

Introduction to the UML-Editor

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Chapter 1

Einleitung

This introduction gives a step by step description of the *UML-Editor*. It is an aim of the UML-Editor to enhance the use of the model-based method, to facilitate the mastering of the complex subject of UML and INTERLIS thanks to an intuitive device and thus to make it accessible to a greater number of users.

We presume understanding of UML and a certain knowledge of INTERLIS.

This introduction is not a reference manual.

You will find further information

- concerning the UML-Editor in the reference manual [8]
- concerning INTERLIS in the manuals [5], [6]
- concerning UML in various books z.B. [3], [4]

This manual is structured as follows

- chapter 2 explains how to start the editor,
- chapter 3 deals with data modeling,
- chapter 5 deals with the formal examination of the model,
- the conversion of UML in INTERLIS is explained in chapter 6,
- chapter 7 will teach you how to make a graphic representation of an existing INTERLIS model file.

Chapter 2

How to start the UML-editor

Depending on the configuration, a double-click on the file is all that is needed `umleditor.jar`, to start the editor (fig. 2.1). If this should fail: consult chapter 2.1 for Windows or chapter 2.2 for Mac.

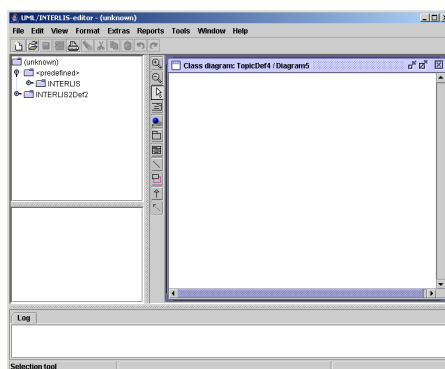


Figure 2.1: Der UML-Editor.

Depending on the configuration of your system, the texts (menu description, dialog title, ...) will be either in German or French.

2.1 Windows

2.1.1 System Configuration

In order to execute the UML-Editor, the JAVA-run time environment (JRE) version 1.4.2 or more recent must be installed on your system. A free version of JAVA run time environment (JRE) is available at the website <http://www.java.com/>.

2.1.2 Installation

In order to install the UML-editor, extract the ZIP-file into a new directory.

Establish a new link (fig. 2.2) on your desk-top. Als *Location of object* enter the following command line:

```
javaw -jar "$UMLEDITOR\umleditor.jar"
```

\$UMLEDITOR is a fill-in and corresponds to the UML-editor installation directory on your system.

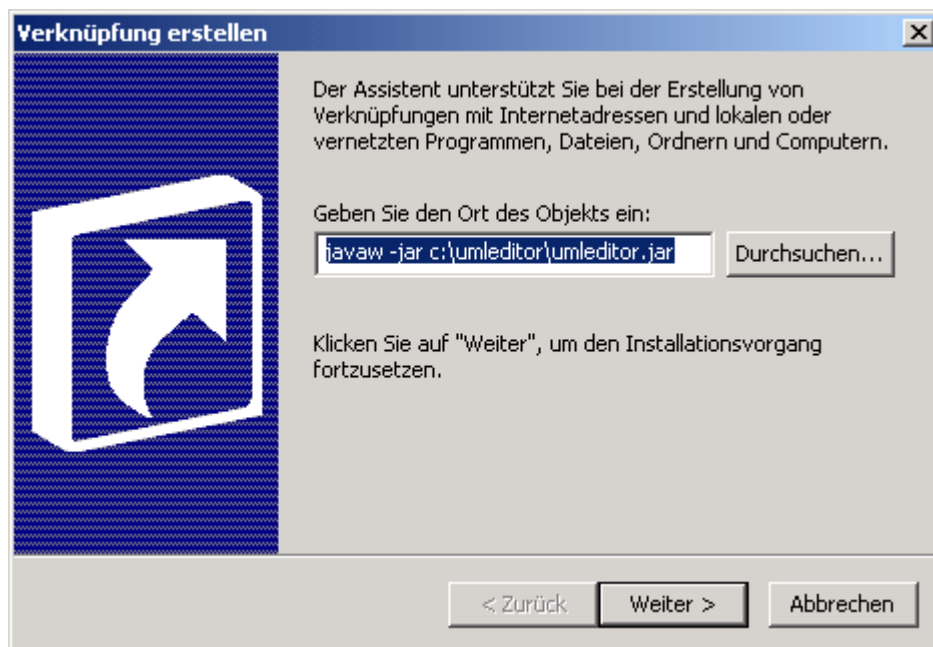


Figure 2.2: Verknüpfung auf dem Windows-Desktop erstellen.

2.2 Mac

2.2.1 System Anforderungen

In order to execute the UML-editor, the JAVA-run time environment (JRE) version 1.3 or more recent must be installed on your system. A free version of JAVA-run time environment (JRE) is available at the website <http://java.sun.com/j2se/>

2.2.2 Installation

In order to install the UML-Editor, extract the ZIP-file into a new directory.

Chapter 3

Data Modelling

In the following a detail of the data model Roads (from the INTERLIS-reference manual, appendix C) will be modeled.

Having started the UML-Editor, the main window will appear (Abb. 3.1).

