

## SACM 2.0 Argumentation Example

The usage of the argumentation package of SACM 2.0 will be illustrated using examples of [Goal Structuring Notation](#) (GSN) which is widely adopted and has a concrete syntax for visualisation. GSN can be seen as an implementation of the Argumentation package of SACM. GSN diagrams can be fully translated to SACM 2.0 using model-to-model transformation.

### 1.1 Claim

The purpose of GSN is to document how Goals are supported by sub-Goals. In GSN, a goal is represented as it is in Figure 1;

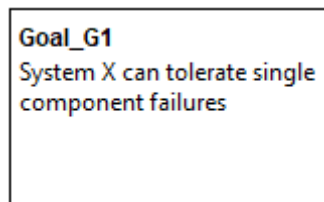


Figure 1

The goal has a name and a description. The underlying SACM model is represented in Figure 2.

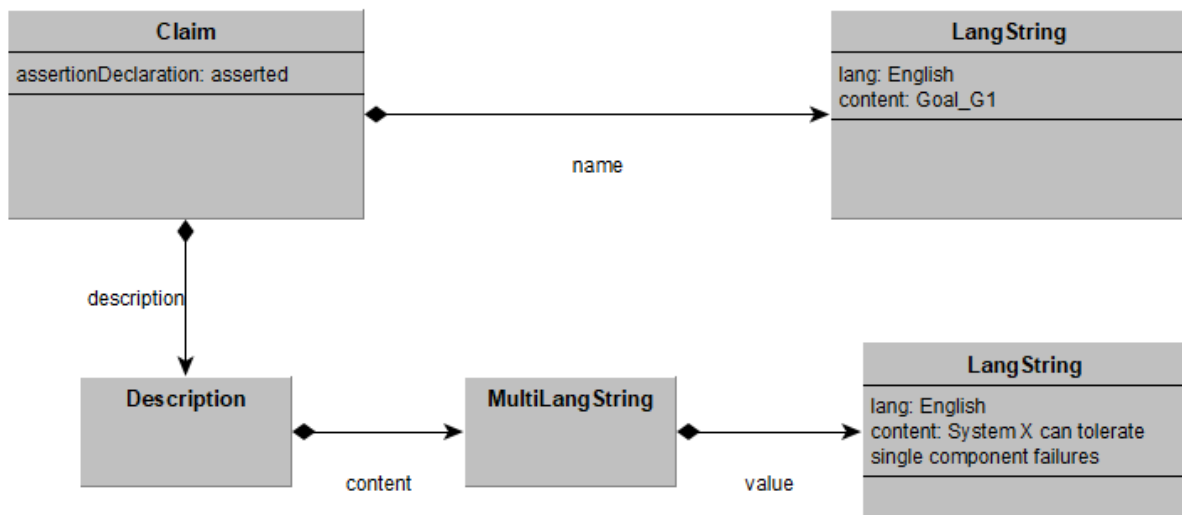


Figure 2

## 1.2 Solution

Where evidence is asserted to support the truth of the claim, this can be documented by providing a Solution in GSN, as shown in Figure 3.

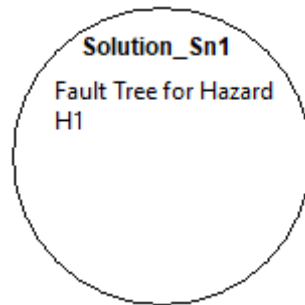


Figure 3

The solution also has a name and a description. The underlying SACM model is represented in Figure 4.

