About the FBX Exporter package

Version: 1.3.0b3

The FBX Exporter package provides a round-trip workflow for editing geometry assets. Use this workflow to send geometry from Unity to Maya, Maya LT, or 3ds Max, and back again, with minimal effort.

The FBX Exporter package includes the following features:
- **FBX Exporter:** Exports geometry as FBX files.
- **Convert To Linked Prefab:** Converts a GameObject hierarchy to two linked files: a Prefab file and an FBX file. It also configures the Prefab for auto-updating so that whenever the FBX Model changes on disk, the converter can non-destructively merge those changes back into the Prefab.
- **Name Remapping**: Allows you to map names from the Unity Prefab to the FBX file in order to synchronize any name changes that happen between Unity and the 3D modeling software.
- **Unity Integration for 3D modeling software:** Imports and exports assets between Unity and Maya, Maya LT, or 3ds Max, with minimal effort.

Requirements

The FBX Exporter package is compatible with the following versions of the Unity Editor:
- 2017.3 and later (recommended)

The Unity Integration for Maya feature supports the following versions of Maya:
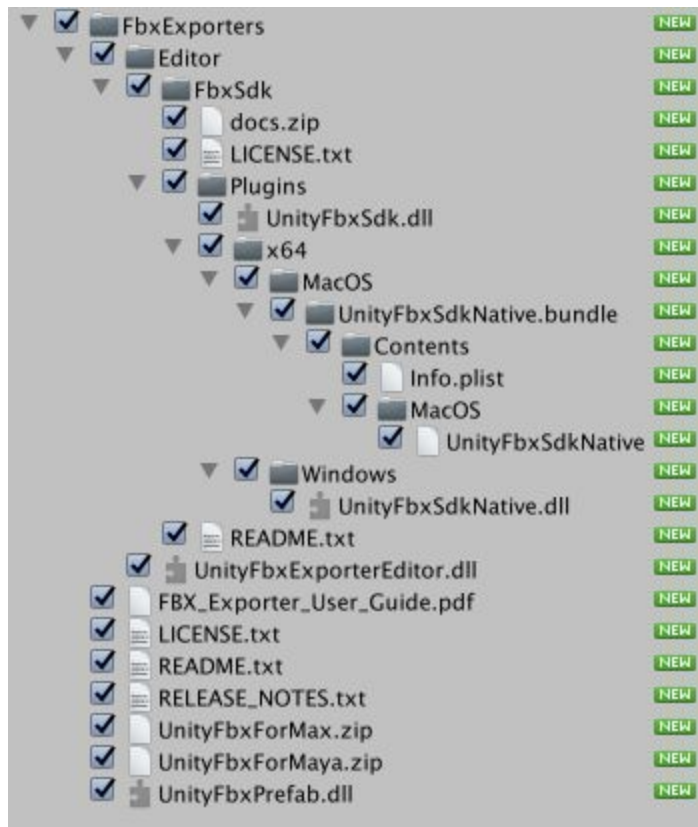- Maya 2017
- Maya 2018
- Maya LT 2017
- Maya LT 2018

The Unity Integration for 3ds Max feature supports the following versions of 3ds Max:
- 3ds Max 2017
- 3ds Max 2018

Contents

The FBX Exporter package contains:

- FBX Exporter
- Convert to Linked Prefab Instance
- FBX Prefab Component
- Integration with 3D modeling software (3ds Max and Maya)

Known Issues

- When installing a new version of the FBX Exporter Package after using version 1.1.0.b1, the link between Assets and FbxPrefab components may be lost. See Installing the FBX Exporter Package for repairing instructions.

Installing the FBX Exporter package in Unity

Before you install the FBX Exporter Package, follow these steps (recommended):
1. Back up your Project.
2. Restart Unity.
3. Delete the *FbxExporters* folder.
4. Select **Assets** > **Import Package** > **Custom Package** in Unity.
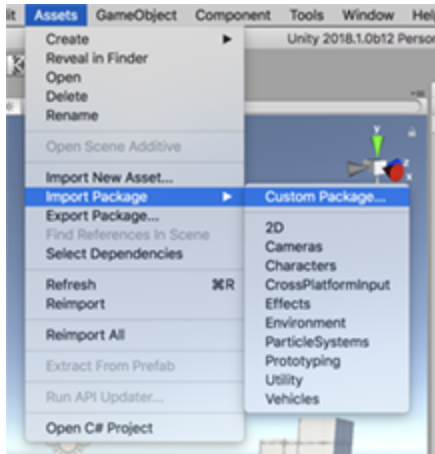
5. Select the FbxExporter package from the file browser and click **Open** to import and install the new version of the FBX Exporter package.

Fixing broken Linked Prefabs after updating

If your previous version of the FBX Exporter Package was 1.1.0b1, some Assets in your Project may lose their FbxPrefab components. To repair this issue, follow these steps:
1. If your Project Assets are serialized as Binary, select **Edit** > **Project Settings** > **Editor** to view the Editor Settings.
2. Change the **Asset Serialization** mode to **Force Text**. The **Force Text** option converts all Project Assets to text.
3. Before continuing, back up your Project.
4. Select **Edit** > **Project Settings** > **Fbx Export** to view the Fbx Export Settings.
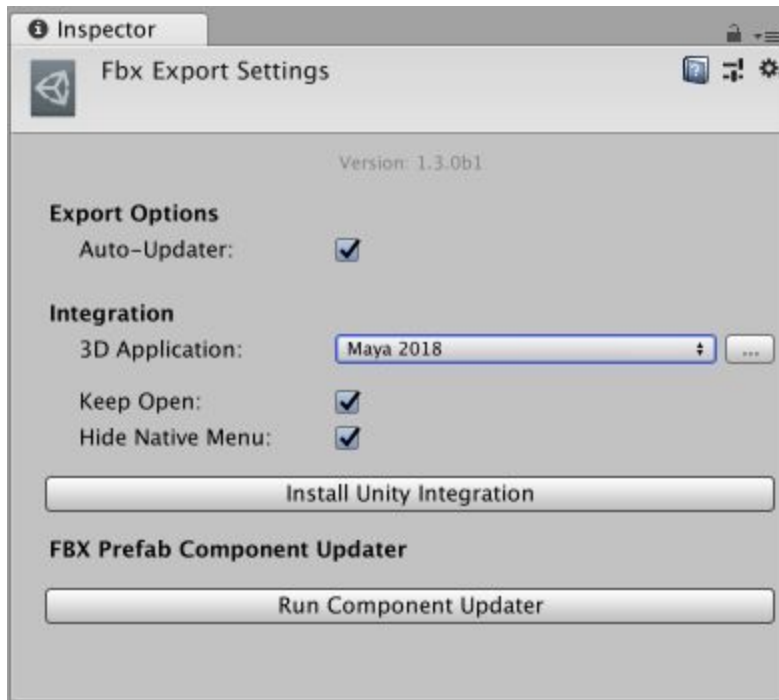
5. Click the **Run Component Updater** button to repair all text serialized Prefab and Scene Assets in the Project containing the FbxPrefab component.

Exporting FBX files from Unity

Use **Export To FBX** (menu: **GameObject** > **Export To FBX**) to manually export GameObject hierarchies to an FBX file. The FBX Exporter exports selected objects and their descendants to a single FBX file. However, if you select both a parent and a descendant, only the parent's hierarchy is exported.