- The navigation pane on the left side of the main window of the UML-editor will guide you as fast as possible to a certain element of the model.
- Within the modeling space data can be modeled graphically in individual diagrams.
- Within the documentation space a description concerning the currently selected model element can be entered.


For further information see reference manual ([8], Kap. 3).

3.1 Model and Class

Create a new data model using the menu item *File/New* ([8], Kap. 3.1.1) (fig. 3.2).

A basic structure will be generated (fig. 3.3).

Add a new class (ClassDef) to this new model: In the navigation pane ([8], Kap. 3.3) mark the element ModelDef, press the right mouse button and use the function *New/Class* (fig. 3.4).

Using the tool  a new class can be generated directly within a diagram. This tool is to be found in the tool bar ([8], Kap. 3.4.1).

Classes that have been generated in the navigation pane, will not be added automatically to the diagram. In order to add this class to the diagram, mark the relevant class and

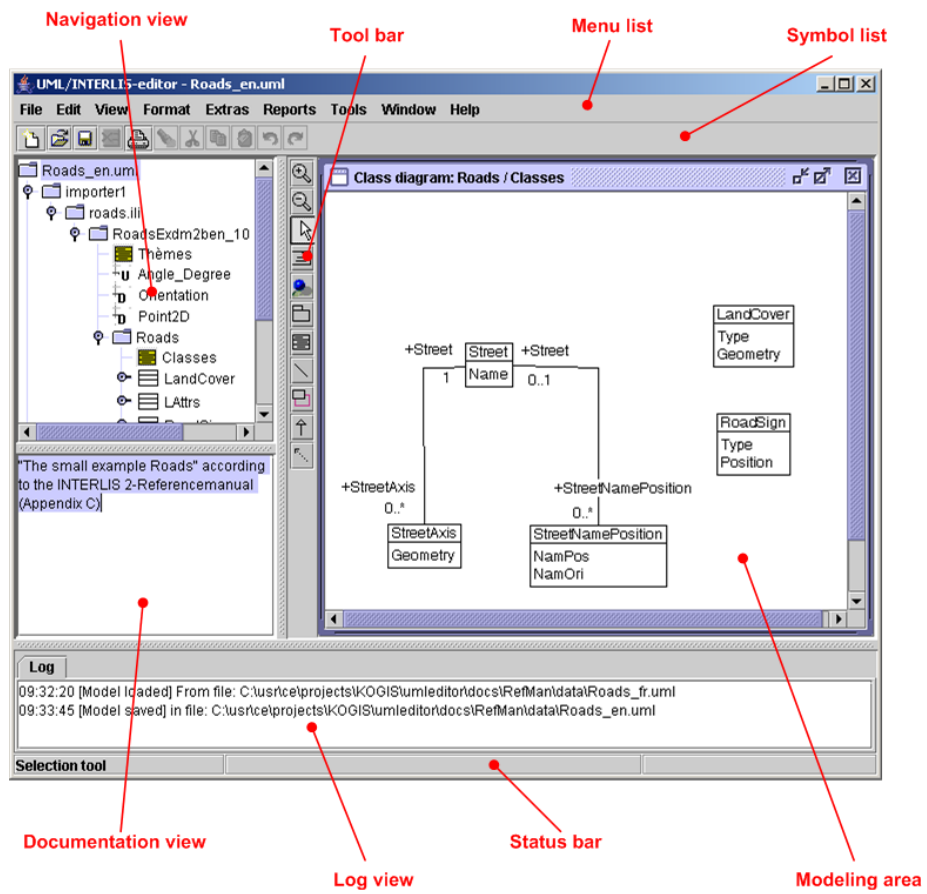


Figure 3.1: Hauptfenster des UML-Editors.

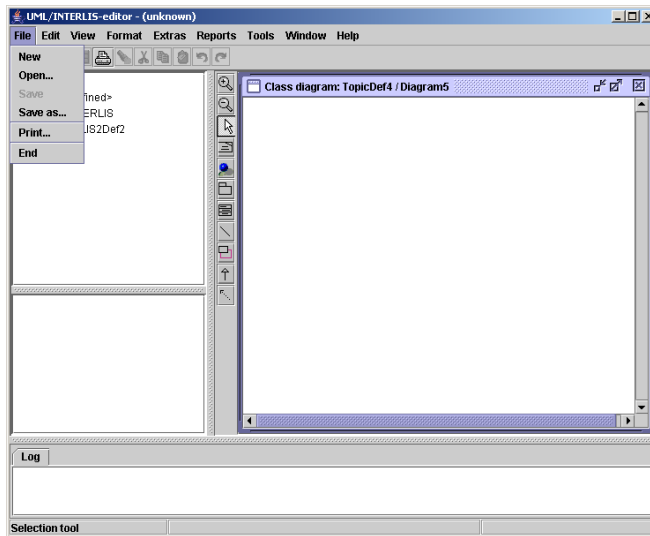


Figure 3.2: Menu item *File/New*.