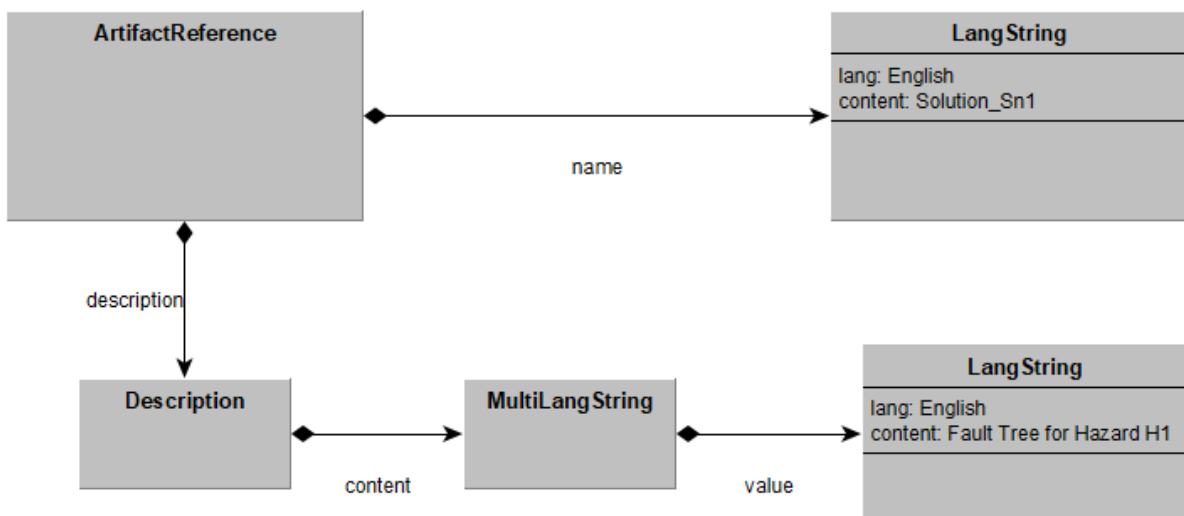


Figure 4.

### 1.3 SupportedBy

When documenting how claims are said to be supported by its evidence, a SupportedBy relationship is used. As illustrated in Figure 5.

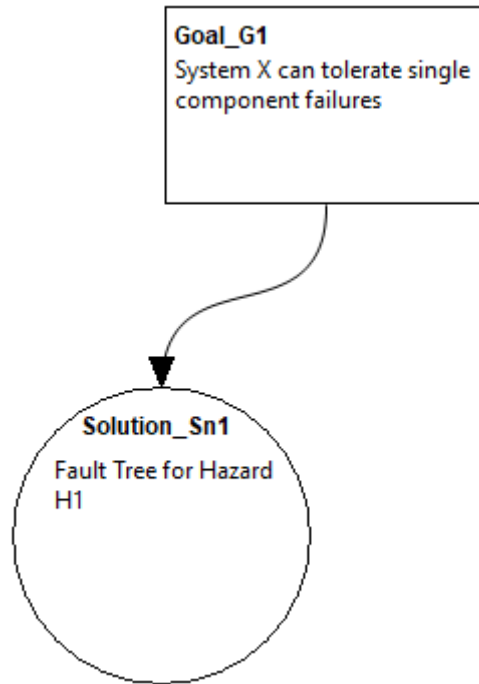


Figure 5.

The underlying SACM model is shown in Figure 6 (omitting the *name* and the *description* for both the elements for clarity).

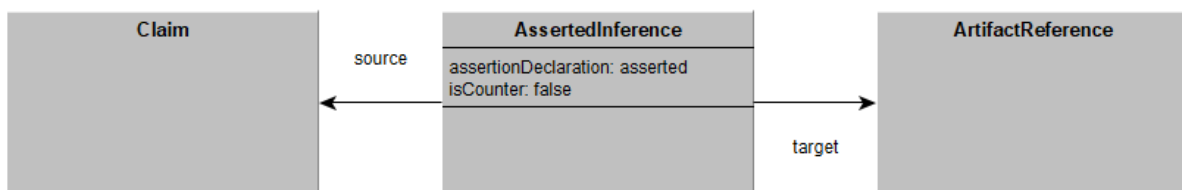


Figure 6.

## 1.4 Strategy

When document how claims are said to be supported by sub-claims, it can be useful to document the reasoning step – i.e. the nature of the argument that connects the claim to its sub-claims. Figure 7 shows an example strategy in GSN:

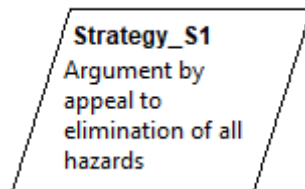


Figure 7.

