AKKA Technologies

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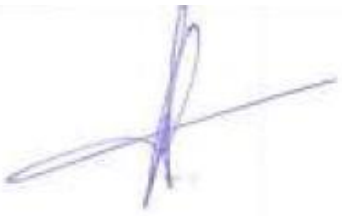
INSTALLATION MANUAL
CNES CCSDS PAIS PROTOTYPE INSTALLATION AND USER MANUAL

Drafted by: CEPHIRINS Vincent	AKKA IS	On: 06/03/2015	
Validated by: LORMANT Nicolas	AKKA IS	On: 06/03/2015	
For application:		On:	

INDEX SHEET

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DOCUMENT TITLE: Installation Manual CNES CCSDS PAIS Prototype Installation and User Manual			
AUTHOR(S): CEPHIRINS Vincent AKKA IS			
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INTERNAL DISTRIBUTION

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Name	Abbreviation	Observations
LORMANT Nicolas	AKKA TECHNOLOGIES	

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Iss.	Rev.	Date	Reference, Author(s), Reasons for change
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1 GLOSSARY AND LIST OF TBC & TBD PARAMETERS

CNES	Centre National d'Etudes Spatiales
XML	eXtended Markup Language

List of TBC parameters:

List of TBD parameters:

2 GENERAL

2.1 REFERENCE DOCUMENTS

DR1 Producer-Archive Interface Specification
CCSDS-651.1.1-R-1

DR2 XML formatted data unit (XFDU) structure and construction rules
CCSDS 661.0-B-1

2.2 APPLICABLE DOCUMENTS

3 INTRODUCTION

This document explains how to install and use the CNES CCSDS PAIS prototype.

4 ENVIRONMENT

The minimum configuration recommended for installation of the software is as follows:

- PC operating system: Windows XP sp2 or higher
- Memory: at least 512MB.
- Java run time: JRE 1.6 or higher

4.1 SOFTWARE AND TEST CASE TREE STRUCTURE

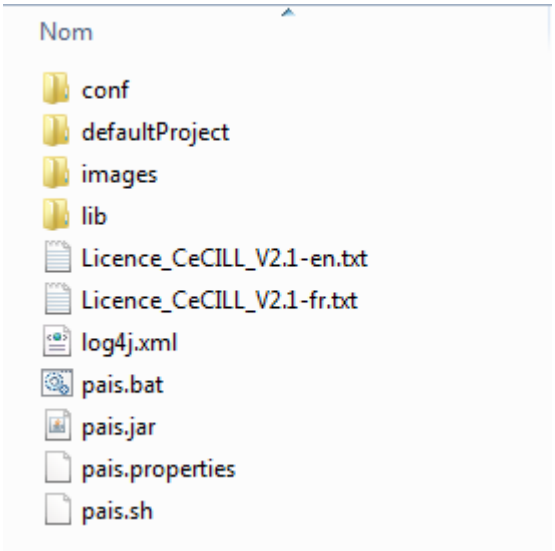
All of the files required are grouped together in zip packages with the following names:

- pais-<version>.exe (self-extracting executable for Windows), or pais-<version>.zip (zip archive for Mac),
- pais-data-<version>.zip

The first package contains the prototype and the libraries needed to run the program.

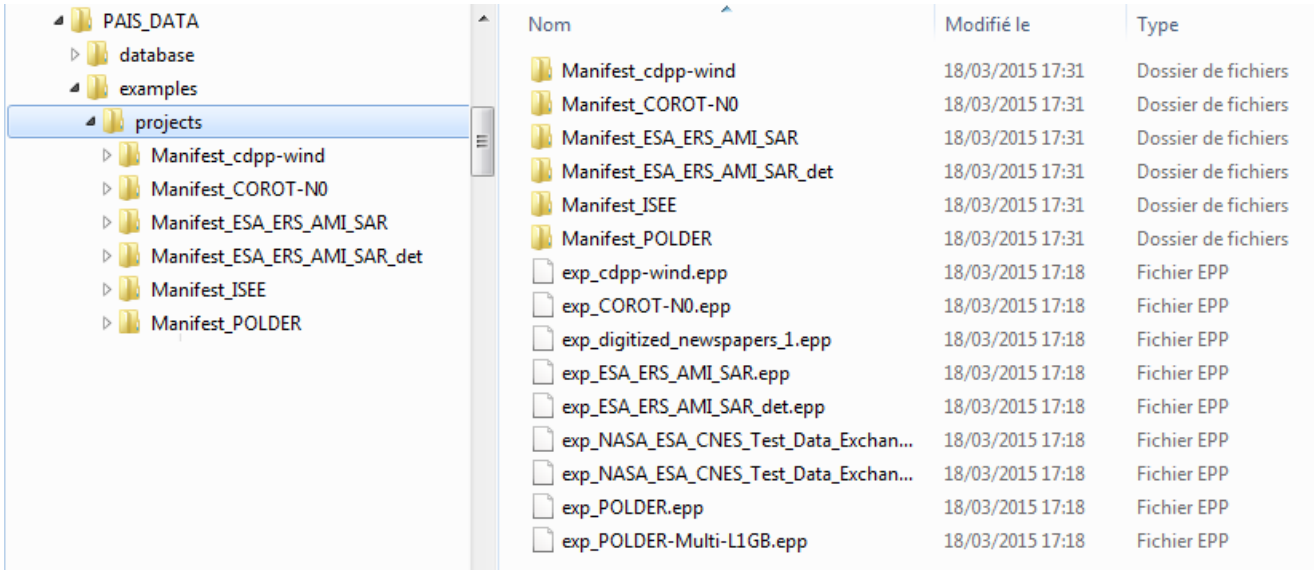
The second package contains example cases with their description and the required data files for the database.

The software installs under a conventional directory, such as C:\Program files\PAIS:



in which pais.jar is the software, lib is the directory of required libraries, pais.properties is the configuration file for the software and directories in particular, log4j.xml is the log4j configuration file and pais.bat (or pais.sh) is the program launcher.

Examples and the associated files can be deployed in a dedicated space, such as C:\PAIS_DATA:



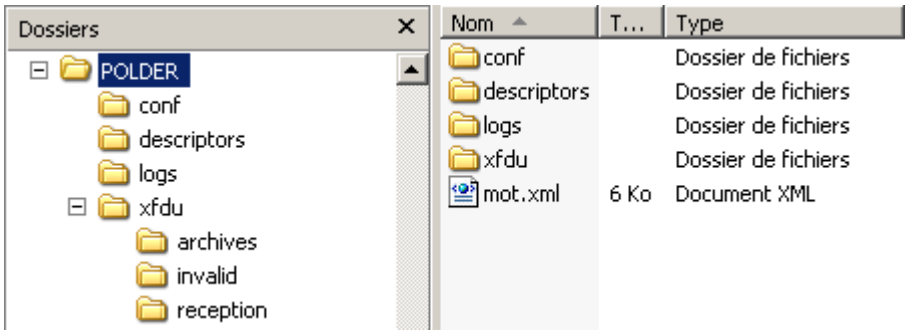
The “database” directory contains the tables and data managed by the “Apache Derby” database.

The “examples/projects/” contains the example files:

- “exp_*.epp” files which are exported from example projects.
- “Manifests_*” directories which contain the SIP manifests of exported projects.

To install the example projects, refer to the “6. Quick start-up” section.

Once deployed, the project appears as follows:



The “conf” directory contains the model definition files (Xml Schema).

The “descriptors” directory contains the project description files.

The “logs” directory holds the processing log for this project

The “xfdu” directory is made up of 3 sub-directories:

- “archives” which contains the xfdu files received.

- "invalid" which contains the incorrect xfdu files received.
- "reception" which contains the xfdu files to be processed.

Note: For Mac, copy the zip files into /Applications. The program launcher is called pais.sh.

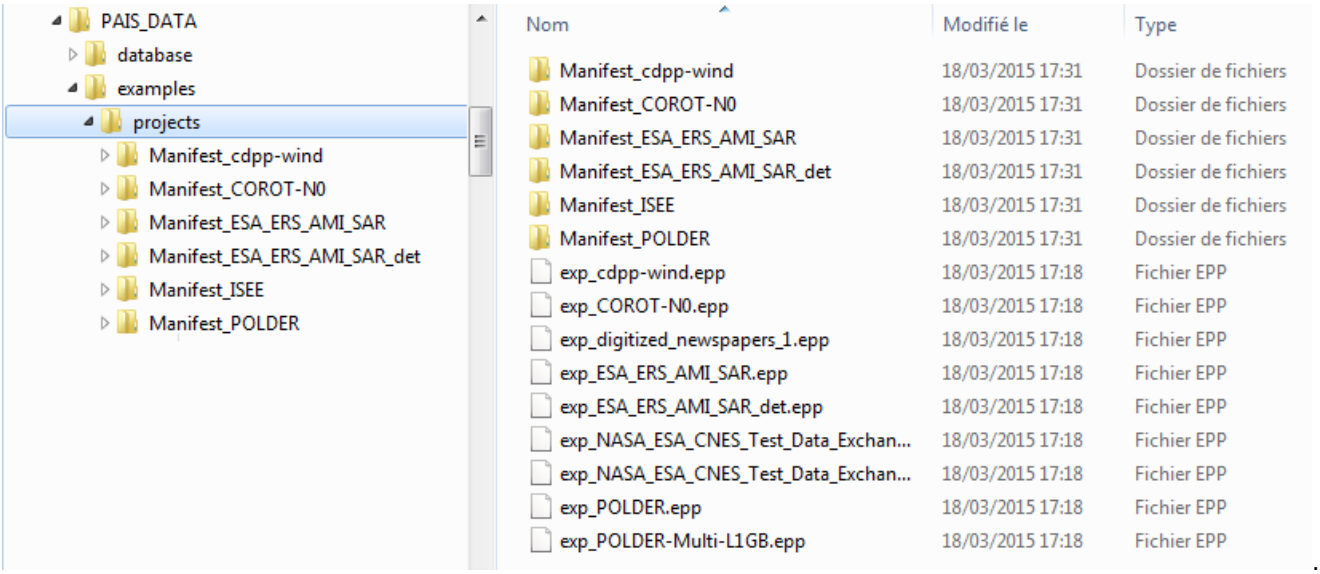
4.2 SOFTWARE INSTALLATION

- **For Windows**:

From the Windows explorer, execute (double-click) the pais-<version>.exe file.

Select the software installation directory and then click "start".

Deploy the example file pais-<version>-data.zip which contains the manifest files, project exports and some files to manage the database, under "C:\PAIS_DATA" in our example:



Issue the "pais.properties" file (default location is "C:\Program files\PAIS\Vx.y", vx.y is the version number) to update the "pais.dataroot.dir" variable with the directory corresponding to the installation of PAIS_DATA, and enter the "pais.proxy" parameter if necessary.

- **For Mac**:

Copy the zip files into /Applications.

Issue the "pais.properties" file (default location "/Applications/PAIS/Vx.y", vx.y is the version number") to update the "pais.dataroot.dir" variable with the directory corresponding to the installation of PAIS_DATA, and enter the "pais.proxy" parameter if necessary.

4.3 DATABASE INSTALLATION

Since the version 2.13 of the CNES CCSDS PAIS prototype, the database is managed by an “Apache Derby” relational database embedded by the application. No specific installation is needed, and administrator rights are not required.

4.4 DATABASE VISUALISATION

Note: This section is an administrative one, and doesn’t concern a common usage of PAIS. The next installation **IS NOT NEEDED** to run the application.

PAIS use a Derby database. To show database content, you can use a client like ‘SQuirreL SQL’. After the installation of this tool (http://squirrel-sql.sourceforge.net/), you need to follow these steps:

First, you need to download and unzip the lib distribution of ‘Apache Derby’ (http://db.apache.org/derby/derby_downloads.html),

Then, you need to define an ‘Apache Derby Embedded’ driver: Click on the tab ‘Drivers’ on the left side select ‘Apache Derby Embedded’ in the list and double click on it. On the driver configuration dialog, select the tab ‘Extra Class Path’, click on ‘Add’ button and select all ‘jar’ files included in the lib folder of your ‘Apache Derby’ distribution installed during the previous step,

To finish, you need to define a new alias to connect to the PAIS database: Click i the tab ‘Aliases’ on the left side, click on the tool button with the blue icon ‘+’ to create a new alias. In the alias definition dialog box: define a name for your alias (for example ‘PAIS’), select the ‘Apache Derby Embedded’ driver, and define the URL with: ‘jdb:derby:YOUR_PAIS_DATA_FOLDER\database\PAIS’ (Replace ‘YOUR_PAIS_DATA_FOLDER’ by the path of your ‘PAIS_DATA’ folder).

Now, you can open the connection dialog by double clicking on your alias, and connect to your database by clicking on the ‘Connect’ button.

5 GETTING STARTED

5.1 STARTING UP THE SOFTWARE

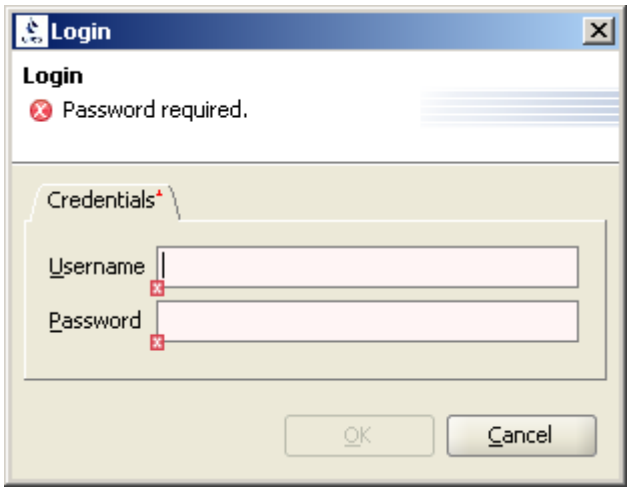
- For Windows

From the Windows explorer, execute (double-click) the “pais.bat” launcher (default location: “C:\Program files\PAIS\Vx.y”, vx.y is the version number).

- For Mac

From the explorer, execute (double-click) the “pais.sh” launcher (default location: “/Applications/PAIS/Vx.y”, vx.y is the version number).

Enter a login / password; then click on “OK”. In the case of the prototype, no account is created and any username and password can be used.



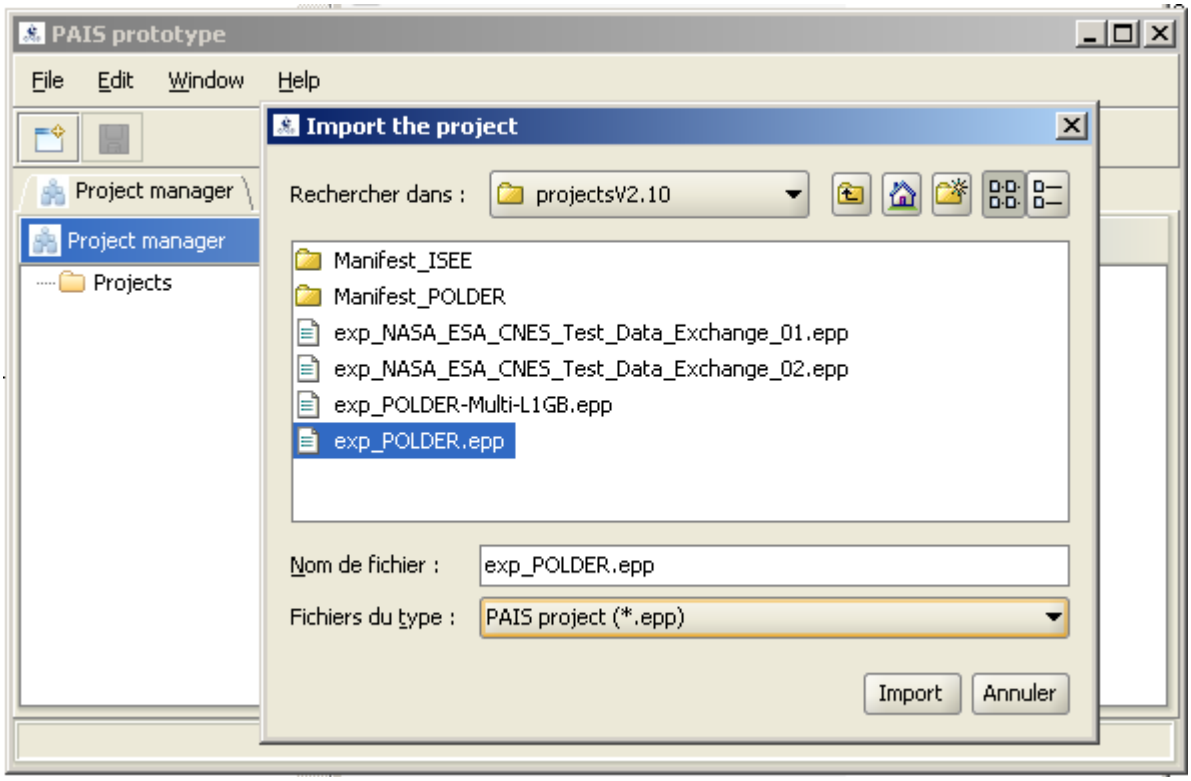
To facilitate quick start-up with the software, example projects are provided in the PAIS_DATA directory. These exported projects are in the form files with the extension “epp” for “Export Pais Projet”. For each project, a “Manifest_*” directory with example SIPs are provided. For quick start-up, see the 6. Quick start-up paragraph.