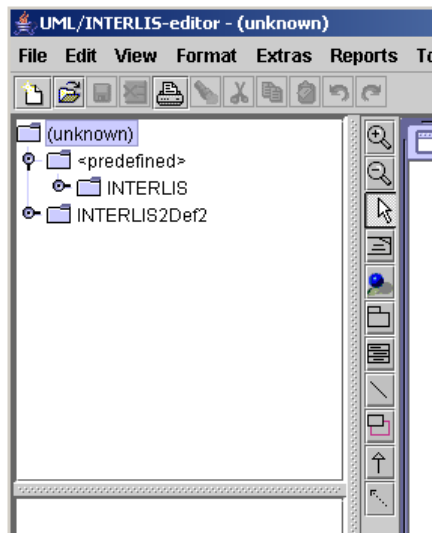


Figure 3.3: basic structure after selecting menu item *File/New*.

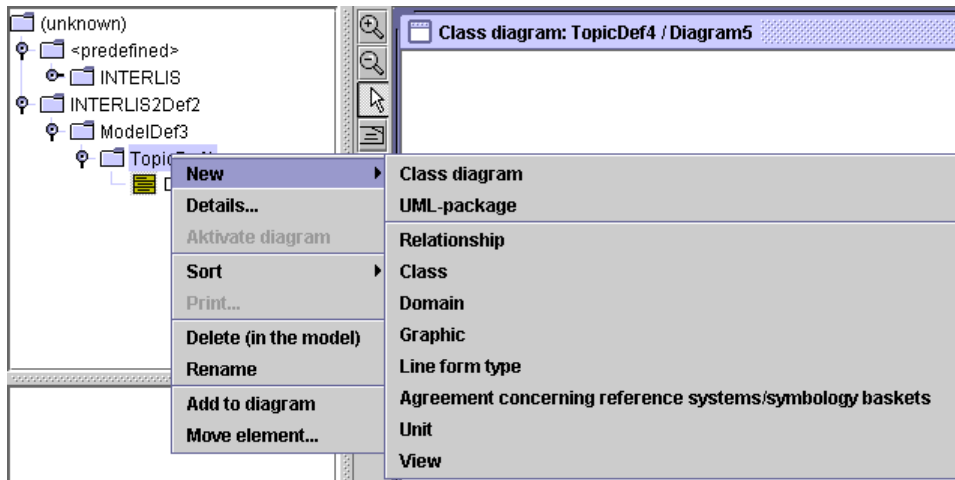


Figure 3.4: Function *New/Class* in the navigation pane.

press the right mouse button. Using the function *Insert in diagram* ([8], Kap. 3.3) you can add the classes to the diagram.

3.2 Rename

All model elements can be modified: Mark an element and press the right mouse button. By means of the function *Rename* you can assign new names to individual elements (Fig. 3.5).

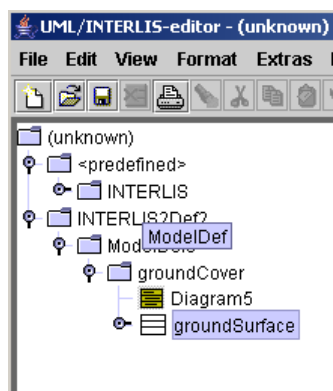


Figure 3.5: Die Klasse *Street*.

Now you have both generated a small model and modified the names of the elements.

3.3 Deleting

Please note the difference between *Deleting within a model* and *Deleting within a diagram*: When marking a class in a diagram and pressing the key *Delete*, the class will be deleted in the diagram, but remains in the model (as you can easily see on the navigation pane). In order to delete a class from the model you must press the right mouse button and use the function *Delete (within the model)*.

3.4 Attribute

On the navigation pane mark the class *BoFlaechen* and select the function *New/Attribute* (Fig. 3.6) in the context menu (right mouse button).

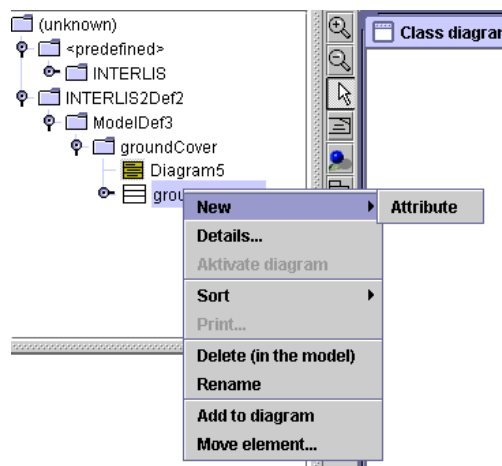



Figure 3.6: Function *New/Attribute* in the Navigation Pane.

Assign the name *Type* to the attribute. For this, open the specification catalog of the attribute: Mark the new attribute on the navigation pane and the select the function *Modify...* in the context menu (Fig. 3.7).

3.5 Relationship

Generate one more class *Gebaeude*.

Using the tool  ([8], Kap. 3.4.1) generate a relation between the two classes *BoFlaechen* and *Gebaeude*, by clicking the class *BoFlaechen* and pulling the mouse cursor (keep on pressing the left mouse button) over to the class *Gebaeude* (release the left mouse button).

