Welcome to 3DXchange

About 3DXchange

Welcome to **3DXchange**, the most powerful bridge for you to connect iClone with the 3D models world-wide. In addition to the 3DS and OBJ files, you may also utilize the SKP files, created by SketchUp, to create your own 3D imaginary world. Downloading 3D model from 3D warehouse means to compact the entire 3D world as your own 3D vault! You can adjust the material settings, such as color, opacity, self-illumination, of props, accessories or 3D scenes prior to apply them in iClone.

System Requirements

The following system specification is required to run 3DXchange software:

- Pentium III 600 MHz (Pentium 4 :1GHz or higher recommended)
- 256 MB RAM (512 MB RAM or higher recommended)
- 1 GB hard disk (or higher recommended)
- Display Resolution: High Color (24-bit) or True Color (32-bit)
- Support for DirectX 8.1 Graphics Card (DX9 and above recommended)
- Video Memory: 32 MB (64MB+ recommended)
- OS: Windows Vista/XP/2000
- Active Internet connection for serial number activation
- A video card compatible with Pixel Shader 1.0 is recommended for optimized visual performance

Key Features

The key features for **3DXchange** include:

New Features

- Support SKP files from **SketchUp**.
- Direct Picking and Multiple Item Selection.
- Rename Nodes - An effective way to manage your model items.
- Export Selected objects - Easier to extract your selected items from the whole scene.
- Enhanced Facing and Material Editing - transparency, illumination, and weld vertex.
- Exclude SKP back faces - A crucial way to save polygon count.
- Hide Excluded Items - This feature simplify scene tree display if users has cleaned up unnecessary back faces.
- Seamless Workflow between **3D Warehouse, Google Sketchup** and **3DXchange2**.
    - **Google 3D Warehouse** - Unlimited Free Access to the largest collaborated 3D model library.
    - **Google SketchUp** - Free 3D Modeling Tool with native format support to **iClone.**
    - Scratch build any 3D model via the most easy-to-use 3D modeling tool.
    - Auto prompt save skp file when download **3D Warehouse** model directly from **3DXchange**.

Import and Convert 3D Files

- Tools designed for building up massive iClone model libraries - Scenes, Props, and Accessories.
- Load and convert 3DS and OBJ files into iClone VNS formats.
- Load iClone VNS files for material attribute editing, pivot setting, or bring back individual elements from Merged Props.
- Full texture conversion - unwrapped UV, multi sub-material texturing, diffuse, bump, opacity.
- Texture format supported: JPG, BMP, PNG, TGA, TIFF.
- Support 3DS animation data import and export (spline not supported).
- Model Export Filter: check on/off using the Scene Tree to determine what models or model object components are exported to the final VNS file.

Transformation, Material Editing and Attribute Setting

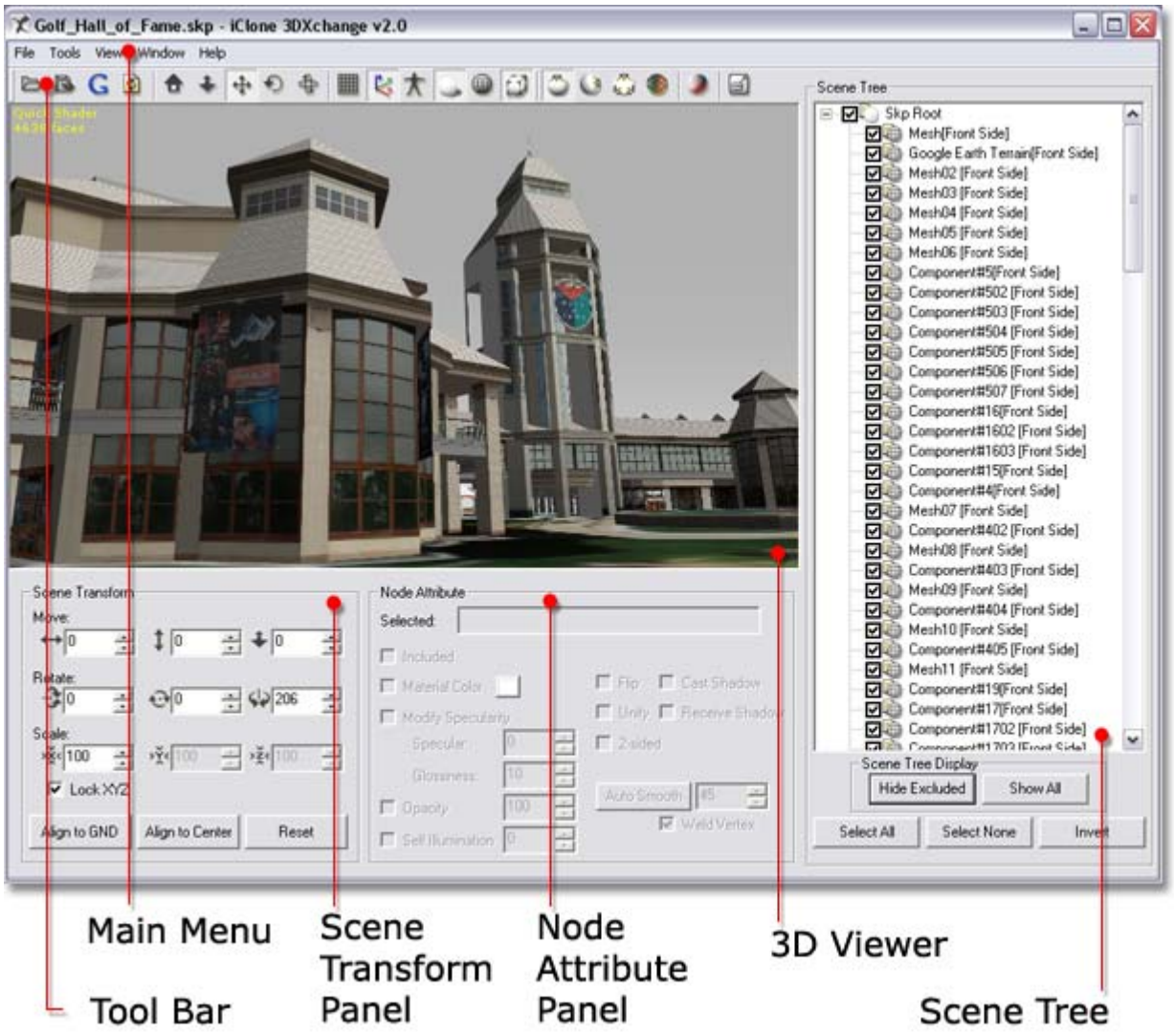
- Material Editing: material color, glossiness, specular (how shiny the material appears, eg. plastic, metal, glass).
- Normal Correction: 2-sided, flip, unify.
- iClone Shadow Attribute Setting: Cast Shadow , Receive Shadow.
- Scene Transformation: Rotation, Translation, Scaling.
- Quick Align to Center and Ground: Auto move the scene to the origin or align scene elements to iClone root ground position.
- Edge Smoothness: define hard or soft edge by specified angle threshold.
- Pivot Setting: set pivot for rotation in iClone - eg. door - rotate based on edge, wheels - rotate based on center:

Ease-of-use Design

- Drag and Drop file import: SKP, 3DS, OBJ or VNS file formats.
- Scene Tree: multiple elements selection for node attributes editing.
- Quick project reload - press F5 to reload last project, effective tuning loop for model creation.
- Auto locate and export VNS files to specified iClone folder - Scene, Props, Accessories, user define.
- Keep last folder file saved path assigned to save repetitive path finding efforts.

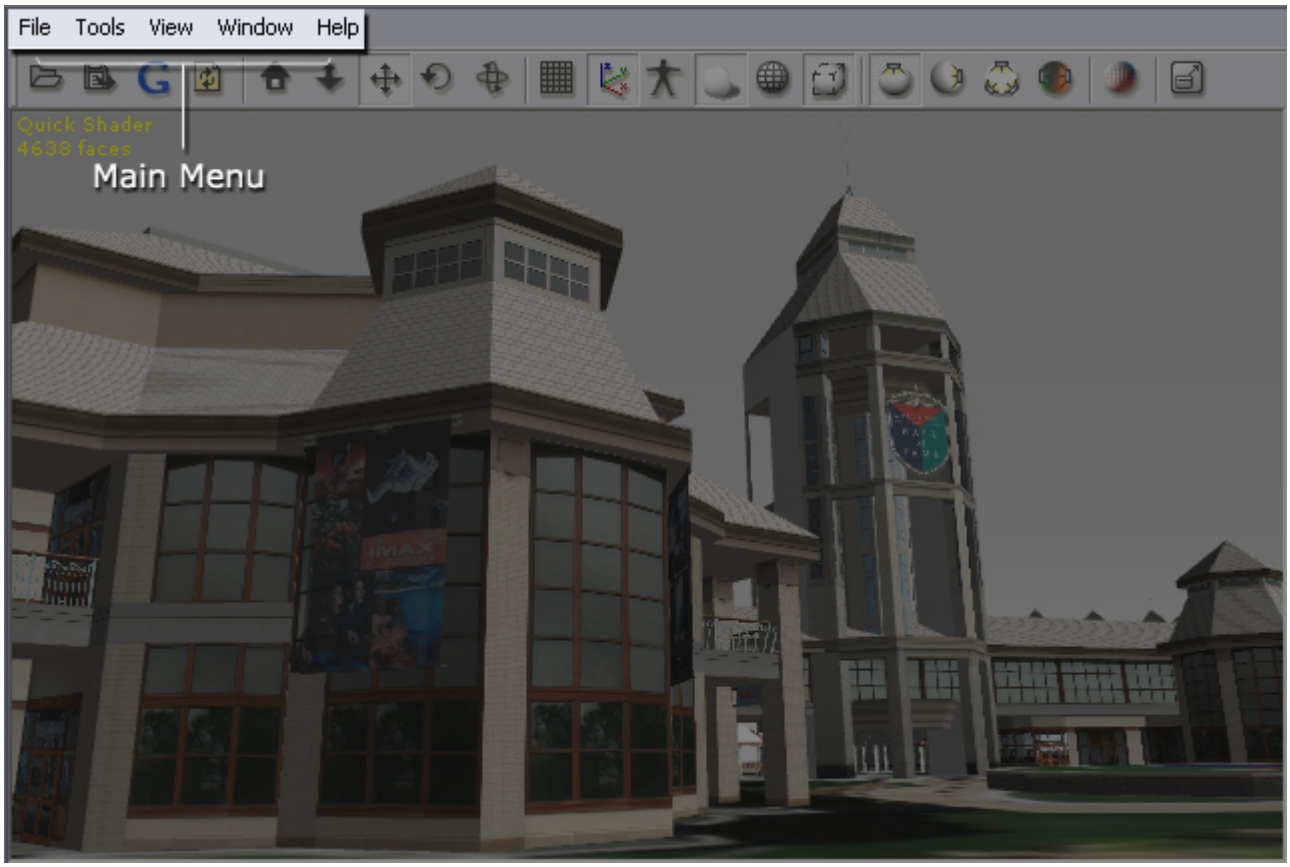
User Interface Introduction

The user interface of 3DXchange is divided into 6 sections:



User Interface - Main Menu

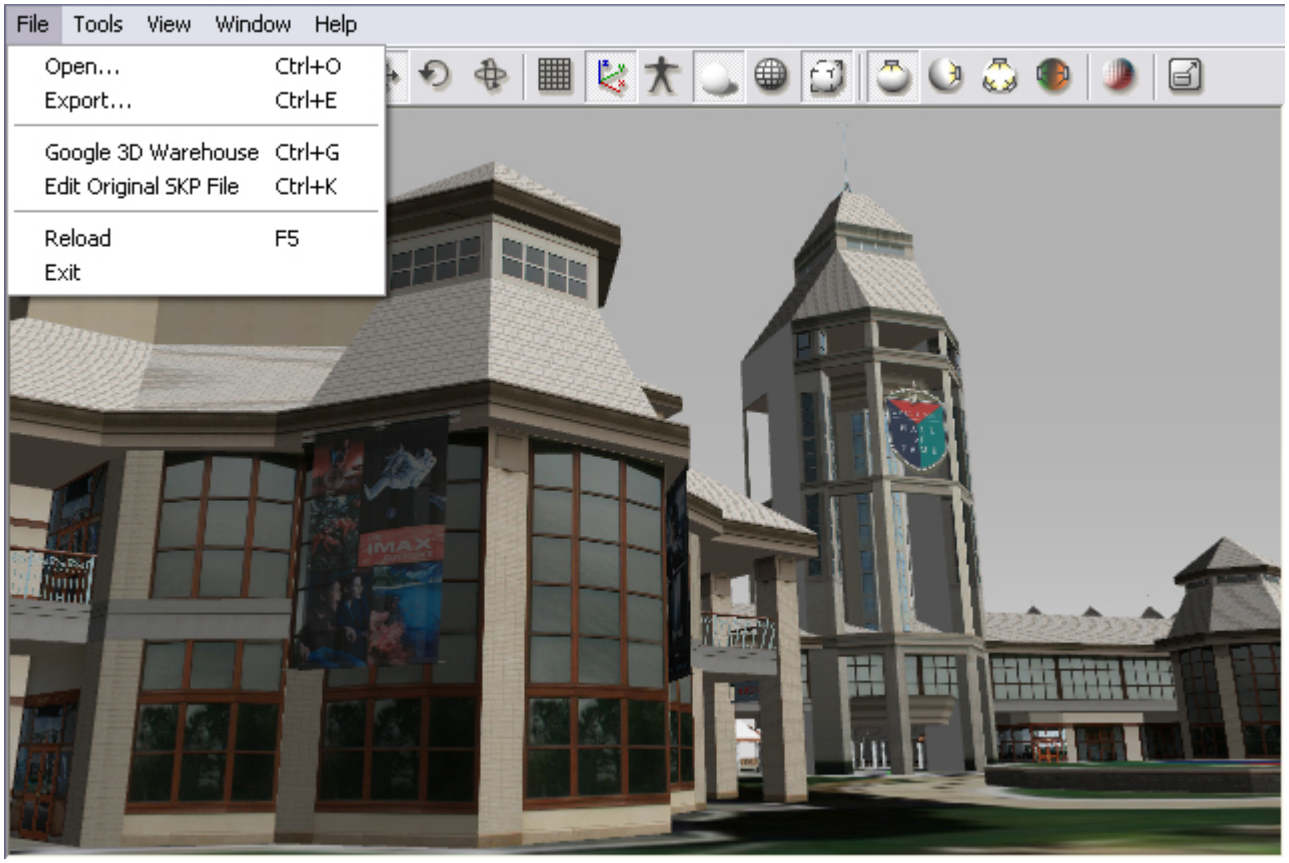
The main menu contains all the function UI controls you can find on the top of the main program. It is divided into 5 sections.



- **File** - To open, export, reload file and to exit 3DXchange.
- **Tools** - To center to scene root, align to the ground, reset transform, and to check included mesh nodes, modify color, modify material boxes. It also contains two groups with sub-menu for further editing, shadow and normal.
- **View** - To show / hide grid, world axis, dummy and highlight.
- **Window** - To toggle full / normal screen mode.
- **Help** - To invoke the Help document and about box window.

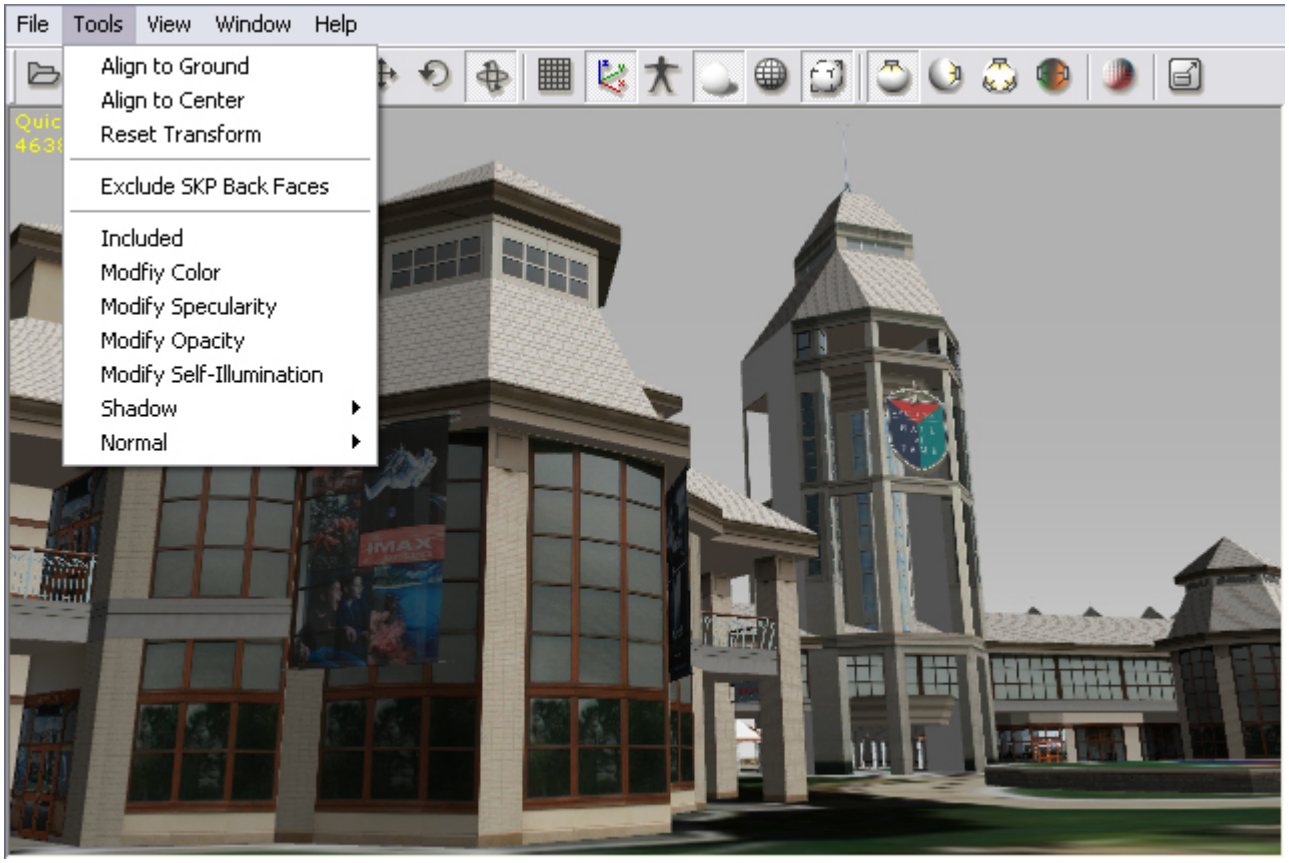
User Interface - Main Menu - File

The **File** menu contains several items mapping to the file handlers section in the tool bar. You may open, export and reload 3DS, OBJ, VNS or SKP files through the sub-items in this menu, or save the SKP files downloaded from Google 3D Warehouse and Launch SketchUp to edit the SKP files that you downloaded. You may also click Exit to shut down 3DXchange.



