

# EXPRESS Importer

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This tool imports EXPRESS Schemas into MagicDraw 14.0. EXPRESS is a text based modeling language defined by ISO 10303-11. There is also a corresponding graphical representation, a standard for clear text representation of instance data (ISO 10303-21), and standardized APIs for accessing this instance data from several programming languages. EXPRESS is used by the large family of STEP (Standard for The Exchange of Product model data) standards. Despite this use, most software developers have never even heard of EXPRESS. In contrast, most developers have some familiarity with UML, so it would be useful to be able to import/export EXPRESS models to/from UML. The current tool only imports.

In some ways, EXPRESS is very much like UML. It supports behaviorless but otherwise class-like structures called entities (with multiple inheritance), interface-like types with select statements that let you specify the substitution of other types or entities, package-like schemas, as well as primitive-like types.

In other ways EXPRESS is rather alien. It is perfectly acceptable in EXPRESS to create a single instance which contains data from multiple subclasses of a given root class. Although this functionality is not unique (it is available, for example, in zeta-lisp), that is not something you can directly do in any popular object oriented language. Another eccentricity is that aforementioned select statements can be provided with constraints that require evaluation at the instance level. The schema (package) import semantics are unusual as well, but it seems a common practice is to construct a “long form schema” that includes all the imported elements. Although EXPRESS does not have object behaviors, it does have functions. These functions could actually be used to implement behaviors, by adopting the convention that the first argument represents the recipient of the message. In practice, this is not done.

Behaviorless interfaces should not be too surprising: they are even used occasionally in Java (where they are sometimes called “tagging interfaces”).

This importer does not attempt to translate EXPRESS constraints into OCL (object constraint language), nor does it attempt to handle functions. In fact it strips out these features before the EXPRESS Schema is parsed. The current version of the tool should be used only with long forms (that do not import other schemas).

## Installation

Installation is fairly straightforward:

1. Decompress the archive, and drop the contents into the MagicDraw plugins folder.
2. Edit the MagicDraw bin/mduml.properties file, and add the following paths (Make certain you use the correct separator) to the CLASSPATH on line 3:

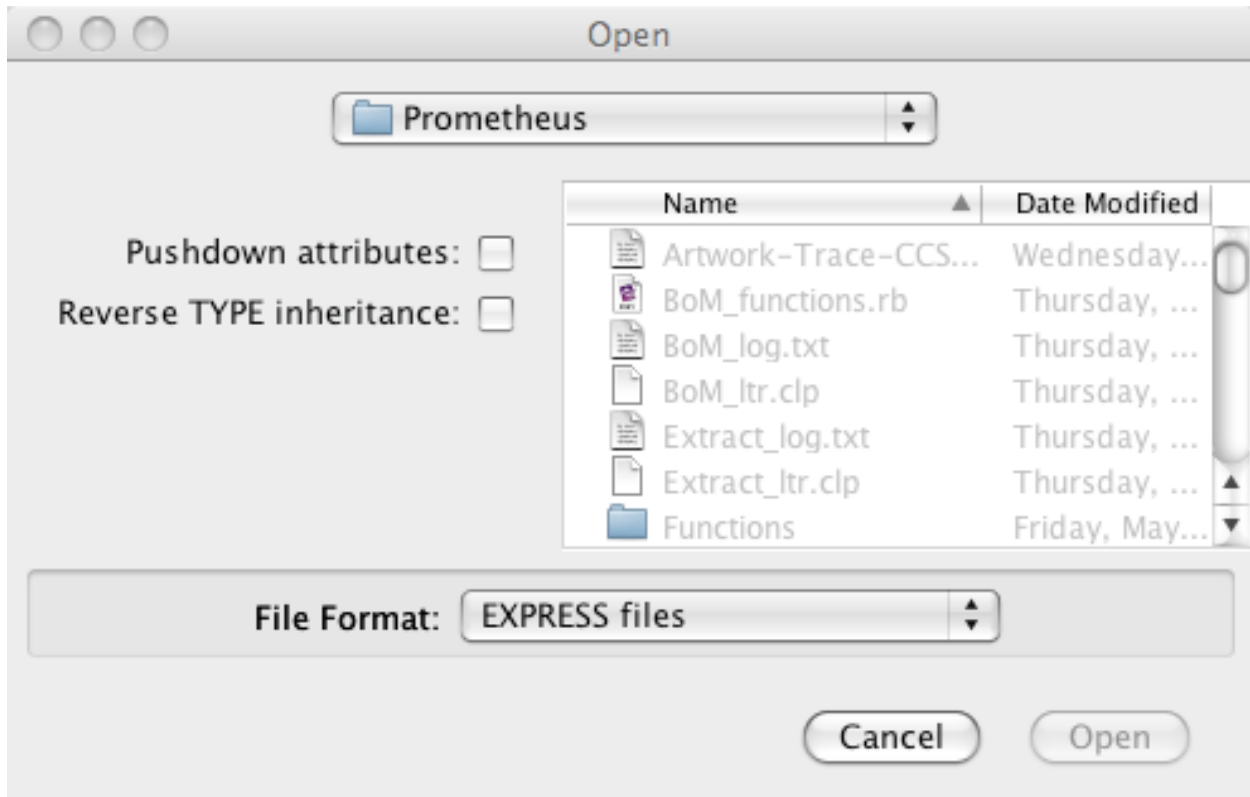
```
plugins/com.prometheus.extensions/profligacy/parser.jar
plugins/com.prometheus.extensions/profligacy/swing-layout.jar
plugins/com.prometheus.extensions/profligacy
plugins/com.prometheus.rubyAdapter/RubyAdapter.jar
```

## Use

1. Start MagicDraw
2. Open StartingPoint\_new.mdxml (this contains required EXPRESS primitive classes), and save a copy which will become your new document.
3. Select a package in the containment browser. This package will become the parent of a new package that corresponds to the EXPRESS Schema. It is suggested that you create a new package for this purpose, and *\*not\** use the root package (labeled "Data"), because the imported classes may not be sorted (apparently due to an idiosyncrasy of MagicDraw), which can make them difficult to find.
4. Right click on the selected package and choose "Import EXPRESS Schema" from the context menu.
5. A file selection dialog will let you pick the EXPRESS schema you want to import. This dialog contains a couple of checkboxes described in the section titled "Options".
6. If you wish you can look for additional warnings in the MagicDraw log. Under Unix, the log file is located in ~/.magicdraw\_<edition>/<version\_number>/md.log.
7. A new package will be created within the selected package: this contains the imported model. The model does not have a diagram associated with it.
8. Under Options > Environment > Diagram make certain you have a check mark in "Display paths on element drop" (without this, associations and inheritance will not be represented graphically in your diagram).
9. Drag the classes and interfaces you are interested into a class diagram to create a class diagram of the model you just imported. The classes you have dragged will be an overlapping jumble. The more expensive editions of MagicDraw can lay out the classes for you (using several algorithms), but I have never been satisfied with the results.

## Options

The importer provides two options represented by checkboxes in the file selection dialog.



If you check “Pushdown attributes”, then the attributes of all superclasses will be represented in every subclass (with a leading underscore prepended to the attribute name). In ambiguous cases (multiple inheritance “diamond patterns”), the class name that defines the attribute will be prepended as well. Normally this checkbox should not be checked.

If you check “Reverse TYPE inheritance”, then Interfaces representing select statements will have the direction of their inheritance reversed. Normally this checkbox should not be checked. It can be useful if your application lets you ignore the constraints on the selection, and you wish to determine programatically which classes “implement” a given interface.

## Room for Improvement

- A progress indicator during EXPRESS Schema import and processing
- Support for imported schemas