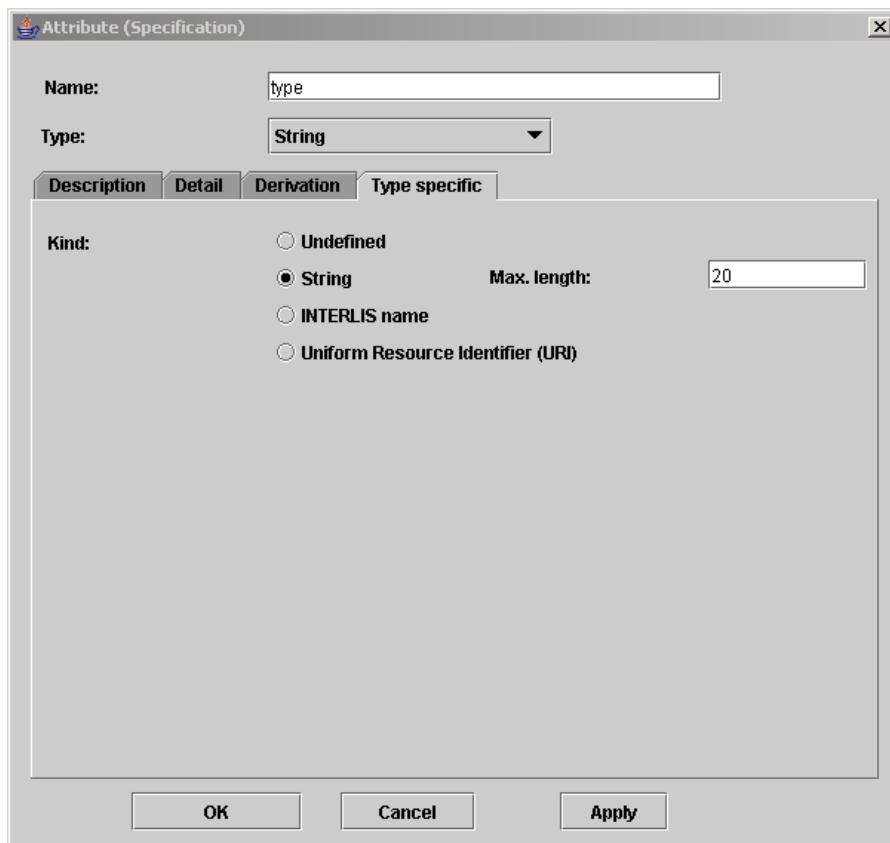


Figure 3.7: Specification Dialog for an Attribute.

You have now generated a relationship between the two classes (Fig. 3.8). Assign any name to the relation (in our example *GebaeudeFlaeche*).

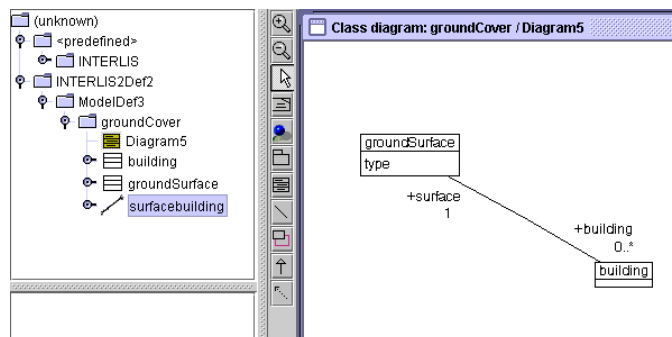


Figure 3.8: A relationship between two classes.

In the specification dialog ([8], Kap. 4.2.11) of the two roles (Fig. 3.9) you can modify your names. For one of the roles enter the name *Flaeche* and for the other the name *Gebaeude*.

In the corresponding roles it is also possible to modify the cardinality (Fig. 3.10). Select the value 1 for the role *Flaeche* and the value 0..* for the role *Gebaeude*.

By positioning the mouse cursor above a role (end of the relationship), the relationship can be converted into a composition by means of the context menu (Fig. 3.11).

In order to define further properties of the relationship, you can mark the relationship and open the specification dialog ([8], Kap. 4.2.9).

3.6 Domaine, Unity

In order to define a domaine or a unity, mark the package in which you want to establish the definition on the navigation pane. By means of the function *New/Unity* (in the context menu) you then generate the corresponding definition (Fig. 3.12). Both domaines and unities cannot be represented in a diagram in the UML-editor.

Modify the names of the unity in *m*. The exact definition of the unit will ensue by means of INTERLIS. It is possible to enter a corresponding text in the INTERLIS syntax in the specification dialog ([8], Kap. 4.2.14) of the unity (Fig. 3.13).

