

MagicDraw Model-Tool-Interchange User's Guide

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Colophon

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1. Introduction

MagicDraw is a modeling tool developed by No Magic. More information on this tool can be found at: <https://www.nomagic.com/products/magicdraw> Future Airborne Capability Environment (FACE™) is a consortium developed standard. More information on this standard can be found at: <https://www.opengroup.org/face> This document provides information on the installation and use of the following plugins running within MagicDraw:

- FACE 3.0 MagicDraw Model-Tool-Interchange Plugin
- FACE 3.1 MagicDraw Model-Tool-Interchange Plugin

Note: "Model-Tool-Interchange Plugin" is synonymous with "Import/Export Plugin".

Note: An * will be used when the version number is referenced that applies to any version of the plugin.

Note: The "Model-Tool-Interchange Plugin" is delivered in a zip file. That zip file contains only one version (i.e. 3.0 or 3.1 but not both) of the software. Therefore, if you are installing the 3.0 version, none of the 3.1 capabilities would be available.

The plugins perform two functions as follows:

- Import an Extensible Markup Language (XML) Metadata Interchange (XMI) file (i.e. .face file) into an MagicDraw model

- Export an MagicDraw model to XMI file (i.e. .face file)

The FACE Technical Standard Edition defines the meta-model and XMI schema that are used to create MagicDraw data models and XMI files. These documents can be found at: <https://prod.opengroup.org/face/docsandtools>

2. FACE™ 3.* MagicDraw Model-Tool-Interchange Plugin Setup

This section describes the steps necessary to setup the FACE MagicDraw Model-Tool-Interchange Plugin.

2.1. Prerequisites

The prerequisites for the FACE 3.* MagicDraw Model-Tool-Interchange Plugin Setup follow:

- Version of Java as specified by <https://www.nomagic.com/support/jvm-list>
- MagicDraw version 18.5 or 19.0

2.2. Installation

Installation for each of these sections will start in the MagicDraw installation directory (C:\Program Files\MagicDraw by default).

These instructions are based off the plugin installation directions found here: <https://docs.nomagic.com/display/NMDOC/Installing+plugins>

If you do not have admin access to your machine, you can install the plugin in an alternative location the user defines such as C:\Users\<username>\AppData\Local\magicdraw<version>}. To get the exact path to the configuration files follow the instructions below:

- Open the help menu and select About MagicDraw.
- From the Help menu, select About MagicDraw. The About screen opens.
- Click the Environment tab.
- Click the hyperlink next to Configuration files. The folder containing MagicDraw configuration files opens.

Additional information can be found here: <https://docs.nomagic.com/display/MD185/Plugins+directories>

2.3. Install Plugin

To install the FACE MagicDraw Model-Tool-Interchange open the plugin directory in the MagicDraw installation directory (C:\Program Files\MagicDraw by default) or Cameo (C:\Program Files\Cameo Systems Modeler by default) and copy the FACE 3.* MagicDraw Model-Tool-Interchange Plugin into

this directory. If you have magic draw open when you install the plugin you will need to restart the application.

2.4. Install Profile

Within the plugin package is a directory called "profile" which contain the following based on the plugin version:

- FACE 3.0 Plugin
 - FACE_3.0_Unified_Profile_Customizations_v1.mdzip
 - FACE_3.0_Unified_Profile_v1.mdzip
- FACE 3.1 Plugin
 - FACE_3.1_Unified_Profile_Customizations_v1.mdzip
 - FACE_3.1_Unified_Profile_v1.mdzip

These files need to be copied into the profile folder of the MagicDraw installation directory (C:\Program Files\MagicDraw by default). This is important if you do not want to use the Starter Model to initialize a new project.

2.5. Setting Up Custom Diagrams

Begin by opening MagicDraw and selecting "Diagrams" in the tool bar. Navigate to Customize; you may need to expand the menu to see this option.

Now select "Import" and navigate to the FACE 3.* MagicDraw Model-Tool-Interchange Plugin installation directory (C:\Program Files\MagicDraw\plugins\edu.vanderbilt.isis.bns.md_v3* by default) then open the diagrams folder. You will need to import each of these diagrams for the full functionality of the tools and models be accessed.

Once you have completed this process the custom diagrams should have each of the following entries:

- FACE 3.0 Plugin
 - FACE Architecture Model Diagram
 - FACE Conceptual Data Model Diagram
 - FACE Data Model Diagram
 - FACE Integration Context Diagram
 - FACE Integration Model Diagram
 - FACE Logical Data Model Diagram
 - FACE Platform Data Model Diagram
 - FACE Traceability Model Diagram
 - FACE UoP Model Diagram
- FACE 3.1 Plugin

- FACE 3.1 Architecture Model Diagram
- FACE 3.1 Conceptual Data Model Diagram
- FACE 3.1 Data Model Diagram
- FACE 3.1 Integration Context Diagram
- FACE 3.1 Integration Model Diagram
- FACE 3.1 Logical Data Model Diagram
- FACE 3.1 Platform Data Model Diagram
- FACE 3.1 Traceability Model Diagram
- FACE 3.1 UoP Model Diagram

