

DATEX II V2.3

PROFILING GUIDELINE D2

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DATEX II Profile guideline



Introduction

Objective

This deliverable documents the work on creating a profile for the exchange of DATEX II based data. The first chapter describes the concept of profiling. The following chapters each document how to profile information on the different granularity levels of the DATEX II model.

Document structure

This document is structured as follows:

- Section 1 gives an overview on the objectives of this document, its structure and how it fits into the whole set of DATEX II reference documents.
- Section 2 describes the profiling process

DATEX II reference documents

Reference in this document	DATEX II document	Document version	Date
[Modelling methodology]	DATEX II Modelling methodology	2.3	30-09-2014
[Data model]	DATEX II Data model	2.3	30-09-2014
[Schema generation tool]	DATEX II schema generation tool	2.3	30-09-2014
[Exchange PSM]	DATEX II Exchange PSM	2.3	30-09-2014
[WSDL]	DATEX II Push/Pull	2.3	30-09-2014
[XML schema]	DATEX II v2.3 schema	2.3	30-09-2014
	Supporting documentation		
[User guide]	DATEX II User guide	2.3	30-09-2014
[Software developers guide]	DATEX II dev guide	2.3	30-09-2014
[XML schematool guide]	DATEX II Schema generation tool guide	2.3	30-09-2014
[Extension guide]	DATEX II Extension guideline	2.3	30-09-2014
[Profile guide]	DATEX II Profile guideline	2.3	30-09-2014
[Exchange PIM]	DATEX II Exchange PIM	1.01	08-02-2005

General introduction into profiling in DATEX II

The DATEX II information model is a vast model for all kinds of information that is possibly exchanged in the traffic and travel domain. In operational practise the implementers of information links focus on parts of the model only, as these parts are relevant for their operational exchange requirements.

To manage this focus and in order to ensure the standardisation of subdomains, the concept of profiling is developed. In this guideline the way a profile can be defined to support a specific information link is provided. Be aware that this guideline is using an example, which is no more than an example, documenting the concepts of profiling. The resulting schema has no status whatsoever.

The concept of profiling for DATEX II is the method to limit the number of information attributes on an exchange link for traffic- and travel information/data.

In this guideline the following workflow is expected in setting up an information exchange of traffic and travel information using DATEX II:

- 1) Define the need to exchange information (see DATEXIIv2.0-UserGuide)
- 2) Define the information that is going to be exchanged on a functional level at sufficient detail (see DATEXIIv2.0-UserGuide)
- 3) Define the location referencing system(s) that will be used to localise the objects information is provided about (See DATEXIIv2.0-UserGuide)
- 4) Define the update mechanism on information level (single element or all element update (i.e. only the modified information, or the complete information set) (See DATEX II User Guide)
- 5) Define the way information a client gets access to information, whether he should pull it from a server or gets it posted/pushed to his system (see DATEXIIv2.0-UserGuide).
- 6) Map the defined information on the DATEX II UML model
- 7) Create extensions for the information elements that could not be mapped on the base model (See DATEX II Extension Guideline)

The steps above are platform independent steps. The next logical step is creating the reference set of information that actually is going to be implemented. As DATEX II version 2.1 supports the exchange of information with webservices only, this step currently is combined with the creation of the xml schema. Once other Platform specific models are defined, the profiling concept will be adapted to that. So the next step is:

- 8) Create, with the help of the DATEX II conversions tool, the xml schema that contains only the mandatory and required information elements for the link. This is what is called profiling and supports the following options
 - a) Deselecting information classes and attributes from the complete model, that will not be used anyway
 - b) Limit the available literals in the enumerations
 - c) Make cardinality of optional attributes and/or elements more strict then the base model prescribes
 - d) Generate the resulting xml schema

WARNING: a profile is by definition a subset of the entire datamodel. It is recommended to use the profiled schema's only for the data publisher. A client that is connected to more than one publisher, should be aware that each publisher can have its own profile, that have different class and attribute selections!

Deselecting classes and attributes

Major reason for profiling is limiting the amount of information objects that are used on a link. The use of the DATEX II conversion tool is documented in the DATEX II schema generation tool guide.

