MDG Integration for TcSE
User Guide

Welcome to the MDG Integration Version 2.0 for Siemens PLM Teamcenter Systems Engineering (TcSE). The MDG Integration for TcSE takes the high-level modeling power of Enterprise Architect and the Unified Modeling Language and directly integrates it with TcSE.

SPARX SYSTEMS

MDG Integration for TcSE User Guide

Introduction

by Simon Zhang

MDG Integration for TcSE takes the high-level modeling power of Enterprise Architect and the Unified Modeling Language, and directly integrates it with Teamcenter Systems Engineering.

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Printed: October 2009

Publisher

Sparx Systems

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Special thanks to:

All the people who have contributed suggestions, examples, bug reports and assistance in the development of MDG Integration for Teamcenter Systems Engineering. The task of developing and maintaining this tool has been greatly enhanced by their contribution.

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Foreword

MDG Integration for TcSE takes the high-level modeling power of Enterprise Architect and the Unified Modeling Language, and directly integrates it with TcSE.

1 Welcome

Welcome to the MDG Integration for Siemens PLM Teamcenter Systems Engineering (TcSE) - Enterprise Architect MDG Add-In, Version 2.0.

The Add-in extends the capability of Enterprise Architect to enable you to work with models simultaneously in both Enterprise Architect and TcSE. The MDG Integration for TcSE Add-In works with the **Corporate, Business & Software Engineering, Systems Engineering,** and **Ultimate** editions of Enterprise Architect.

Getting Started

For instructions on how to register and configure the MDG Integration for TcSE, see Getting Started 10.

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Technical support for the MDG Integration for TcSE is available to registered users of Enterprise Architect. Responses to support queries are sent by email. Sparx Systems endeavors to provide a rapid response to all product-related questions or concerns.

Registered users can lodge a support request, by visiting:
http://www.sparxsystems.com/registered/reg_support.html.

Trial users can contact Sparx Systems with questions regarding their evaluation at:
support@sparxsystems.com.

An online user forum is also available for your questions and perusal, at
http://www.sparxsystems.com/cgi-bin/yabb/YaBB.cgi.

1.5 System Requirements

The following software must be installed to use the MDG Integration for TcSE, Version 2.0.

Operating System

Any of the following:

- Windows NT® (SP5 or later)
- Windows XP Professional
- Windows XP Home
- Windows XP Media Edition
- Windows XP Tablet Edition
- Windows 2000 Professional (SP3 or later)
- Windows Vista

Enterprise Architect

Any of the following:

- Enterprise Architect Professional Version 7.5 (or later)
- Enterprise Architect Corporate Version 7.5 (or later)
- Enterprise Architect Business Engineering Version 7.5 (or later)
- Enterprise Architect Systems Engineering Version 7.5 (or later)
- Enterprise Architect Ultimate Version 7.5 (or later)

Other

All of the following:

- Microsoft .NET Framework Version 2.0
- Siemens PLM Teamcenter for Systems Engineering Release 2007.3.2 (or later)
- Siemens PLM Teamcenter for Systems Engineering Office-Live Interface

2 Getting Started

This topic describes how to register 11 the MDG Integration for TcSE Add-In, and how to configure the TcSE server 13 for use with this integration:

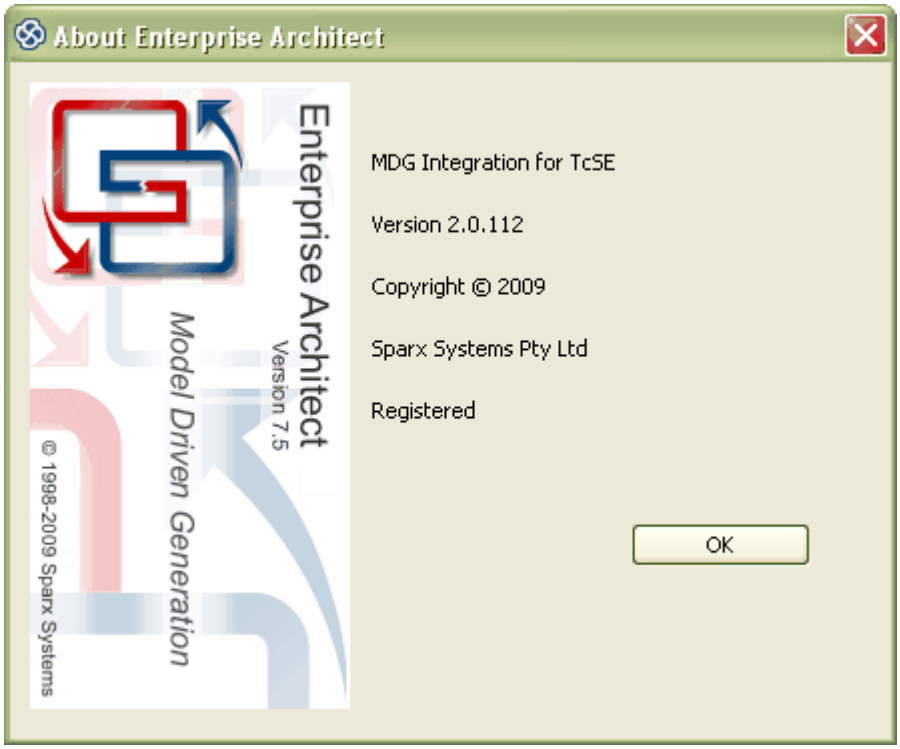
- Register the MDG Integration for TcSE 11
- Configure the TcSE Server 13
- Enable TcSE Project Integration 15

To begin the Enterprise Architect integration in a TcSE Project an Enterprise Architect model must be 'connected' to an *Enterprise Architect project folder*. For further information see the Connect an Enterprise Architect Model 19 topic.

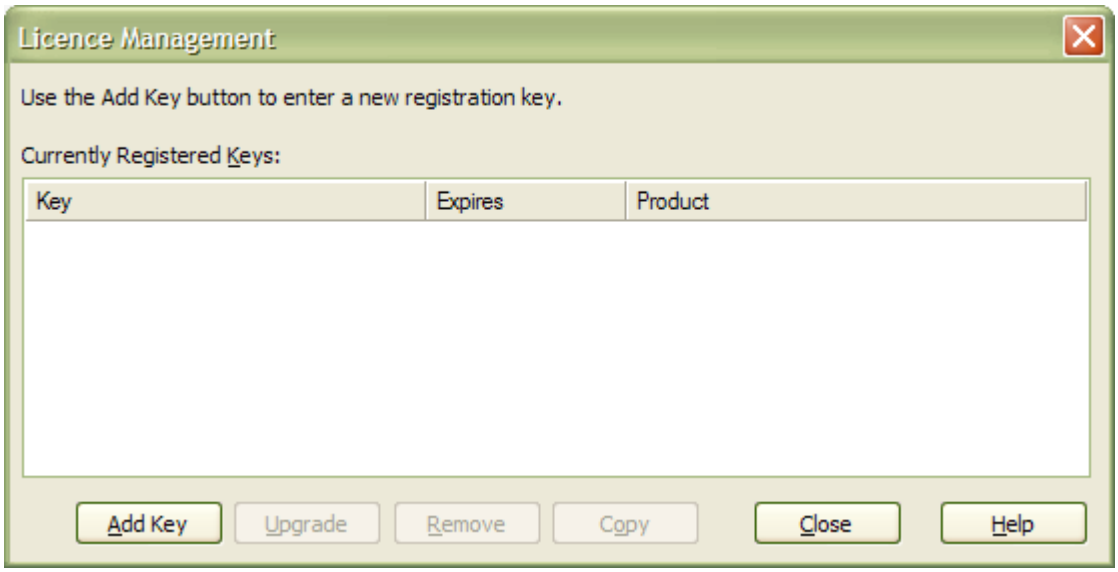
2.1 Register the MDG Integration for TcSE

To register and activate the MDG Integration for TcSE Add-In, follow the steps below:

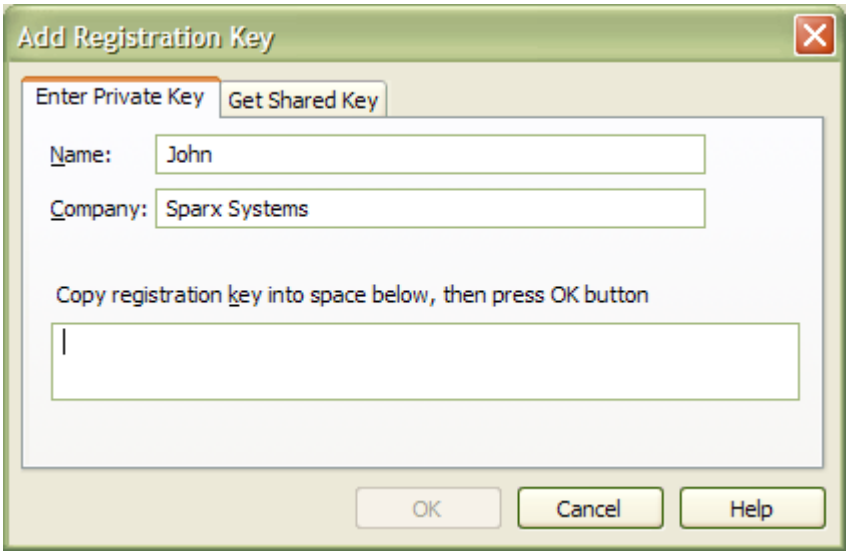
1. Purchase one or more licenses. Once you have paid for a licensed version of MDG Integration for TcSE, you receive (via email or other suitable means)
   - a license key or keys
   - the address of the web site from which to download the full version.
2. Save the license key and download the latest full install package from the address supplied.
3. Run the setup program to install the full version.
4. Run Enterprise Architect. If this is the first time you have installed MDG Integration for TcSE, an MDG Integration for TcSE - About dialog displays, prompting you to register MDG Integration or to continue the trial.



5. To enter the new key click on the **Enter Key** button. The License Management dialog displays.



6. Click on the **Add Key** button. The Add Registration Key dialog displays.

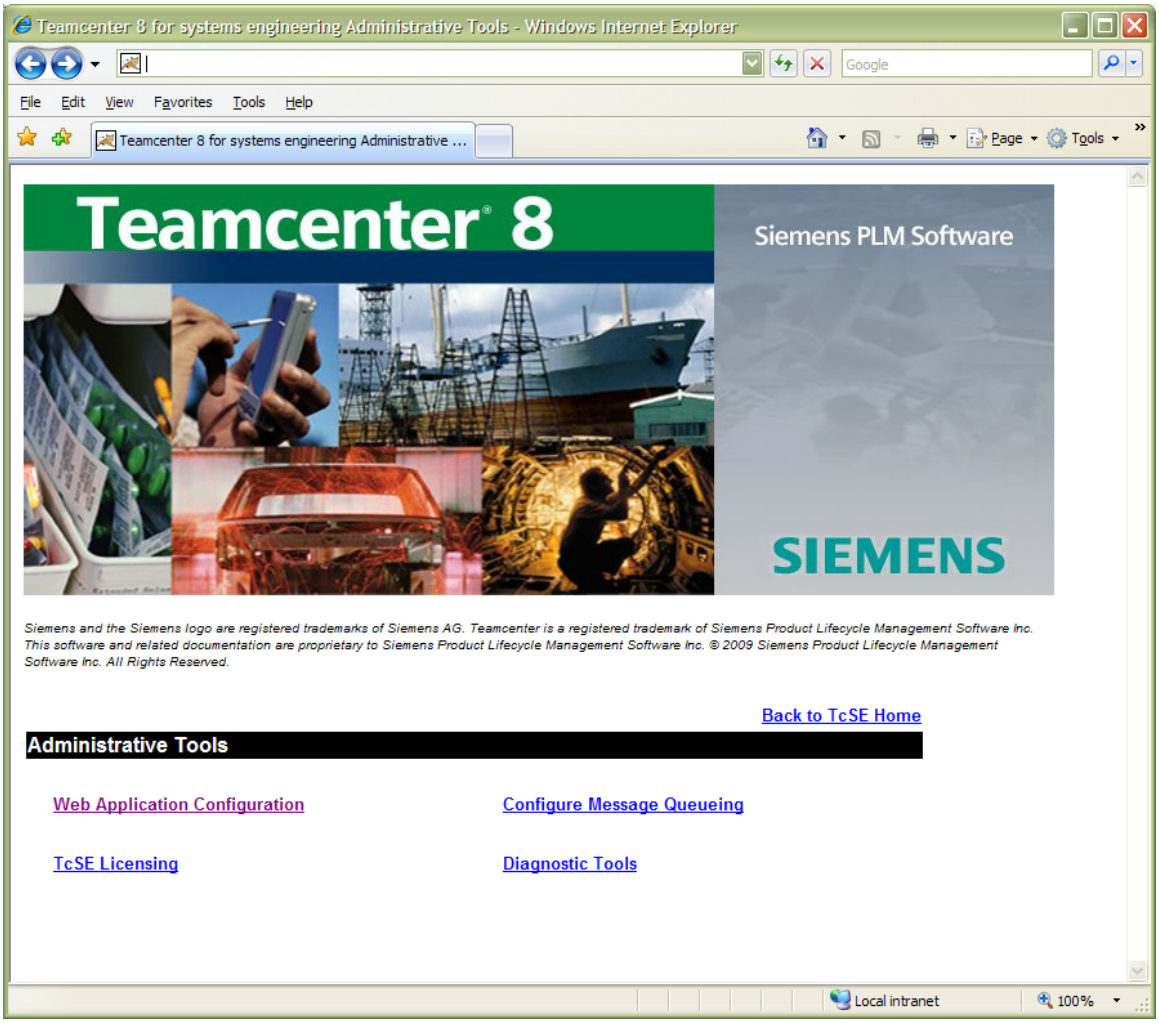


7. Copy the license key from the email and paste it into the **Copy registration key...** field, to avoid typing mistakes.
8. Click on the **OK** button. The full version of MDG Integration for TcSE is now available for use with your version of Enterprise Architect.

2.2 Configure the TcSE Server

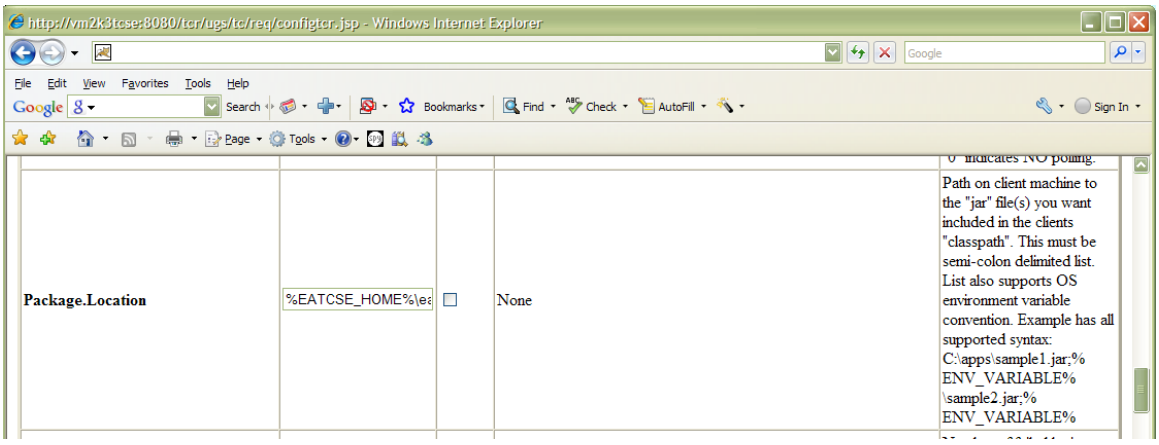
After registering MDG Integration for TcSE, you must configure the *Package.Location* web application parameter for your TcSE installation. To do this, follow the steps below:

1. Connect to the Web Application Configuration page in the TcSE server Administrative Tools website.:



2. Add the following to the *Package.Location* configuration parameter:

```
%EATCSE_HOME%\eatcse.jar;%EATCSE_HOME%\swt.jar
```



The `%EATCSE_HOME%` environment variable is defined when MDG Integration for TcSE is installed. It

specifies the path to which the product is installed on the computer.

3. Click on the **Update** button to confirm and save the changes.

2.3 Enable TcSE Project Integration

The following topics describe how to configure TcSE Projects for MDG integration with Enterprise Architect:

See Also

- Use the MDG Integration in TcSE 18
- Model Management 21

2.3.1 Set User Privileges

For the TcSE project integration to function correctly the following user privileges must be assigned to the respective TcSE users:

- **TcSE Project Configuration**:
  - Project Administrator
  - Architect
  - Script Author.
- **TcSE & EA Project Integration**:
  - Architect.

