SysMLv2 Extension

Asma Smaoui, Ansgar Radermacher

Contains material from Ed Seidewitz and Sanford Friedenthal

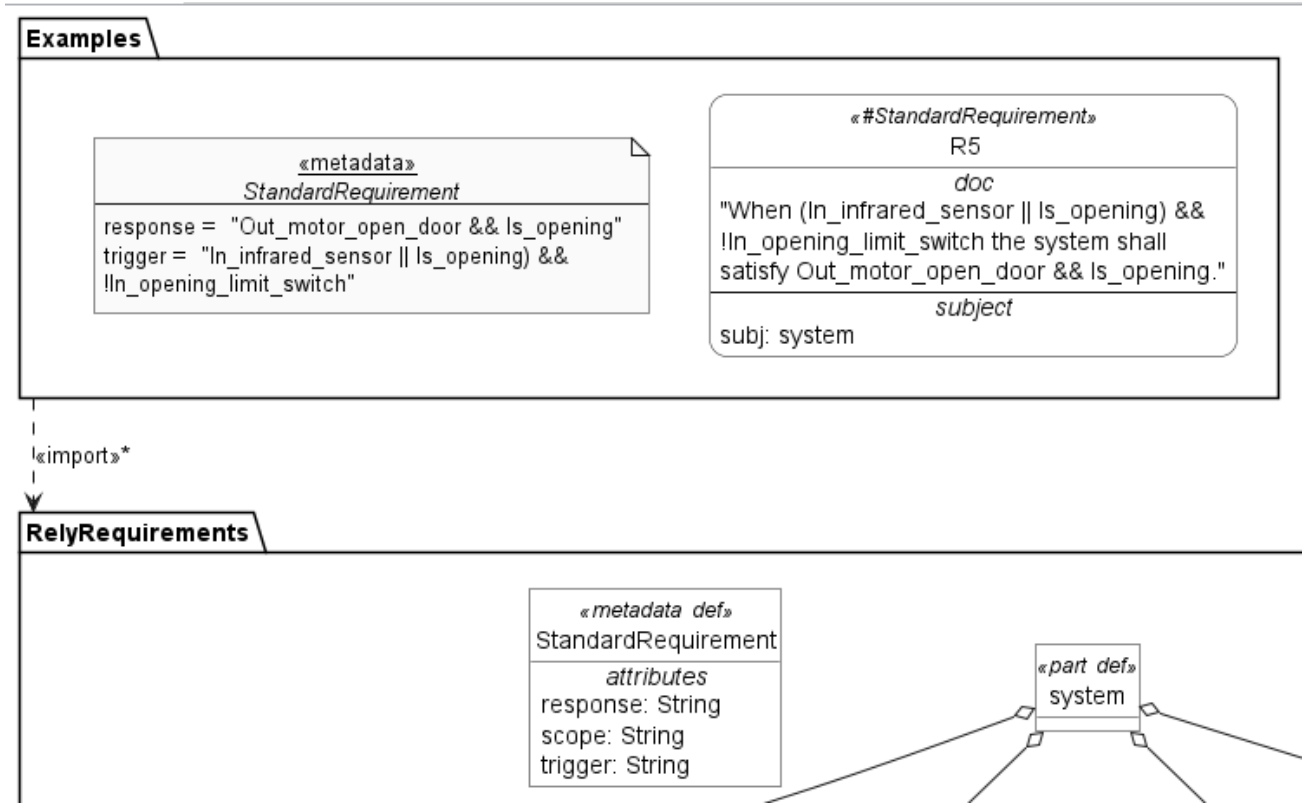
Some interesting links for SysMLv2

- OMG Standards
  - SysMLv2: https://www.omg.org/spec/SysML/2.0/Beta2/Language/PDF
  - OMG Sysml1->Sysml2 transformation : (very hard to read, only for info) https://www.omg.org/spec/SysML/2.0/Beta2/Transformation/PDF
- Pilot Implementation examples

https://github.com/Systems-Modeling/SysML-v2-Release/tree/master/sysml/src/examples

Example of Metadata use

```
    }
    metadata def StandardRequirement {

    attribute scope [0..1]: String;

    attribute response: String ;

    attribute trigger [*]: String ;

    }

}

package 'Examples' {
import 'RelyRequirements'::*;

requirement R5  {
    doc  /* "When (In_infrared_sensor || Is_opening) && !In_opening_limit_switch the
        @StandardRequirement{

                response = "Out_motor_open_door && Is_opening";
                trigger= "In_infrared_sensor || Is_opening) && !In_opening_limit_
        }

        subject : system;
    }

}
```



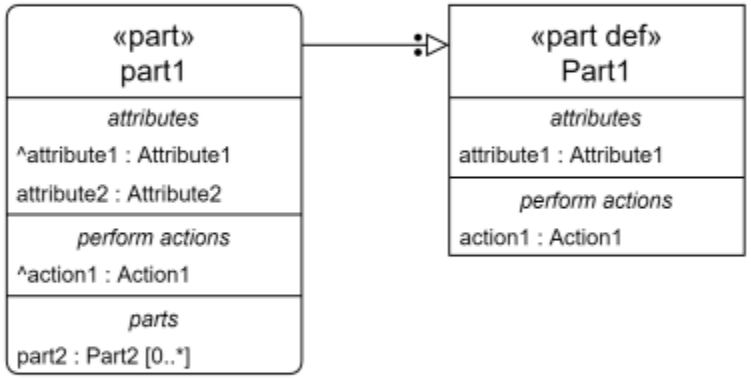
Requirements Package: assume vs require

Formally, a requirement is a kind of constraint. However, rather than specifying its constraint expression directly, a requirement constraint is built from two sets of other constraints: the *assumed* and *required* constraints of the requirement. The effective constraint for the requirement is them a logical implication: if all the assumption constraints are true, all the required constraints must be true. Required and assumed constraints are declared as composite constraint usages in the body of a requirement definition or usage, by prefixing a regular constraint usage declaration (see 7.19.2) with the keyword **assume** or **require**.

```
requirement def <'1.1'> MaximumMass {
    doc
    /*
     * Assuming the required mass is greater than 0,
     * the actual mass shall be less than or equal to
     * the required mass.
     */

    attribute massActual : MassValue;
    attribute massRequired : MassValue;
    assume constraint { massRequired > 0[kg] }
    require constraint { massActual <= massRequired }
}
```

