class creates the feature of the MetadataUsage.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

Association

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
Set{AssociationMetadataUsageRedefinition_Mapping.getMapped(from),  
AssociationMetadataUsageFeatureValue_Mapping.getMapped(from)}
```

### 7.7.12.2.7 AssociationMetadataUsageFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Association

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`LiteralBoolean_Factory.create(from.isDerived)`

### 7.7.12.2.8 AssociationMetadataUsageMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Association

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  
`AssociationMetadataUsage_Mapping.getMapped(from)`

### 7.7.12.2.9 AssociationMetadataUsageRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Association

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`  
`SYSML2::AttributeUsage.allInstances()`  
`->any(m | m.qualifiedName = 'SysMLv1Library::AssociationData::isDerived')`

### 7.7.12.2.10 Class\_Mapping

#### Description

A `UML4SysML::Class` is mapped to a SysML v2 `OccurrenceDefinition`. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
occurrence def UML4SysMLClass;
```

### General Mappings

BehavioredClassifier\_Mapping

### Mapping Source

Class

### Mapping Target

OccurrenceDefinition

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not Helper.isRequirement(src) and not src.oclIsTypeOf(UML::AssociationClass)
```

### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

## 7.7.12.2.11 ConnectionEndToSubsetting\_Mapping

### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

### General Mappings

GenericToSubsetting\_Mapping

### Mapping Source

ConnectorEnd

### Mapping Target

Subsetting

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::ownedRelationship () : Relationship [0..\*]

```

let propertyPath: OrderedSet(UML::Property) =
  Helper.getTagValueAsElementColl
    (from, 'SysML::Blocks::NestedConnectorEnd', 'propertyPath')
  ->asOrderedSet() in
if propertyPath->notEmpty() then
  OrderedSet{ConnectorEndToSubsettedFeatureMembership_Mapping.getMapped(from)}
else
  OrderedSet{}
endif

```

- Subsetting::subsettedFeature () : Feature [1]

```

let propertyPath: OrderedSet(UML::Property) =
  Helper.getTagValueAsElementColl
    (src, 'SysML::Blocks::NestedConnectorEnd', 'propertyPath')
  ->asOrderedSet() in
if propertyPath->isEmpty() then
  ElementMain_Mapping.getMapped(from.role)
else
  ConnectorEndToSubsettedFeature_Mapping.getMapped(from)
endif

```

- Subsetting::subsettingFeature () : Feature [1]

```

ConnectorEndToOwnedFeature_Mapping.getMapped(from)

```

### 7.7.12.2.12 Connector\_Mapping

#### Description

A UML4SysML::Connector is mapped to a SysMLv2 ConnectionUsage. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

part def SysMLv1Block3 {
  part sysMLv1PartProperty1 : SysMLv1Block1;
  part sysMLv1PartProperty2 : SysMLv1Block2;
  connection sysMLv1Connector connect sysMLv1PartProperty1 to sysMLv1PartProperty2;
}
part def SysMLv1Block1;
part def SysMLv1Block2;

```

#### General Mappings

NamedElementMain\_Mapping  
 GenericToConnector\_Mapping

#### Mapping Source

Connector

#### Mapping Target

ConnectionUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConnectionUsage::ownedRelationship () : Relationship [0..\*]

```
from.end->collect (e | ConnectorEndToMembership_Mapping.getMapped (e) )  
->including (ConnectorMultiplicityMembership_Mapping.getMapped (from) )
```

### 7.7.12.2.13 ConnectorEndToFeatureCommon\_Mapping

#### Description

The mapping class is the abstract base class for UML4SysML::ConnectorEnd mapping classes.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

ConnectorEnd

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::isOrdered () : Boolean [1]

```
from.isOrdered
```



#### 7.7.12.2.14 ConnectorEndToMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

ConnectorEnd

##### Mapping Target

EndFeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- EndFeatureMembership::ownedMemberFeature () : Feature [1]  
`ConnectorEndToOwnedFeature_Mapping.getMapped(from)`

#### 7.7.12.2.15 ConnectorEndToOwnedFeature\_Mapping

##### Description

The mapping class creates the SysML v2 Feature element for the UML4SysML::ConnectorEnd mapping.

##### General Mappings

ConnectorEndToFeatureCommon\_Mapping  
ElementMain\_Mapping

##### Mapping Source

ConnectorEnd

##### Mapping Target

Feature

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
let subsetting: KerML::Subsetting =
    ConnectionEndToSubsetting_Mapping.getMapped(from) in
if subsetting.oclIsUndefined() then
    OrderedSet{MultiplicityMembership_Mapping.getMapped(from) }
else
    OrderedSet{MultiplicityMembership_Mapping.getMapped(from), subsetting}
endif
```

#### 7.7.12.2.16 ConnectorEndToSubsettedFeature\_Mapping

##### Description

The mapping class maps UML4SysML::ConnectorEnd that are part of a SysML::Ports&Flows::NestedConnectorEnd.

##### General Mappings

ConnectorEndToFeatureCommon\_Mapping

##### Mapping Source

ConnectorEnd

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
let propertyPath: OrderedSet(UML::Property) =
    Helper.getTagValueAsElementColl(src, 'SysML::Blocks::NestedConnectorEnd', 'propertyPath')
->asOrderedSet() in
propertyPath->notEmpty()
```

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
let propertyPath: OrderedSet(UML::Property) =
  Helper.getTagValueAsElementColl
    (from, 'SysML::Blocks::NestedConnectorEnd', 'propertyPath')
  ->asOrderedSet() in
let chain: OrderedSet(KerML::FeatureChaining) =
  propertyPath->collect(p | PropertyToFeatureChaining_Mapping.getMapped(p))
  ->asOrderedSet()
  ->including(PropertyToFeatureChaining_Mapping.getMapped(from.role)) in
chain->union(OrderedSet{MultiplicityMembership_Mapping.getMapped(from)})
```

- Feature::declaredName () : String [0..1]

```
'featureChain'
```

### 7.7.12.2.17 ConnectorEndToSubsettedFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

ConnectorEnd

#### Mapping Target

EndFeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- EndFeatureMembership::ownedMemberFeature () : Feature [1]

```
ConnectorEndToSubsettedFeature_Mapping.getMapped(from)
```

### 7.7.12.2.18 ConnectorMultiplicityMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

DefaultMultiplicityMembership\_Mapping

### Mapping Source

Connector

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::memberName () : String [0..1]  
`from.name+'_Connector_multiplicity'`

## 7.7.12.2.19 ConnectorType\_Mapping

### Description

A UML4SysML::Association is mapped to a SysML v2 ConnectionDefinition.

### General Mappings

AssociationCommon\_Mapping

### Mapping Source

Association

### Mapping Target

ConnectionDefinition

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```

let this: UML::Association = src.oclAsType(UML::Association) in
if this.oclIsUndefined() then
  false
else
  not src.memberEnd->exists( m | m.type.oclIsKindOf(UML::UseCase)) and
  not src.isDerived and
  not src.oclIsTypeOf(UML::AssociationClass) and
  Helper.isConnectionDef(src)
endif

```

## Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.7.12.2.20 ConnectorTypeDerived\_Mapping

#### Description

The mapping class is a concrete mapping class of the abstract AssociationCommon\_Mapping class for mappings of derived associations. The UML4SysML::Association::isDerived property is not supported in SysML v2. To preserve the information, it is stored in a metadata annotation.

#### General Mappings

AssociationCommon\_Mapping

#### Mapping Source

Association

#### Mapping Target

ConnectionDefinition

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```

(src.memberEnd->select( m | m.type.oclIsKindOf(UML::UseCase))->isEmpty()) and
(let this: UML::Association = src.oclAsType(UML::Association) in
if this.oclIsUndefined() then
  false
else
  this.isDerived and
  not this.oclIsTypeOf(UML::AssociationClass) and
  Helper.isConnectionDef(this)
endif)

```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ConnectionDefinition::ownedRelationship () : Relationship [0..*]`

```
let nonOwnedEnds: OrderedSet(UML::Property) =
    (from.memberEnd-from.ownedEnd)->asOrderedSet() in
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Generalization)) in
let others: OrderedSet(UML::Element) =
    ((from.ownedElement-from.memberEnd)-generalizations)->asOrderedSet() in
nonOwnedEnds->collect(e | NonOwnedEndMembership_Mapping.getMapped(e))
->union(from.ownedEnd->collect(e | OwnedEndMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
->union(others->collect(e | ElementOwningMembership_Mapping.getMapped(e)))
->asOrderedSet()
->including(AssociationMetadataUsageMembership_Mapping.getMapped(from))
```

### 7.7.12.2.21 End\_Mapping

#### Description

The mapping class is the abstract base class of mapping classes for properties that are defined by association ends.

#### General Mappings

PropertyCommon\_Mapping

#### Mapping Source

Property

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.ocIsKindOf(UML::Property) and
not src.ocAsType(UML::Property).association.ocIsUndefined()
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Feature::isEnd () : Boolean [1]`

true

#### 7.7.12.2.22 EndMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

StructuralFeatureMembership\_Mapping

##### Mapping Source

Property

##### Mapping Target

EndFeatureMembership

##### Owned Mappings

(none)

#### 7.7.12.2.23 EndToSubsettedFeature\_Mapping

##### Description

The mapping class creates a feature element for the UML4SysML::ConnectorEnd mapping.

##### General Mappings

PropertyCommon\_Mapping

##### Mapping Source

Property

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
let property: UML::Property = src.oclAsType(UML::Property) in
not property.association.oclIsUndefined()
and property.association.ownedEnd->excludes(property)
```

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Feature::ownedRelationship () : Relationship [0..*]`

```
let chain: OrderedSet (KerML::FeatureChaining) =  
    OrderedSet {EndToSubsettedFeatureChaining_Mapping.getMapped (from)} in  
chain->including (MultiplicityMembership_Mapping.getMapped (from))
```

#### 7.7.12.2.24 EndToSubsettedFeatureChaining\_Mapping

##### Description

The mapping class creates a feature chaining element for the `UML4SysML::ConnectorEnd` mapping.

##### General Mappings

GenericToRelationship\_Mapping

##### Mapping Source

Property

##### Mapping Target

FeatureChaining

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureChaining::declaredName () : String [0..1]`

```
'featureChain'
```

- `FeatureChaining::chainingFeature () : Feature [1]`

```
Property_Mapping.getMapped (from)
```

#### 7.7.12.2.25 NonOwnedEndSubsetting\_Mapping

##### Description

Creates a subsetting relationship for the `subsettingFeature()` and the `subsettedFeature()`.

##### General Mappings

GenericToSubsetting\_Mapping



### Mapping Source

Property

### Mapping Target

Subsetting

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettedFeature () : Feature [1]

```
Property_Mapping.getMapped(from)
```

## 7.7.12.2.26 NonOwnedEndToSubsettedFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Property

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.oclIsKindOf(UML::Property) and  
not src.oclAsType(UML::Property).association.oclIsUndefined()
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`EndToSubsettedFeature_Mapping.getMapped(from)`

#### 7.7.12.2.27 NonOwnedEnd\_Mapping

##### Description

The mapping class maps `UML4SysML::Property` elements that are not owned by an association to a SysML v2 Feature element.

##### General Mappings

`End_Mapping`

##### Mapping Source

`Property`

##### Mapping Target

`Feature`

##### Owned Mappings

- `nonOwnedEndTyping : NonOwnedEndFeatureTyping_Mapping`

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Feature::declaredName () : String [0..1]`  
`'nonOwnedEnd'`
- `Feature::ownedRelationship () : Relationship [0..*]`  
`Set{MultiplicityMembership_Mapping.getMapped(from),`  
`nonOwnedEndTyping.to,`  
`NonOwnedEndSubsettingMembership_Mapping.getMapped(from),`  
`NonOwnedEndToSubsettedFeatureMembership_Mapping.getMapped(from) }`  
`->union(from.qualifier`  
`->collect(q | ElementFeatureMembership_Mapping.getMapped(q) )->asSet() )`

#### 7.7.12.2.28 NonOwnedEndMembership\_Mapping

##### Description

Creates a membership relationship for `memberElement()`.

## General Mappings

EndMembership\_Mapping

## Mapping Source

Property

## Mapping Target

EndFeatureMembership

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.oclIsKindOf(UML::Property)
  and not src.oclAsType(UML::Property).association.oclIsUndefined()
  and src.oclAsType(UML::Property).association.ownedEnd->excludes(src)
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- EndFeatureMembership::ownedMemberFeature () : Feature [1]  
NonOwnedEnd\_Mapping.getMapped(from)

### 7.7.12.2.29 NonOwnedEndSubsettingMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Property

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  
`NonOwnedEndSubsetting_Mapping.getMapped (from)`

#### 7.7.12.2.30 NonOwnedEndFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

StructuralFeatureToFeatureTyping\_Mapping

##### Mapping Source

Property

##### Mapping Target

FeatureTyping

##### Owned Mappings

- `nonOwnedEnd : NonOwnedEnd_Mapping`

#### 7.7.12.2.31 OwnedEnd\_Mapping

##### Description

The mapping class maps `UML4SysML::Property` elements that are owned by an association to a SysML v2 Feature element.

##### General Mappings

End\_Mapping  
NamedElementMain\_Mapping

##### Mapping Source

Property

##### Mapping Target

Feature

##### Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
let p: UML::Property = src.oclAsType(UML::Property) in
not p.oclIsUndefined() and
(not p.association.oclIsUndefined()
 and p.association.ownedEnd->includes(p)) and
(not p.association.memberEnd
->select( m | (not m.type.oclIsUndefined())
 and m.type.oclIsTypeOf(UML::UseCase))->notEmpty())
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
let qualifiers: Set(KerML::FeatureMembership) =
  from.qualifier
  ->collect(q | ElementFeatureMembership_Mapping.getMapped(q))->asSet() in
let typing: KerML::FeatureTyping =
  StructuralFeatureToFeatureTyping_Mapping.getMapped(from) in
let subsetting: Set(KerML::Subsetting) =
  from.subsettedProperty
  ->collect(p | PropertySubsetting_Mapping.getMapped(from, p))->asSet() in
let subsettingMultiplicityTyping: Set(KerML::Relationship) =
  subsetting->union(if typing.oclIsUndefined() then
    Set{MultiplicityMembership_Mapping.getMapped(from)}
  else
    Set{MultiplicityMembership_Mapping.getMapped(from), typing}
  endif)->asSet() in
let relationships: Set(KerML::Relationship) = qualifiers->union(
  if from.defaultValue.oclIsTypeOf(UML::OpaqueExpression) then
    subsettingMultiplicityTyping
    ->including(ElementOwningMembership_Mapping.getMapped(from.defaultValue))
  else
    subsettingMultiplicityTyping
  endif) in

if from.defaultValue.oclIsUndefined() then
  relationships
else
  relationships->including(
    if from.defaultValue.oclIsTypeOf(UML::OpaqueExpression) then
      DefaultValueOpaqueExpression_Mapping.getMapped(from.defaultValue)
    else
      DefaultValue_Mapping.getMapped(from.defaultValue)
    endif)
endif
```

### 7.7.12.2.32 OwnedEndMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

EndMembership\_Mapping

### Mapping Source

Property

### Mapping Target

EndFeatureMembership

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.oclIsKindOf(UML::Property)
  and not src.oclAsType(UML::Property).association.oclIsUndefined()
  and src.oclAsType(UML::Property).association.ownedEnd->includes(src)
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- EndFeatureMembership::ownedMemberFeature () : Feature [1]  
OwnedEnd\_Mapping.getMapped(from)

## 7.7.12.2.33 Port\_Mapping

### Description

A UML4SysML::Port that is typed by an interface block is mapped to a SysML v2 PortUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
port sysMLv1Port : SysMLv1InterfaceBlock;
port def SysMLv1InterfaceBlock
```

### General Mappings

Property\_Mapping

### Mapping Source

Port

### Mapping Target

PortUsage

## Owned Mappings

(none)