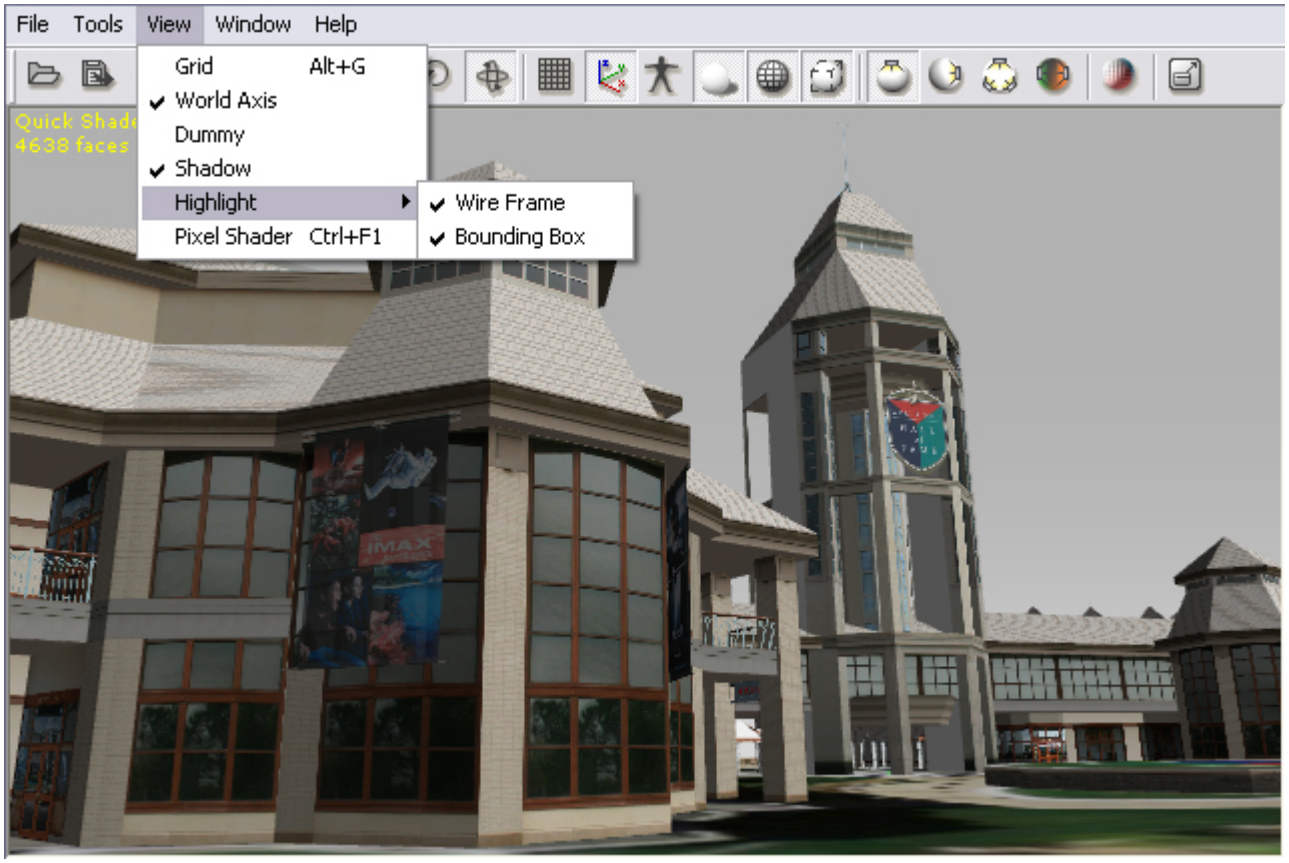
User Interface - Main Menu - Tools

The items in the **Tools** menu map to two features in the scene transform and all the features in the node attribute. The sub-menu of shadow and normal also map to the cast / receive shadow check boxes and the features in the normal section. The back side faces nodes in the scene can be excluded altogether by the **Exclude SKP Back Faces** entry.



User Interface - Main Menu - View

You may show / hide grid, world axis, dummy, wire frame, and bounding box by checking on / off the items in the **View** menu. All the entries in this menu map to the indicators section in the tool bar.

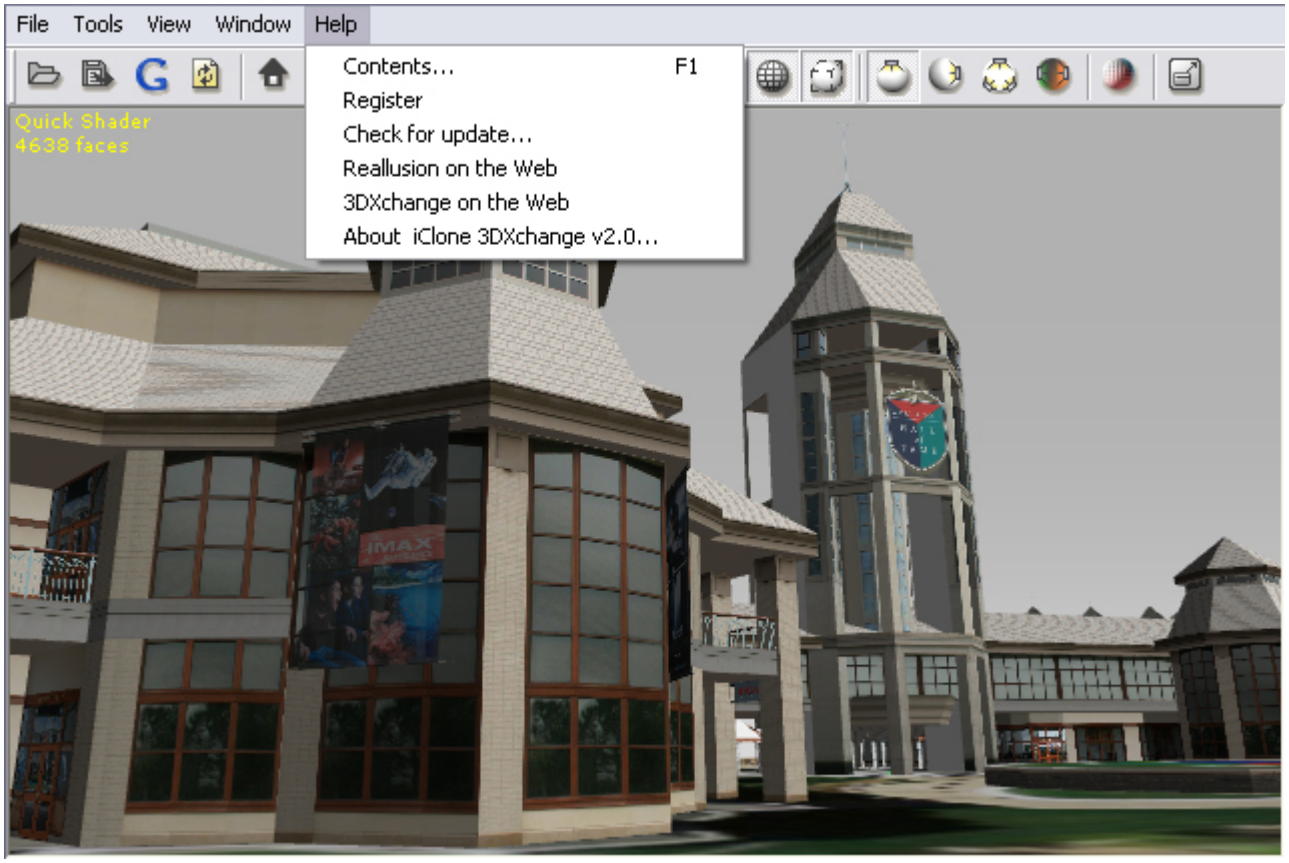


User Interface - Main Menu - Window

The item in the **Window** menu enable you to change the 3D viewer into full screen mode, which resembles to the function of full 3D view in the tool bar.

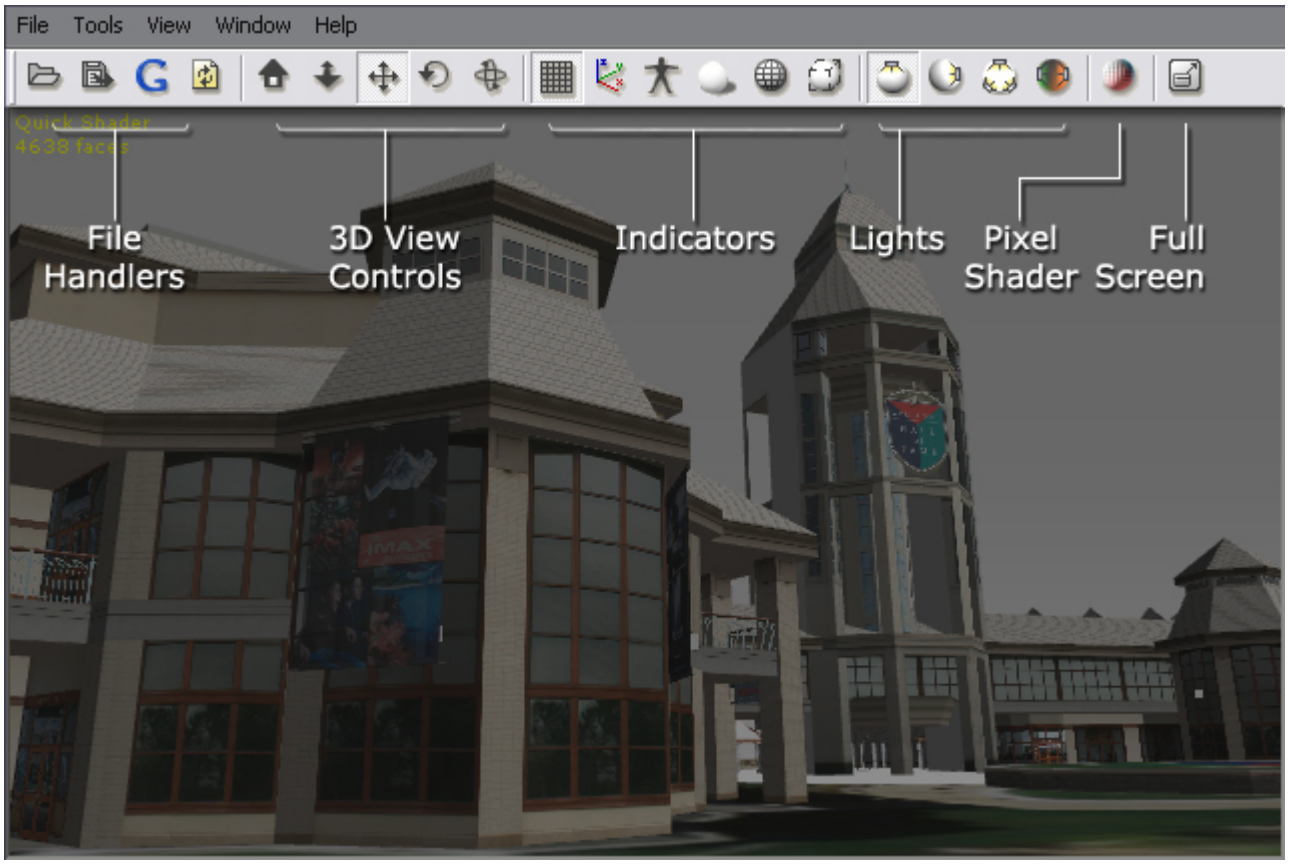
User Interface - Main Menu - Help

The **Help** menu contains sub-entry to invoke Help document and the about box. You can get more information about 3DXchange, Reallusion on the Web, 3DXchange on the Web or even check for the update.



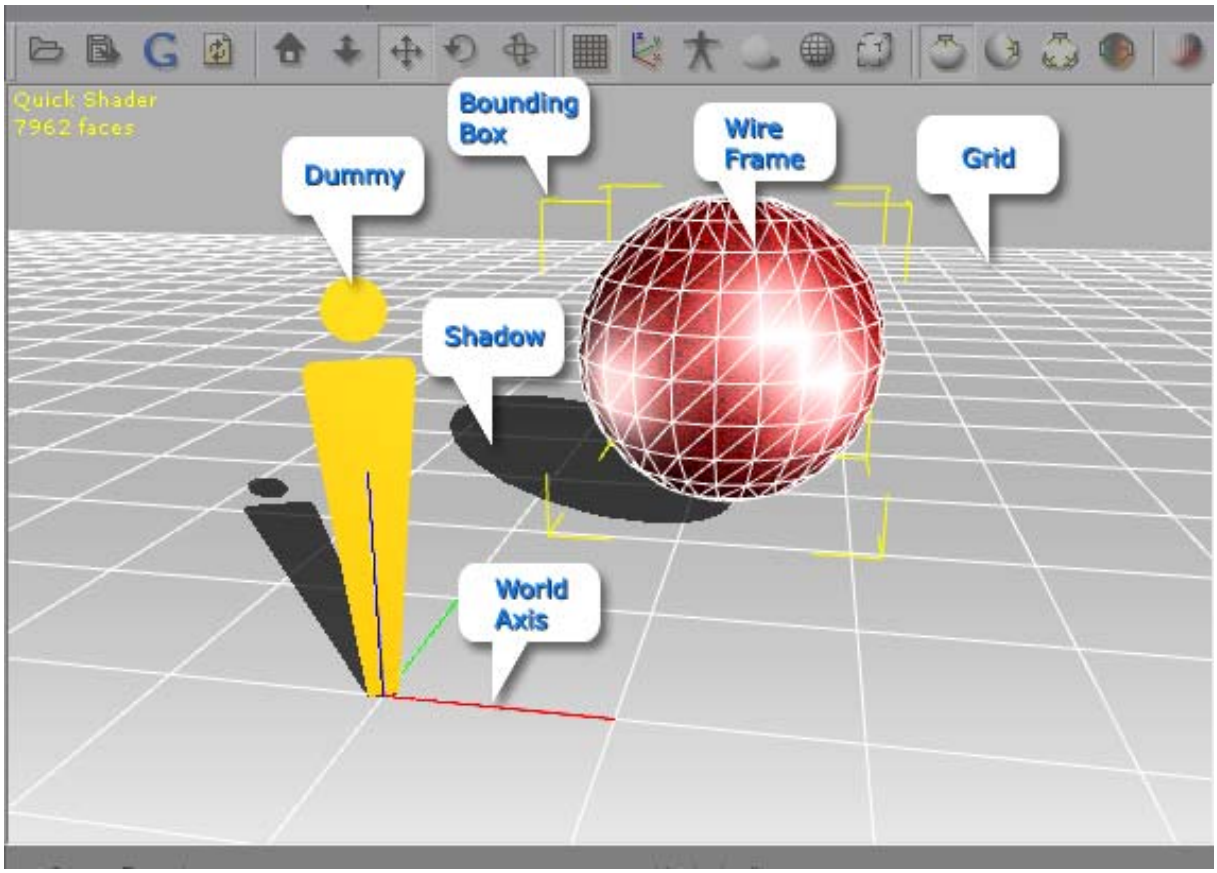
User Interface - Tool Bar

The tool bar is divided into several sections: File Handlers, 3D View Controls, Indicators, Lights, Pixel Shader and Full Screen button.



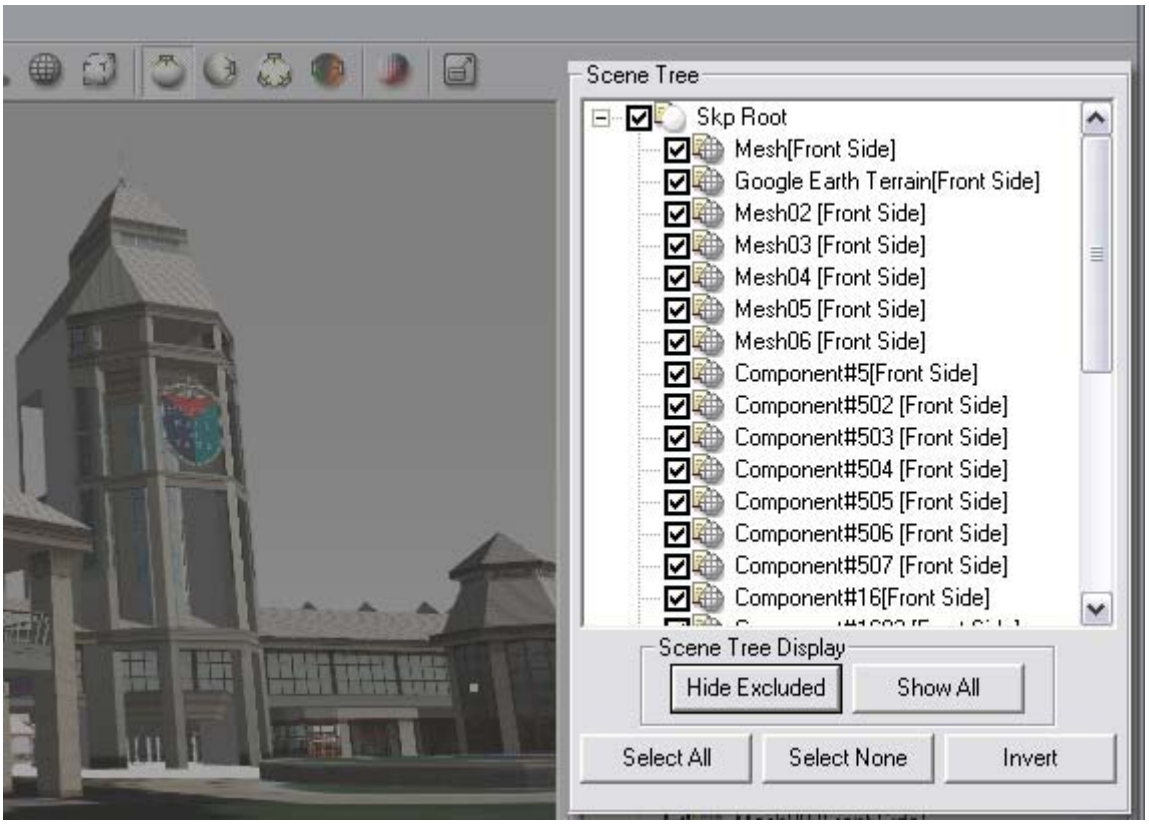
User Interface - 3D Viewer

The mesh nodes not only can be shown in the 3D viewer, some indicators also optionally appear on the 3D viewer for reference. You may show / hide them by pushing buttons in the indicators section in the tool bar, or selecting items of view in the main menu.