Warning: limiting the allowed classes and attributes imposes this change on all systems that connect to each other using the resulting XML Schema.

In the workflow as described in the previous chapter is followed. We assume an functional information exchange in which no extensions are required.

- In steps 1 and 2 is defined that a traffic centre will deliver travel time information per vehicle type on roadsegments that are defined as exit to exit, to a service provider. The traveltime is provided for the following vehicle types
 - motorcycles
 - cars,
 - cars with trailers,
 - busses,
 - lorries.
- In step 3 is decided that the location referencing system is AlertCLinear and the x,y coordinates of the start location are provided
- In step 4 is decided that the update mechanism is all element
- In step 5 is determined that all information that is decided upon in step 2 can be delivered by making use of the class Elaborated Data

Step 1: select the required payloadPublication classes only

So the profile that will be generated is first restricted to the ElaboratedDataPublication class by deselecting all other publication classes in Payload.

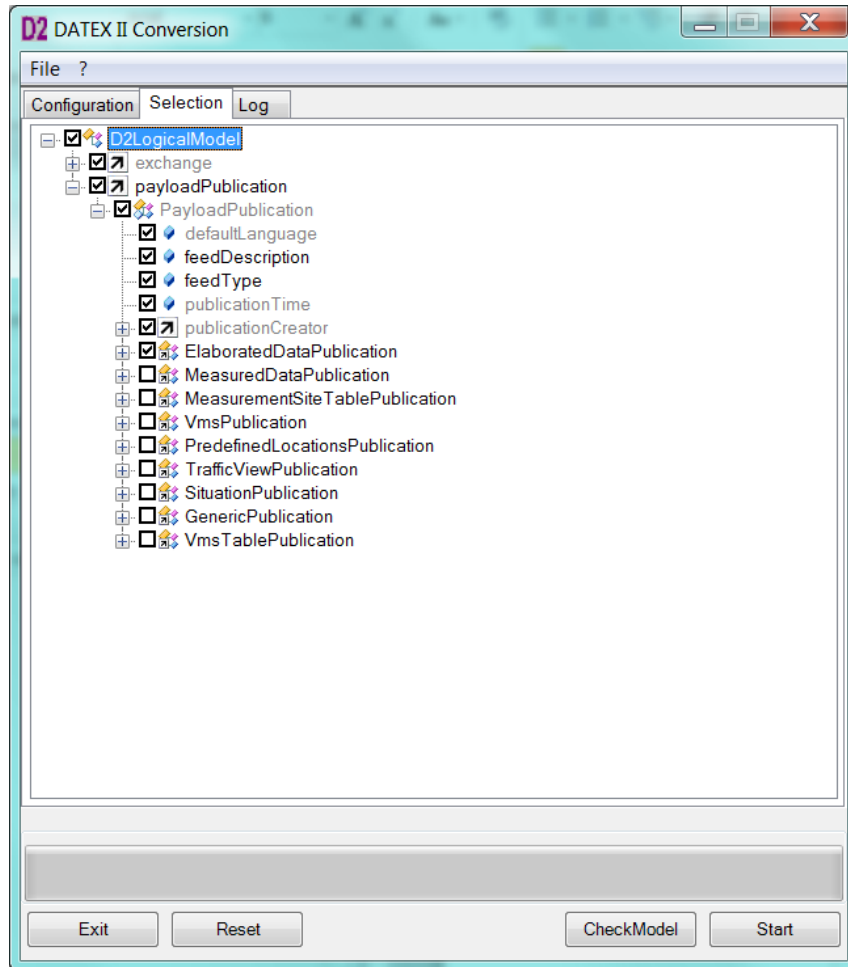


Figure 1 Deselection of non used classes in the payLoadPublication

Step 2: select the required classes and attributes in the publication

As in steps 1 and 2 is defined that traveltime will be delivered, which will always be the traveltime of certain vehicleTypes.

All classes and attributes that are not required for this purposes, are deselected. The required classes and attributes are marked in the figure 2.