Graphical Syntax: Defined by

Part defined by Part Definition



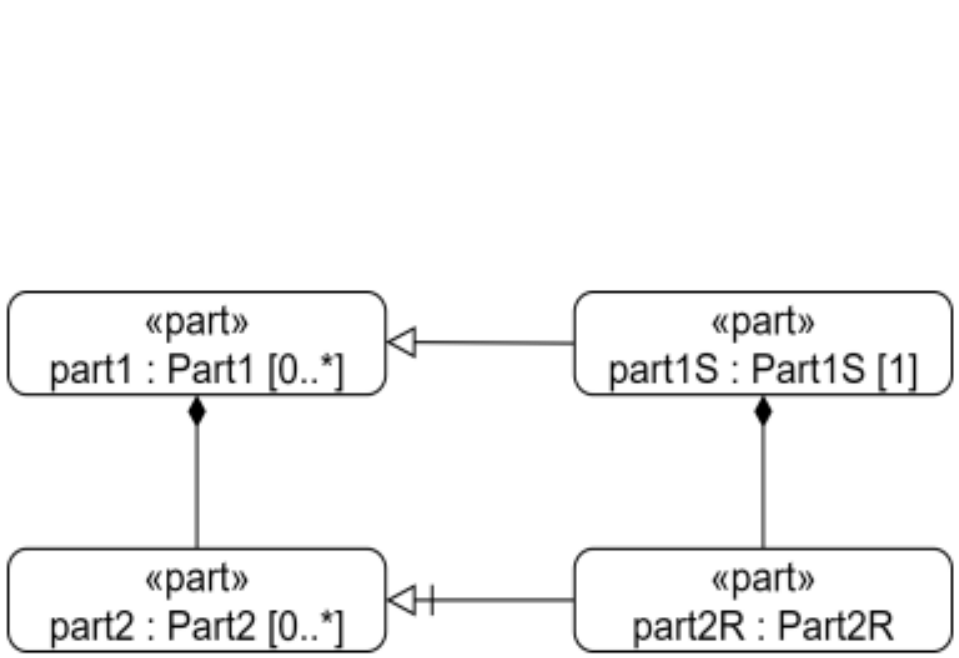

```
part def Part1 {
   attribute attribute1
: Attribute1;
   perform action
action1 : Action1;
}

part part1 : Part1 {
   attribute attribute2
: Attribute2;
   part part2 : Part2
[0..*];
}
```

or

```
part part1
   defined by Part1 {
   ...
}
```

Graphical Syntax: redefines

Redefinition




```
part part1 : Part1
[0..*] {
   part part2 : Part2
[0..*];
}

part part1S : Part1S
[1] :> part1 {
   part part2R : Part2R
:>> part2;
}
```

or

```
part part1S : Part1S
[1] subsets part1 {
  part part2R : Part2R
redefines part2;
}
```

SST Participating Organizations

- Aerospace Corp
- Airbus
- ANSYS medini
- Aras
- Army Aviation & Missile Center
- Army CBRND
- BAE
- BigLever Software
- Boeing
- U.S. Army DEVCOM Armaments Center
- CalTech CTME
- CEA
- Contact Software
- Defence Science and Technology Group
- DEKonsult
- Delligatti Associates
- Draper Lab
- ESTACA
- Ford
- Fraunhofer FOKUS
- General Motors
- George Mason University
- GfSE
- Georgia Tech/GTRI
- IBM
- Idaho National Laboratory
- IncQuery Labs
- Intercax
- Itemis
- Jet Propulsion Lab
- John Deere
- Kenntnis
- KTH Royal Institute of Technology
- LieberLieber
- Lightstreet Consulting
- Lincoln Lab
- Lockheed Martin
- MathWorks
- Maplesoft
- Mercury Systems
- Mgnite Inc
- MID
- MITRE
- ModelAlchemy Consulting
- Model Driven Solutions
- Model Foundry
- NIST
- No Magic/Dassault Systemes
- OAR
- Obeo
- OOSE
- Ostfold University College
- Phoenix Integration/ANSYS
- PTC
- Qualtech Systems, Inc (QSI)
- Raytheon
- Rolls Royce
- Saab Aeronautics
- SAF Consulting *
- SAIC
- Siemens
- Sierra Nevada Corporation
- Simula
- Space Cooperative
- Sodius Willert
- System Strategy *
- Tata Consultancy Services
- Thales
- Thematix
- Tom Sawyer
- Twingineer
- UFRPE
- University of Western Switzerland (Rosas Center)
- University of Cantabria
- University of Alabama in Huntsville
- University of Detroit Mercy
- University of Kaiserslautern / VPE
- Vera C. Rubin Observatory
- Vitech
- 88solutions

Academia/Research
Tool Vendor
Government Rep
End User
INCOSE rep *

OMG Standards Development Organization.

Many Implementations in progress

Dassault/3DS
Cameo

IBM
Rhapsody

PTC
Windchill Modeler

Sparx
Enterprise Architect

Intercax
Syndeia

Siemens

Ansys