The underlying SACM model can be found in Figure 8.

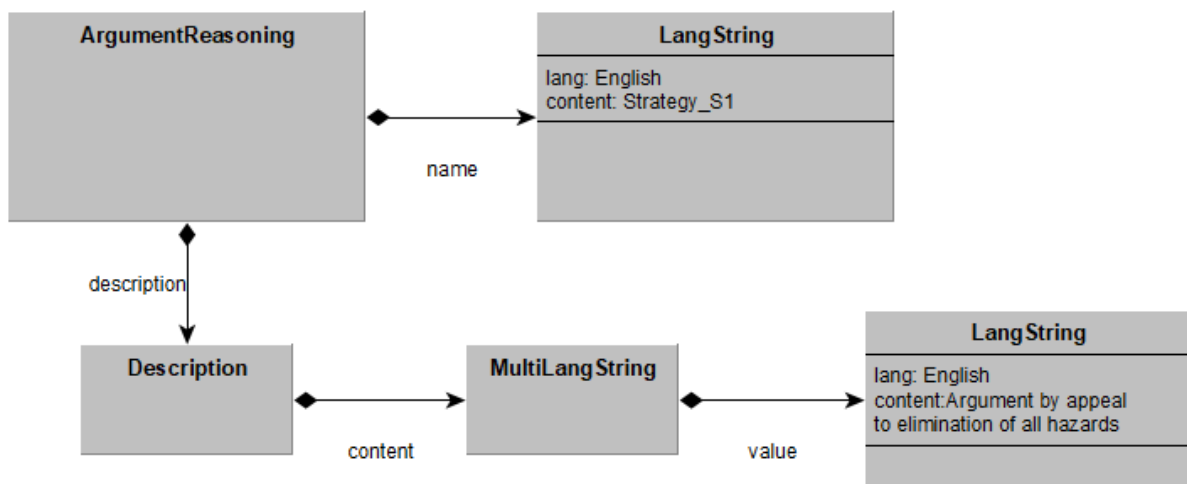


Figure 8

Strategy can be seen as an additional piece of information/description added to a supported by. Thus, for the argument shown in Figure 9, the underlying SACM model would look like it is shown in Figure 10 (omitting *name* and *description* for clarity).