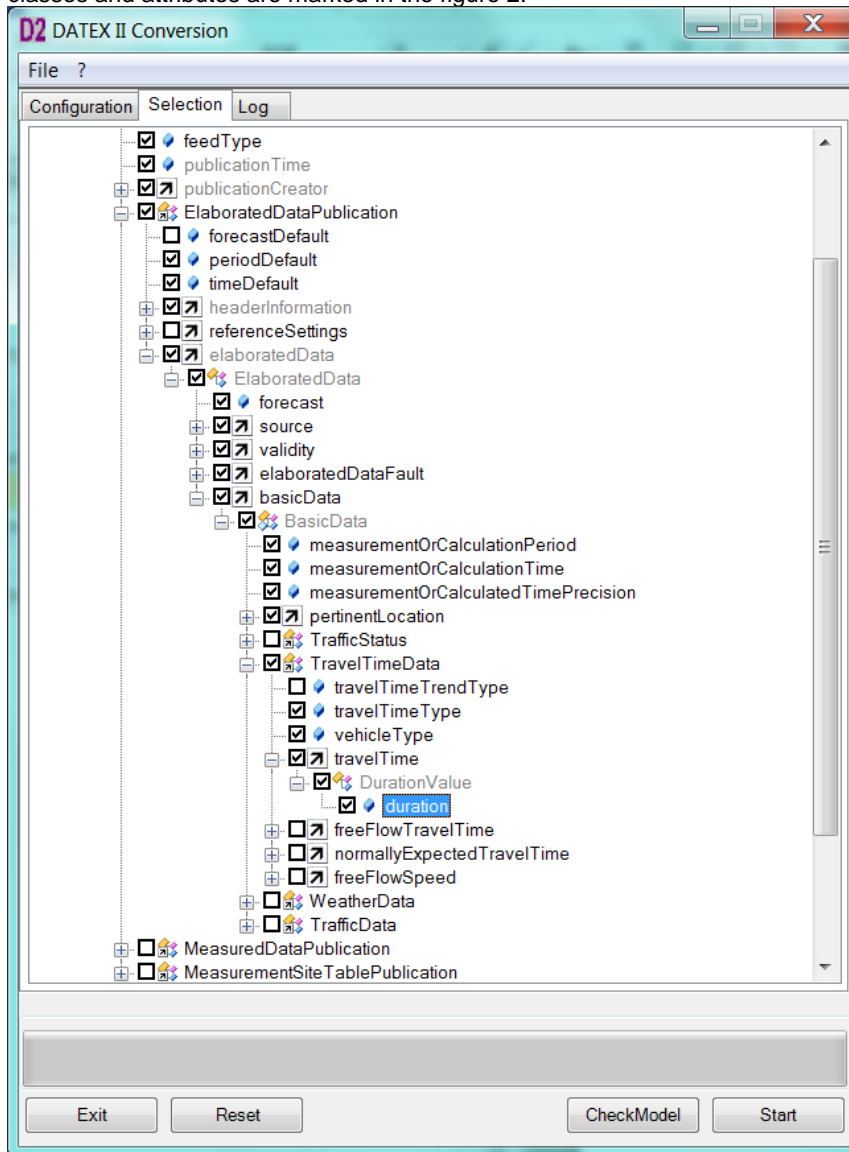


Figure 2 Deselection of not used classes and attributes

Step 3: select the supported locationreferencing systems

Next step is to limit the profile to the use of the supported location referencing systems: AlertC Linear for the trajectory and x,y coordinates for the location of the start of the itinerary.

- Deselect all not used location referencing systems
- Select the AlertCLinear location class. In this specific case it is decided to use AlertC Method 4 only, so all others should be deselected
- Select x,y coordinates of location type point.

In ElaboratedDataPublication location information is provided in the class pertinentLocation. All non supported referencing systems are deselected.

