

Maya FBX Plug-in Guide

***Maya FBX plug-in
November 2006***

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1

Installation

The Maya FBX plug-in is used by Maya to import, export, and convert files using the *.fbx* file format. This chapter describes how to install the Maya FBX plug-in on Windows®, Mac® OS X, and Linux systems.

The Maya FBX plug-in comes with Maya and is installed automatically. This procedure is included so you can upgrade your Maya FBX plug-in with later versions.

Important

Plug-ins run only on the version of Maya for which they are created so you should verify that the version of the Maya FBX plug-in that you are installing is appropriate for the version of Maya you are running. Maya rejects plug-ins created for different versions.

Windows installation

The Maya FBX plug-in is available for Windows 2000 and Windows XP.

To install the Maya FBX plug-in:

- 1** Download the install file from the Autodesk web site (<http://www.Autodesk.com>).

1 | Installation

Windows installation

- 2 Double-click the install file to launch the Autodesk plug-in installer (figure 1-1).

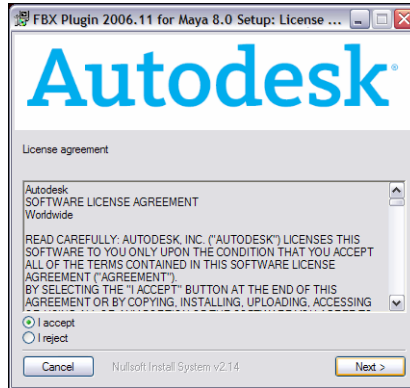


figure 1-1: Autodesk Installer window

- 3 Click I accept to accept the terms of the license agreement, and then click Next.
- 4 The next window shows the recommended installation location for the plug-in (figure 1-2). To specify another location, click Browse to launch the file browser so you can select a new location. Click Next.



figure 1-2: Autodesk Destination folder window.

- 5 The next window shows the recommended installation location for the plug-in documentation. To specify another location, click Browse to launch the file browser. Click Next
- 6 A series of dialog boxes appear asking if you would like to keep older versions of the plug-in (if applicable), see the readme, and view the plug-in documentation. Select Yes or No for each of the options.
- 7 The installation completed window appears. Click Close to exit the installer.

The Maya FBX plug-in is now installed.

- 8 Start Maya and navigate to Window > Settings/Preferences > Plug-in Manager.
- 9 Activate the Loaded option for *Fbxmaya.mll* in the Plug-in Manager.
- 10 Activate the *Fbxmaya.mll* Autoload option so Maya loads the Maya FBX plug-in automatically at start-up.

Removing the Maya FBX plug-in from Windows

- 1 In Maya, disable the *Fbxmaya.mll* Loaded and Autoload options in the Plug-in Manager.
- 2 Exit Maya.
- 3 Delete *fbxmaya.mll* from the *Maya<ver>\bin\plugins* directory, where *<ver>* is the version of Maya you have installed.

Macintosh installation

The Maya FBX plug-in is available for MacOS X.

- 1 Download the *.sit* file from the Autodesk web site (<http://www.Autodesk.com>) to your desktop.
- 2 Double-click the *.sit* file to extract the Installation disk image.

1 | Installation

Macintosh installation

- 3 Double-click the package icon to start the installation. The Welcome pane appears (figure 1-3).

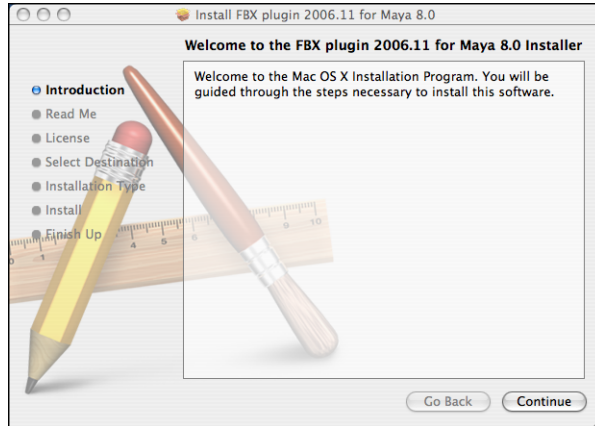


figure 1-3: Mac installation Welcome pane.

- 4 Click Continue to start the installation process. The Software License Agreement pane appears.
- 5 Read the License Agreement and click Continue. A dialog box appears asking if you accept the terms and continue with the installation.



figure 1-4: Terms of Software License Agreement dialog box,

- 6 Click Agree to accept. The Select a Destination pane appears. Select the destination disk where you want install the Maya FBX plug-in and click Continue.
- 7 The Easy Install pane appears. Click Upgrade.

1 | Installation

Macintosh installation

- 8 A dialog box appears asking you to enter your name and login password to continue the installation.

Note *You must obtain administrator privileges to continue installation.*

- 9 The installation begins. A progress bar indicates the time remaining of the installation. When the progress reaches 100%, the Finish Up pane appears.

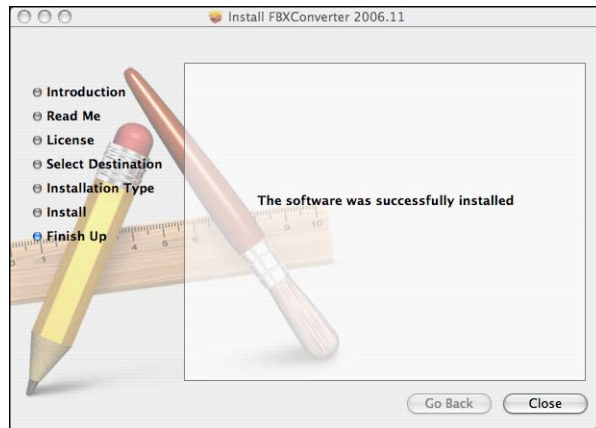


figure 1-5: Finish Up pane.

- 10 Click Close to exit the installation program.

Note *The Maya FBX plug-in is installed in the following directory: <Macintosh Drive>/Applications/Alias/maya<ver>/Maya.app/Contents/MacOS/plug-ins, where <ver> is the version of Maya you have installed.*

- 11 Start Maya and navigate to Window > Settings/Preferences > Plug-in Manager.