5.2 IMPORTING AND EXPORTING A PROJECT

5.2.1 Importing a project

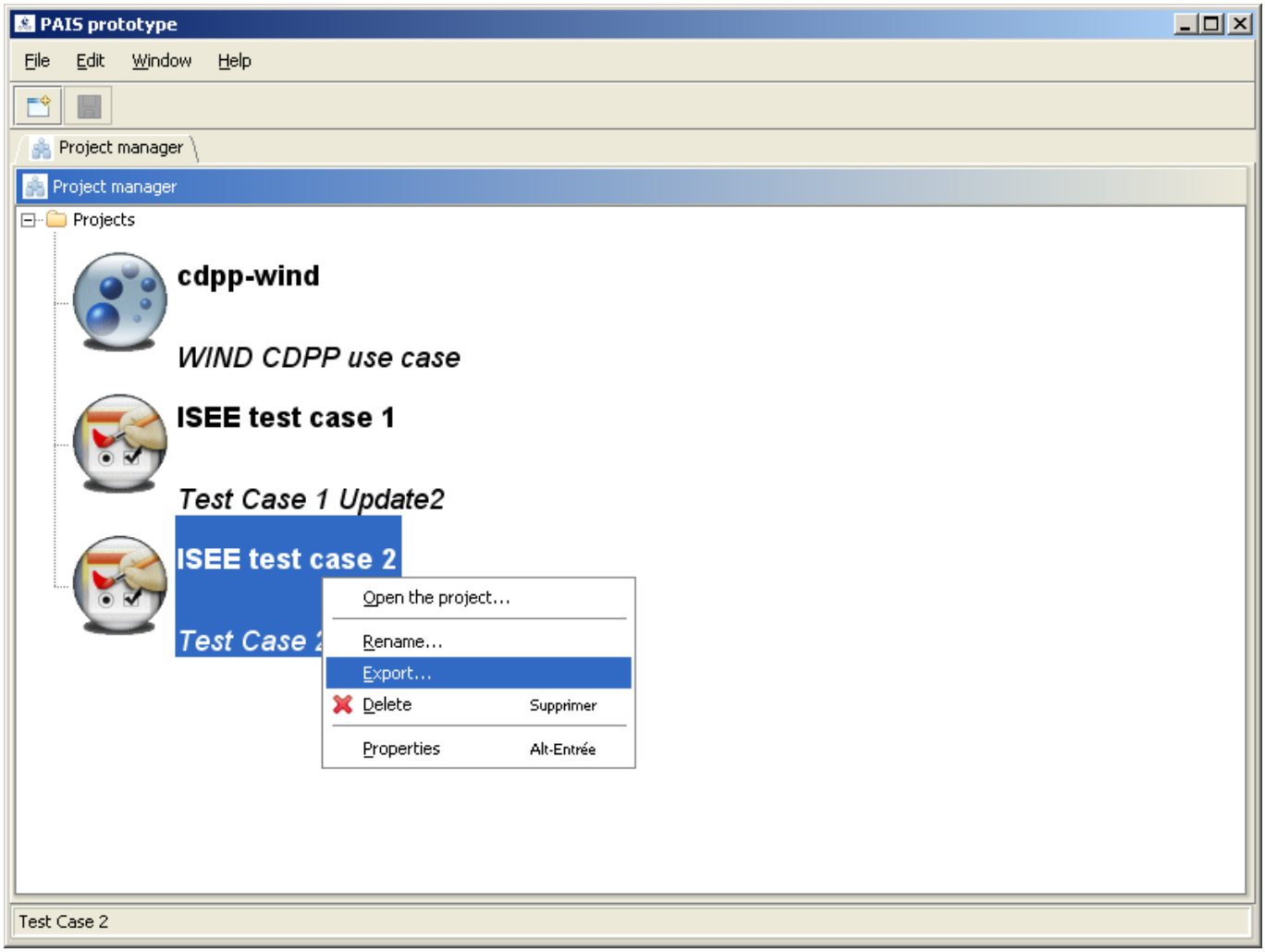
Importing a previously exported project is only possible if the project is no longer in the “Project manager” space; otherwise, it needs to be deleted or renamed before being imported (check that other tabs are closed).

Open the “File” menu and click on “Import …”. Select an “epp” extension export file in the “PAIS_DATA/examples/projects” directory, then validate by clicking on the “Import” button.



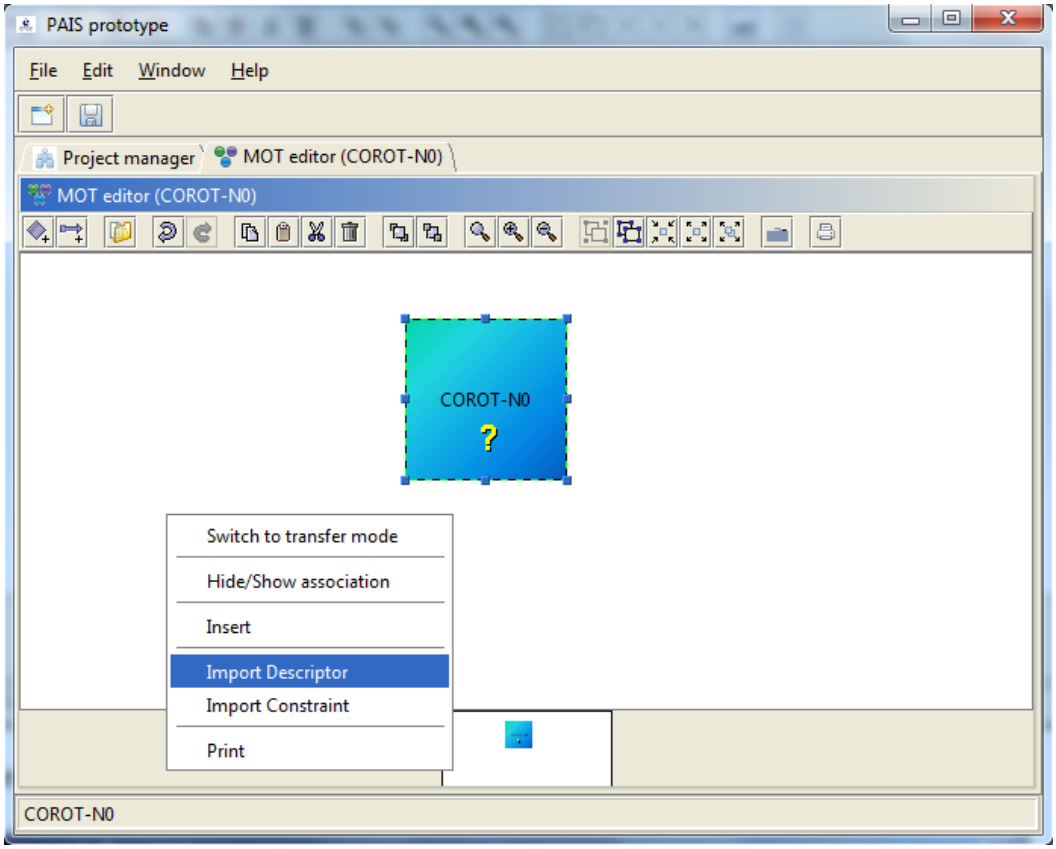
5.2.2 Exporting a project

A project can be exported into an “epp” extension file on the “Project manager” page. The project export concerns only the model files and the descriptors. Select a project and then click on “Export”, either from the contextual menu (right-click the mouse on the selected element) or the “File” menu.

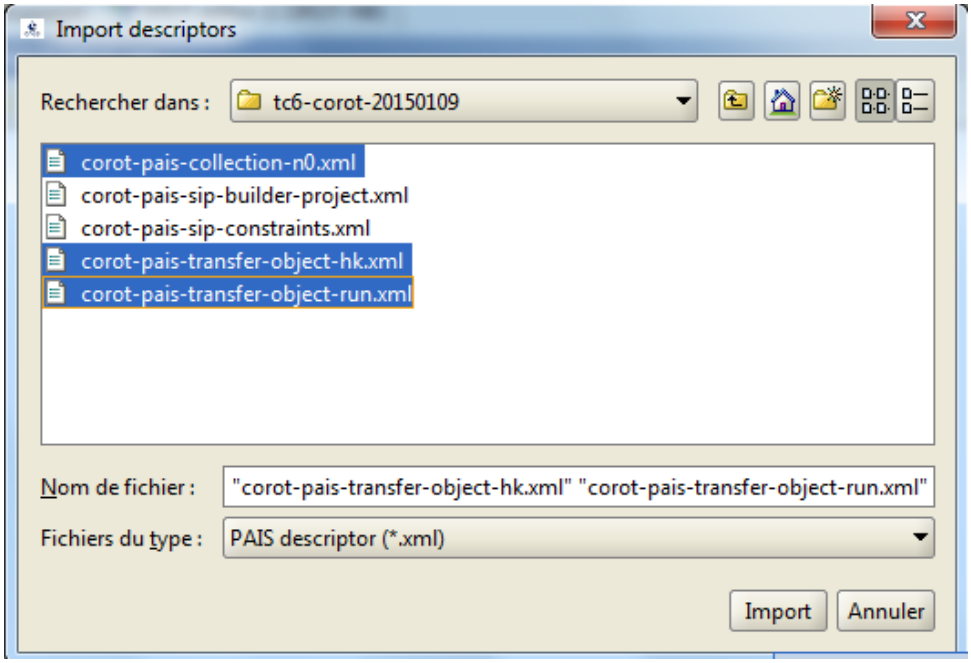


5.3 IMPORTING A DESCRIPTOR OR CONSTRAINT FILE

A descriptor can be imported into an existing project and opened via the MOT editor. If this descriptor does not comply, it is rejected and the errors are logged into the monitor. Imported descriptors must then be associated in the model.



To import descriptors, select “Import Descriptor” in the contextual menu and select files in the dialog:

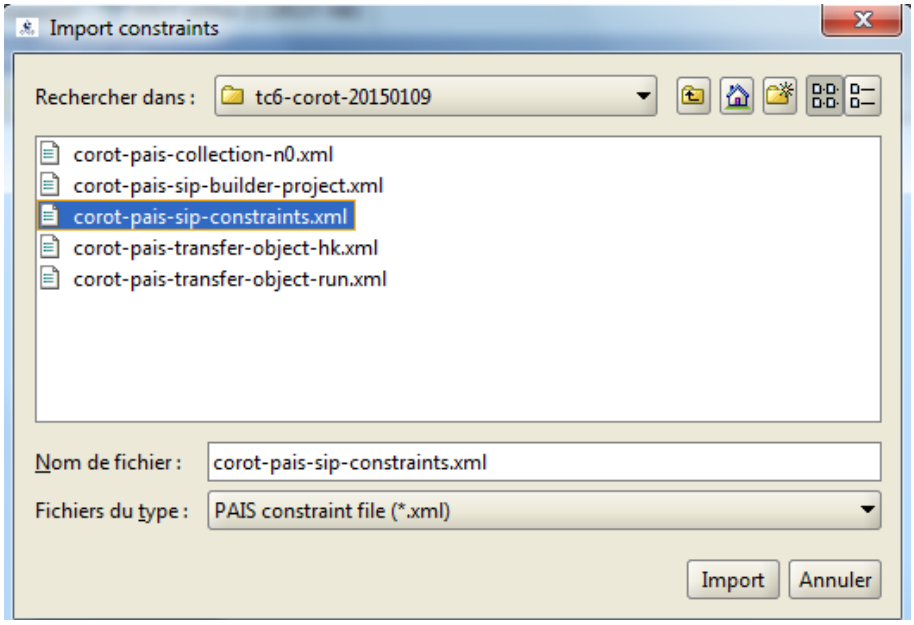


You have then to associate the exported descriptors to the right nodes by links.

Note: the imported descriptors may have a wrong parentCollection Identifier (this causes no error because what is

required for the transfer is the mandatory controls performed on the Transfer Object descriptors). Nevertheless, if you want to update this Identifier, you have to change the XML files directly in the “descriptors” directory.

To import the constraint file, select the “Import Constraint” in the contextual menu and select files in the dialog:

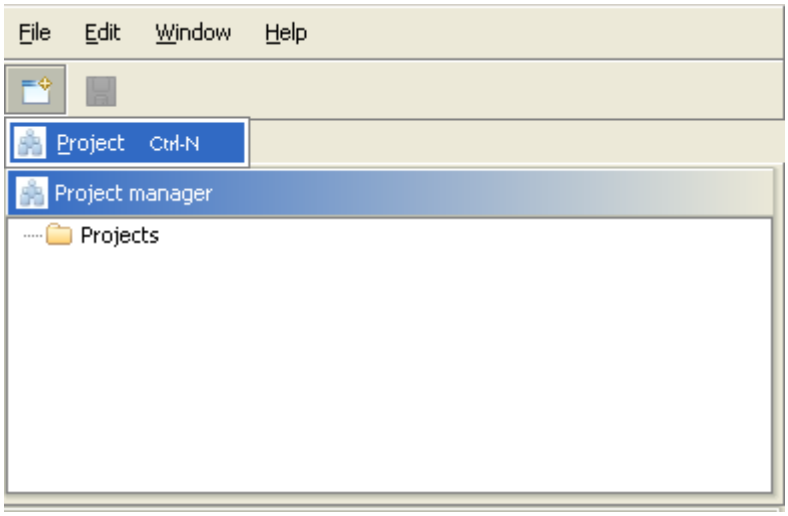


5.4 CREATING A PROJECT AND SETTING UP THE MOT

5.4.1 Creating the project

Select the “new project” icon on the left in the toolbar (), and then enter the project name and description.

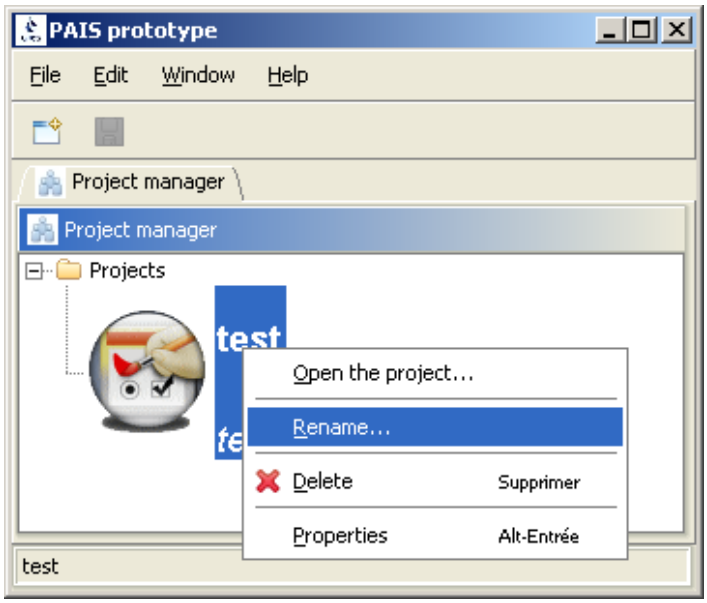
Note: The only characters permitted for project names are alphanumeric characters + the following characters: ‘_’, ‘-‘, ‘$’.