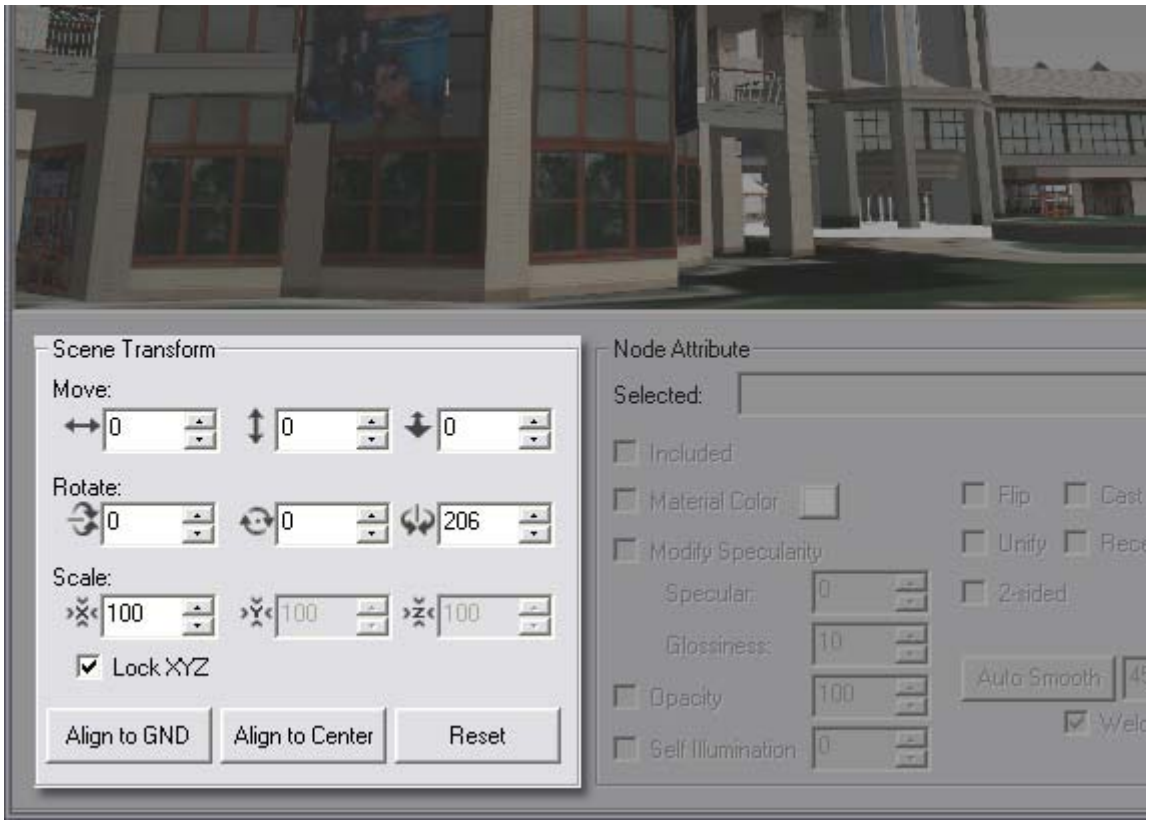
User Interface - Scene Tree

The scene tree lists all the mesh nodes (objects) in a scene. It mounts all the objects according to the hierarchy of the loaded files as they are exported from other 3D applications. It also shows the editable status for each object and provides check boxes for you to include / exclude mesh objects for exporting.



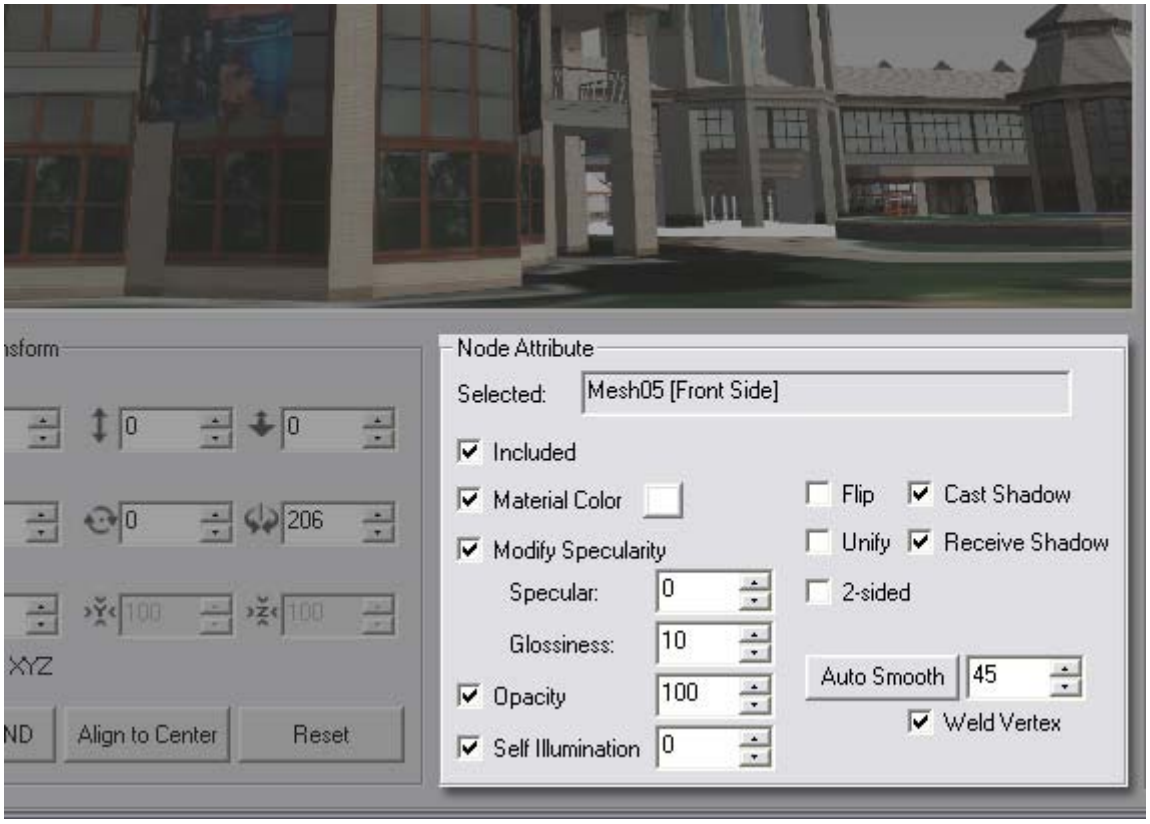
User Interface - Scene Transform Control Panel

The scene transform control panel provides editable controls to modify the transform attributes of the whole scene. Once the values are modified, the result will be reflected on the 3D viewer instantly. You may also align or reset the scene any time you desire to do so.



User Interface - Node Attribute Panel

The node attribute panel modifies the attributes for each mesh node in the entire scene. You may also decide if the nodes are to be included or not for exporting. There are attributes of material, shadow and normal provided for the node to be adjusted.



Features

Open External 3D Files

3DXchange is a powerful converter application for you to translate your 3DS, OBJ, VNS or even SKP files into props, accessories and 3D scene files. It keeps the hierarchy structure of your source files and the texture settings for the mesh nodes in it. You may also edit these nodes in 3DXchange and then export as your favorite 3D assets.

The applications, generating 3DS or OBJ files, supported by 3DXchange are: SketchUp, DAZ Studio, Poser, ZBrush, Bryce, Vue, and LightWave. Each of them has different main targets for creating various models.

Open Files

What kind of files can be loaded into 3DXchange?

3DS (from Autodesk) and OBJ (from Wavefront) are two of the most widely supported file format in the 3D world. Almost 100% 3D modeling tools allow users to import or export static 3D models in those formats. The SKP file is the project file from SketchUp. In addition, you may also import VNS files from iClone for further editing. 3DXchange opens iClone to massive 3D assets for unlimited production content.

If you have 3DS, OBJ, VNS, or SKP files prepared at hand, you may import them through several methods.

Method 1:

1. Click the **Google 3D Warehouse** button on the tool bar or select **File / Google 3D Warehouse**. (Ctrl + G)
2. Browse to the desired 3D model, click **Get Model** button. (You are prompted to save the downloaded file to your custom directory.)
3. The model will be loaded into **3DXchange2** afterward.

Method 2:

1. Click **File / Open...(Ctrl + O)** in the main menu.
2. In the file browser, locate your 3DS, OBJ, VNS or SKP file.
3. Click the **Open** button.

Method 3:

1. Click the **Open** button in the tool bar.
2. In the file browser, locate your 3DS, OBJ, VNS or SKP file.
3. Click the **Open** button.

Method 4:

1. Locate one of your 3DS, OBJ, VNS or SKP files
2. Drag the file and drop it onto the 3DXchange main program.

Tips:

- If you select multiple files and drag them into 3DXchange, only the one under your cursor as you are dragging will be opened and you will be prompted for this issue.
- If 3DXchange is not launched and you drag and drop a 3DS, OBJ, VNS or SKP file onto its program icon, it launches 3DXchange with the file loaded.

File Format: SKP, 3DS and OBJ

SKP

It is the format pertaining to the **Google SketchUp** - The most easy-to-use 3D modeling tool. With **Google SketchUp**, you may:

- Build 3D architectures, accessories and props.
- Get Fast Photo texturing and Perspective Correction.
- Create 3D Terrain.
- Create 3D Text.
- Import PNG Billboard Objects such as grass, fence or sign board easily made by Photoshop or any PNG tools with transparency info.

Please see Appendix C for more details.

3DS

The 3ds file format is made up of chunks. They describe what information is to follow and what it is made up, its ID and the location of the next block. If you don't understand a chunk you can quite simply skip it. The next chunk pointer is relative to the start of the current chunk and in bytes. The binary information in the 3ds file is written in a special kind of way. Namely the least significant byte comes first.

Most of the time, the exported 3DS will comes compacted with their texture files such as JPEG, BMP, PNG, TIFF or TGA (targa).

Please see Appendix A for more details.

OBJ

Object files define the geometry and other properties for objects. They can be in ASCII format (.obj) or binary format (.mod). The .obj file format supports both polygonal objects and free-form objects. Polygonal geometry uses points, lines, and faces to define objects while free-form geometry uses curves and surfaces.

the exported OBJ will come with the MTL (Material) file, which contains texture and material settings.

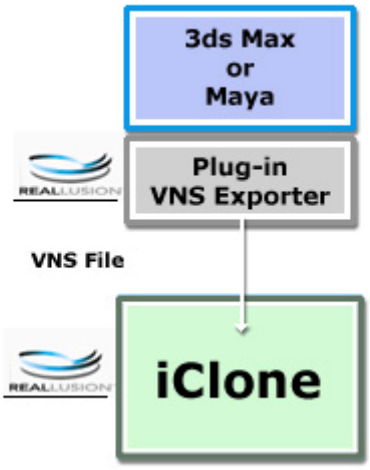
Please see Appendix B for more details.

Pipelines to Transmit Models

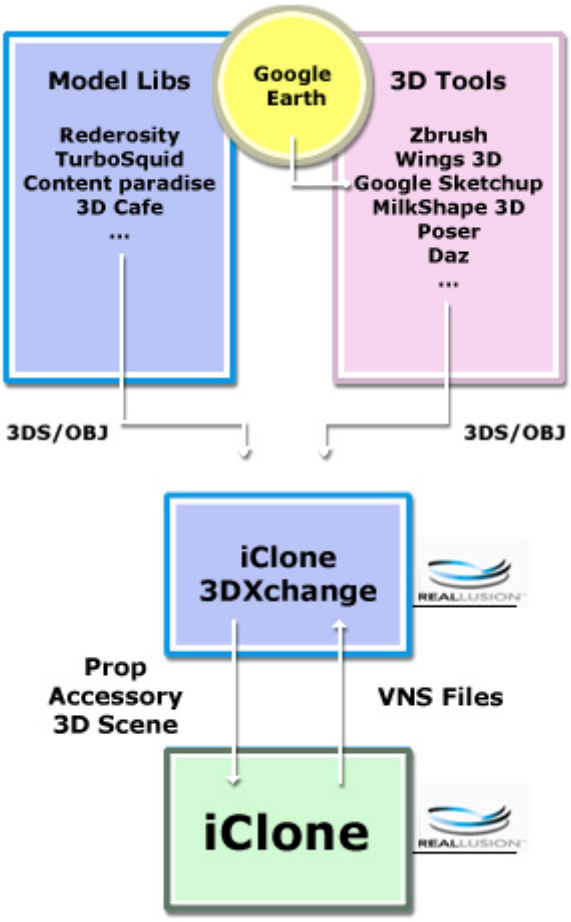
The pipeline for transmitting models is described in the illustrations below. You may also check out our web site for more details about the pipeline.

Maya, Max users

Please use the plug-in provided by Reallusion to convert the objects into VNS files and then apply them in iClone.



Other 3D Tools

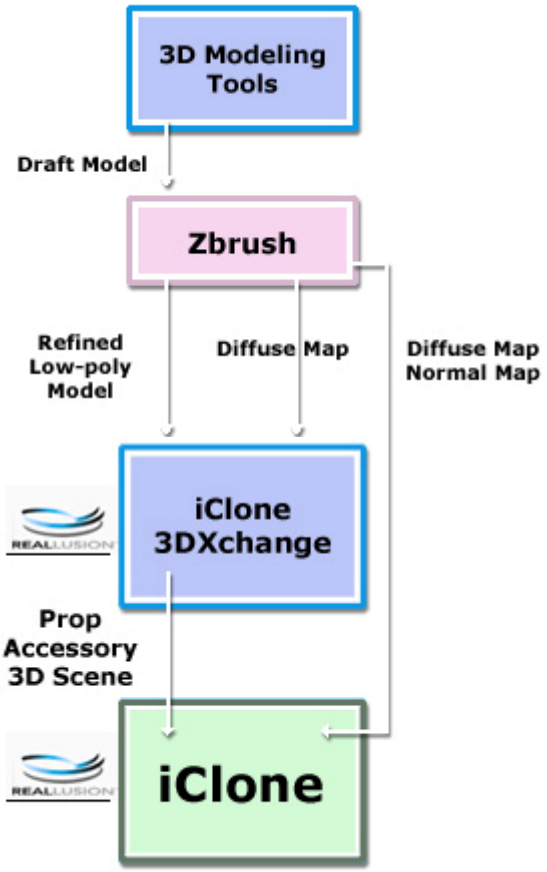


Zbrush

Zbrush is a special application for generating normal maps of low polygon 3D objects. The normal map cannot be imported into 3DXchange. Therefore, the pipeline of it is a little different from other 3D tools.

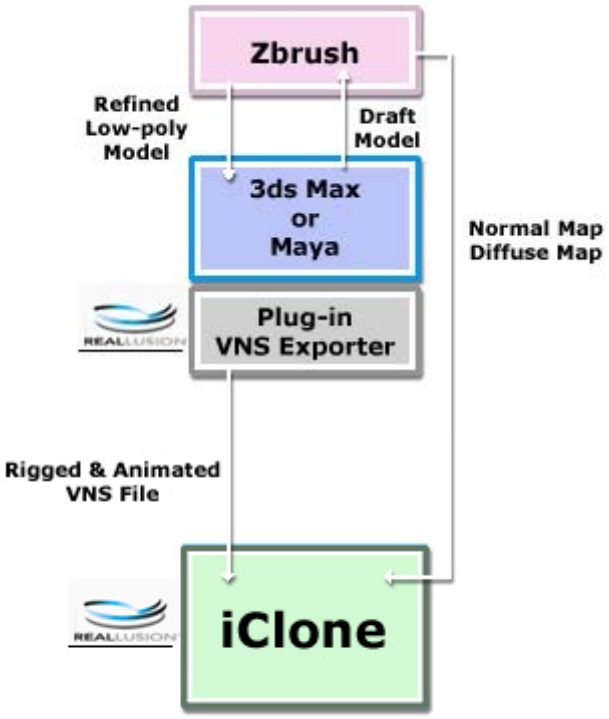
- Still Model

  If you want to use Zbrush as your source application for creating a still model in 3DXchange, please follow the flow:



- Animated Model

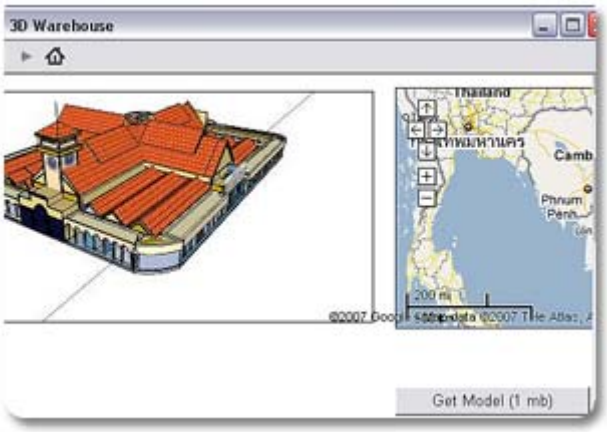
  For the animated models, you may keep the animation information, please follow the flow:



Pipeline: 3D Warehouse, 3DXchange and SketchUp

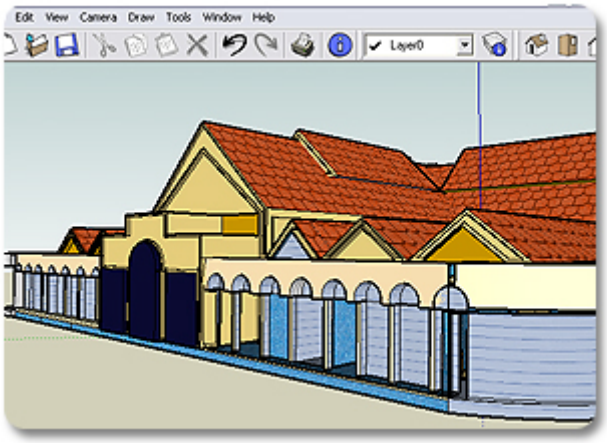
The common pipeline for Google 3D Warehouse, 3DXchange and Google SketchUp is as below:

1. Click the **Google 3D Warehouse** button on the tool bar.
2. Search for the desired Model. Click **Get Model** button. You are prompted to save the model into your desired directory.



The Model Loaded into 3DXchange

3. Click **File / Edit Original SKP File** (Ctrl + K) to invoke **SketchUp** if you want to re-edit the model.
4. Click **Save** in **SketchUp** after you finish editing.