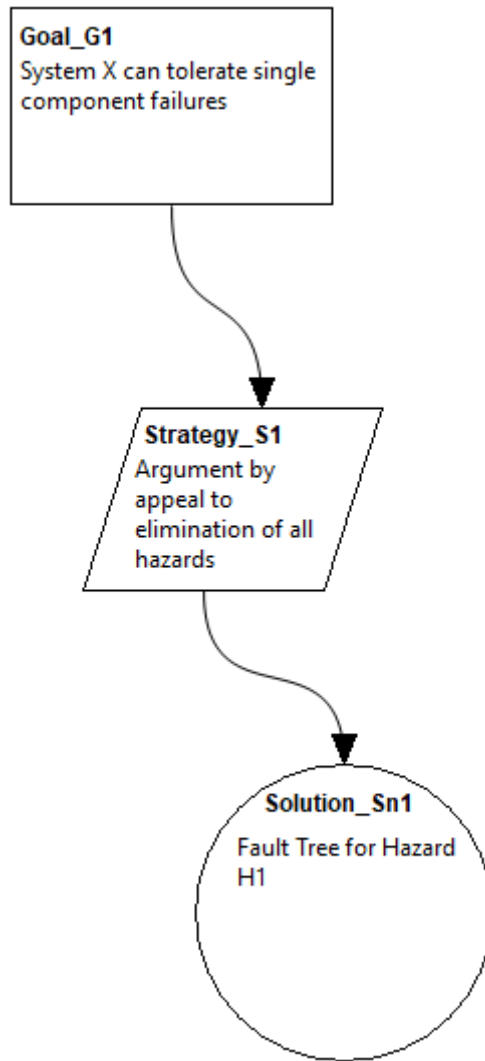


Figure 9

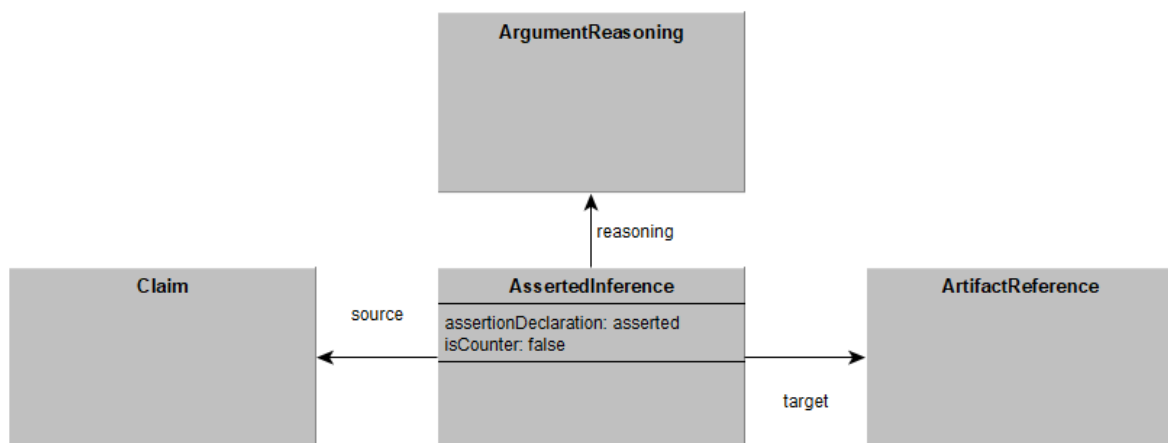


Figure 10

## 1.5 Context

When documenting a GSN goal or strategy it can also be important to capture the context in which the claim or reasoning step should be interpreted. This is done in GSN by documenting context.

Figure 11 shows an example context in GSN;

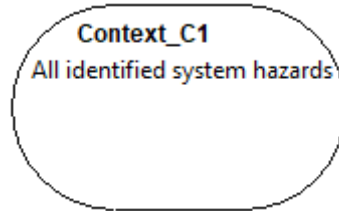


Figure 11

The underlying SACM model is shown in Figure 12.

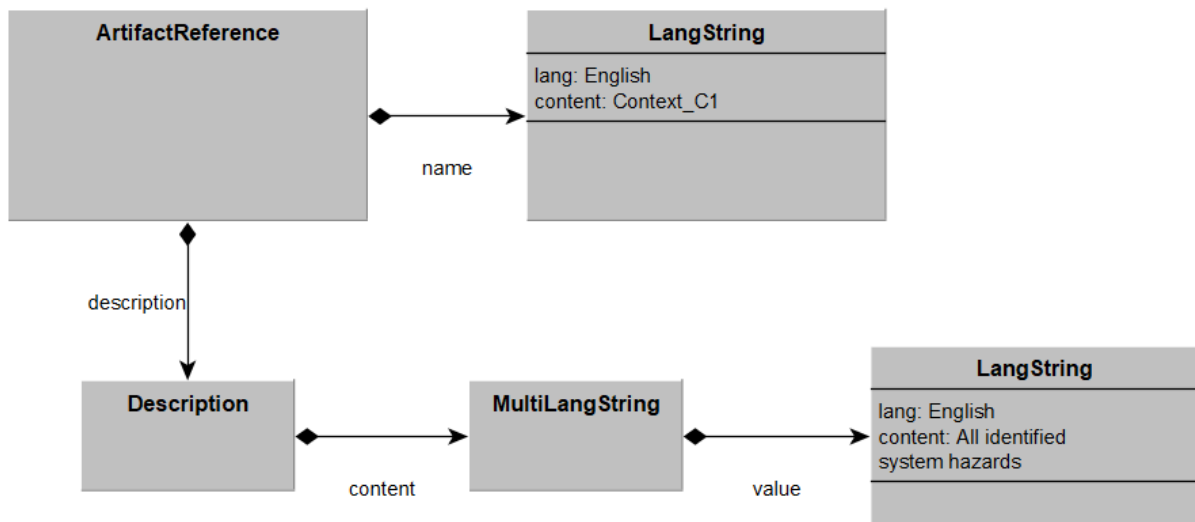


Figure 12

## 1.6 Assumption

Some claims and argument strategies rely on assumptions to hold valid. These assumptions can be documented explicitly in GSN using the *assumption* element. As shown in Figure 13.

