

11 SACM Argumentation Metamodel

11.1 General

This chapter presents the normative specification for the SACM Argumentation Package. It begins with an overview of the metamodel structure followed by a description of each element.

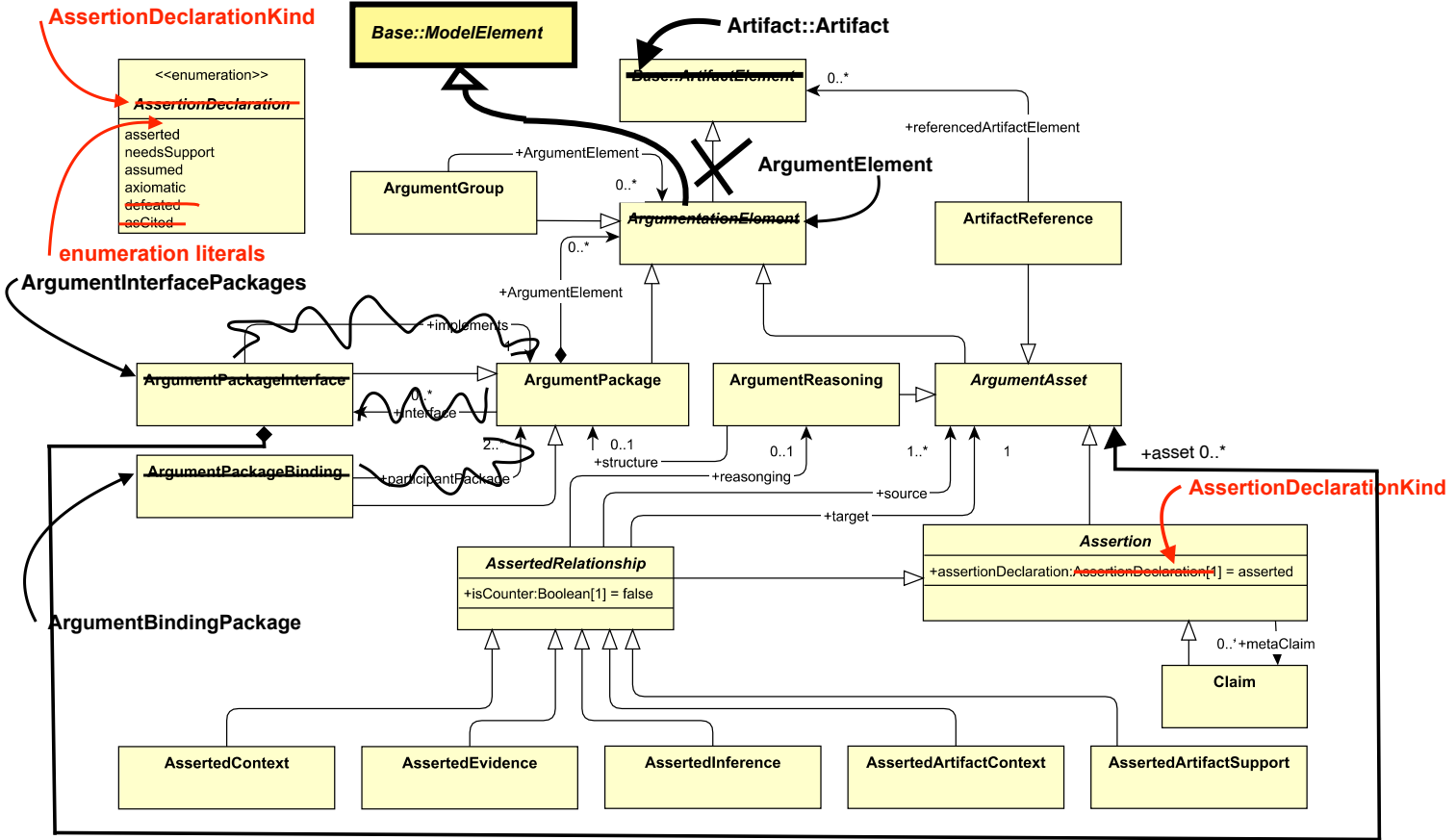


Figure 11.1 - Argumentation Package Diagram

This portion of the SACM model describes and defines the concepts required to model structured arguments. Arguments are represented in SACM through explicitly representing the Claims and citation of artifacts (e.g., as evidence) (ArtifactReference), and the ‘links’ between these elements – e.g., how one or more Claims are asserted to infer another Claim, or how one or more artifacts (referenced by ArtifactReference) are asserted as providing evidence for a Claim (AssertedEvidence). In addition to these core elements, in SACM it is possible to provide additional description of the ArgumentReasoning associated with inferential and evidential relationships, represent counter-arguments and counter-evidence (through isCounter: Boolean), and represent how artifacts provide the context in which arguments should be interpreted (through AssertedContext).