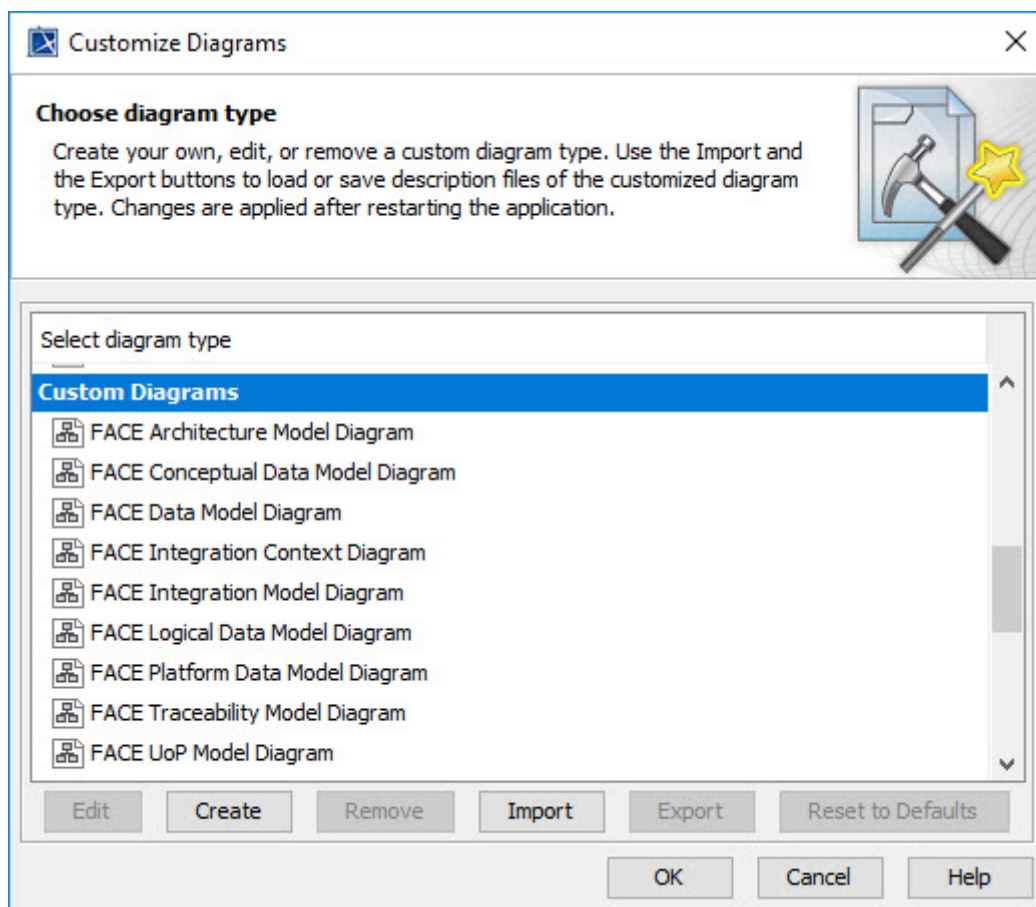


Figure 1. Loading Custom Diagrams for FACE

3. FACE v3.* MagicDraw Model-Tool-Interchange Plugin Usage

This chapter will discuss the functionality of the FACE v3.* MagicDraw Model-Tool-Interchange Plugin and how to set a project up to take advantage of this capability. Below in [Import/Export GUI](#) is the FACE v3.* MagicDraw Model-Tool-Interchange Plugin interface.

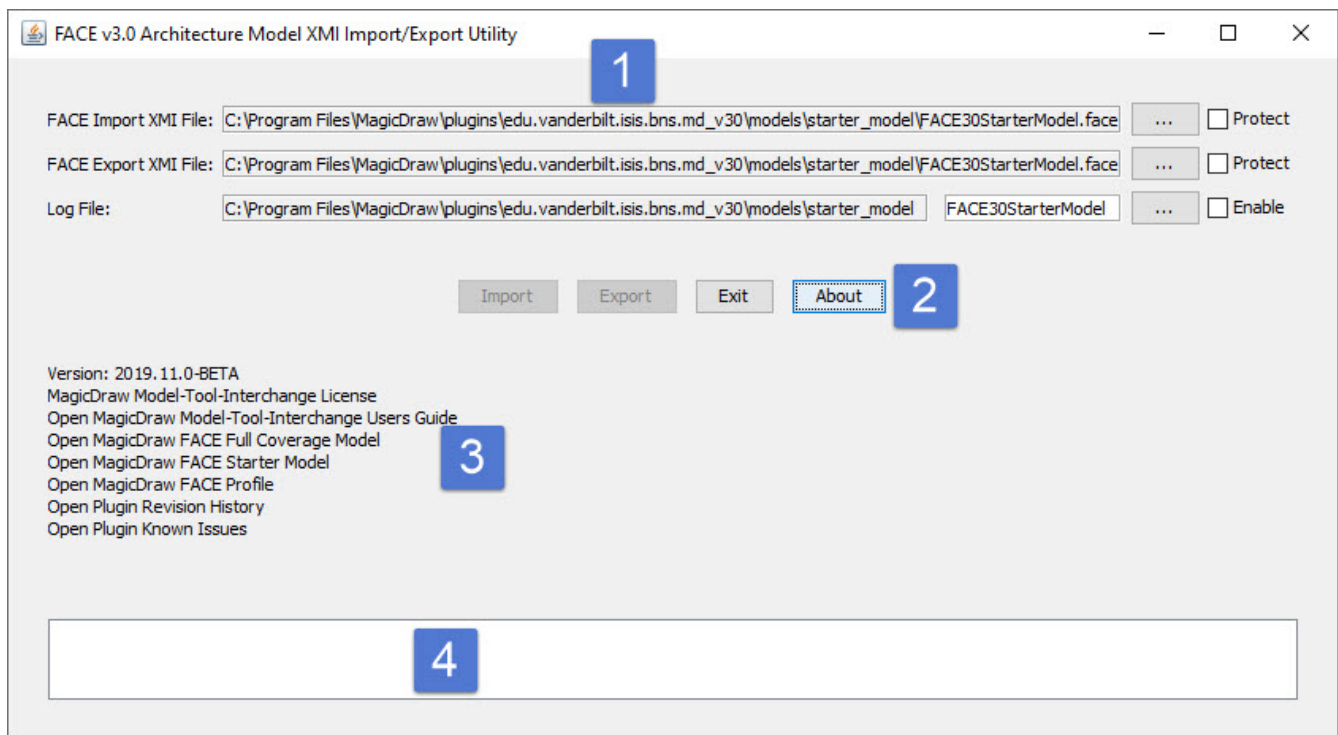


Figure 2. Import/Export GUI

The Plugin has 4 main sections. Section 1 is used to define import, export, and log file paths. This section provides the ability to lock the paths for import and export to prevent accidental name change. You can also enable or disable logging from here as well. Section 2 is used to initiate import or export of a model. These buttons are context sensitive based upon what elements in the containment tab are currently highlighted. The About button opens up the additional options seen in Section 3. These options contain a variety of useful resources for the user. Section 4 is a console feed for that reports the status of an import or export as it is happening.

The plugin can be accessed from any open MagicDraw project once the plugin has been installed as described in Chapter [\[FACE 3.* MagicDraw Model-Tool-Interchange Plugin Setup\]](#) by opening the context menu from the Containment Tab within MagicDraw (Figure [FACE Import/Export Architecture Utility](#)).

WARNING – You must select an element in the containment tree (e.g. Model) before right clicking to open the context menu. This indicates the package to import into or export from. Failing to select the containment tree element will cause the plugin to fail on imports/exports.