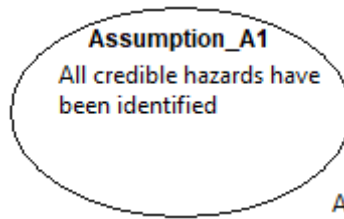


Figure 13

The underlying SACM model is shown in Figure 14.

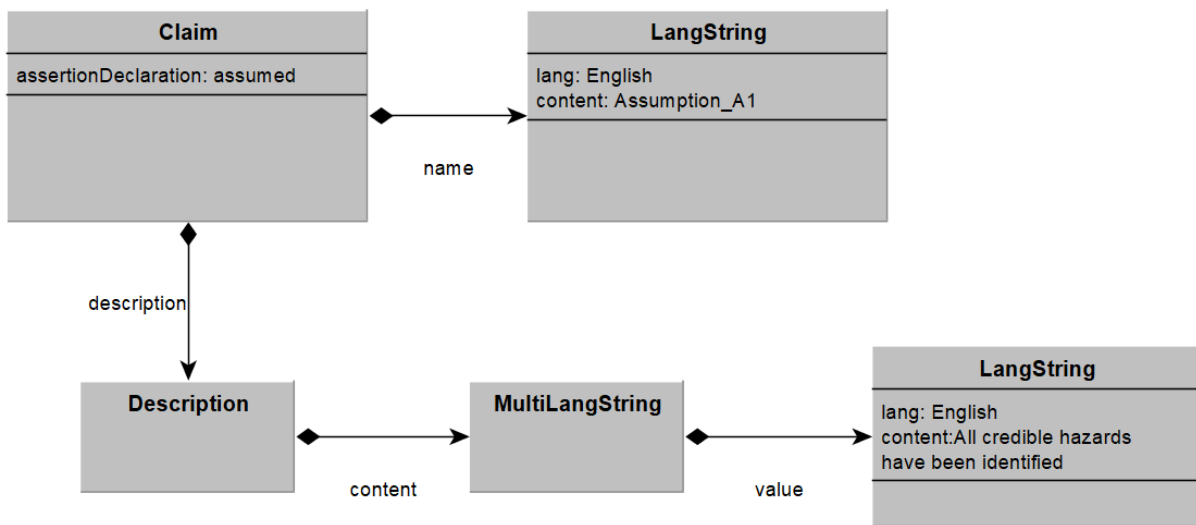


Figure 14.

## 1.7 Justification

Argument authors may feel the need to justify a particular claim or argument strategy, to provide some explanation as to why they consider it acceptable. This is achieved in GSN by the use of the *justification* element. An example of *justification* is shown in Figure 15.

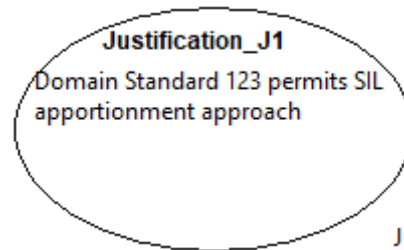


Figure 15

The underlying SACM model is shown in Figure 16.