Model Edited in SketchUp

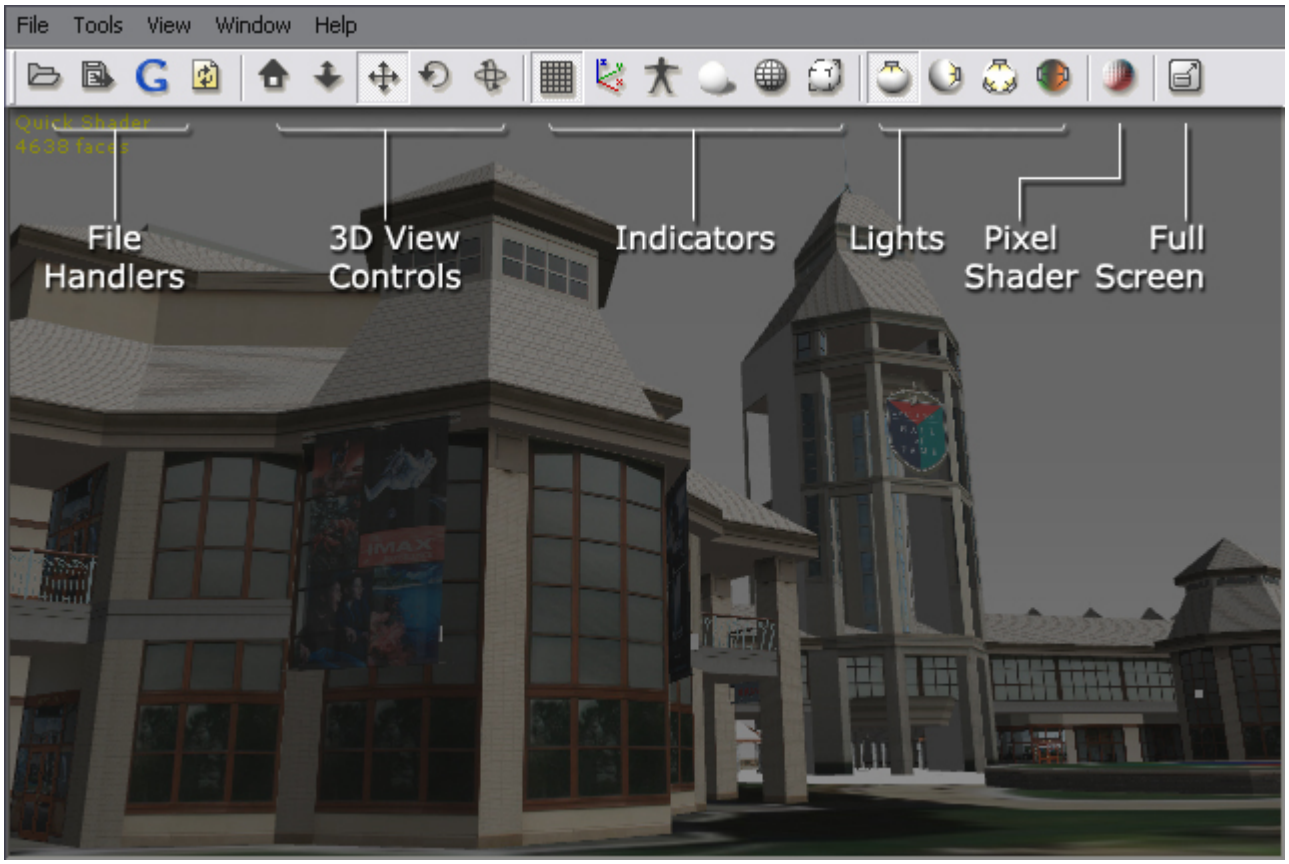
5. Click **Reload** (F5) button to reload the edited model into **3DXchange**.

Result in 3DXchange

For more details, please visit http://www.reallusion.com/iclone/3dx_pipeline.asp

Tool Bar

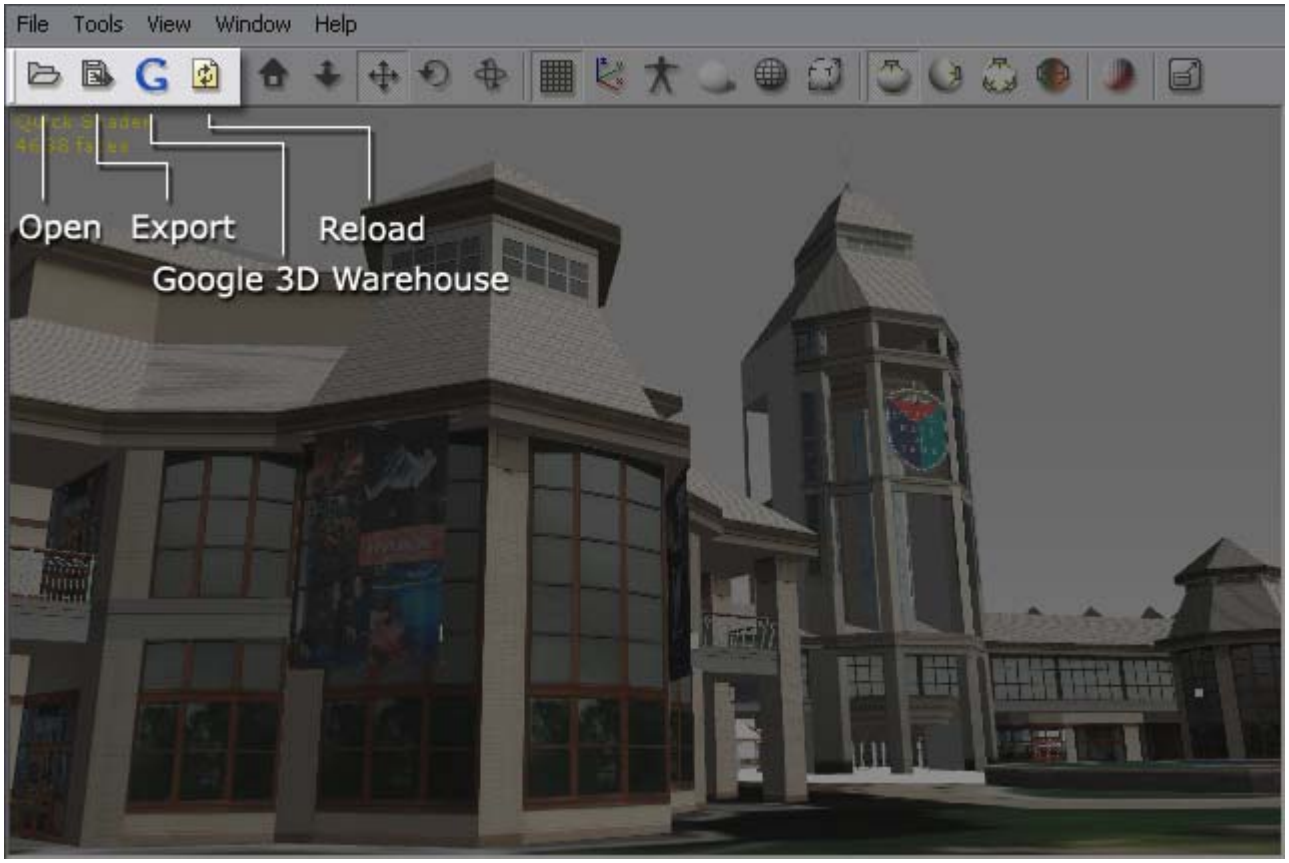
The tool bar is under the main menu in 3DXchange. It is divided into several groups:



File Handlers

There are three buttons in this section, which maintains all the file-related functions.

- **Open** (Ctrl + O) - Click this button to load the 3DS, OBJ or VNS files.
- **Export** (Ctrl + E) - Click this button to invoke the export dialog box.
- **Google 3D Warehouse** (Ctrl + G) - Click to invoke the **Google 3D Warehouse** browser and search for your favorite models.
- **Reload** (F5) - Click this button to retrieve the initial status of the currently used source file. All the changes you ever made will be discarded. You may also press **F5** on your keyboard to reload the current file any time.



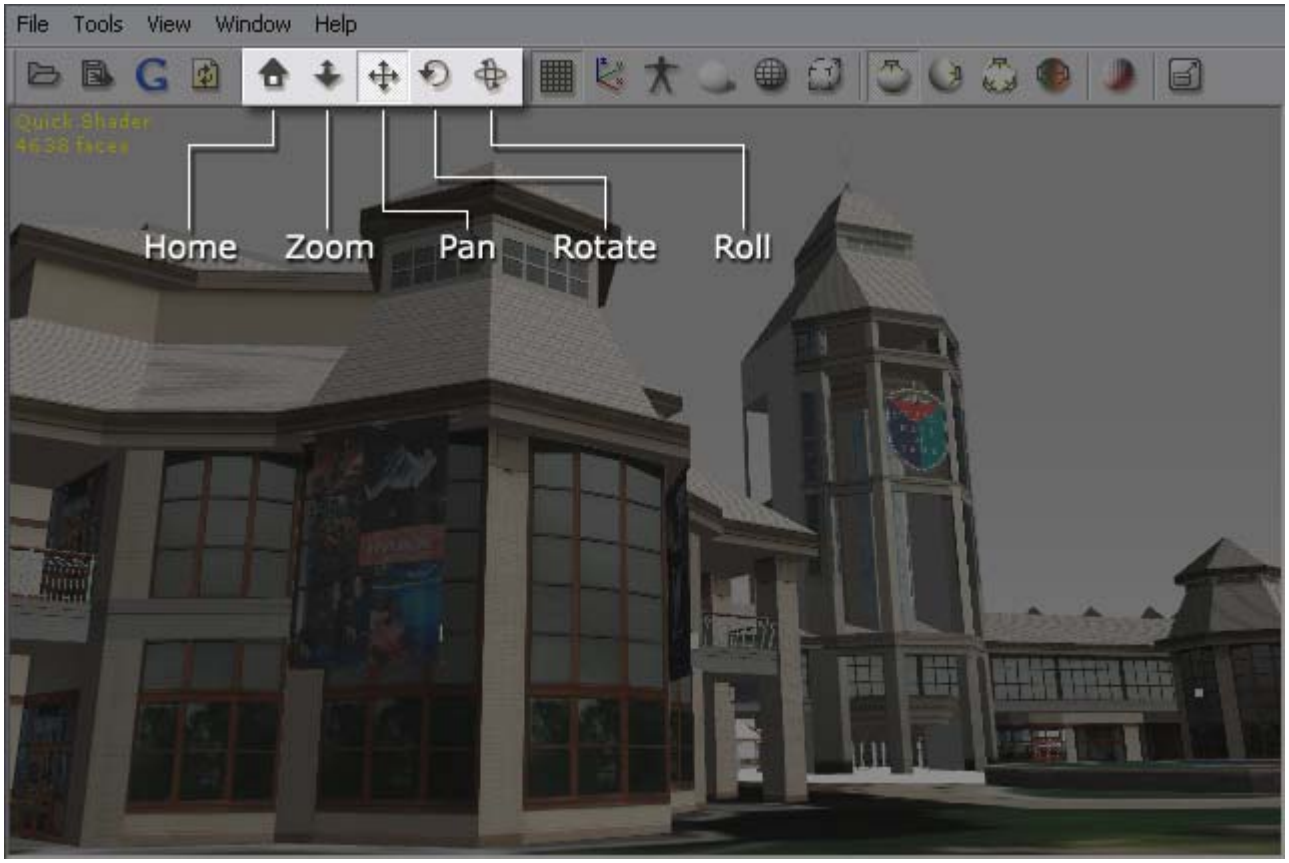
3D Viewer Controls

You can control the perspective of the camera by means of these control items. The **Pan** button is pressed down by default.

- **Home** (F) - Click this button to set the camera to the initial view of the scene. You may press hotkey **F** to fast return to the home view.
- **Zoom** - toggles the camera to **Zoom** mode by pressing this button. Click and drag the mouse cursor up in the 3D viewer to zoom in and click and drag the cursor down to zoom out the scene.
- **Pan** - toggles the camera to **Pan** mode. Drag the 3D view left / right to move the scene horizontally. Drag the 3D view up / down to move the scene vertically.
- **Rotate** - toggles the camera to **Rotate** mode. It turns the whole scene counter clockwise as you move up the cursor and clockwise as you move the cursor down.
- **Roll** - toggles the camera to **Roll** mode. Drag the cursor up / down to roll the scene vertically and drag it left / right to roll the scene horizontally.

Tip:

Press down the **Shift** key to accelerate the speed of **Pan** and **Zoom** by ten times.



Operate 3D Viewer with mouse

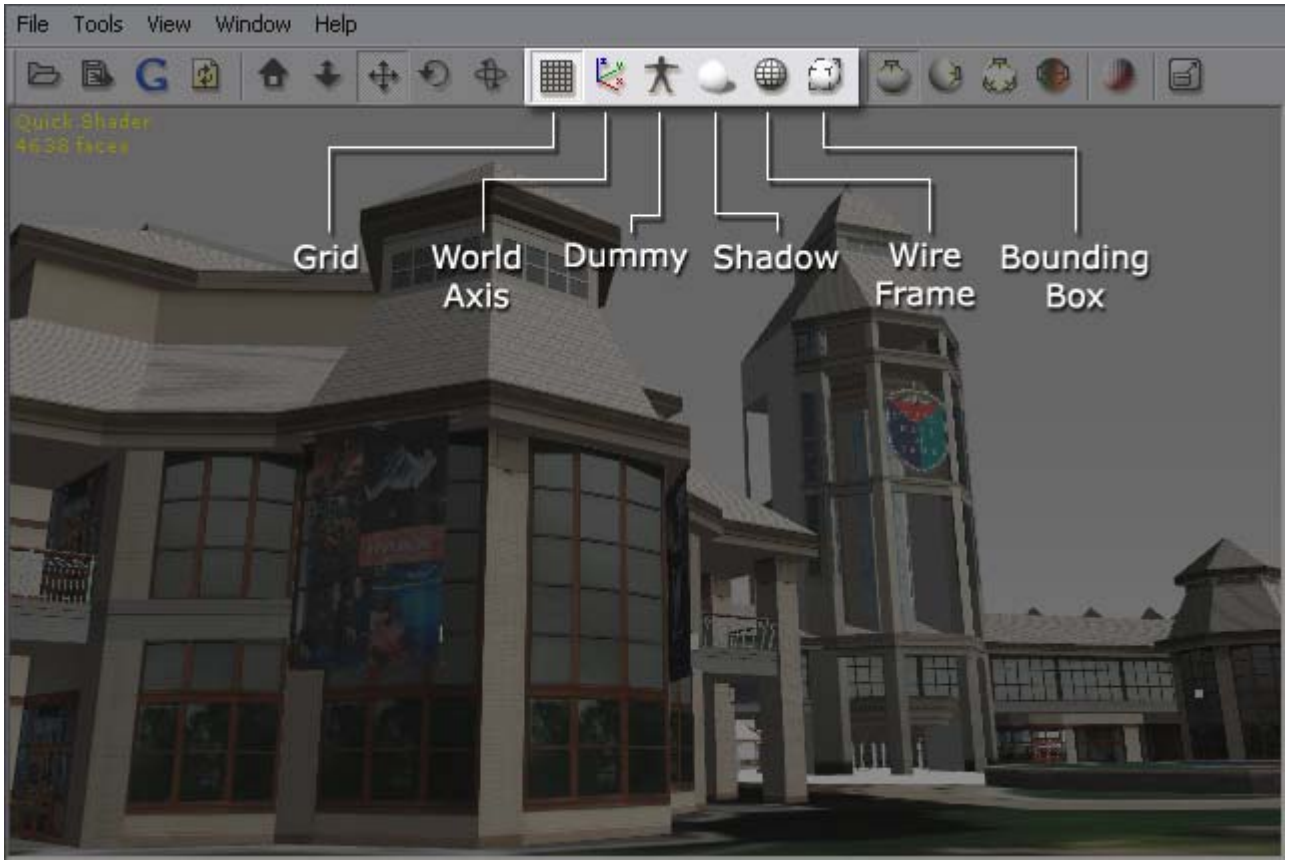
You can also change the camera view to observe the scene in different perspectives with mouse.

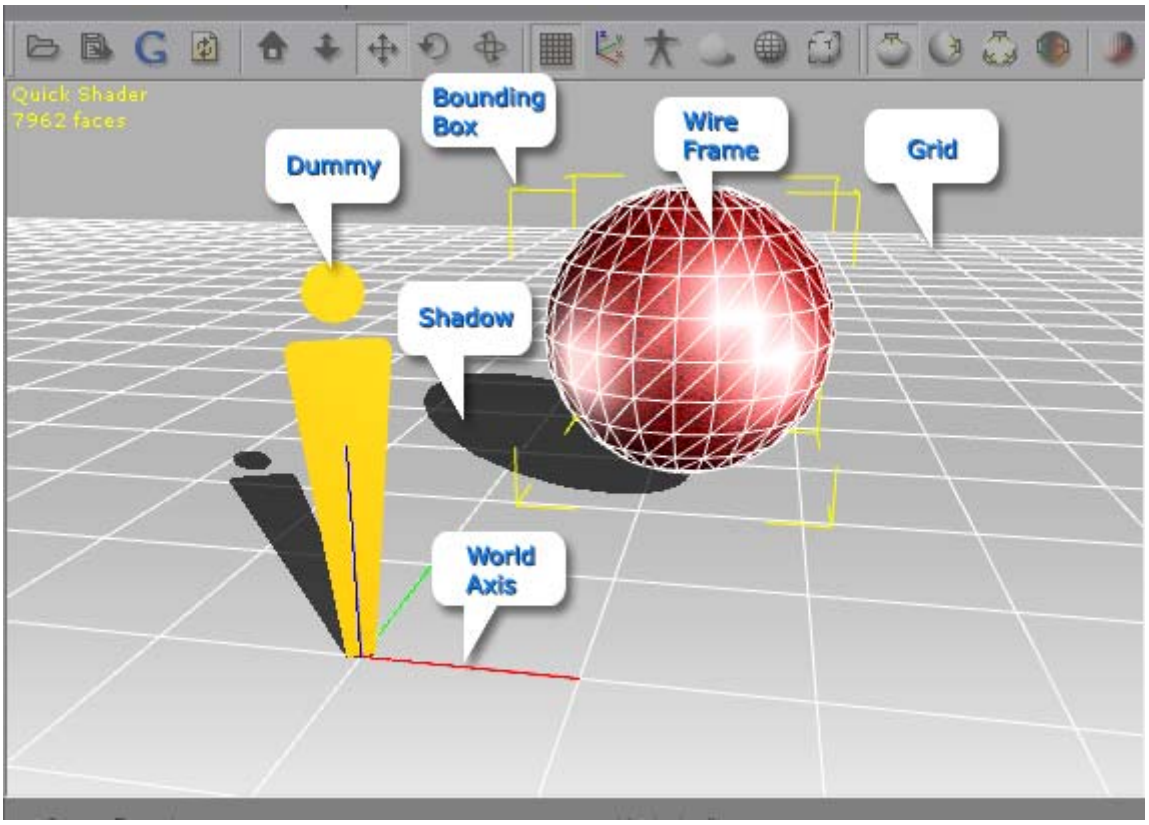
- **Zoom In / Out**: Press down both left and right mouse buttons, move the cursor up / down to **Zoom In / Out**.
- **Horizontal Roll**: Press down the left or right mouse button, move the cursor left / right to roll the scene horizontally.
- **Vertical Roll**: Press down the left or right mouse button, move the cursor up / down to roll the scene vertically.

Indicators

The buttons in this sections toggle the indicators in the 3D viewer. You may see the floor grid, the world axis, the dummy, the shadow, the wire frame, and the bounding box of the selected objects.