5.4.2 Renaming the project

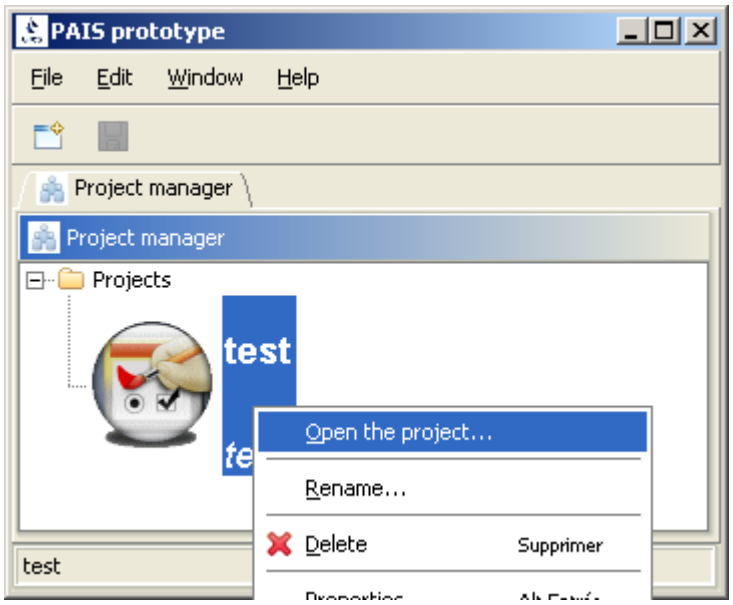
Select the project, right-click the mouse (to display the contextual menu) and click on “Rename…”.

Note: The only characters permitted for project names are alphanumeric characters + the following characters: ‘_’, ‘-‘, ‘$’.



5.4.3 Editing the project

Select the project, right-click the mouse (to display the contextual menu) and click on “Open the project…”.



5.4.4 Creating the descriptors

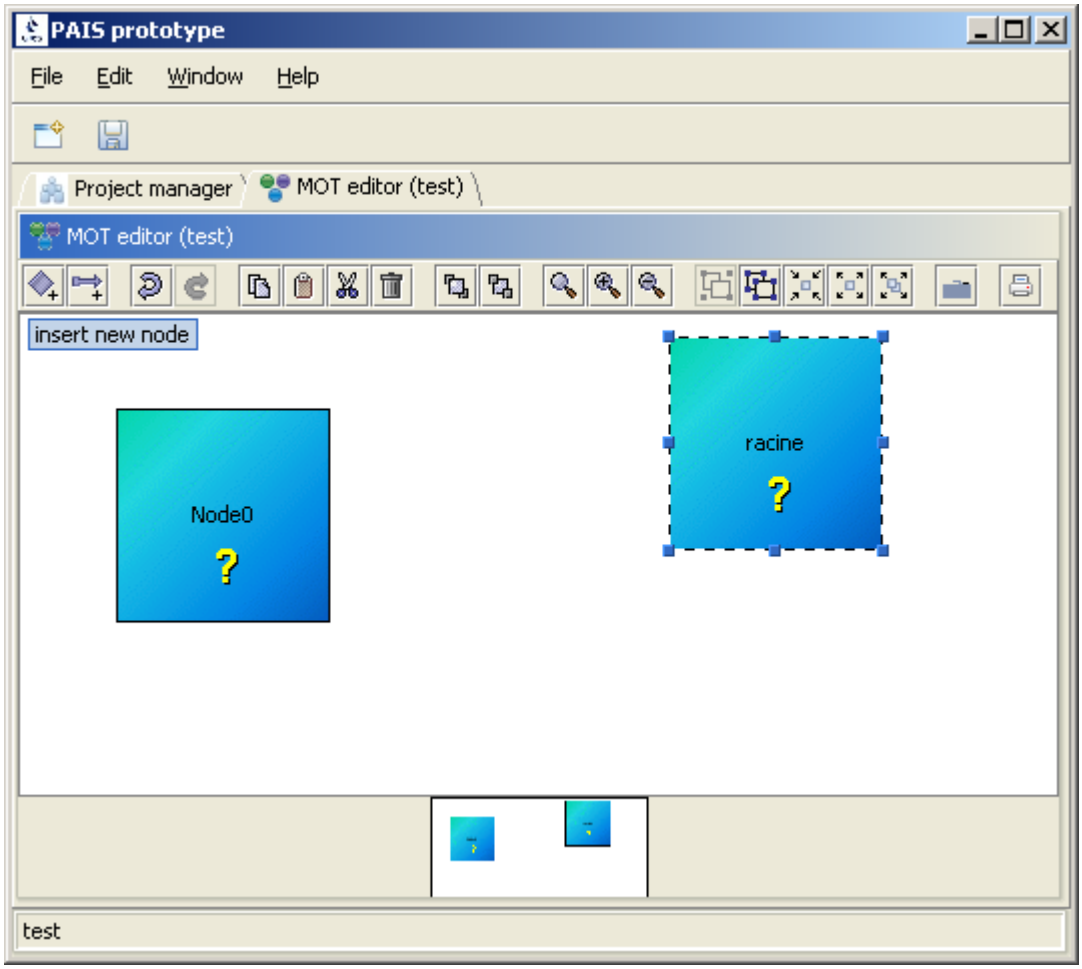
Two models exist by default: CCSD0015 for the Collections descriptors which are the nodes of the tree, and CCSD0014 for the Terminal descriptors (leaves of the tree) which contain the data descriptions.

Select the root descriptor (created by default), double-click or right-click the mouse (to display the contextual menu) and then click on “Edit”. Enter the node identifier and label, and then select the Collection model (CCSD0015).

We assume that the MOT contains at least one collection of objects to transfer. By default, the name of the root node is the same as the project name.

Move the graphic descriptor object on the graph and then create a new descriptor by clicking the icon on the left () in the toolbar. Enter its identifier, its label and its model.

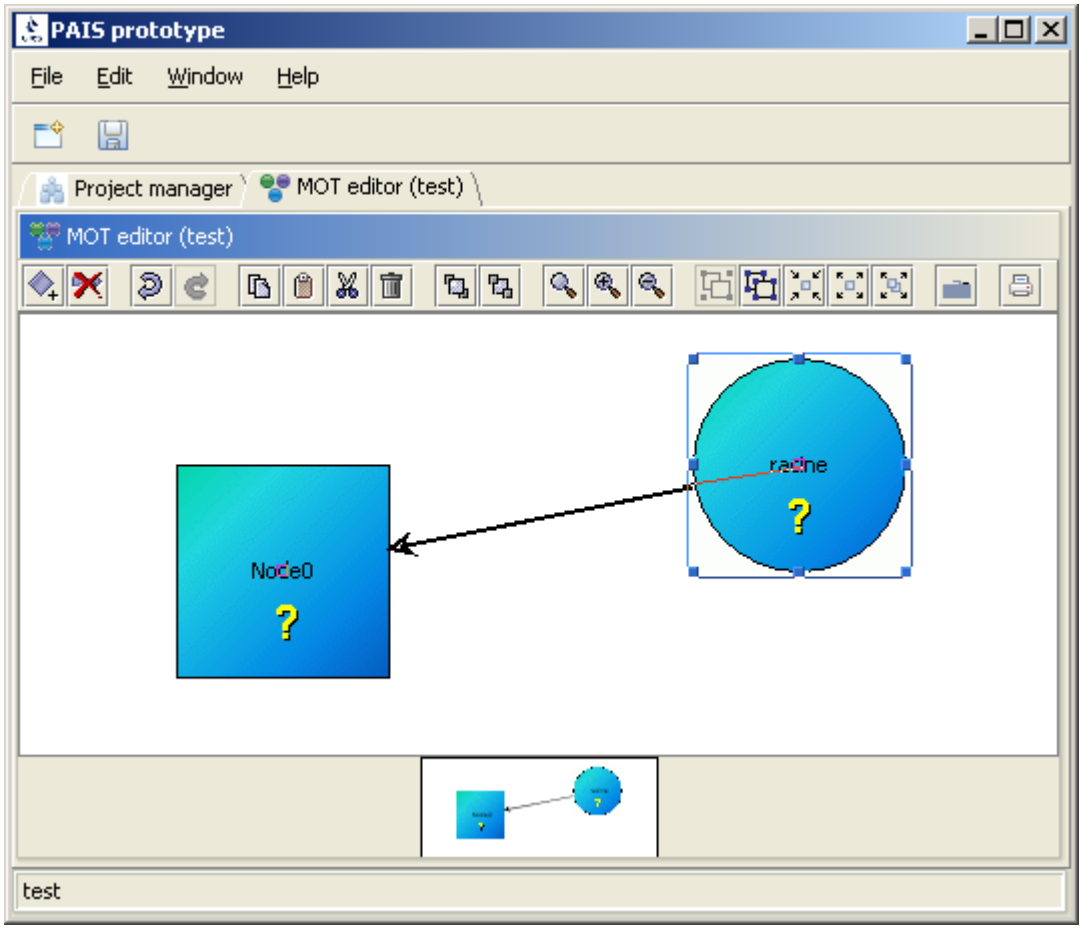
Note: The only characters permitted for descriptor names are alphanumeric characters + the following characters: ‘_’, ‘-‘, ‘$’.



5.4.5 Creating a link between descriptors

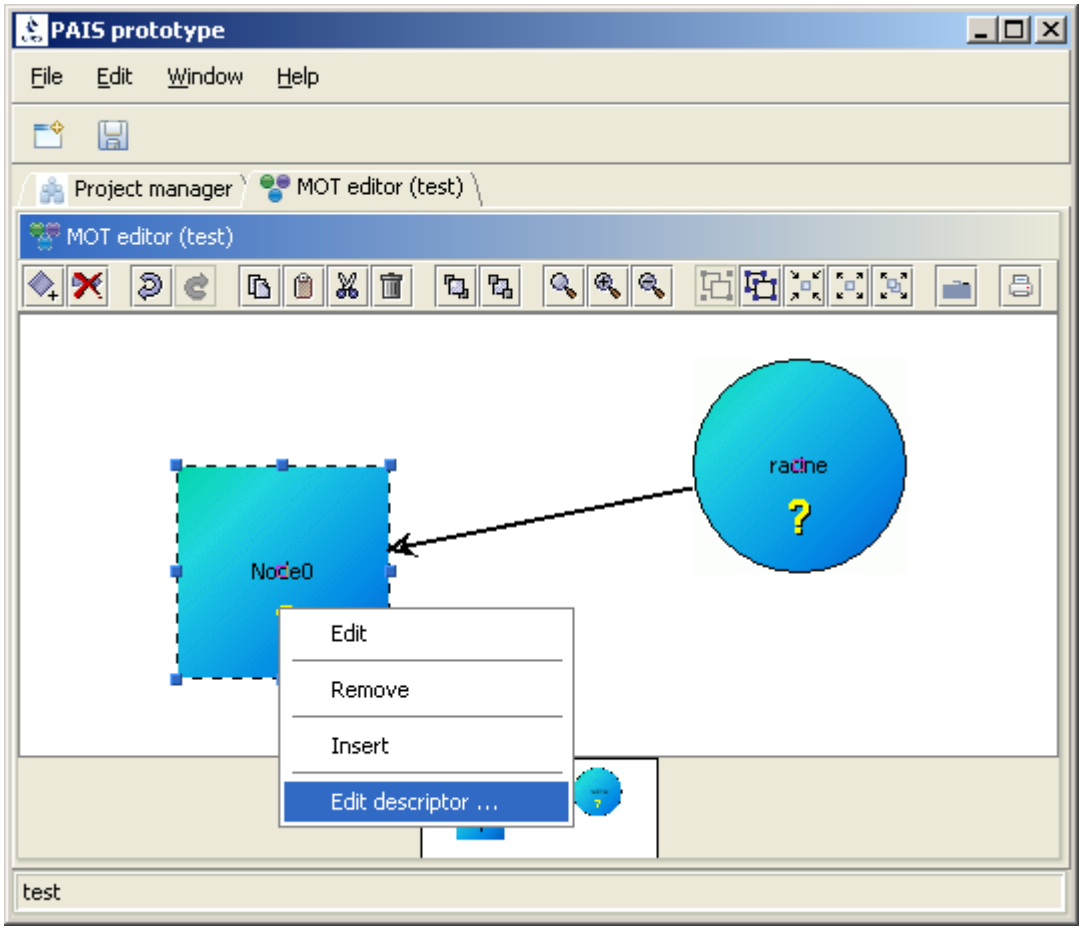
Activate the link creation function by clicking the 2nd icon on the left ( ) in the toolbar. Click on the original descriptor to select it and then “drag” it to the target descriptor.

Remark: position the cursor in the centre of the object to drag it (a “hand” appears).