1 | Installation

Linux installation

- 12 Activate the Loaded option for *Fbxmaya.lib* in the Plug-in Manager.
- 13 Activate the *Fbxmaya.lib* Autoload option so Maya loads the Maya FBX plug-in automatically at start-up.

Removing the Maya FBX plug-in from Mac OS X

- 1 In Maya, deactivate the *fbxmaya.lib* Loaded and Autoload options in the Plug-in Manager.
- 2 Exit Maya.
- 3 Locate the *fbxmaya.lib* plug-in. This file is found in the <Macintosh Drive>/Applications/Alias/maya<ver>/Maya.app/Contents/MacOS/plug-ins directory, where <ver> is the version of Maya you have installed.
- 4 Delete the *fbxmaya.lib* file.

Linux installation

- 1 Download the installation file from the Autodesk web site (<http://www.Autodesk.com>).
- 2 Remove the old plug-in from the `/usr/aw/maya<ver>/bin/plug-ins/` (where <ver> is the version of Maya you have installed,) directory by entering `% rm -f fbxmaya*.so` at the command prompt.
- 3 Type the following command to install the Maya FBX plug-in:

```
% FBX<ver>_MAYA_LINUX_ENU
```

(Where *FBX<ver>* is the version of the Maya FBX plug-in you have installed.)

The plug-in is installed to the following directory:

`/usr/aw/maya<ver>/bin/plug-ins/` (where <ver> is the version of Maya you have installed).

If Maya is installed in another folder, you can specify the path on the command line after `FBX<ver>_MAYA_LINUX_ENU /home/maya/mypath/`

(Where *FBX<ver>* is the version of the Maya FBX plug-in you have installed.)

- 4 Start Maya and navigate to Window > Settings/Preferences > Plug-in Manager.
- 5 Activate the Loaded option for *Fbxmaya.so* in the Plug-in Manager.
- 6 Activate the *Fbxmaya.so* Autoload option so Maya loads the Maya FBX plug-in automatically at start-up.

Removing the Maya FBX plug-in from Linux

- 1 In Maya, deactivate the *fbxmaya.so* Loaded and Autoload options in the Plug-in Manager.
- 2 Exit Maya.
- 3 Log into your system as root.
- 4 Remove the Maya FBX plug-in by entering the following command:

```
%rm -f /usr/aw/maya<ver>/bin/plugin/fbxmaya.so
```

1 | Installation

Linux installation

2

Importing and Exporting

This section describes how to export scenes from Maya using the *.fbx* file format and how to import them back into Maya.

It also includes a list of the Maya features supported by this version of the Maya FBX plug-in, as well as a list of improvements and enhancements for this version.

Exporting from Maya to an *.fbx* file

Note

To increase the export speed, trim insignificant weights on deformed models with Maya's Skin > Edit Smooth Skin > Prune Small Weights command.

- 1 Open the scene that you want to save as an *.fbx* file in Maya.

Note

When you create Blend Shapes in Maya, set the Timeline to the first frame, especially if there is animation. The Blend Shapes must be set to zero before export.

- 2 Select File > Export All or File > Export Selection. A file browser appears.
- 3 Select Fbx as the file type.
- 4 Use the file browser to locate the destination for your exported *.fbx* file.
- 5 Type the name of the *.fbx* file in the File Name field, and click Ok.

2 | Importing and Exporting

Exporting from Maya to an .fbx file

The FBX Exporter window appears (figure 2-1). Select the options that apply to your scene.

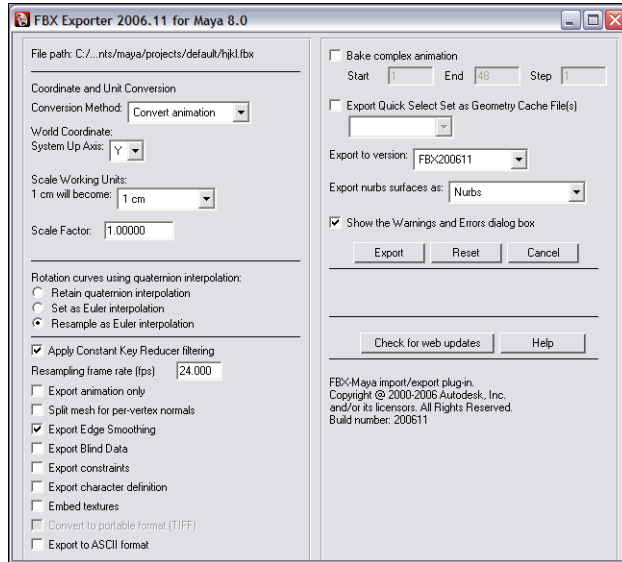


figure 2-1: FBX Exporter window

Note

Read "What's not supported in the Maya FBX plug-in" on page 32 for a list of elements that may not export correctly.

For more information about the FBX Exporter window options, see "FBX Exporter window options" on page 11.

- 6 Click Export. The exporter window shows the progress of the export process.
- 7 Open the file in MotionBuilder or another 3D package.
- 8 If you are using MotionBuilder, when you are finished, merge the animation from all layers with the Base layer using the Layers pane in the FCurves window.

FBX Exporter window options

Once you select an *.fbx* file to export from Maya, the FBX Exporter window appears (figure 2-2).

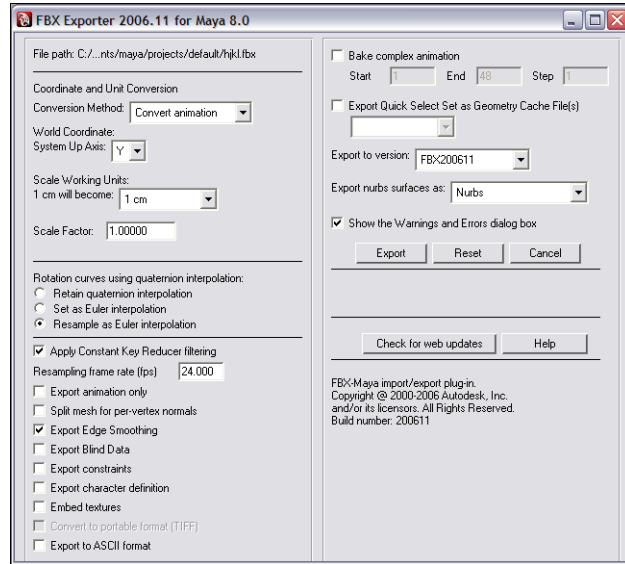


figure 2-2: FBX Exporter window

The FBX Exporter window contains the following export options:

File path

Shows the path of the file selected for export.