### 7.7.12.2.34 PortUntyped\_Mapping

#### Description

A UML4SysML::Port that is untyped is mapped to a SysML v2 PortUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
port sysMLv1Port;
```

#### General Mappings

PropertyUntyped\_Mapping

#### Mapping Source

Port

#### Mapping Target

PortUsage

#### Owned Mappings

(none)

### 7.7.12.2.35 PropertyToFeatureChaining\_Mapping

#### Description

The mapping class creates the SysML v2 FeatureChaining for the UML4SysML::Property mapping.

#### General Mappings

GenericToRelationship\_Mapping

#### Mapping Source

Property

#### Mapping Target

FeatureChaining

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureChaining::chainingFeature () : Feature [1]  
ElementMain\_Mapping.getMapped(from)

#### 7.7.12.2.36 QualifierMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

StructuralFeatureMembership\_Mapping

##### Mapping Source

StructuralFeature

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

### 7.7.13 UseCases

#### 7.7.13.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::UseCases elements are transformed with which mapping class. The mapping details are in [7.7.13.3](#).

The justifications for the elements without mapping are given in [7.7.13.2](#).

**Table 18. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Actor	ItemDefinition
Extend	
ExtensionPoint	
Include	IncludeUseCaseUsage
UseCase	UseCaseDefinition



### 7.7.13.2 UML4SysML::UseCases elements not mapped

Table 19. List of SysML v1 elements not mapped of this section

SysML v1 Concept	Rationale
Extend	The semantics of the UML4SysML::Extend relationship is not supported by SysML v2.
ExtensionPoint	The semantics of the UML4SysML::Extend relationship is not supported by SysML v2 Therefore, UML4SysML::ExtensionPoint is also not covered by the transformation.

### 7.7.13.3 Mapping Specifications

#### 7.7.13.3.1 Actor\_Mapping

##### Description

A UML4SysML::Actor is mapped to a SysML v2 ItemDefinition. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
item def SysMLv1Actor;
```

##### General Mappings

ElementMain\_Mapping  
BehavioredClassifier\_Mapping

##### Mapping Source

Actor

##### Mapping Target

ItemDefinition

##### Owned Mappings

(none)

#### 7.7.13.3.2 Include\_Mapping

##### Description

A UML4SysML::Include is mapped to a SysML v2 IncludeUseCaseUsage. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
use case def SysMLv1UseCase1 {  
    include use case : SysMLv1UseCase2;  
}  
use case def SysMLv1UseCase2;
```

##### General Mappings

GenericToOccurrenceUsage\_Mapping  
NamedElementMain\_Mapping

#### Mapping Source

Include

#### Mapping Target

IncludeUseCaseUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- IncludeUseCaseUsage::ownedRelationship () : Relationship [0..\*]  

```
Set { IncludeFeatureTyping_Mapping.getMapped (from) ,  
ReturnParameterFeatureMembership_Factory.create () ,  
EmptySubjectMembership_Factory.create () }
```

### 7.7.13.3 IncludeFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Include

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
from.addition
```

### 7.7.13.3.4 UseCase\_Mapping

#### Description

A UML4SysML::UseCase is mapped to a SysML v2 UseCaseDefinition. The expected SysML v2 textual syntax of a mapped UML4SysML::UseCase with a defined subject is as follows.

```
use case def SysMLv1UseCase {  
  subject subject_SysMLv1Block : SysMLv1Block;  
}  
part def SysMLv1Block;
```

Currently, only one use case subject is supported by the mapping class. Since the UML4SysML::Extend relationship is not considered by the SysML v1 to SysML v2 transformation, the extension points of a use case are also not mapped.

#### General Mappings

BehavioeredClassifier\_Mapping

NamedElementMain\_Mapping

#### Mapping Source

UseCase

#### Mapping Target

UseCaseDefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- UseCaseDefinition::ownedRelationship () : Relationship [0..\*]

```
let properties : Set(UML::Element) =  
  from.ownedElement->select(e | e.ocIsKindOf(UML::Property) and  
    e.ocIsType(UML::Property).association.ocIsUndefined()) in
```

```

let actors : Set(UML::Property) =
    UML::Association.allInstances()
    ->collect(m | m.memberEnd)
    ->flatten()
    ->select( m | m.type = from)->collect(a | a.owningAssociation)
    ->collect( p | p.memberEnd->select( m | not (m.type = from) ))->flatten() in
let extensionPoints : Sequence(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::ExtensionPoint)) in
let extend : Sequence(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Extend)) in
let include : Sequence(UML::Element) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Include)) in
let elements : Set(UML::Element) =
    (((from.ownedElement-properties) - extensionPoints) - extend) - include) in
let relationships : Sequence(KerML::Relationship) =
    elements->collect(e | ElementOwningMembership_Mapping.getMapped(e))
    ->union(properties->collect(e | PropertyMembership_Mapping.getMapped(e)))
    ->including(UseCaseSubjectMembership_Mapping.getMapped(from))
    ->including(UseCaseObjectiveMembership_Mapping.getMapped(from))
    ->including(CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from))
    ->union(actors->collect(e | UseCaseActorMembership_Mapping.getMapped(e))) in
if from.classifierBehavior.ocIsUndefined() then
    relationships
else
    relationships
    ->including(ClassifierBehaviorFeatureMembership_Mapping.getMapped(from))
endif

```

### 7.7.13.3.5 UseCaseActor\_Mapping

#### Description

The mapping class creates the PartUsage representing an actor of the use case.

#### General Mappings

GenericToPartUsage\_Mapping

#### Mapping Source

Property

#### Mapping Target

PartUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `PartUsage::declaredName () : String [0..1]`  
`from.name`
- `PartUsage::ownedRelationship () : Relationship [0..*]`  
`Set {UseCaseActorFeatureTyping_Mapping.getMapped(from) }`

### 7.7.13.3.6 UseCaseActorFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Property

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`  
`from.type`

### 7.7.13.3.7 UseCaseActorMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToActorMembership\_Mapping

#### Mapping Source

Property

### Mapping Target

ActorMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ActorMembership::ownedMemberParameter () : Feature [1]

`UseCaseActor_Mapping.getMapped (from)`

### 7.7.13.3.8 UseCaseEmptySubjectReferenceUsage\_Mapping

#### Description

The mapping class creates an "empty" ReferenceUsage for the subject, if the subject is not given at the SysML v1 UseCase element.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

UseCase

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

### 7.7.13.3.9 UseCaseObjectiveMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToObjectiveMembership\_Mapping

### Mapping Source

UseCase

### Mapping Target

ObjectiveMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ObjectiveMembership::ownedMemberFeature () : Feature [1]  
`UseCaseObjectiveRequirementUsage_Mapping.getMapped(from)`

### 7.7.13.3.10 UseCaseObjectiveRequirementUsage\_Mapping

#### Description

The mapping class creates the RequirementUsage element for the use case objective. The element is not set by an element from the SysML v1 UseCase.

#### General Mappings

GenericToRequirementUsage\_Mapping

#### Mapping Source

UseCase

#### Mapping Target

RequirementUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- RequirementUsage::ownedRelationship () : Relationship [0..\*]

```
Set { UseCaseObjectiveSubjectMembership_Mapping.getMapped (from) ,  
CommonReturnParameterReferenceUsageMembership_Mapping.getMapped (from) }
```

### 7.7.13.3.11 UseCaseObjectiveSubjectMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToSubjectMembership\_Mapping

#### Mapping Source

UseCase

#### Mapping Target

SubjectMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SubjectMembership::ownedMemberParameter () : Feature [1]

```
UseCaseEmptySubjectReferenceUsage_Mapping.getMapped (from)
```

### 7.7.13.3.12 UseCaseSubjectFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

UseCase



## Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]  

```
if from.subject->size() > 0 then from.subject->get(0) else OclUndefined endif
```

### 7.7.13.3.13 UseCaseSubjectMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToSubjectMembership\_Mapping

#### Mapping Source

UseCase

#### Mapping Target

SubjectMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SubjectMembership::ownedMemberParameter () : Feature [1]  

```
if from.subject->size() > 0 then  
  UseCaseSubjectReferenceUsage_Mapping.getMapped(from)
```

```

else
    UseCaseEmptySubjectReferenceUsage_Mapping.getMapped(from)
endif

```

### 7.7.13.3.14 UseCaseSubjectReferenceUsage\_Mapping

#### Description

The mapping class creates the ReferenceUsage element for the subject.

#### General Mappings

UseCaseEmptySubjectReferenceUsage\_Mapping

#### Mapping Source

UseCase

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  

```
Set { UseCaseSubjectFeatureTyping_Mapping.getMapped (from) }
```
- ReferenceUsage::declaredName () : String [0..1]  

```
'subject_' + from.subject->get (0) .name
```

## 7.7.14 Values

### 7.7.14.1 Overview

The following table gives an overview of which SysML v2 elements the UML4SysML::Values elements are transformed with which mapping class. The mapping details are in [7.7.14.3](#).

The justifications for the elements without mapping are given in [7.7.14.2](#).

**Table 20. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Duration	

SysML v1 Concept	SysML v2 Concept
DurationConstraint	
DurationInterval	
DurationObservation	
Expression	OperatorExpression OperatorExpression
Interval	
IntervalConstraint	
LiteralBoolean	LiteralBoolean
LiteralInteger	LiteralInteger
LiteralNull	NullExpression
LiteralReal	LiteralRational
LiteralString	LiteralString
LiteralUnlimitedNatural	LiteralInfinity LiteralInteger
OpaqueExpression	CalculationUsage
StringExpression	
TimeConstraint	
TimeExpression	TriggerInvocationExpression
TimeInterval	
TimeObservation	

#### 7.7.14.2 UML4SysML::Values elements not mapped

Table 21. List of SysML v1 elements not mapped of this section

SysML v1 Concept	Rationale
Duration	Mapping is not specified yet.
DurationConstraint	Mapping is not specified yet.
DurationInterval	Mapping is not specified yet.
DurationObservation	Mapping is not specified yet.
Interval	Mapping is not specified yet.
IntervalConstraint	Mapping is not specified yet.
StringExpression	Mapping is not specified yet.
TimeConstraint	Mapping is not specified yet.
TimeInterval	Mapping is not specified yet.
TimeObservation	Mapping is not specified yet.

#### 7.7.14.3 Mapping Specifications

### 7.7.14.3.1 EqualOperatorExpressionFeature\_Mapping

#### Description

The mapping class creates the feature element for the equal operator.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

TypedElement

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
Set { EqualOperatorExpressionFeatureValue_Mapping.getMapped (from) }
```

### 7.7.14.3.2 EqualOperatorExpressionFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

TypedElement

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`CommonFeatureReferenceExpression_Mapping.getMapped(from)`

### 7.7.14.3.3 EqualOperatorExpressionOperandParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

TypedElement

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ParameterMembership::ownedMemberParameter () : Feature [1]  
`EqualOperatorExpressionFeature_Mapping.getMapped(from)`
- ParameterMembership::visibility () : VisibilityKind [1]  
`KerML::VisibilityKind::private`

### 7.7.14.3.4 Expression\_Mapping

#### Description

A UML4SysML::Expression element is mapped to a SysML v2 OperatorExpression element.

## General Mappings

GenericToExpression\_Mapping  
NamedElementMain\_Mapping

## Mapping Source

Expression

## Mapping Target

OperatorExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OperatorExpression::operator () : String [1]  
`from.symbol`

### 7.7.14.3.5 ExpressionElse\_Mapping

#### Description

A UML4SysML::Expression element with operator "else" is mapped to a SysML v2 TextualRepresentation element with language set to "SysMLv1" and body set to "else".

#### General Mappings

Expression\_Mapping

#### Mapping Source

Expression

#### Mapping Target

OperatorExpression

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.symbol = 'else'
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OperatorExpression::ownedRelationship () : Relationship [0..*]`  
`Set{ExpressionElseMembership_Mapping.getMapped(from) }`

#### 7.7.14.3.6 ExpressionElseMembership\_Mapping

##### Description

Creates the membership relationship for the textual representation for the else guard condition specification.

##### General Mappings

GenericToOwningMembership\_Mapping

##### Mapping Source

Expression

##### Mapping Target

OwningMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  
`ExpressionElseSpecification_Mapping.getMapped(from)`

#### 7.7.14.3.7 ExpressionElseSpecification\_Mapping

##### Description

Creates the textual representation for the else guard condition specification.

##### General Mappings

GenericToTextualRepresentation\_Mapping

### **Mapping Source**

Expression

### **Mapping Target**

TextualRepresentation

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TextualRepresentation::language () : String [1]  
    'SysMLv1'
- TextualRepresentation::body () : String [1]  
    'else'

### **7.7.14.3.8 LiteralBoolean\_Mapping**

#### **Description**

The mapping class maps UML4SysML::LiteralBoolean to SysML v2 LiteralBoolean.

#### **General Mappings**

LiteralSpecificationCommon\_Mapping

#### **Mapping Source**

LiteralBoolean

#### **Mapping Target**

LiteralBoolean

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**



In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralBoolean::value () : Boolean [1]

`from.value`

#### **7.7.14.3.9 LiteralInteger\_Mapping**

##### **Description**

The mapping class maps UML4SysML::LiteralInteger to SysML v2 LiteralInteger.

##### **General Mappings**

LiteralSpecificationCommon\_Mapping

##### **Mapping Source**

LiteralInteger

##### **Mapping Target**

LiteralInteger

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralInteger::value () : Integer [1]

`from.value`

#### **7.7.14.3.10 LiteralNull\_Mapping**

##### **Description**

The mapping class maps UML4SysML::LiteralNull to SysML v2 NullExpression.

##### **General Mappings**

LiteralSpecificationCommon\_Mapping

##### **Mapping Source**

LiteralNull

### **Mapping Target**

NullExpression

### **Owned Mappings**

(none)

### **7.7.14.3.11 LiteralReal\_Mapping**

#### **Description**

The mapping class maps UML4SysML::LiteralReal to SysML v2 LiteralRational.

#### **General Mappings**

LiteralSpecificationCommon\_Mapping

#### **Mapping Source**

LiteralReal

#### **Mapping Target**

LiteralRational

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralRational::value () : Real [1]

`from.value`

### **7.7.14.3.12 LiteralSpecificationCommon\_Mapping**

#### **Description**

The mapping class the is abstract base class for all concrete UML4SysML::LiteralSpecification mappings.

#### **General Mappings**

ValueSpecification\_Mapping

#### **Mapping Source**

LiteralSpecification

## Mapping Target

LiteralExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralExpression::ownedRelationship () : Relationship [0..\*]

```
let ownerships: Set(SYSML2::Relationship) =
    ElementOwnership_Mapping.getMappedColl(from.ownedComment)
    ->including(CommonReturnParameterFeatureMembership_Mapping.getMapped(from)) in
if from.type.ocliIsUndefined() then
    ownerships
else
    ownerships->including(LiteralSpecificationTyping_Mapping.getMapped(from))
endif
```

### 7.7.14.3.13 LiteralSpecificationFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

TypedElementFeatureTyping\_Mapping

#### Mapping Source

LiteralSpecification

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

### 7.7.14.3.14 LiteralString\_Mapping

#### Description

The mapping class maps UML4SysML::LiteralString to the SysML v2 LiteralString.

#### General Mappings

LiteralSpecificationCommon\_Mapping

#### **Mapping Source**

LiteralString

#### **Mapping Target**

LiteralString

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `LiteralString::value () : String [1]`  
`if from.value.oclIsUndefined() then '' else from.value endif`

### **7.7.14.3.15 LiteralUnlimitedUnbounded\_Mapping**

#### **Description**

The mapping class maps UML4SysML::LiteralUnlimited to SysML v2 LiteralInfinity if it is the unlimited value.

#### **General Mappings**

LiteralUnlimitedInteger\_Mapping

#### **Mapping Source**

LiteralUnlimitedNatural

#### **Mapping Target**

LiteralInfinity

#### **Owned Mappings**

(none)

#### **Applicable filters**

This mapping applies only if the following (OCL) condition is verified:

```
(from.value = -1)
```

#### **Mapping rules**

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

#### **7.7.14.3.16 LiteralUnlimitedInteger\_Mapping**

##### **Description**

The mapping class maps UML4SysML::LiteralUnlimited to SysML v2 LiteralInteger if it is not the unlimited value.

##### **General Mappings**

LiteralSpecificationCommon\_Mapping

##### **Mapping Source**

LiteralUnlimitedNatural

##### **Mapping Target**

LiteralInteger

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- LiteralInteger::value () : Integer [1]

`from.value`

#### **7.7.14.3.17 OpaqueExpressionAsValue\_Mapping**

##### **Description**

The mapping class maps a UML4SysML::OpaqueExpression if it is used as a value to a SysML v2 FeatureChainExpression.

##### **General Mappings**

GenericToExpression\_Mapping

##### **Mapping Source**

OpaqueExpression

##### **Mapping Target**

FeatureChainExpression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureChainExpression::ownedRelationship () : Relationship [0..*]`

```
Set{OpaqueExpressionParameterMembership_Mapping.getMapped(from),  
CommonReturnParameterFeatureMembership_Mapping.getMapped(from)}
```

### 7.7.14.3.18 OpaqueExpression\_Mapping

#### Description

A `UML4SysML::OpaqueExpression` element is mapped to a `SysMLv2 CalculationUsage` element.. The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
calc sysMLv1OpaqueExpression {  
    return result : ScalarValues::Integer;  
    language "Built-in Math"  
    /*  
    * result = 42 + 23;  
    */  
}
```

## General Mappings

`CommonAction_Mapping`  
`ValueSpecification_Mapping`

## Mapping Source

`OpaqueExpression`

## Mapping Target

`CalculationUsage`

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- CalculationUsage::ownedRelationship () : Relationship [0..\*]  

```
Set { OpaqueExpressionMembership_Mapping.getMapped (from) ,  
      OpaqueExpressionReferenceUsageReturnParameterMembership_Mapping.getMapped (from) }
```

#### 7.7.14.3.19 OpaqueExpressionFeature\_Mapping

##### Description

The mapping class creates the feature of the FeatureChainExpression.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

OpaqueExpression

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]  

```
Set { OpaqueExpressionFeatureValue_Mapping.getMapped (from) ,  
      OpaqueExpressionFeatureFeatureMembership_Mapping.getMapped (from) }
```

#### 7.7.14.3.20 OpaqueExpressionFeatureFeature\_Mapping

##### Description

The mapping class creates the Feature of the FeatureReferenceExpression.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

OpaqueExpression

### Mapping Target

Feature

### Owned Mappings

(none)

## 7.7.14.3.21 OpaqueExpressionFeatureFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

OpaqueExpression

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`OpaqueExpressionFeatureFeature_Mapping.getMapped(from)`

## 7.7.14.3.22 OpaqueExpressionFeatureValue\_Mapping

### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

### Mapping Source



OpaqueExpression

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

`OpaqueExpressionFeatureValueExpression_Mapping.getMapped(from)`

## 7.7.14.3.23 OpaqueExpressionFeatureValueExpression\_Mapping

### Description

The mapping class creates the value of the FeatureChainExpression that is a FeatureReferenceExpression.