The FBX Exporter exports the following objects:
- GameObject hierarchies and their transforms
- Meshes. The FBX Exporter exports multiple copies of the same mesh as instances. The FBX Exporter also exports the following mesh attributes:
  - Normals
  - Binormals
  - Tangents
  - Vertex Colors
  - All 4 Mesh UVs, if present
  - Quads or Triangles
- SkinnedMeshRenderers with the following exceptions:
  - Humanoid rigs are not supported
  - Animated meshes in bone hierarchy are not supported
- Materials as Phong if the material has specular; Lambert in all other cases
- Textures
- Cameras as film cameras with 35mm TV Projection; also the following camera attributes:
  - Projection type (perspective/orthographic)
  - Aperture Width and Height (width set to 0.816 inches and height calculated as 0.612 inches relative to the aspect ratio of the Unity camera)
  - Aspect ratio
  - Focal length
  - Field of view
  - Near and far clipping plane
- Lights of type *Directional*, *Spot* , *Point*, and *Area*; also the following light attributes:
  - Spot Angle (for Spot lights)
  - Color
  - Intensity
  - Range
  - Shadows (either On or Off)
- Legacy and Generic Animation from Animation and Animator components, or from a Timeline clip; also the following animated attributes:
  - Transforms
  - Lights:
    - Intensity
    - Spot Angle (for Spot lights)

- ■ Color
  - ○ Cameras:
    - ■ Field of View
- ● Blendshapes

Export Options window

When exporting an FBX file, the following Export Options window opens, displaying options for specifying what gets exported.
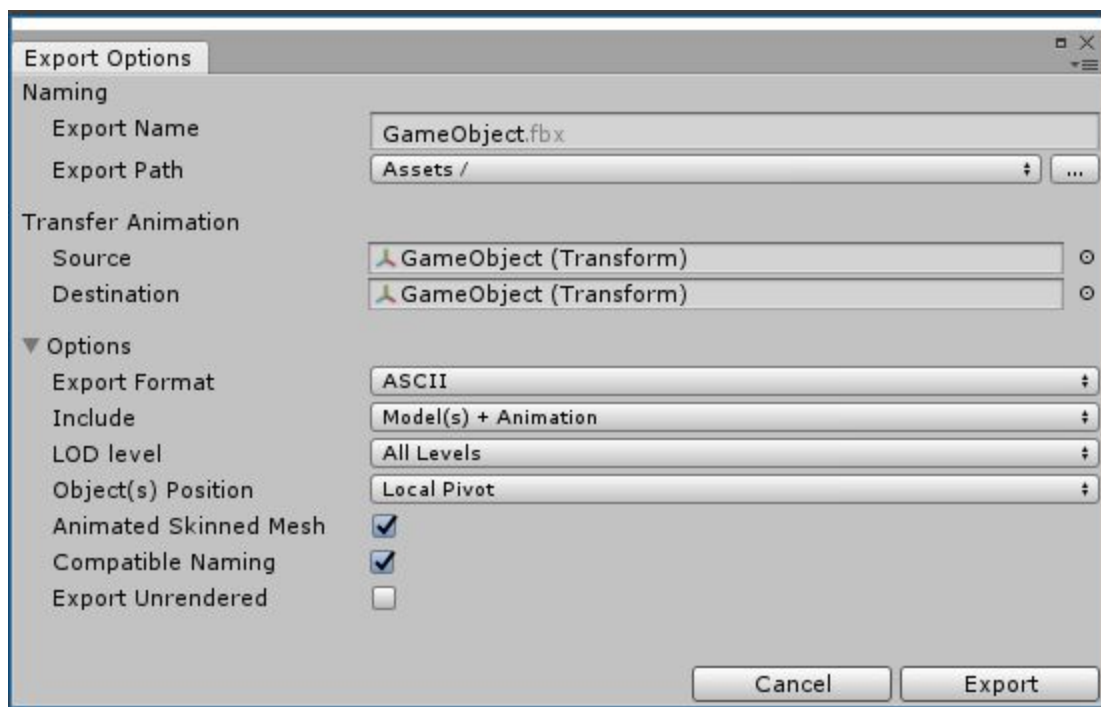
Export Options Properties

Property:	Function:
Export Name	Specify the filename to export to.
Export Path	Specify the location where the FBX Exporter will save the FBX file.

Source	Transfer the transform animation from this transform to the **Destination**. **Notes:** ● **Source** must be an ancestor of **Destination.** ● **Source** may be an ancestor of the selected object.
Destination	Where to transfer the transform animation to (which Transform object). This object receives the transform animation on objects between **Source** and **Destination** as well as the animation on the **Source** itself.
Export Format	Select the format for the FBX Exporter to use when exporting the FBX file (ASCII or binary).
Include	Choose whether to export both Models and Animation, only Models, or only Animations.
LOD level	For level of detail (LOD) groups, choose the desired level of detail to export (all, highest, or lowest). **Notes:** ● The FBX Exporter ignores LODs outside of selected hierarchy. ● The FBX Exporter does not filter out objects that are used as LODs and doesn't export them if they aren't direct descendants of their respective LOD Group
Object(s) Position	Choose whether to reset the exported objects to world center, or keep world transforms during export. If you select multiple objects for export, and you choose **Local Centered** from this drop-down menu, the FBX Exporter centers objects around a shared root while keeping their relative placement unchanged.
Animated Skinned Mesh	Check this option to export animation on objects with skinned meshes. If unchecked, the FBX Exporter does not export animation on skinned meshes.

Compatible Naming	Check this option to control renaming the GameObject and Materials during export. The FBX Exporter ensures compatible naming with Maya to avoid unexpected name changes between Unity and Maya. During export the FBX Exporter replaces characters in Unity names as follows: ● Replaces invalid characters with underscores ("_"). Invalid characters are all non-alphanumeric characters, except for the colon (":"). ● Adds an underscore ("_") to names that begin with a number. ● Replaces diacritics. For example, replaces "é" with "e". For FBX Model filenames, the FBX Exporter ensures that names do not contain invalid characters for the file system. The set of invalid characters may differ between file systems. **Note:** If you have a Material with a space in its name, the space is replaced with an underscore ("_"). This results in a new Material being created when it is imported. For example, the Material named "Default Material" is exported as "Default_Material" and is created as a new Material when it is imported. If you want the exported Material to match an existing Material in the scene, you must manually rename the Material before exporting.
Export Unrendered	Check this option to export meshes that either don't have a renderer component, or that have a disabled renderer component. For example, a simplified mesh used as a mesh collider.

Exporting Animation from the Timeline

In order to export an animation clip from the timeline, in the Timeline editor select the desired clip, then from the top menu select **GameObject** > **Export Selected Timeline Clip**.

Exporting with relevant system units

The FBX Exporter exports in centimeter units (cm) with the Mesh set to real world meter (m) scale. For example, if vertex[0] is at [1, 1, 1] m., it is converted to [100, 100, 100] cm.

In 3ds Max, it is recommended to set the system units to centimeters to avoid any scaling on Model import and export.

There are no specific import options to adjust between Unity and Maya. When working in Maya, you can set the working units to meters if you prefer.

For example, when working with large models in Maya, to ensure that the models clip to meters, adjust the scale of the near and far clipping planes for all cameras by 100x. In addition, you should scale lights by 100x so that objects display in the viewport.

Known Issues

- Bind pose of animated skinned mesh is lost on export. For example, if you export an animated skinned mesh from Unity and import it into Maya you will not be able to set the character into the bind pose using the Rigging > Skin > Go to Bind Pose command.
- Animated skinned meshes may not export with the correct skinning if they are not in the bind pose on export (that is, not being previewed in the Animation or Timeline windows, and the original Rig's FBX must not contain animation)
- For skinned meshes all bones must be descendants of the root bone. For example, if the root bone is "hips" and the right leg for the same skinned mesh is not a descendant of hips, export will fail.

Converting GameObjects to Linked Prefabs

A Linked Prefab is a Prefab which maintains a link to an FBX file and is responsible for updating the Prefab so that it remains in sync with its source. These updates include: updating the meshes, hierarchy, and transforms, preserving components and their object references.