Coordinates and Unit Conversion area

This section lets you specify the world space in which your scene is exported.

2 | Importing and Exporting

FBX Exporter window options

The plug-in reads the World Coordinate System and/or the Scale Working units from the current scene settings and converts them to the specified space. The specified values are saved in the *.fbx* file as global settings for the scene.

Conversion Method

Use the Conversion Method menu to select from one of the following conversion methods:

Option	Function
None	No conversion takes place and the exported data is unaffected.
Convert animation	Recalculates all animation FCurves so their values reflect the new World system.
Add FBX_Root node	<p>Adds a transformation node to the top of the scene to contain the transformations needed to transport the data into the new World system.</p> <p>This option facilitates backward compatibility as it generates the <i>.fbx</i> file the same way as earlier releases of the plug-in.</p> <p>Note: <i>If the plug-in does not detect a need for the conversion, no Fbx_Root node is added.</i></p>

World Coordinate System Up Axis

Use this menu to define the up axis in your *.fbx* file. The up axis is the global axis that is pointing upwards. By default, Maya's up axis is the Y axis.

There are two choices:

- Y-axis
- Z-axis

The default for this setting is Y.

Scale working units

This area lets you set the unit of measurement you want to use in your file.

1 cm will become

Use the 1 cm will become menu to specify the units of the scene saved in the *.fbx* file from a list of commonly-used unit conversions.

By default, the plug-in offers no conversion, that is, 1 centimeter remains 1 centimeter.

Scale factor

Defines a global scale that affects the entire scene.

Rotation curves using quaternion interpolation

Lets you select options for the export of Rotation curves. Activate any of the following options to set how the plug-in processes Rotation curves:

Option	Function
Retain quaternion interpolation	Transfers quaternion interpolation flags to Maya's FCurves whenever the Maya FBX plug-in encounters rotation curves marked to be interpolated.

2 | Importing and Exporting

FBX Exporter window options

Option	Function
Set as Euler interpolation	Does not transfer quaternion interpolation flags to Maya's FCurves, and instead interpolates the FCurves in Euler space whenever the Maya FBX plug-in encounters rotation curves marked for interpolation.
Resample as Euler interpolation	Resamples rotation curves in the quaternion space and transfers the resulting curves to Maya as Euler curves. Use this method if you are experiencing problems with quaternion curves inside Maya. This is the default setting.

Apply Constant Key Reducer filtering

Deletes any redundant keyframes. This removes keyframes or keys that have the same value, which are the same as the flat sections of an FCurve.

Resampling frame rate (fps)

Sets the rate that the FBX Exporter produces keyframes when it needs to resample data.

Resampling is used when the interpolation of the Maya animation curve cannot be accurately represented by curves in MotionBuilder.

Export animation only

Activate this option to exports any animation in your scene.

When you activate this option, the plug-in ignores any non-animated objects and replaces all animated objects with NULL objects, creating a smaller file containing animation but no geometry, lights, or cameras.

Split mesh for per-vertex normals

Activate this option for the *.fbx* file to support normal per-polygon vertices. It duplicates the vertices at the polygons, creating the effect of hard edges.

Note

This option was previously named Export hard edges.

Export Edge Smoothing

When this option is active, the plug-in exports the required information for identifying edges that are defined as hard or smooth. This option does not duplicate the vertices as is done by the Split Mesh for per-vertex normals option.

This setting is active by default.

Export Blind Data

Blind Data is information stored with polygons that is not used by Maya in any way, but is useful to the platform to which the polygons are exported, such as a games engine.

Activate this option if you want to save any Blind Data stored with the polygons so that it will be available for later use.

Export constraints

Activate this option to include all constraints in the file on export.

2 | Importing and Exporting

FBX Exporter window options

When this option is disabled, the export process ignores all the constraints defined in the Maya scene and does not include them in the *.fbx* file.

The default setting is active.

Export character definition

Activate this option to include character definition in the file on export.

When this option is disabled, the character definition in the Maya scene does not export to the *.fbx* file.

Embed textures

Activate this option to copy the texture and material files associated with the file into the *.fbx* file, so that they are not referred to from the hard disk.

Convert to portable format (TIFF)

Activate this option to convert textures into *.tiff* format, which makes them readable on other platforms.

Export to ASCII format

Activate this option to save the *.fbx* file in ASCII format.

Bake complex animation

Evaluates the animation of objects that are not directly supported, such as Handles, Expression constraints, and so on. This is done between the frames specified in the Start and End fields.

Baking the animation increases portability between 3D packages.

Set the following parameters:

Parameter	Function
Start	The first frame to be evaluated. All animation before the start frame is not included in the baked file.
End	The last frame to be evaluated. All animation after the End frame is not included in the baked file. When you click Export, the scene is baked from the Start time until the End time.
Step	The increment used when baking the animation between the Start and End times.

Export Quick Select Set as Geometry Cache file(s)

Creates a cache file for the Quick Select Set that to be referenced by the *.fbx* file so that the Quick Select Set is available after conversion.

Three files are generated when you activate this option:

- an *.fbx* file,
- an *.xml* file
- a *.mc* file

The *.xml* and *.mc* files are stored in a sub-folder that is named for the *.fbx* file and has the extension *.fpc*.

For example, if you export a scene containing a cube named pCube1 to the *.fbx* file *myTest.fbx*, you create the following files:

- *myTest.fbx*
- *myTest.fpc*

2 | Importing and Exporting

FBX Exporter window options

- *pCubeShape1.xml*
- *pCubeShape1.mc*

Note	<i>This option is only available with the plug-in for Maya 8.0.</i>
-------------	---

Export Quick Select Set menu

Choose a set from the list.