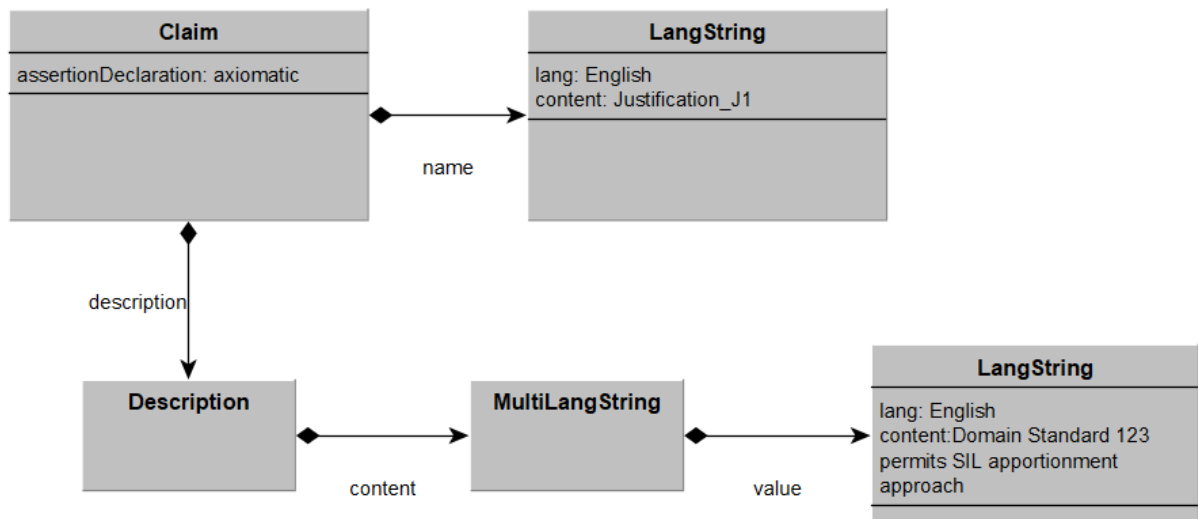


Figure 16



## 1.8 InContextOf

Context, Assumption and Justification can be attached to Goal or Strategy with the InContextOf relationship as shown in Figure 17.

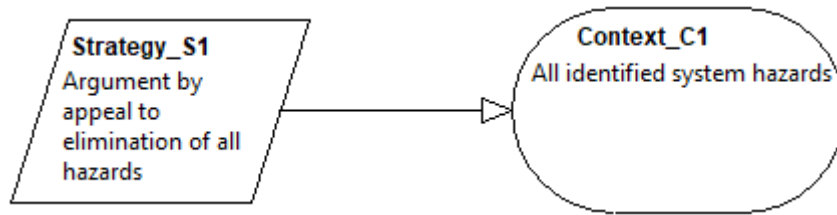


Figure 17

The underlying SACM model is shown in Figure 18 (omitting *name* and *description* for clarity).

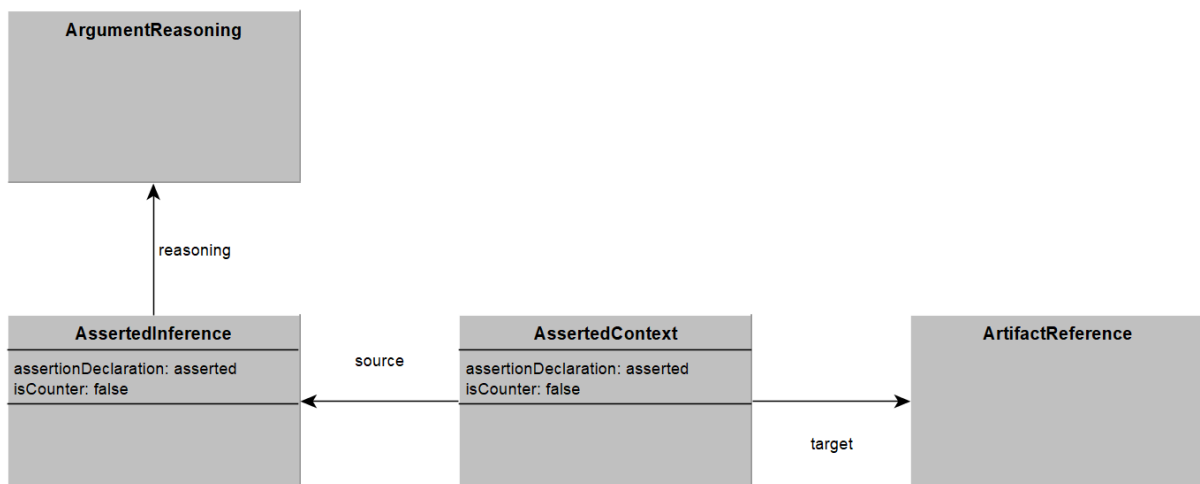


Figure 18

### 1.9 Module

In modular GSN notations, Modules are used to organize argumentations. An example of Module is shown in Figure 19