The Linked Prefab contains a FbxPrefab script component that is responsible for recording name changes and merging FBX Model changes into the Linked Prefab.

The FBX Exporter package supports a minimal workflow for converting a GameObject hierarchy into a Linked Prefab. A Linked Prefab automatically updates whenever the linked FBX file changes on disk.

Use **Convert To Linked Prefab** (menu: **GameObject** > **Convert To Linked Prefab Instance**) to replace the GameObject hierarchy with an instance of a Prefab that is linked to an FBX Model.

Convert To Linked Prefab exports each selected GameObject hierarchy and writes both a .prefab and a .fbx file. Linked Prefabs use the same rules as for exporting: all selected objects and their descendants are exported to a single FBX file. However, if you select both a parent and a descendant, the Linked Prefab only exports the parent's hierarchy.

Convert Options window

When converting to a Linked Prefab, the following window opens, displaying options to specify what gets exported:
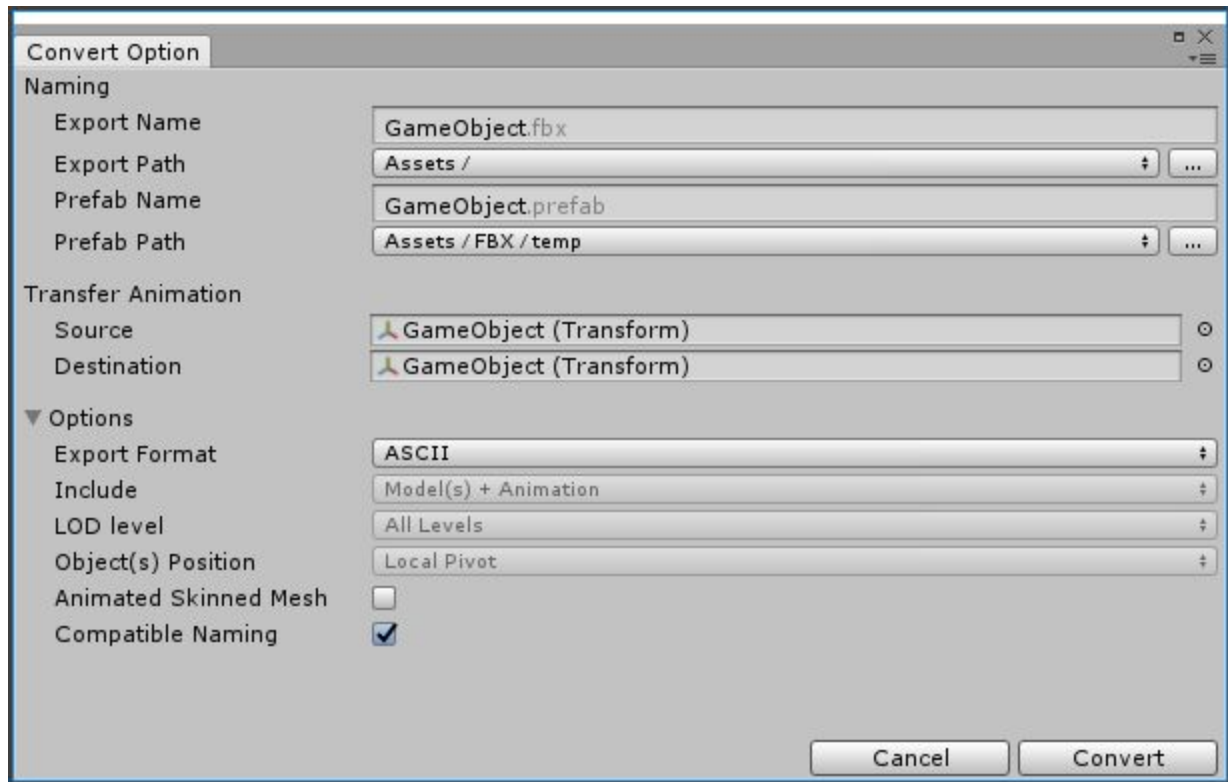
Convert Option Properties

Property:	Function:
Export Name	Specify the filename to export to
Export Path	Specify the location where the FBX Exporter will save the FBX file.
Prefab Name	Specify the filename to save the Linked Prefab to
Prefab Path	Specify the location where the FBX Exporter will save the linked prefab file.
Source	Transfer the transform animation from this transform to **Destination**. **Notes:** ● **Source** must be an ancestor of **Destination**.

	● **Source** may be an ancestor of the selected object.
Destination	Where to copy the transform animation to (which Transform object).
	This object receives the transform animation on objects between **Source** and **Destination** as well as the animation on the **Source** itself.
Export Format	Select the format for the FBX Exporter to use when exporting the FBX file (ASCII or binary).
Include	**Convert to Linked Prefab Instance** always exports both Models and Animation in the hierarchy.
LOD level	**Convert to Linked Prefab Instance** always exports All levels of detail (LOD) available in the hierarchy for LOD groups.
Object(s) Position	**Convert to Linked Prefab Instance** always resets the root object's transform during export. However, the Prefab maintains the global transform for the root object.
Animated Skinned Mesh	Check this option to export animation on objects with skinned meshes. If unchecked, the FBX Exporter does not export animation on skinned meshes.
Compatible Naming	Check this option to control renaming the GameObject and Materials during export. The FBX Exporter ensures compatible naming with Maya to avoid unexpected name changes between Unity and Maya. During export the FBX Exporter replaces characters in Unity names as follows: ● Replaces invalid characters with underscores ("_"). Invalid characters are all non-alphanumeric characters, except for colon (":"). ● Adds an underscore ("_") to names that begin with a number. ● Replaces diacritics. For example, replaces "é" with "e". For FBX Model filenames, the FBX Exporter ensures that names do not contain invalid characters for the file system. The set of invalid characters may differ between file systems. **Note:** If you have a Material with a space in its name, the space is replaced with an underscore ("_"). This results in a new Material

	being created when it is imported. For example, the Material named "Default Material" is exported as "Default_Material" and is created as a new Material when it is imported. If you want the exported Material to match an existing Material in the scene, you must manually rename the Material before exporting.

Automatic updates

When you enable the **Auto-Updater** option in the Fbx Export Settings, the Linked Prefab automatically updates whenever the linked FBX file is reimported. If this option is disabled, you revert back to the default prefab behaviour of only reflecting material attribute and vertex value changes.
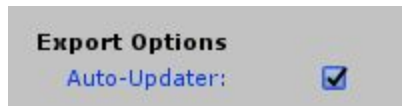
Whenever an FBX file changes on disk and the FBX file resides within the Asset folder of the Unity Project, the built-in FBX Importer runs and updates the geometry. A Linked Prefab merges the following additional changes:
- Adding or removing objects in the hierarchy
- Changing the parent of objects in the hierarchy
- Adding or removing the mesh component for an object
- Changing the transform of the children in the hierarchy
- Adding or removing a camera component for an object
- Changing the camera component's properties

Note: If a merge conflict occurs between a changed FBX file and a Linked Prefab, the FBX file takes precedence.

Name Remapping between FBX and Prefabs

You can use the **Name Remapping** feature in the FBX Exporter tool to apply name changes to nodes in Unity's Linked Prefab by remapping them to use the names from your 3D modeling software. For example, during level design you might use names that are less formal in Unity. When you are in production mode, you might have to change the names to match the more formal names coming from Maya.

In order to access the Name Remapping feature, first disable the Auto-Updater. When you disable the **Auto-Updater** option in the Fbx Export Settings, no automatic updates to the Prefab occur when you re-import the Linked FBX.