The packaging of structured arguments into ‘modular’ argument packages is enabled through ArgumentPackages. Users are able to declare interfaces for their packages through the use of **argument** ArgumentPackageInterface. Within an ArgumentPackageInterface, users create citations of the **argumentation** elements they select to disclose to external parties. Users are able to integrate ArgumentPackages through the use of ArgumentPackageBinding. An ArgumentPackageBinding binds ArgumentPackages together by including the declared ArgumentPackageInterfaces for the ArgumentPackages, it may contain additional argument structures to provide the rationale of the binding. It is also possible within a package to cite elements contained within other argument packages (through ArtifactReference).

ArgumentPackageInterface that cites only a subset of those claims that are intended to be mapped / used (e.g. by means of an ArgumentPackageBinding) by other ArgumentPackages. There may be more than one ArgumentPackageInterface for a given ArgumentPackage that reveal different aspects of the ArgumentPackage for different audiences.

An ArgumentPackageInterface resides inside the ArgumentPackage to which it refers. It refers to ArgumentationElements using isCitation=True that reside within the same ArgumentPackage as itself. Similar relationships exist for an ArtifactPackageInterface and for a TerminologyPackageInterface.

Constraints

ArgumentPackageInterfaces are only allowed with isCitation=true and +citedElement refer to ArgumentAssets within the ArgumentPackage implementation referred to by implements.

11.7 ArgumentAsset (abstract)

ArgumentAsset is the abstract base element for the elements of any structured argument represented in SACM.

Superclass

~~ArgumentationElement~~
ArgumentationElement

Semantics

ArgumentAssets represent the constituent building blocks of any structured argument contained in an ArgumentPackage.

For example, ArgumentAssets can represent the Claims made within a structured argument contained in an ArgumentPackage.

AssertionDeclarationKind

11.8 ~~AssertionDeclaration (Enumeration)~~

~~AssertionDeclaration~~ provides a list of declarations which can be used to declare the state of an Assertion.

Superclass

N/A

Enumeration Literals

asserted – the default enumeration literal, indicating that an Assertion is asserted.

needsSupport – a flag indicating that further argumentation has yet to be provided to support the Assertion.

assumed – a flag indicating that the Assertion being made is declared by the author as being assumed to be true rather than being supported by further argumentation.

axiomatic – a flag indicating that the Assertion being made by the author is axiomatically true, so that no further argumentation is needed.

~~defeated – a flag indicating that the Assertion is defeated by counter evidence and/or argumentation.~~

~~asCited – a flag indicating that because the Assertion is cited, the AssertionDeclaration should be transitively derived from the value of the AssertionDeclaration of the cited Assertion.~~

Semantics

~~AssertionDeclaration~~ provides a list of declarations which indicate the state of an Assertion.

11.9 ArtifactReference

ArtifactReference enables the citation of an artifact as information that relates to the structured argument.

Superclass

ArgumentAsset

Associations

referencedArtifactElement:Base::ArtifactElement[0..*] – reference to a collection of ArtifactElements.

Semantics

It is necessary to be able to cite artifacts that provide supporting evidence, context, or additional description within an argument structure. ArtifactReferences allow there to be an objectified citation of this information within the structured argument, thereby allowing the relationship between this artifact and the argument to also be explicitly declared.

11.10 Assertion (abstract)

Assertions are used to record the propositions of Argumentation (including both the Claims about the subject of the argument and the structure of the Argumentation being asserted). Propositions can be true or false, but cannot be true and false simultaneously.

Superclass

ArgumentAsset

Attributes

assertionDeclaration:AssertionDeclaration[1] = asserted – the declaration indicating the state of the Assertion.

AssertionDeclarationKind



Associations

metaClaim:Claim[0..*] - references Claims concerning (i.e., about) the Assertion (e.g., regarding the confidence in the Assertion)

Semantics

Structured arguments are declared by stating claims, citing evidence and contextual information, and asserting how these elements relate to each other.

11.11 Claim

Claims are used to record the propositions of any structured argument contained in an ArgumentPackage. Propositions are instances of statements that could be true or false, but cannot be true and false simultaneously.

Superclass

Assertion

Semantics

The core of any argument is a series of claims (premises) that are asserted to provide sufficient reasoning to support a (higher- level) claim (a conclusion).

A Claim that is intentionally declared without any supporting evidence or argumentation can be declared as being assumed (i.e., assertionDeclared = assumed). It is an assumption. However, it should be noted that a Claim that is not ‘assumed’ (i.e., assertionDeclaration = asserted) is not being declared as false. However, there is the expectation of the provision of a supporting argument structure (e.g., it may represent part of an incomplete structure).

A Claim that is intentionally declared as requiring further evidence or argumentation can be denoted by setting +assertionDeclaration to “needsSupport”.

A Claim that is being declared as axiomatically true can be denoted by setting +assertionDeclaration to “axiomatic”.

A Claim that is defeated by counter evidence or counter argument can be denoted by setting +assertionDeclaration to “defeated”.

A Claim which cites another claim and supported by the cited claim can be denoted by setting +assertionDeclaration to “asCited”.