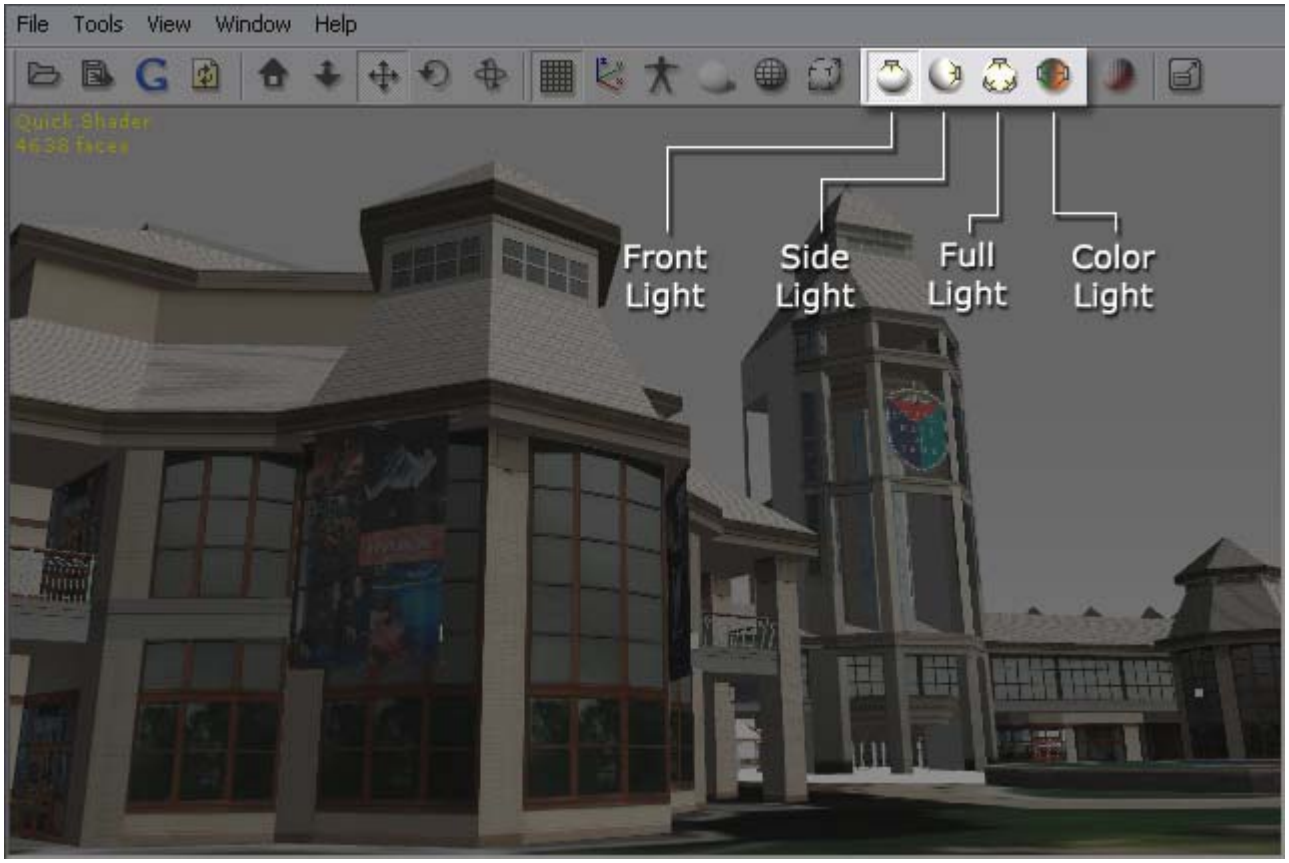
- **Grid** (Alt + G) - Press this button so the floor grid shows in the 3D viewer. The length for two adjacent, parallel lines is 100 units. The grid facilitates you to see the distance you move the scene and also indicates the location of the floor. It is pressed down by default.
- **World Axis** - Press this button so the world axis indicator shows. It will always locate on the center of the scene (0, 0, 0). The **Red** line represents the left / right axis, the **Green** line represents the forward / backward axis, and the **Blue** line represents the up / down axis. It is pressed down by default.
- **Dummy** - This button shows / hides a dummy on the center of the scene as a reference. The position as well as the size of the dummy is the same as the default character's in iClone so that you can move and scale your scene with nodes accordingly. The dummy cannot be edited nor included to VNS file. It is like a billboard that always faces front. This button is un-pressed by default.
- **Cast Shadow** - This button shows / hides the shadow in the 3D viewer. Though you may not see the shadow in the 3D viewer in **Hide** mode, it doesn't influence the shadow settings in the node attribute of all the nodes for exporting. It is simply to show or hide the shadow in the 3D viewer.
- **Wire Frame** - When this button is pressed, the nodes you select in the tree view will show their mesh lines in the 3D viewer. It is un-pressed by default.
- **Bounding Box** - If you press this button, when you select one or more nodes in tree view, it shows bounding boxes around each object of the scene in the 3D viewer. This is useful when you desire to know which nodes are selected without being intervened by the wire frames, especially the complicated ones. It is pressed by default.


File Tools View Window Help
Quick Shader
4638 faces
Grid
World Axis
Dummy
Shadow
Wire Frame
Bounding Box

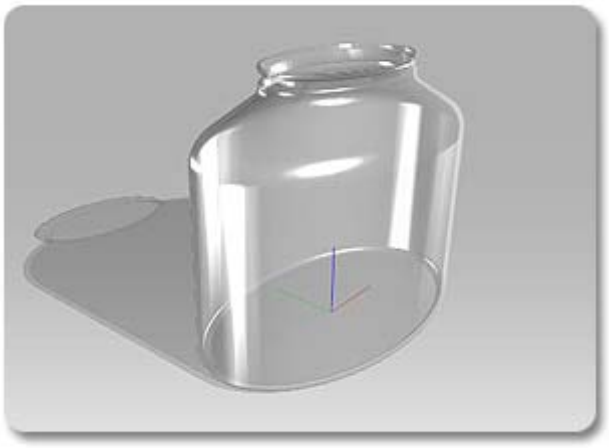

Quick Shader
7962 faces
Bounding Box
Wire Frame
Grid
Dummy
Shadow
World Axis

Lights

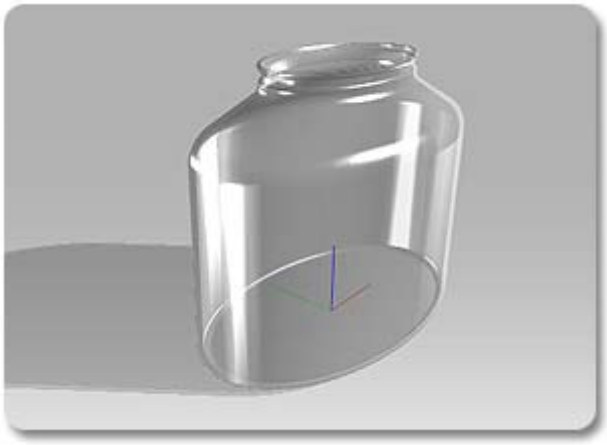
There are four sets of lights prepared for you to change the light scheme in the scene. You may see the change of lights casting on your objects in the scene.



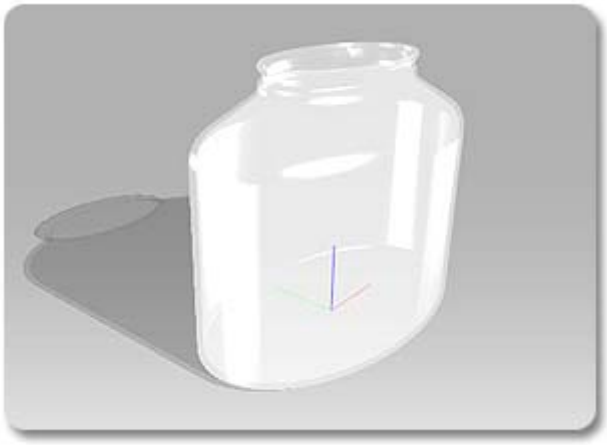
- **Front Light** - This light set gives light from the front of the scene.



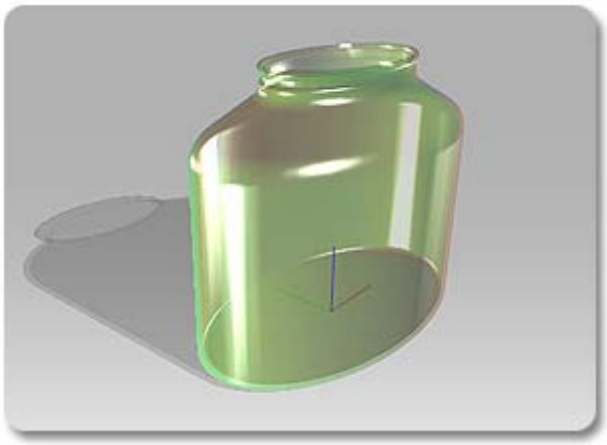
- **Side Light** - This light set gives light from the side of the scene.



- **Full Light** - This light set turns all the lights on in the scene.



- **Color Light** - This light set consists of two lights, green and red, from two sides of the scene.



Pixel Shader

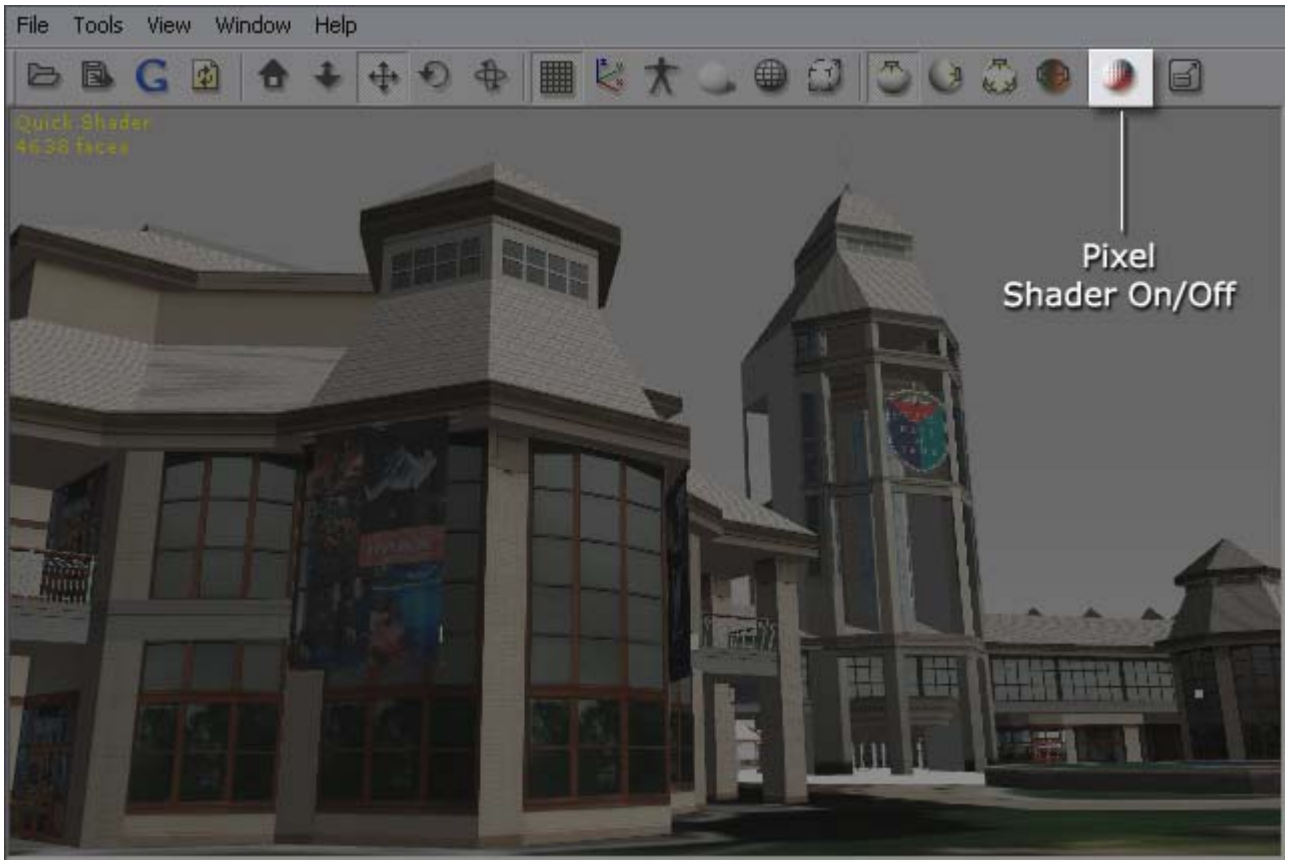
3DXchange supports pixel shader on your graphics card. The **Pixel Shader** mainly shows some of the texture effects, such as glow, reflection, and bump effects.

When the **Pixel Shader** is turned on / off, the 3D viewer shows **Pixel Shader** / **Quick Shader (Default)** at the left-top corner.

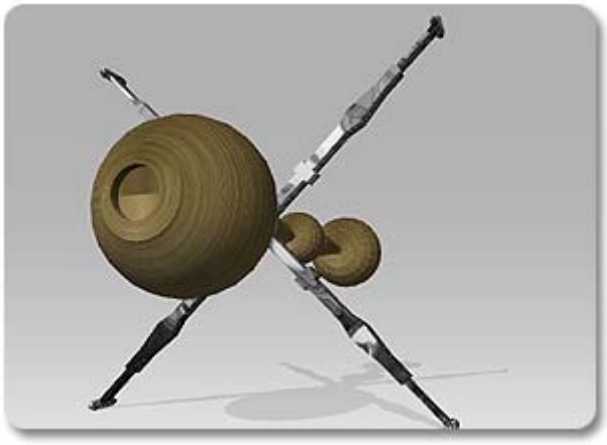
However, when you import a large file, with the **Pixel Shader** on, the performance of the system may be very slow since the **Pixel Shader** needs to occupy additional system resources. Under this circumstance, it is highly recommended for you to turn off this feature.

To turn Pixel Shader on:

- Click the UI button.
- Select **View / Pixel Shader**
- Use the hotkey: **Ctrl + F1**.

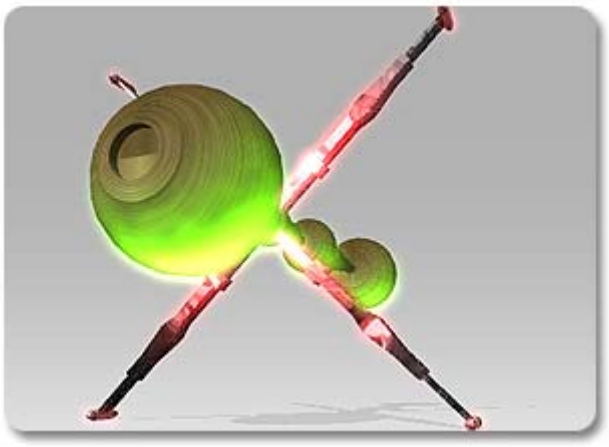


- **Pixel Shader OFF**

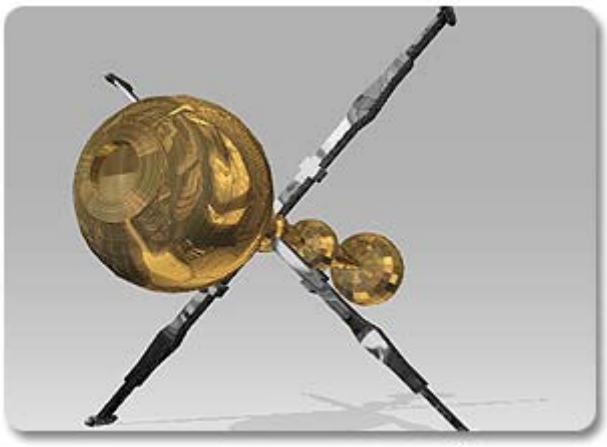


- **Pixel Shader ON - Bump**

- **Pixel Shader ON - Glow**



- **Pixel Shader ON - Reflection**

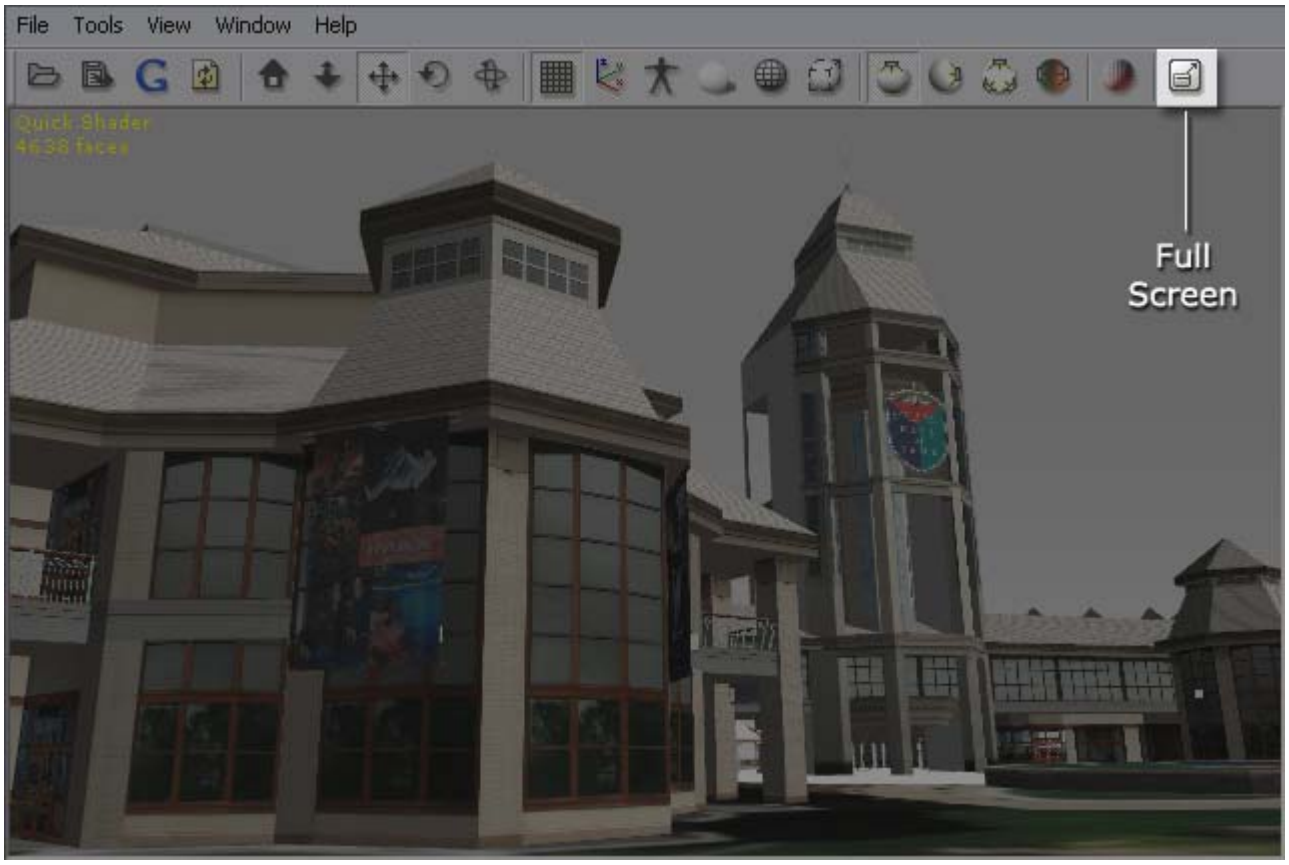


- **Pixel Shader ON - Bump, Glow, Reflection**

Full-Screen

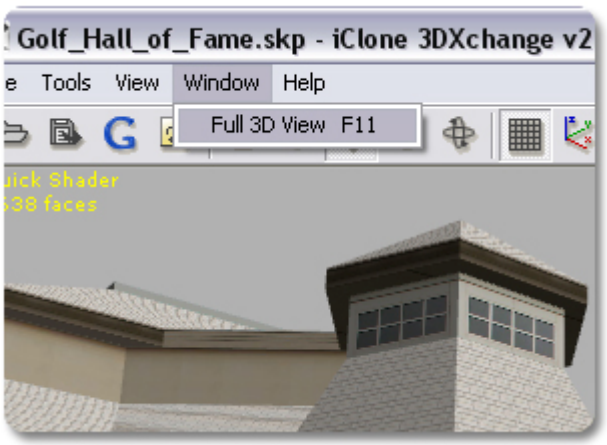
You may view your scene in **Full-Screen** mode. In full-screen mode, you may see much higher detail of your objects in the scene, such as the position, orientation, or the textures.