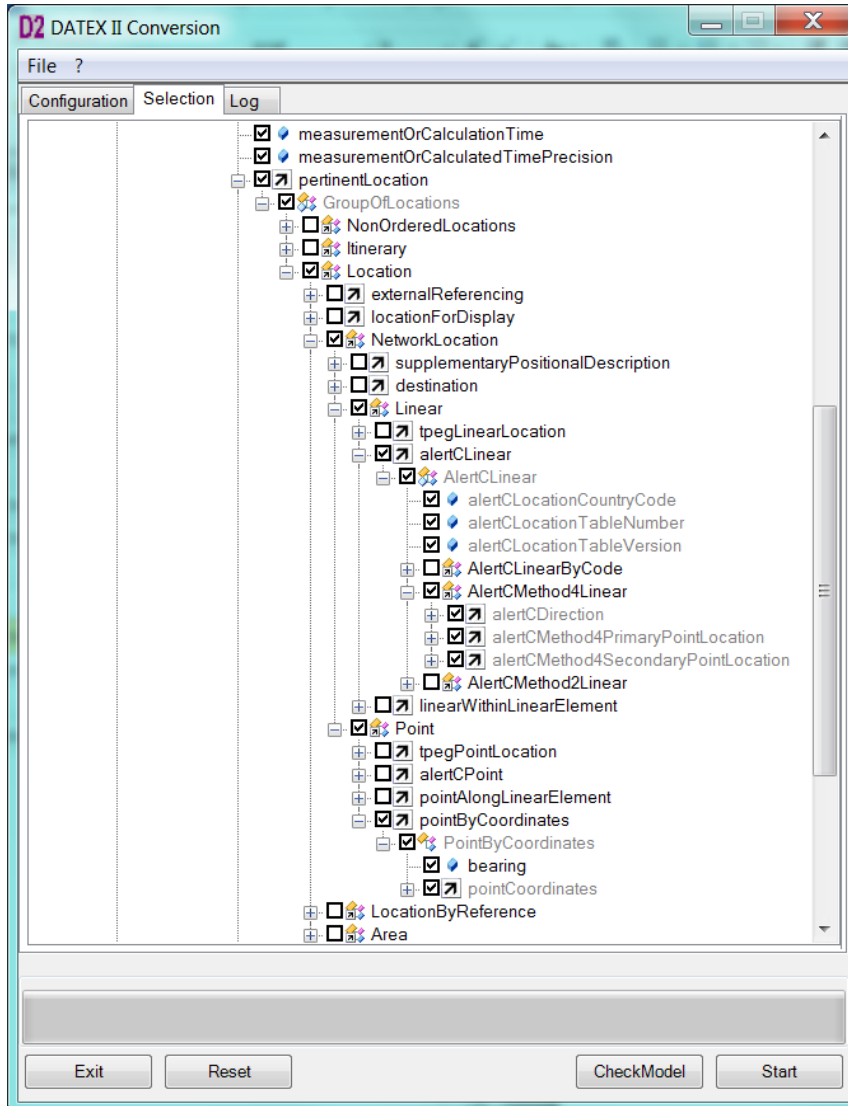


Figure 3 Deselecting the not used location referencing systems

Restricting optionality

Now we have a much smaller selection of the allowed classes and attributes. However, it might be that we want to make certain classes mandatory in our own link, that are optional in the base DATEX II model. In the DATEX II Conversion tool, the cardinality of classes and attributes can be modified. This

Warning: modifying the cardinality imposes this change on all systems that connect to each other using the resulting XML Schema

In our example in step 1 and 2 is determined that traveltime is delivered per vehicle type. As a result vehicle type should be mandatory in our schema. To achieve this the cardinality of this attribute in the model should be changed. This is done as in the figures below