### General Mappings

GenericToExpression\_Mapping

### Mapping Source

OpaqueExpression

### Mapping Target

FeatureReferenceExpression

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set { OpaqueExpressionFeatureValueExpressionMembership_Mapping.getMapped(from),  
EmptyReturnParameterFeatureMembership_Mapping.getMapped(from) }
```

#### 7.7.14.3.24 OpaqueExpressionFeatureValueExpressionMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToMembership\_Mapping

##### Mapping Source

OpaqueExpression

##### Mapping Target

Membership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Membership::memberElement () : Element [1]

from

#### 7.7.14.3.25 OpaqueExpressionMembership\_Mapping

##### Description

Creates a membership relationship for *memberElement()*.

##### General Mappings

GenericToOwningMembership\_Mapping

##### Mapping Source

OpaqueExpression

##### Mapping Target

OwningMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  
`OpaqueExpressionSpecification_Mapping.getMapped(from)`

### 7.7.14.3.26 OpaqueExpressionParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

OpaqueExpression

#### Mapping Target

ParameterMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ParameterMembership::ownedMemberParameter () : Feature [1]`  
`OpaqueExpressionFeature_Mapping.getMapped(from)`

### 7.7.14.3.27 OpaqueExpressionReferenceUsageReturnParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToReturnParameterMembership\_Mapping

### Mapping Source

OpaqueExpression

### Mapping Target

ReturnParameterMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReturnParameterMembership::ownedMemberParameter () : Feature [1]

```
    if from.type.ocliIsUndefined() then
      OpaqueExpressionReferenceUsageUntyped_Mapping.getMapped(from)
    else
      OpaqueExpressionReferenceUsage_Mapping.getMapped(from)
    endif
```

### 7.7.14.3.28 OpaqueExpressionReferenceUsage\_Mapping

#### Description

The mapping class creates the return parameter reference usage of the calculation usage.

### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

OpaqueExpression

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_'out'`
- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set { OpaqueExpressionReferenceUsageFeatureTyping_Mapping.getMapped (from) }`

### 7.7.14.3.29 OpaqueExpressionReferenceUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

TypedElementFeatureTyping\_Mapping

#### Mapping Source

OpaqueExpression

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

### 7.7.14.3.30 OpaqueExpressionReferenceUsageUntyped\_Mapping

#### Description

The mapping class creates the return parameter reference usage of the calculation usage, if the UML4SysML::OpaqueExpression is untyped.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

OpaqueExpression

#### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]

```
KerML::FeatureDirectionKind::_'out'
```

### 7.7.14.331 OpaqueExpressionSpecification\_Mapping

#### Description

The mapping class creates the specification of the calculation usage based on the language and body of the UML4SysML::OpaqueExpression.

#### General Mappings

GenericToTextualRepresentation\_Mapping

#### Mapping Source

OpaqueExpression

#### Mapping Target

TextualRepresentation

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TextualRepresentation::language () : String [1]

```
if from.language->size() = 0 then OclUndefined else from.language.get(0) endif
```

- TextualRepresentation::body () : String [1]

```
if from.body->size() = 0 then OclUndefined else from.body.get(0) endif
```

### 7.7.14.3.32 TimeExpression\_Mapping

#### Description

A UML4SysML::TimeExpression is mapped to a SysML v2 TriggerInvocationExpression. The details of the mapping are not specified yet.

#### General Mappings

ValueSpecification\_Mapping

#### Mapping Source

TimeExpression

#### Mapping Target

TriggerInvocationExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- TriggerInvocationExpression::kind () : TriggerKind [1]

```
SysMLv2::TriggerKind::at
```

### 7.7.14.3.33 ValueSpecification\_Mapping

#### Description

The mapping class is the abstract base class of all mapping classes for special value specifications.

#### General Mappings

NamedElementMain\_Mapping

GenericToExpression\_Mapping

#### Mapping Source

ValueSpecification

#### Mapping Target

Expression

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Expression::ownedRelationship () : Relationship [0..\*]  

```
if from.type.oclIsUndefined() then
  Set{CommonReturnParameterFeatureMembership_Mapping.getMapped(from)}
else
  Set{LiteralSpecificationTyping_Mapping.getMapped(from),
  CommonReturnParameterFeatureMembership_Mapping.getMapped(from)}
endif
```

## 7.8 Mappings from SysML v1.7 stereotypes

This chapter lists all mapping specifications of SysML v1 stereotype model elements.

### 7.8.1 Overview

The following subclasses of [7.8](#) are organized according to the main packages of SysML v1.

### 7.8.2 Activities

This chapter lists all mapping specifications of SysML::Activities model elements.

#### 7.8.2.1 Overview

The following table gives an overview of which SysML v2 elements the SysML::Activities elements are transformed with which mapping class. The mapping details are specified in [7.8.2.3](#).

The justifications for the elements without mapping are given in [7.8.2.2](#).

**Table 22. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Continuous	MetadataUsage
ControlOperator	
Discrete	MetadataUsage
NoBuffer	
Optional	
Overwrite	
Probability	MetadataUsage



SysML v1 Concept	SysML v2 Concept
Rate	MetadataUsage

### 7.8.2.2 SysML::Activities elements not mapped

**Table 23. List of SysML v1 elements not mapped of this section**

SysML v1 Concept	Rationale
ControlOperator	The concept that an action can control other actions is not supported by SysML v2.
NoBuffer	Mapping is not specified yet.
Optional	The stereotype states that the lower multiplicity of the parameter is 0. Since the multiplicity of the parameter is transformed, the additional statement that the parameter is optional is redundant. Therefore, the stereotype is not considered in the transformation.
Overwrite	Mapping is not specified yet.

### 7.8.2.3 Mapping Specifications

#### 7.8.2.3.1 ProbabilityMetadataUsage\_Mapping

##### Description

A SysML::Activities::Probability is mapped to a SysML v2 MetadataUsage owned by the appropriate target element of the UML4SysML::ActivityEdge or UML4SysML::ParameterSet.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

action def SysMLv1Activity {
    action sysMLv1Action1;
    succession sysMLv1ControlFlow1 first sysMLv1Action1 then sysMLv1Action2 {
        @SysMLv1Library::ProbabilityData {probability = 0.42;}
    }
    action sysMLv1Action2;
}

```

##### General Mappings

GenericToMetadataUsage\_Mapping

##### Mapping Source

Element

##### Mapping Target

MetadataUsage

##### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Probability')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
Set{ProbabilityMetadataUsageFeatureTyping_Mapping.getMapped(from),  
ProbabilityMetadataUsageFeatureMembership_Mapping.getMapped(from)}
```

#### 7.8.2.3.2 ProbabilityMetadataUsageFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Element

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Probability')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
ProbabilityMetadataUsageReferenceUsage_Mapping.getMapped(from)
```

#### 7.8.2.3.3 ProbabilityMetadataUsageFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

Element

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Probability')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SysML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::ProbabilityData')
```

## 7.8.2.3.4 ProbabilityMetadataUsageReferenceUsage\_Mapping

### Description

Creates a reference usage.

### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

Element

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Probability')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{ProbabilityMetadataUsageReferenceUsageRedefinition_Mapping.getMapped(from),  
ProbabilityMetadataUsageReferenceUsageFeatureValue_Mapping.getMapped(from)}
```

### 7.8.2.3.5 ProbabilityMetadataUsageReferenceUsageFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Probability')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
let probability : OclAny =  
Helper.getTagValue(from, 'SysML::Activities::Probability', 'probability') in  
LiteralRational_Factory.create(probability)
```

### 7.8.2.3.6 ProbabilityMetadataUsageReferenceUsageRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Element

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Probability')
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SysML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::ProbabilityData::probability')
```

### 7.8.2.3.7 ProbabilityOwningMembership\_Mapping

#### Description

Creates an owning membership relationship for *ownedMemberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

OwningMembership

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Probability')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  
`ProbabilityMetadataUsage_Mapping.getMapped(from)`

### 7.8.2.3.8 RateMetadataUsage\_Mapping

#### Description

A `SysML::Activities::Rate` and the specializations `SysML::Activities::Discrete` and `SysML::Activities::Continuous` are mapped to a SysML v2 `MetadataUsage` owned by the appropriate target element of the `UML4SysML::ActivityEdge` or `UML4SysML::Parameter`.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
succession flow sysMLv1ObjectFlow of SysMLv1Block
  from sysMLv1Action1.outputValue to sysMLv1Action1.inputValue {
    @SysMLv1Library::RateData {isDiscrete = true;}
  }
```

The mapping of the rate instance value is not supported yet.

## General Mappings

`GenericToMetadataUsage_Mapping`

### Mapping Source

Element

### Mapping Target

MetadataUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Rate')
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Continuous')
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Discrete')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
let relationships : Set(KerML::Relationship) =
  Set{RateMetadataUsageFeatureTyping_Mapping.getMapped(from)} in
if Helper.hasStereotypeApplied(from, 'SysML::Activities::Discrete') then
  relationships
->including(
  RateMetadataUsageDiscreteFeatureMembership_Mapping.getMapped(from))
else if Helper.hasStereotypeApplied(from, 'SysML::Activities::Continuous') then
  relationships
->including(
  RateMetadataUsageContinuousFeatureMembership_Mapping.getMapped(from))
else
  relationships
endif
endif
```

#### 7.8.2.3.9 RateMetadataUsageContinuousFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Element

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Continuous')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`RateMetadataUsageContinuousReferenceUsage_Mapping.getMapped (from)`

### 7.8.2.3.10 RateMetadataUsageFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Rate')  
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Continuous')  
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Discrete')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureValue::value () : Expression [1]`  
`LiteralBoolean_Factory.create (true)`

### 7.8.2.3.11 RateMetadataUsageContinuousReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping



## Mapping Source

Element

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Continuous')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set {RateMetadataUsageContinuousReferenceUsageRedefinition_Mapping.getMapped(from),  
RateMetadataUsageFeatureValue_Mapping.getMapped(from)}
```

### 7.8.2.3.12 RateMetadataUsageContinuousReferenceUsageRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Element

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Continuous')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SysML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::RateData::isContinuous')
```

### 7.8.2.3.13 RateMetadataUsageDiscreteFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Discrete')
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`

```
RateMetadataUsageDiscreteReferenceUsage_Mapping.getMapped(from)
```

### 7.8.2.3.14 RateMetadataUsageDiscreteReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

## Mapping Source

Element

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Discrete')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set {RateMetadataUsageDiscreteReferenceUsageRedefinition_Mapping.getMapped(from) ,  
RateMetadataUsageFeatureValue_Mapping.getMapped(from) }
```

### 7.8.2.3.15 RateMetadataUsageDiscreteReferenceUsageRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Element

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Discrete')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SYSML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::RateData::isDiscrete')
```

### 7.8.2.3.16 RateMetadataUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Element

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Rate')  
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Continuous')  
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Discrete')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
SYSML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::RateData')
```

### 7.8.2.3.17 RateOwningMembership\_Mapping

#### Description

Creates a owning membership relationship for *ownedMemberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

### Mapping Source

Element

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Activities::Rate')  
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Continuous')  
or Helper.hasStereotypeApplied(src, 'SysML::Activities::Discrete')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`RateMetadataUsage_Mapping.getMapped(from)`

## 7.8.2.3.18 Model Libraries

### 7.8.2.3.18.1 ControlValues

The SysML v1 model library ControlValues contains the enumeration ControlValueKind.

#### 7.8.2.3.18.1.1 ControlValueKind

The enumeration ControlValueKind is mapped to the SysML v2 enumeration definition SysMLv1Library::Enumerations::ControlValueKind (see [7.3.2](#)).

## 7.8.3 Allocations

This chapter lists all mapping specifications of SysML::Allocations model elements.

### 7.8.3.1 Overview

The following table gives an overview of which SysML v2 elements the SysML::Allocations elements are transformed with which mapping class. The mapping details are in [7.8.3.3](#).

The justifications for the elements without mapping are given in [7.8.3.2](#).

**Table 24. List of all mappings**

<b>SysML v1 Concept</b>	<b>SysML v2 Concept</b>
Allocate	AllocationUsage
AllocateActivityPartition	

### 7.8.3.2 SysML::Allocations elements not mapped

**Table 25. List of SysML v1 elements not mapped of this section**

<b>SysML v1 Concept</b>	<b>Rationale</b>
AllocateActivityPartition	Mapping is not specified yet.

### 7.8.3.3 Mapping Specifications

#### 7.8.3.3.1 AllocationDefinition\_Mapping

##### Description

A SysML::Allocations::Allocate is mapped to a SysML v2 AllocationDefinition if it is an allocation between definition elements.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
action def SysMLv1Activity;  
part def SysMLv1Block;  
  
allocation def SysMLv1Allocation {  
    end : SysMLv1Activity;  
    end : SysMLv1Block;  
}
```

##### General Mappings

Abstraction\_Mapping

##### Mapping Source

Dependency

##### Mapping Target

AllocationDefinition

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
(Helper.hasStereotypeApplied(src, 'SysML::Allocations::Allocate')) and  
src.client->any(c | true).oclIsKindOf(UML::Type)
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- AllocationDefinition::ownedRelationship () : Relationship [0..\*]  

```
Set { AllocationDefinitionFromFeatureMembership_Mapping.getMapped (from) ,  
AllocationDefinitionToFeatureMembership_Mapping.getMapped (from) }
```

### 7.8.3.3.2 AllocationDefinitionToFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Dependency

#### Mapping Target

FeatureMembership

#### Owned Mappings

- allocationDefinitionToReferenceUsage : AllocationDefinitionToReferenceUsage\_Mapping

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::memberName () : String [0..1]  

```
'allocatedTo'
```
- FeatureMembership::ownedMemberFeature () : Feature [1]  

```
allocationDefinitionToReferenceUsage.to
```

### 7.8.3.3.3 AllocationDefinitionFromFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Dependency

### Mapping Target

FeatureMembership

### Owned Mappings

- allocationDefinitionFromReferenceUsage : AllocationDefinitionFromReferenceUsage\_Mapping

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::memberName () : String [0..1]  
    'allocatedFrom'
- FeatureMembership::ownedMemberFeature () : Feature [1]  
    allocationDefinitionFromReferenceUsage.to

#### 7.8.3.3.4 AllocationDefinitionFromFeatureTyping\_Mapping

### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

Dependency

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)



## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
from.source.get(0)
```

### 7.8.3.3.5 AllocationDefinitionFromReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Dependency

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::ownedRelationship () : Relationship [0..*]`

```
Set{AllocationDefinitionFromFeatureTyping_Mapping.getMapped(from)}
```

- `ReferenceUsage::isEnd () : Boolean [1]`

```
true
```

### 7.8.3.3.6 AllocationDefinitionToFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

### **Mapping Source**

Dependency

### **Mapping Target**

FeatureTyping

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
from.target.get(0)
```

### **7.8.3.3.7 AllocationDefinitionToReferenceUsage\_Mapping**

#### **Description**

Creates a reference usage.