In order to update the Prefab, select the Prefab instance in the Scene and select **GameObject** > **Update from FBX**. This performs the update, and in the case of a name change, the following window opens, allowing you to determine the outcome of the update.
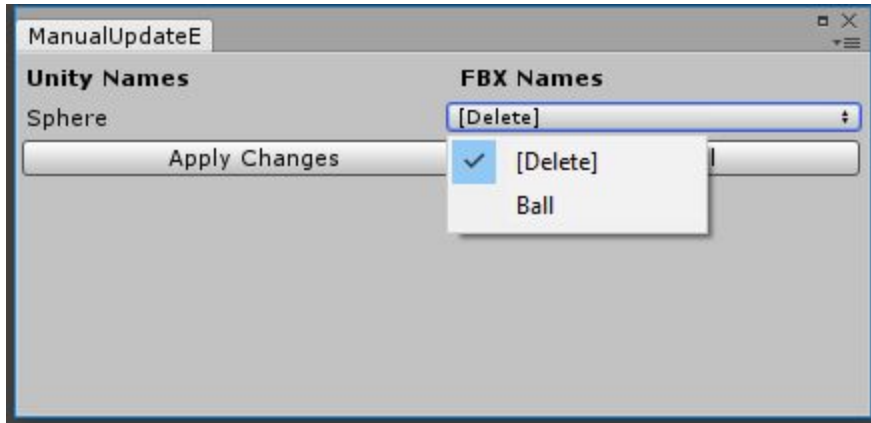
Click **Apply Changes** to make the changes, or **Cancel** to cancel the update.

If you re-enable the **Auto-Updater** option after having disabled manual updates, you need to manually run **Update from FBX** on each Prefab to ensure that all pending updates have been processed. If the FBX changes, the automatic update is applied with the last name remapping settings.

Notes:
- It is very important to disable the Auto-Updater option in the FBX Settings window before starting this process.
- The Name Remapping ignores the root object, since the name comes from the name of the FBX file, rather than what's in the file.

Known Issues

- Converting a Model instance that has been modified in the scene fails to re-export the FBX file.

Integrating Unity with 3D modeling software

The Unity Integration tool provides an effortless experience for exchanging Assets between Unity and either **Maya**, **Maya LT** or **3ds Max**.

Use the Unity Integration tool to import and export FBX files directly to and from Unity without having to specify filenames, select objects, or set FBX importer or exporter settings.

To customize the FBX Importer or Exporter settings in Maya or Maya LT, use the *unityFbxImportSettings.mel* and *unityFbxExportSettings.mel* files. Both files are located in the *Integrations/Autodesk/maya/scripts* folder.

For 3ds Max, use the *unityFbxImportSettings.ms* and *unityFbxExportSettings.ms* files located in the *Integrations/Autodesk/max/scripts* folder.

Installing an Integration

To install Unity Integration for Maya, Maya LT, or 3ds Max, open Fbx Export Settings (menu: **Edit** > **Project Settings** > **Fbx Export**) in Unity:

Use the **3D Application** property to choose the 3D modeling software and version where you want to install the Unity Integration.

To select a version of Maya, Maya LT, or 3ds Max installed outside the default location, click the Browse button.
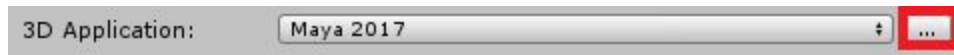

3D Application property with Browse button (red outline)

Before installing Unity Integration, close all instances of the selected 3D modeling software that matches the specified version.

Click **Install Unity Integration** to install the Unity Integration for the selected 3D modeling software. Unity Integration comes packaged in several zip files (one zip file per supported application). Then select a target folder to extract the Unity Integration to when prompted. The target folder can be outside of your current Project. Maya and Maya LT both use the same zip folder.

The application starts, configures the plug-in, and automatically exits. Unity reports whether the installation was a success.
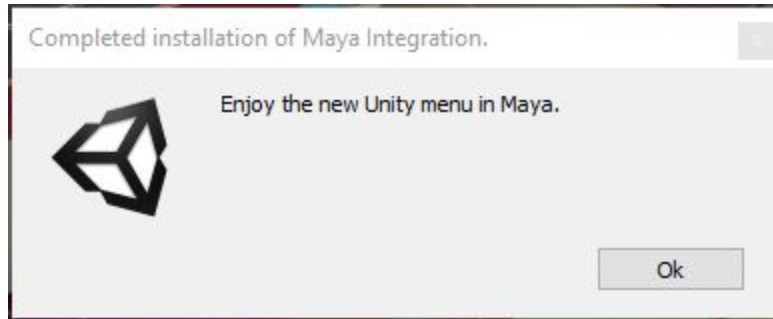
If an error occurs during startup, Maya may not close. If this happens, check the Maya console to see if you can resolve the issue, and then manually close Maya.

If you enabled the **Keep Open** option in the [Fbx Export Settings](#) window, then Maya stays open after installation completes.

Manually Installing a Maya Integration

Sometimes you need to install a Maya integration manually. For example, if you are using an unsupported version of Maya.

To manually install a Maya Integration, follow these steps:

1. Extract the *UnityFbxForMaya.zip* file in the *FbxExporters/* folder from the Unity package to a writable location. This can be in or outside of your Unity Project.

2. Copy the contents of *Integrations/Autodesk/maya/UnityFbxForMaya.txt* from the unzipped folder to the following file:

- On Windows:
  C:\Users\{username}\Documents\maya\modules\UnityFbxForMaya.mod
- On Mac:
  $HOME/Library/Preferences/Autodesk/Maya/modules/UnityFbxForMaya.mod

3. In *UnityFbxForMaya.mod*, modify the following line (mel code):

```
+ UnityFbxForMaya {Version} {UnityIntegrationsPath}/Integrations/Autodesk/maya
```

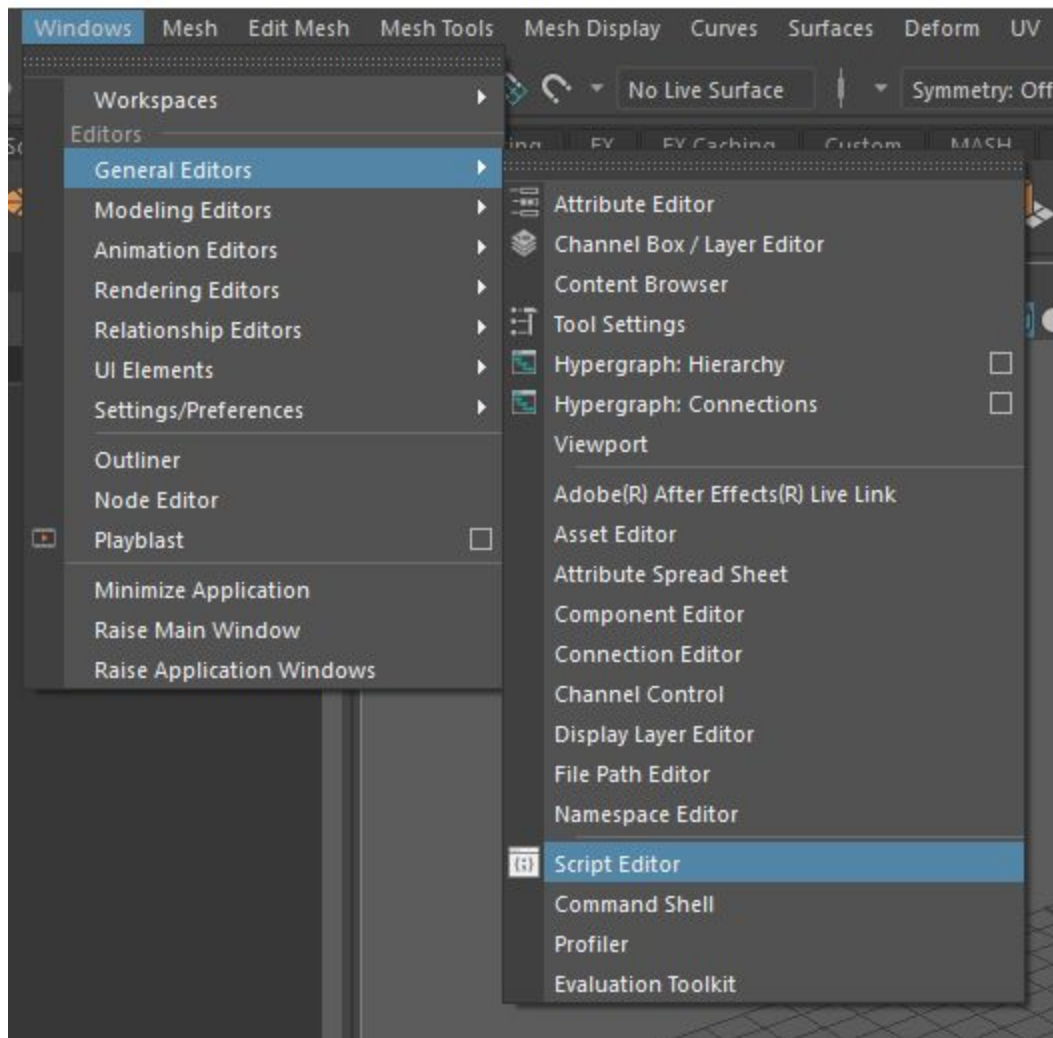| Where this:	Corresponds to:
`{Version}`	`1.3.0b1` (or your version number of the FBX Exporter package)
`{UnityIntegratio nsPath}`	the location where you unzipped *UnityFbxForMaya.zip* in step 1