Note	<i>This item is available only if the Export Quick Select Set as Geometry Cache file(s) option is active.</i>
-------------	---

Export to version

Exports your file to a legacy *.fbx* file format.

Expand the Version menu to choose a different *.fbx* version. See "FBX Versions" on page 20 for more information about each different *.fbx* file format version.

Export NURBS surfaces as

This option lets you choose how the plug-in exports NURBS surfaces. Select from the 3 options:

Option	Function
NURBS	NURBS surfaces are not converted and their definition is stored in the <i>.fbx</i> file.

Option	Function
Interactive display mesh	NURBS surfaces are converted to a mesh object (tessellated) using the values that best imitate the interactive display settings.
Software render mesh	NURBS surfaces are converted to a mesh object (tessellated) with the same resolution used by the software renderer.

Show the Warnings and Errors dialog box

Lets you disable the Warnings and Errors dialog box that may appear during the import/export process.

The default setting is Active.

Export

Starts the export process.

Reset

Restores the FBX Exporter window's default values.

Cancel

Closes the FBX Exporter window without performing any action.

Check for web updates

Opens a browser window and searches the Autodesk web site for newer versions of the plug-in.

2 | Importing and Exporting

FBX Exporter window options

Help

Accesses the Maya FBX Plug-in Guide (in .pdf format).

FBX Versions

The following table lists the different versions available for you to select from the Export to version menu in the FBX Exporter window.

Version	Description
FBX200611	Select this version to use your file with the latest version of the Maya FBX plug-in (for example, version FBX200611). Note: Do not use this version to export from Maya into MotionBuilder 7.5. Use the FBX200602_MB75.
FBX200608	Select this version to use your file with the 200608 version of the Maya FBX plug-in. Note: Do not use this version to export from Maya into MotionBuilder 7.5. Use the FBX200602_MB75.
FBX200602_MB75	Select this version to use your file with MotionBuilder 7.5 and its associated plug-ins (for example, version FBX200602). Note: Use this option to export Maya files into MotionBuilder 7.5. Otherwise, NURBS are lost and mesh normals may be inverted. In this mode, normals in normal per polygon/vertex mode are transformed to normals per vertex and hard edges become smooth edges.

2 | Importing and Exporting

Importing .fbx files into Maya

Version	Description
FBX200508_MB70	Select this version to export into a format that can be read by MotionBuilder 7.0 and its associated plug-ins (for example, version FBX200508).
FBX60_MB60	Select this version to export into a format that can be read by MotionBuilder 6.0 and its associated plug-ins).
FBX53_MB55	Select this version to export into a format that can be read by MotionBuilder 5.5 and its associated plug-ins).

Importing .fbx files into Maya

The following procedure is for importing an .fbx file into Maya.

Files remain backward compatible, for example, a file saved with FBX53_MB55 can be read by applications supporting FBX60_MB60, FBX200508_MB70 and FBX200602_MB75.

To import an .fbx file into Maya:

- 1 In Maya, select File > Import. A file browser appears.
- 2 Select Fbx as the file type.

Note

If you do not select .fbx as the file type, MAC OS X systems runs the image viewer “Check” program instead of loading the file.

- 3 Locate the .fbx file that you want to import.

2 | Importing and Exporting

Importing .fbx files into Maya

The FBX Importer window appears (figure 2-3).

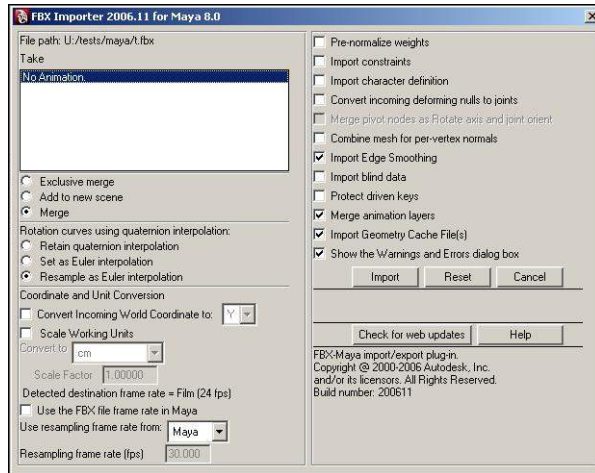


figure 2-3: FBX Importer window

- 4 Activate any options that you want applied to your scene.

For information about the options in the FBX Importer window, see "FBX Importer window options" on page 23.

Note

Read "What's not supported in the Maya FBX plug-in" on page 32 for a list of elements that may not import correctly.

- 5 Click Import.

FBX Importer window options

Once you select an *.fbx* file to import into Maya, the FBX Importer window appears (figure 2-4).

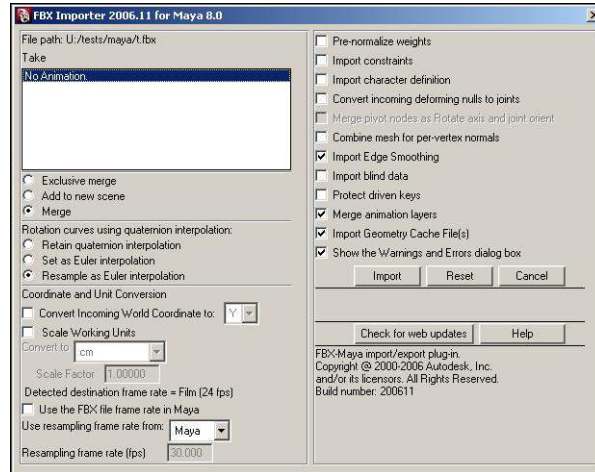


figure 2-4: FBX Importer window

The FBX Importer window contains the following import options:

File path

Shows the path of the file selected for import.

Take

Displays the takes included in the scene. Click a take to select it for import.

Note

You can only select one take at a time.

2 | Importing and Exporting

FBX Importer window options

Option	Function
Exclusive merge	Transfers animation into nodes that exist in both the current Maya scene and the <i>.fbx</i> file. No new nodes are created.
Add to new scene	Imports your data into a new scene.
Merge	Merges the imported <i>.fbx</i> file to the current scene by creating any node without its equivalent in the scene. Nodes with the same name but not of the same nature, for example, sphere and bone, are replaced. Nodes with the same name and nature have only their animation replaced. This is the default setting.