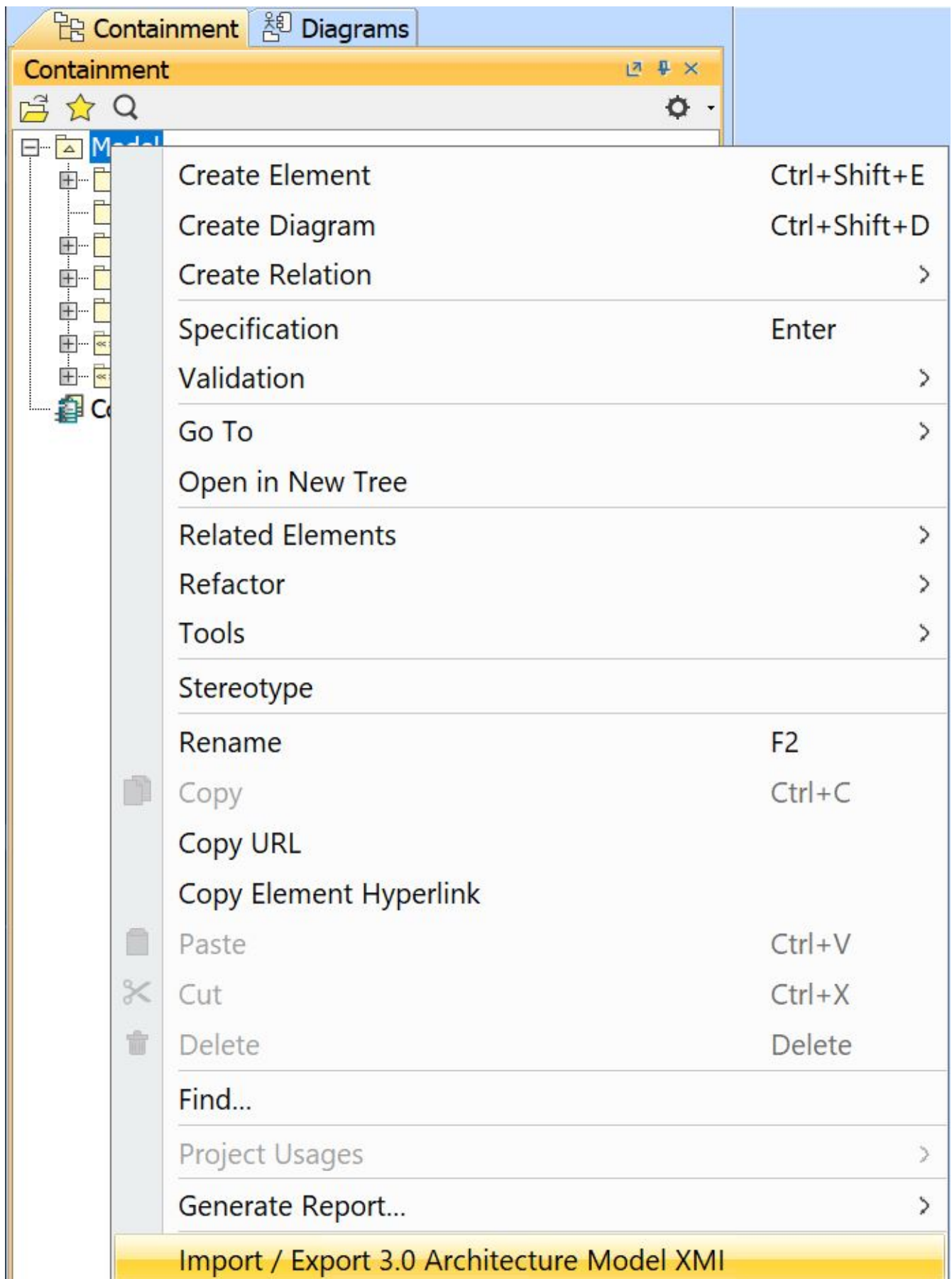


Figure 3. FACE Import/Export Architecture Utility

3.1. Setup a New Project

From a newly created MagicDraw Project, open the context menu in the Containment Tab and navigate to "Import/Export Architecture Model XMI". This will open the [FACE v3.* Import/Export Architecture Model XMI Utility](#).

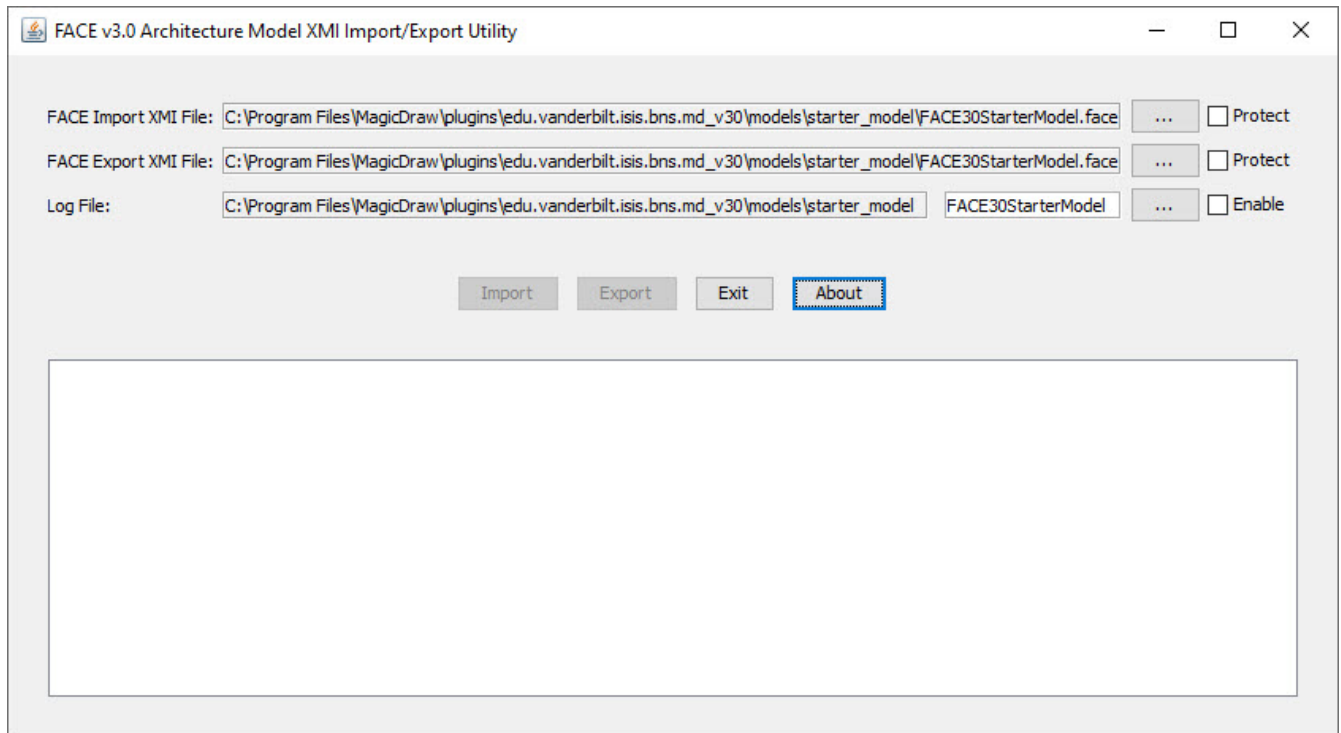


Figure 4. FACE v3.* Import/Export Architecture Model XMI Utility

Click the "About" Button to open a menu of options. From this list select "Open MagicDraw FACE Starter Model". Once the model opens, Save-As to the location you want to store your project.