Step 1: click right on the attribute that will be restricted

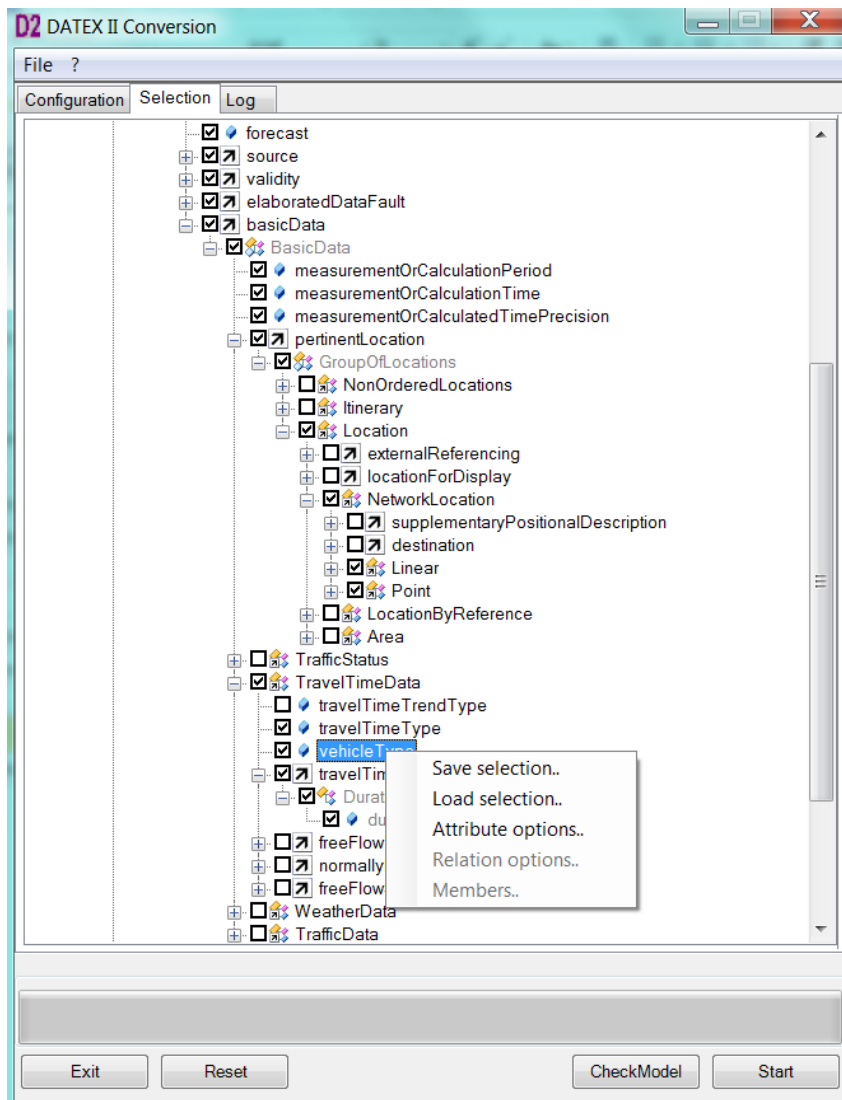
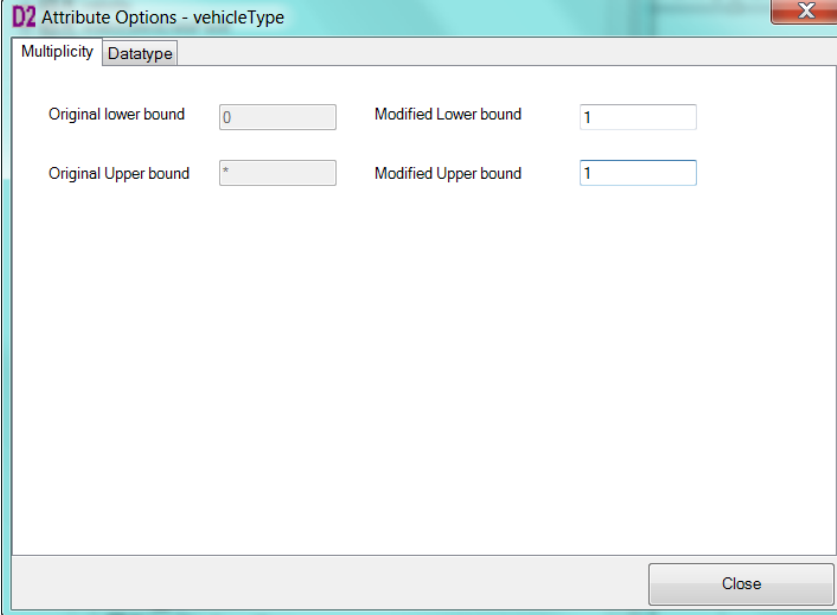


Figure 4 Step 1 Select attribute to modify

Step 2: change Attribute options

After rightclicking the attribute vehicleType, select the Attribute Options in the upopping screen. A screen as in the figure below will open.