4. Locate the following file (if it doesn't exist, create the file):

- On Windows:
  C:\Users\{username}\Documents\maya\scripts\userSetup.mel
- On Mac:
  $HOME/Library/Preferences/Autodesk/Maya/scripts/userSetup.mel

5. Add this line (mel code):

```
if(`exists unitySetupUI`){ unitySetupUI; }
```

6. Open Maya, and then open the Script Editor:

7. Run the following (mel code):

```
unityConfigure "{UnityProjectPath}" "{ExportSettingsPath}"
"{ImportSettingsPath}" 0 0;
```

| Where this:	Corresponds to:
{UnityProjectPath}	*path/to/UnityProject*

{ExportSettingsPath}	*path/to/Integrations/Autodesk/maya/scripts/unityFbxExportSettings.mel*
{ImportSettingsPath}	*path/to/Integrations/Autodesk/maya/scripts/unityFbxImportSettings.mel*

Working with Maya 2017+ and Maya LT 2017+

Importing from Unity

Importing an FBX Model automatically configures the plug-in for export. The plug-in remembers your Unity Project, the export filenames, and which objects to export per file.

Select **File** > **Unity** > **Import** to open a file browser directly in your current Unity Project. Use the file browser to select the FBX files to import. One or more files can be selected at once. Hold Shift or Ctrl to select multiple files.
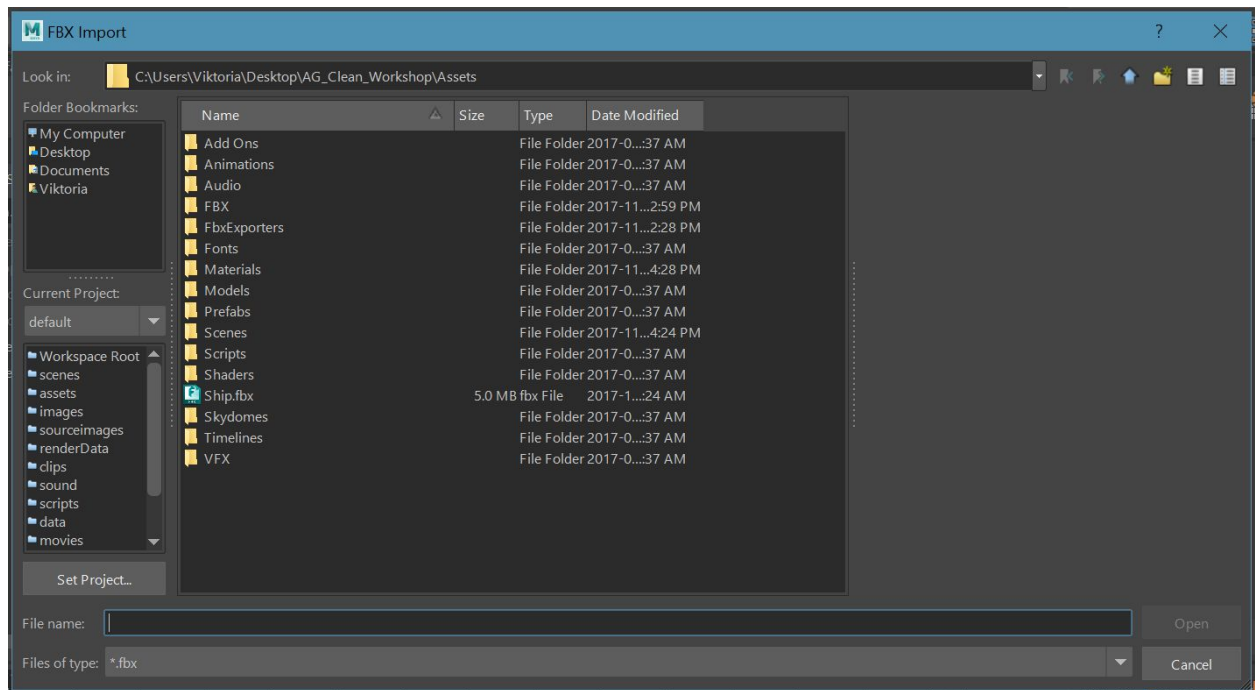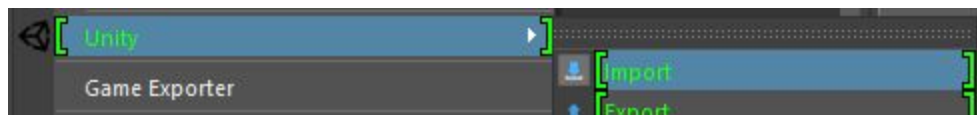
Maya and Maya LT FBX import menu

The FBX Exporter adds the contents of each imported file to an export set named after the imported FBX file. For example, if you import *model.fbx*, you can find its contents in an export set called *model_UnityExportSet*.

In addition, the contents of the file are placed into a namespace based on the filename. For *model.fbx*, the contents are placed into the `model:` namespace.

Animation files using the **@** notation (*<modelname>@<animation>.fbx*), are recognized as animation files belonging to the Model contained in *model.fbx*.

For instance, if you import a file called *model@anim.fbx*, the export set and namespace name are based on the name before the **@** symbol. Therefore, it uses the same set and namespace as *model.fbx*.

This allows animation files to be easily imported and applied to the appropriate objects in the Scene. Maya stores the animation filename and path for easy export. A single animation file is supported per model file. Importing a new animation overwrites the existing animation in the Scene.

Exporting to Unity

There are three options available for export in Maya and Maya LT:
- Export
- Export Model Only
- Export Animation Only
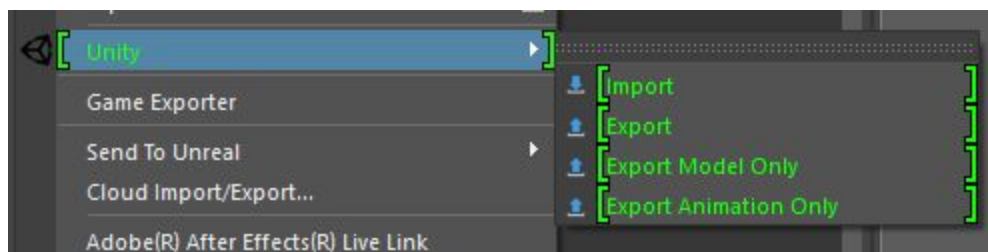
File > **Unity** > **Export** exports both Models and animation contained in the export sets selected for export.