Rotation curves using quaternion interpolation

Lets you select options for the import of Rotation curves. Activate any of the following options to set how the plug-in treats Rotation curves:

Option	Function
Retain quaternion interpolation	Transfers quaternion interpolation flags to Maya's FCurves whenever the Maya FBX plug-in detects rotation curves marked to be interpolated.
Set as Euler interpolation	Does not transfer quaternion interpolation flags to Maya's FCurves, and instead interpolates the FCurves in Euler space whenever the Maya FBX plug-in detects rotation curves marked to be interpolated.

Option	Function
Resample as Euler interpolation	Resamples rotation curves in the quaternion space, and transfers the resulting curves to Maya as Euler curves. Use this method if you are experiencing problems with quaternion curves inside Maya. This is the default setting.

Coordinate and Unit Conversion

This section lets you specify the world space in which your scene is imported.

The plug-in processes the conversions of the World Coordinate System and/or the Scale Working units defined in the .fbx file, as well as the options you set.

Note	<i>This conversion affects only the incoming data. Maya's settings are not changed.</i>
-------------	---

Convert incoming World coordinate to

Activate this option so you can use the menu to select a Y- or Z-up axis convention for the import of your file.

If this option is disabled, the menu is grayed out and displays the current Maya world coordinate setting.

World Coordinate System Up axis

Use this menu to define the up axis in your .fbx file. The up axis is the global axis that is pointing upwards. By default, Maya's up axis is the Y axis.

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FBX Importer window options

There are two choices:

- Y-axis
- Z-axis

The default setting is Y.

Scale Working Units

Activate this option so you can specify units to import data from the *.fbx* file. Use the 1 cm will become list to choose from commonly-used conversion units.

Convert to

Use the Convert to menu to specify the units of the scene saved in the *.fbx* file from a list of commonly-used unit conversions.

By default, the plug-in offers no conversion, that is, 1 centimeter remains 1 centimeter.

Scale factor

Defines a global scale that affects the entire scene.

Detected destination frame rate

Shows Maya's current frame rate.

Use FBX file frame rate in Maya

Activate this option to import the frame rate from the *.fbx* file. This overwrites the rate used in Maya.

Use resampling frame rate from

Lets you choose a resampling frame rate for the plug-in to use when it resamples FCurves.

Choose from the following options:

Option	Function
Maya (default)	Retains Maya's current frame rate.
FBX	Changes Maya's frame rate to the one specified in the <i>.fbx</i> file.
Custom	Activates the Resampling Frame Rate field.

Resampling frame rate (fps)

Sets the rate at which the importer produces keyframes when it needs to resample data.

Resampling is needed when the interpolation of the Maya animation curve cannot be perfectly represented by curves in MotionBuilder.

Pre-normalize weights

Activate this option if you notice unusual skin weighting, as this option forces the *.fbx* file's weights to conform to Maya's conventions.

Depending on the size of your scene, this process may take several minutes.

Import constraints

Imports all constraints into the new scene.

When this option is disabled, all the constraints defined in the *.fbx* file are ignored by the importing process and are not present in the Maya scene.

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FBX Importer window options

The default setting is active.

Note

When using Exclusive Merge or Merge, activating this option does not import constraints.

Import character definition

Imports Character Definitions into the scene.

When this option is disabled, the Character definition in the *.fbx* file is not imported into the Maya scene.

Convert incoming deforming nulls to joints

Converts deforming nulls into Maya bones.

This option was originally provided because Maya did not support null elements (that is, transform nodes that are not joints,) within a bone hierarchy).

While Maya now supports this, in some cases using this option improves the skinning behavior.

Merge Pivot nodes as Rotate axis and joint orient

Activate this option only when you use older *.fbx* files.

Assigns the rotation transformation of the null (or joints) elements in the hierarchy that are used as pre- and post-rotation to the joint orient and the rotate axis of the original node.

The pre-rotation and post-rotation nodes are then deleted. Older files created with the Export Pre/Post Rotation as Nulls option are merged back to the original Maya setup.

Combine mesh for per-vertex normals

Activate this option to merge vertex duplication previously created by the Export option Split mesh for per vertex normals. See "Split mesh for per-vertex normals" on page 15.

Note

This option was previously named Import hard edges.

Import Edge Smoothing

When this option is active, the plug-in exports the required information for identifying edges that are defined as hard or smooth and sets the polygon edges with the saved state.

If you disable this option, these states are discarded and Maya recomputes the normals with internal algorithms. All hard edges are lost.

This setting is active by default.

Import blind data

Blind Data is information stored with polygons that is not used by Maya in any way, but is useful to the platform to which the polygons are exported, such as a games engine.

Activate this option if you want to save any Blind Data stored with the polygons so that it will be available for later use.

Protect driven keys

Prevents any channels with driven keys from being overwritten by the incoming animation.

2 | Importing and Exporting

FBX Importer window options

Merge animation layers

Computes the effect of all animation layers and transfers the resulting animation to Maya whenever multiple layers of animation are used.

Import Geometry Cache file(s)

Loads cache file(s) referenced by the *.fbx* file.

Note

This option is only available with the plug-in for Maya 8.0.

Show the Warnings and Errors dialog box

Lets you disable the Warnings and Errors dialog box that may appear during the import/export process.

The default setting is Active.

Import

Begins the import process.

Reset

Restores the FBX Importer window's default values.

Cancel

Closes the FBX Importer window, without performing any action.

Check for web updates

Opens a browser window and searches the Autodesk web site for newer versions of the plug-in.

Help

Accesses the Maya FBX Plug-in Guide in *.pdf* format.