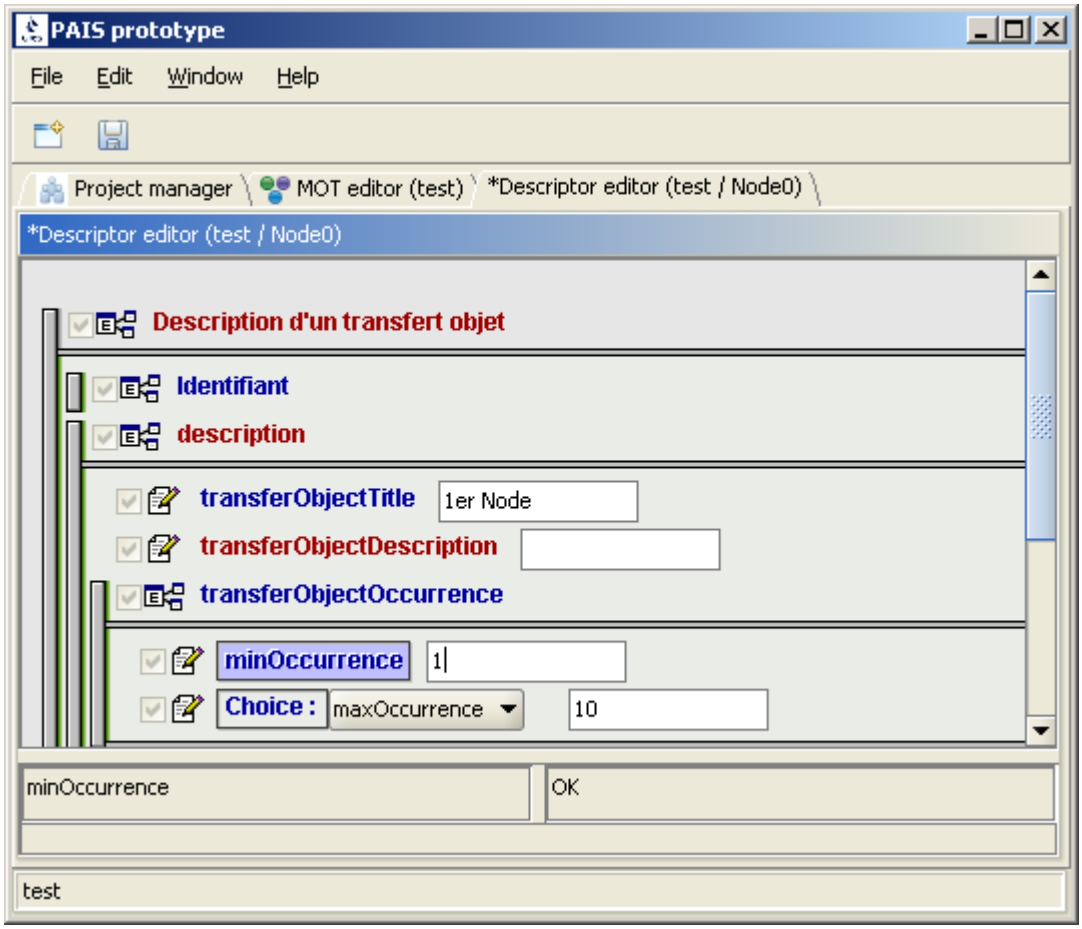


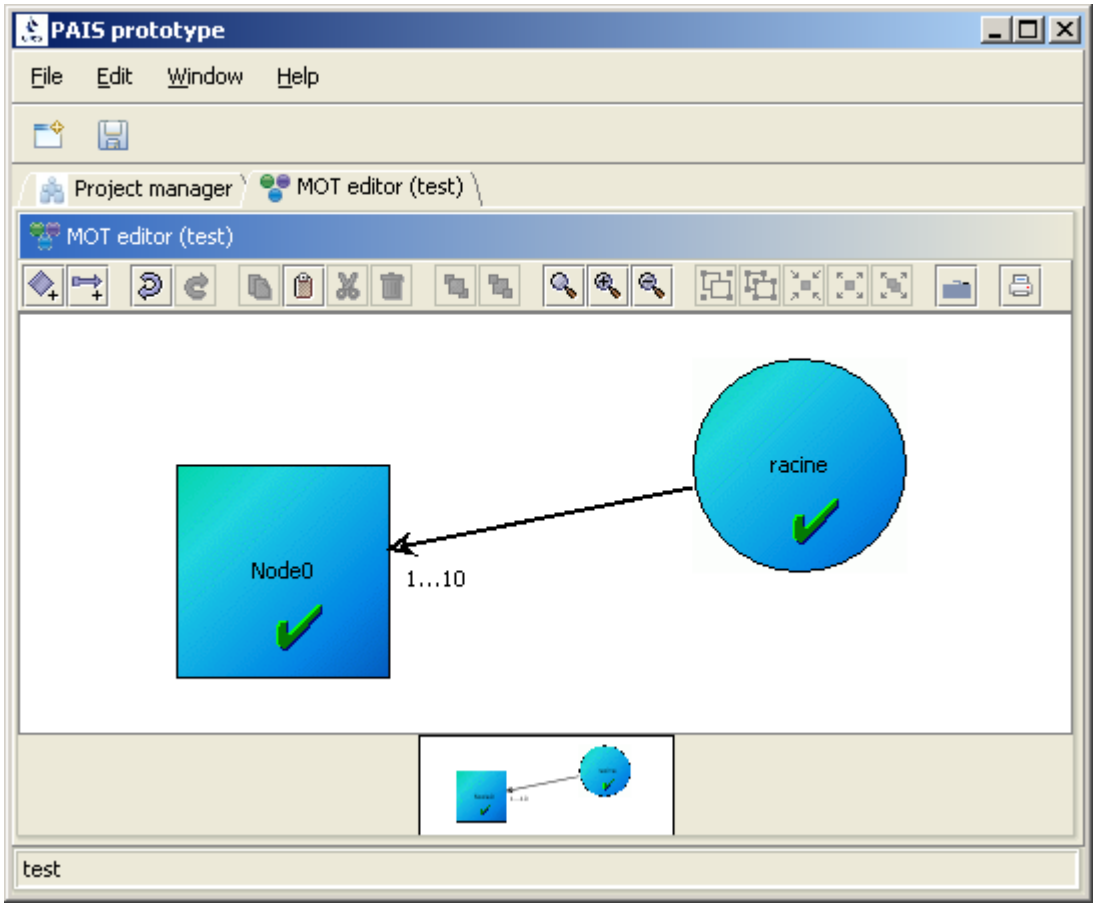
5.4.6 Editing descriptor attributes

Save the project ( ), select a descriptor, right-click the mouse (to display the contextual menu) and then click on "Edit descriptor …"



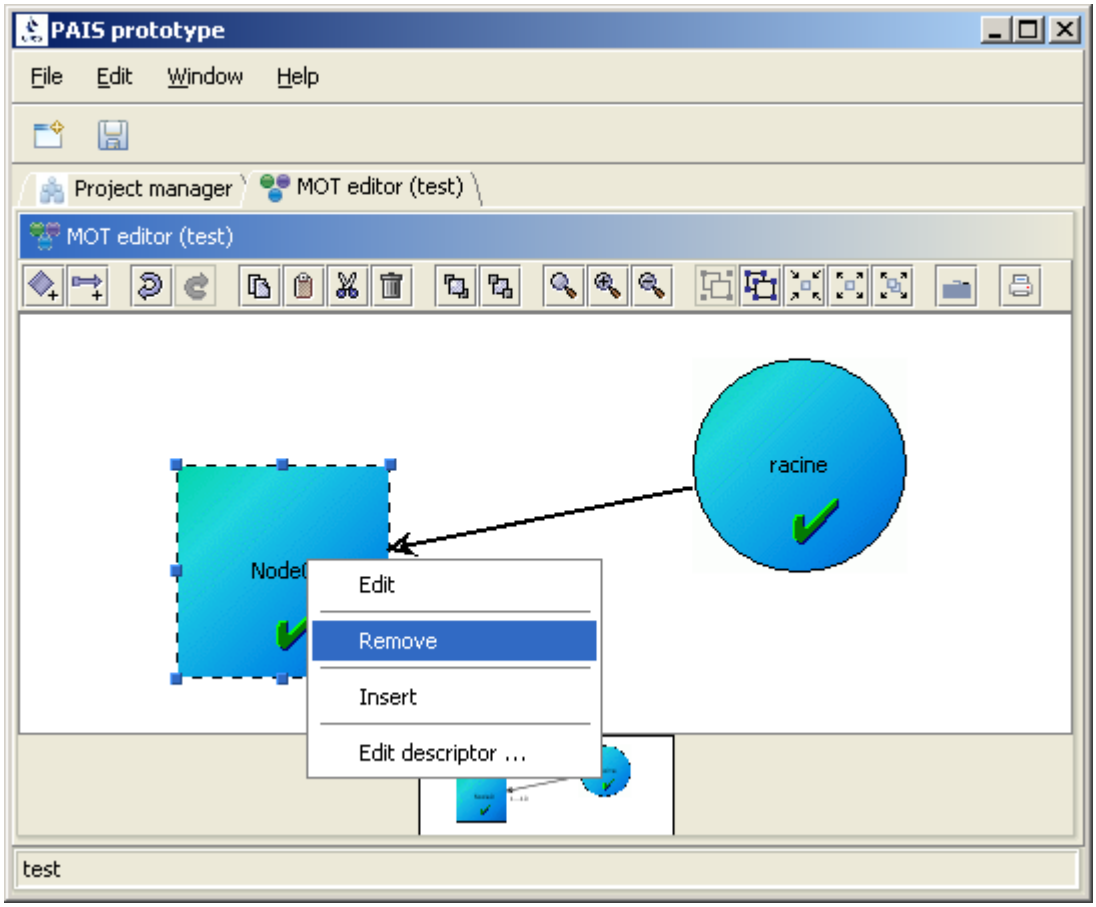
Fill in the fields using the editor. Red-coloured fields indicate that they are not valid (mandatory, incorrect value, etc.). Once all of the fields are valid, and after saving ( ) the changes, the descriptor's status on the graph also switches to valid.


PAIS prototype
File
Edit
Window
Help
Project manager
MOT editor (test)
*Descriptor editor (test / Node0)
*Descriptor editor (test / Node0)
Description d'un transfert objet
Identifiant
description
transferObjectTitle
1er Node
transferObjectDescription
transferObjectOccurrence
minOccurrence
1
Choice :
maxOccurrence
10
minOccurrence
OK
test


PAIS prototype
File
Edit
Window
Help
Project manager
MOT editor (test)
MOT editor (test)
racine
Node0
1...10
test

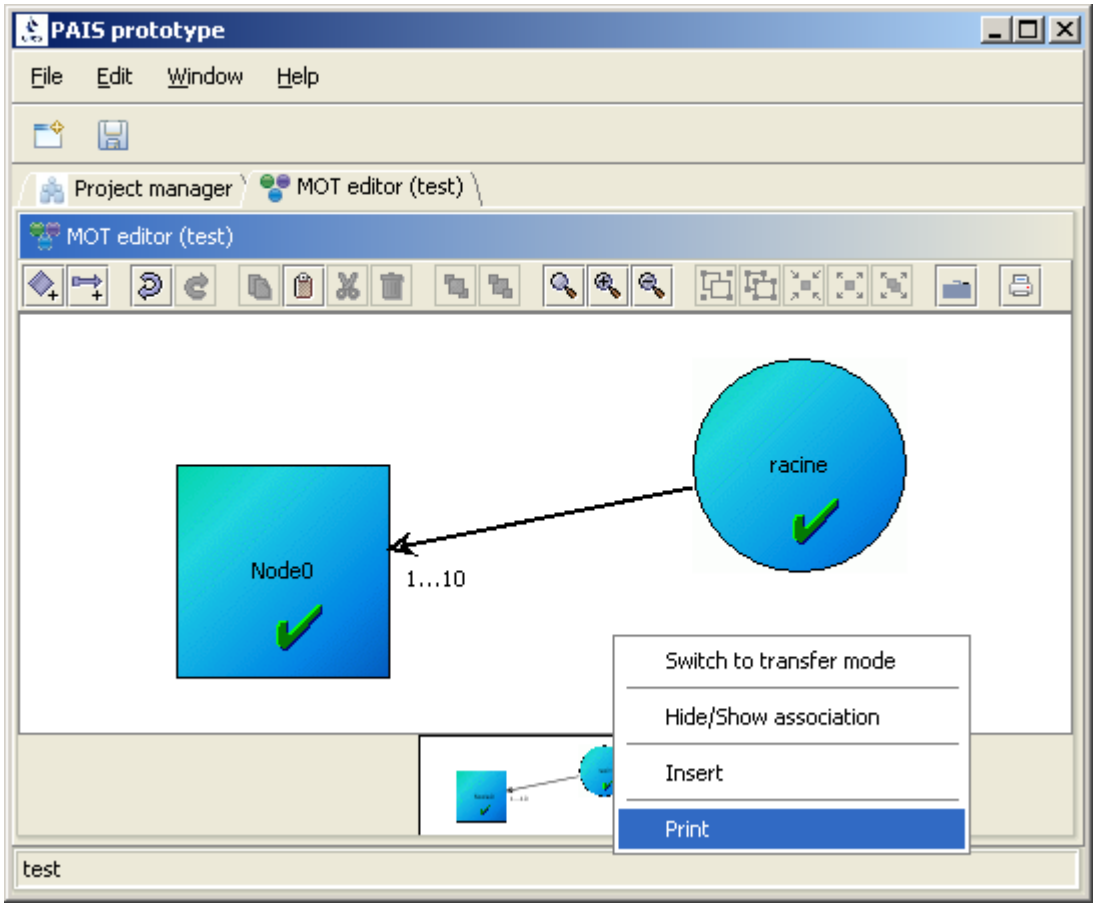
5.4.7 Deleting a descriptor

Select a descriptor, right-click the mouse (to display the contextual menu) and click on “Remove…”. The descriptor is permanently deleted, as are the links attached to the deleted node.



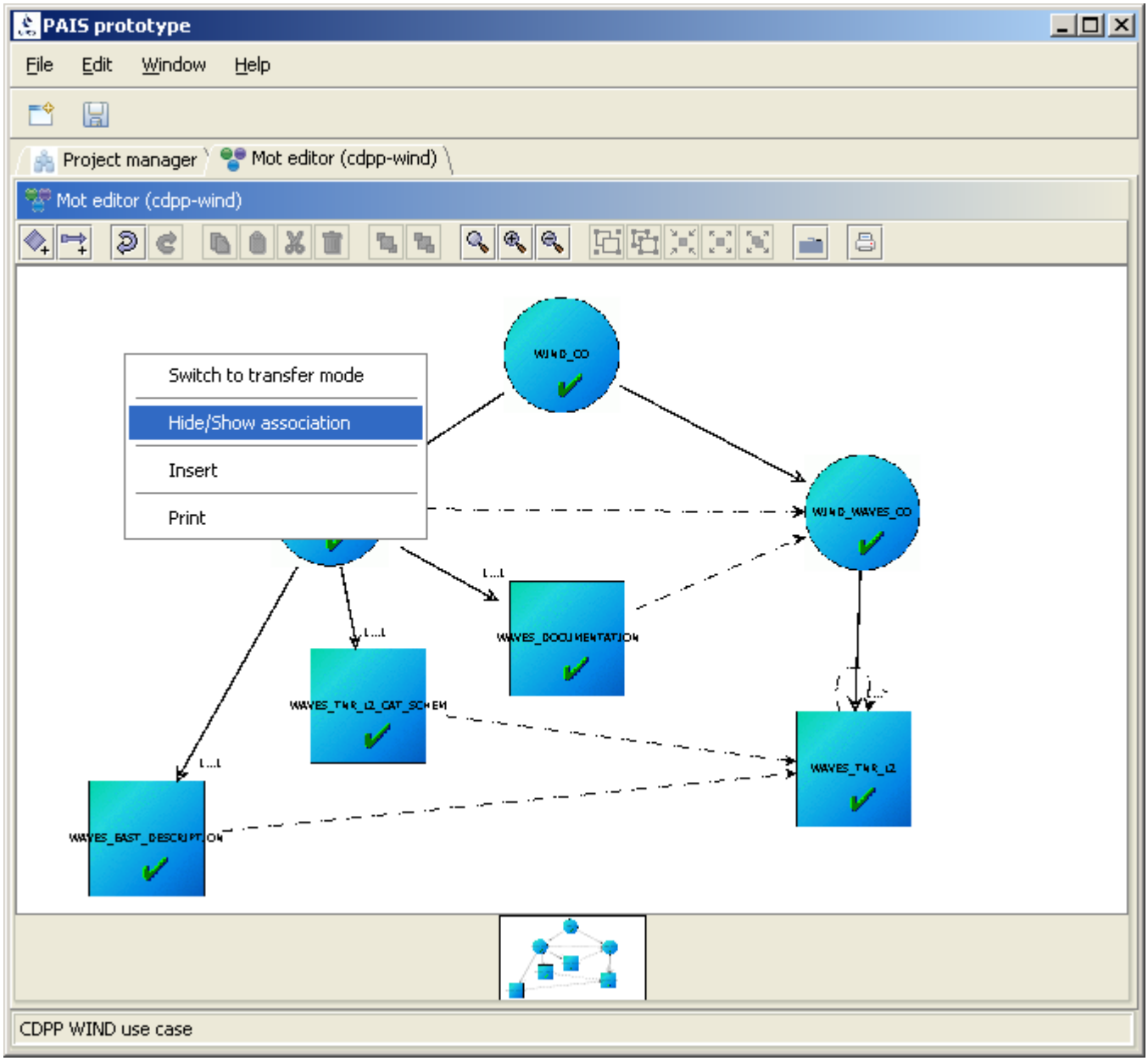
5.4.8 Printing the model

Print the model by clicking on the icon ( ) in the bar or right-clicking the mouse (to display the contextual menu) and then clicking on “Print …”. The entire model is printed as it is shown on the screen (WYSIWYG mode).

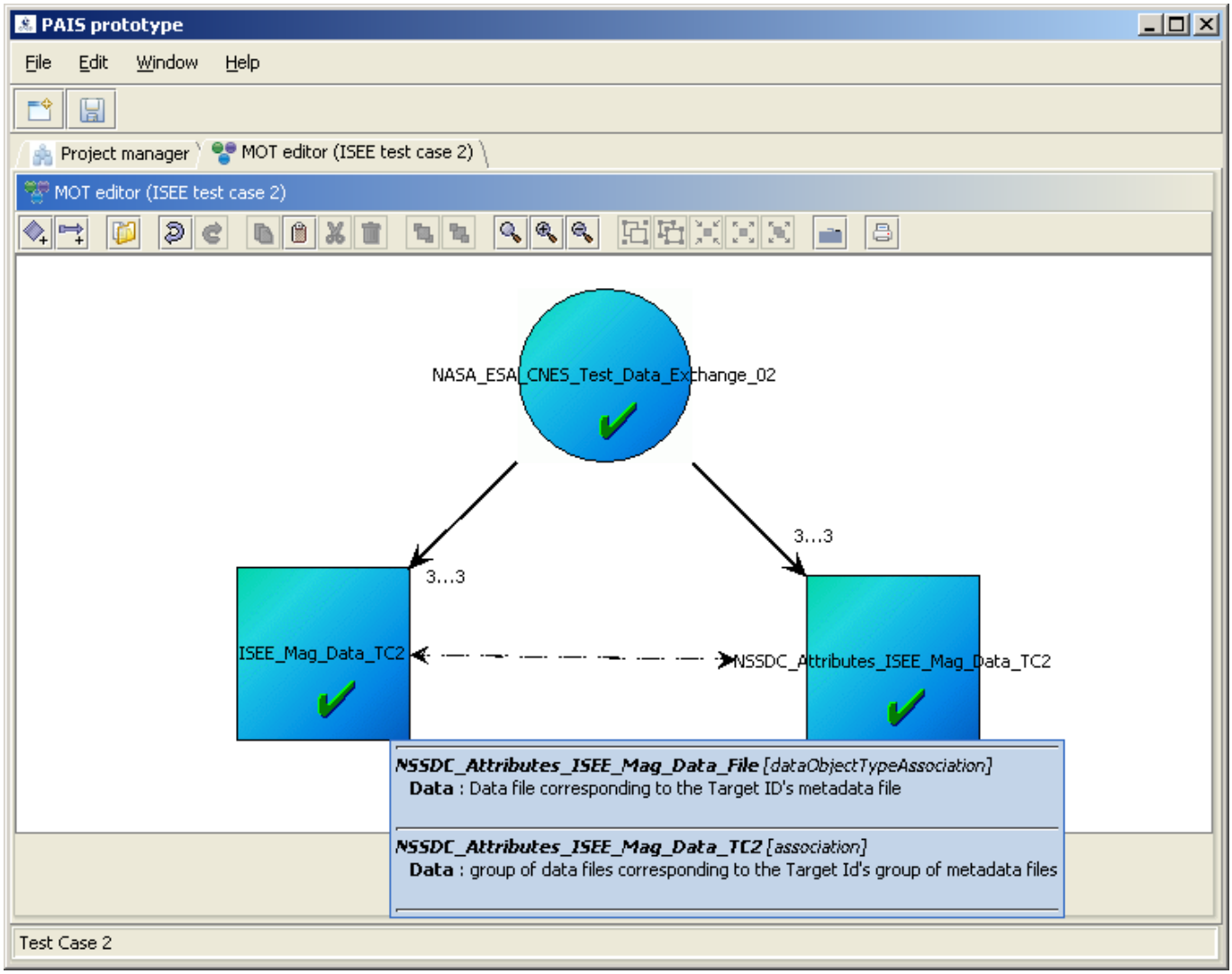


5.4.9 Hiding / Showing association links

Show links by clicking on the icon ( ) in the bar or right-clicking the mouse (to display the contextual menu) and then clicking on “Hide/show association …”.