WARNING – You must always start with the starter model. This model has the profile and customizations that are needed to create a FACE model. The plugin will not work without the profile and customizations. In addition to using the About menu above to obtain the starter model, you could copy the model from the MTI zip file directory "models\starter_model" under the "edu.vanderbilt.isis.bns.md_v30/31" directory. Once copied to a new location, it should be renamed to reflect the model purpose.

3.1.1. Creating FACE Architecture Models

With a project set up with steps detailed in section [Setup a New Project](#) you can now use the tools to begin creating a FACE Architecture Models.

First create a package and stereotype it as <FACEArchitectureModel>. Any child elements, diagrams, and relationships of this package will only be those allowed in the <FACEArchitectureModel> based upon the context you are modeling. For example, Observables can only be created in Conceptual Models. These elements will also be color coded. When creating diagrams, the pallet will be filtered based upon the type of diagram you are constructing.

3.2. Model-Tool-Interchange Plugin Usage

A MagicDraw project must be setup per Chapter [Plugin Setup](#), and one of Sections [Setup a New Project](#) or [Advanced Users](#) with a MagicDraw FACE 3.* profile setup before importing or exporting a FACE Architecture Model (i.e. .face XMI file). Note: You can only import a FACE 3.* XMI file into an MagicDraw model that has the corresponding FACE profile.

3.2.1. Importing and Export

Importing and Exporting are available based on the context selected in the Containment Tab. When Exporting a model, all children of the package with a stereotype of <FACEArchitectureModel> will be export to a FACE XMI file. Importing a FACE XMI will create packages with the <FACEArchitectureModel> stereotype that will contain imported FACE XMI model.

The model will be import or exported based on the file paths in [section \(1\)](#) of the plugin. These paths are generated based on the location of the MagicDraw project. You can change these paths to a custom destination. If you do, make sure to select the "Protect" box as the path will change if another project is selected. While a model is being transformed to or from the MagicDraw project, the status will be displayed in the [console \(4\)](#) within the plugin interface. If there are any errors that occur during the import or export they will also be displayed here as well.

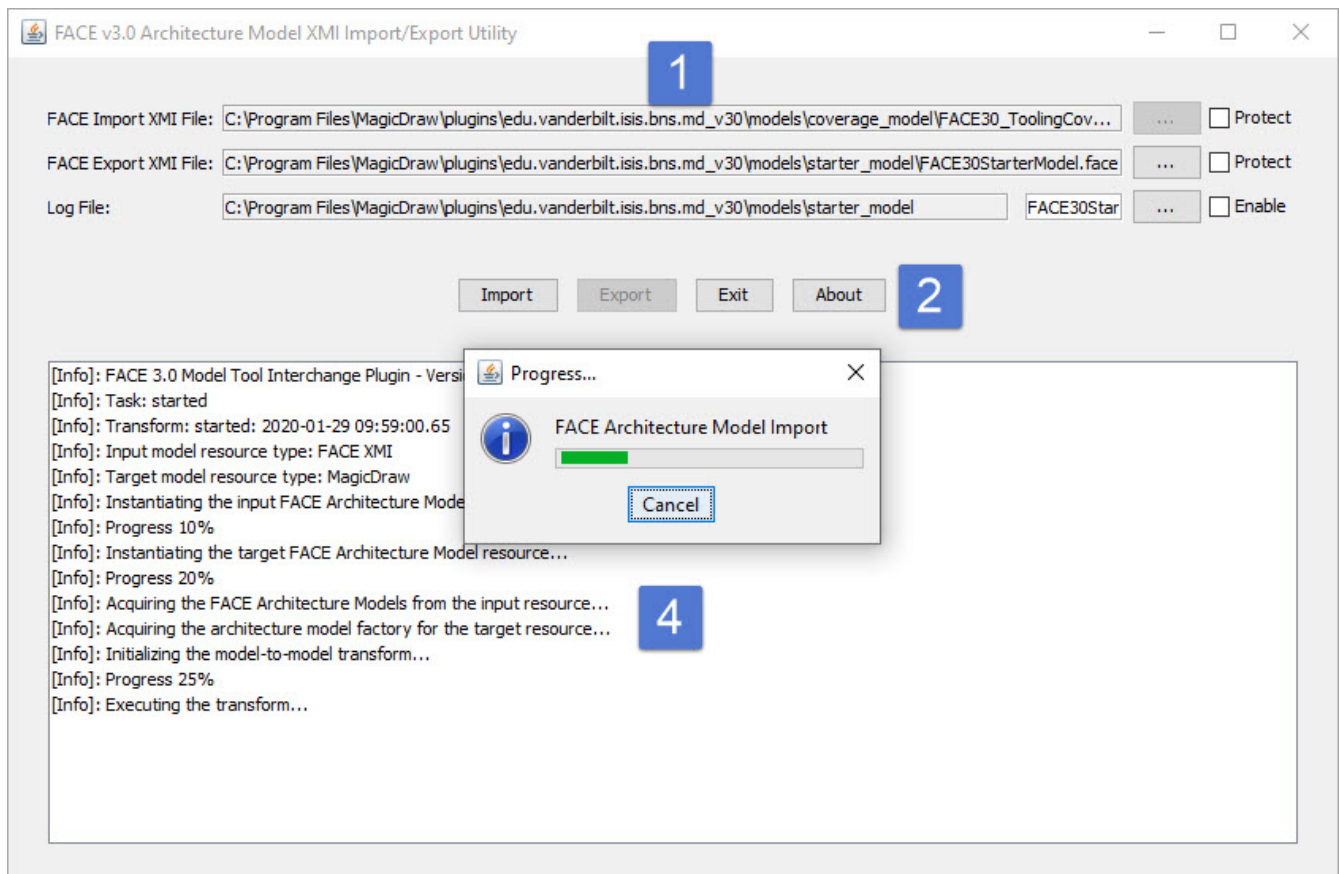


Figure 5. FACE XMI Export in progress

3.2.2. About

The about button brings up a menu of options. These include the license information, revision history, User Guide(the document you are currently reading), and known issues. Additionally there

are links to several useful models and the profile supported by the tool. [console \(3\)](#) shows the complete menu.