In **Full-Screen** mode, you may also dolly, tumble or rotate the view of the camera with your mouse buttons.



To enter **Full-Screen** mode, you may use one of the methods below:

- Select **Window / Full 3D View** in the main menu.



- Click **Full 3D View**, the right-most button in the tool bar.

- Press the **F11** key on your keyboard.

To leave the **Full-Screen** mode, please use either of the ways below:

- Press the **ESC** key on your keyboard.
- Press the **F11** key on your keyboard.

Tips:

You can also change the camera view in the full screen mode to observe the scene in different perspectives.

- **Zoom In / Out**: Press down both left and right mouse buttons, move the cursor up / down to **Zoom In / Out**.
- **Horizontal Roll**: Press down the left or right mouse button, move the cursor left / right to roll the scene horizontally.
- **Vertical Roll**: Press down the left or right mouse button, move the cursor up / down to roll the scene vertically.

Scene Tree

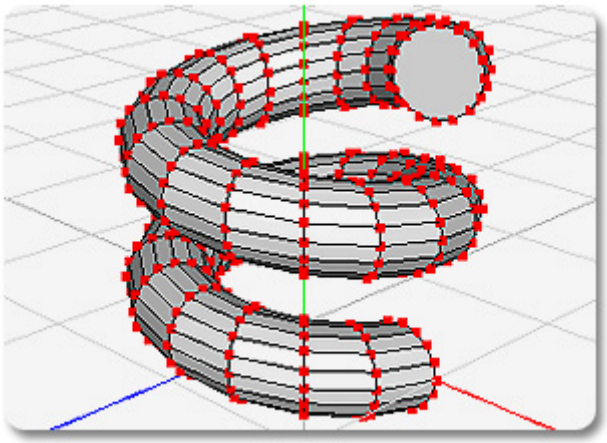
- The scene tree pane shows the hierarchy of the meshes in your loaded scene. You can select single or multiple meshes for adjusting, include or exclude meshes for exporting, and observe the node types in the scene tree window.

Components of Node

In this section, we will describe the components of a node with illustrations. The name of these components can be seen throughout this document and other common 3D softwares.

Vertex (Plural: Vertices)

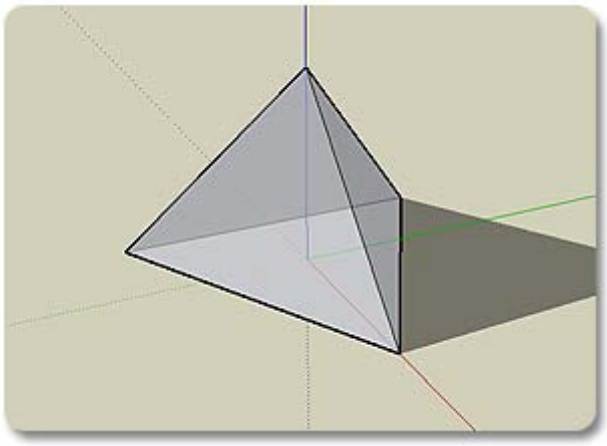
A vertex is a point in 3D space. When two or more polygonal faces share one single corner, this corner is also a vertex for all of them.



Vertices of a node (points in red)

Face

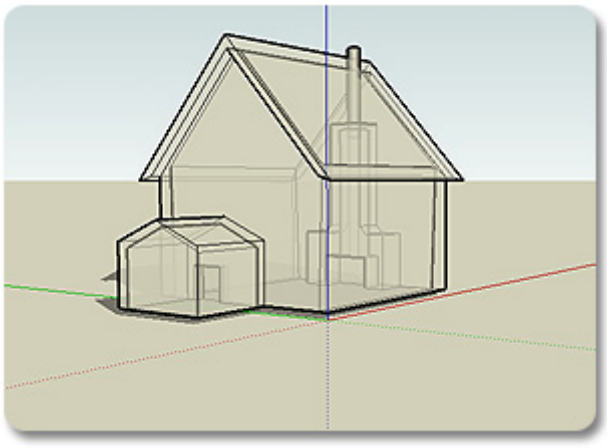
When three or more vertices are linked by edges and form a closed space, the space is called a face.



Pyramid formed by 4 faces, each face is a shape of triangle.

Mesh

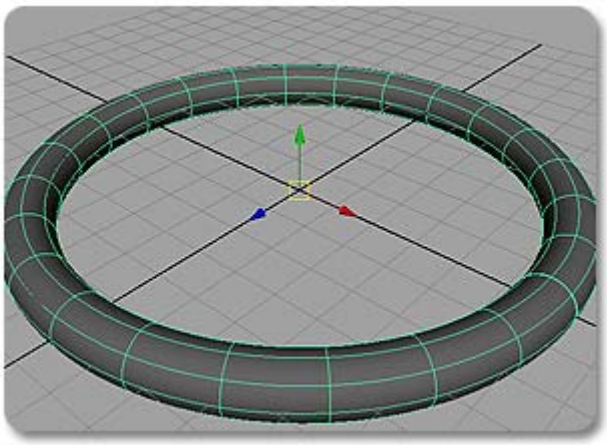
A mesh contains a collection of polygons, which can be of different types (Triangles, quads, multi-sided).



Mesh house formed by polygons

Pivot

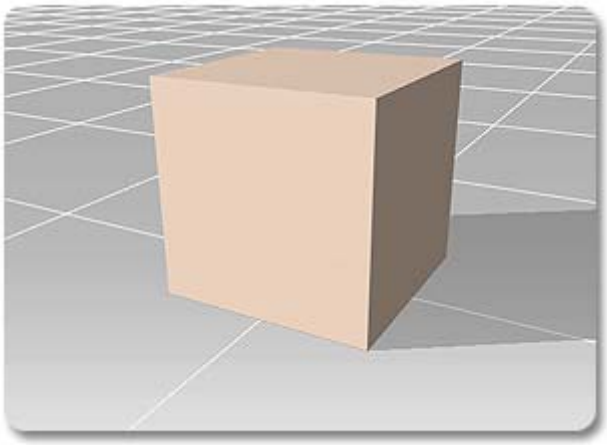
A pivot is a specific position used as a reference for the transformations of objects. Every object or a group of objects has a pivot point that can be moved relative to the object. Pivot is also known as "center" in some other 3D software.



Pivot of a torus

Texture UV

It is a coordinate system to define the locations for projecting a texture map onto an object.



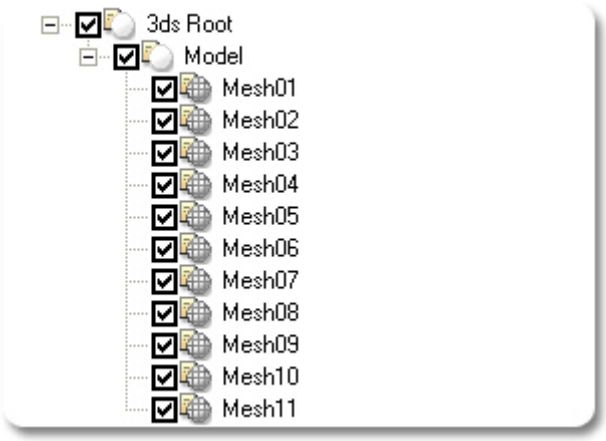
- The original look of the box.
- The UV reference is described in the illustration below.
- Two faces of it are taken as examples.

- Texture mapping adjusted according to the reference.

Node Types

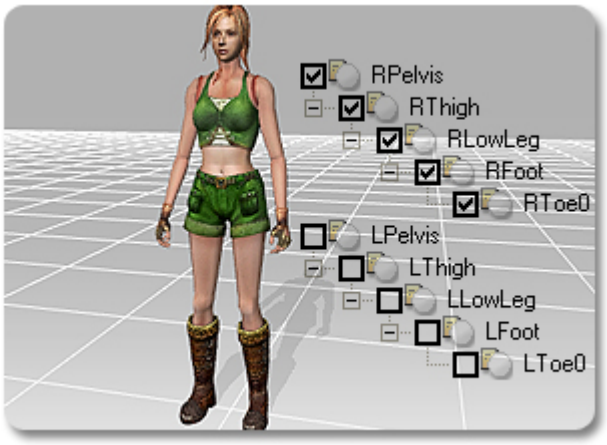
There are two types of nodes shown in the scene tree. They are separated by being attached with two different icons.

- **Icon with a White Ball** - It indicates that the attributes of the node are not editable, which means the node contains no mesh for editing. The nodes in this category can be the scene root, the group name of objects.
- **Icon with a Mesh Ball** - It indicates that the attributes of the node are editable. These nodes contain meshes for editing in 3DXchange.

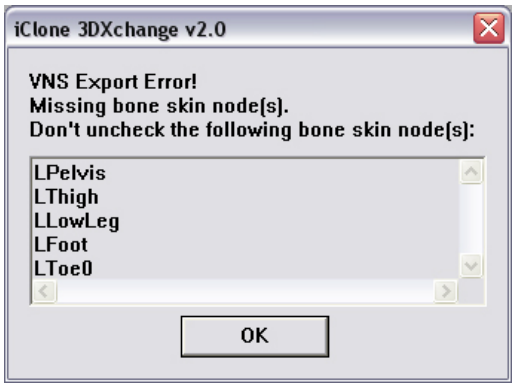


Tip:

After you open a character VNS file, the bone nodes cannot be excluded as you export it. You will be prompted a warning message. Please include them for exporting.



Character's bone nodes are excluded



Warning message

Renaming Nodes

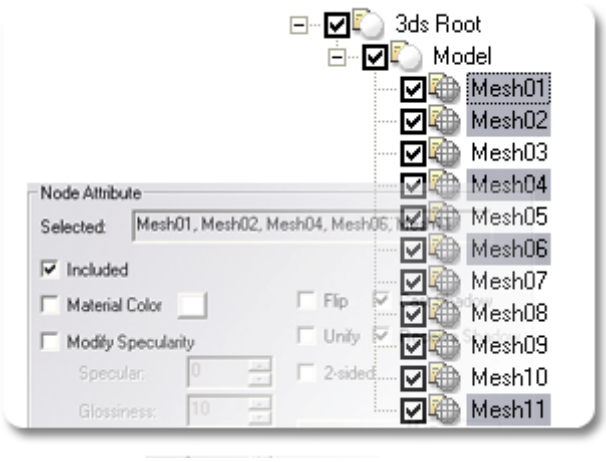
3DXchange provides convention method to change the names of the nodes. It facilitates you to recognize and organize the nodes in your scene.

1. Select the node for changing name.
2. Click on the name to enter the name-editing mode.
3. Press **Enter** or click on another node after you finish changing.

Scene Tree and Node Attribute

The **Scene tree** window and the **Node Attribute** panel works interactively with two attributes - **Selected** and **Included**.

- **Selected** - When you click the name of the node, it will also be shown in the **Selected** box of the node attribute. See Selecting Mesh Nodes for more details.
- **Included** - You can see that each node has one check box in front of its name. When the box is checked, **3DXchange** includes this node in exporting process. This function facilitates you to export certain objects in a scene as one single object. See Including and Excluding Mesh Nodes for more details.



Selecting Mesh Nodes

You may select mesh nodes in the **3D Viewer** panel or in the **Scene Tree**.

Select in the 3D Viewer

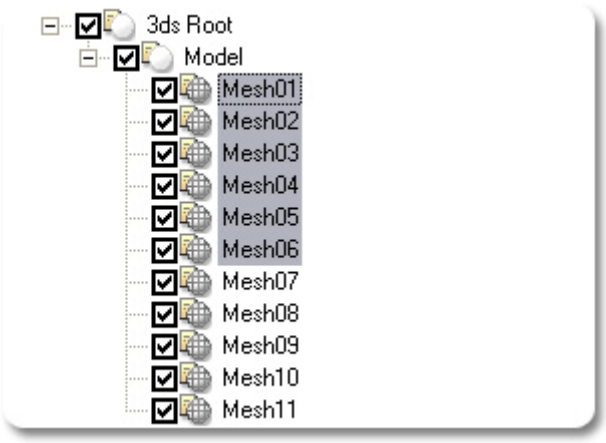
Please refer to the **Direct Picking** section for more details.

Select in the Scene Tree

To Select a series of nodes:

1. Press the **Shift** key on your keyboard without releasing it.
2. Click the first node that you desire to select.
3. Click the last node that you desire to select.
4. Release the **Shift** key.

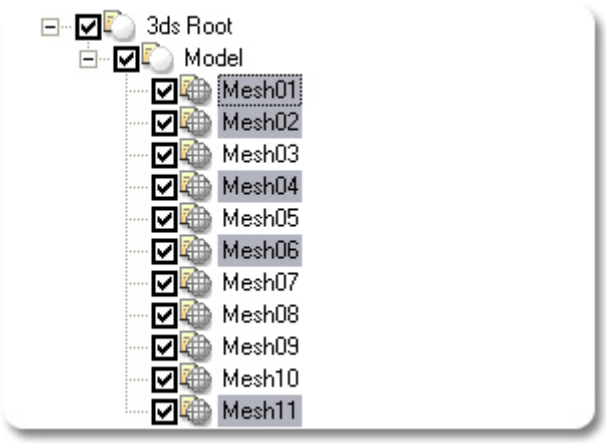
The series of desired nodes are highlighted now. You can adjust their attribute at the same time from now on.



To Select non-series nodes:

1. Press the **Ctrl** key on your keyboard without releasing it.
2. Randomly click on the nodes you want to adjust.
3. Release the **Ctrl** key.

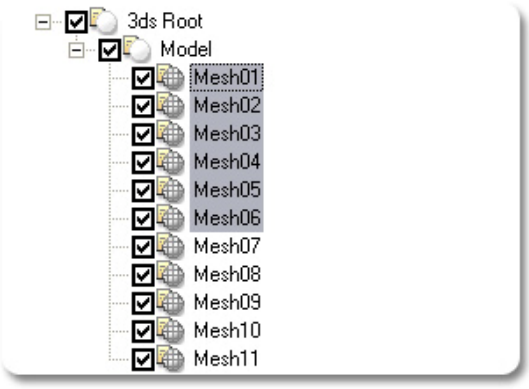
The desired nodes are highlighted now. You can adjust their attribute at the same time from now on.


3ds Root
Model
Mesh01
Mesh02
Mesh03
Mesh04
Mesh05
Mesh06
Mesh07
Mesh08
Mesh09
Mesh10
Mesh11

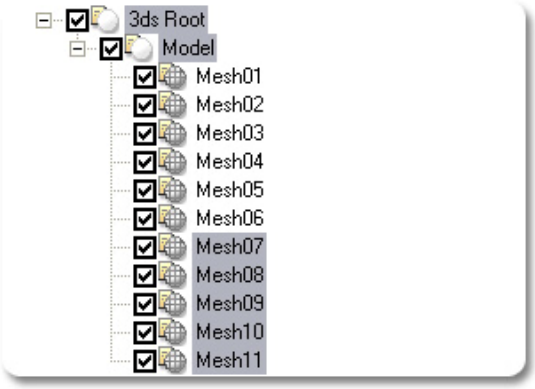
To "Select All", "Select None" or "Invert"

You may click the three buttons in the scene tree window to select all, none nodes or even invert the selection to select the nodes un-selected.

- Click **Select All** button to select all the nodes in the scene tree.
- Click **Select None** button to deselect nodes.
- Click **Invert** button to deselect the currently-selected nodes and select the other nodes.



Nodes Selected



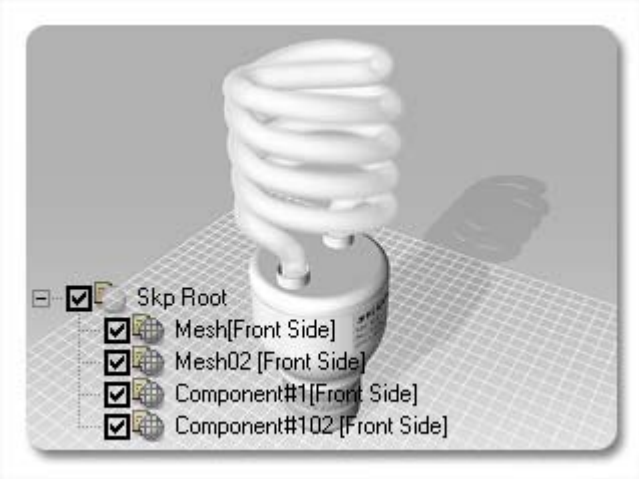
Invert the selection

Including and Excluding Mesh Nodes

After importing 3D model files, usually, you export all the nodes in the scene as an entity to be edited further in iClone. However, you may want to export specific parts of the nodes, which means to disassemble objects, so that you can transform them in iClone as a separate object without influencing the other fixed parts of the nodes.