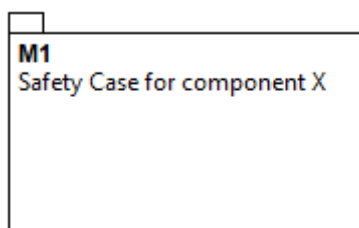


Figure 19

The underlying SACM model is shown in Figure 20.

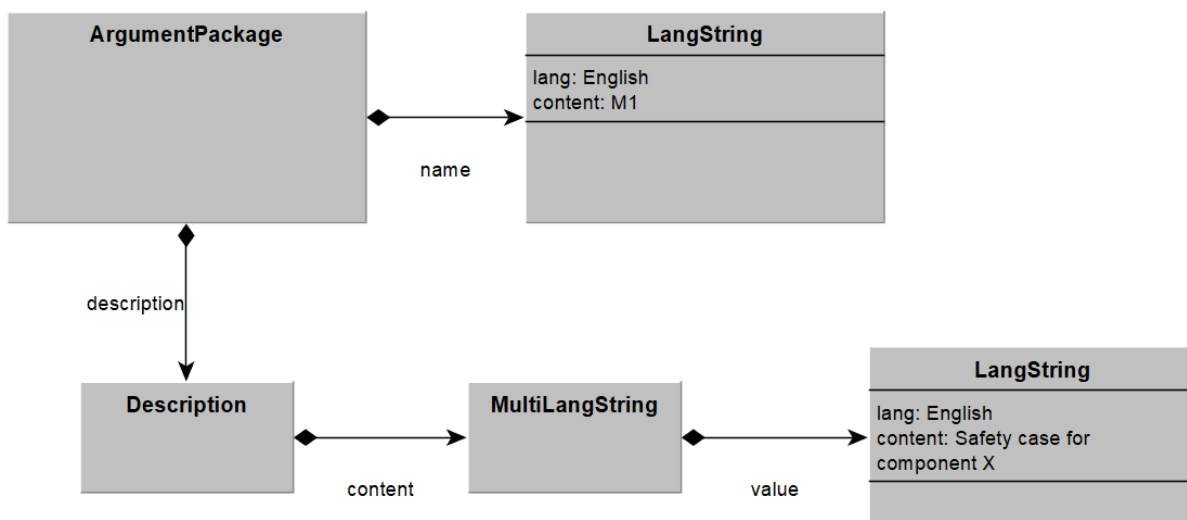


Figure 20

The example Module in Figure 21 puts together all previously mentioned concepts in one module. The underlying SACM model is shown in Figure 22.