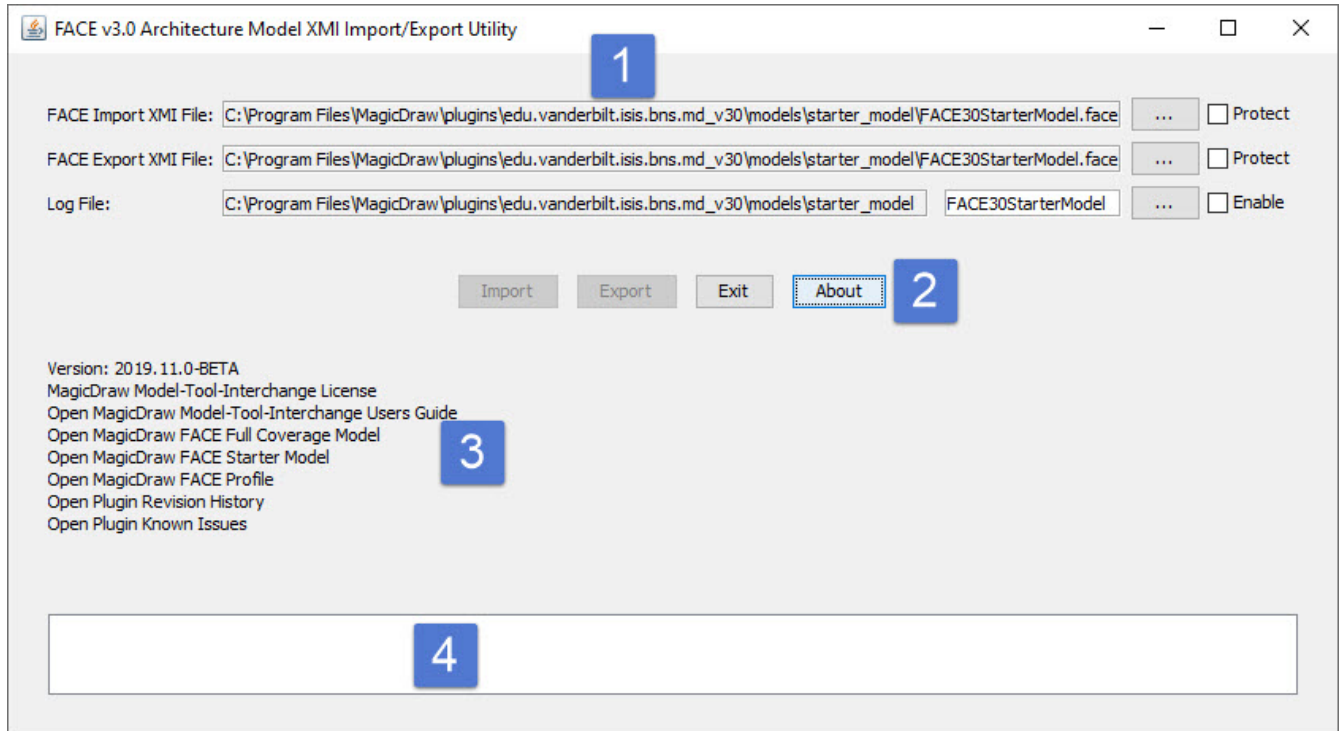


Figure 6. About Menu

Some MTI versions have an extra text box in the About panel as shown in the following figure ([console \(3.5\)](#))

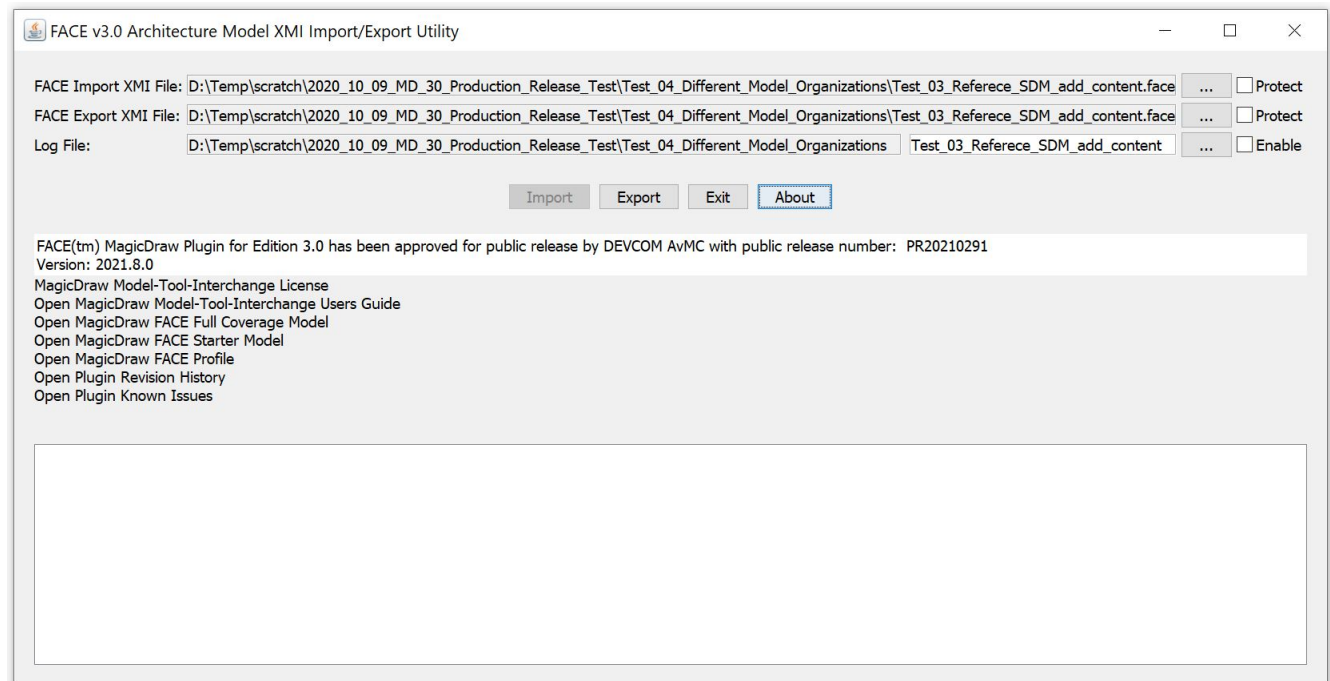


Figure 7. About Menu with Added Text Box

3.3. Advanced Users

For advanced users who find the automation to be cumbersome or that interferes with experiments using FACE in novel ways, it is possible to load the profile with out the additional support functions.

