

Manual Preparation Requirements

Short Manual to prepare the subset 26 ReqIF files for ProR traceability work

The general documentation how to use ProR to do Requirement Engineering is presented in the toolchain documentation under

<https://github.com/openETCS/toolchain/wiki/Documentation>

The tutorial to work with requirements is presented under the point

Authoring Requirements (ProR)

https://wiki.eclipse.org/RMF/User_Guide/Tutorial#Create_the_Model

The way every ReqIF file has to be prepared to allow the use of the ProR – Papyrus traceability is presented in section:

Tracing Requirements and SysML Models

The main steps are:

- The datatype configuration dialog is opened via ProR | Datatype Configuration....
- Datatypes for the Proxy Element:
 - **Proxy Type:** This is a Spec Object Type for the proxy elements.
 - **Description:** This is an Attribute Definition String that is a child of **Proxy Type**. This is where the URL to the linked element is stored.
 - **T_Proxy:** This is the Datatype Definition String that is associated with **Proxy Attribute**.
- Datatypes for the Link Element:
 - **Link Type:** This is a Spec Relation Type that connects the **Proxy Type** with the requirement.
- Select ProR | Presentation Configuration
- From the dropdown Select Action... pick Tracing
- Upon selecting the newly created configuration element, the property view shows 7 entries:
 - **Attribute Names:** Enter the attribute name you picked earlier (**Description**). Note: That you need to type the name exactly as you created it earlier.
 - **Datatype:** The datatype you created earlier (**T_Proxy**).
 - **Link From Target:** Whether the source of the link is the SysML Proxy, and the target the requirement, or the other way around.
 - **Link Type:** The SpecRelationType you created earlier (**Link Type**).
 - **Package Prefix:** (Advanced users) This is the package namespace of the Java object that is being dragged on the requirement. If the namespace fits the beginning of the dragged object, then the drop operation is enabled. The default (org.eclipse.uml) fits

all Papyrus model elements. Changing this allows to configure multiple tracing integrations without interfering with each other.

- **Proxy Attribute:** The attribute from the Proxy attribute, from the drop down (**Description (String) Proxy Type**)
- **Proxy Type:** The SpecObjectType you created earlier (**Proxy Type:**)