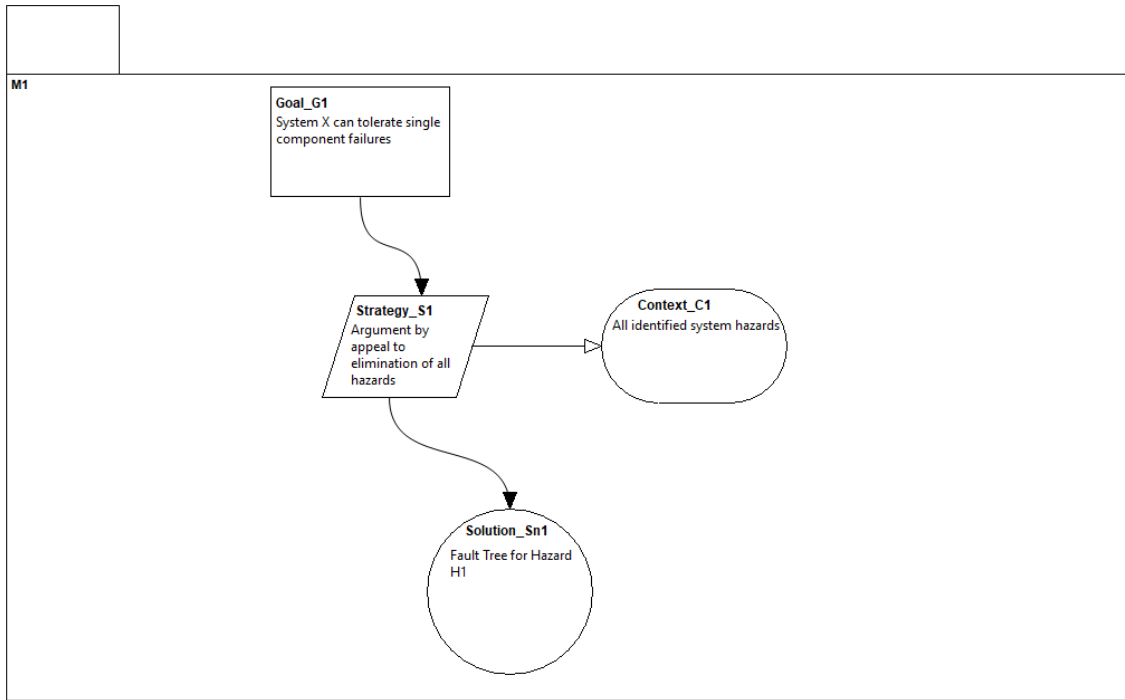


Figure 21

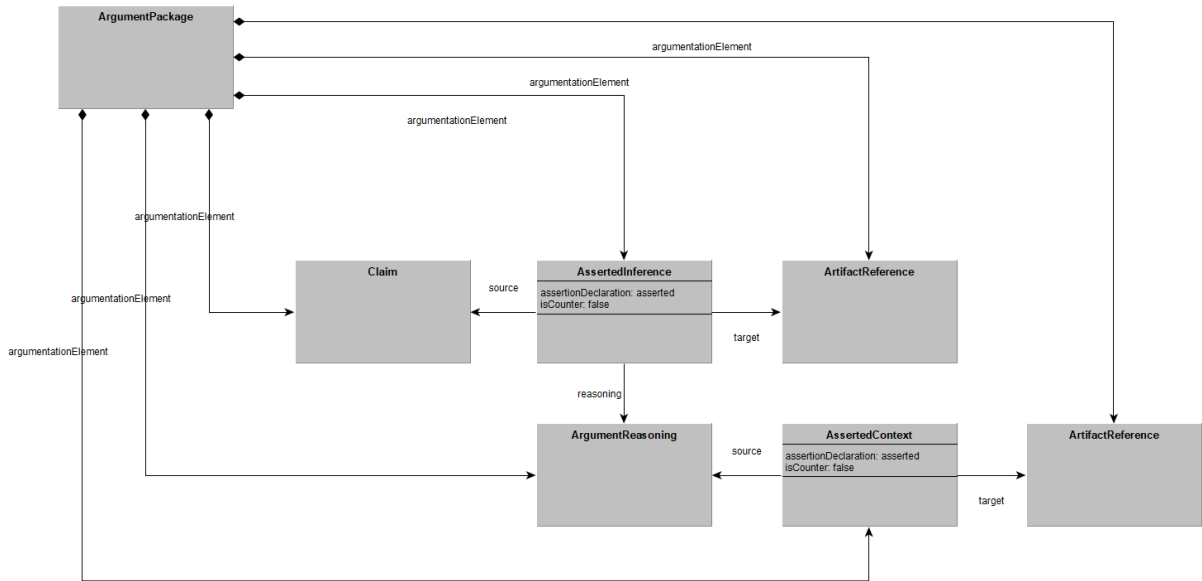


Figure 22