Go to:

- "File" → "Use Project" → "Local Project".

Next select "<install.root\profiles>" from the "Paths to used Projects" then navigate to "FACE_3.*_Unified_Profile_v*.mdzip" as seen in [Advanced User](#). This will load the base profile with no customizations or automation to facilitate your experimentation. You can also use the plugin to load this profile from the about menu.

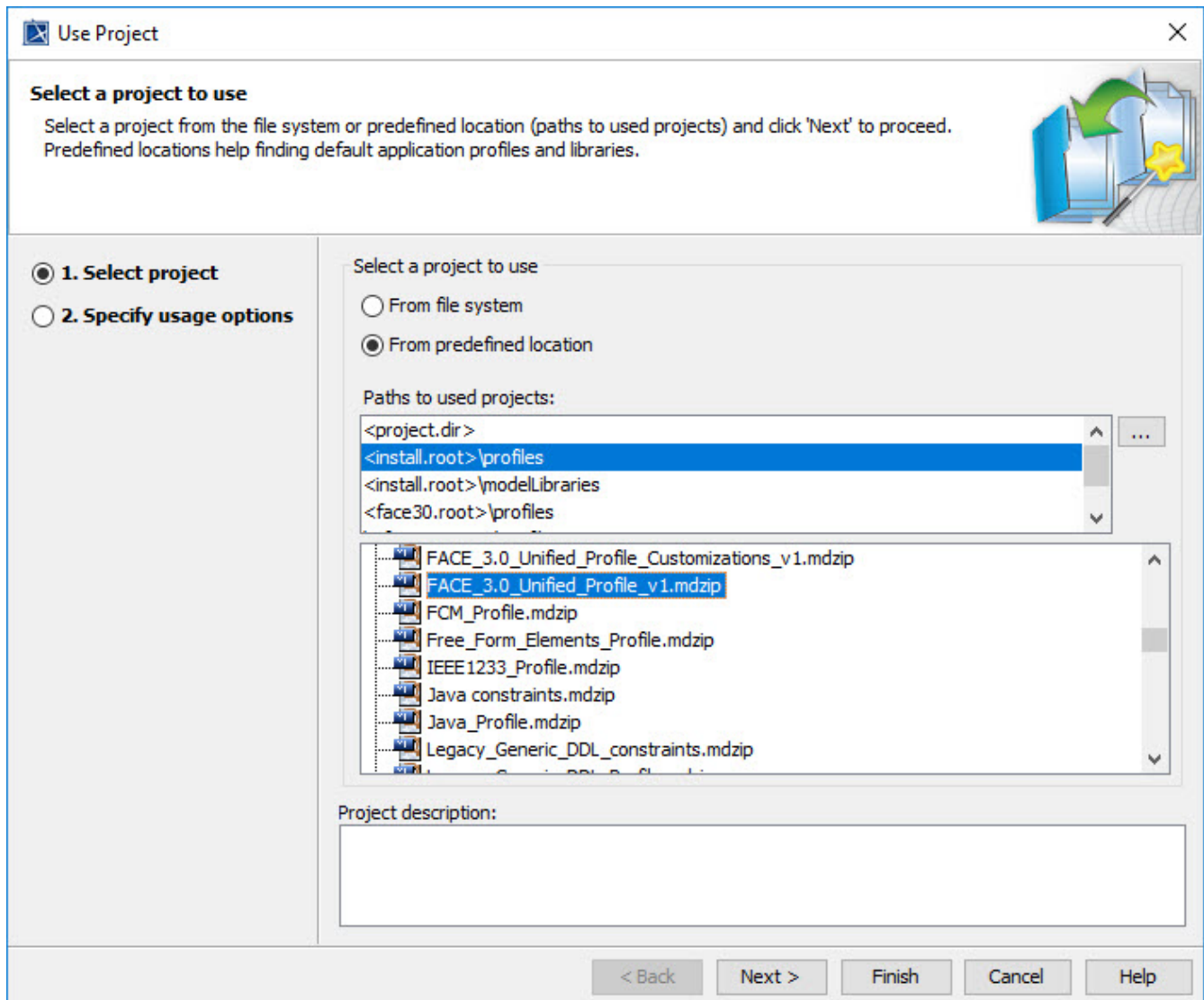


Figure 8. Using Profile without Customizations

The spreadsheet at C:\Program Files\MagicDraw\plugins\edu.vanderbilt.isis.bns.md_v3*\profiles\FACE_3.Unified_Profile_v1.xlsx contains the intended usage of each element in FACE_3.*_Unified_Profile.mdzip to help ensure you are using them in the intended manner.

Note: The customizations do not cover all use cases

4. Models

Two Magic Draw models are included with the plugin: MagicDraw Coverage Test Model.mdzip and FACE30StarterModel.mdzip. These models are included to help the user get started modeling

quickly and to have an in tool reference for how each element in the profile should be represented.

4.1. MagicDraw Coverage Test Model

This model includes examples of how to each element from the profile to construct a FACEArchitectureModel. This model is not valid, and is only intended demonstrate the correct usage of each UML element within Magic Draw.

This model is also intended to be used as a tool to validate installation of the Profile and Model-Tool-Interchange Plugin. You should be able to export and import this model with no errors. You can compare the exported model to the included FACE XMI model (FACE30_ToolingCoverageModel.face) with the plugin package to confirm the export was successful.

4.2. Starter Model

This model is preconfigured with the profiles customizations allowing for users to more quickly begin modeling using the tools provided. When using this model you will need to save a copy of the project before making edits to ensure the template remains intact.

5. Modeling Examples

5.1. External References

A model could consist of all the contents residing under a package stereotyped with FACEArchitectureModel (i.e. FACEArchitectureModel package). For example, FACEArchitectureModel package could contain:

- FACEDataModel 0..*
- UoPModel 0..*
- IntegrationModel 0..*
- TraceabilityModel 0..*

However, this approach is limiting. To provide greater flexibility, SmartPackages are used to reference entities that are not directly subordinate to the FACEArchitectureModel package.