For further information on assigning user privileges in TcSE projects, see the *Teamcenter Systems Engineering* documentation.

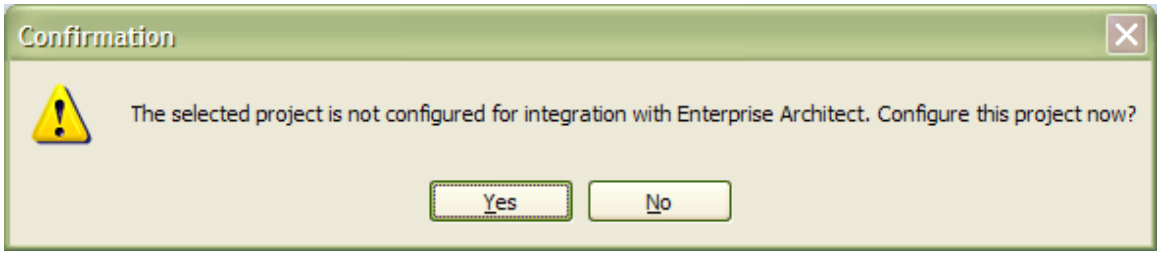
2.3.2 Configure a TcSE Project

Configuring a TcSE project for integration with Enterprise Architect enables the TcSE project to connect to Enterprise Architect projects and to exchange model data via import and export. It also enables the model data to be synchronized between Enterprise Architect and TcSE using the **Update** command.

The configuration process defines the language Schema and mapping rules for inclusion into the TcSE project. The schema defines the TcSE subtypes, property definitions and activators that contain the Enterprise Architect modeling data. The mapping rules, used to create the TcSE schema, are stored as an activator in the TcSE project. The mapping is loaded automatically by the integration environment to automatically resolve the type and property definitions between TcSE and Enterprise Architect.

Configure a TcSE Project for Integration with Enterprise Architect

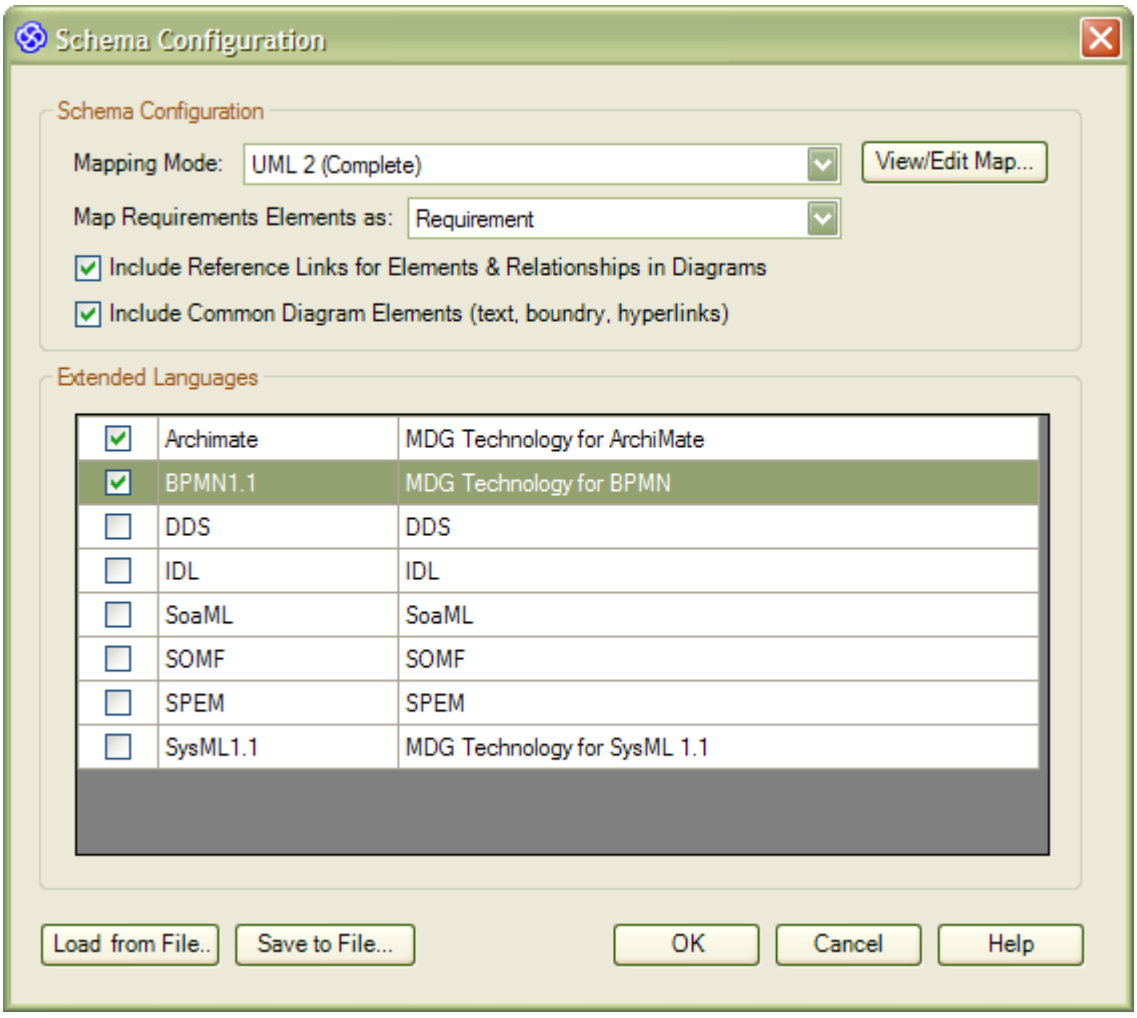
1. To configure a TcSE Project for Integration with Enterprise Architect, select the **Enterprise Architect | Configure** menu option in the TcSE Administration view. The Confirmation dialog displays:



Note:

After the TcSE Project has been configured for Integration with Enterprise Architect, this menu option will allow you to Configure Options 30.

2. Click on the **Yes** button to configure the current project for integration with Enterprise Architect. The Schema Configuration dialog displays.



Option	Description
Mapping Mode	Enables you to select one of the pre-configured mapping modes for the reference UML. Select the mode that best suits the integration requirements.
Map Requirements Elements as	Specifies the TcSE type that will be used to map Enterprise Architect's Requirements elements into. • ***Requirement***: to map into a TcSE *Requirement* subtype • ***Building Block***: to map into a TcSE *Building Block* subtype • ***Note***: to map into a TcSE *Note* subtype • ***none***: to define no mapping rule into TcSE
Include Reference Links for Elements & Relationships in Diagrams	Select this checkbox to include mapping rules for referencing occurrences of *Elements* and *Relationships* in *Diagrams*. By default this creates a Generic Link subtype in TcSE between the diagram and the selected element or relationship.
Include Common Diagram Elements (text, boundary, hyperlinks)	Select this checkbox to include mapping rules for common drawing elements that may exist in Enterprise Architect model diagrams. Such elements include: *Text* shapes, *Boundary* objects, *Hyperlinks*, *Legends*, and *Note* objects.

- Click on the **View/Edit Map...** button to open the Schema Map Editor 35 dialog for viewing/editing the schema's mapping definitions.
- Select each of the checkboxes in the **Extended Languages** section to include any mapping definitions for domain-specific modeling languages available in Enterprise Architect's MDG Technologies. Such extended languages include common modeling languages like:
  Business Process Modeling Notation (BPMN)
  MindMapping
  SOA Modeling Language (SoaML)
  System's Modeling Language (SysML)
- Click on the **Load from File...** button to load a Schema's mapping XML file.
- Click on the **Save to File...** button to save the current Schema's mapping configuration to a XML file.

3. Select the Mapping Mode, any extended languages and other options that are most appropriate for your integration requirements. Click on **OK** button to apply the configuration to the selected TcSE project.