Data Types Modifications at the Subset 26 Doors Export ReqIF files

8 ReqIF have been created by Jan Welte using the DOORS 9.5 Client in the following way:

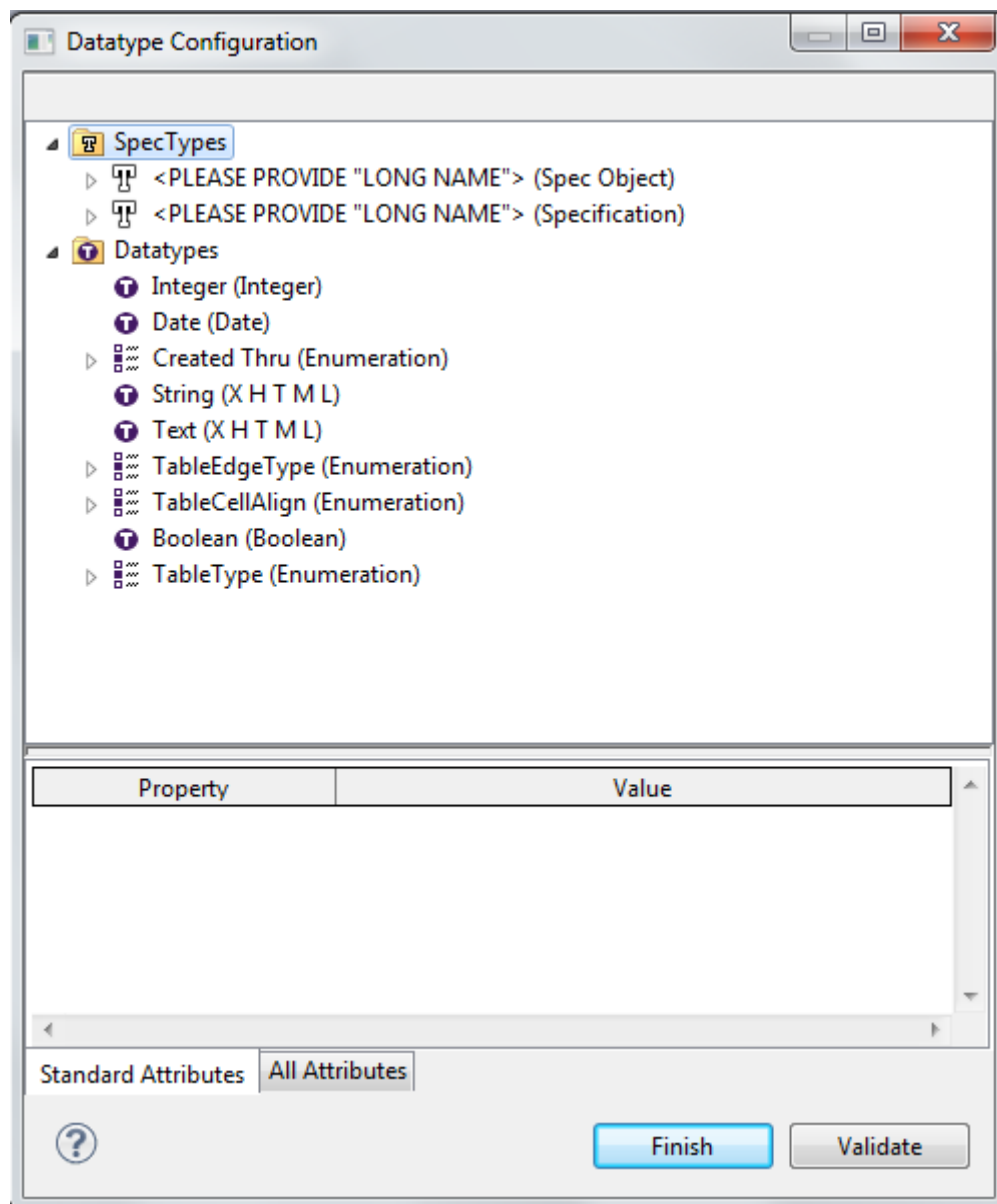
1. Prepare the Subset26 Requirements Word Files
 - a. Change all Meta- and Vector graphics to png-files to allow import
 - b. Modify headline numbers in text (by saving file as rtf) to provide import of the Requirement Numbering as text
 - c. Delete content of Sections 1. Modification and 2. Table of Content to avoid import as requirement
2. Import Subset26 Requirements with the Doors Word Import plugin to create Doors Database Project
3. Export every Subset 26 Chapter as a ReqIF File with the DOORS ReqIF Export Manager

Note: The Subset has been separated in 8 ReqIF Models (1 per Chapter) to reduce the size of every ReqIF model. (One single model has slowed down the ProR/Eclipse tool too much).

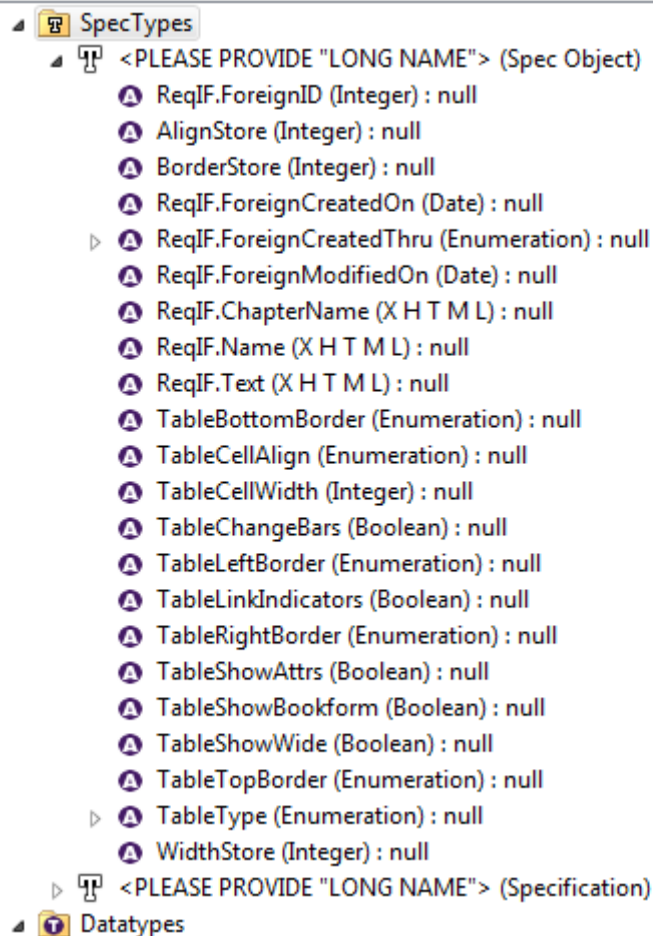
As the Doors Export of ReqIF is preconfigured to a large degree and provides a number of Spec and Data Types