All of a node’s associations can be seen via the MOT editor, by leaving the mouse on the node for approximately 1s. A tooltip appears, stating the details of each association.


PAIS prototype
File
Edit
Window
Help
Project manager
MOT editor (ISEE test case 2)
MOT editor (ISEE test case 2)
NASA_ESA_CNES_Test_Data_Exchange_02
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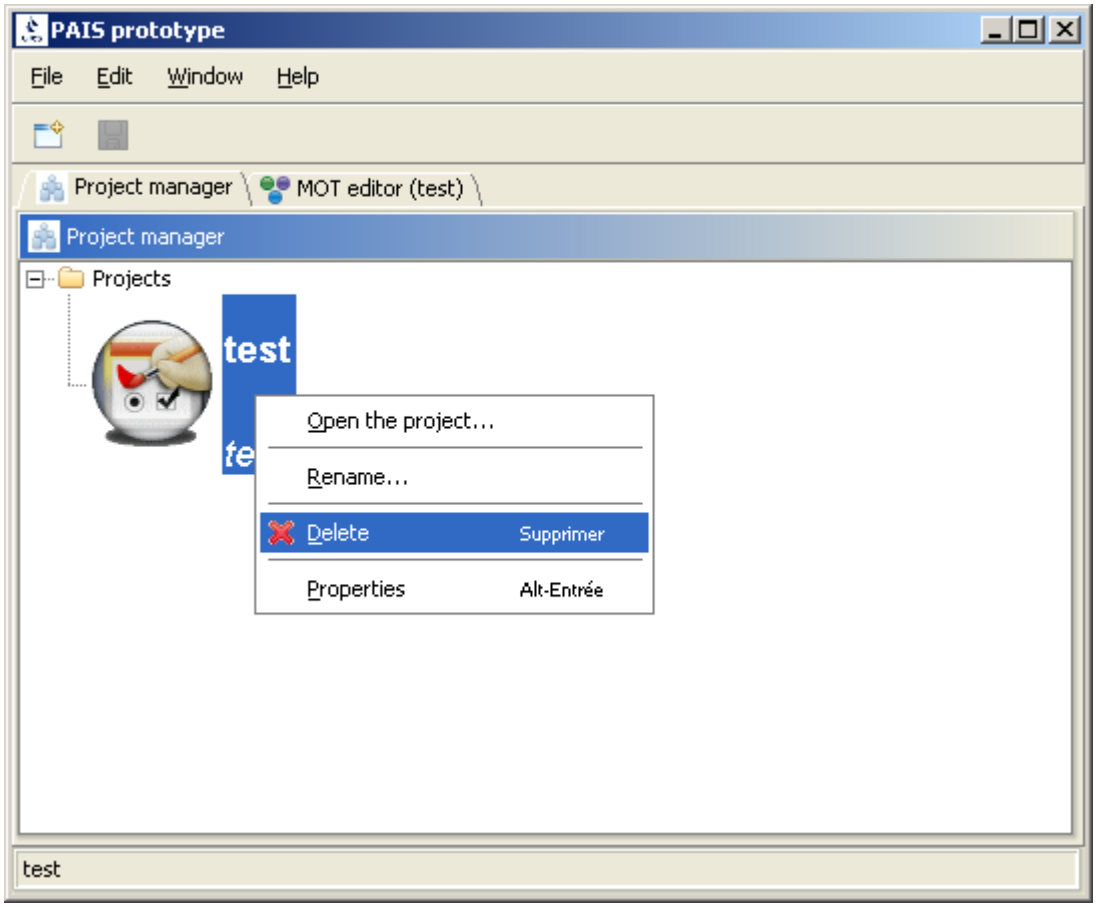
3...3
ISEE_Mag_Data_TC2
NSSDC_Attributes_ISEE_Mag_Data_TC2
NSSDC_Attributes_ISEE_Mag_Data_File [dataObjectTypeAssociation]
Data : Data file corresponding to the Target ID's metadata file
NSSDC_Attributes_ISEE_Mag_Data_TC2 [association]
Data : group of data files corresponding to the Target Id's group of metadata files
Test Case 2

5.4.10 Deleting a project

Select a project, right-click the mouse (to display the contextual menu) and click on “Delete”. Deleting the project results in permanent deletion of the descriptors associated with the project.



5.4.11 Receiving XFDU files and validating

In order to switch to transfer mode, all MOT descriptors need to have valid status, and the MOT needs to have been saved. In the current prototype context, at this stage, no further changes should be made to the structure of the MOT (adding nodes, ID changes, etc.).

To switch to transfer mode, first, open the corresponding project editor (right-click on the name of the project on the home page), and then click on "Switch to transfer mode".

Completing the description of this part involves creating XFDU files and placing them in the reception directory, which is not covered in this document.

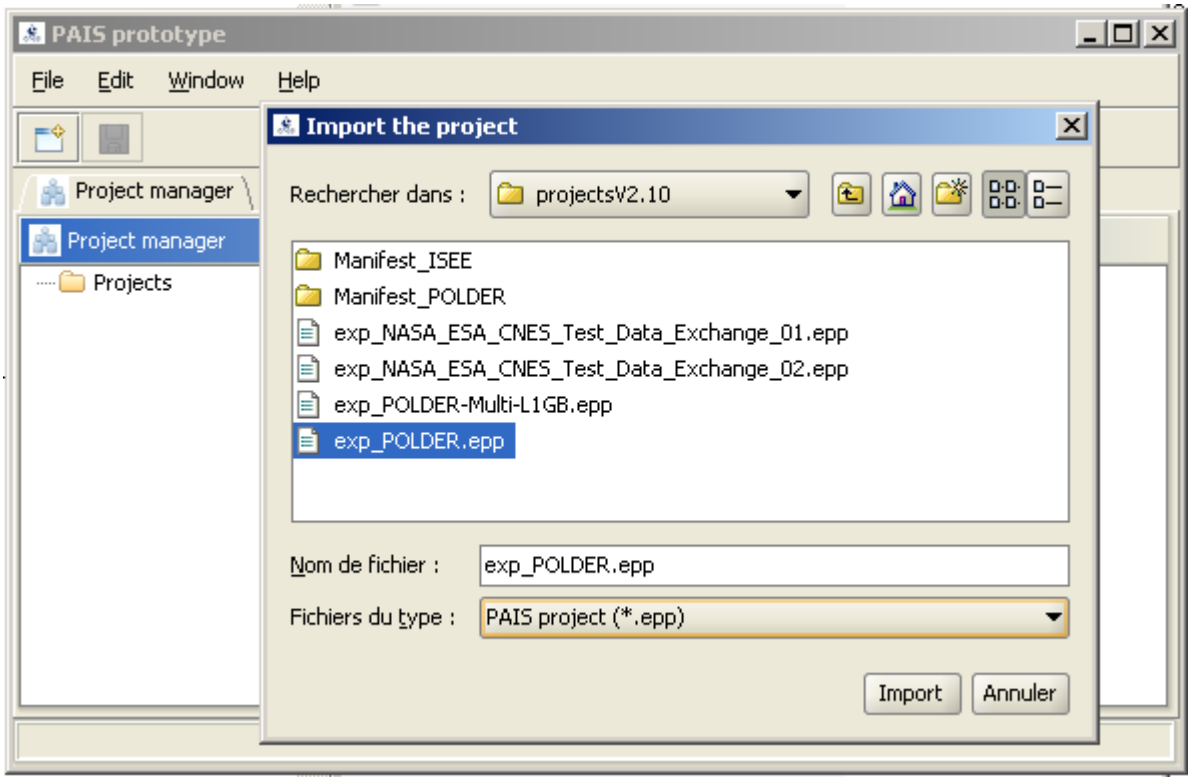
See section 6.3 of the test case on using this part of the tool.

6 QUICK START-UP

To illustrate quick start-up, we will use the POLDER project provided as an example.

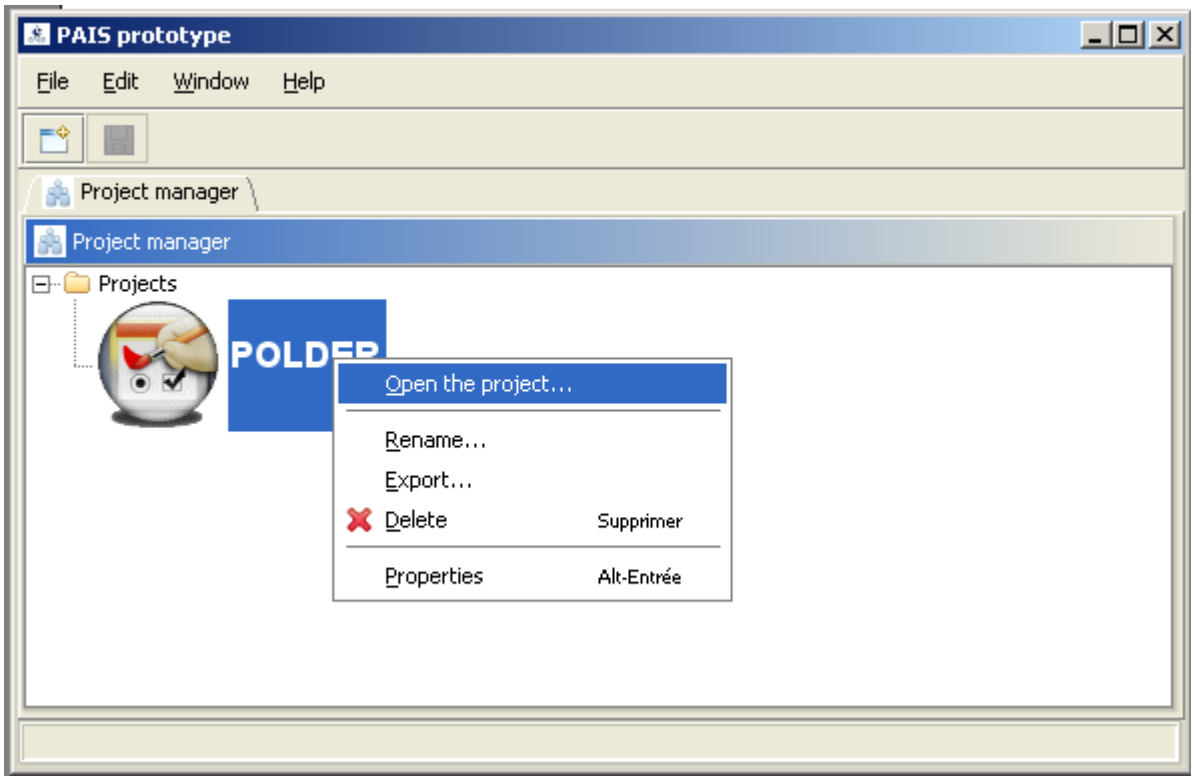
6.1 IMPORTING THE POLDER PROJECT

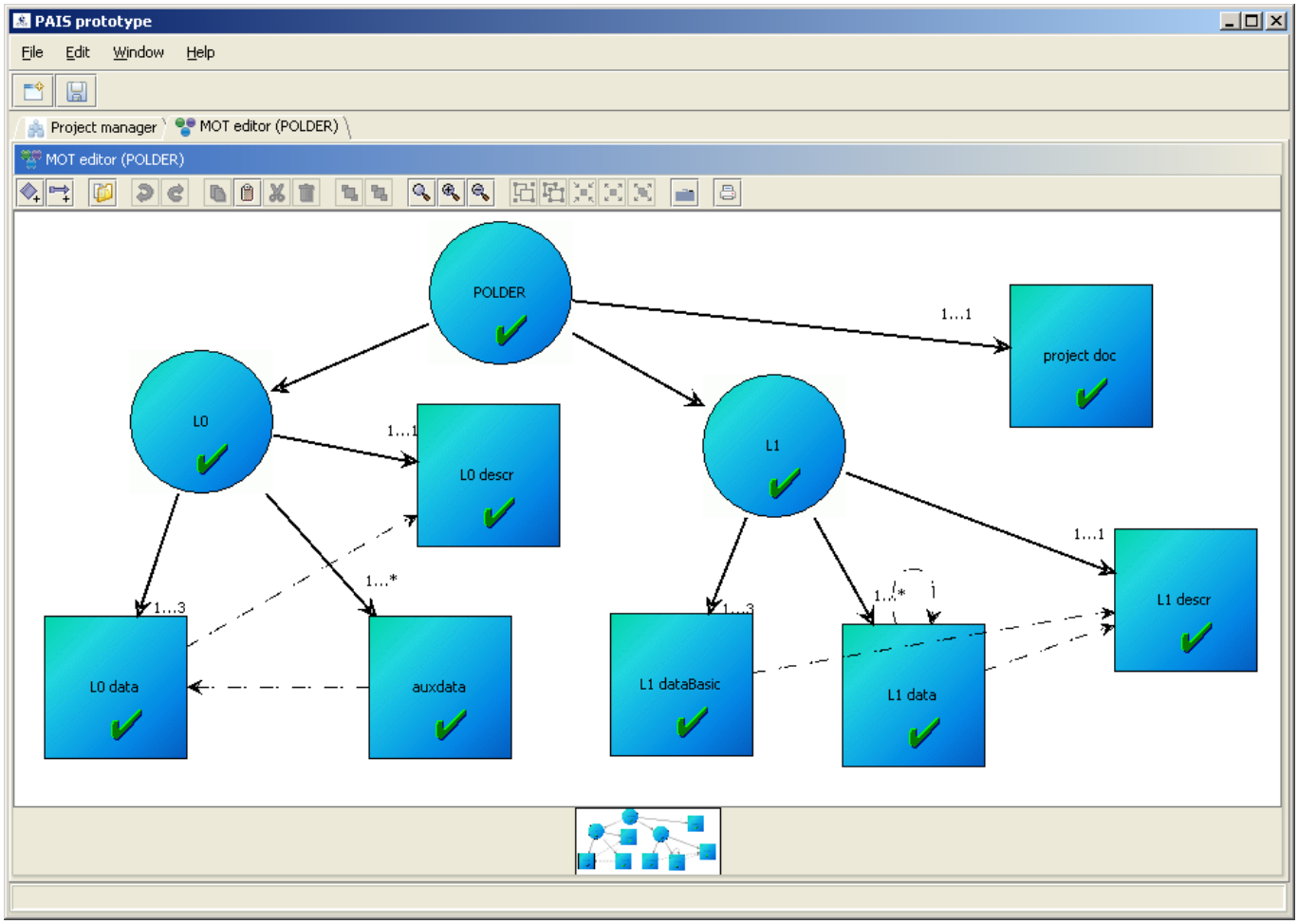
Open the “File” menu and click on “Import …”. Select the “epp” extension project file in the “PAIS_DATA/examples/project /exp_POLDER.epp” directory, and then validate by clicking on the “Import” button. The project created in the Project manager space is in design mode.



6.2 OPENING THE PROJECT

Select the project, right-click the mouse (to display the contextual menu) and click on “Open the project…” or double-click on the project.