3.7 Determining Order of Classes, Domaines and Units

Depending on the order in which model elements are entered in the UML-editor, they will appear in a false order in the INTERLIS model file. In order to enforce a certain

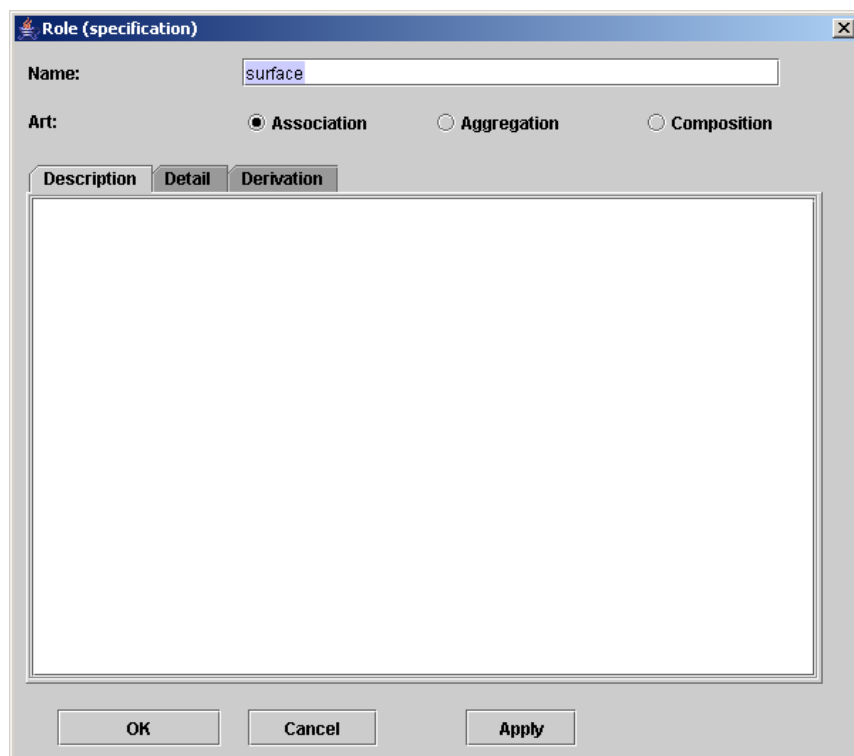


Figure 3.9: Specification dialog for a role.

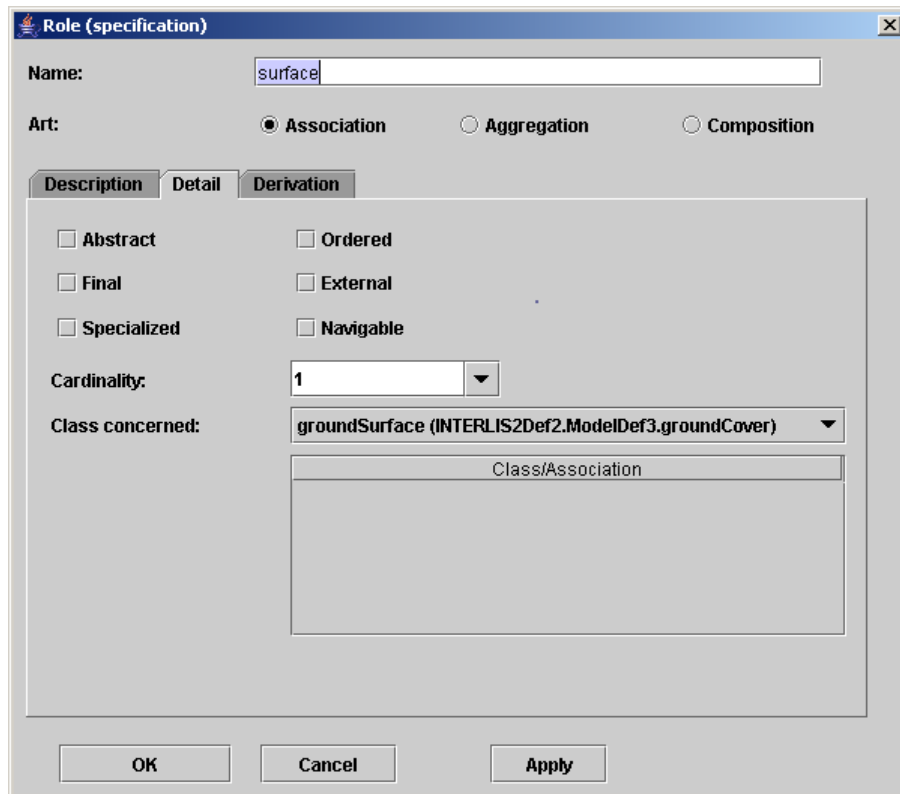


Figure 3.10: How to modify cardinality.

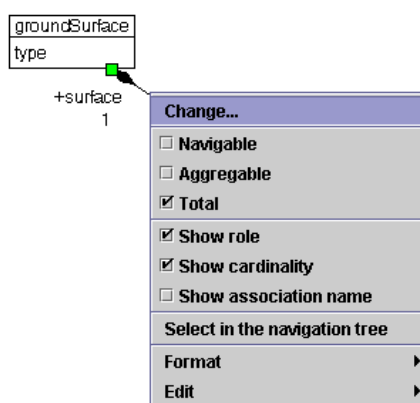


Figure 3.11: Context Menu of a Role.