The datatype configuration dialog is opened via `ProR | Datatype Configuration....`

- Spectypes and Datatypes for the Doors ReqIF Export



Spec Types and Data Types in the Doors Export ReqIF File



Attributes delivered by the doors export

Goal:

- Keep the important content, but reduce the unnecessary number of Table attributes
- Ease readability
- Add further needed attributes
- Add further spec and data types to distinguish between original and new requirements

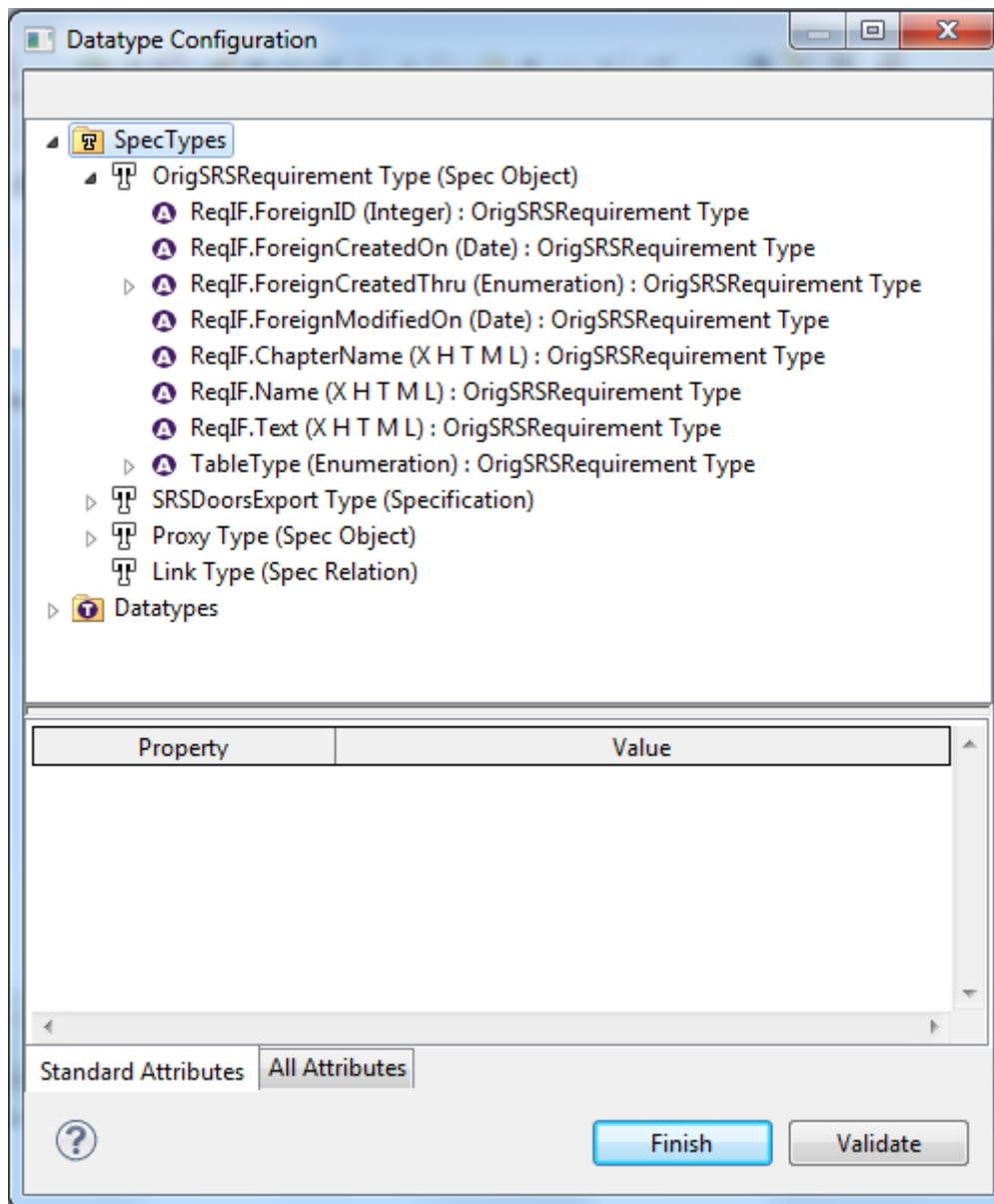
1. Step – Change Name of Existing Spec Object Type and Specification Type