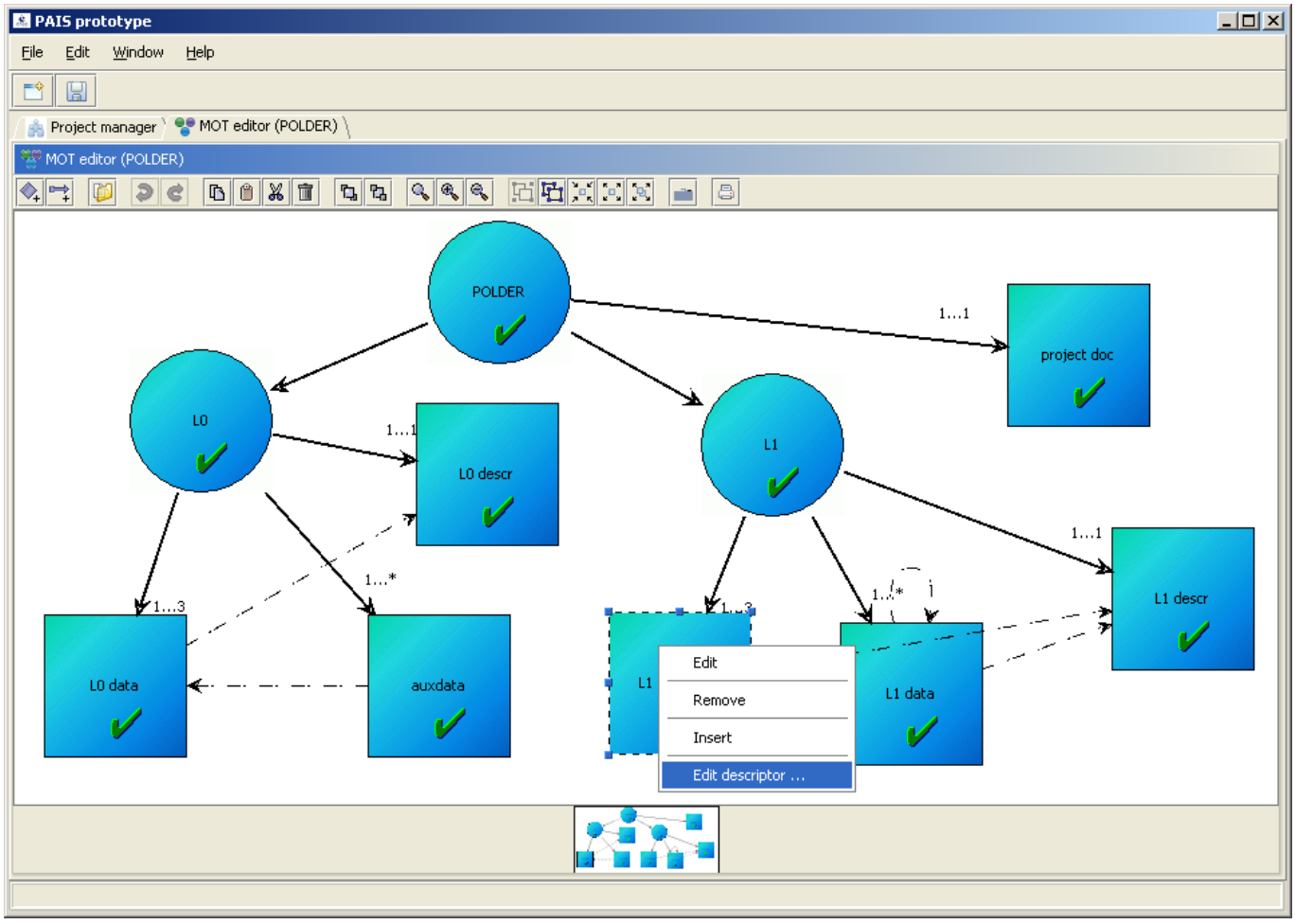




By default, the project is in design mode. The various nodes can be edited and modified.

6.2.1 Editing a descriptor

For accessing to the XML Editor, select a descriptor, right-click the mouse (to display the contextual menu) and click on “Edit descriptor…”.

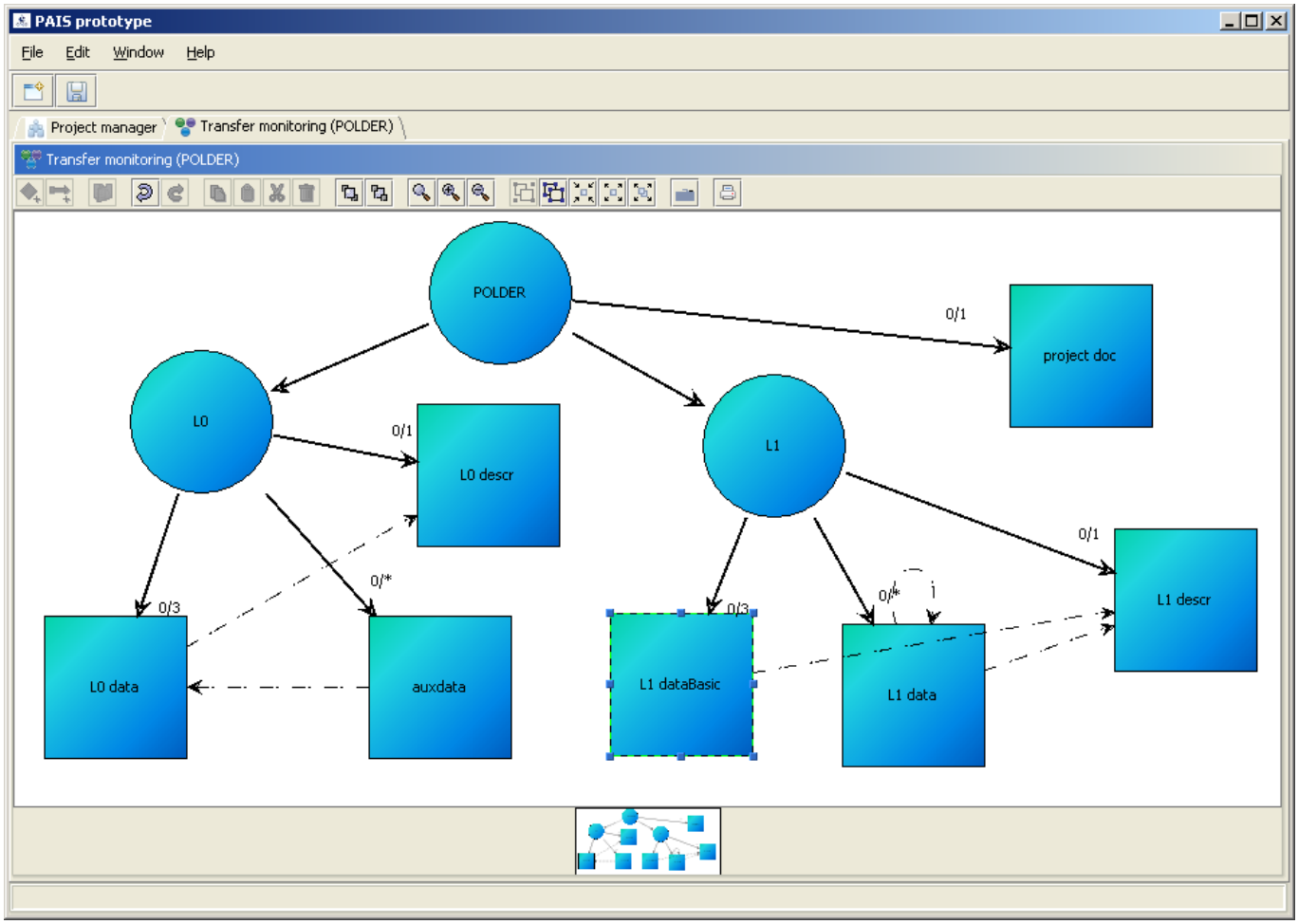


6.3 RECEIVING XFDU FILES AND VALIDATING

6.3.1 Switching to transfer mode

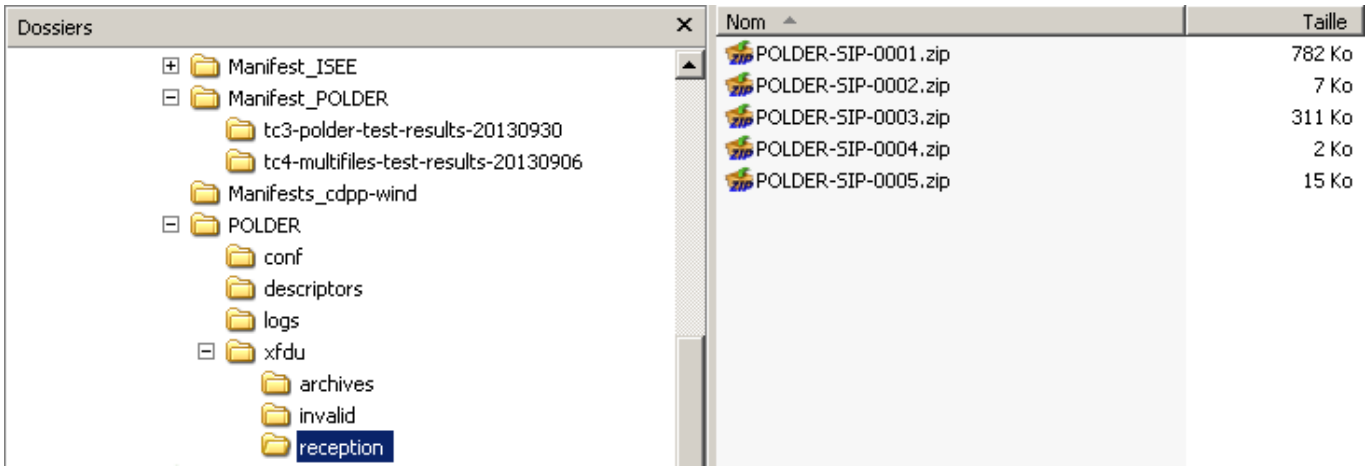
On the main project tab, the following two types of icons show the project status, i.e. in design mode (at left) and in transfer mode (at right):

On the “MOT editor” tab, right-click the mouse (to display the contextual menu) and then click on “Switch to transfer mode …”. The project then becomes:



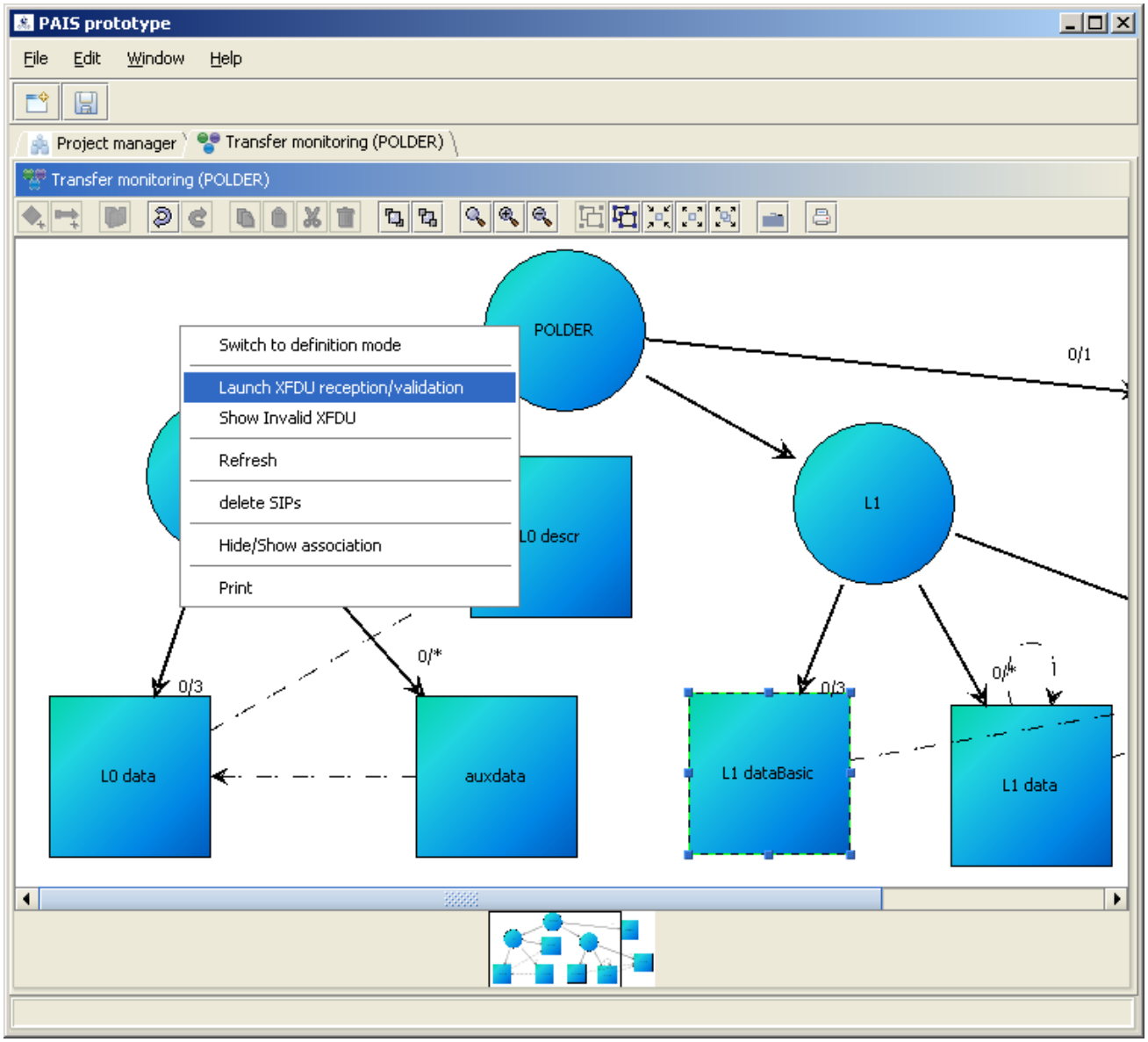
6.3.2 Placing XFDU files in the “reception” directory

To simulate the XFDU file’s arrival in the archive (from the producer), copy one or several “.zip” files from the “PAIS_DATA\examples\projects \Manifest_POLDER\tc3-polder-test-results” directory into the “PAIS_DATA\projects \POLDER\xfdu\reception” directory.



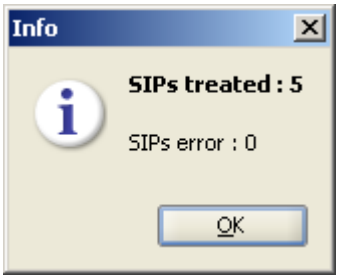
6.3.3 Launching the acquisition

On the “Transfer monitoring” tab, right-click the mouse (to display the contextual menu) and then click on “Launch XDFU reception/validation…”.