#### **General Mappings**

GenericToReferenceUsage\_Mapping

#### **Mapping Source**

Dependency

#### **Mapping Target**

ReferenceUsage

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  
`Set {AllocationDefinitionToFeatureTyping_Mapping.getMapped (from) }`
- ReferenceUsage::isEnd () : Boolean [1]  
`true`

### 7.8.3.3.8 AllocationUsage\_Mapping

#### Description

A SysML::Allocations::Allocate is mapped to a SysML v2 AllocationUsage if it is an allocation between usage elements.

The details of the mapping is not defined yet.

#### General Mappings

GenericToUsage\_Mapping  
Abstraction\_Mapping

#### Mapping Source

Dependency

#### Mapping Target

AllocationUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
(Helper.hasStereotypeApplied (src, 'SysML::Allocations::Allocate')) and  
not src.client->any (c | true).oclIsKindOf (UML::Type)
```

#### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

## 7.8.4 Blocks

This chapter lists all mapping specifications of SysML::Blocks model elements.

### 7.8.4.1 Overview

The following table gives an overview of which SysML v2 elements the SysML::Blocks elements are transformed with which mapping class. The mapping details are in [7.8.4.3](#).

The justifications for the elements without mapping are given in [7.8.4.2](#).

**Table 26. List of all mappings**

SysML v1 Concept	SysML v2 Concept
AdjunctProperty	
BindingConnector	BindingConnectorAsUsage
Block	PartDefinition PartDefinition
BoundReference	
ClassifierBehaviorProperty	
ConnectorProperty	
DistributedProperty	
EndPathMultiplicity	
NestedConnectorEnd	
ParticipantProperty	
PropertySpecificType	
ValueType	AttributeDefinition

### 7.8.4.2 SysML::Blocks elements not mapped

**Table 27. List of SysML v1 elements not mapped of this section**

SysML v1 Concept	Rationale
AdjunctProperty	The concept of adjunct properties is not needed in SysML v2, where the principal of the adjunct property can be used directly in the appropriate place.
BoundReference	Mapping is not specified yet.
ClassifierBehaviorProperty	The classifier behavior is already mapped to a property which also plays the role of the classifier behavior property. Therefore, there is no explicit mapping of a classifier behavior property.
ConnectorProperty	The connector property is a special case of an adjunct property and is not mapped, just like the adjunct property.
DirectedRelationshipPropertyPath	The stereotype is abstract is therefore not mapped. The concept of the DirectedRelationshipPropertyPath is included in the SysML v2 language.
DistributedProperty	Mapping is not specified yet.

<b>SysML v1 Concept</b>	<b>Rationale</b>
ElementPropertyPath	The stereotype is abstract is therefore not mapped. The concept of the ElementPropertyPath is included in the SysML v2 language.
EndPathMultiplicity	Mapping is not specified yet.
NestedConnectorEnd	The concept of NestedConnectorEnd is already included in the SysML v2 language. It is not required to do an explicit mapping.
ParticipantProperty	Mapping is not specified yet.
PropertySpecificType	Mapping is not specified yet.

### 7.8.4.3 Mapping Specifications

#### 7.8.4.3.1 AssociationBlock\_Mapping

##### Description

An AssociationBlock is mapped to a SysML v2 ConnectionDefinition.

The SysML::Blocks::ParticipantProperties transformation is not defined yet. Therefore, the mapping is currently identical with the mapping of UML4SysML::AssociationClass.

##### General Mappings

AssociationClass\_Mapping

##### Mapping Source

AssociationClass

##### Mapping Target

ConnectionDefinition

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Blocks::Block')
```

##### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

#### 7.8.4.3.2 BindingConnector\_Mapping

##### Description

A SysML::Blocks::BindingConnector is mapped to a SysML v2 BindingConnectorAsUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block1 {
    part sysMLv1PartProperty1 : SysMLv1Block2;
    part sysMLv1PartProperty2 : SysMLv1Block2;

    binding sysMLv1BindingConnector
        bind sysMLv1PartProperty1 = sysMLv1PartProperty2;
}
part def SysMLv1Block2;
```

### General Mappings

Connector\_Mapping

#### Mapping Source

Connector

#### Mapping Target

BindingConnectorAsUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Blocks::BindingConnector')
```

#### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.8.4.3.3 Block\_Mapping

#### Description

A SysML::Blocks::Block is mapped to a SysML v2 PartDefinition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part definition SysMLv1Block;
```

### General Mappings

Class\_Mapping

## Mapping Source

Class

## Mapping Target

PartDefinition

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.ooclIsTypeOf(UML::AssociationClass)
  and Helper.hasStereotypeApplied(src, 'SysML::Blocks::Block')
  and not Helper.hasStereotypeApplied(src, 'SysML::ConstraintBlocks::ConstraintBlock')
  and not Helper.hasStereotypeApplied(src, 'SysML::Ports&Flows::InterfaceBlock')
```

## Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.8.4.3.4 EncapsulatedBlock\_Mapping

#### Description

A SysML::Block with *isEncapsulated=true* is mapped to a SysML v2 PartDefinition, and, additionally, gets a metadata feature defined by the SysML v1 library which represents the SysML v1 *isEncapsulated* property.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1EncapsulatedBlock {
  @SysMLv1Library::BlockData {isEncapsulated = true;}
}
```

## General Mappings

Block\_Mapping

## Mapping Source

Class

## Mapping Target

PartDefinition

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
not src.oclIsTypeOf(UML::AssociationClass) and
  Helper.hasStereotypeApplied(src, 'SysML::Blocks::Block') and
  not Helper.hasStereotypeApplied(src, 'SysML::ConstraintBlocks::ConstraintBlock') and
  not Helper.hasStereotypeApplied(src, 'SysML::Ports&Flows::InterfaceBlock') and
  Helper.getTagValue(src, 'SysML::Blocks::Block', 'isEncapsulated')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `PartDefinition::ownedRelationship () : Relationship [0..*]`

```
let toElementFMS: Set(UML::Element) =
  from.ownedElement->select(e | e.oclIsKindOf(UML::Property) and
    (e.oclAsType(UML::Property).redefinedProperty->size() = 0)) in
let redefinedAttributes: Set(UML::Element) =
  from.ownedElement->select(e | from.oclIsKindOf(UML::DataType) and
    (e.oclAsType(UML::Property).redefinedProperty->size() > 0)) in
let generalizations : Set(UML::Generalization) =
  from.ownedElement->select(e | e.oclIsKindOf(UML::Generalization)) in
let toElementOMS: Set(UML::Element) =
  (((from.ownedElement - toElementFMS) - redefinedAttributes) -
  generalizations) in
let relationships: Sequence(UML::Element) =
toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS
  ->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
->union(redefinedAttributes
  ->collect(e | AttributeRedefinedMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
->including(EncapsulatedBlockMetadataMembership_Mapping.getMapped(from)) in
if from.classifierBehavior.oclIsUndefined() then
  relationships
else
  relationships
  ->append(ClassifierBehaviorFeatureMembership_Mapping.getMapped(from))
endif
```

### 7.8.4.3.5 EncapsulatedBlockMetadataMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Class



### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`EncapsulatedBlockMetadata_Mapping.getMapped(from)`

### 7.8.4.3.6 EncapsulatedBlockMetadata\_Mapping

#### Description

The mapping class creates the metadata for the property SysML::Blocks::Block::isEncapsulated.

#### General Mappings

GenericToMetadataUsage\_Mapping

#### Mapping Source

Class

#### Mapping Target

MetadataUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]  
`Set { EncapsulatedBlockMetadataFeatureTyping_Mapping.getMapped(from),  
EncapsulatedBlockMetadataFeatureMembership_Mapping.getMapped(from) }`

#### 7.8.4.3.7 EncapsulatedBlockMetadataFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Class

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]  
EncapsulatedBlockMetadataReferenceUsage\_Mapping.getMapped(from)

#### 7.8.4.3.8 EncapsulatedBlockMetadataFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

Class

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SYSML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::BlockData')
```

### 7.8.4.3.9 EncapsulatedBlockMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Class

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{EncapsulatedBlockMetadataRedefinition_Mapping.getMapped(from),  
EncapsulatedBlockMetadataFeatureValue_Mapping.getMapped(from)}
```

### 7.8.4.3.10 EncapsulatedBlockMetadataFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

## General Mappings

GenericToFeatureValue\_Mapping

## Mapping Source

Class

## Mapping Target

FeatureValue

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`LiteralBoolean_Factory.create(true)`

### 7.8.4.3.11 EncapsulatedBlockMetadataRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Class

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SysML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::BlockData::isEncapsulated')
```

#### 7.8.4.3.12 Part\_Mapping

##### Description

A `UML4SysML::Property` with composite aggregation kind which is typed by a block is mapped to a `SysML::PartUsage`.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part def SysMLv1Block1 {  
    part sysMLv1PartProperty1 : SysMLv1Block2;  
}  
part def SysMLv1Block2;
```

##### General Mappings

Property\_Mapping

##### Mapping Source

Property

##### Mapping Target

PartUsage

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
if src.ocIsKindOf(UML::Property) and not src.ocIsKindOf(UML::Port) then  
    let p: UML::Property = src.ocAsType(UML::Property) in  
    not p.type.ocIsUndefined() and  
    Helper.hasStereotypeApplied(p.type, 'SysML::Blocks::Block') and  
    (p.association.ocIsUndefined() or p.association.ownedEnd->excludes(p)) and  
    p.aggregation = UML::AggregationKind::composite  
else  
    false  
endif
```

##### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

### 7.8.4.3.13 Model Libraries

The Blocks section of the SysML v1 specification contains two model libraries.

#### 7.8.4.3.13.1 PrimitiveValueTypes

The SysML v1 model library PrimitiveValueTypes contains primitive types that are mapped to the appropriate scalar values in SysML v2.

##### 7.8.4.3.13.1.1 Boolean

The SysML v1 primitive type Boolean is mapped to the SysML v2 ScalarValues::Boolean element.

##### 7.8.4.3.13.1.2 Complex

The SysML v1 primitive type Complex is mapped to the SysML v2 ScalarValues::Complex element.

##### 7.8.4.3.13.1.3 Integer

The SysML v1 primitive type Integer is mapped to the SysML v2 ScalarValues::Integer element.

##### 7.8.4.3.13.1.4 Number

The SysML v1 primitive type Number is abstract. Therefore, no mapping is defined for it.

##### 7.8.4.3.13.1.5 Real

The SysML v1 primitive type Real is mapped to the SysML v2 ScalarValues::Real element.

##### 7.8.4.3.13.1.6 String

The SysML v1 primitive type String is mapped to the SysML v2 ScalarValues::String element.

#### 7.8.4.3.13.2 UnitAndQuantityKind

The SysML v1 model library UnitAndQuantityKind contains the blocks Unit and QuantityKind.

##### 7.8.4.3.13.2.1 QuantityKind

The mapping of the SysML v1 QuantityKind element is not specified yet.

##### 7.8.4.3.13.2.2 Unit

The mapping of the SysML v1 QuantityKind element is not specified yet.

## 7.8.5 ConstraintBlocks

### 7.8.5.1 Overview

The following table gives an overview of which SysML v2 elements the SysML::ConstraintBlocks elements are transformed with which mapping class. The mapping details are in [7.8.5.2](#).

**Table 28. List of all mappings**

SysML v1 Concept	SysML v2 Concept
ConstraintBlock	ConstraintDefinition

## 7.8.5.2 Mapping Specifications

### 7.8.5.2.1 ConstraintBlock\_Mapping

#### Description

A SysML::ConstraintBlocks::ConstraintBlock is mapped to a SysML v2 ConstraintDefinition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
onstraint def SysMLv1ConstraintBlock {
    in attribute a : ScalarValues::Integer;
    in attribute b : ScalarValues::Integer;
    in attribute c : ScalarValues::Integer;

    constraint constraintExpression {
        language "OCL2.0"
        /*
         * c == a + b
         */
    }
}
```

#### General Mappings

Class\_Mapping

#### Mapping Source

Class

#### Mapping Target

ConstraintDefinition

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::ConstraintBlocks::ConstraintBlock')
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConstraintDefinition::ownedRelationship () : Relationship [0..\*]

```
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.ocIsKindOf(UML::Generalization)) in
let toElementFMS : Set(UML::Element) =
```

```

    from.ownedElement
    ->select(e | e.ocIsKindOf(UML::Property) or e.ocIsKindOf(UML::Constraint)) in
    let toElementOMS: Set(UML::Element) =
        (from.ownedElement - generalizations) - toElementFMS in
    toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
    ->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
    ->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
    ->including(CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from))

```

### 7.8.5.2.2 ConstraintParameter\_Mapping

#### Description

The mapping class maps SysML v1 constraint parameter to SysML v2 attribute usages.

#### General Mappings

Property\_Mapping

#### Mapping Source

Property

#### Mapping Target

AttributeUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```

Helper.hasStereotypeApplied(src.owner, 'SysML::ConstraintBlocks::ConstraintBlock')

```

#### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

## 7.8.6 Model Elements

This chapter lists all mapping specifications of SysML::ModelElements model elements.

### 7.8.6.1 Overview

The following table gives an overview of which SysML v2 elements the SysML::ModelElements elements are transformed with which mapping class. The mapping details are in [7.8.6.3](#).

The justifications for the elements without mapping are given in [7.8.6.2](#).

**Table 29. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Conform	



SysML v1 Concept	SysML v2 Concept
ElementGroup	Package
Expose	
Problem	Comment
Rationale	Comment
Stakeholder	ItemDefinition
View	
Viewpoint	

### 7.8.6.2 SysML::ModelElements elements not mapped

Table 30. List of SysML v1 elements not mapped of this section

SysML v1 Concept	Rationale
Conform	Mapping is not specified yet.
Expose	Mapping is not specified yet.
View	Mapping is not specified yet.

### 7.8.6.3 Mapping Specifications

#### 7.8.6.3.1 ProblemRationaleMetadataFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Comment

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [0..1]

```
ProblemRationaleMetadataReferenceUsage_Mapping.getMapped(from)
```

### 7.8.6.3.2 ProblemRationaleMetadataFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Comment

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
if Helper.hasStereotypeApplied(from, 'SysML::ModelElements::Problem') then
  SYSML2::MetadataDefinition.allInstances()
  ->any(m | m.qualifiedName = 'ModelingMetadata::Issue')
else if Helper.hasStereotypeApplied(from, 'SysML::ModelElements::Rationale') then
  SYSML2::MetadataDefinition.allInstances()
  ->any(m | m.qualifiedName = 'ModelingMetadata::Rationale')
else OclUndefined endif endif
```

### 7.8.6.3.3 ProblemRationaleMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

Comment

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  

```
Set{ ProblemRationaleMetadataRedefinition_Mapping.getMapped(from),  
  ProblemRationaleMetadataFeatureValue_Mapping.getMapped(from) }
```

## 7.8.6.3.4 ProblemRationaleMetadataFeatureValue\_Mapping

### Description

Creates a feature value relationship.

### General Mappings

GenericToFeatureValue\_Mapping

### Mapping Source

Comment

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
LiteralString_Factory.create(from.body)
```

### 7.8.6.3.5 ProblemRationaleMetadataMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Comment

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

```
ProblemRationaleMetadataUsage_Mapping.getMapped(from)
```

### 7.8.6.3.6 Concern\_Mapping

#### Description

The concern comments of a SysML::ModelElements::Stakeholder or a SysML::ModelElements::Viewpoint are mapped to SysML v2 ConcernUsages. The concern comments of the stakeholder are mapped to ConcernUsages which reference the stakeholder item definition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
item def SysMLv1Stakeholder {
    @SysMLv1Library::StakeholderData {isStakeholder = true;}
}
concern concernCommentXMI_ID {
```

```

        doc /* concern string */
        stakeholder : SysMLv1Stakeholder;
    }

```

## General Mappings

Comment\_Mapping

## Mapping Source

Comment

## Mapping Target

ConcernUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```

(not Helper.hasStereotypeApplied(src, 'SysML::ModelElements::ElementGroup')) and
((UML::Classifier.allInstances()
->select(s |
    Helper.hasStereotypeApplied(s, 'SysML::ModelElements::Stakeholder'))
->collect(c |
    Helper.getTagValue(c, 'SysML::ModelElements::Stakeholder', 'concernList'))
->flatten()
->includes(src)) or
(UML::Classifier.allInstances()
->select(s |
    Helper.hasStereotypeApplied(s, 'SysML::ModelElements::Viewpoint'))
->collect(c |
    Helper.getTagValue(c, 'SysML::ModelElements::Viewpoint', 'concernList'))
->flatten()->includes(src)))

```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConcernUsage::ownedRelationship () : Relationship [0..\*]

```

let toStakeholderMS : Set(UML::Classifier) =
    UML::Classifier.allInstances()
->select(s |
    Helper.hasStereotypeApplied(s, 'SysML::ModelElements::Stakeholder'))
->select(s |
    Helper.getTagValue(s, 'SysML::ModelElements::Stakeholder', 'concernList')
->flatten()->includes(from)) in

```

```

toStakeholderMS
->collect(e | ConcernStakeholderMembership_Mapping.getMapped(e))
->including(ConcernOwningMembership_Mapping.getMapped(from))
->including(
    CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from))
->including(EmptySubjectMembership_Factory.create())

```

### 7.8.6.3.7 ConcernDocumentation\_Mapping

#### Description

The mapping class creates the documentation element with the body string of the UML4SysML::Comment model element representing a concern.