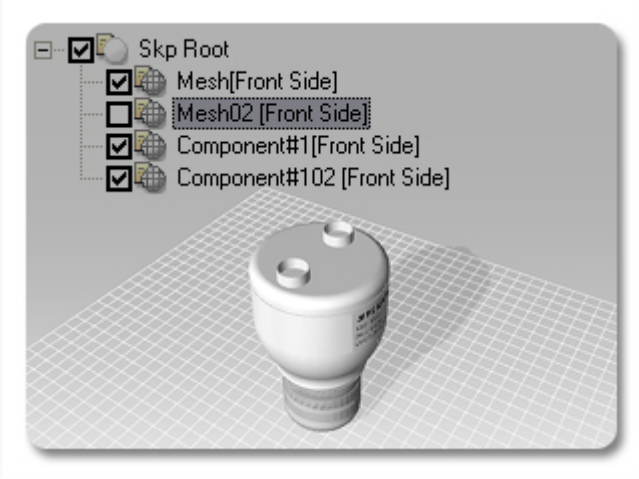
To export specific parts of the nodes:

1. Import a 3D model file. All the nodes in the scene tree are checked by default.

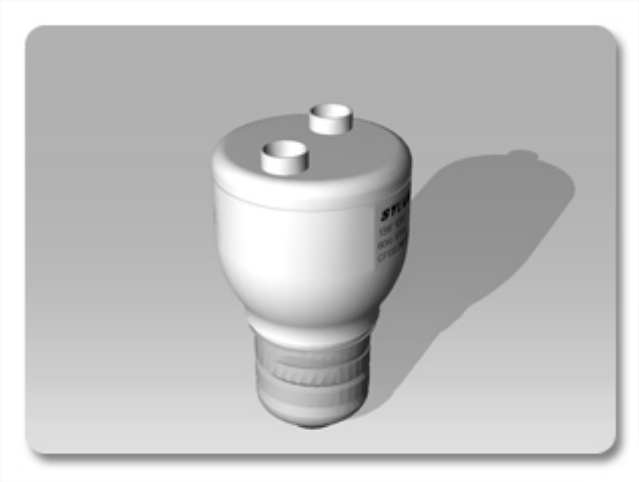


2. In the scene tree, uncheck the boxes at the left side of the nodes that you DO NOT want to export.

   (You will see the nodes being checked off disappear in the 3D viewer, which means these nodes are excluded from exporting)



3. Click **Export** button to include the checked nodes into an iClone compatible VNS file.



Result in iClone

Note:

- The **Include / Exclude** behavior doesn't affect the original content and structure of the source files. You may click **Reload** button to retrieve the initial status of them.

Excluding Back Faces

If the imported file is an SKP file, **3DXchange** generates corresponding **Back Face** for each node. You may see them listed in the **Scene Tree**.

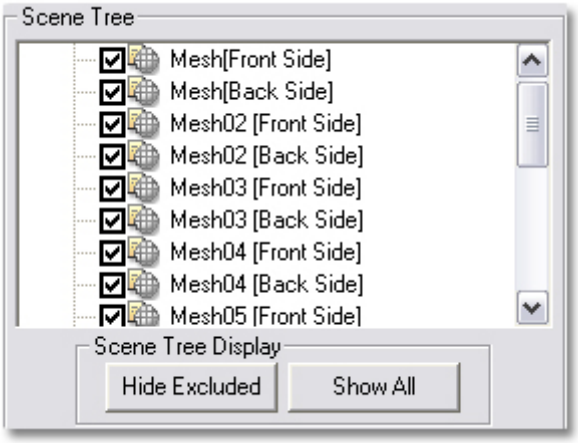
- If you need to assign different textures to both sides of a polygon, such as a wall, you may need to assign to the back side node.
- It is highly recommended to exclude the back sides for exporting if there is no need for the camera to view from the inside of the model. Click **Tools / Exclude SKP Back Faces** can reduce the face count of the scene.

Note:

- Please refer to http://www.reallusion.com/iclone/3dx_BackFaces.asp for more details about **Back Faces**.

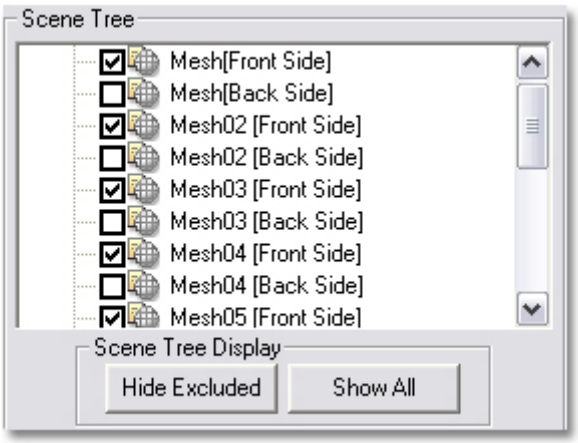
Scene Tree Display - Hiding the Excluded Nodes

You may clean up the display window of the **Scene Tree** to organize your desired nodes.

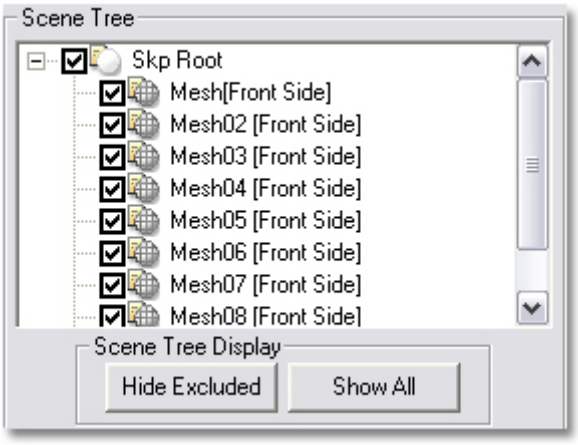


To Hide the Excluded Nodes:

1. Uncheck the boxes besides the un-necessary nodes.



2. Click **Hide Excluded** button.
3. The **Scene Tree** displays only the desired node afterward.



Note:

- Click **Show All** button to display all the nodes of the scene.
- Please refer to **Including and Excluding Mesh Nodes** for more details.

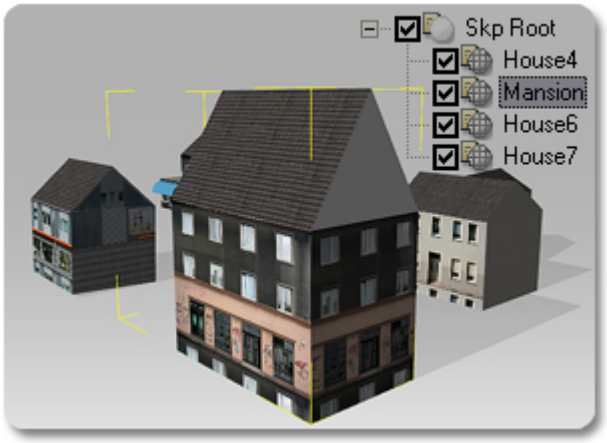
Direct Picking

3DXchange provides a direct method to pick the mesh nodes.

Direct Picking

iClone provides a convenient method to use your mouse to pick and edit a character, an accessory or a prop directly from inside the 3D viewer. You may use hotkeys to manipulate the transformed data of the selected objects.

- **Picking**
  1. In the 3D viewer, double click the mesh that you want to select.
  2. You will see the selected mesh node shows its bounding box in the 3D viewer, and the corresponding node is highlighted in the scene tree.



  3. You may now modify the selected node.

Note:

- Multiple mesh nodes can be selected by pressing the **Ctrl** key down and double click on desired nodes.

Hide Bounding Box

Select one or multiple nodes, the bounding boxes shows.

- Click up the **Bounding Box** button to stop the bounding box mode.
- Double click elsewhere in the 3D Viewer to hide all the bounding boxes temporarily.

Scene Transform

Sometimes the scene of the loaded files are frustrating because of its inadequate position, orientation or size. You can then adjust manually by means of the **Scene Transform** features provided by 3DXchange.

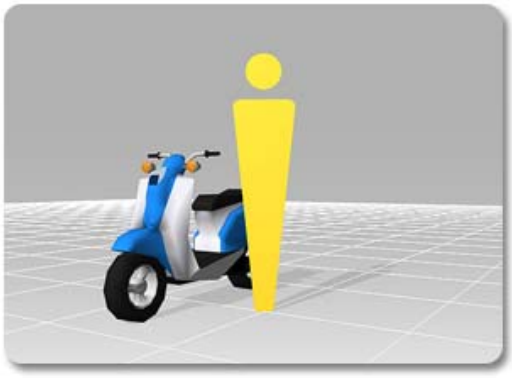
Note:

All the features work globally for the whole scene. They do not work for adjusting single mesh or objects in the scene.

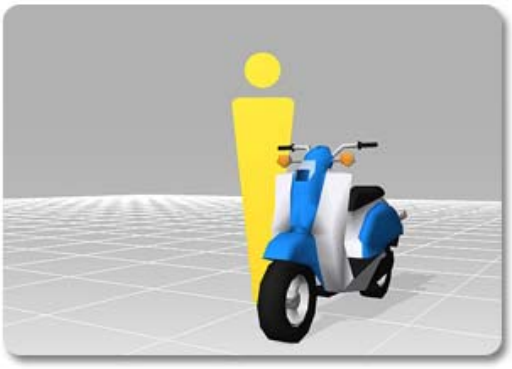
Moving the Scene

You may move the position of the whole scene, comparing with the dummy, to the location you desire. The moving directions along the axis map to the coordinate system in iClone.

- **Left / Right** - Click the up arrow to increase the value of the scene position and click the down arrow to decrease it along the **Red Axis**. You may also key in the value into the edit box to move the scene.

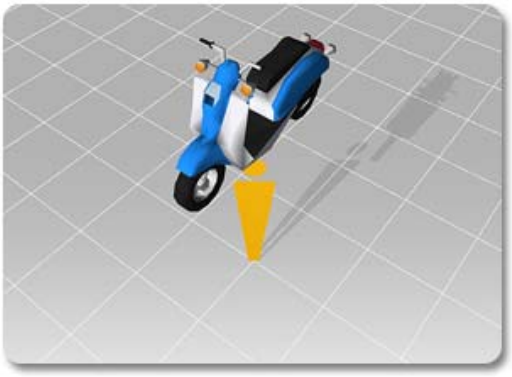


Move Left

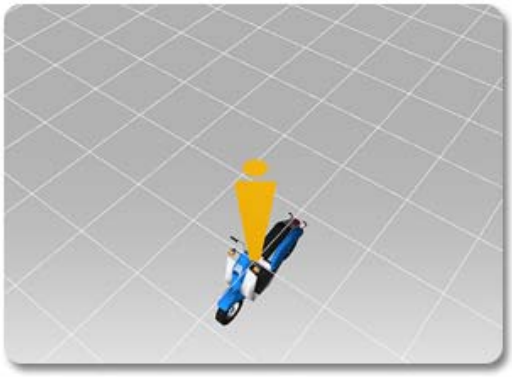


Move Right

- **Up / Down** - Click the up arrow to increase the value of the scene position and click the down arrow to decrease it along the **Blue Axis**. You may also key in the value into the edit box to move the scene.

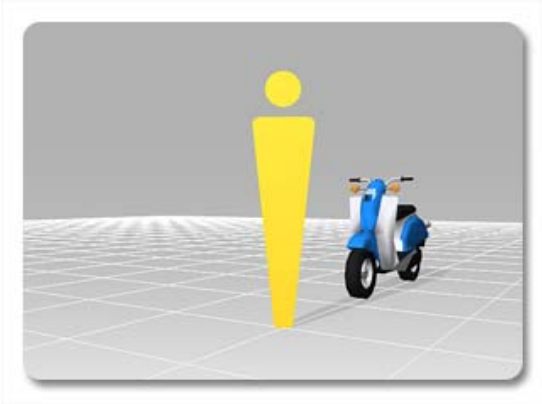


Move Up



Move Down

- **Forward / Backward** - Click the up arrow to increase the value of the scene position and click the down arrow to decrease it along the **Green Axis**. You may also key in the value into the edit box to move the scene.



Move Farther

Move Closer

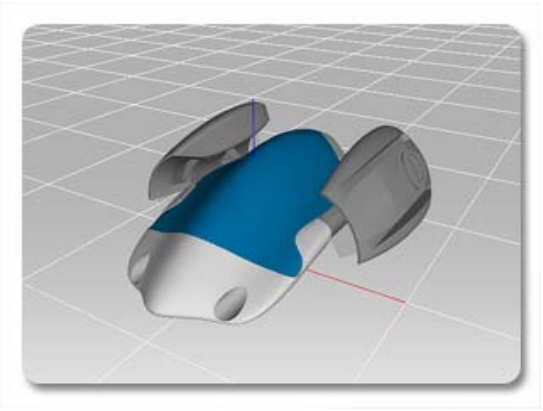
Tips:

- Press the arrow buttons over 3 seconds to double the speed for increasing / decreasing the value. Press the arrow buttons over 6 seconds to triple the speed for increasing / decreasing the value.
- Press the arrow buttons and drag your cursor to increase / decrease the value. The value won't change if you keep your cursor un-moved, which is useful if you want to set the value slowly without using the keyboard.

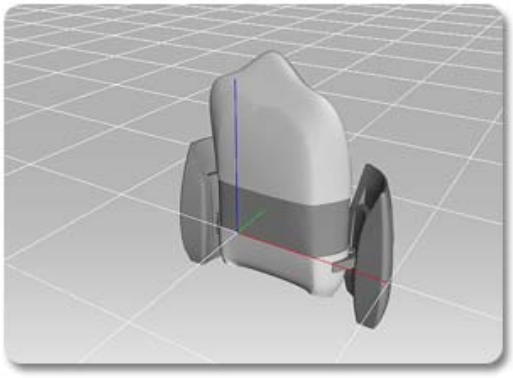
Rotating the Scene

If the file loaded shows incorrect orientation when compared with the dummy, you may adjust the model by these **Rotate** control items. The rotating directions around three axes map to the coordinate system in iClone.

- **Around Red Axis** - Click the up arrow to increase the value of the scene orientation and click the down arrow to decrease it around the **Red Axis**. You may also key in the value into the edit box to rotate the scene.

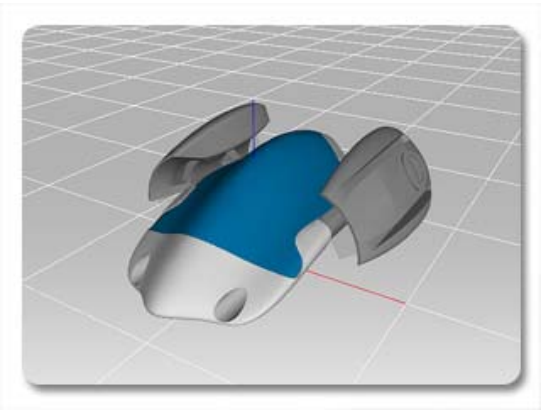


Original Orientation

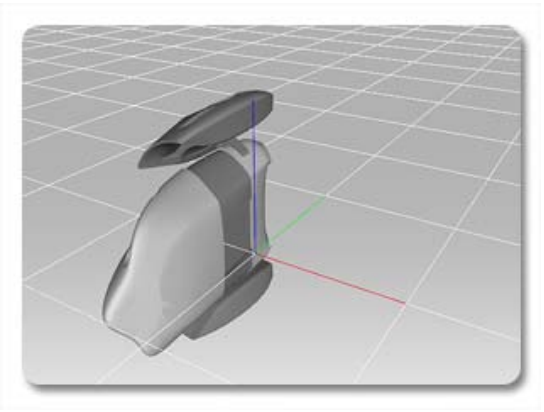


Rotated Around Red Axis

- **Around Green Axis** - Click the up arrow to increase the value of the scene orientation and click the down arrow to decrease it around the **Green Axis**. You may also key in the value into the edit box to rotate the scene.

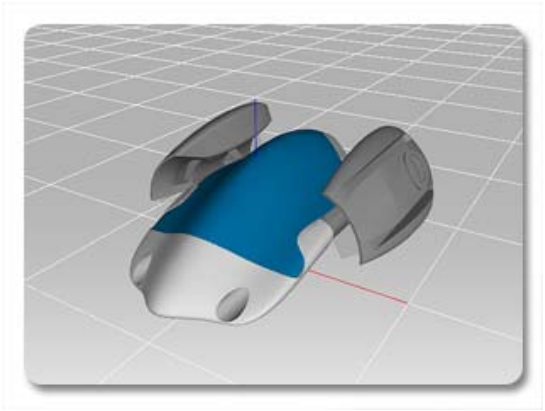


Original Orientation

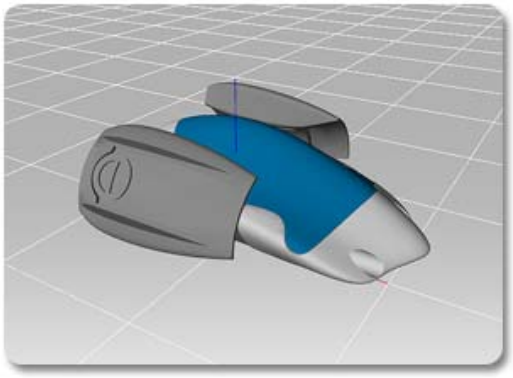


Rotated Around Green Axis

- **Around Blue Axis** - Click the up arrow to increase the value of the scene orientation and click the down arrow to decrease it around the **Blue Axis**. You may also key in the value into the edit box to rotate the scene.



Original Orientation



Rotate Around Blue Axis

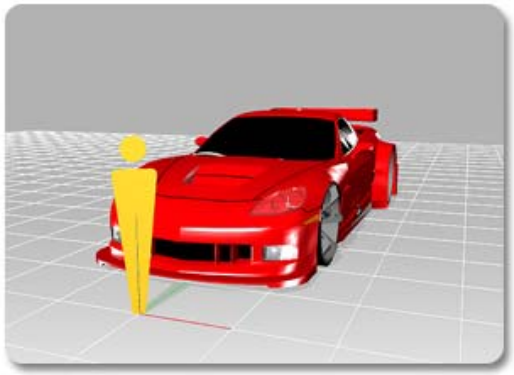
Tips:

- Press the arrow buttons over 3 seconds to double the speed for increasing / decreasing the value. Press the arrow buttons over 6 seconds to triple the speed for increasing / decreasing the value.
- Press the arrow buttons and drag your cursor to increase / decrease the value. The value won't change if you keep your cursor un-moved, which is useful if you want to set the value slowly without using the keyboard.

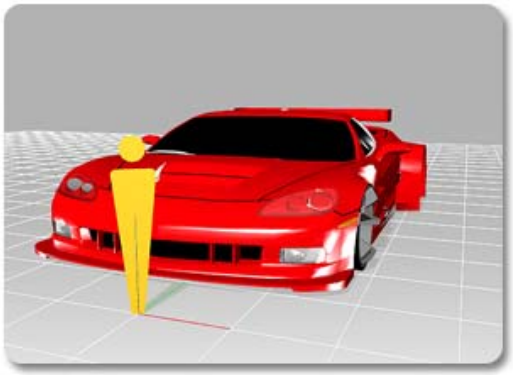
Scaling the Scene

If the objects in the loaded scene need to be resized to match the scale of the dummy, you may want to re-scale it. The scaling directions along three axes map to the coordinate system in iClone.

- **Scaling X** - Click the up arrow to increase the value of the scene orientation and click the down arrow to decrease it around the **Red Axis**. You may also key in the value into the edit box to rotate the scene.