See Also

- Project Schema Configuration 33
- Schema Map Editor 35
- Configure Options 30

3 Using the MDG Integration in TcSE

In Teamcenter Systems Engineering the MDG Integration displays the following **Enterprise Architect** menu, which is accessible from either the **Tools** menu or the right-click context menu whenever a valid folder is selected within the TcSE project:

Option	Description
Open in EA	Opens the selected item in the corresponding Enterprise Architect model using Enterprise Architect.
Model Management	Opens the Model Management 21 submenu.
Help	Open this Help subsystem.
About	Displays product information for MDG Integration for TcSE.

3.1 Connect An Enterprise Architect Model

Connecting an Enterprise Architect Model to a folder in TcSE establishes the link between the folder and the Enterprise Architect model. The folder stores the relevant connection information to the model and contains within it any selected model data from Enterprise Architect.

Connect a TcSE Folder to Enterprise Architect

To connect an Enterprise Architect model to a TcSE folder, follow the steps below:

1. At the TcSE Project root, create an Enterprise Architect project folder using the TcSE **Add Subtype** command. This specialized folder maintains the connection information for the Enterprise Architect project, and stores within it the model data selected for integration.

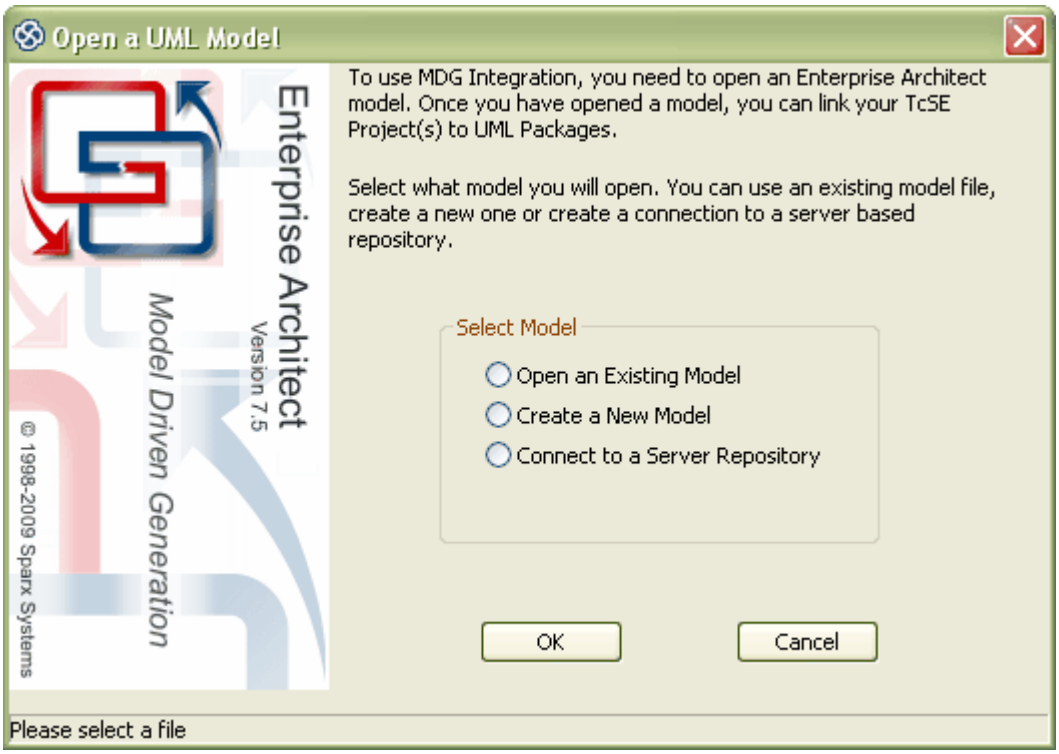
Note:

For the model connection to operate the Enterprise Architect project folder must not be created nested under a previously created Enterprise Architect project folder.

2. Click on the Enterprise Architect project and select the **Enterprise Architect | Model Management | Connect EA Model** menu command. The Open a UML Model dialog displays.

Note:

If the selected Enterprise Architect project folder is already connected to an existing Enterprise Architect project, a warning message displays confirming that the system is continuing with the command.



Option	Description
Open an Existing Model	Enables you to select an existing model to link to your project.
Create a New Model	Creates a new, empty model and links it to your project.
Connect to Server Repository	Enables you to connect to a model on a database repository.

Once a model is connected to an Enterprise Architect project folder, you can begin importing 22 model

packages from Enterprise Architect, or begin populating your model packages, using the elements provided by the MDG Integration. You can then export 23 your model data to the Enterprise Architect project.

See Also

- Import from Enterprise Architect 22
- Export to Enterprise Architect 23
- Update Package 24

3.2 Model Management

The **Enterprise Architect | Model Management** menu contains the **Model Management** submenu.

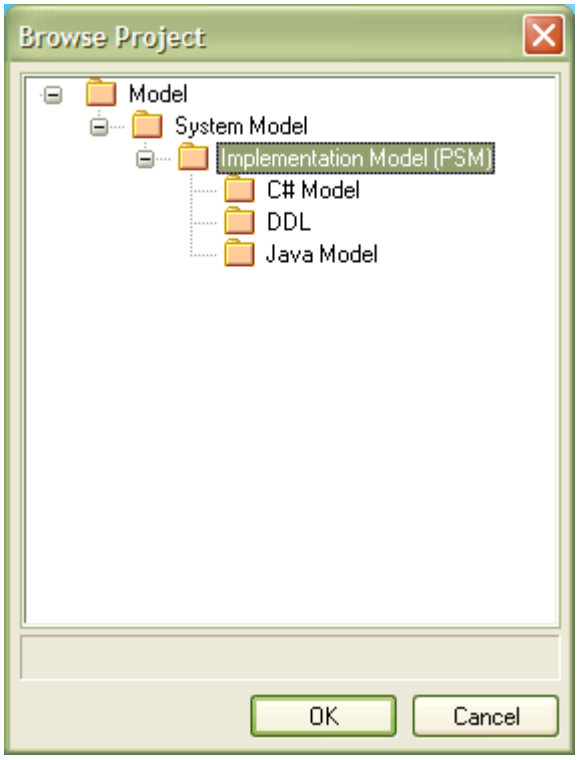
Option	Description
Connect EA Model	Connects the selected Enterprise Architect project folder to a new or existing Enterprise Architect model. Refer to the Connect an Enterprise Architect Model 19 topic for more information.
Import from EA	Imports a model from the connected Enterprise Architect model to the selected Enterprise Architect project folder. Refer to the Import from Enterprise Architect 22 topic for more information.
Export to EA	Exports the selected folder to the connected Enterprise Architect model. Refer to the Export to Enterprise Architect 23 topic for more information.
Update Package	Updates the selected package in TcSE with the corresponding model package in the connected Enterprise Architect model. Refer to the Update Package 24 topic for more information.

See Also

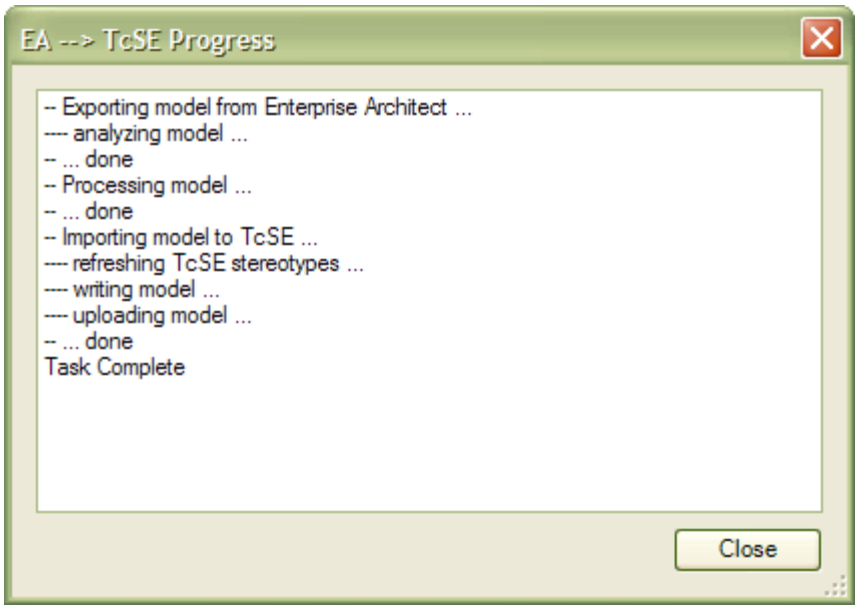
- Use the MDG Integration in TcSE 18
- Enable TcSE Project Integration 15

3.2.1 Import from Enterprise Architect

To import a package from Enterprise Architect into the selected TcSE Folder, select the **Enterprise Architect | Model Management | Import from EA** menu option. The Browse Project dialog displays.