#### General Mappings

GenericToDocumentation\_Mapping

#### Mapping Source

Comment

#### Mapping Target

Documentation

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Documentation::body () : String [1]

```
from.body
```

### 7.8.6.3.8 ConcernOwningMembership\_Mapping

#### Description

Creates a owning membership relationship for *ownedMemberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

### Mapping Source

Comment

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`ConcernDocumentation_Mapping.getMapped(from)`

### 7.8.6.3.9 ConcernStakeholderMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

StakeholderMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- StakeholderMembership::ownedMemberParameter () : Feature [1]

```
ConcernStakeholderPartUsage_Mapping.getMapped(from)
```

### 7.8.6.3.10 ConcernStakeholderPartUsage\_Mapping

#### Description

In SysML v1, the stakeholder element has concerns. In SysML v2, the Concern element has stakeholders. This mapping class creates a PartUsage of the type of the stakeholder for the concern element.

#### General Mappings

GenericToPartUsage\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

PartUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PartUsage::ownedRelationship () : Relationship [0..\*]

```
Set { ConcernStakeholderPartUsageFeatureTyping_Mapping.getMapped(from),  
      ConcernStakeholderPartUsageOwningMembership_Mapping.getMapped(from) }
```

### 7.8.6.3.11 ConcernStakeholderPartUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source



Classifier

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

from

## 7.8.6.3.12 ConcernStakeholderPartUsageOwningMembership\_Mapping

### Description

Creates a owning membership relationship for *ownedMemberElement()*.

### General Mappings

GenericToOwningMembership\_Mapping

### Mapping Source

Classifier

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

```
ConcernStakeholderPartUsageFeature_Mapping.getMapped(from)
```

### 7.8.6.3.13 ConcernStakeholderPartUsageFeature\_Mapping

#### Description

The mapping class creates a feature element for the concern stakeholder part usage.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

Multiplicity

#### Owned Mappings

(none)

### 7.8.6.3.14 ElementGroup\_Mapping

#### Description

A SysML::ModelElements::ElementGroup element is mapped to a SysML v2 Package with membership import relationships representing the grouping.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
package ElementGroupModel {
    part def SysMLv1Block1;
    attribute def SysMLv1ValueType;
    part def SysMLv1Block2 {
        part sysMLv1PartProperty:SysMLv1Block1;
    }
}

package SysMLv1ElementGroup {
    import ElementGroupModel::SysMLv1Block1;
    import ElementGroupModel::SysMLv1ValueType;
    import ElementGroupModel::SysMLv1Block2::sysMLv1PartProperty;

    @SysMLv1Library::ElementGroupData {criterion = "criterion string";}
}
```

#### General Mappings

Comment\_Mapping

#### Mapping Source

Comment

### Mapping Target

Package

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::ModelElements::ElementGroup')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Package::ownedRelationship () : Relationship [0..\*]

```
let elements : Set(KerML::Relationahip) =  
  Helper.getTagValueAsElementColl(from,  
    'SysML::ModelElements::ElementGroup', 'member')  
  ->collect(e | CommonElementImport_Mapping.getMapped(e)) in  
elements->including(ElementGroupMetadaMembership_Mapping.getMapped(from))
```

- Package::declaredName () : String [0..1]

```
Helper.getTagValueAsString(from, 'SysML::ModelElements::ElementGroup', 'name')
```

### 7.8.6.3.15 ElementGroupMetadaMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Comment

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `OwningMembership::ownedMemberElement () : Element [1]`  
`ElementGroupMetadataUsage_Mapping.getMapped (from)`

#### 7.8.6.3.16 ElementGroupMetadataFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Comment

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`ElementGroupMetadataReferenceUsage_Mapping.getMapped (from)`

#### 7.8.6.3.17 ElementGroupMetadataFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

## Mapping Source

Comment

## Mapping Target

FeatureTyping

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SYSML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::ElementGroupData')
```

### 7.8.6.3.18 ElementGroupMetadataFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Comment

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
let criterion: String = Helper.getTagValueAsString(from, 'SysML::ModelElements::ElementGroup')
LiteralString_Factory.create(criterion)
```

### 7.8.6.3.19 ElementGroupMetadataRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Comment

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]

```
let m : SYSML2::Membership =
  SYSML2::AttributeUsage.allInstances()
  ->collect(dt | dt.owningRelationship)
  ->select(r | r.ocIsKindOf(SYSML2::Membership))
  ->any(m | m.memberName = 'criterion') in
if (m.ocIsUndefined()) then
  OclUndefined
else
  m.memberElement
endif
```

### 7.8.6.3.20 ElementGroupMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

Comment

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{ElementGroupMetadataRedefinition_Mapping.getMapped(from),  
ElementGroupMetadataFeatureValue_Mapping.getMapped(from)}
```

### 7.8.6.3.21 ElementGroupMetadataUsage\_Mapping

#### Description

The mapping class creates the metadata usage element for the SysML::ModelElements::ElementGroup mapping.

#### General Mappings

GenericToMetadataUsage\_Mapping

#### Mapping Source

Comment

#### Mapping Target

MetadataUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
Set { ElementGroupMetadataFeatureTyping_Mapping.getMapped (from) ,  
      ElementGroupMetadataFeatureMembership_Mapping.getMapped (from) }
```

### 7.8.6.3.22 ProblemRationale\_Mapping

#### Description

The mapping class combines the mapping of SysML::ModelElements::Problem and SysML::ModelElements::Rationale. The SysML::ModelElements::Problem is mapped to the library element ModelingMetadata::Issue and the SysML::ModelElements::Rationale is mapped to ModelingMetadata::Rationale.

The expected SysML v2 textual syntax of the mapping is as follows.

```
@ModelingMetadata::Issue {text = "This is a problem statement";}
@ModelingMetadata::Rationale {text = "This is a rationale statement";}
```

#### General Mappings

Comment\_Mapping

#### Mapping Source

Comment

#### Mapping Target

Comment

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
(not Helper.hasStereotypeApplied(src, 'SysML::ModelElements::ElementGroup')) and  
(Helper.hasStereotypeApplied(src, 'SysML::ModelElements::Problem') or  
Helper.hasStereotypeApplied(src, 'SysML::ModelElements::Rationale'))
```

#### Mapping rules



In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Comment::ownedRelationship () : Relationship [0..\*]

```
self.annotation()  
->append(ProblemRationaleMetadataMembership_Mapping.getMapped(from))
```

### 7.8.6.3.23 ProblemRationaleMetadataRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Comment

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]

```
if Helper.hasStereotypeApplied(from, 'SysML::ModelElements::Problem') then  
  SYSML2::AttributeUsage.allInstances()  
  ->any(m | m.qualifiedName = 'ModelingMetadata::Issue::text')  
else if Helper.hasStereotypeApplied(from, 'SysML::ModelElements::Rationale') then  
  SYSML2::AttributeUsage.allInstances()  
  ->any(m | m.qualifiedName = 'ModelingMetadata::Rationale::text')  
else  
  OclUndefined  
endif  
endif
```

### 7.8.6.3.24 ProblemRationaleMetadataUsage\_Mapping

#### Description

The mapping class creates the metadata usage element for the SysML::ModelElements::Problem and SysML::ModelElements::Rationale transformation target.

### General Mappings

GenericToMetadataUsage\_Mapping

### Mapping Source

Comment

### Mapping Target

MetadataUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
Set{ProblemRationaleMetadataFeatureTyping_Mapping.getMapped(from),  
ProblemRationaleMetadataFeatureMembership_Mapping.getMapped(from)}
```

### 7.8.6.3.25 Stakeholder\_Mapping

#### Description

A SysML::ModelElements::Stakeholder is mapped to a SysML v2 ItemDefinition with metadata to tag it as a stakeholder. The concern comments of the stakeholder are mapped to ConcernUsages which reference the stakeholder item definition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
item def SysMLv1Stakeholder {@SysMLv1Library::StakeholderData {isStakeholder = true;}}  
concern concernCommentXMI_ID {  
    doc /* concern string */  
    stakeholder : SysMLv1Stakeholder;  
}
```

### General Mappings

Class\_Mapping

### Mapping Source

Class

## Mapping Target

ItemDefinition

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::ModelElements::Stakeholder')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ItemDefinition::ownedRelationship () : Relationship [0..\*]

```
let toElementFMS: Set(UML::Element) =
  from.ownedElement
  ->select(e | (e.ocIsKindOf(UML::Property) and
    (e.ocAsType(UML::Property).redefinedProperty->size() = 0)) or
    e.ocIsKindOf(UML::Operation)) in
let redefinedAttributes: Set(UML::Element) =
  from.ownedElement
  ->select(e | from.ocIsKindOf(UML::DataType) and
    (e.ocAsType(UML::Property).redefinedProperty->size() > 0)) in
let generalizations : Set(UML::Generalization) =
  from.ownedElement
  ->select(e | e.ocIsKindOf(UML::Generalization)) in
let constraints : Set(UML::Constraint) =
  UML::Constraint.allInstances()
  ->select(c | c.constrainedElement->includes(from)) in
let toElementOMS: Set(UML::Element) =
  (((from.ownedElement - toElementFMS) - redefinedAttributes) -
  generalizations) in
let relationships: Sequence(KerML::Relationship) =
  toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
  ->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
  ->union(constraints
    ->collect(e | ConstrainedElementFeatureMembership_Mapping.getMapped(e)))
  ->union(redefinedAttributes
    ->collect(e | AttributeRedefinedMembership_Mapping.getMapped(e)))
  ->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
  ->including(StakeholderMetadataOwningMembership_Mapping.getMapped(from)) in
if from.classifierBehavior.ocIsUndefined() then
  relationships
else
  relationships->append(ClassifierBehaviorFeatureMembership_Mapping.getMapped(from))
endif
```

### 7.8.6.3.26 StakeholderMetadataUsage\_Mapping

#### Description

The mapping class creates the metadata usage element for the SysML::ModelElements::Stakeholder mapping.

#### General Mappings

GenericToMetadataUsage\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

MetadataUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
Set { StakeholderMetadataFeatureTyping_Mapping.getMapped (from) ,  
      StakeholderMetadataFeatureMembership_Mapping.getMapped (from) }
```

### 7.8.6.3.27 StakeholderMetadataFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`StakeholderMetadataReferenceUsage_Mapping.getMapped(from)`

### 7.8.6.3.28 StakeholderMetadataFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`  
`SysML2::MetadataDefinition.allInstances()`  
`->any(m | m.qualifiedName = 'SysMLv1Library::StakeholderData')`

### 7.8.6.3.29 StakeholderMetadataOwningMembership

#### Description

Creates a owning membership relationship for *ownedMemberElement()*.

## General Mappings

GenericToOwningMembership\_Mapping

## Mapping Source

Classifier

## Mapping Target

OwningMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`StakeholderMetadataUsage_Mapping.getMapped(from)`

### 7.8.6.3.30 StakeholderMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set { StakeholderMetadataReferenceUsageRedefinition_Mapping.getMapped (from) ,  
StakeholderMetadataReferenceUsageFeatureValue_Mapping.getMapped (from) }
```

### 7.8.6.3.31 StakeholderMetadataReferenceUsageFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Classifier

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
LiteralBoolean_Factory.create (true)
```

### 7.8.6.3.32 StakeholderMetadataReferenceUsageRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Classifier

## Mapping Target

Redefinition

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
    SYSML2::AttributeUsage.allInstances()  
    ->any(m | m.qualifiedName = 'SysMLv1Library::StakeholderData::isStakeholder')
```

### 7.8.6.3.33 Viewpoint\_Mapping

#### Description

A `SysML::ModelElements::Viewpoint` is mapped to a SysML v2 `ViewDefinition` with an owned SysML v2 `ViewpointUsage`. In SysML v1, the viewpoint combines the purpose and stakeholder concerns as well as presentation information. This is covered by a SysML v2 `ViewDefinition` with owned SysML v2 `ViewpointUsage`.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
view def SysMLv1Viewpoint {  
    viewpoint sysMLv1Viewpoint {  
        frame concern1XmiID1;  
        frame concern2XmiID2;  
        metadata SysMLv1Library::ViewpointData {  
            languages = ("language1", "language2");  
            presentations = ("presentation1", "presentation2");  
        }  
        require constraint {  
            doc /* thisIsThePurpose */  
        }  
    }  
    satisfy sysMLv1Viewpoint;  
    rendering {  
        action : SysMLv1ViewpointMethodBehavior1;  
        action : SysMLv1ViewpointMethodBehavior2;  
    }  
}  
action def SysMLv1ViewpointMethodBehavior1;  
action def SysMLv1ViewpointMethodBehavior2;  
  
item def SysMLv1Stakeholder {@SysMLv1Library::StakeholderData {isStakeholder = true;}}  
  
concern concern1XmiID1 {  
    doc /* Concern1 */
```



```

        stakeholder : SysMLv1Stakeholder;
    }
    concern concern2XmiID2 {
        doc /* Concern2 */
        stakeholder : SysMLv1Stakeholder;
    }

```

## General Mappings

Class\_Mapping

### Mapping Source

Class

### Mapping Target

ViewDefinition

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::ModelElements::Viewpoint')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ViewDefinition::ownedRelationship () : Relationship [0..\*]

```

let toElementFMS: Set(UML::Element) =
    from.ownedElement->select(e | (e.oclIsKindOf(UML::Property) and
        (e.oclAsType(UML::Property).redefinedProperty->size() = 0)) or
        e.oclIsKindOf(UML::Comment)) in
let redefinedAttributes: Set(UML::Element) =
    from.ownedElement->select(e | from.oclIsKindOf(UML::DataType) and
        (e.oclAsType(UML::Property).redefinedProperty->size() > 0)) in
let generalizations : Set(UML::Generalization) =
    from.ownedElement->select(e | e.oclIsKindOf(UML::Generalization)) in
let toElementOMS: Set(UML::Element) =
    (((from.ownedElement - toElementFMS) - redefinedAttributes) -
        generalizations) in
let relationships: Sequence(UML::Element) =
    toElementOMS->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->union(toElementFMS->collect(e | ElementFeatureMembership_Mapping.getMapped(e)))
->union(redefinedAttributes
    ->collect(e | AttributeRedefinedMembership_Mapping.getMapped(e)))
->union(generalizations->collect(e | Generalization_Mapping.getMapped(e)))
->including(ViewpointViewpointUsageFeatureMembership_Mapping.getMapped(from))
->including(ViewpointSatisfyFeatureMembership_Mapping.getMapped(from))

```

```

->including(ViewpointRenderingFeatureMembership_Mapping.getMapped(from))
->including(
    CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from)) in
if from.classifierBehavior.oclIsUndefined() then
    relationships
else
    relationships
->append(ClassifierBehaviorFeatureMembership_Mapping.getMapped(from))
endif

```

### 7.8.6.3.34 ViewpointConcernReferenceSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

#### General Mappings

GenericToReferenceSubsetting\_Mapping

#### Mapping Source

Comment

#### Mapping Target

ReferenceSubsetting

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceSubsetting::referencedFeature () : Feature [1]

from

### 7.8.6.3.35 ViewpointConcernUsage\_Mapping

#### Description

The mapping class creates the concern usage element for the SysML::ModelElements::Viewpoint mapping.

#### General Mappings

GenericToRequirementUsage\_Mapping

#### Mapping Source

Comment

### Mapping Target

ConcernUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ConcernUsage::ownedRelationship () : Relationship [0..\*]  

```
Set {ViewpointConcernReferenceSubsetting_Mapping.getMapped(from),  
EmptySubjectMembership_Factory.create(),  
CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from)}
```

## 7.8.6.3.36 ViewpointConstraintUsage\_Mapping

### Description

The mapping class creates the constraint usage element for the SysML::ModelElements::Viewpoint mapping.

### General Mappings

GenericToConstraintUsage\_Mapping

### Mapping Source

Class

### Mapping Target

ConstraintUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ConstraintUsage::ownedRelationship () : Relationship [0..*]`