Rename the Spec Object in “OrigSRSRequirement Type”. (To indicate the original requirement)

Rename the Specification in “SRSDoorsExport Type”. (To indicate the source for the Specification)

2. Step – Delete not needed Attribute of the “OrigSRSRequirement”.Spec Object

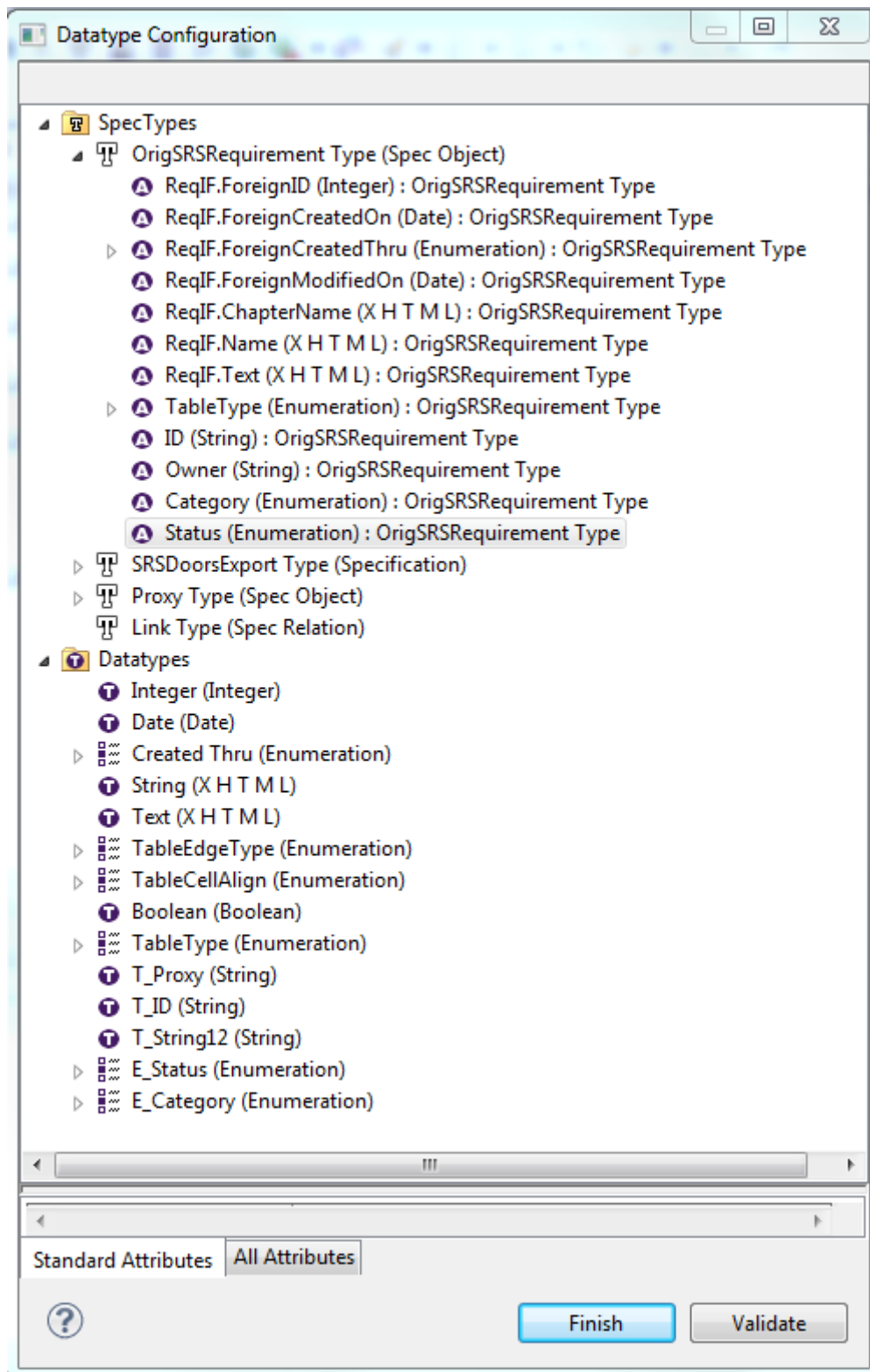
Delete nearly all Table Attributes only keep TableType and all ReqIF.... attributes