Select the required Enterprise Architect package, and click on the **OK** button to import the package into TcSE. The EA-->TcSE Progress dialog displays the progress messages as the process completes.

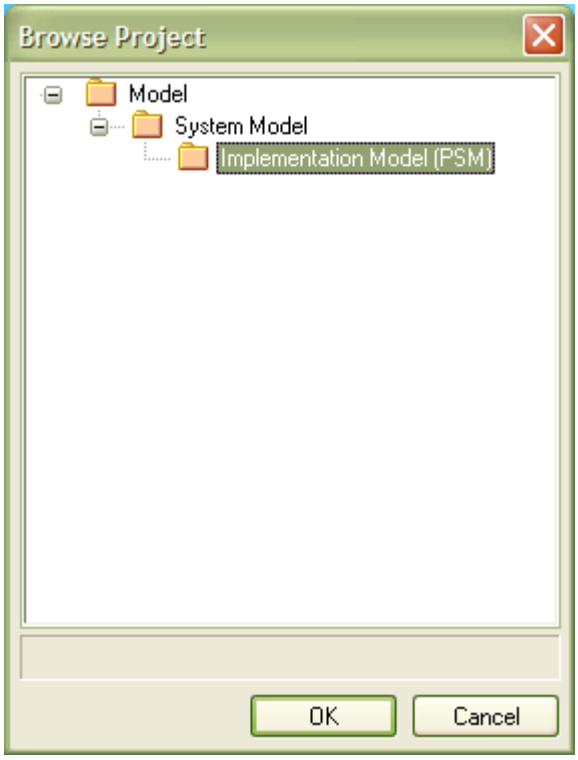


See Also

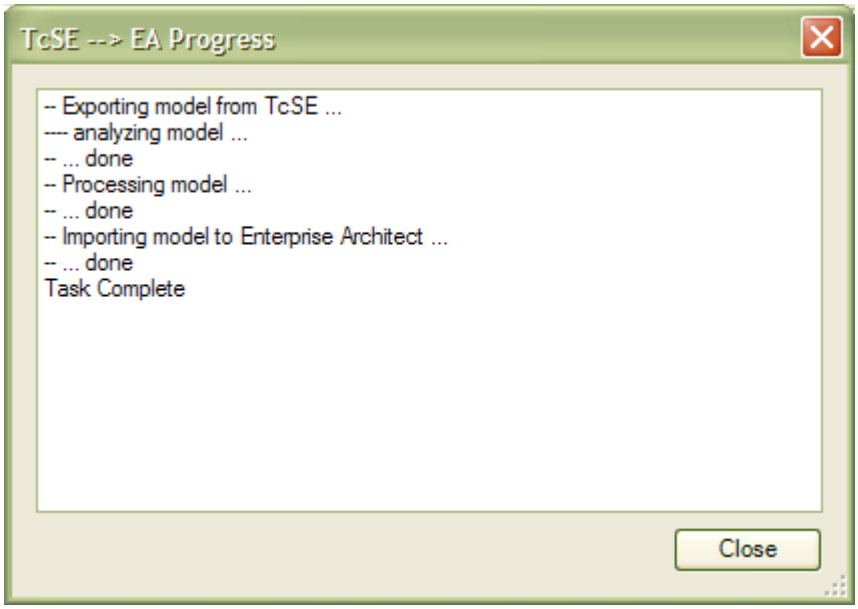
- Export to Enterprise Architect 23
- Update Package 24

3.2.2 Export to Enterprise Architect

To export the selected package from TcSE into the Enterprise Architect model, select the **Enterprise Architect | Model Management | Export to EA** menu option. The Browse Project dialog displays.



Select the required Enterprise Architect package, and click on the **OK** button to export the package from TcSE into Enterprise Architect. The TcSE-->EA Progress dialog displays the progress messages as the process completes.

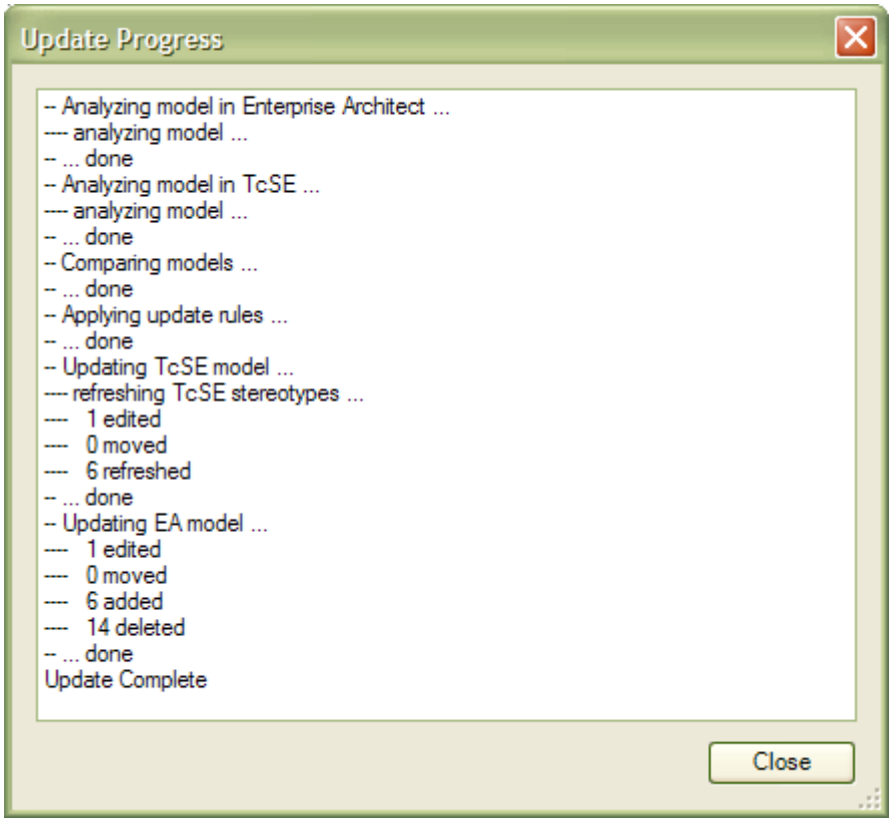


See Also

- Import from Enterprise Architect 22
- Update Package 24

3.2.3 Update Package

To update the selected package in TcSE from the package in the Enterprise Architect model, select the **Enterprise Architect | Model Management | Update Package** menu option. The Update Progress dialog displays progress messages as the process completes.



Click on the **Close** button once the process has completed.

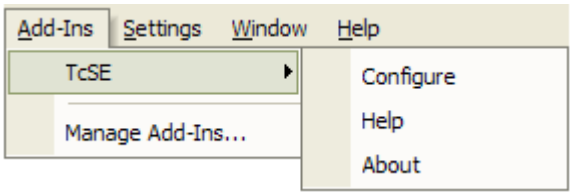
See Also

- Import from Enterprise Architect 22
- Export to Enterprise Architect 23
- Model Update 32

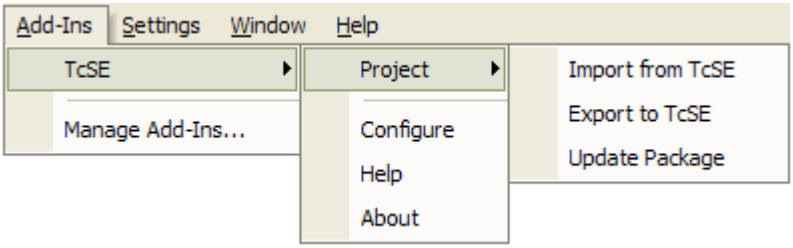
4 Using the MDG Integration in Enterprise Architect

In Enterprise Architect you display the MDG Integration for TcSE menu by selecting the **Add-Ins | TcSE** menu.