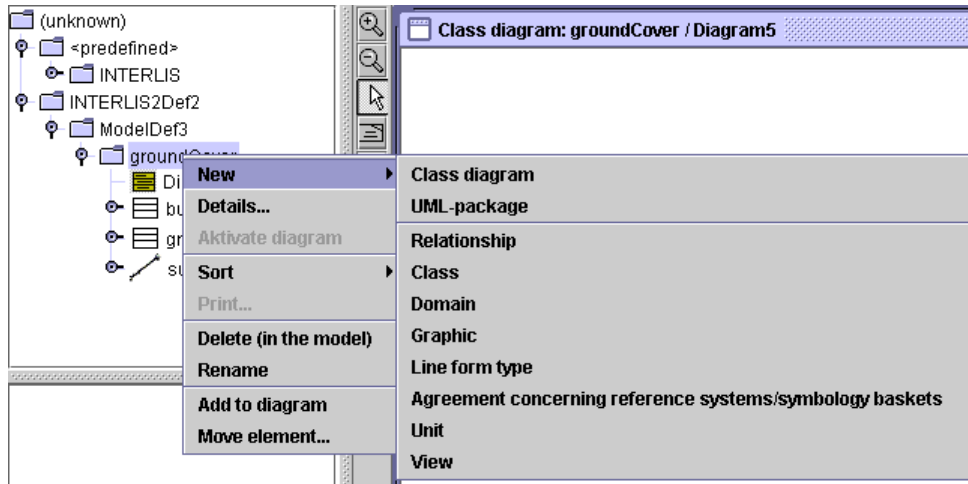


Figure 3.12: Function *New/Unity* on the navigation pane.

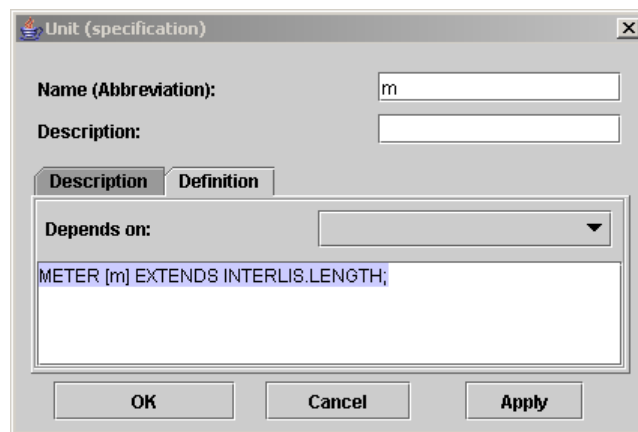



Figure 3.13: Specification dialog for a unit.

order, a dependency relationship must be defined between the relevant model elements. Such a dependency is defined by means of the tool . However since e.g. *units* cannot be represented in the diagram, the dependency can be indicated in the corresponding specification catalog under *Definition-Depends on* (Fig. 3.14).

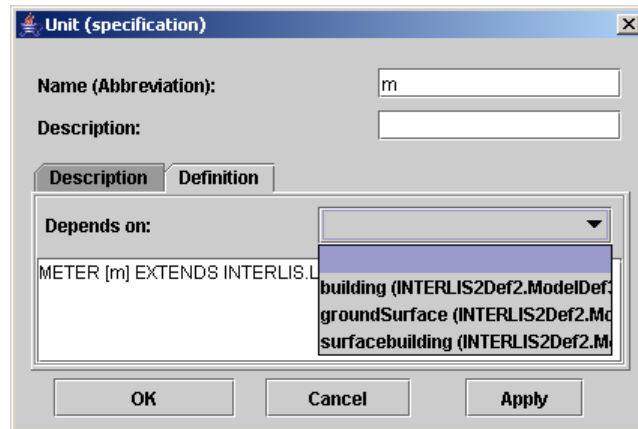


Figure 3.14: Defining dependency for a unit.

The dependency relationship between individual classes can be represented in the diagram.

Chapter 4

Creating a Documentation

When selecting a menu item *Reports/Object catalog...* ([8], Kap. 3.1.6) (Fig. 4.1), you must select a data name and thus an HTML-file will be generated.



Figure 4.1: Menu item *Reports/Object catalog...*

In this file all model elements will be listed along with their description. Using your web-browser you can inspect and print this file (Fig. 4.2).

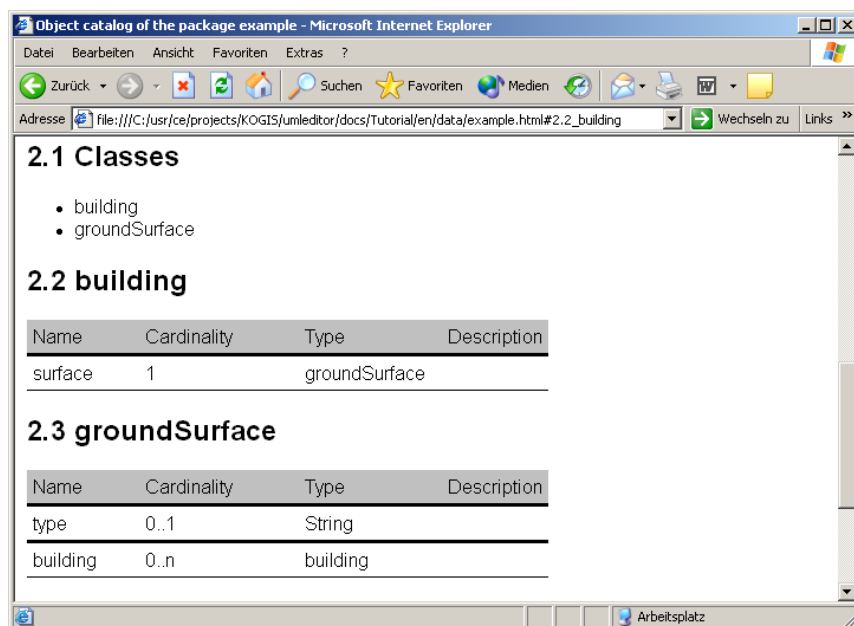


Figure 4.2: Object catalog in the Web-Browser.