In this screen the Upper- and Lower bound of this attribute will be modified. As in the definition phase it was said that a traveltime is always related to a vehicleType the modified values are 1 for both. The attribute is mandatory now and is allowed only once per traveltime.



Field	Value
Original lower bound	0
Modified Lower bound	1
Original Upper bound	*
Modified Upper bound	1

Figure 5 Modify the optionality of attributes

Limiting enumeration values

Now the model is optimised in terms of allowed and mandatory information classes and attributes in our exchange.

It could be still the case that the resulting schema allows options that are not desired on a functional level. Cause for this is the fact that the DATEX II base model contains possible values in the selectable lists called enumerations, that are not in line with the functional desires.

Warning: limiting the allowed enumeration values imposes this change on all systems that connect to each other using the resulting XML Schema.

In the conversion tool it is possible to shortlist the enumerations that will appear in the xml schema.

In our example the it was defined in step 2 that vehicle types of which the traveltime will be provided are categorised in groups of cars, cars with trailers, busses, lorries and motorcycles.

Step 1: click right the attribute of which the list of enumeration literals will be shortened

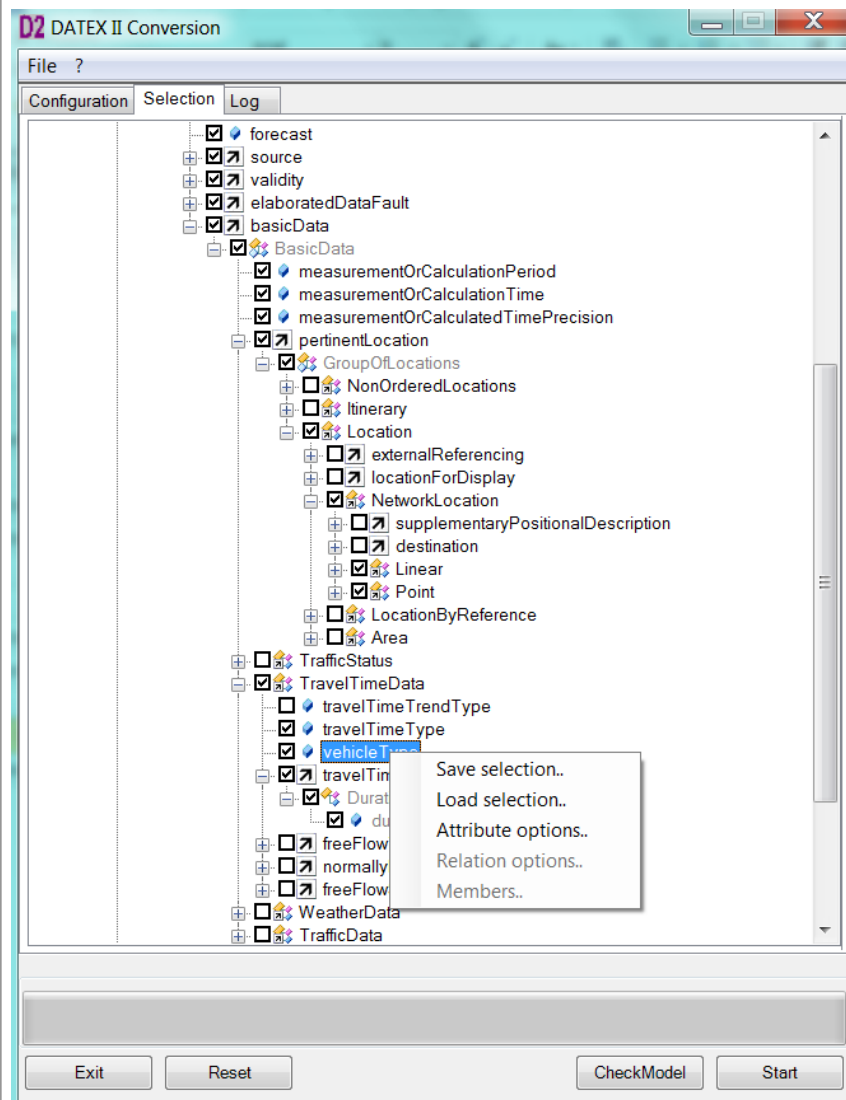
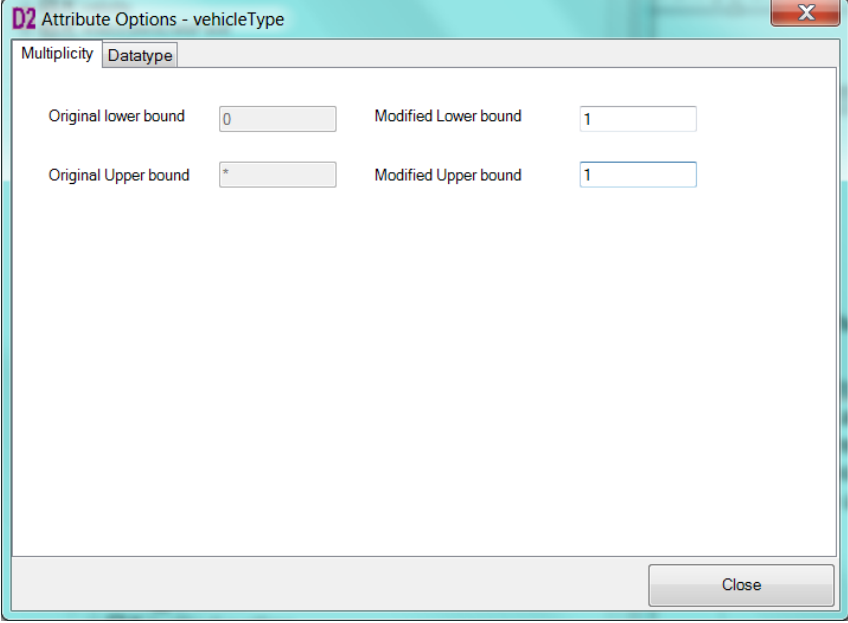