When Enterprise Architect is run stand-alone, the following menu displays:



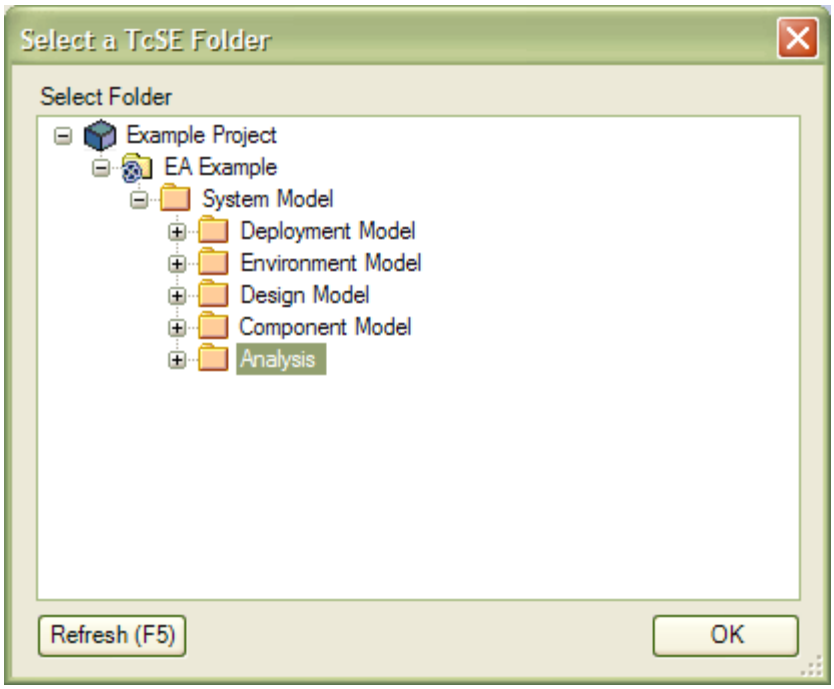
When Enterprise Architect is run from within TcSE, the following menu displays:



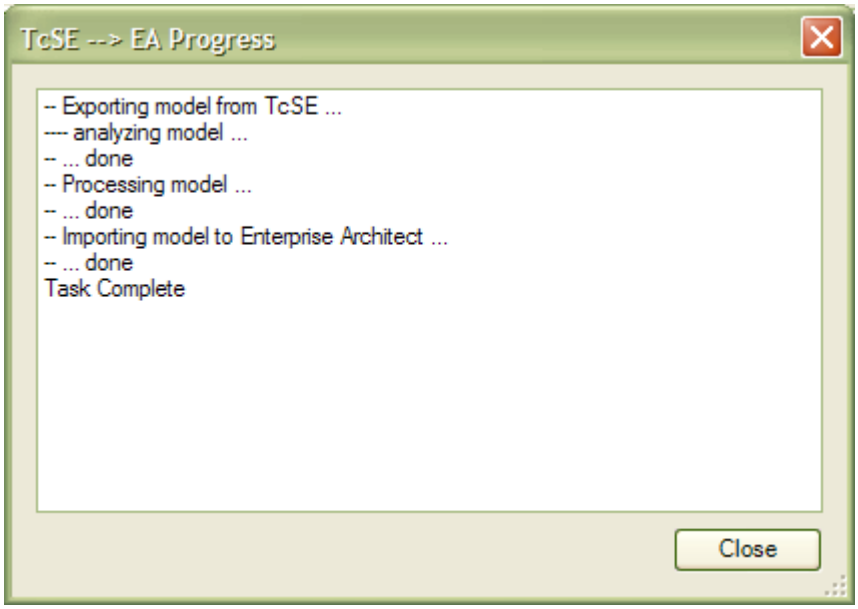
Option	Description
Import from TcSE	Imports a folder from the TcSE project to the selected Enterprise Architect package. See the Import from TcSE 26 topic for more information.
Export to TcSE	Exports the selected Enterprise Architect package to a TcSE folder. See the Export to TcSE 27 topic for more information.
Update Package	Updates the selected Enterprise Architect package with the corresponding folder in TcSE. See the Update Package 28 topic for more information.
Configure	Configures options relevant to the MDG Integration. See the Configure Options 30 topic for more information.
Help	Opens this Help subsystem.
About	Displays product information for MDG Integration for TcSE.

4.1 Import from TcSE

To import a package from TcSE into the selected package in Enterprise Architect, select the **Add-Ins | TcSE | Project | Import from TcSE** menu option. The Select a TcSE Folder dialog displays.



Select the required folder in TcSE and click on the **OK** button to import the folder into the selected Enterprise Architect package. The TcSE-->EA Progress dialog displays the progress messages as the process completes.

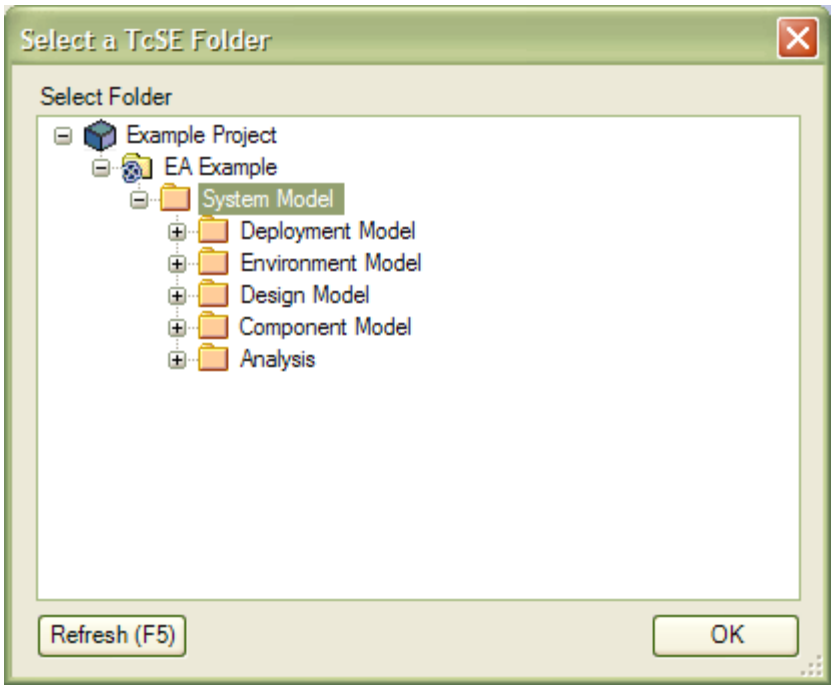


See Also

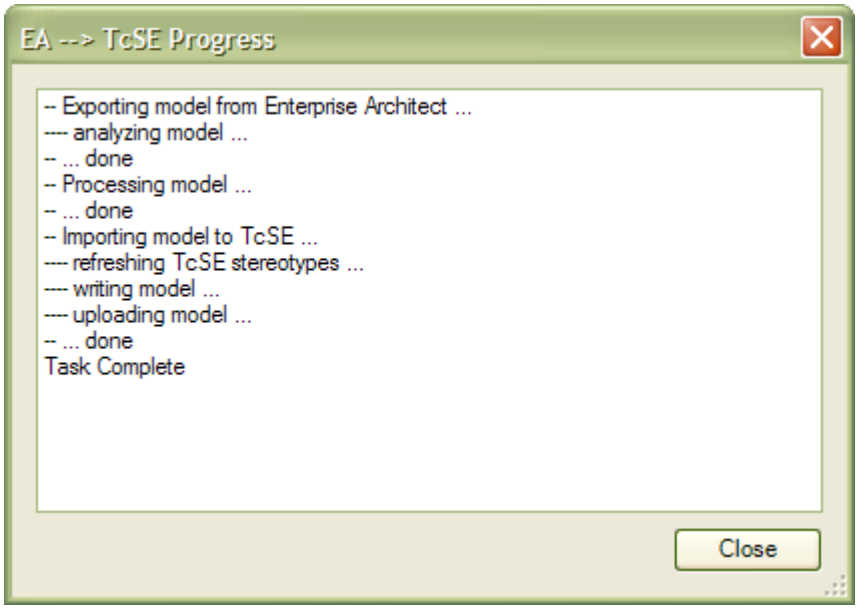
- Export to TcSE 27
- Update Package 28

4.2 Export to TcSE

To export the selected Enterprise Architect package into TcSE, select the **Add-Ins | TcSE | Project | Export to TcSE** menu option. The Select a TcSE Folder dialog displays:



Select the required TcSE folder to export the selected Enterprise Architect package into, and click on the **OK** button to export the package into TcSE. The EA-->TcSE Progress dialog displays the progress messages as the process completes.