Note - SmartPackages are supported in MTI v2021.10.0 and later.

Notice in the following figure ([SmartPackage Used to Reference External Entities](#)) that MyArchitecture<<FACEArchitectureModel>> contains two SmartPackages identified as SDM_Reference and UoP_Reference. Under the SDM_Reference SmartPackage there is a reference to SDM_3_0_2<<FACEDataModel>>, which points to SDM_3_0_2<<FACEDataModel>> under SDM_30[SDM_30.mdzip]. Notice that the model for this reference is in an external model named SDM_30.mdzip. The example illustrates referencing an external model for a portion of the content of the FACEArchitectureModel.

The second example shown in the figure is the UoP_Reference SmartPackage. For this case, the

model referenced is contained in the MD project (i.e. not an external MD project). Under the UoP_Reference SmartPackage is a reference to UoPModel<<UoPModel>>, which points to UoPModel<<UoPModel>> under the UoPModels package.

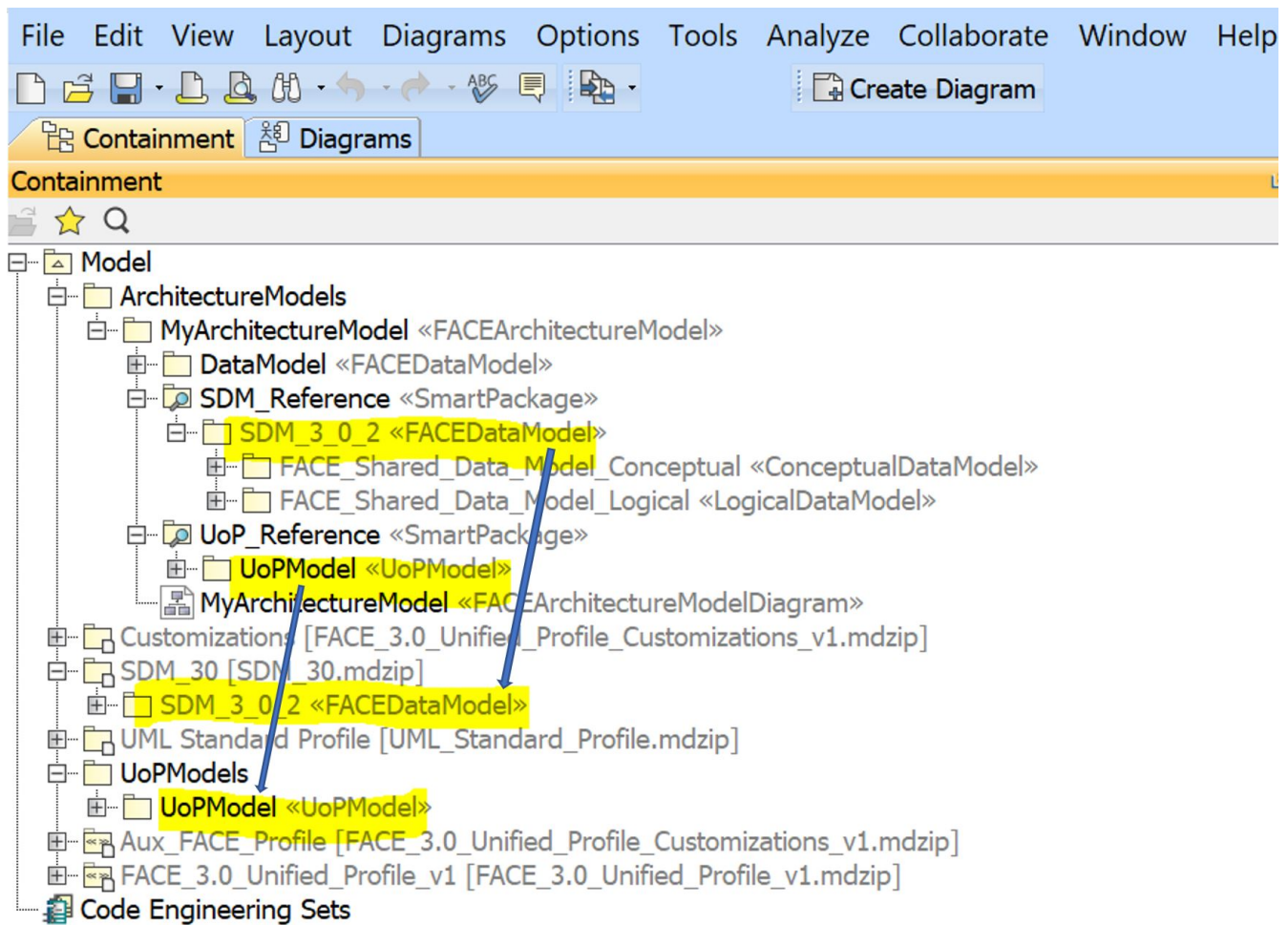


Figure 9. SmartPackage Used to Reference External Entities

Notes:

- Cardinality Rules – A FACEArchitectureModel can contain zero to many SmartPackages. A SmartPackage can contain zero to many references to models of stereotype of FACEDataModel, UoPModel, IntegrationModel, and/or TraceabilityModel.
- FACE Hierarchy Rules - A FACEDataModel cannot contain a FACEDataModel. However, a UoPModel can contain a UoPModel, an IntegrationModel can contain a IntegrationModel, and a TraceabilityModel can contain a TraceabilityModel. For those cases, a SmartPackage may appear at any level in the containment structure. In other words, if a UoPModel contains a UoPModel, a SmartPackage may appear at the top-level UoPModel and/or the subordinate level UoPModel.
- MTI Search of SmartPackages - It is important to understand that only the immediate SmartPackage is searched for FACE references. In other words, if a SmartPackage contains a SmartPackage, then only the highest level SmartPackage would be searched for FACE references.

6. Customizations

6.1. Customizing Diagrams

The section [Setting Up Custom Diagrams](#) describes how to setup the diagrams that define the tool palettes for each diagram type. You may wish to add additional tools to the tool palettes. To do so, within MagicDraw, select Diagrams Customize and select one of the Diagrams and select Edit. Follow the prompts to edit the diagram. See MagicDraw documentation for additional information. The plugin ignores entities that are not stereotyped with a FACE stereotypes; and thus, your non-FACE additions will not be exported.

7. Additional Information

7.1. Compatibility between FACE Editions

The FACE 3.0 MagicDraw plugin can only be used with MagicDraw models and XMI files (i.e. .face files) created for FACE 3.0.