What's supported in the Maya FBX plug-in

The Maya FBX plug-in supports the following Maya functionalities:

- Texture maps
- Collada format (beta-level support only). When exporting from Collada to *.fbx* format, use the Y-Axis option from the World Coordinate System Up Axis menu and the Add FBX_Root node option from the Conversion Method menu.
- Maya Point, Orient, Scale, Parent, Chain IK, Aim and Character constraints.
- Full Body IK.
- NURBS and Polygons.
- Skeletons.
- Cluster deformations, Smooth and Rigid bindings
- User attributes.
- Plateau interpolation.
- COLLADA format now supports texture channels.
- File textures.
- Texture mapping is converted as UV Maps. Texture placement and rotation is supported. Image maps on all channels.
- Expressions, Driven Keys and Constraints.
Supported, but with a conversion. You must bake on export. See "Bake complex animation" on page 16.
- Pivots.
- Lights.

2 | Importing and Exporting

What's not supported in the Maya FBX plug-in

Intensity value, animation, as well as color value and animation are supported.

- Cameras.
Squeeze ratio, Near and Far plane values, Aperture width, Height, FOV, and Focus Length.
- Phong and Lambert standard materials are supported directly with no conversion. Blinn materials are converted to Phong.
- Light property Decay rate and Decay start settings for light properties and near/far attenuation.

Note

The Maya FBX plug-in stores the near/far attenuation as dynamic attributes on the light nodes to preserve them during the import and export process.

- Blend Shape deformations.
Supported, provided that the target(s) are not deleted. Blend shape weights are ignored on export, and remain unchanged on import.

Note

The Maya FBX plug-in only supports Blend Shapes that have a "Deformation Order" that is upstream, that is, Before, FrontOfChain or Default.

What's not supported in the Maya FBX plug-in

The Maya FBX plug-in does not support the following Maya features:

- Procedural textures.
- Deformers.

Deformers other than clusters, or Smooth or Rigid binding, are not supported.

- Subdivs.

- Curves.

Curves show up as nulls (locators) in MotionBuilder.

- Groups.

Parent geometry instead.

- Use File Textures and Polygon projections.

Bake (Hypergraph>Convert to File Textures) any procedural textures (Grid, Ramp, and so on) that have a UV rotation (Place 2D texture node).

In MotionBuilder the UV rotation has a corner pivot instead of Maya's center pivot.

What's new

The following section contains the new features, bug fixes, and known limitations for this version of the Maya FBX plug-in:

New features

- This version of the Maya FBX plug-in contains many enhancements intended to optimize the transfer of files. These improvements have been made to further stabilize and improve the behavior of the previous version (200608) of the plug-in.
- Added support for image maps on all channels on import and export.

2 | Importing and Exporting

Known limitations

- Support for Decay rate and Decay start settings for light properties, as well as near/far attenuation.

Note

The Maya FBX plug-in stores the near/far attenuation as dynamic attributes on the light nodes to preserve them during the import and export process.

- The Maya FBX plug-in is compatible for export to the 2006.11 version.
- Import and export to COLLADA format now supports texture channels.

Bug fixes

- A problem with exporting to .dxf format (DXF_FBX) where object names caused a “Invalid or incomplete DXF input” error has been corrected.
- Textured layers are now added in the correct order.
- The plug-in now correctly supports pre/post-infinity attributes on Maya animation curves.
- A problem involving the CV weighting export/import/write of NURBS has been fixed.
- A connection bug involving Transparency has been fixed.
- Problems with the display of optical marker locators have been resolved.
- You can now export multiple regions on a trim surface.

Known limitations

This section lists the known limitations of the Maya FBX plug-in:

2 | Importing and Exporting

Known limitations

- Instanced geometry incorrectly exported. When exporting scenes with instanced geometry, the geometry is duplicated but is parented under the original's parent, creating incorrect positioning.
- Bump texture Depth values not saved. The Maya FBX Plug-in does not retain Bump texture Depth values on import or export, and resets all Depth values to 1 on export regardless of their original value.
- You may encounter memory issues when using large architectural scenes. If this problem occurs, keep the scene minimal and try to avoid an excessive polygon count.
- Currently a limitation exists where Blinn materials are converted to Phong.
- The Visibility FCurve adjusts itself to contain a value of only 0 or 1. Also the FCurve is converted to Constant (step) interpolation. Therefore, any value above 0 is considered as 1 (visible) and any value below or equal 0 is considered 0 (invisible).

When exporting, if the Tangent type is Slow or Fast, the Maya FBX plug-in resamples FCurves. They are also resampled if the OutTangent is Linear and the InTangent is different, or the OutTangent is Flat, Smooth, or Fixed and the InTangent is not Flat, Smooth or Fixed.

- Nurbs display precision is supported and exported as StepU and StepV parameters in MotionBuilder. Both U and V are assigned the same value; as in Maya, its value is unique. Values of the Precision parameters are clamped to a maximum of 15 (the software's limit).

Note

When importing, the larger value between StepU and StepV is used.

- Maya's Ambient Area and Volume lights are not supported.

2 | Importing and Exporting

Known limitations

- The Maya FBX plug-in is only capable of processing upstream Blend Shape deformers. Default mode is supported but In-Between and Global modes are not.
- A renaming strategy is used when there are multiple instances of the same name in a scene, as well as any Upper/Lower case conflicts. See "Renaming strategy" on page 36 for details on how this renaming is applied.

Renaming strategy

When the Maya FBX plug-in discovers objects or elements that have the same name, a naming conflict occurs. The plug-in compensates for this by renaming the elements on import or export. The same is true for any upper- and lower-case conflicts.

The following is a description of what happens:

Redundant names

When the Maya FBX plug-in finds multiple instances of the same name in the scene, a symbolic code is used. The Maya FBX plug-in can read older files, although it no longer writes them this way.

The new suffix is then: `_ncl1_x` (where `x` is the instance number).

Case conflicts

When the Maya FBX plug-in finds upper- and lower-case conflicts in the names of objects or elements in the scene, a more complex suffix is used to keep track of which character was/is upper- or lower-case so it can be converted back on import/merge.

The following suffixes are used to indicate the case:

Situation	Suffix
Indicates case	<code>_ncl2</code>

2 | Importing and Exporting

Known limitations

Situation	Suffix
To depict characters that were originally upper case and have become lower case	_ulXXXX
To depict characters that were originally lower case and have become upper case	_luxxxx Where xxxx is a four-digit integer representing the character position in the string (bit-wise). For example, _ul5 indicates that the first and third characters in the string have been changed from upper to lower case. A suffix can be made of the combination of _ul and _lu sub-suffixes.