Attributes of the Spec Object after deletion

3. Step – Add additional attributes and related data types for Spec Object

- Attributes (Data Type):
 - ID (T_ID) String
 - Owner (T_String12) String
 - Category (E_Category) Enumeration (Architecture, Behavioral, Data, Definitions, Environmental, Note, Property, Scenario)
 - Status (E_Status) Enumeration (Unknown, To be verified, Verified)



Attributes and Data Types after adding additional information

4. Step – Edit Columns in editor (for better usability)

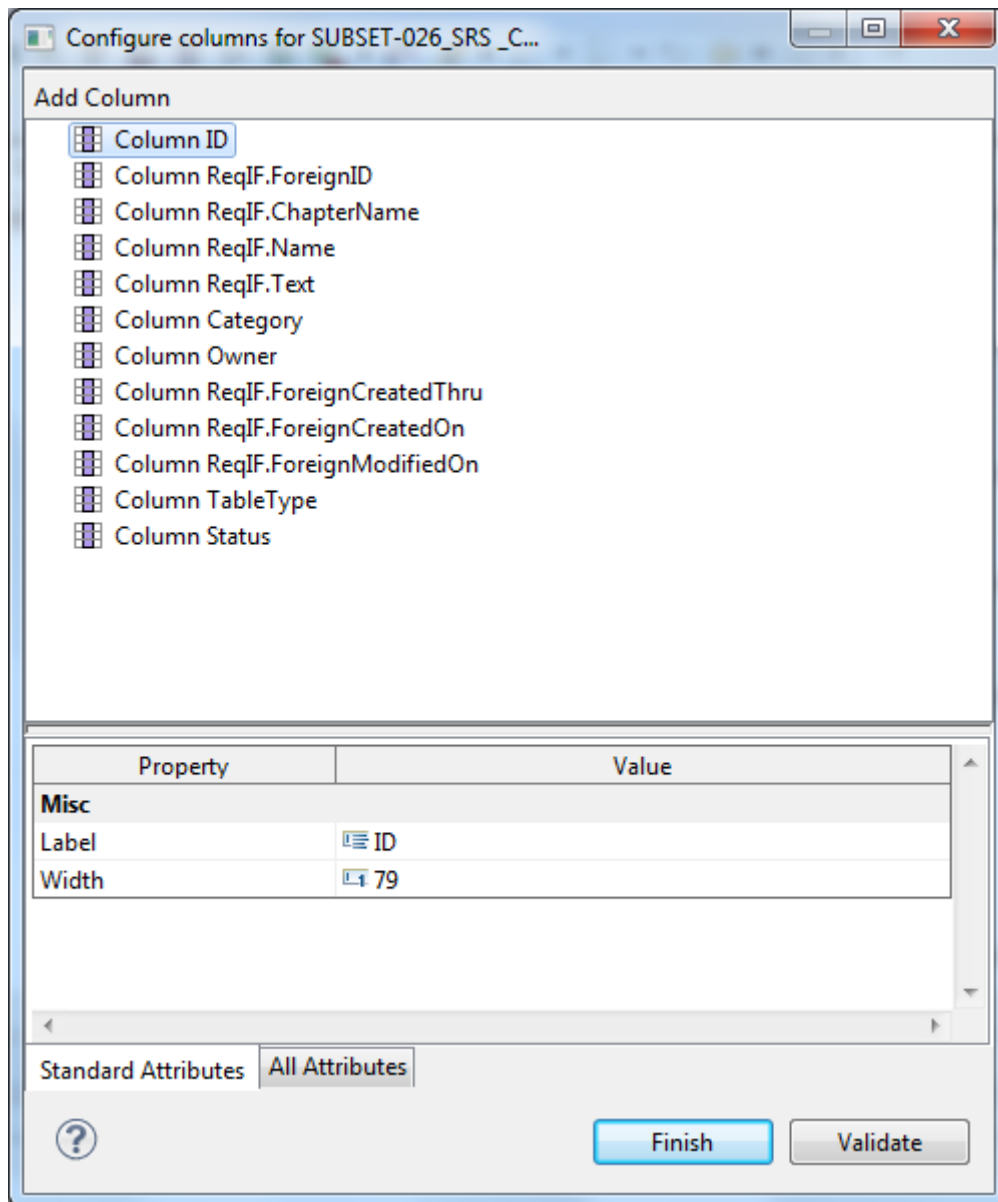
- Select `ProR | Configure Columns`
- Select Column to delete
- Select `Add column` to create