The FACE 3.1 MagicDraw plugin can only be used with MagicDraw models and XMI files (i.e. .face files) created for FACE 3.1.

7.2. Testing History

There are limited resources to test the plugins on multiple operating systems and with multiple versions of MagicDraw. The following table provides information on the level of testing that has been conducted.

7.2.1. FACE 3.0 MagicDraw Model-Tool-Interchange Plugin

Plugin Version	Operating System	MagicDraw Version	Test Scope
2019.9.0-BETA	Windows 10	18.5, 19.0 (Import Only)	Testing with coverage model
2019.10.0-BETA	Windows 10	18.5, 19.0 (Import Only)	Testing with coverage model, BALSA, and other models
2019.11.0-BETA	Windows 10	18.5, 19.0	Testing with coverage model, BALSA, and other models

2020.2.0	Windows 10	18.5, 19.0	Testing with coverage model, BALSA, and other Models
2021.7.0	Windows 10	18.5, 19.0, 2021	Testing with coverage model, BALSA, and other Models. Note - MD v2021 (i.e. Cameo 2021) had anomalies; and thus, Cameo 2021 should not be used. For Cameo 2021, the import/export worked correctly, but logging and display of messages to the UI window did not work correctly.
2021.7.1	Windows 10	18.5, 19.0	Due to only a minor change (notification events call) to the UI, only a subset of the 2021.7.0 tests were conducted.
2021.8.0	Windows 10	18.5, 19.0	Due to only a minor change to the About panel, only a subset of the 2021.7.0 tests were conducted.
2021.10.0	Windows 10	18.5, 19.0	Testing with coverage model, BALSA, and other Models

7.2.2. FACE 3.1 MagicDraw Model-Tool-Interchange Plugin

Plugin Version	Operating System	MagicDraw Version	Test Scope
2020.5.0-BETA	Windows 10	18.5, 19.0	Testing with coverage model, BALSA, and other Models

2020.8.0	Windows 10	18.5, 19.0	Testing with coverage model, Balsa, and other Models
2020.2.0	Windows 10	18.5, 19.0	Testing with coverage model, Balsa, and other Models

7.3. Bug Reports

Send all bug reports and improvement suggestions to robert.l.owens@vanderbilt.edu.

8. Troubleshooting

8.1. Unresolved GUID

Possible Causes The referenced element GUID was not exported because it is defined as a child of an element is not owned by a parent.

8.1.1. Example

A Connection(QueuingConnection, SingleInstanceMessageConnection, ClientServerConnection) element is an end point for a Unit of Portability. Then the Connection(QueuingConnection, SingleInstanceMessageConnection, ClientServerConnection) is used as MessageType to a Platform View.

8.2. Installation of MagicDraw in a Non-Standard (i.e. not Program Files) Location Known Issues

Under the following conditions, the Importer/Exporter Plugin may not appear when right clicking on an item in the MagicDraw containment tree:

1. MagicDraw installed in a non-standard location.
2. Start MagicDraw with the icon setup by the MagicDraw installer. This is just a shortcut to the MagicDraw exe (magicdraw.exe)....

MagicDraw installed in a non-standard location. Start MagicDraw with the icon setup by the MagicDraw installer. This is just a shortcut to the MagicDraw exe (magicdraw.exe).

If this condition occurs, a workaround is to start MagicDraw by double clicking on the exe (magicdraw.exe) located in the bin folder of the installation directory. Another workaround is to delete the shortcut created by the MagicDraw installer, and manually recreate the shortcut.

8.3. Inconsequential Logging Error Messages

The log file may contain errors (i.e. [ERROR]), which are artifacts of configuring logging. These errors will contain the string “PerObject”. When reviewing the log file, these errors should be ignored. They are not relevant to the model being valid/invalid.

8.3.1. Example

```
[ERROR]
edu.vanderbilt.isis.face.v31.architecturemodel.transform.model2model.executor.Model2ModelTransformExecutor.PerObject.2 -
[INFO ] edu.vanderbilt.isis.common.logger.ListAppender - Registering
"edu.vanderbilt.isis.face.v31.architecturemodel.transform.model2model.executor.Model2ModelTransformExecutor$$Lambda$709/1806812515" listener for logger
"edu.vanderbilt.isis.face.v31.architecturemodel.transform.model2model.executor.Model2ModelTransformExecutor.PerObject.2"
[ERROR]
edu.vanderbilt.isis.face.v31.architecturemodel.transform.model2model.executor.Model2ModelTransformExecutor.PerObject.2 -
edu.vanderbilt.isis.face.v31.architecturemodel.transform.model2model.executor.Model2ModelTransformExecutor$$Lambda$709/1806812515@1fd66a5c
```

9. Acronyms

Acronym	Description
FACE	Future Airborne Capability Environment
MTI	Model Tool Interchange
XMI	Extensible Markup Language Metadata Interchange
XML	Extensible Markup Language

10. Version History

Revision	Date	Authors(s)	Description
2019.9.0	10/25/2019	FE,RD,RO,JH	Initial Publication
2019.10.0	10/25/2019	JH	Added instructions for installing the plugin without Admin privileges

2019.11.0	11/22/2019	JH	Added Troubleshooting section in Appendix A
2020.2.0	02/21/2020	JH,RO	<ul style="list-style-type: none"> • Corrected an error in the Install Plugin section. • "copy the FACE 3.0 MagicDraw Model-Tool-Interchange Plugin into this directory" was ambiguous. • Updated to name the directory to copy. • Updated Images to Reflect Current Tool. Added instructions for installing with Cameo. • Added "Standard Workflow" section
2020.5.0	06/03/2020	JH	Added 3.1 support in document
2020.8.0	08/12/2020	RO	Updated test scope to indicate the testing that was done for version 2020.8.0
No formal revision	10/08/2020	RO	Updated the Vanderbilt copyright notice with the latest wording. Corrected several typographical and section reference errors.

2021.7.0	7/14/2021	RO	Updated Figure FACE Import/Export Architecture Utility to show the version (i.e. 3.0) number in the dropdown menu.
2021.8.0	8/25/2021	RO	Added an extra About Figure, About Menu with Added Text Box .
2021.10.0	10/6/2021	RO	Added Sections External References and Customizing Diagrams .
2021.10.0_A	2/7/2022	RO	Added a WARNING in Section FACE v3.* MagicDraw Model-Tool-Interchange Plugin Usage to select an element in the containment tree. Added a WARNING in Section Setup a New Project to always start with the starter model.