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Known limitations

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Maya MEL Scripting

This section contains scripts required for scripting with Maya MEL commands.

All of the Maya FBX plug-in's MEL commands begin with the FBX prefix. When error conditions are encountered, they will display error messages in the Script Editor window. The MEL commands that are registered by the Maya FBX plug-in are listed in the Plug-in Manager information dialog box.

Note

To use the following MEL commands, the Maya FBX plug-in must be installed on your computer.

FBXExport -f [filename]

Exports the specified file. If FBXExportShowUI is True, the Export dialog box is shown.

FBXExportShowUI -v [true | false]

True

Displays the Export dialog box each time user clicks File > Export or uses the FBXExport MEL command.

False

Never displays the Export dialog box. The only way to have the Export dialog box displayed again is to set this flag to True by using this MEL command or by checking the appropriate check box in the Batch dialog box.

3 | Maya MEL Scripting

FBXExportHardEdges -v [true|false]

FBXExportHardEdges -v [true | false]

Duplicates all vertices in the scene's meshes for each polygon connected to them. The vertices' normals are set accordingly, depending on whether they are connected to a hard or smooth edge.

Note

This function allows MotionBuilder to display hard edges.

If two vertices are located exactly at the same position, a warning is issued, as this causes unpredictable results when FBXImportHardEdges is set to True.

This command is the script version of the FBX Exporter window's Split mesh for per Vertex Normals option. See "Split mesh for per-vertex normals" on page 15.

FBXExportConstraints -v [true | false]

Causes all the constraints defined in the Maya scene to be ignored by the exporting process, and excluded from the .fbx file.

FBXExportCharacter -v [true | false]

Causes the export of Character definition in the Maya scene to be excluded from the .fbx file.

FBXExportApplyConstantKeyReducer -v [true | false]

True

Filters FBX animation FCurves through a Constant Key reducer. This eliminates constant keys on a FCurve and helps to reduce the size of resampled FCurves, especially Scale.

FBXExportEmbeddedTextures -v [true|false]

False

Setting this command to False ensures that the animation data is not filtered.

FBXExportEmbeddedTextures -v [true | false]

True

Saves all textures in the *.fbx* file. This command performs the same action as the Embed Textures option in the FBX Exporter window.

FBXExportQuaternion -v [quaternion | euler | resample]

This command has the same definition as the FBXImportQuaternion but works in the reverse.

FBXExportBakeComplexAnimation -v [true | false]

This command is the script equivalent of the Bake complex animation option. See "Bake complex animation" on page 16.

FBXExportBakeComplexStart -v int

This command is the script equivalent of the Bake complex animation option's Start field. The passed value is an integer number. See "Start" on page 17.

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FBXExportBakeComplexEnd -v int

FBXExportBakeComplexEnd -v int

This command is the script equivalent of the Bake complex animation option's End field. The passed value is an integer number. See "End" on page 17.

FBXExportBakeComplexStep -v int

This command is the script equivalent of the Bake complex animation option's Step field. The passed value is an integer number. See "Step" on page 17.

FBXResetExport

This command is the script equivalent of the FBX Exporter window's Reset button. See "Reset" on page 19.

FBXExportAxisConversionMethod [none | convertAnimation | addFbxRoot]

This command is the script version of the FBX Exporter window's Conversion Method menu. See "Conversion Method" on page 12.

FBXExportUpAxis [y | z]

This command is the script version of the FBX Exporter window's Convert Incoming World Coordinate system Up axis menu. See "World Coordinate System Up axis" on page 25.

FBXExportScaleFactor value

(Where *value* is a float number.)

This command is the script version of the FBX Exporter window's Scale Factor field. See "Scale factor" on page 13.

FBXConvertUnitString [mm|cm|m|km|in|ft |yd|mi]

This command returns the scale factor required to convert one cm to the specified unit and is the script version of the 1cm will become menu in the FBX Exporter and Importer windows.

FBXExportCacheFile -v [true|false]

This command is the script version of the FBX Exporter window's Export Quick Select Set as Geometry Cache file option. See "Export Quick Select Set as Geometry Cache file(s)" on page 17.

FBXExportEdgeSmoothing -v [true|false]

This command is the script version of the FBX Exporter window's Export Edge Smoothing option. See "Export Edge Smoothing" on page 15.

FBXExportQuickSelectSetAsCache -v "setName"

This command stores the setName as the set to be used when exporting the cache file.

This command does not validate the received string. However, if the string used here does not correspond to an existing (and valid) set in the Maya scene, the cache export fails.

FBXExportQuickSelectSetAsCache -q

This command returns the current set name as defined by the last call to FBXExportQuickSelectSetAsCache. See "FBXExportQuickSelectSetAsCache -v "setName"" on page 43.

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FBXImportAxisConversionEnable -v [true|false]

FBXImportAxisConversionEnable -v [true|false]

This command is the script version of the FBX Importer window's Convert Incoming World Coordinates to option. See "Convert incoming World coordinate to" on page 25.

FBXImportScaleFactorEnable -v [true|false]

This command is the script version of the FBX Importer window's Scale Working units option. See "Scale working units" on page 13.

FBXImportScaleFactor value

(Where *value* is a float number.)

This command is the script version of the FBX Importer window's Scale Factor menu. See "Scale factor" on page 26.

FBXImportUpAxis [y|z]

This command is the script version of the FBX Importer window's World Coordinate system up axis menu. See "World Coordinate System Up axis" on page 25.

FBXImportEdgeSmoothing -v [true|false]

This command is the script version of the FBX Importer window's **Import Edge Smoothing** option. See "Import Edge Smoothing" on page 29.

FBXImportCacheFile -v [true|false]

This command is the script version of the FBX Importer window's Import geometry Cache file(s) option. See "Import Geometry Cache file(s)" on page 30.

FBXImport -f [filename] -t [take index]

Imports the specified file. If FBXImportShowUI is True, the Import dialog box is shown.