Figure 6 Step 1 Select attribute of which the list of enumeration literals will be shortened

Step 2: change Attribute options

After right clicking the attribute vehicleType, select the Attribute Options in the upopping screen. A screen as in the figure below will open. Click on the Datatype tab



The screenshot shows a dialog box titled "D2 Attribute Options - vehicleType". It has two tabs: "Multiplicity" and "Datatype", with "Datatype" selected. The dialog contains four input fields arranged in a 2x2 grid:

Original lower bound	<input type="text" value="0"/>	Modified Lower bound	<input type="text" value="1"/>
Original Upper bound	<input type="text" value="*"/>	Modified Upper bound	<input type="text" value="1"/>

A "Close" button is located at the bottom right of the dialog.

Figure 7 select the Datatype tab

Step 3: deselect the not used enumeration literals

After clicking the Data Type tab screen will show all allowed literals of the enumeration. Deselect the ones that are not allowed. In our example the following attributes are selected.

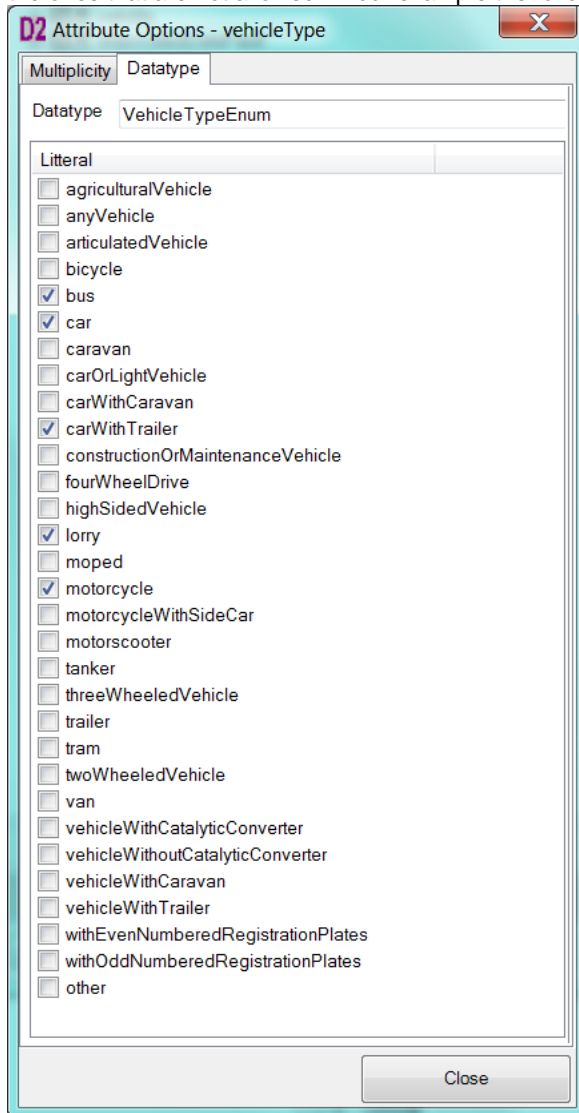
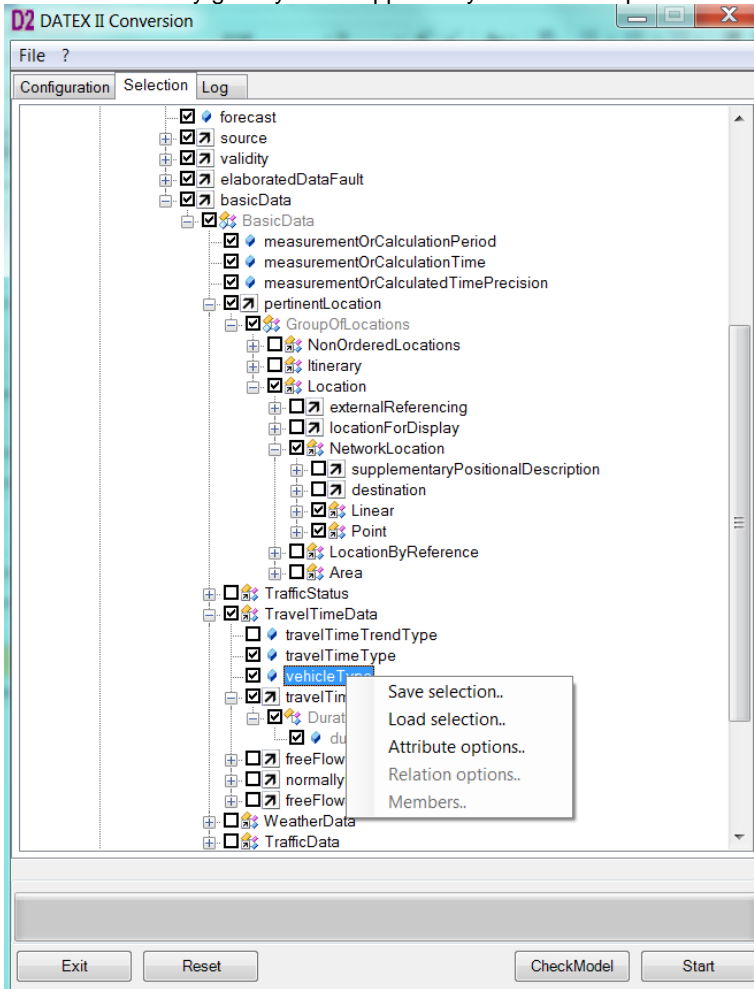


Figure 8 Deselect the not used enumeration literals

Final steps

Now the model is tailored completely to the functional requirements of the exchange. The last 2 steps are:

- Saving the selection by rightclicking one of the objects in the model and select *Save Selection*. This way gives you the opportunity to reload the profile and maintain it



- Df
- The final step is creating the xml schema by clicking the Start button.