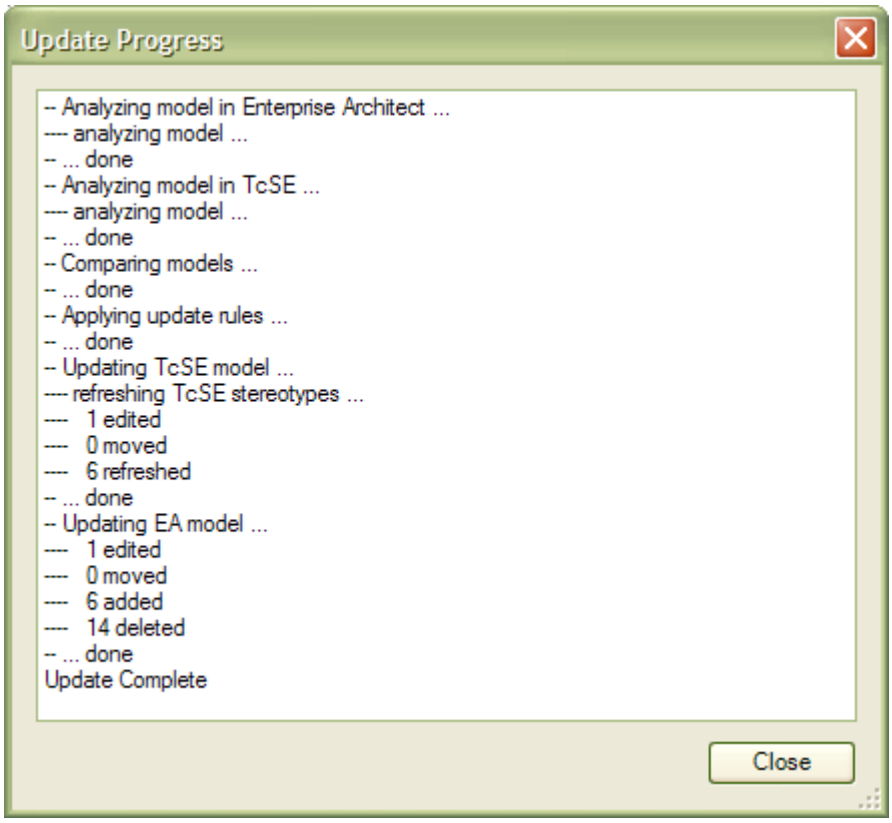


See Also

- Import from TcSE 26
- Update Package 28

4.3 Update Package

To update the selected Enterprise Architect package from the corresponding package in TcSE , select the **Add-Ins | TcSE | Project | Update Package** menu option. The Update Progress dialog displays progress messages as the process completes.



Click on the **Close** button once the process has completed.

See Also

- Import from TcSE 26
- Export to TcSE 27
- Model Update 32

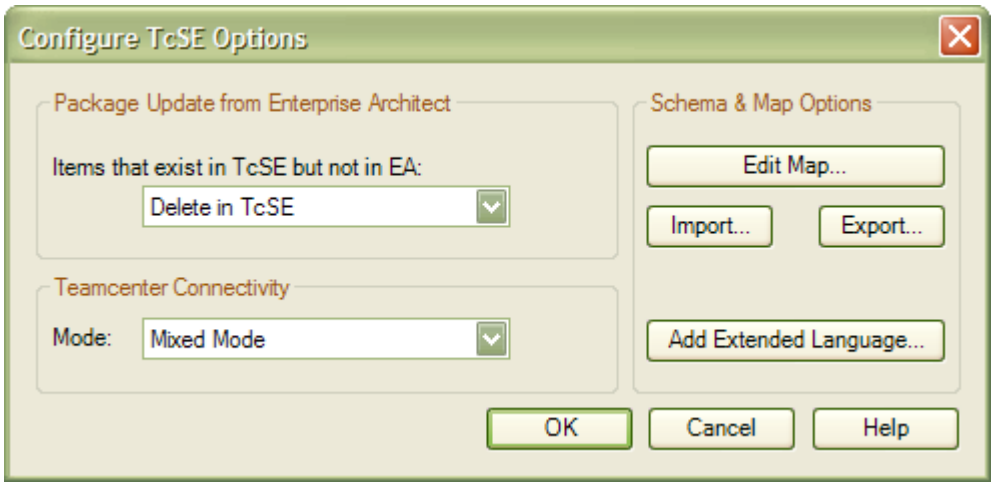
5 Advanced Topics

This topic describes important advanced information on the MDG Integration for TcSE and how it behaves in the following situations:

5.1 Configure Options

The Configure Options command allows you to configure how the MDG Integration for TcSE behaves in specific circumstances. It also enables you to modify the Schema and Map of a TcSE project that is configured for use in the integration environment.

To configure MDG Integration for TcSE, you can either select the **Enterprise Architect | Configure** menu option in the TcSE Administration view, or select the **Add-Ins | TcSE | Configure** menu option on Enterprise Architect. The Configure TcSE Options dialog displays the following options.



Options for Package Update from Enterprise Architect

Option	Description
Mark as deleted	Package updates from Enterprise Architect mark removed items as '*deleted*' in TcSE.
Delete in TcSE	Package updates from Enterprise Architect permanently remove deleted items in TcSE.

Options for Teamcenter Connectivity

Option	Description
Mixed Mode	Establishes a connection to TcSE using both the Server and Client connectivity modes for optimum integration performance.
Client Mode	Establishes a connection to TcSE through the Client interface.
Server Mode	Establishes a connection to TcSE directly to the Server.

Schema & Map Options

Button	Description
Edit Map...	Opens the Schema Map Editor 35 to view/edit the mapping rules defined for the selected TcSE project.
Import...	Imports the schema mapping rules from a XML file.
Export...	Exports the current schema mapping rules to a XML file.
Add Extended Language...	Adds additional extended languages to the TcSE schema and mapping rules.

Note:

For best performance set *Teamcenter Connectivity* to **Mixed Mode**.

See Also

- Configure a TcSE Project 15
- Model Update 32
- Schema Map Editor 35

5.2 Model Update

The Model Update process automates the task of synchronizing the model data in a TcSE project folder with the connected Enterprise Architect model.

The action the update process takes on a model item depends on the condition that model item is in, and where the command itself is invoked: whether via the TcSE 24 or via the Enterprise Architect 28 menus.

Model Item Condition	From Enterprise Architect	From TcSE
Unchanged in both models	No action.	No action.
Changed/Edited	No action in Enterprise Architect. Item edited in TcSE.	No action in TcSE. Item edited in Enterprise Architect.
Moved	No action in Enterprise Architect. Item moved in TcSE.	No action in TcSE. Item moved in Enterprise Architect.
Exists in 'from' model, but not in 'to' model	No action in Enterprise Architect. Item added in TcSE.	Item refreshed in TcSE. Item added in Enterprise Architect.
Exists in 'to' model, but not in 'from' model	No action in Enterprise Architect. Item deleted (or marked) in TcSE.	No action in TcSE. Item deleted in Enterprise Architect.

See Also

- Update Package (TcSE) 24
- Update Package (Enterprise Architect) 28

5.3 Project Schema Configuration

The default UML types are mapped to the following TcSE object types:

UML Type	TcSE Base Type	TcSE Parent Type Name
Element	Building Block	UML Building Block
Feature	Port	UML Port
Relationship	Connection	UML Connection
Diagram	Building Block	UML Diagram