Chapter 5

Model Check

When selecting the menu item *Tools/INTERLIS/Model check* ([8], Kap. 3.1.7) (Fig. 5.1), the entire UML-Modell is checked for its correctness.

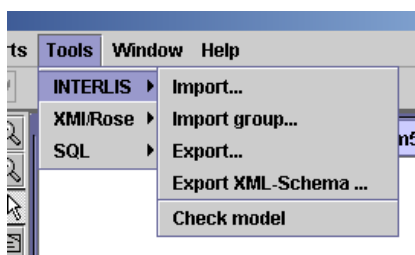


Figure 5.1: Menu item *Tools/INTERLIS/Model check*.

In a temporary directory the UML-editor generates all INTERLIS-files and checks them by means of the INTERLIS-compiler. If any errors occur, they will appear in the log pane (Fig. 5.2).

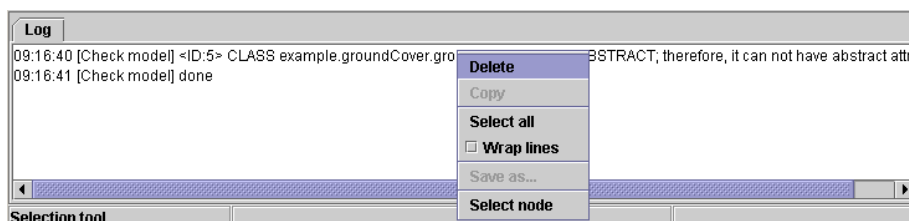


Figure 5.2: Error messages in the log pane after model check.

By positioning the mouse cursor on an error message, it is possible to open the corresponding specification catalog in the context menu (Fig. 5.2) by means of the function *Select knots* and thus the source of error can be eliminated.

Chapter 6

From UML to INTERLIS

The name of the INTERLIS file, that is being generated, will be determined in the *INTERLIS 2-file-specification* dialog ([8], Kap. 4.2.3) (Fig. 6.1).

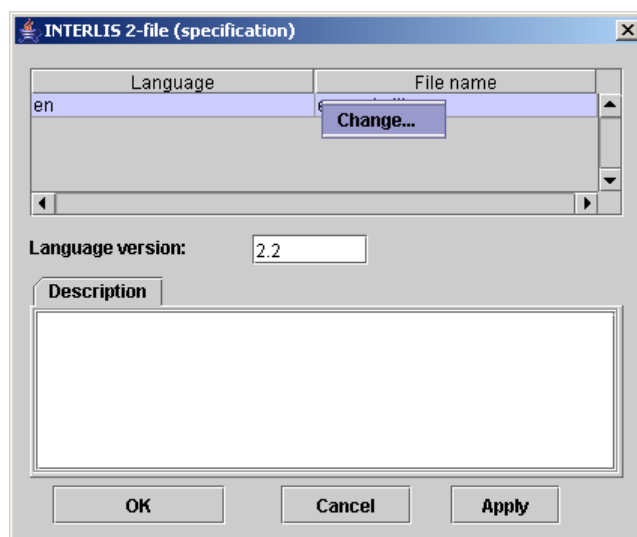


Figure 6.1: Specification dialog for an *INTERLIS 2 file*.

Any name can be entered as file name (Fig. 6.2). Use your right mouse button to reach *Modify...*

Using the button on the right side, right next to the text field, you can select a path as file name. If the file name does not contain a path indication, then the INTERLIS-file will be generated in the directory of the UML model file. You may generate (model) any number of INTERLIS-files in a UML-model.

By selecting the menu item Tools/INTERLIS/Export... ([8], Kap. 3.1.7) (Fig. 6.3), all INTERLIS-model files will be generated (Fig. 6.4).

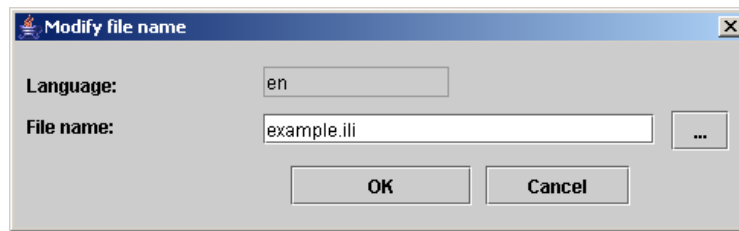


Figure 6.2: Dateiname für die INTERLIS-Datei ändern.