```
Set{ViewpointConstraintUsageOwningMembership_Mapping.getMapped(from),  
ReturnParameterFeatureMembership_Factory.create() }
```

### 7.8.6.3.37 ViewpointConstraintUsageDocumentation\_Mapping

#### Description

The mapping class creates the documentation element for the SysML::ModelElements::Viewpoint mapping.

#### General Mappings

GenericToDocumentation\_Mapping

#### Mapping Source

Class

#### Mapping Target

Documentation

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Documentation::body () : String [1]`

```
Helper.getTagValueAsString(from, 'SysML::ModelElements::Viewpoint', 'purpose')
```

### 7.8.6.3.38 ViewpointConstraintUsageOwningMembership\_Mapping

#### Description

Creates a owning membership relationship for *ownedMemberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Class

### Mapping Target

OwningMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`ViewpointConstraintUsageDocumentation_Mapping.getMapped(from)`

## 7.8.6.3.39 ViewpointFramedConcernMembership\_Mapping

### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Comment

### Mapping Target

FramedConcernMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FramedConcernMembership::ownedMemberFeature () : Feature [1]  
`ViewpointConcernUsage_Mapping.getMapped(from)`

#### 7.8.6.3.40 ViewpointLanguagesMetadataFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

##### General Mappings

GenericToFeatureMembership\_Mapping

##### Mapping Source

Class

##### Mapping Target

FeatureMembership

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ViewpointLanguagesMetadataReferenceUsage_Mapping.getMapped (from)`

#### 7.8.6.3.41 ViewpointLanguagesMetadataFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

Class

##### Mapping Target

FeatureValue

##### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
ViewpointLanguagesMetadataOperatorExpression_Mapping.getMapped(from)
```

### 7.8.6.3.42 ViewpointLanguagesMetadataRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Class

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]

```
SYSML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::ViewpointData::languages')
```

### 7.8.6.3.43 ViewpointLanguagesMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

### Mapping Source

Class

### Mapping Target

ReferenceUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]  

```
Set {ViewpointLanguagesMetadataRedefinition_Mapping.getMapped (from) ,  
ViewpointLanguagesMetadataFeatureValue_Mapping.getMapped (from) }
```

## 7.8.6.3.44 ViewpointMetadataFeatureTyping\_Mapping

### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

Class

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules



In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SysML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::ViewpointData')
```

#### 7.8.6.3.45 ViewpointLanguagesMetadataOperatorExpression\_Mapping

##### Description

The mapping class creates the operator expression for the list of languages of the SysML::ModelElements::Viewpoint mapping.

##### General Mappings

GenericToOperatorExpression\_Mapping

##### Mapping Source

Class

##### Mapping Target

OperatorExpression

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OperatorExpression::operator () : String [1]

```
','
```

- OperatorExpression::ownedRelationship () : Relationship [0..\*]

```
Helper.getTagValueAsStringColl(from, 'SysML::ModelElements::Viewpoint', 'language')  
->collect(e | StringParameterMembership_Factory.create(e))
```

#### 7.8.6.3.46 ViewpointMetadataOwningMembership\_Mapping

##### Description

Creates a owning membership relationship for *ownedMemberElement()*.

##### General Mappings

GenericToOwningMembership\_Mapping

**Mapping Source**

Class

**Mapping Target**

OwningMembership

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
    ViewpointMetadataUsage\_Mapping.getMapped (from)

**7.8.6.3.47 ViewpointMetadataUsage\_Mapping**

**Description**

The mapping class creates the metadata usage element for the SysML::ModelElements::Viewpoint mapping.

**General Mappings**

GenericToMetadataUsage\_Mapping

**Mapping Source**

Class

**Mapping Target**

MetadataUsage

**Owned Mappings**

(none)

**Applicable filters**

(none)

**Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `MetadataUsage::ownedRelationship () : Relationship [0..*]`

```
Set {ViewpointMetadataFeatureTyping_Mapping.getMapped (from) ,  
ViewpointLanguagesMetadataFeatureMembership_Mapping.getMapped (from) ,  
ViewpointPresentationsMetadataFeatureMembership_Mapping.getMapped (from) }
```

#### **7.8.6.3.48 ViewpointPresentationsMetadataFeatureMembership\_Mapping**

##### **Description**

Creates a feature membership relationship for *ownedMemberFeature()*.

##### **General Mappings**

GenericToFeatureMembership\_Mapping

##### **Mapping Source**

Class

##### **Mapping Target**

FeatureMembership

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`

```
ViewpointPresentationsMetadataReferenceUsage_Mapping.getMapped (from)
```

#### **7.8.6.3.49 ViewpointPresentationsMetadataFeatureValue\_Mapping**

##### **Description**

Creates a feature value relationship.

##### **General Mappings**

GenericToFeatureValue\_Mapping

##### **Mapping Source**

Class

### Mapping Target

FeatureValue

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]  
`ViewpointPresentationsMetadataOperatorExpression_Mapping.getMapped(from)`

## 7.8.6.3.50 ViewpointPresentationsMetadataOperatorExpression\_Mapping

### Description

The mapping class creates the operator expression for the list of presentations of the SysML::ModelElements::Viewpoint mapping.

### General Mappings

GenericToOperatorExpression\_Mapping

### Mapping Source

Class

### Mapping Target

OperatorExpression

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OperatorExpression::ownedRelationship () : Relationship [0..\*]

```

Helper.getTagValueAsStringColl(from,
    'SysML::ModelElements::Viewpoint', 'presentation')
->collect(e | StringParameterMembership_Factory.create(e))

```

- OperatorExpression::operator () : String [1]
- ','

### 7.8.6.3.51 ViewpointPresentationsMetadataRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

#### General Mappings

GenericToRedefinition\_Mapping

#### Mapping Source

Class

#### Mapping Target

Redefinition

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Redefinition::redefinedFeature () : Feature [1]

```

SYSML2::AttributeUsage.allInstances()
->any(m | m.qualifiedName = 'SysMLv1Library::ViewpointData::presentations')

```

### 7.8.6.3.52 ViewpointPresentationsMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Class

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{ViewpointPresentationsMetadataRedefinition_Mapping.getMapped(from),  
ViewpointPresentationsMetadataFeatureValue_Mapping.getMapped(from)}
```

### 7.8.6.3.53 ViewpointRenderingFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Class

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]

```
ViewpointRenderingUsage_Mapping.getMapped(from)
```

### 7.8.6.3.54 ViewpointRenderingUsage\_Mapping

#### Description

The mapping class creates the rendering usage element for the SysML::ModelElements::Viewpoint mapping class.

#### General Mappings

GenericToPartUsage\_Mapping

#### Mapping Source

Class

#### Mapping Target

RenderingUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- RenderingUsage::ownedRelationship () : Relationship [0..\*]

```
from.ownedOperation
->select( o | Helper.hasStereotypeApplied(o, 'Create') )
->collect( e |
    ViewpointRenderingUsageActionUsageFeatureMembership_Mapping.getMapped(e))
```

### 7.8.6.3.55 ViewpointRenderingUsageActionUsage\_Mapping

#### Description

The mapping class creates the action usage element for the rendering usage element for the SysML::ModelElements::Viewpoint mapping class.

#### General Mappings

GenericToActionUsage\_Mapping

#### Mapping Source

Class

#### Mapping Target

ActionUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ActionUsage::ownedRelationship () : Relationship [0..*]`  
`Set{ViewpointRenderingUsageActionUsageFeatureTyping_Mapping.getMapped(from)}`

### 7.8.6.3.56 ViewpointRenderingUsageActionUsageFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Class

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`ViewpointRenderingUsageActionUsage_Mapping.getMapped(from)`

### 7.8.6.3.57 ViewpointRenderingUsageActionUsageFeatureTyping\_Mapping

#### Description



Creates a feature typing relationship owned by the element *typedFeature()*.

### General Mappings

GenericToFeatureTyping\_Mapping

### Mapping Source

Class

### Mapping Target

FeatureTyping

### Owned Mappings

(none)

## 7.8.6.3.58 ViewpointRequirementConstraintMembership\_Mapping

### Description

Creates a membership relationship for *memberElement()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Class

### Mapping Target

RequirementConstraintMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- RequirementConstraintMembership::ownedMemberFeature () : Feature [1]  
ViewpointConstraintUsage\_Mapping.getMapped(from)

## 7.8.6.3.59 ViewpointSatisfyFeatureMembership\_Mapping

### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

Class

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
ViewpointSatisfyRequirementUsage\_Mapping.getMapped(from)

## 7.8.6.3.60 ViewpointSatisfyRequirementUsage\_Mapping

### Description

The mapping class creates the satisfy requirement usage element for the SysML::ModelElements::Viewpoint mapping.

### General Mappings

GenericToRequirementUsage\_Mapping

### Mapping Source

Class

### Mapping Target

SatisfyRequirementUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SatisfyRequirementUsage::ownedRelationship () : Relationship [0..\*]

```
Set {ViewpointSatisfyRequirementUsageReferenceSubsetting_Mapping.getMapped (from) ,  
EmptySubjectMembership_Factory.create () ,  
ReturnParameterFeatureMembership_Factory.create () }
```

#### 7.8.6.3.61 ViewpointSatisfyRequirementUsageReferenceSubsetting\_Mapping

##### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettingFeature()*.

##### General Mappings

GenericToReferenceSubsetting\_Mapping

##### Mapping Source

Class

##### Mapping Target

ReferenceSubsetting

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceSubsetting::referencedFeature () : Feature [1]

```
ViewpointViewpointUsage_Mapping.getMapped (from)
```

#### 7.8.6.3.62 ViewpointViewpointUsage\_Mapping

##### Description

The mapping class creates the embedded viewpoint usage for the SysML::ModelElements::Viewpoint mapping.

##### General Mappings

GenericToUsage\_Mapping

### Mapping Source

Class

### Mapping Target

ViewpointUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ViewpointUsage::ownedRelationship () : Relationship [0..\*]

```
Helper.getTagValueAsElementColl(  
    from, 'SysML::ModelElements::Viewpoint', 'concernList')  
->collect(e | ViewpointFramedConcernMembership_Mapping.getMapped(e))  
->including(ViewpointMetadataOwningMembership_Mapping.getMapped(from))  
->including(EmptySubjectMembership_Factory.create())  
->including(ViewpointRequirementConstraintMembership_Mapping.getMapped(from))
```

- ViewpointUsage::declaredName () : String [0..1]

```
from.name.substring(1,1).toLowerCase() + from.name.substring(2, from.name.size())
```

### 7.8.6.3.63 ViewpointViewpointUsageFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Class

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
ViewpointViewpointUsage\_Mapping.getMapped(from)

## 7.8.7 PortsAndFlows

This chapter lists all mapping specifications of SysML::PortsAndFlows model elements.

### 7.8.7.1 Overview

The following table gives an overview of which SysML v2 elements the SysML::Ports&Flows elements are transformed with which mapping class. The mapping details are in [7.8.7.3](#).

The justifications for the elements without mapping are given in [7.8.7.2](#).

**Table 31. List of all mappings**

SysML v1 Concept	SysML v2 Concept
AcceptChangeStructuralFeatureEventAction	AcceptActionUsage
AddFlowPropertyValueOnNestedPortAction	
ChangeStructuralFeatureEvent	
DirectedFeature	PerformActionUsage
FlowProperty	
FullPort	PartUsage
InterfaceBlock	PortDefinition
InvocationOnNestedPortAction	
ItemFlow	FlowConnectionUsage
ProxyPort	
TriggerOnNestedPort	
~InterfaceBlock	

### 7.8.7.2 SysML::Ports&Flows elements not mapped

**Table 32. List of SysML v1 elements not mapped of this section**

SysML v1 Concept	Rationale
AddFlowPropertyValueOnNestedPortAction	Mapping is not specified yet.

<b>SysML v1 Concept</b>	<b>Rationale</b>
ChangeStructuralFeatureEvent	Mapping is not specified yet.
FlowProperty	Mapping is not specified yet.
InvocationOnNestedPortAction	Mapping is not specified yet.
TriggerOnNestedPort	Mapping is not specified yet.
~InterfaceBlock	Mapping is not specified yet.

### 7.8.7.3 Mapping Specifications

#### 7.8.7.3.1 AcceptChangeStructuralFeatureEventAction\_Mapping

##### Description

The SysML::PortsAndFlows::AcceptChangeStructuralFeatureEventAction element is mapped to SysML v2 AcceptActionUsage. The details of the mapping are not defined yet.

##### General Mappings

AcceptEventAction\_Mapping

##### Mapping Source

AcceptEventAction

##### Mapping Target

AcceptActionUsage

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src,
'SysML::Ports&Flows::AcceptChangeStructuralFeatureEventAction')
```

##### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

#### 7.8.7.3.2 CommonFullPort\_Mapping

##### Description

The abstract mapping class is the base class of the mapping classes for the SysML::Ports&Flows::FullPort mappings.

##### General Mappings

PropertyCommon\_Mapping

## Mapping Source

Port

## Mapping Target

PartUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PartUsage::ownedRelationship () : Relationship [0..\*]

```
let typings: Set(KerML::FeatureTyping) = if from.type.ocIsUndefined() then
    Set{}
else
    Set{StructuralFeatureToFeatureTyping_Mapping.getMapped(from)}
endif in
let subsetings: Set(KerML::Subsetting) = from.subsettedProperty
->collect(p | PropertySubsetting_Mapping.getMapped(from, p))->asSet() in
let defaultValue: Set(KerML::OwningMembership) =
if from.defaultValue.ocIsUndefined() then
    Set{}
else
    Set{DefaultValue_Mapping.getMapped(from)}
endif in
typings->union(subsetings)->union(defaultValue)
->including(MultiplicityMembership_Mapping.getMapped(from))->asSet()
->including(FullPortMetadataOwningMembership_Mapping.getMapped(from))
```

### 7.8.7.3.3 FeatureDirectionKind

The SysML::Ports&Flows::FeatureDirectionKind enumeration is mapped to the SysML v2 FeatureDirectionKind enumeration according to the following mapping table.

SysML::Ports&Flows::FeatureDirectionKind	SysML v2 FeatureDirectionKind
provided	out
required	in
provreqd	inout

### 7.8.7.3.4 FlowDirectionKind

The SysML::Ports&Flows::FlowDirectionKind enumeration is mapped to the SysML v2 FeatureDirectionKind enumeration according to the following mapping table.

SysML::Ports&Flows::FlowDirectionKind	SysML v2 FeatureDirectionKind
out	out
in	in
inout	inout

### 7.8.7.3.5 FullPort\_Mapping

#### Description

A SysML::Ports&Flows::FullPort element is mapped to a part usage in SysML v2 with metadata that marks the part usage as a full port. The metadata is defined in the SysML v1 library for SysML v2.

The mapping class FullPortUntyped\_Mapping does the same for full ports that have no type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part sysMLv1FullPort : SysMLv1Block {SysMLv1Library::PortData {isFullPort = true;}}
```

#### General Mappings

Port\_Mapping  
CommonFullPort\_Mapping

#### Mapping Source

Port

#### Mapping Target

PartUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
(not src.type.oclIsUndefined()) and  
Helper.hasStereotypeApplied(src, 'SysML::Ports&Flows::FullPort')
```

#### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.



### 7.8.7.3.6 FullPortMetadata\_Mapping

#### Description

Create the metadata usage element to annotate a port with the information that its SysML v1 mapping source element is a SysML v1 full port element.

#### General Mappings

GenericToMetadataUsage\_Mapping

#### Mapping Source

Port

#### Mapping Target

MetadataUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
Set { FullPortMetadataFeatureTyping_Mapping.getMapped (from) ,  
      FullPortMetadataFeatureMembership_Mapping.getMapped (from) }
```

### 7.8.7.3.7 FullPortMetadataFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Port

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`FullPortMetadataReferenceUsage_Mapping.getMapped(from)`

### 7.8.7.3.8 FullPortMetadataFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Port

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`  
`SysML2::MetadataDefinition.allInstances()`  
`->any(m | m.qualifiedName = 'SysMLv1Library::PortData')`

### 7.8.7.3.9 FullPortMetadataOwningMembership\_Mapping

#### Description

Creates a owning membership relationship for *ownedMemberElement()*.

## General Mappings

GenericToOwningMembership\_Mapping

## Mapping Source

Port

## Mapping Target

OwningMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

```
FullPortMetadata_Mapping.getMapped(from)
```

### 7.8.7.3.10 FullPortMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Port

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::ownedRelationship () : Relationship [0..*]`

```
Set { FullPortMetadataReferenceUsageRedefinition_Mapping.getMapped (from) ,  
FullPortMetadataReferenceUsageFeatureValue_Mapping.getMapped (from) }
```

#### 7.8.7.3.11 FullPortMetadataReferenceUsageFeatureValue\_Mapping

##### Description

Creates a feature value relationship.