- Select column and shift it to the new place to change order

Delete the column not needed anymore, as the attributes have been deleted.

Add column for the new attributes.

Shift column to create a more intuitive order



New order of Columns

ID	ReqID	ReqF.ChapterName	ReqF.Name	ReqF.Te	Cateq	Ownr	ReqF.Forei	ReqF.Foi	ReqF.Foi	TableTyp	Status	Link
1	1						Manual Inp	23.01.20	23.01.20	TableNoi		
1.1	2	8.1 Modification History					Manual Inp	23.01.20	23.01.20	TableNoi		
1.2	3	8.2 Table of Contents					Manual Inp	23.01.20	23.01.20	TableNoi		
1.3	4	8.3 Introduction					Manual Inp	23.01.20	23.01.20	TableNoi		
1.3.1	5	8.3.1 Scope and Purpose					Manual Inp	23.01.20	23.01.20	TableNoi		
1.3.1	6	8.3.1.1 This chapter defines the format and content of messages necessary for ERTMS/ETCS functions.					Manual Inp	23.01.20	23.01.20	TableNoi		
1.3.1	7	8.3.1.2 Concerning the transmission media, this chapter does not cover considerations such as medium-specific use constraints (e.g. distance between track-circuit and balise#(2026)), as well as functions (e.g. detection of balise reference, time and location stamp, identifying type of receiving balise, Key Management, Releasing/maintaining a radio connection#(2026)) and performance of the transmission media.					Manual Inp	23.01.20	23.01.20	TableNoi		
1.3.2	8	8.3.2 Definitions					Manual Inp	23.01.20	23.01.20	TableNoi		
1.3.2	9	8.3.2.1 Transmission media considered hereafter are standard ERTMS/ETCS transmission media used for ETCS (Eurobalise, Euroradio and Euroloop).					Manual Inp	23.01.20	23.01.20	TableNoi		
1.3.2	10	8.3.2.2 A message includes user data (application level) and protocol data (depending on the transmission medium).					Manual Inp	23.01.20	23.01.20	TableNoi		
		8.3.2.3 A Eurobalise message is the information sent by a balise group (i.e. the message is composed of one or several telegrams										

ProR editor with new columns

5. Step – Create new Specification and Spec Object Types for OpenETCS

Copy the existing Specification Type (click and move to the bottom and press Ctrl).