The file imported is the one accessible for take querying after the execution of the command.

FBXImportShowUI -v [true|false]

Once FBXImportShowUI is set to False, the user interface does not appear until FBXImportShowUI is set to True.

There are two possible states:

True

Shows the Import dialog box each time you click File > Import or use the FBXImport MEL command.

False

Hides the Import dialog box. The only way to show the Import dialog box again is to set this flag to True with this MEL command or by checking the corresponding check box in the Batch dialog box.

3 | Maya MEL Scripting

FBXImportHardEdges -v [true|false]

FBXImportHardEdges -v [true|false]

Merges back all vertices located at the same exact position as a unique vertex. The Maya FBX plug-in then determines if the edges connected to each vertex are hard edges or smooth edges, based on their normals.

Use this function when FBXExportHardEdges is set to True on export.

This command is the script version of the FBX Importer window's Combine Mesh for per Vertex Normals option. See "Combine mesh for per-vertex normals" on page 29.

FBXImportConstraints -v [true|false]

Causes all constraints defined in the *.fbx* file to be ignored by the importing process and excluded from the Maya scene.

FBXImportCharacter -v [true|false]

Causes the import of the Character definition in the *.fbx* file to be excluded from the Maya scene.

FBXImportMergeBackNullPivots -v [true|false]

True

Assigns the rotation transformation of the null (or joints) elements in the hierarchy that are used as pre-rotation and post-rotation to the joint orient and the rotate axis of the original node.

The pre-rotation and post-rotation nodes are then deleted.

The look-up is done by name as the pre-rotation node's name contains the “__Pre_” suffix, while the post-rotation node's name has a “__Post_” suffix.

FBXImportConvertDeformingNullsToJoint -v [true|false]

Use this function only when the scene was exported using the FBXExportReplacePivotsByNulls script set to True.

Note

When the import mode is set to Exmerge or Merge this option is automatically set to True.

FBXImportConvertDeformingNullsToJoint -v [true|false]

Converts deforming nulls into Maya bones.

True

Transforms all null elements into joint nodes.

Note

This option was originally provided because Maya did not support null elements (that is, transform nodes that are not joints,) within a bone hierarchy.

While Maya now supports this, in some cases this option improves the skinning behavior.

FBXImportMode -v [exmerge|add|merge]

This command has three possible states:

Exmerge

Merges the imported *.fbx* file to the current scene in the following way:

Nodes of the same name and nature have only their animation curve replaced. No new nodes are created.

Add

Creates a new scene prior to the file import.

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FBXImportOverrideNormalsLock -v [true|false]

Merge

Merges the imported *.fbx* file to the current scene in the following way: any node without its equivalent in the scene is created. Nodes with the same name but not of the same nature, for example, sphere and bone, are replaced. Nodes with the same name and nature only have their animation replaced.

FBXImportOverrideNormalsLock -v [true | false]

Overrides the default Maya locking of normals.

True

Recomputes the normals on the objects using Maya internal algorithms.

FBXImportQuaternion -v [quaternion | euler | resample]

Lets you specify how quaternion rotations should be treated on import into Maya. This option compensates for differences between Maya quaternions and MotionBuilder quaternions.

FBXImportResamplingRateSource -v [Maya | FBX | Custom]

This command is the script equivalent of the Use resampling frame rate from option. See "Use resampling frame rate from" on page 26.

FBXImportSetMayaFrameRate -v [true | false]

This command is the script equivalent of the Use FBX file frame rate in Maya option. See "Use FBX file frame rate in Maya" on page 26.

FBXExportConvert2Tif -v [true|false]

This command is the script version of the FBX Exporter window's Convert to portable format (TIFF) option. See "Convert to portable format (TIFF)" on page 16.

Note

You can use this option only if the "Embed textures" option is enabled.

FBXResetImport

This command is the script equivalent of the FBX Importer window's Reset button. See "Reset" on page 30.

FBXRead -f [filename]

Reads the specified .fbx file without importing anything into Maya. The file is instead stored in a buffer. This command is used for take querying.

Once read or imported, use the commands FBXGetTakeCount, FBXGetTakeName, FBXGetTakeIndex for take querying.

Note

The file you are reading must match an existing file name, otherwise the file in the buffer is destroyed if you attempt to read or import a non-existent file.

FBXGetTakeCount

Returns the number of takes saved in the file stored in the file buffer.

Load a file into the file buffer using the FBXRead command.

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FBXGetTakeIndex [take name]

FBXGetTakeIndex [take name]

Returns the index of the first take named as the parameter in the take array. This command uses the file stored in the file buffer.

Load a file into the file buffer using the FBXRead command.

FBXGetTakeName [index]

Returns the name of the take at the specified index in the take array. This command uses the file stored in the file buffer.

Load a file into the file buffer using the FBXRead command.

FBXGetTakeComment [index]

Returns the comment attached to the take at the specified index in the take array. This command uses the file stored in the file buffer.

Load a file into the file buffer using the FBXRead command.

FBXGetTakeLocalTimeSpan [index]

Returns the local start and local stop time of the take at the specified index in the take array. This command uses the file stored in the file buffer.

Load a file into the file buffer using the FBXRead command.

FBXGetTakeReferenceTime Span [index]

Returns the reference start and stop times of the take at the specified index in the take array. This command uses the file stored in the file buffer.

Load a file into the file buffer using the FBXRead command.

FBXBatchDialog

Displays the Batch dialog box. This box contains all the import and export controls displayed by the Import dialog box and the Export dialog box, plus a check box to enable or disable those user interfaces.

The Batch Dialog box must be opened from the script editor. Since you must use this MEL command to disable the import/export user interfaces, you can call it again when you want to re-enable the import/export user interfaces.

FBXResamplingRate -v [float]

Sets the rate at which the exporter produces keyframes when it needs to resample data.

Resampling is needed when the interpolation of the Maya animation curve cannot be perfectly represented by curves in MotionBuilder.

FBXCheckForWebUpdates [no arguments]

The script version of the Check for web updates button in the Importer and Exporter windows. See "Check for web updates" on page 19.

3 | Maya MEL Scripting

FBXCheckForWebUpdates [no arguments]