##### General Mappings

GenericToFeatureValue\_Mapping

##### Mapping Source

Port

##### Mapping Target

FeatureValue

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureValue::value () : Expression [1]`

```
LiteralBoolean_Factory.create (true)
```

#### 7.8.7.3.12 FullPortMetadataReferenceUsageRedefinition\_Mapping

##### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

##### General Mappings

GenericToRedefinition\_Mapping

##### Mapping Source

Port

## Mapping Target

Redefinition

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SysML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::PortData::isFullPort')
```

### 7.8.7.3.13 FullPortUntyped\_Mapping

#### Description

A `SysML::Ports&Flows::FullPort` element is mapped to a part usage in SysML v2 with metadata that marks the part usage as a full port. The metadata is defined in the SysML v1 library for SysML v2.

The mapping class `FullPort_Mapping` does the same for full ports with a type.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
part sysMLv1FullPort {SysMLv1Library::PortData {isFullPort = true;}}
```

#### General Mappings

PortUntyped\_Mapping  
CommonFullPort\_Mapping

#### Mapping Source

Port

#### Mapping Target

PartUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
src.type.oclIsUndefined() and  
Helper.hasStereotypeApplied(src, 'SysML::Ports&Flows::FullPort')
```

### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

#### 7.8.7.3.14 InterfaceBlock\_Mapping

##### Description

A SysML::Ports&Flows::InterfaceBlock element is mapped to a SysML v2 PortDefinition.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
port def SysMLv1InterfaceBlock;
```

##### General Mappings

Block\_Mapping

##### Mapping Source

Class

##### Mapping Target

PortDefinition

##### Owned Mappings

(none)

##### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Ports&Flows::InterfaceBlock')
```

### Mapping rules

The mapping class only has inherited rules. See the mapping classes in the general mapping section for details.

#### 7.8.7.3.15 ItemFlow\_Mapping

##### Description

A SysML::Ports&Flows::ItemFlow element is mapped to a SysML v2 FlowConnectionUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

part sysMLv1PartProperty1 : SysMLv1Block1;
part sysMLv1PartProperty2 : SysMLv1Block2;

connection sysMLv1Connector connect sysMLv1PartProperty1 to sysMLv1PartProperty2;
message sysMLv1ItemFlow :> sysMLv1Connector
  of SysMLv1Block3
  from sysMLv1PartProperty1 to sysMLv1PartProperty2;

part def SysMLv1Block1;
part def SysMLv1Block2;
part def SysMLv1Block3;

```

## General Mappings

InformationFlow\_Mapping

### Mapping Source

InformationFlow

### Mapping Target

FlowConnectionUsage

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Ports&Flows::ItemFlow')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FlowConnectionUsage::ownedRelationship () : Relationship [0..\*]  

```
Set{ItemFlowFeatureMembership_Mapping.getMapped(from),
ItemFlowSourceEndFeatureMembership_Mapping.getMapped(from),
ItemFlowTargetEndFeatureMembership_Mapping.getMapped(from)}
```
- FlowConnectionUsage::source () : Element [0..\*]  

```
NamedElementMain_Mapping.getMappedColl(from.informationSource)
```
- FlowConnectionUsage::target () : Element [0..\*]  

```
NamedElementMain_Mapping.getMappedColl(from.informationTarget)
```

#### 7.8.7.3.16 ItemFlowFeatureMembership\_Mapping

##### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

### General Mappings

GenericToFeatureMembership\_Mapping

### Mapping Source

InformationFlow

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ItemFlowItemFeature_Mapping.getMapped(from)`

## 7.8.7.3.17 ItemFlowItemFeature\_Mapping

### Description

The mapping class creates the item feature element for the item that flows.

### General Mappings

GenericToFeature\_Mapping

### Mapping Source

InformationFlow

### Mapping Target

ItemFeature

### Owned Mappings

(none)

### Applicable filters

(none)



## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ItemFeature::ownedRelationship () : Relationship [0..*]`

```
Set { ItemFlowItemFeatureTyping_Mapping.getMapped (from) }
```

### 7.8.7.3.18 ItemFlowItemFeatureTyping\_Mapping

#### Description

Currently, only one conveyed item is supported

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

InformationFlow

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
if from.conveyed->size() > 0 then
Classifier_Mapping.getMapped (from.conveyed.get (0))
else OclUndefined
endif
```

### 7.8.7.3.19 ItemFlowSourceEndFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

### **Mapping Source**

InformationFlow

### **Mapping Target**

FeatureMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ItemFlowSourceFeature_Mapping.getMapped (from)`

### **7.8.7.3.20 ItemFlowSourceFeature\_Mapping**

#### **Description**

The mapping class creates the source item flow end for the item flow mapping.

#### **General Mappings**

GenericToFeature\_Mapping

#### **Mapping Source**

InformationFlow

#### **Mapping Target**

ItemFlowEnd

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ItemFlowEnd::isEnd () : Boolean [1]  
`true`
- ItemFlowEnd::ownedRelationship () : Relationship [0..\*]  
`Set {ItemFlowSourceFeatureSubsetting_Mapping.getMapped (from) }`

### 7.8.7.3.21 ItemFlowSourceFeatureSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

InformationFlow

#### Mapping Target

Subsetting

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettedFeature () : Feature [1]  
`from.source.get (0)`

### 7.8.7.3.22 ItemFlowTargetEndFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

InformationFlow

### **Mapping Target**

FeatureMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`ItemFlowTargetFeature_Mapping.getMapped (from)`

## **7.8.7.3.23 ItemFlowTargetFeature\_Mapping**

### **Description**

The mapping class creates the target item flow end for the item flow mapping.

### **General Mappings**

GenericToFeature\_Mapping

### **Mapping Source**

InformationFlow

### **Mapping Target**

ItemFlowEnd

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ItemFlowEnd::isEnd () : Boolean [1]

true

- ItemFlowEnd::ownedRelationship () : Relationship [0..\*]

Set { ItemFlowTargetFeatureSubsetting\_Mapping.getMapped (from) }

#### 7.8.7.3.24 ItemFlowTargetFeatureSubsetting\_Mapping

##### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

##### General Mappings

GenericToSubsetting\_Mapping

##### Mapping Source

InformationFlow

##### Mapping Target

Subsetting

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Subsetting::subsettedFeature () : Feature [1]

from.target.get (0)

#### 7.8.7.3.25 OperationDirectedFeature\_Mapping

##### Description

The mapping class sets the direction of the perform action usage if the SysML v1 mapping source operation has the stereotype SysML::Ports&Flows::DirectedFeature applied.

##### General Mappings

Operation\_Mapping

##### Mapping Source

Operation

## Mapping Target

PerformActionUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Ports&Flows::DirectedFeature')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- PerformActionUsage::direction () : FeatureDirectionKind [0..1]

```
Helper.getKerMLFeatureDirectionKind(  
  Helper.getTagValueAsElement(  
    from, 'SysML::Ports&Flows::DirectedFeature', 'featureDirection'  
  ))
```

## 7.8.8 Requirements

This chapter lists all mapping specifications of SysML::Requirements model elements.

### 7.8.8.1 Overview

The following table gives an overview of which SysML v2 elements the SysML::Requirements elements are transformed with which mapping class. The mapping details are in [7.8.8.3](#).

The justifications for the elements without mapping are given in [7.8.8.2](#).

**Table 33. List of all mappings**

SysML v1 Concept	SysML v2 Concept
Copy	
DeriveReq	ConnectionUsage
Refine	Dependency
Requirement	RequirementUsage
Satisfy	SatisfyRequirementUsage
TestCase	VerificationCaseDefinition
Trace	Dependency
Verify	RequirementVerificationMembership

## 7.8.8.2 SysML::Requirements elements not mapped

Table 34. List of SysML v1 elements not mapped of this section

SysML v1 Concept	Rationale
Copy	The copy relationship is not covered by SysML v2.

## 7.8.8.3 Mapping Specifications

### 7.8.8.3.1 DeriveReq Mapping

#### Description

A SysML::Requirements::DeriveReq relationship is mapped to a SysML v2 DerivationConnections::Derivation model library element.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
requirement <'id1'> SysMLv1Requirement {
    doc /*
        * requirement text
        */
}
requirement <'id2'> SysMLv1RequirementDerived {
    doc /*
        * requirement text
        */
}
connection : DerivationConnections::Derivation
    connect SysMLv1RequirementDerived to SysMLv1Requirement;
```

#### General Mappings

Abstraction\_Mapping  
GenericToConnectionUsage\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

ConnectionUsage

#### Owned Mappings

(none)

#### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Requirements::DeriveReq')
```

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ConnectionUsage::ownedRelationship () : Relationship [0..*]`

```
Set { DeriveReqFeatureTyping_Mapping.getMapped (from) ,  
DeriveReqSourceEndFeatureMembership_Mapping.getMapped (from) ,  
DeriveReqTargetEndFeatureMembership_Mapping.getMapped (from) }
```

### 7.8.8.3.2 DeriveReqFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Dependency

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
SYSMML2::ConnectionDefinition.allInstances ()  
->any (m | m.qualifiedName = 'DerivationConnections::Derivation')
```

### 7.8.8.3.3 DeriveReqSourceEndFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source



Dependency

### Mapping Target

FeatureMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureMembership::ownedMemberFeature () : Feature [1]  
`DeriveReqSourceFeature_Mapping.getMapped(from)`

#### 7.8.8.3.4 DeriveReqSourceFeature\_Mapping

##### Description

The mapping class creates the source feature of the ConnectionUsage relationship for the mapping of the SysML v1 deriveReq relationship.

##### General Mappings

GenericToFeature\_Mapping

##### Mapping Source

Dependency

##### Mapping Target

Feature

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Feature::ownedRelationship () : Relationship [0..\*]

```
Set{DeriveReqSourceFeatureReferenceSubsetting_Mapping.getMapped(from)}
```

### 7.8.8.3.5 DeriveReqSourceFeatureReferenceSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettingFeature()*.

#### General Mappings

GenericToReferenceSubsetting\_Mapping

#### Mapping Source

Dependency

#### Mapping Target

ReferenceSubsetting

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceSubsetting::referencedFeature () : Feature [1]

```
from.client->any(c | true)
```

### 7.8.8.3.6 DeriveReqTargetEndFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToEndFeatureMembership\_Mapping

#### Mapping Source

Dependency

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`DeriveReqTargetFeature_Mapping.getMapped(from)`

### 7.8.8.3.7 DeriveReqTargetFeature\_Mapping

#### Description

The mapping class creates the target feature of the `ConnectionUsage` relationship for the mapping of the SysML v1 `deriveReq` relationship.

#### General Mappings

`GenericToFeature_Mapping`

#### Mapping Source

Dependency

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Feature::ownedRelationship () : Relationship [0..*]`  
`Set{DeriveReqTargetFeatureReferenceSubsetting_Mapping.getMapped(from)}`

### 7.8.8.3.8 DeriveReqTargetFeatureReferenceSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the `subsettingFeature()` and the `subsettingFeature()`.

## General Mappings

GenericToReferenceSubsetting\_Mapping

## Mapping Source

Dependency

## Mapping Target

ReferenceSubsetting

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceSubsetting::referencedFeature () : Feature [1]

```
from.supplier->any(c | true)
```

### 7.8.8.3.9 Refine\_Mapping

#### Description

A SysML::Requirements::Refine relationship is mapped to a SysML v2 Dependency relationship annotated with a metadata usage tagging it as a former SysML v1 refine relationship.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
requirement <'id1'> SysMLv1Requirement {
    doc /*
        * requirement text
        */
}
use case def SysMLv1UseCase;

dependency from SysMLv1UseCase to SysMLv1Requirement {
    @SysMLv1Library::RefineData {isRefine = true;}
}
```

## General Mappings

Abstraction\_Mapping

## Mapping Source

Abstraction

### Mapping Target

Dependency

### Owned Mappings

(none)

### Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Requirements::Refine')
```

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Dependency::ownedRelationship () : Relationship [0..\*]

```
ElementOwnership_Mapping.getMappedColl(from.ownedComment)  
->including(RefineAnnotation_Mapping.getMapped(from))
```

## 7.8.8.3.10 RefineAnnotation\_Mapping

### Description

The mapping class creates the annotation relationship for the SysML::Requirements::Refine mapping.

### General Mappings

GenericToAnnotation\_Mapping

### Mapping Source

Abstraction

### Mapping Target

Annotation

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Annotation::annotatingElement () : AnnotatingElement [1]`  
`RefineMetadataUsage_Mapping.getMapped(from)`

#### **7.8.8.3.11 RefineMetadataFeatureMembership\_Mapping**

##### **Description**

Creates a feature membership relationship for *ownedMemberFeature()*.

##### **General Mappings**

GenericToFeatureMembership\_Mapping

##### **Mapping Source**

Abstraction

##### **Mapping Target**

FeatureMembership

##### **Owned Mappings**

(none)

##### **Applicable filters**

(none)

##### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`RefineMetadataReferenceUsage_Mapping.getMapped(from)`

#### **7.8.8.3.12 RefineMetadataReferenceUsage\_Mapping**

##### **Description**

Creates a reference usage.

##### **General Mappings**

GenericToReferenceUsage\_Mapping

##### **Mapping Source**

Abstraction

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set { RefineMetadataReferenceUsageRedefinition_Mapping.getMapped(from),  
      RefineMetadataReferenceUsageFeatureValue_Mapping.getMapped(from) }
```

### 7.8.8.3.13 RefineMetadataReferenceUsageFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
LiteralBoolean_Factory.create(true)
```

#### 7.8.8.3.14 RefineMetadataReferenceUsageRedefinition\_Mapping

##### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

##### General Mappings

GenericToRedefinition\_Mapping

##### Mapping Source

Abstraction

##### Mapping Target

Redefinition

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SysML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::RefineData::isRefine')
```

#### 7.8.8.3.15 RefineMetadataUsage\_Mapping

##### Description

Create the metadata usage element to annotate a dependency relationship with the information that its SysML v1 mapping source element is a SysML v1 refine relationship.

##### General Mappings

GenericToMetadataUsage\_Mapping

##### Mapping Source

Abstraction

##### Mapping Target

MetadataUsage

##### Owned Mappings



(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- MetadataUsage::ownedRelationship () : Relationship [0..\*]

```
Set { RefineMetadataUsageFeatureTyping_Mapping.getMapped (from) ,  
      RefineMetadataFeatureMembership_Mapping.getMapped (from) }
```

### 7.8.8.3.16 RefineMetadataUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureTyping::type () : Type [1]

```
SysML2::MetadataDefinition.allInstances ()  
->any (m | m.qualifiedName = 'SysMLv1Library::RefineData')
```

### 7.8.8.3.17 Requirement\_Mapping

#### Description

A SysML::Requirement is mapped to a SysML v2 RequirementUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
requirement <'id1'> SysMLv1Requirement {
  doc /*
      * requirement text
  */

  requirement <'id2'> SysMLv1NestedRequirement {
    doc /*
        * requirement text
        */
  }
}
```

## General Mappings

NamedElementMain\_Mapping  
GenericToRequirementUsage\_Mapping

## Mapping Source

Class

## Mapping Target

RequirementUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.isRequirement(src)
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- RequirementUsage::reqId () : String [1]

```
let stereotype: UML::Stereotype = Helper.getRequirementStereotype(from) in
Helper.getTagValueAsString(from, stereotype.qualifiedName, 'id')
```

- RequirementUsage::ownedRelationship () : Relationship [0..\*]

```
from.ownedElement->collect(e | ElementOwningMembership_Mapping.getMapped(e))
->including(CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from))
```

```
->including(RequirementDocumentationMembership_Mapping.getMapped(from))
->including(RequirementSubjectMembership_Mapping.getMapped(from))
```

### 7.8.8.3.18 RequirementDocumentation\_Mapping

#### Description

The mapping class creates a Comment contained in a Requirement which contains the SysML::Requirements::AbstractRequirement::text property.

#### General Mappings

GenericToDocumentation\_Mapping

#### Mapping Source

Class

#### Mapping Target

Documentation

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Documentation::body () : String [1]

```
let stereotype: UML::Stereotype = Helper.getRequirementStereotype(from) in
Helper.getTagValueAsString(from, stereotype.qualifiedName, 'text')
```

### 7.8.8.3.19 RequirementDocumentationMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Class

#### Mapping Target

OwningMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]  
`RequirementDocumentation_Mapping.getMapped(from)`

### **7.8.8.3.20 RequirementSubject\_Mapping**

#### **Description**

The mapping class creates the subject reference usage element of the requirement. It is not used since the concept does not exist SysML v1.