At the end of the acquisition, a message appears on the screen indicating the number of SIPs treated and those

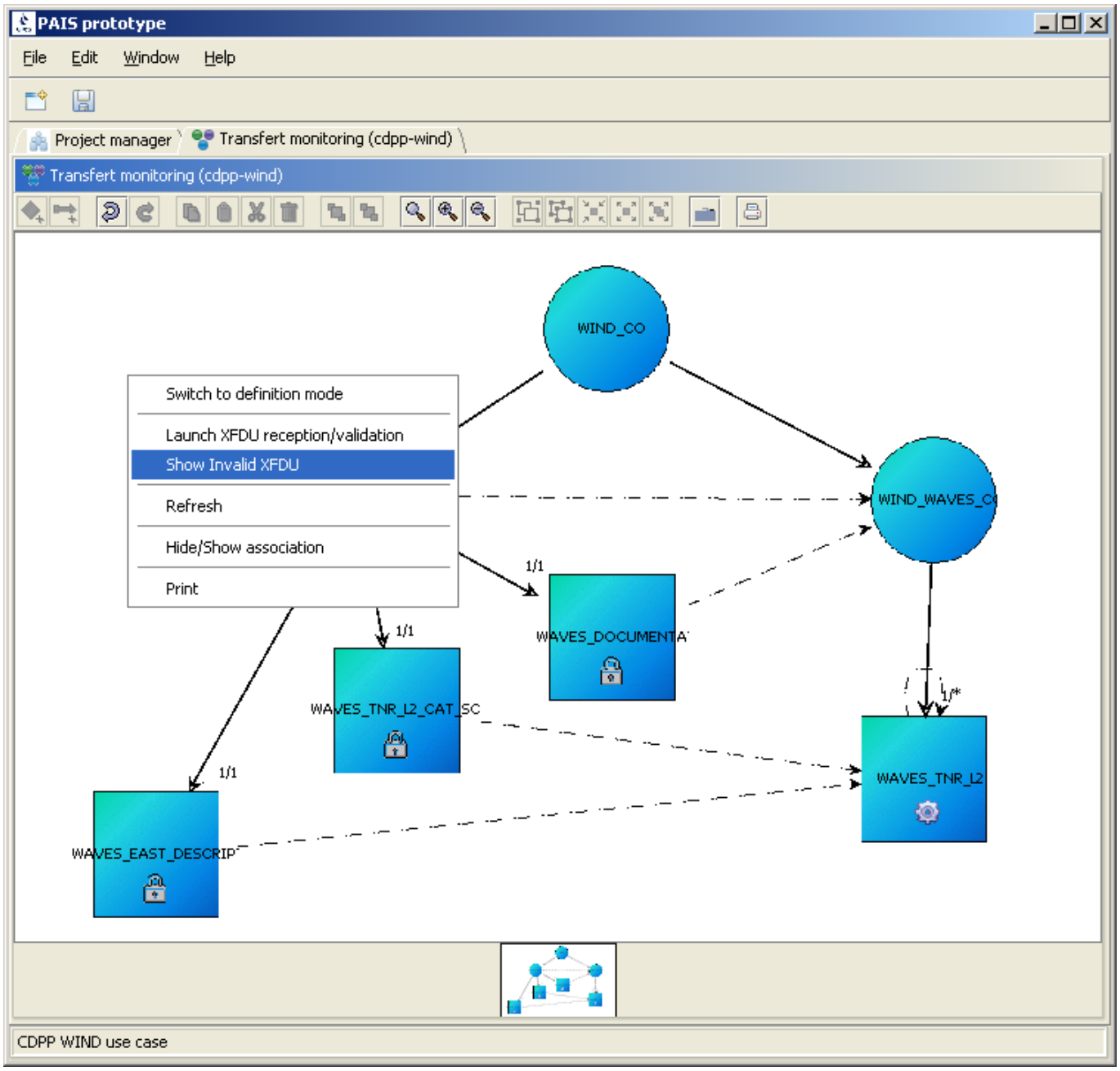
rejected due to error, if any:



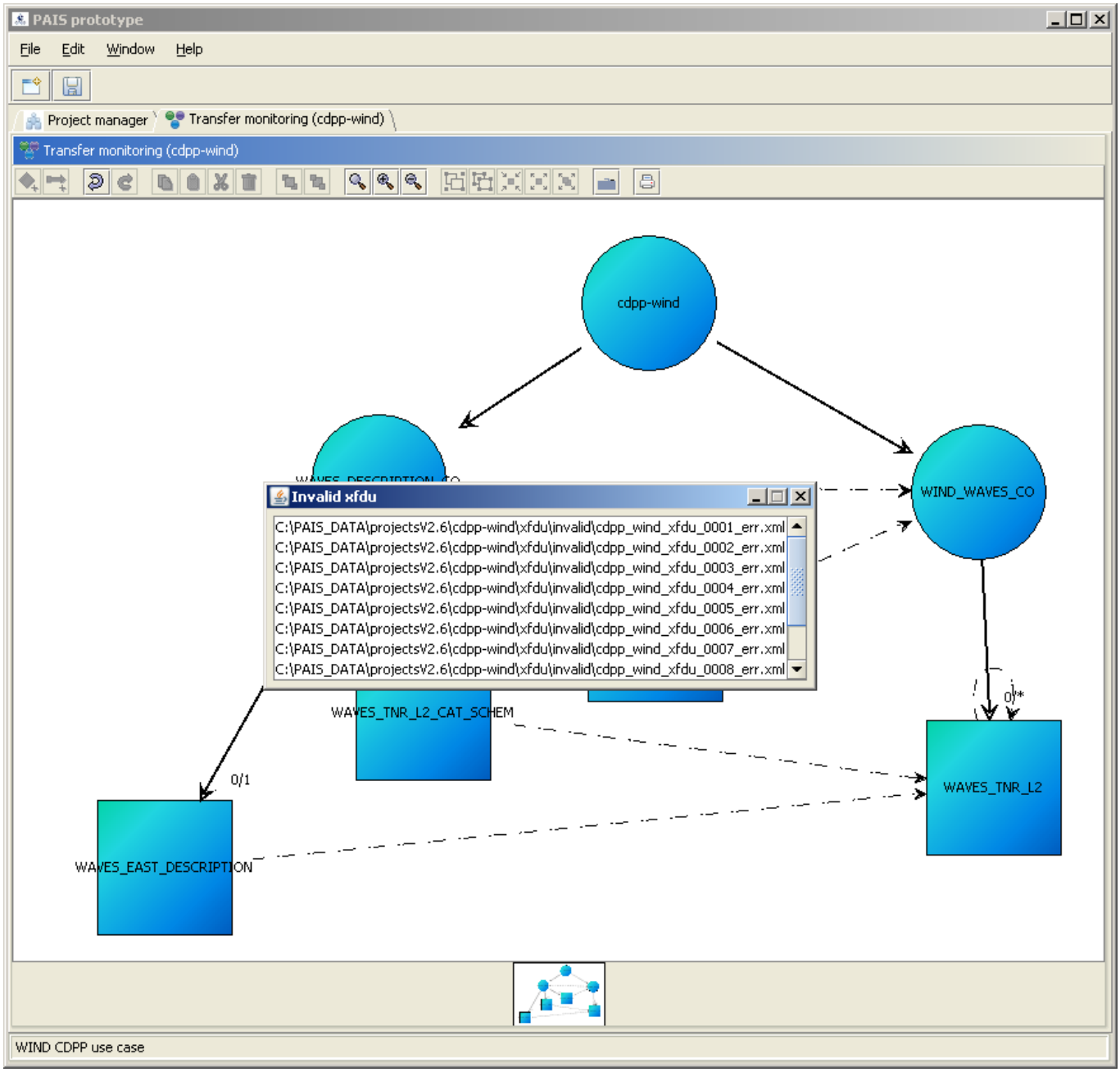
If all of the SIPs are correct, the “transfer object” reception counters are updated.

6.3.4 Check the invalid SIP files and associated reports.

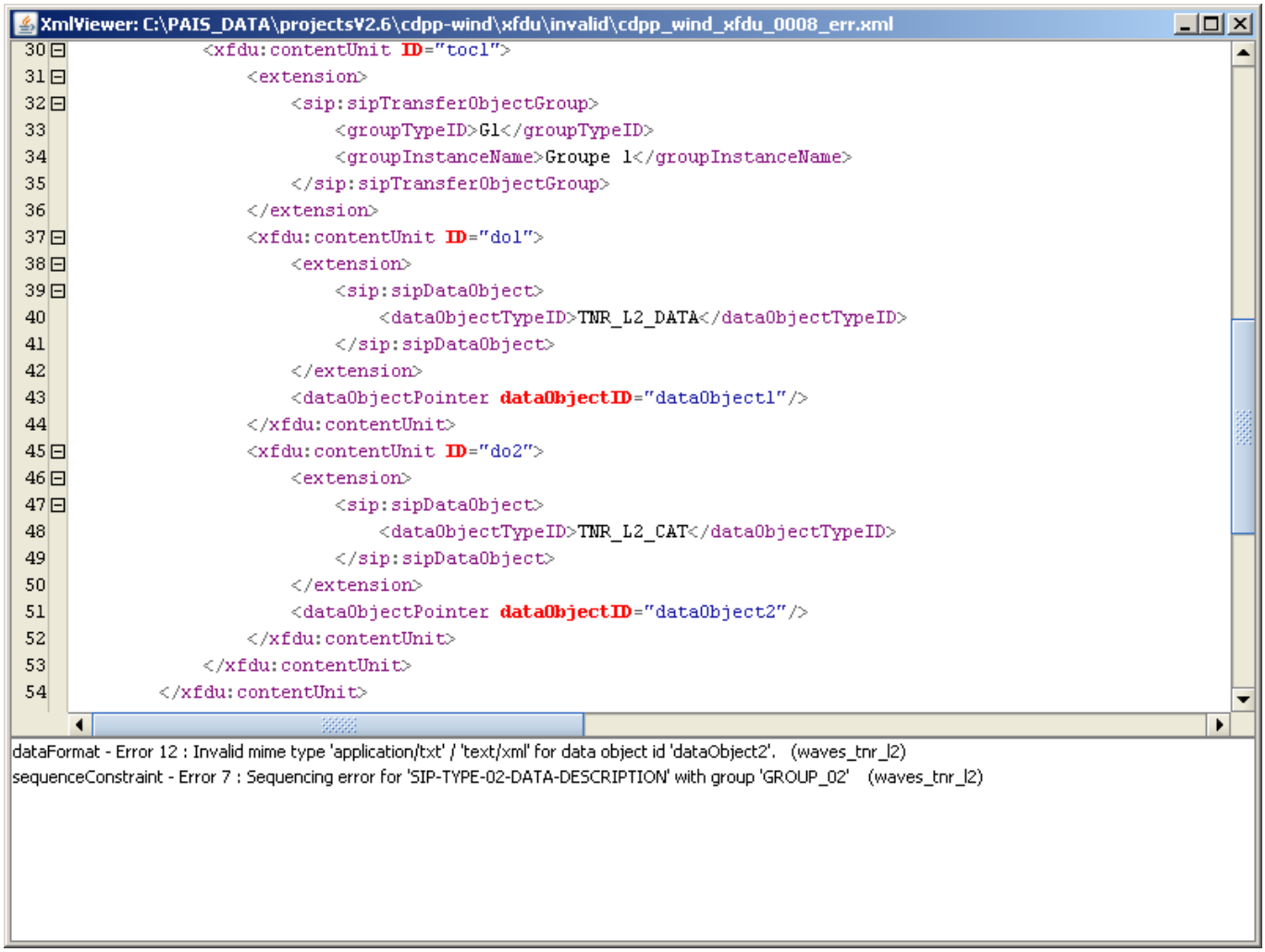
If SIPs are invalid during the acquisition, the error messages can be checked from the “Transfer monitoring” tab by right-clicking the mouse (to display the contextual menu) and then clicking on “Show invalid XFDU …”.



Double-click on the file that you want to view.

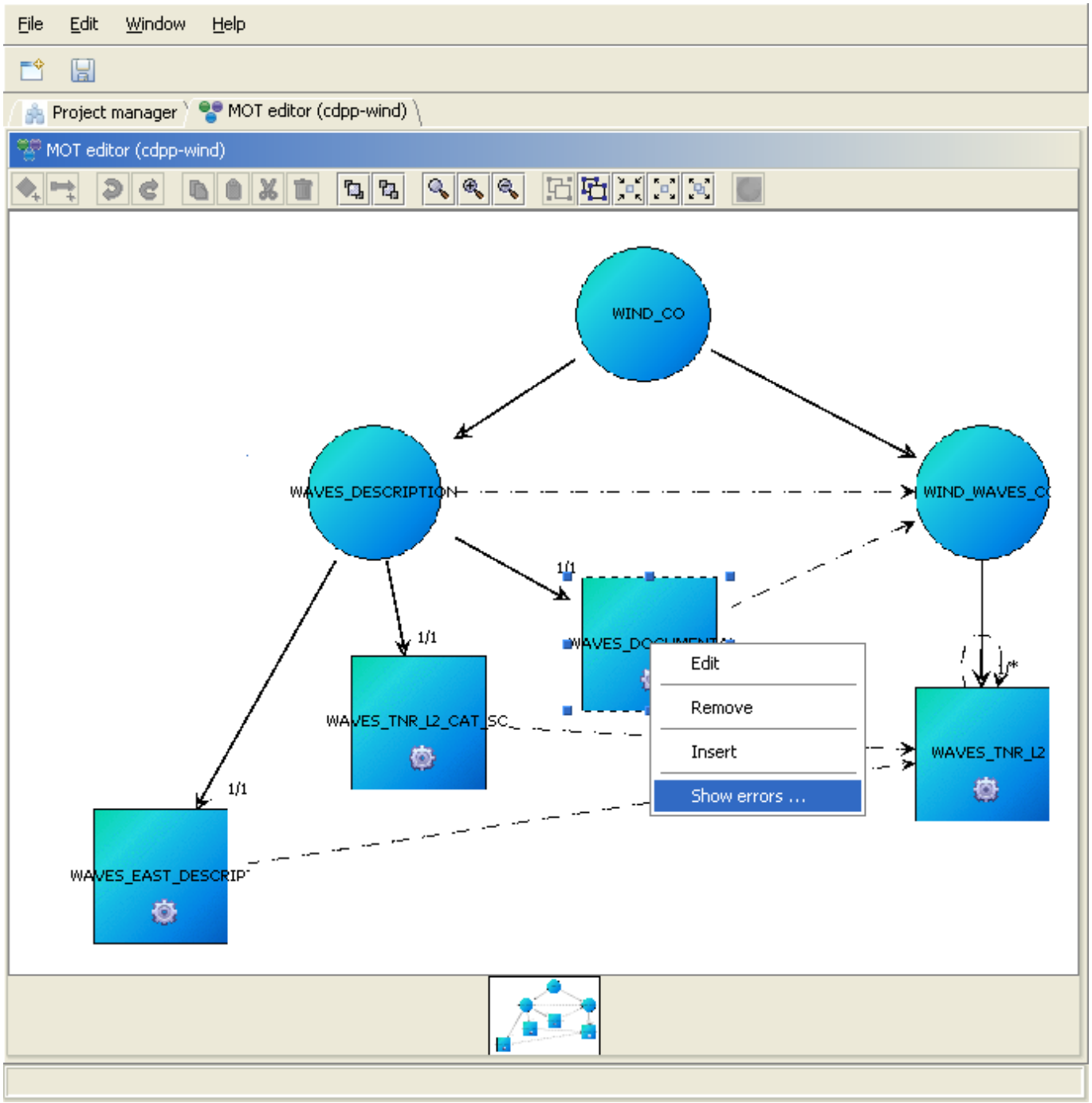

PAIS prototype
File
Edit
Window
Help
Project manager
Transfer monitoring (cdpp-wind)
Transfer monitoring (cdpp-wind)
cdpp-wind
WIND_WAVES_CO
Invalid xfdu
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0001_err.xml
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0002_err.xml
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0003_err.xml
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0004_err.xml
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0005_err.xml
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0006_err.xml
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0007_err.xml
C:\PAIS_DATA\projectsV2.6\cdpp-wind\xfdu\invalid\cdpp_wind_xfdu_0008_err.xml
WAVES_TNR_L2_CAT_SCHEM
0/1
0/*
WAVES_TNR_L2
WAVES_EAST_DESCRIPTION
WIND CDPP use case

In the XFDU display window, the associated errors are displayed in the lower section.