File > **Unity** > **Export Model Only** exports all Models in the selected export sets, but does not export any animation.

File > **Unity** > **Export Animation Only** exports only the animation applied to the objects in the export set as well as the minimum components required for the animation (such as transforms, animated lights and cameras).

Note: If no animation file with the **@** notation has been imported, then this option has no effect. The workaround for exporting a new animation is to first import an empty FBX file with the **@** notation (*{model}@anim.fbx*), so that the export set is configured correctly.

In order to export objects from the desired export set, you can select one or more objects in the set or the set itself. In either case, the FBX Exporter exports the entire contents of the set.

If you select multiple sets or objects from multiple sets, then the FBX Exporter exports each set to its respective file defined in the attributes of the set.
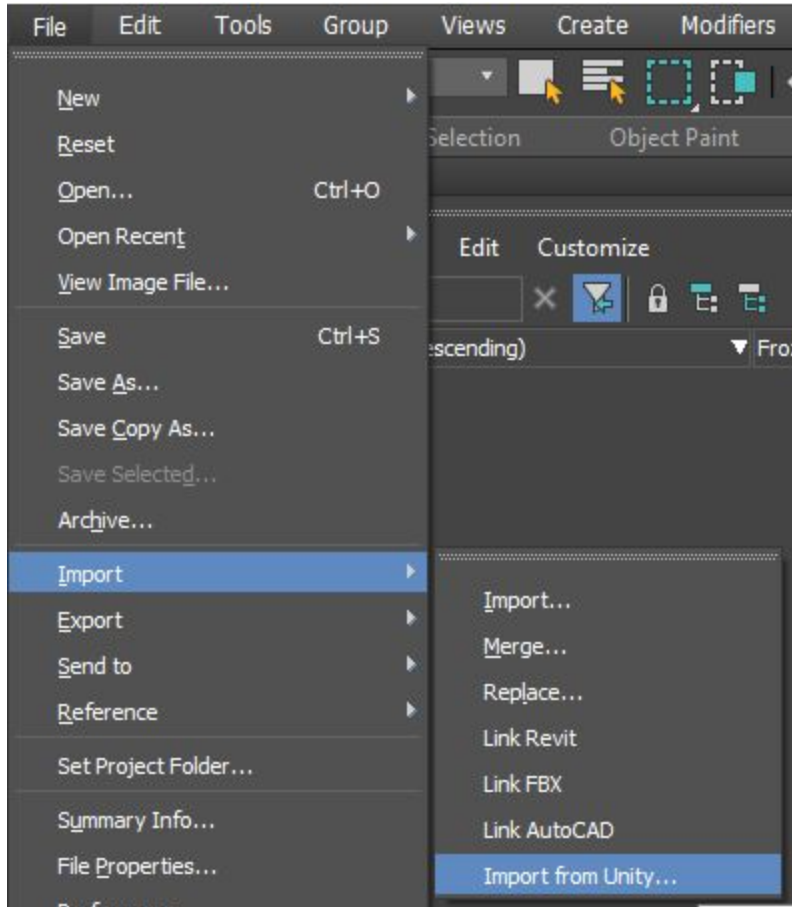

Working with 3ds Max 2017+
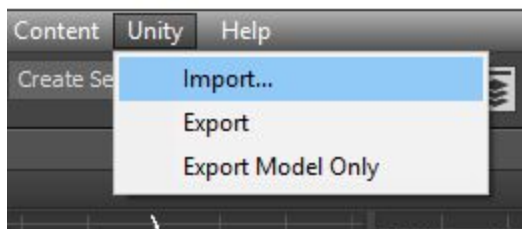
Importing from Unity

Importing an FBX Model automatically configures the plug-in for export. The plug-in remembers your Unity Project, the export filename, and which objects to export.

Select **Import** to open a file browser directly in your current Unity Project:

- In 3ds Max 2018, select **File** > **Import** > **Import from Unity....**

- In 3ds Max 2017, select **Unity** > **Import...**.

Use the file browser to select one or more Model(s) to import. You can hold the Shift or Ctrl keys to select multiple files.

The FBX Exporter automatically adds the contents of each imported file to a selection set named after the imported FBX file. For example, if you import *model.fbx*, you can find its contents in a selection set called *model_UnityExportSet*.

A dummy with the same name (*model_UnityExportSet*) is also created for each imported file and parented under another dummy object called *UnityFbxExportSets*.
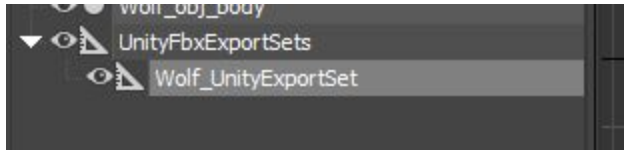
Dummy created in 3ds Max after importing Wolf.fbx

This dummy contains the imported file's path and filename as custom attributes, which the FBX Exporter also uses on export.
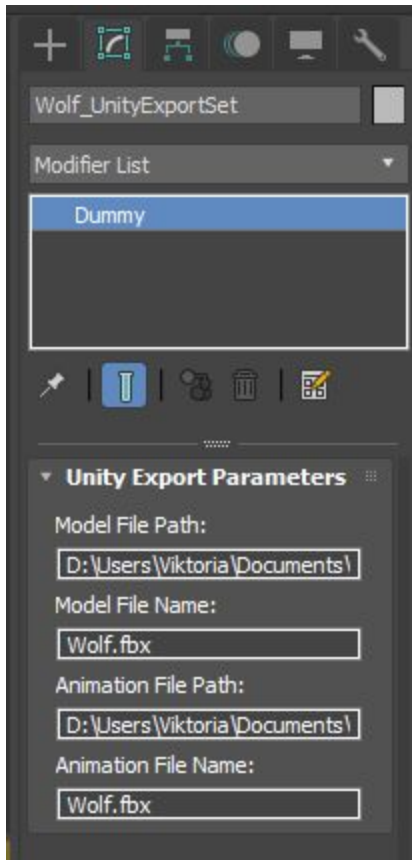

Custom attributes on a UnityExportSet dummy

The **@** notation (*<modelname>@<animation>.fbx*), indicates that this is an animation file belonging to the Model contained in *model.fbx*.

For instance, if you import a file called *model@anim.fbx*, the export set is based on the name before the **@** symbol. Therefore, it uses the same set as *model.fbx*.