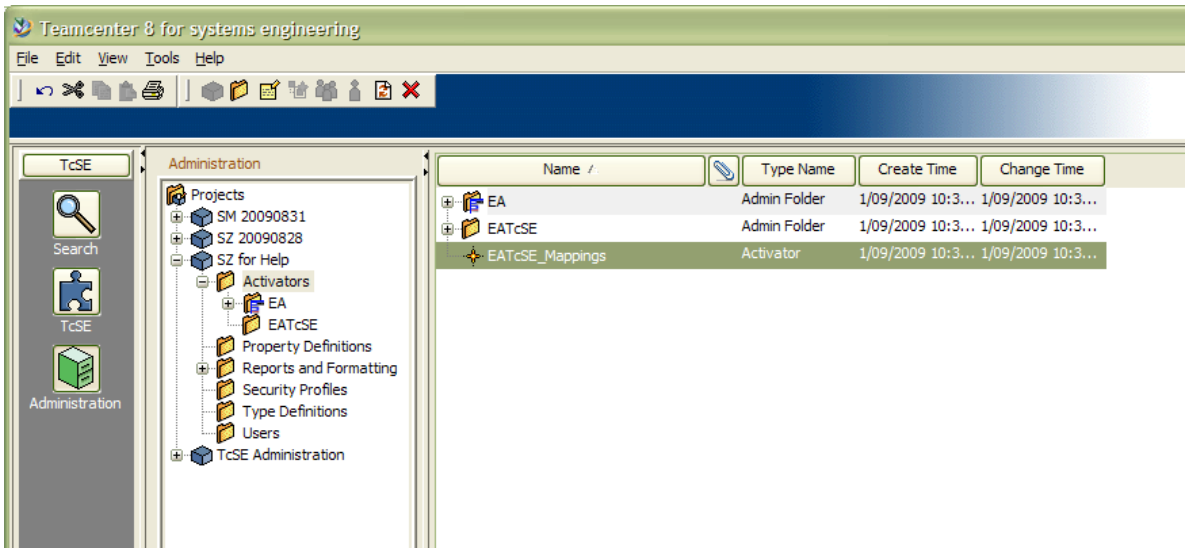
When a TcSE project is configured for integration with Enterprise Architect, it modifies the project's schema in the following ways:

1. It creates an activator, called *EATcSE_Mappings*, which defines the rules that the MDG Integration uses to map model artifacts between Enterprise Architect and TcSE. It relates *Elements*, *Relationships*, *Diagrams* and *Properties* in Enterprise Architect models to their corresponding counterparts in TcSE.

2. It creates the definitions for each of the TcSE *Types* and *Properties* defined in the mapping.

3. Additional schema definitions for *Menus*, *Activators*, and *Reports* that provide convenient access to Enterprise Architect model data in the TcSE environment.

4. System-level *Type* and *Property* definitions that are used to store essential Enterprise Architect model data to ensure proper operation of the integration environment.



By modifying the rules defined in the *EATcSE_Mappings* activator, it is possible to change the way in which TcSE Types and Properties are mapped into Enterprise Architect. Use the Edit Map... command in the Configure Options 30 command to edit these mapping rules.

Mapping Modes

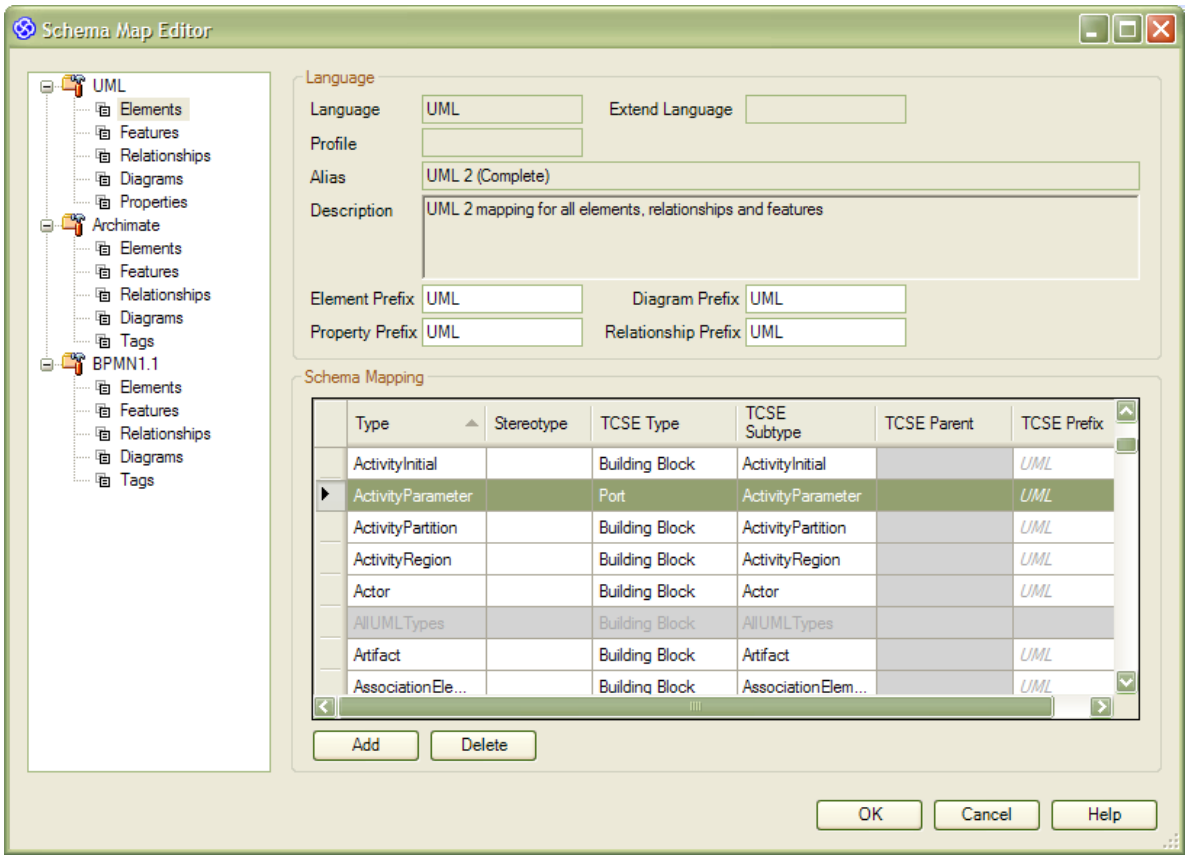
MDG Integration for TcSE provides a range of Mapping Modes to suit your project's integration requirements. Refer to the Configure a TcSE Project 15 for more information.

See Also

- Configure a TcSE Project 15
- Configure Options 30

5.4 Schema Map Editor

The Schema Map Editor allows you to view/edit the mapping rules that define how model *Elements*, *Relationships*, *Diagrams* and *Properties* in an Enterprise Architect project are represented in a TcSE project:



The Schema Map is an XML document which contains a collection of mapping rules for both the base *UML* and the user-defined *Extended Languages*. Each of the languages contain groups of rules that govern how model information is exchanged between Enterprise Architect and TcSE.

Mapping Rule Groups

Each of the mapping rules are arranged into a collection of groups for each language:

Group	Description
Elements	Defines the set of mapping rules for model elements such as Classes, Ports, Packages, Attributes and Operations.
Features	Defines the set of mapping rules for element features such as Constraints, Parameters, Arguments, Tags and Relationship Ends.
Relationships	Defines the set of mapping rules for relationships such as Associations, Dependencies, Transitions and Flows.
Diagram	Defines the set of mapping rules for diagrams such as Class Diagrams, Statecharts and Sequence Diagrams.
Properties	Defines the set of mapping rules for properties defined in Elements, Relationships and Features.
Tags	Defines the set of mapping rules that map a TcSE Property to a Tagged Value in an Extended Language.

Editing the Schema Map

The Language and Schema Mapping panels allow you to edit general mapping properties for the selected languages, as well as the mapping rules defined in each of the above groups.

Language

The **Language** panel allows you to modify the default **Prefixes** attached to every *Type* and *Property* definition defined in TcSE. Attaching a prefix to the name of a type definition allows the MDG Integration for TcSE to support data interchange between multiple modeling languages that define a language construct with duplicate type names.

Schema Mapping

The **Schema Mapping** panel allows you to define the mapping rules for each of the constructs defined in the selected group. A rule is simply defined by associating an Enterprise Architect construct to a *TcSE Type* and *TcSE Subtype*.

- A construct in Enterprise Architect can be excluded by the integration by deleting its corresponding rule, or by defining a *'null rule'* (where the TCSE Type is set to nothing).
- **Grayed-out rows** represent rules that are marked as *read-only* and cannot be modified. They typically define system-level rules that access system-level properties used to maintain data-integrity between Enterprise Architect and TcSE to ensure correct operation of the Integration environment.
- A **parent subtype** can be defined to group common type definitions together under a single parent subtype by specifying the subtype in the TcSE Parent column. By default, MDG Integration for TcSE automatically creates these parent subtypes during the project configuration process.
- By default, the value of the **TcSE Prefix** is obtained from the corresponding *Prefix* defined in the *Language* panel. A custom Prefix value can be specified for any mapping rule.

See Also

- Configure a TcSE Project 15
- Configure Options 30

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