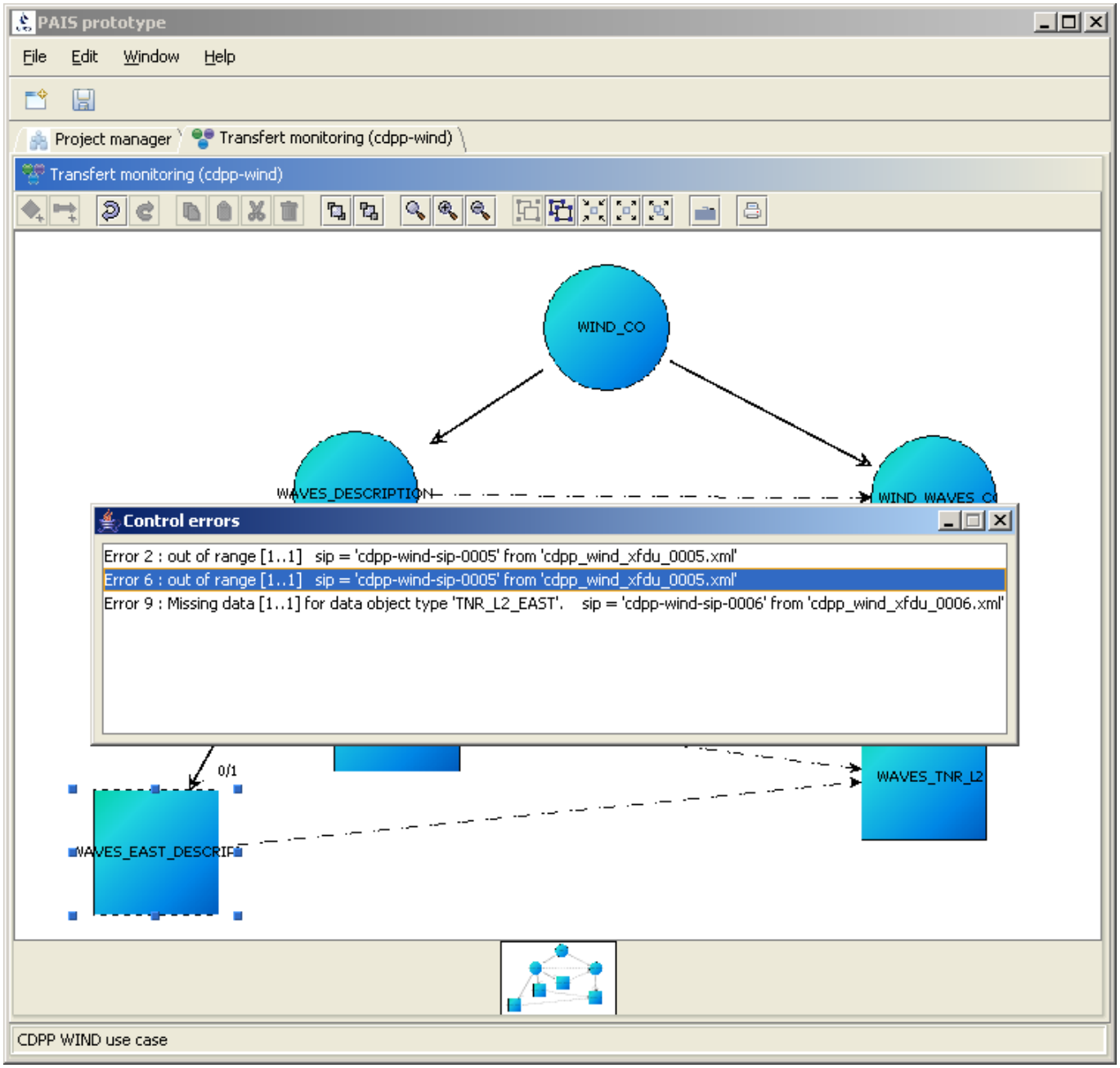


6.3.5 Viewing control errors on a given descriptor

Select a descriptor, right-click the mouse (to display the contextual menu) and click on “Show errors…”.



Double-click on the error to show the XFDU file that caused the error.



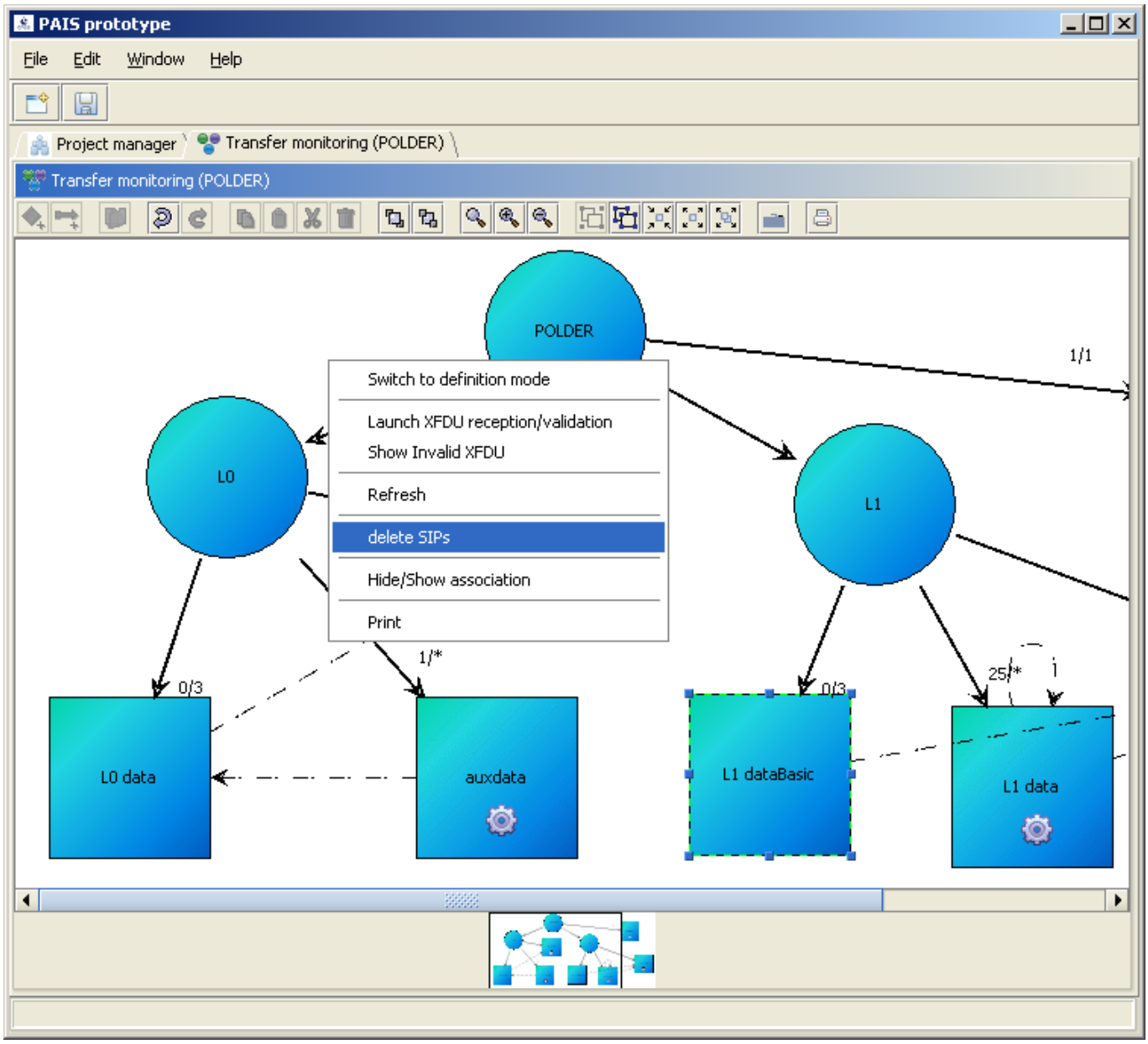
6.3.6 Checking controls carried out on SIPs during acquisition

The controls carried out during SIP acquisition can be shown in a “pais_historic.log” file associated with the project in the “PAIS_DATA\projects \POLDER\logs” directory.

This file can also be viewed on the prototype monitor launched during start-up. See the section on _Journalisation.

6.3.7 Resetting the test set

Within the prototype framework, in order to replay a scenario, it is possible to reset the reception of all SIPs for the project in progress. This also reinitializes all errors and associated counters. To implement a reset, right-click the mouse (to display the contextual menu) and click on “Delete SIPs”.



6.4 LOGGING

Each project has its own “pais_historic.log” treatment log in the logs directory. This file contains all of the operations carried out on this project since its creation.

Messages are logged in the following manner:

<DATE> <[LEVEL]> <[MODULE]> <MESSAGE>

e.g.:

```
2008-08-22 10:17:14 [INFO] [RECEIVER] Initialized
2008-08-22 10:17:14 [INFO] [RECEIVER] started
. . .
2008-08-22 10:17:14 [INFO] [RECEIVER] entry = cdpp_wind_xfdu_0002.xml
2008-08-22 10:17:14 [INFO] [CONTROL] projectId = cdpp-wind
2008-08-22 10:17:14 [INFO] [CONTROL] CU = waves_documentation_cu, TO = cdpp-wind-
transfer-object-0002
2008-08-22 10:17:14 [INFO] [CONTROL] descriptorId
2008-08-22 10:17:14 [INFO] [CONTROL] groupConstraint
2008-08-22 10:17:14 [ERROR] [CONTROL] waves_documentation  : ERROR 3 'Type of the sip
'SIP-TYPE-ERROR' unknown'
2008-08-22 10:17:14 [INFO] [CONTROL] globalOccurrencies
2008-08-22 10:17:14 [INFO] [CONTROL] sipOccurrencies
2008-08-22 10:17:14 [INFO] [CONTROL] dataOccurrencies
2008-08-22 10:17:14 [INFO] [CONTROL] dataFormat
2008-08-22 10:17:14 [INFO] [CONTROL] sequenceConstraint
2008-08-22 10:17:15 [ERROR] [RECEIVER] treated = cdpp_wind_xfdu_0002.xml
. . .
2008-08-22 10:17:17 [INFO] [RECEIVER] entry = cdpp_wind_xfdu_0020.xml
2008-08-22 10:17:17 [INFO] [CONTROL] projectId = cdpp-wind
2008-08-22 10:17:17 [INFO] [CONTROL] CU = waves_documentation_cu, TO = cdpp-wind-
transfer-object-0020
2008-08-22 10:17:17 [INFO] [CONTROL] descriptorId
2008-08-22 10:17:17 [INFO] [CONTROL] groupConstraint
2008-08-22 10:17:17 [INFO] [CONTROL] globalOccurrencies
2008-08-22 10:17:17 [INFO] [CONTROL] sipOccurrencies
2008-08-22 10:17:17 [INFO] [CONTROL] dataOccurrencies
2008-08-22 10:17:17 [INFO] [CONTROL] dataFormat
2008-08-22 10:17:17 [INFO] [CONTROL] sequenceConstraint
2008-08-22 10:17:17 [INFO] [RECEIVER] treated = cdpp_wind_xfdu_0020.xml
. . .
2008-08-25 12:49:40 [INFO] [RECEIVER] stopped
```

The LEVEL indicates whether an error occurred during processing of the XFDU. The error occurring during a control is repeated as a general error for the XFDU received.
The MODULE specifies the source of the error: CONTROL for an error on a specific control or RECEIVER for a general error.

6.4.1 Configuring the error and log output (log4j.xml)

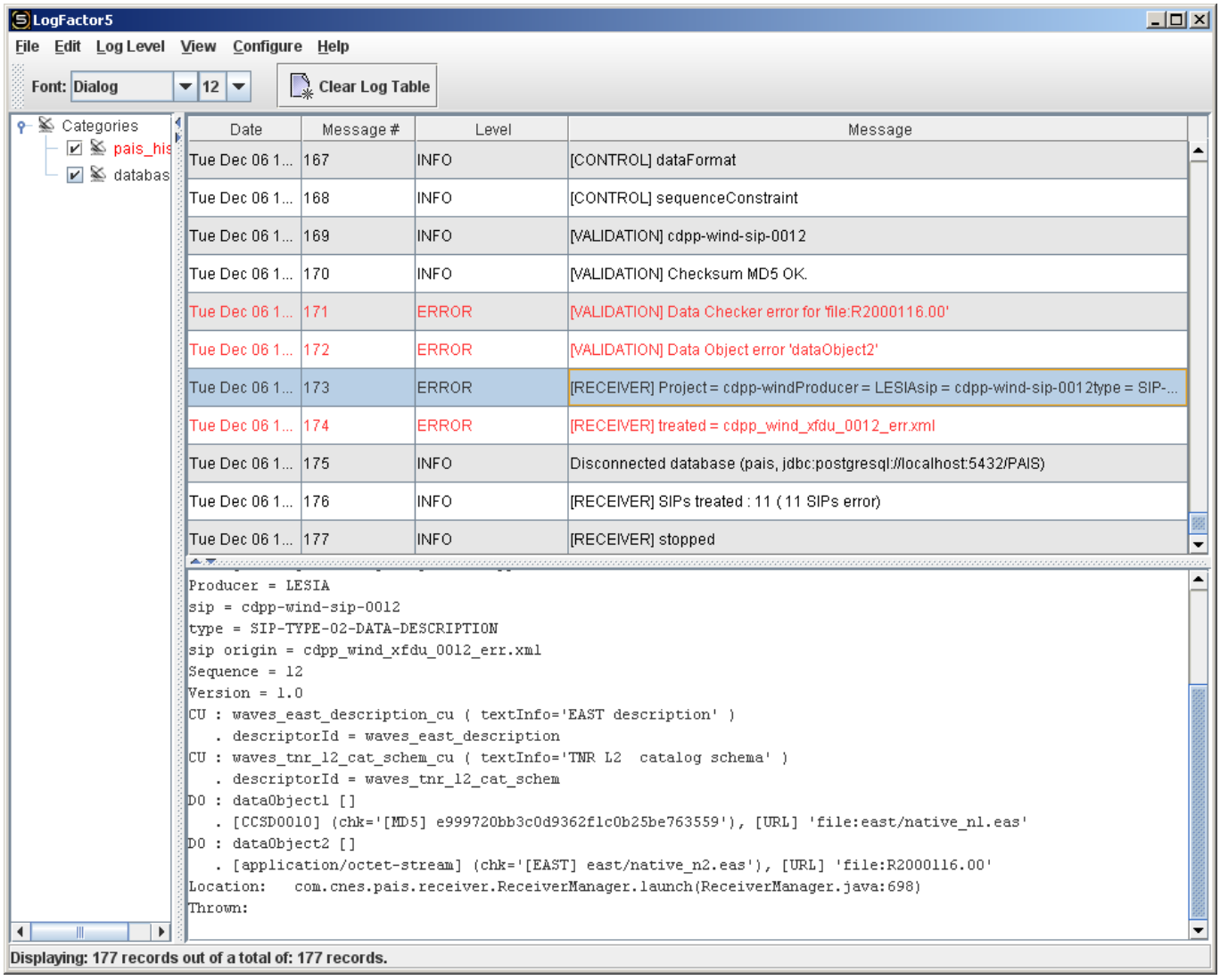
The error output can be parameterized differently using the “log4j.xml” configuration file found in the executable installation directory. The application needs to be restarted to take the change into account.

The error output (for errors other than XFDU processing errors) is logged in the “pais.log” file in the application installation directory. To display these errors on the console (standard output and no more pais.log), edit the “log4j.xml” file and then replace the value “rolling” with “stdout” under the "com.cnes.pais" logger:

```
<!-- level value = (fatal, error, warn, info, debug, trace, all, off) -->
   <logger name="com.cnes.pais" additivity="false">
      <level value="info"/>
      <appender-ref ref="rolling"/>
   </logger>
```

These logs can be viewed using a configurable real-time monitor. To show/hide this MMI monitor at application start-up, the “log4j.xml” configuration file of the application directory needs to be changed by deleting/inserting the comments from the “monitor” line under the “pais_historic” logger:

```
. . .
   <logger name="pais_historic" additivity="false">
        <level value="info"/>
        <appender-ref ref="historic"/>
        <!-- <appender-ref ref="monitor"/> -->
    </logger>
```



For further information on configuring Log4j.xml, see the documentation available on this website:
http://logging.apache.org/log4j/

7 POSSIBLE ERROR MESSAGES DURING PROCESSING

General Error	Message	Comments
-	Control error	There is an error in the Control. See the associated message for further information.
-	packageHeader missing	The SIP heading is missing.
-	informationPackageMap missing	The SIP's general information block is missing.
Error	**Message**	**Comments**
1	Bad descriptor Id	The descriptor identifier does not belong to the model.
2	out of range [{?}..{?}]	The number of descriptors exceeds the limits declared in the model.
3	Type of the sip "{?}" unknown	The SIP type is not known in this model.
4	This descriptor does not exist in this Sip Content Type "{?}"	The descriptor identifier does not belong to the group type declared for this SIP
5	This descriptor is missing in this Sip Content Type "{?}"	The descriptor identifier is missing in the group type declared for this SIP
6	out of range [{?}..{?}]	The number of SIPs received exceeds the limits declared for this type of SIP group
7	Sequencing error for "{?}" with group "{?}"	Non-compliance with the reception sequence for the SIP types.
8	out of range [{?}..{?}] for data object type "{?}"	The number of objects for the descriptor exceeds the limits declared in the model.
9	out of range [{?}..{?}] for group id "{?}"	The number of objects for the group does not match the expected number declared in the model
10	Data object type "{?}" unknown	The type of object is not known in this model
11	Data object pointer "{?}" is not a valid reference	The descriptor refers to an object that does not exist in this SIP.
12	Invalid mime type "{?}" / "{?}" for data object id "{?}"	The object's mime type is not known.

13	Bad group Id “{?}” for data	The group identifier does not belong to this model.
14	Descriptor id different between transfer object id “{?}” and “{?}”	The descriptor identifier is invalid.
15	Descriptor id “{?}” to replace not found for transfer object id “{?}”	Invalid descriptor identifier to be replaced
16	Data validation	Error during data validation