This allows you to easily import animation files and apply them to the appropriate objects in the Scene. A single animation file is supported per Model file. Importing a new animation overwrites the existing animation in the Scene.
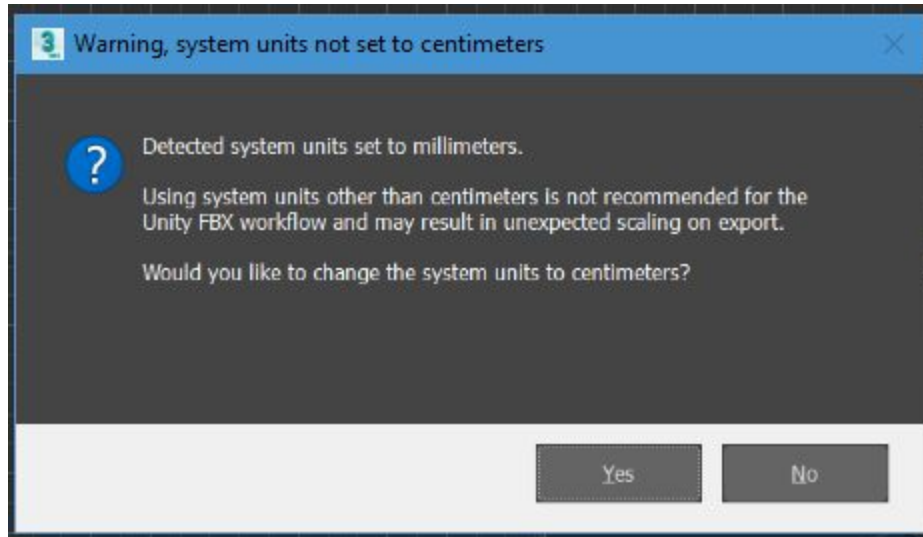
Note: Exporting animation only from 3ds Max is not supported.
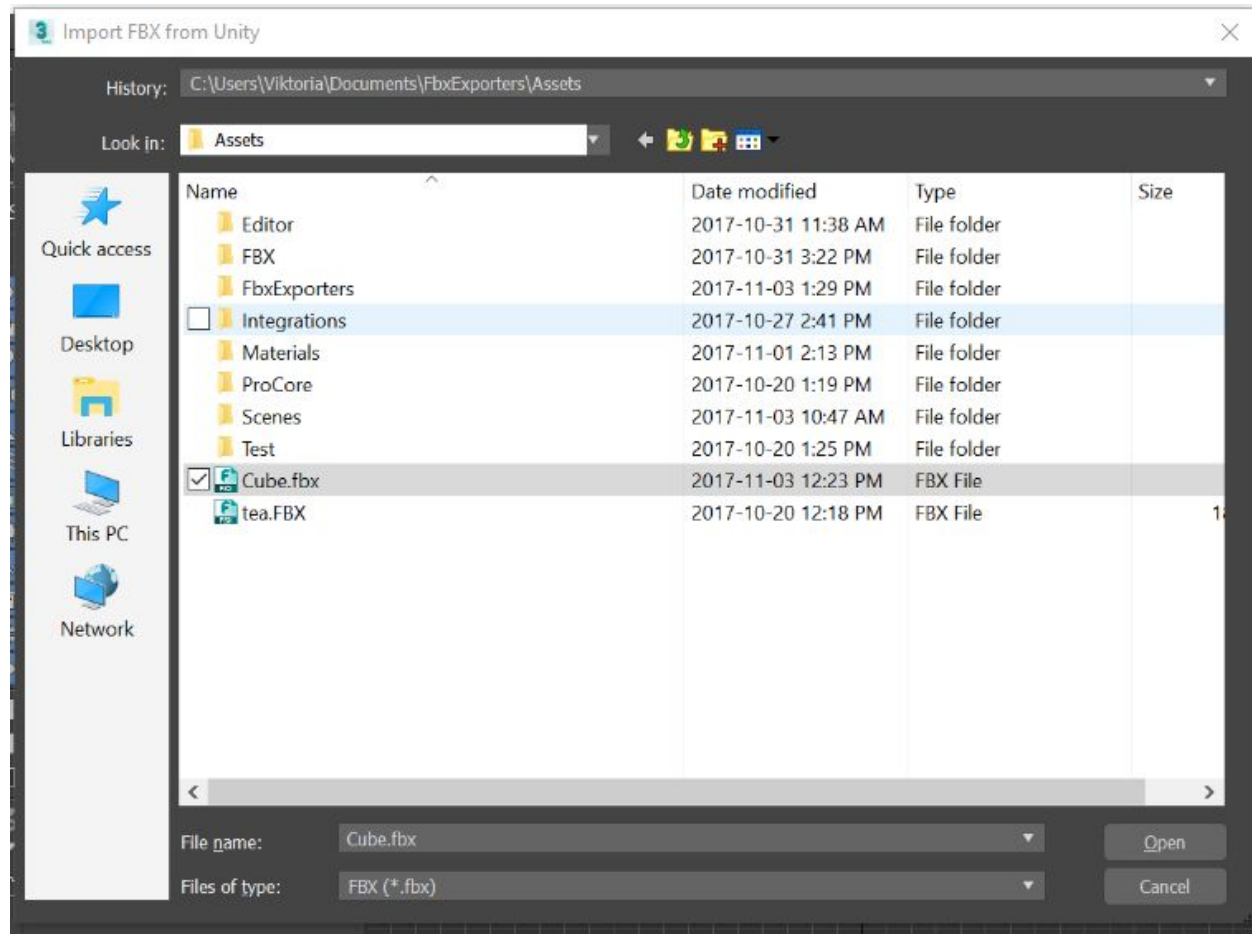
3ds Max FBX import file browser

If the system units are not set to centimeters, 3ds Max prompts you to change the system units to centimeters. Select one of the following options:
- Click **Yes** to change the system units (recommended) to centimeters, ensuring that the scaling is maintained on export.
- Click **No** to use the current system units (not recommended). The prompt does not appear again for the remainder of the 3ds Max session or, in the case of a .max file, does not appear again for this file.

Warning, system units not set to centimeters

Detected system units set to millimeters.

Using system units other than centimeters is not recommended for the Unity FBX workflow and may result in unexpected scaling on export.

Would you like to change the system units to centimeters?

Yes   No

Export to Unity

There are two options available for export in 3ds Max:
- Export
- Export Model Only

Export exports both Models and animation contained in the export sets selected for export.

Export Model Only exports all Models in the selected export sets, but does not export any animation.

Select either to automatically export with the settings and Models configured during import. No additional steps are required.

In 3ds Max 2018, select **File** > **Export** > **Export to Unity** or **File > Export > Export to Unity (Model Only)**.
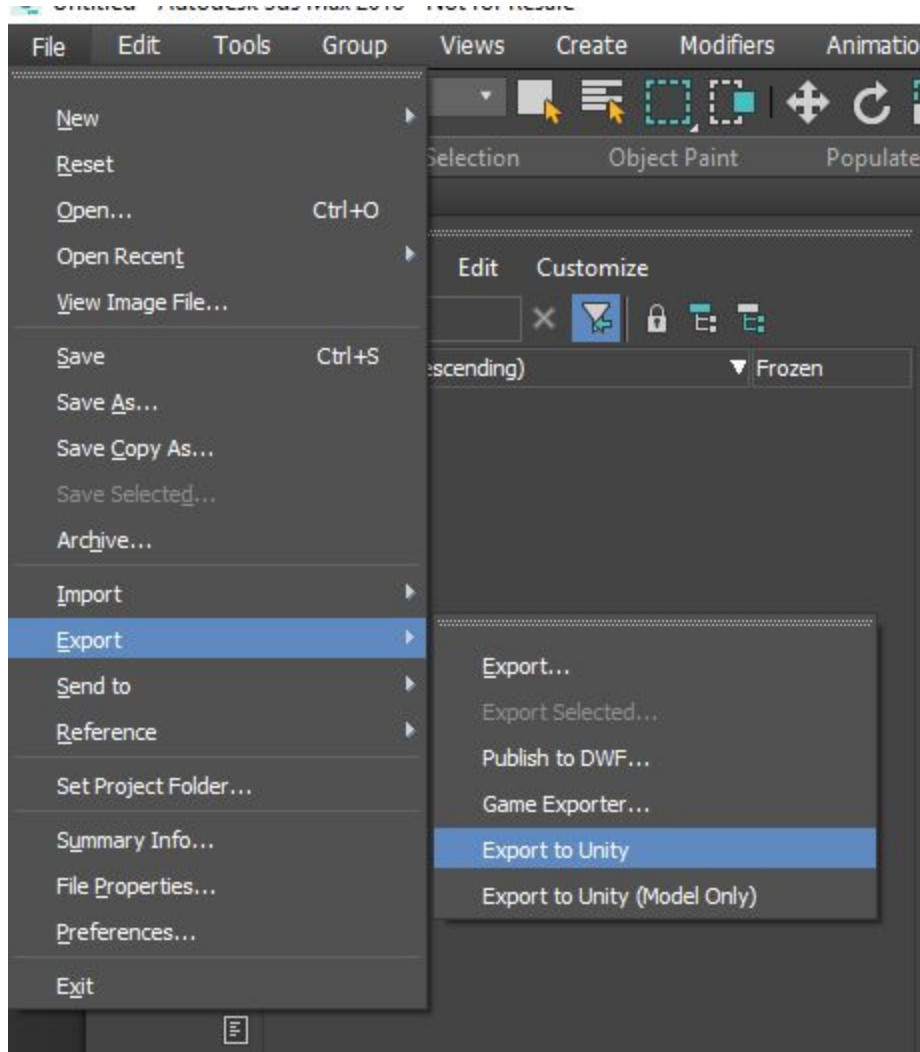
In 3ds Max 2017, select **Unity** > **Export** or **Unity > Export Model Only.**
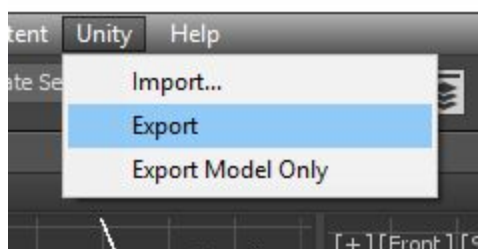