Rename the new copy Specification in “OpenETCS Modeling Type”. (To indicate the source for the Specification)

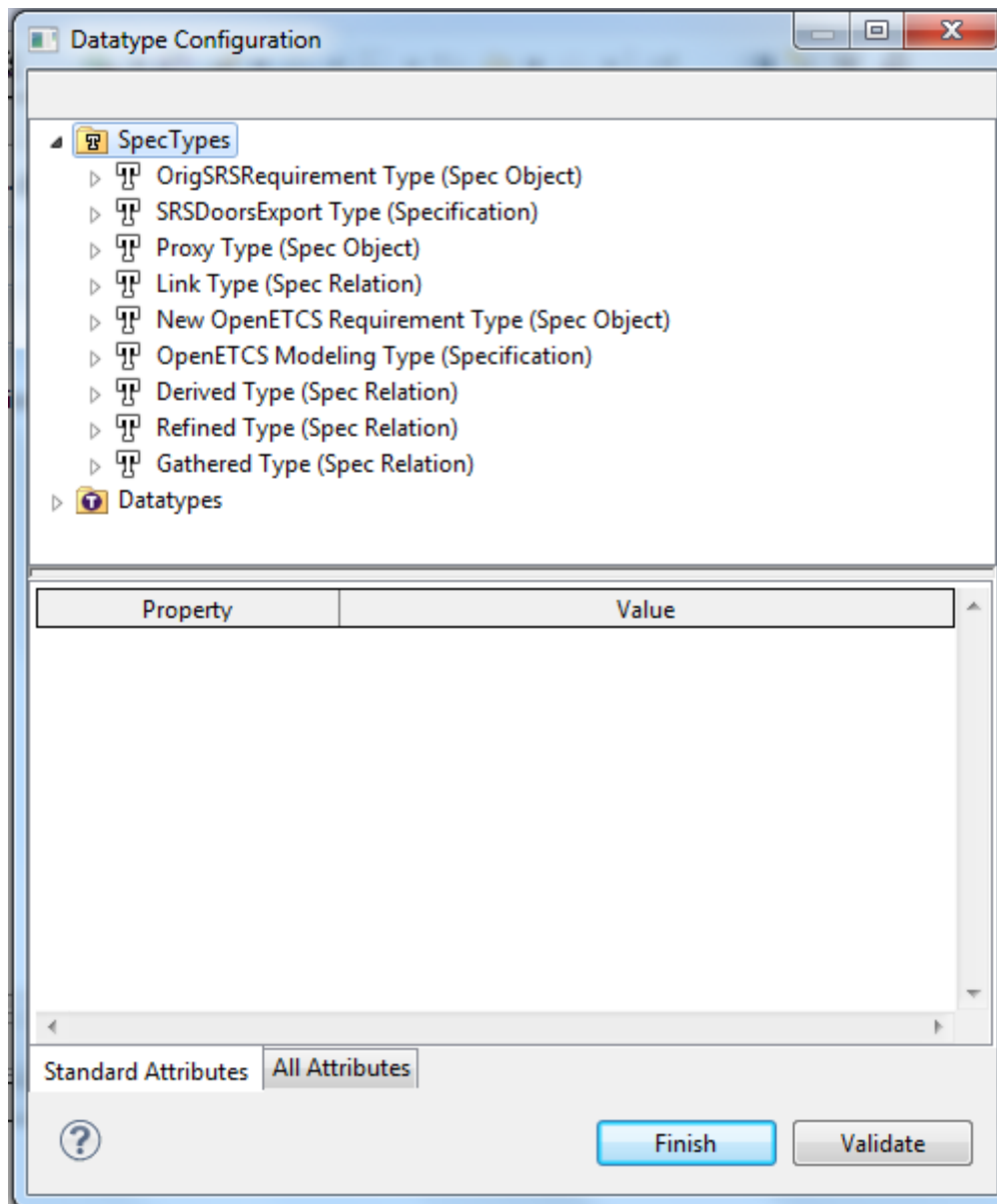
Copy the existing Spec Object Type (click and move to the bottom and press Ctrl).

Rename the new copy Spec Object in “New OpenETCS Requirement Type”. (To indicate the source for the Specification)

6. Step – Create new Spec Relation Types for OpenETCS

Create Derived, Refined, Gathered

Add Attribute Status to all Spec Relation Types



Complete Types

7. Step – (Not yet implemented) Create a human readable ID

- Select ProR | Presentation Configuration
- From the dropdown Select Action... pick Id

Chose the Attribute ID and define the Structure of the human readable ID