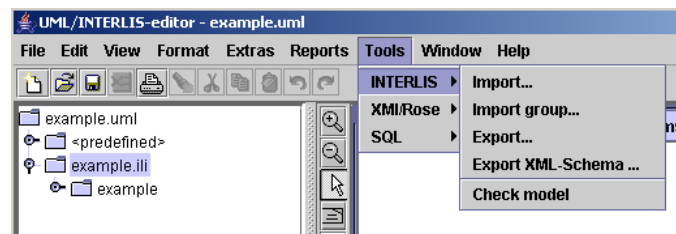


Figure 6.3: Menu item *Tools/INTERLIS/Export...*

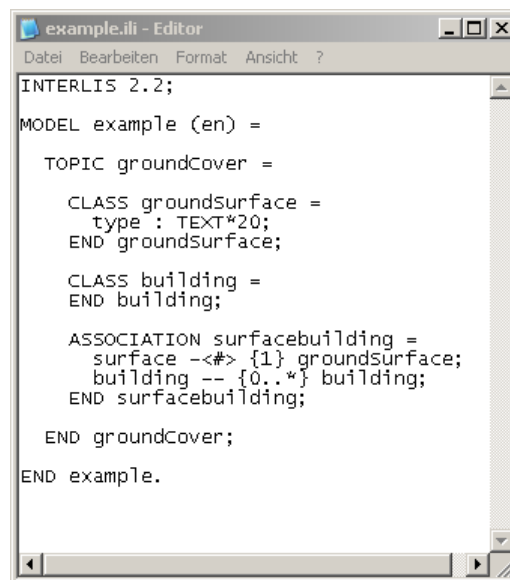


Figure 6.4: The file *bsp.ili* in a text editor.

A message in the log pane will inform you, whether the files have been successfully exported or not (Fig. 6.5).

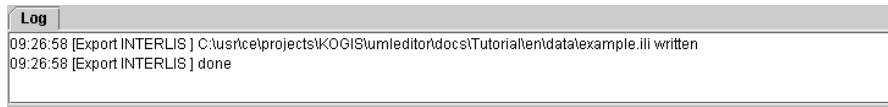


Figure 6.5: Log pane after export of an INTERLIS-model file.

Chapter 7

INTERLIS grafisch darstellen

If you have already modelled by means of INTERLIS data, you can create a graphic representation of the existing INTERLIS-model file by using the UML-Editors. In order to convert the INTERLIS-Model file into a UML-Modell, use the function `Tools/INTERLIS/Import...` (Fig. 7.1). You will perceive a file selection dialog, where you can select the INTERLIS-model file (*.ili) that has to be converted.

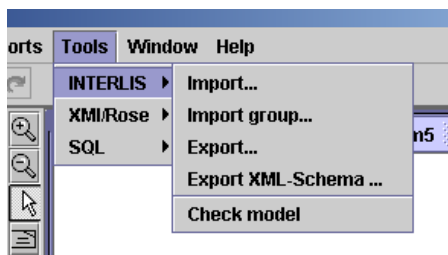


Figure 7.1: Function `Tools/INTERLIS/Import...`

If errors occur during the conversion, e.g. if the INTERLIS-model file should contain a syntactic error or if the INTERLIS-file cannot be found, these errors will appear in the log pane of the UML-editor (Fig. 7.2).



Figure 7.2: Log pane after import of a INTERLIS-model file.

After a conversion the data model can be further treated with the usual application tools. The navigation pane on the left side of the main window of the UML-editor will let you attain a certain element of the model as fast as possible.

In order to view further properties of an element, e.g. parameters or its description, the element must be marked and the dialog for specification must be opened via the context-menu (right mouse button). Thereafter properties of the element, such as its description, can be dealt with in the specification dialog (Fig. 3.7).

During conversion a diagram is automatically generated for each INTERLIS-topic; this diagram will contain all classes of the topic. In general such automatically generated diagrams need further treatment, because the software cannot recognize the importance of a class. When dealing with a topic with many classes, always generate several diagrams and represent only one important class and its direct neighbouring classes per diagram. In order to have more free space in a survey diagram, you can suppress representation of attributes for classes ([8], Kap. 4.1.2).

Bibliography

- [1] *OMG, Object Management Group, <http://www.omg.org>, The Object Management Group (OMG) is an open membership, not-for-profit consortium that produces and maintains computer industry specifications for interoperable enterprise applications. Our membership includes virtually every large company in the computer industry, and hundreds of smaller ones. Most of the companies that shape enterprise and Internet computing today are represented on our Board of Directors.*
- [2] *UML, Cetus-Links, <http://www.cetus-links.org>, Diverse Links zu Objects & Components*
- [3] *Martin Fowler & Kendall Scott, UML konzentriert, Addison-Wesley*
- [4] *James Martin & James Odell, Object-oriented methods a foundation, Prentice-Hall*
- [5] *KOGIS, INTERLIS-Referenzhandbuch, <http://www.interlis.ch>*
- [6] *KOGIS, INTERLIS-Benutzerhandbuch, <http://www.interlis.ch>*
- [7] *KOGIS, Einführung in den UML-Editor, <http://www.eisenhutinformatik.ch/umleditor>*
- [8] *KOGIS, UML-Editor, <http://www.eisenhutinformatik.ch/umleditor>*