In order to export objects from the desired export set, you can select one or more objects in the set, the set itself, or the corresponding dummy object. In either case, the FBX Exporter exports the entire contents of the set.

If you select multiple dummy objects corresponding to sets or objects from multiple sets, then the FBX Exporter exports each set to its respective file defined in the custom attributes of the set's dummy object.

In each case, selecting **Export** automatically exports the current Model back to Unity. When you switch back into Unity, your Scene has already been updated.

Unity export uses the selection sets created on import to determine which objects to export. If you add a new object to the Model, you must also add this new object to the model's UnityExportSet set.
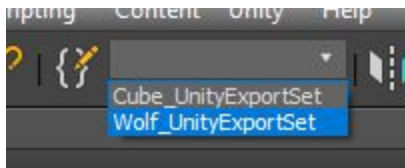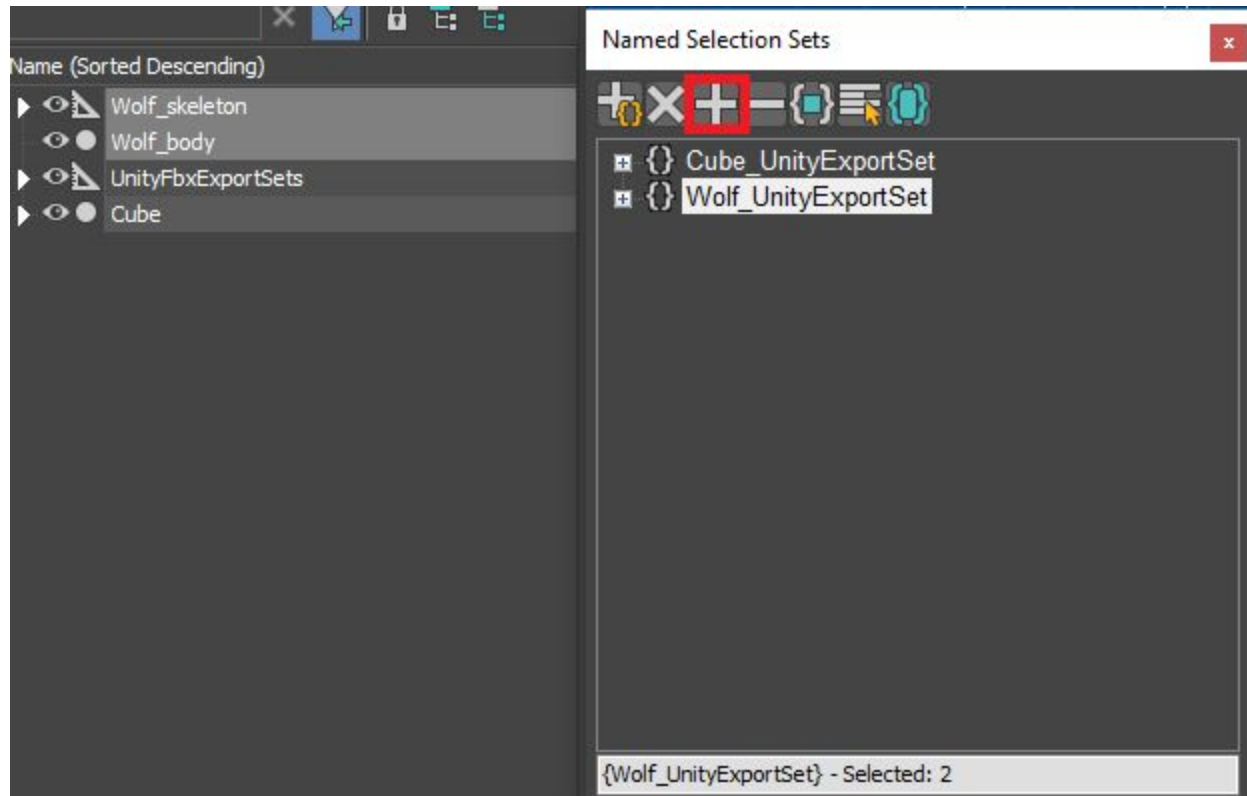

UnityExportSets in 3ds Max

Click the **Edit Named Selection Sets** button to edit a UnityExportSet.

To add an object to a set, select the set, select an object and click the **Add Selected Objects** button.

To remove an object from a set, select the object in the set and click the **Subtract Selected Objects** button.

Tip: You can also right-click the UnityExportSets and add or remove objects using the context menu.

*In 3ds max, use the **Add Selected Objects** button (red outline) to add objects to Wolf_UnityExportSet.*

Setting FBX Export options

Use the Fbx Export Settings window to specify whether or not to automatically update Linked Prefabs and to install the Unity Integration for Maya, Maya LT, or 3ds Max.

Fbx Export Settings window

Property:	Function:
Auto-Updater	Check this option to enable automatic updating for Linked Prefabs whenever their linked FBX files is updated.
3D Application	Select the 3D modeling software you want to integrate with Unity. Maya 2017+, Maya LT 2017+, and 3ds Max 2017+ are the three applications currently supported. Click the Browse button to choose a 3D modeling software installed in a non-standard location.

Keep Open	Check this option to keep the selected 3D modeling software open after installing it.
Hide Native Menu	Check this option to hide the native **Send to Unity** menu in Maya and Maya LT.
Install Unity Integration	Click this button to install Unity Integration for the selected **3D Application**.
Run Component Updater	Click this button to run the Component Updater to repair any broken FbxPrefab components if your previous version of the FBX Exporter Package was 1.1.0b1.

Developer's Guide

As a developer you have access to the FBX Exporter from C# scripting. You can use the basic API for exporting Models with animation, Models only, or Animation only by providing a list of GameObjects.

You can call the FBX Exporter from C# using methods found in the `FbxExporters.Editor` and `FbxExporters.EditorTools` namespaces, for example:

```csharp
using System.IO;

using UnityEditor;
using UnityEngine;

using FbxExporters.Editor;
using FbxExporters.EditorTools;

public static void ExportModelAndAnimation(Objects[] objects)
{
    string filePath = Path.Combine(Application.dataPath, "MyGame.fbx");
    var options = new ExportModelSettingsSerialize ();

    options.SetModelAnimIncludeOption(ExportSettings.Include.ModelAndAnim);

    ModelExporter.ExportObjects(filePath, objects, options);
}
```