#### **General Mappings**

GenericToReferenceUsage\_Mapping

#### **Mapping Source**

Class

#### **Mapping Target**

ReferenceUsage

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::direction () : FeatureDirectionKind [0..1]  
`KerML::FeatureDirectionKind::_in'`

### 7.8.8.3.21 RequirementSubjectMembership\_Mapping

#### Description

The subject is not used, because it is not a SysML v1 concept, but must be created for a SysML v2 requirement.

#### General Mappings

GenericToParameterMembership\_Mapping

#### Mapping Source

Class

#### Mapping Target

SubjectMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SubjectMembership::ownedMemberParameter () : Feature [0..1]  
RequirementSubject\_Mapping.getMapped(from)

### 7.8.8.3.22 Satisfy\_Mapping

#### Description

A SysML::Requirements::Satisfy relationship is mapped to a SysML v2 SatisfyRequirementUsage.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
// satisfy relationship from a block
part def SysMLv1Block {
    part sysMLv1PartProperty;
}
requirement <'ReqId1'> SysMLv1Requirement { doc /* requirement text */ }

ref :SysMLv1Block = all SysMLv1Block {
    satisfy requirement SysMLv1Requirement by self;
}

// satisfy relationship from a part property
satisfy SysMLv1Requirement by sysMLv1BlockUsage.sysMLv1PartProperty {
```

```

        sysMLv1BlockUsage : SysMLv1Block;
    }

```

## General Mappings

GenericToOccurrenceUsage\_Mapping  
Abstraction\_Mapping

## Mapping Source

Abstraction

## Mapping Target

SatisfyRequirementUsage

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```

let satisfy: UML::Abstraction = src.oclAsType(UML::Abstraction) in
    if satisfy.oclIsUndefined() then
        false
    else
        Helper.hasStereotypeApplied(satisfy, 'SysML::Requirements::Satisfy')
    endif

```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SatisfyRequirementUsage::ownedRelationship () : Relationship [0..\*]

```

let relationships : Set(KerML::Relationship) =
    ElementOwnership_Mapping.getMappedColl(from.ownedComment)
->including(SatisfyFeatureTyping_Mapping.getMapped(from))
->including(SatisfySubjectSubjectMembership_Mapping.getMapped(from))
->including(CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from)) in
if from.client->any(c | true).oclIsKindOf(UML::Property) then
    relationships
    ->including(SatisfyReferenceUsageFeatureMembership_Mapping.getMapped(from))
else
    relationships
endif

```

### 7.8.8.3.23 SatisfyReferenceUsage\_Mapping

#### Description

Creates a reference usage.

## General Mappings

GenericToReferenceUsage\_Mapping

## Mapping Source

Abstraction

## Mapping Target

ReferenceUsage

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::declaredName () : String [0..1]

```
from.client
->any(c | true).owner.name.substring(1,1).toLowerCase()
+ from.client
->any(c | true).owner.name.
substring(2,from.client->any(c | true).owner.name.size())
+ 'SatisfyClientUsage'
```

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set{SatisfyReferenceUsageFeatureTyping_Mapping.getMapped(from)}
```

### 7.8.8.3.24 SatisfyReferenceUsageFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureMembership

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`  
`SatisfyReferenceUsage_Mapping.getMapped (from)`

### 7.8.8.3.25 SatisfySubjectReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceUsage::ownedRelationship () : Relationship [0..*]`  
`Set { SatisfySubjectReferenceUsageFeatureValue_Mapping.getMapped (from) }`
- `ReferenceUsage::direction () : FeatureDirectionKind [0..1]`  
`KerML::FeatureDirectionKind::_'in'`



### 7.8.8.3.26 SatisfySubjectReferenceUsageValue\_Mapping

#### Description

The mapping class create the feature reference expression for the subject of the SatisfyRequirementUsage element.

#### General Mappings

GenericToFeatureReferenceExpression\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureReferenceExpression

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureReferenceExpression::ownedRelationship () : Relationship [0..\*]

```
Set { SatisfySubjectReferenceUsageValueOwningMembership_Mapping.getMapped (from) ,  
ReturnParameterFeatureMembership_Factory.create () }
```

### 7.8.8.3.27 SatisfySubjectReferenceUsageValueFeature\_Mapping

#### Description

The mapping class creates the feature element for the feature reference expression of the subject of the SatisfyRequirementUsage element.

#### General Mappings

GenericToFeature\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

Feature

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Feature::ownedRelationship () : Relationship [0..*]`

```
Set { SatisfySubjectReferenceUsageFeatureChaining_Mapping.getMapped (from) ,  
      SatisfySubjectReferenceUsageValueFeatureChainingProperty_Mapping.getMapped (from) }
```

### 7.8.8.3.28 SatisfySubjectReferenceUsageFeatureChaining\_Mapping

#### Description

The mapping class creates the feature chaining element from SysML v2 SatisfyRequirementUsage's reference usage element.

#### General Mappings

GenericToFeatureChaining\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureChaining

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureChaining::chainingFeature () : Feature [1]`

```
SatisfyReferenceUsage_Mapping.getMapped (from)
```

### 7.8.8.3.29 SatisfySubjectReferenceUsageValueFeatureChainingProperty\_Mapping

#### Description

The mapping class creates the feature chaining element from the source element of the SysML v1 satisfy relationship.

### **General Mappings**

GenericToFeatureChaining\_Mapping

### **Mapping Source**

Abstraction

### **Mapping Target**

FeatureChaining

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureChaining::chainingFeature () : Feature [1]  
`from.client->any(c | true)`

## **7.8.8.3.30 SatisfySubjectReferenceUsageFeatureValue\_Mapping**

### **Description**

Creates a feature value relationship.

### **General Mappings**

GenericToFeatureValue\_Mapping

### **Mapping Source**

Abstraction

### **Mapping Target**

FeatureValue

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

`SatisfySubjectReferenceUsageValue_Mapping.getMapped(from)`

### 7.8.8.3.31 SatisfySubjectReferenceUsageValueOwningMembership\_Mapping

#### Description

Creates a owning membership relationship for *ownedMemberElement()*.

#### General Mappings

GenericToOwningMembership\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

OwningMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- OwningMembership::ownedMemberElement () : Element [1]

`SatisfySubjectReferenceUsageValueFeature_Mapping.getMapped(from)`

### 7.8.8.3.32 SatisfySubjectSubjectMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

#### General Mappings

GenericToSubjectMembership\_Mapping

### **Mapping Source**

Abstraction

### **Mapping Target**

SubjectMembership

### **Owned Mappings**

(none)

### **Applicable filters**

(none)

### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- SubjectMembership::ownedMemberParameter () : Feature [1]  
`SatisfySubjectReferenceUsage_Mapping.getMapped(from)`

### **7.8.8.3.33 SatisfyFeatureTyping\_Mapping**

#### **Description**

Creates a feature typing relationship owned by the element *typedFeature()*.

#### **General Mappings**

GenericToFeatureTyping\_Mapping

#### **Mapping Source**

Abstraction

#### **Mapping Target**

FeatureTyping

#### **Owned Mappings**

(none)

#### **Applicable filters**

(none)

#### **Mapping rules**

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`  
`from.supplier->any(s | true)`

#### 7.8.8.3.34 SatisfyReferenceUsageFeatureTyping\_Mapping

##### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

##### General Mappings

GenericToFeatureTyping\_Mapping

##### Mapping Source

Abstraction

##### Mapping Target

FeatureTyping

##### Owned Mappings

(none)

##### Applicable filters

(none)

##### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`  
`from.client->any(c | true).owner`

#### 7.8.8.3.35 TestCaseActivity\_Mapping

##### Description

A `SysML::Requirements::TestCase` applied to an activity is mapped to a SysML v2 `VerificationCaseDefinition` element.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
verification def SysMLv1ActivityTestCase {  
    return verdict : VerificationCases::VerdictKind;  
}
```

## General Mappings

ActivityAsDefinition\_Mapping

## Mapping Source

Activity

## Mapping Target

VerificationCaseDefinition

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Requirements::TestCase')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- VerificationCaseDefinition::ownedRelationship () : Relationship [0..\*]

```
let relationships : Set(KerML::Relationship) =
  Helper.activityOwnedRelationship(from) in
let verdictParameter : Set(UML::Parameter) =
  from.ownedElement->select(e | e.ocIsKindOf(UML::Parameter) and
    (e.ocAsType(UML::Parameter).type.name = 'VerdictKind')) in
let parameters : Set(UML::Parameter) =
  ((from.ownedElement->select(e | e.ocIsKindOf(UML::Parameter))) -
  verdictParameter) in
let verifyRelationships : Set(UML::Abstraction) =
  from.clientDependency
  ->select( v |
    Helper.hasStereotypeApplied(v, 'SysML::Requirements::Verify')) in
relationships
->union(parameters->collect(p | ParameterMembership_Mapping.getMapped(p)))
->union(verdictParameter
  ->collect(vp |
    TestCaseActivityReturnParameterMembership_Mapping.getMapped(vp)))
->including(CaseSubjectMembership_Mapping.getMapped(from))
->including(CaseObjectiveMembership_Mapping.getMapped(from))
->union(verifyRelationships->collect(v | Verify_Mapping.getMapped(v)))
```

### 7.8.8.3.36 TestCaseActivityReturnParameterMembership\_Mapping

#### Description

Creates a membership relationship for *memberElement()*.

## General Mappings

ParameterMembership\_Mapping

## Mapping Source

Parameter

## Mapping Target

ReturnParameterMembership

## Owned Mappings

(none)

### 7.8.8.3.37 TestCaseVerifyObjectiveMembership\_Mapping

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ownedMemberFeature () : Feature [1]

`TestCaseVerifyObjectiveRequirementUsage_Mapping.getMapped(from)`

### 7.8.8.3.38 TestCaseVerifyObjectiveRequirementUsage\_Mapping

#### Description

The mapping class creates the objective requirements usage of the SysML v2 test case.

## General Mappings

No general mappings.

## Mapping Source

Abstraction

## Mapping Target

No target element.

## Owned Mappings

(none)

## Applicable filters

(none)



## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ownedRelationship () : Relationship [0..*]`  
`Set {Verify_Mapping.getMapped(from) }`

### 7.8.8.3.39 TestCaseVerifyRequirementUsageReferenceSubsetting\_Mapping

#### Description

Creates a subsetting relationship for the *subsettingFeature()* and the *subsettedFeature()*.

#### General Mappings

GenericToSubsetting\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

ReferenceSubsetting

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `ReferenceSubsetting::referencedFeature () : Feature [1]`  
`from.supplier->get(0)`

### 7.8.8.3.40 TestCaseVerifyRequirementUsage\_Mapping

#### Description

The mapping class creates the requirements usage of the SysML v2 test case for the verify relationship.

#### General Mappings

GenericToUsage\_Mapping

#### Mapping Source

Abstraction

### Mapping Target

RequirementUsage

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- RequirementUsage::ownedRelationship () : Relationship [0..\*]  

```
Set { TestCaseVerifyRequirementUsageReferenceSubsetting_Mapping.getMapped(from),  
CaseSubjectMembership_Mapping.getMapped(from.client),  
CommonReturnParameterReferenceUsageMembership_Mapping.getMapped(from) }
```

#### 7.8.8.3.41 Trace\_Mapping

##### Description

A SysML::Requirements::Trace relationship is mapped to a SysML v2 Dependency relationship annotated with a metadata usage tagging it as a former SysML v1 trace relationship.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```
requirement <'id1'> SysMLv1Requirement1 {  
    doc /*  
        * requirement text  
    */  
}  
requirement <'id2'> SysMLv1Requirement2 {  
    doc /*  
        * requirement text  
    */  
}  
dependency from SysMLv1Requirement1 to SysMLv1Requirement2 {  
    @SysMLv1Library::TraceData {isTrace = true;}  
}
```

##### General Mappings

Abstraction\_Mapping

##### Mapping Source

Abstraction

## Mapping Target

Dependency

## Owned Mappings

(none)

## Applicable filters

This mapping applies only if the following (OCL) condition is verified:

```
Helper.hasStereotypeApplied(src, 'SysML::Requirements::Trace')
```

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Dependency::ownedRelationship () : Relationship [0..\*]

```
ElementOwnership_Mapping.getMappedColl(from.ownedComment)  
->including(TraceAnnotation_Mapping.getMapped(from))
```

### 7.8.8.3.42 TraceAnnotation\_Mapping

#### Description

The mapping class creates the annotation relationship for the SysML::Requirements::Trace mapping.

#### General Mappings

GenericToAnnotation\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

Annotation

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- Annotation::annotatingElement () : AnnotatingElement [1]

`TraceMetadataUsage_Mapping.getMapped(from)`

### 7.8.8.3.43 TraceMetadataFeatureMembership\_Mapping

#### Description

Creates a feature membership relationship for *ownedMemberFeature()*.

#### General Mappings

GenericToFeatureMembership\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureMembership

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureMembership::ownedMemberFeature () : Feature [1]`

`TraceMetadataReferenceUsage_Mapping.getMapped(from)`

### 7.8.8.3.44 TraceMetadataReferenceUsage\_Mapping

#### Description

Creates a reference usage.

#### General Mappings

GenericToReferenceUsage\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

ReferenceUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- ReferenceUsage::ownedRelationship () : Relationship [0..\*]

```
Set {TraceMetadataReferenceUsageRedefinition_Mapping.getMapped(from) ,  
TraceMetadataReferenceUsageFeatureValue_Mapping.getMapped(from) }
```

### 7.8.8.3.45 TraceMetadataReferenceUsageFeatureValue\_Mapping

#### Description

Creates a feature value relationship.

#### General Mappings

GenericToFeatureValue\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureValue

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- FeatureValue::value () : Expression [1]

```
LiteralBoolean_Factory.create(true)
```

### 7.8.8.3.46 TraceMetadataReferenceUsageRedefinition\_Mapping

#### Description

Creates a redefinition relationship for the *redefiningFeature()* and the *redefinedFeature()*.

## General Mappings

GenericToRedefinition\_Mapping

## Mapping Source

Abstraction

## Mapping Target

Redefinition

## Owned Mappings

(none)

## Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `Redefinition::redefinedFeature () : Feature [1]`

```
SYSML2::AttributeUsage.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::TraceData::isTrace')
```

### 7.8.8.3.47 TraceMetadataUsage\_Mapping

#### Description

Create the metadata usage element to annotate a dependency relationship with the information that its SysML v1 mapping source element is a SysML v1 trace relationship.

#### General Mappings

GenericToMetadataUsage\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

MetadataUsage

#### Owned Mappings

(none)

#### Applicable filters

(none)

## Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `MetadataUsage::ownedRelationship () : Relationship [0..*]`

```
Set {TraceMetadataUsageFeatureTyping_Mapping.getMapped(from) ,  
TraceMetadataFeatureMembership_Mapping.getMapped(from) }
```

### 7.8.8.3.48 TraceMetadataUsageFeatureTyping\_Mapping

#### Description

Creates a feature typing relationship owned by the element *typedFeature()*.

#### General Mappings

GenericToFeatureTyping\_Mapping

#### Mapping Source

Abstraction

#### Mapping Target

FeatureTyping

#### Owned Mappings

(none)

#### Applicable filters

(none)

#### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- `FeatureTyping::type () : Type [1]`

```
SysML2::MetadataDefinition.allInstances()  
->any(m | m.qualifiedName = 'SysMLv1Library::TraceData')
```

### 7.8.8.3.49 Verify\_Mapping

#### Description

A `SysML::Requirements::Verify` relationship is mapped to a SysML v2 `RequirementVerificationMembership` relationship.

The following shows an example of what the textual SysML v2 syntax of the result of the transformation may look like.

```

requirement <'idl'> SysMLv1Requirement {
    doc /*
        * requirement text
        */
}
verification def SysMLv1TestCase {
    objective objective_SysMLv1TestCase {
        verify SysMLv1Requirement;
    }
    return verdict : VerificationCases::VerdictKind;
}

```

## General Mappings

GenericToRelationship\_Mapping

### Mapping Source

Abstraction

### Mapping Target

RequirementVerificationMembership

### Owned Mappings

(none)

### Applicable filters

(none)

### Mapping rules

In addition to the inherited rules, the following lists the mapping class specific mapping rules for the target element properties.

- RequirementVerificationMembership::ownedRelatedElement () : Element [0..\*]  
Set{TestCaseVerifyRequirementUsage\_Mapping.getMapped(from)}

## 7.8.8.3.50 Model Libraries

### 7.8.8.3.50.1 Verdicts

#### 7.8.8.3.50.1.1 VerdictKind

The enumeration VerdictKind is mapped to the SysML v2 VerificationCases::VerdictKind model library element.