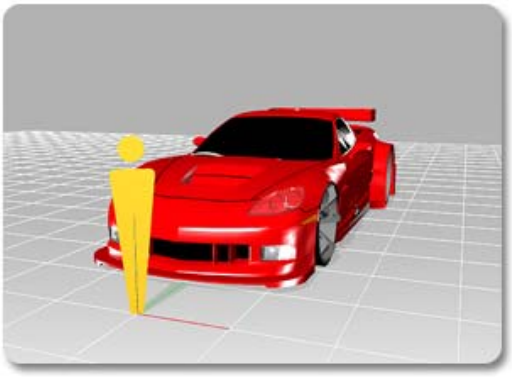


Original Size

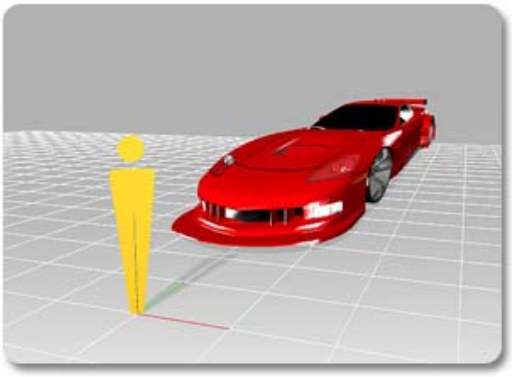


Scaled Along X Axis

- **Scaling Y** - Click the up arrow to increase the value of the scene orientation and click the down arrow to decrease it around the **Green Axis**. You may also key in the value into the edit box to rotate the scene.

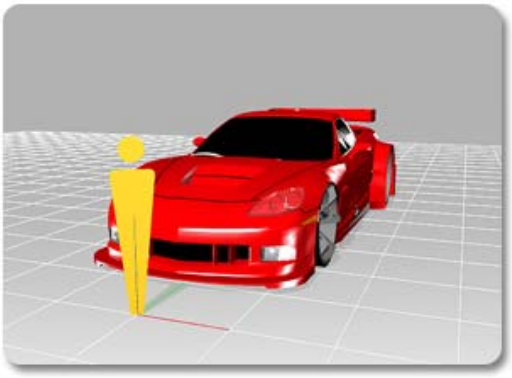


Original Size

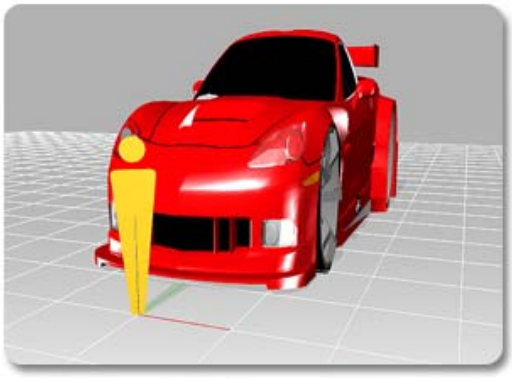


Scaled Along Y Axis

- **Scaling Z** - Click the up arrow to increase the value of the scene orientation and click the down arrow to decrease it around the **Blue Axis**. You may also key in the value into the edit box to rotate the scene.

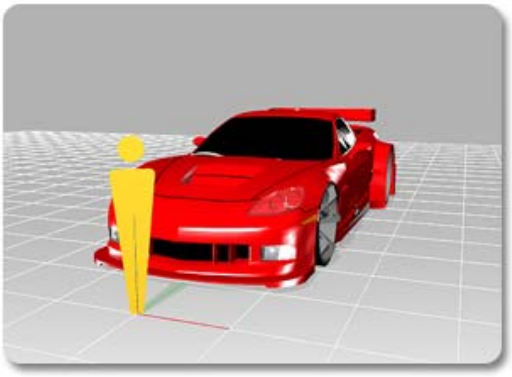


Original Size

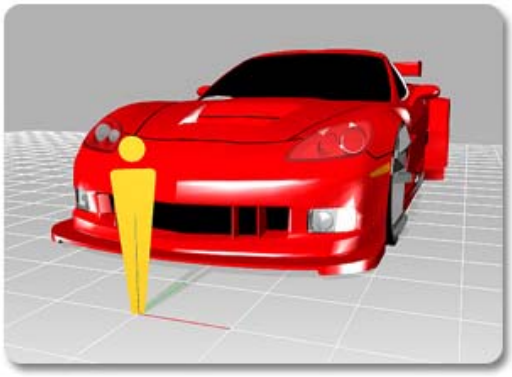


Scaled Along Z Axis

- **Lock XYZ** - Check this box and the node selected will be scaled with the aspect ratio kept. Only the parameter for X is editable. The other two are auto-adjusted in fixed proportion along with the value of X.



Original Size



Locked and Scaled

Tips:

- Press the arrow buttons over 3 seconds to double the speed for increasing / decreasing the value. Press the arrow buttons over 6 seconds to triple the speed for increasing / decreasing the value.
- Press the arrow buttons and drag your cursor to increase / decrease the value. The value won't change if you keep your cursor un-moved, which is useful if you want to set the value slowly without using the keyboard.

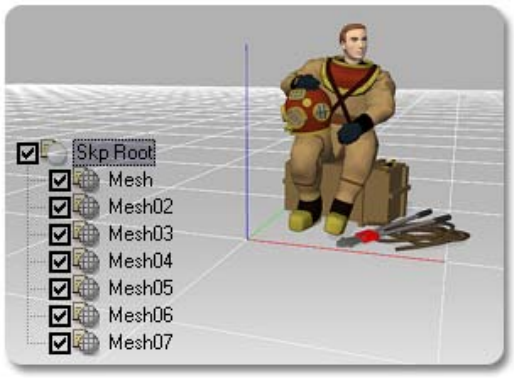
Aligning and Resetting

Sometimes the scene or the mesh nodes may not be built on the center of the scene root. You can align them by means of the **Align to Center** button to align the pivot of the scene, a node, or specific nodes to the scene root. The **Align to GND** (Ground), however, aligns the center point on the bottom of the bounding box containing the scene. Revert to the original object location by clicking the **Reset** button to retrieve the original look of the scene and discard all the transform changes.

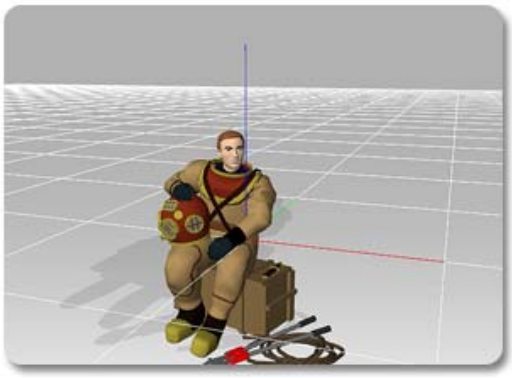
- **Scene Pivot Aligns to Center:**

    1. Load a 3DS, OBJ or VNS file.
    2. Make sure all the mesh nodes are (checked), click the **Align to Center** button.

    3DXchange aligns the pivot of the scene to the origin.



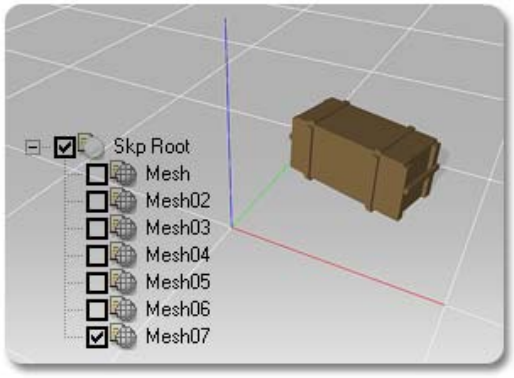
All nodes selected



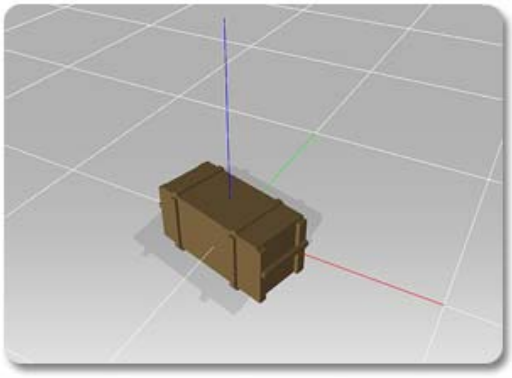
Align scene pivot to the origin

- **Align certain Node Pivot to Center:**

    1. Load a 3DS, OBJ or VNS file, adjust the transform parameters.
    2. Exclude the node that you do not wish to export.
    3. Click the **Align to Center** button. Export the node.



Single node selected



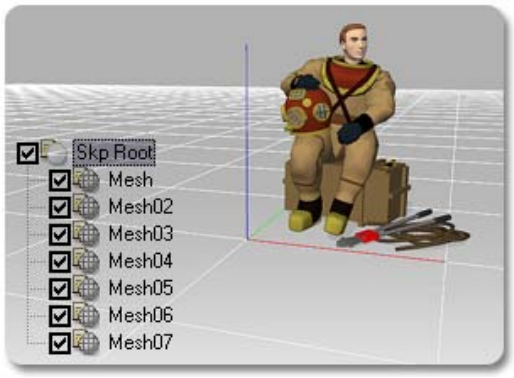
Align pivot to the origin

4. You can see in iClone that the center on the bottom of the node is set to the origin of the coordinate.

- **Scene Aligns to GND (Ground):**

    1. Load a 3DS, OBJ or VNS file.
    2. With all the mesh nodes included, click the **Align to GND** (Ground) button.

        3DXchange aligns the center on the bottom of a bounding box containing all the mesh nodes to the origin.

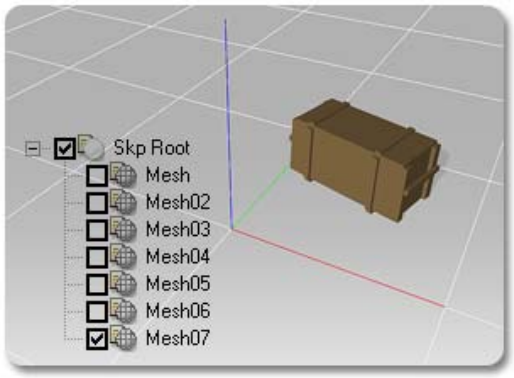


All nodes selected

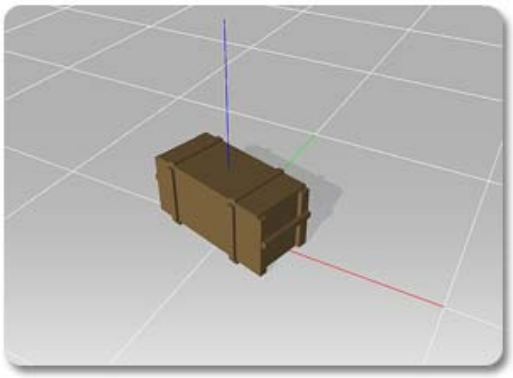
Aligned to the origin

- **Node Aligns to GND (Ground):**

    1. Load a 3DS, OBJ or VNS file, adjust its transform parameters.
    2. Exclude the node that you don't desire for exporting.
    3. Click the **Align to GND** (Ground) button. Export the node.



Single node selected



Aligned to the origin

    4. You can see in iClone that the center on the bottom of the node is set to the origin of the coordinate.

- **Reset:**

    1. Load a 3DS, OBJ or VNS file, adjust its transform parameters.
    2. Click the **Reset** button to quickly retrieve the initial look as the file was loaded.

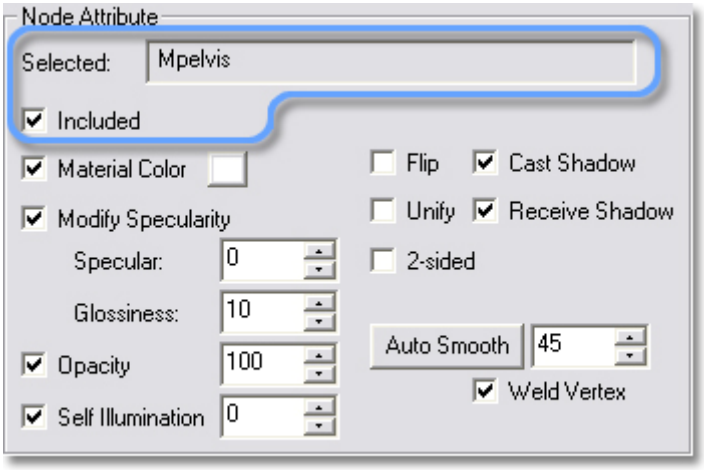
Node Attribute

All the attributes for each of the object nodes can be adjusted in 3DXchange. You may include / exclude objects, modify the color, set the specularity and glossiness of the objects, specify if they cast / receive shadow or not, define the normal direction for each face or smooth the objects.

Selected and Included

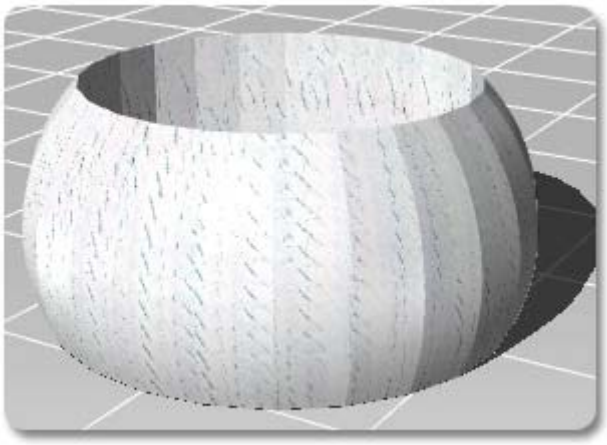
In 3DXchange, you may select nodes in the scene tree to modify their attributes. After modification, you can decide which are to be exported and which are not.

- **Selected** - When you select nodes in the scene tree, the node names show in this box. It is not editable; it only informs you which nodes are selected for editing. If you select multiple nodes, you can edit them all together. Please see Selecting Mesh Nodes for more details.
- **Included** - Check this box to specify the selected node to be exported. The check box status synchronizes with the selected node in the scene tree. This process allows you to export partial nodes of the scene to be used in iClone. For example, you may want to use only a door of a house model, check merely the door's **Included** box and export to further edit the door in iClone. Please see Including and Excluding Mesh Nodes for more details.

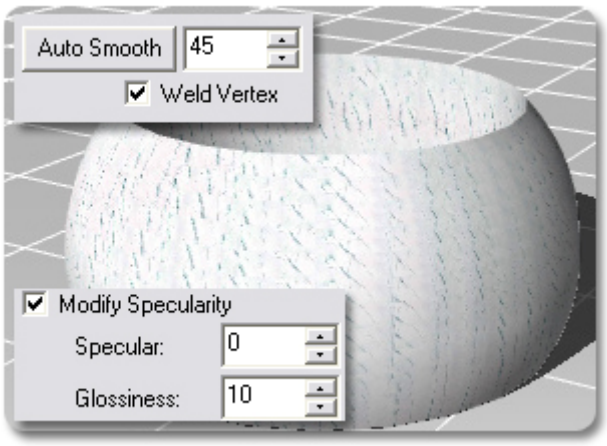


Material Color and Modify Specularity

You may change the color of the selected node by assigning a new color from the color palette. In addition, you may also define the material look of the node, with or without the specularity, by modifying the material attributes provided by 3DXchange.



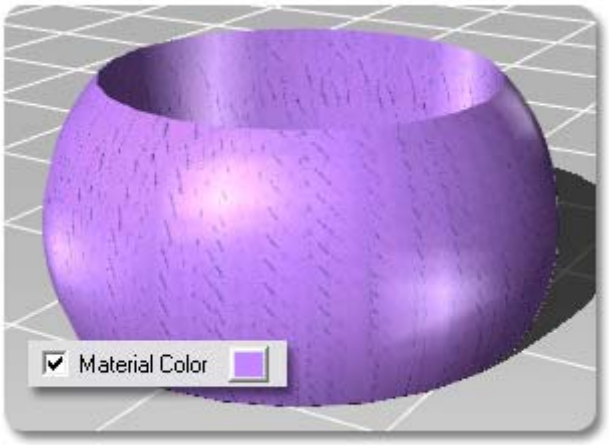
Model with texture from Sketchup Pro



Model smoothed, original specularity

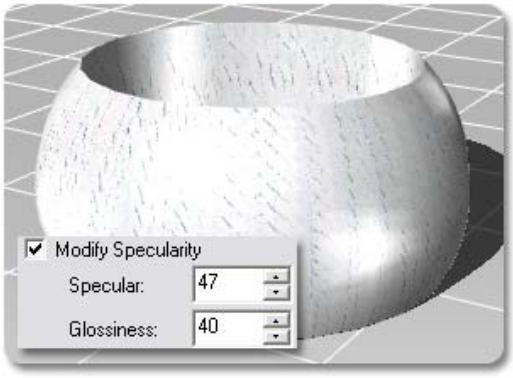
- **Material Color** - If the node selected contains no texture maps, select and apply a new color and if the node contains texture maps, you can also enhance the texture with a color as a tint. Modify Color is unchecked by default.

    1. Select a node in the tree view.
    2. Check the **Material Color** box.
    3. Click the color box to invoke the color palette. Pick one desired color and click **OK** button.

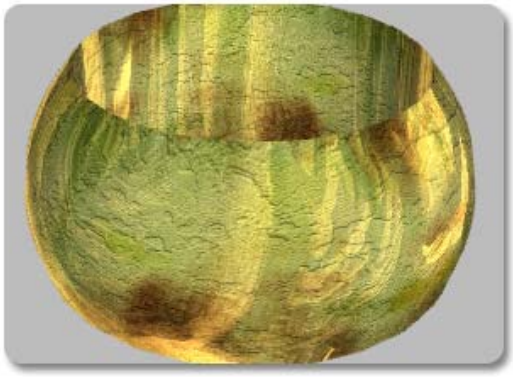


Material Color modified

- **Modify Specularity** - Choose from two parameters, **Specular** and **Glossiness**. These parameters determine the material of the node, to make the node look gold, plastic, metal or wood.
    - **Specular** - The highlights created by light rays reflecting off a shiny surface. It is an important component of a material's definition because it suggests curvature in 3D space. Specular reflection depends on the position of the camera, whereas diffuse light does not.
        1. Pick the node you desire to change the material attributes.
        2. Check the **Modify Specularity** box.
        3. Press the **up / down** arrow button of the **Specular** to increase / decrease the strength of the reflection for the light rays.
    - **Glossiness** - It is the sheen or luster from a surface. The glossiness define the degree to which a surface approaches perfect optical smoothness in its capacity to reflect light. The higher the value is, the more the luster centralizes. It is presented by percentage hence the value ranges from 0 to 100.
        1. Pick the node you desire to change the material attributes.
        2. Check up the **Modify Specularity** box.
        3. Increase the value of the **Specular**.
        4. Press the **up / down** arrow button of the **Glossiness** to increase / decrease the strength of the luster.



Specular and Glossiness modified

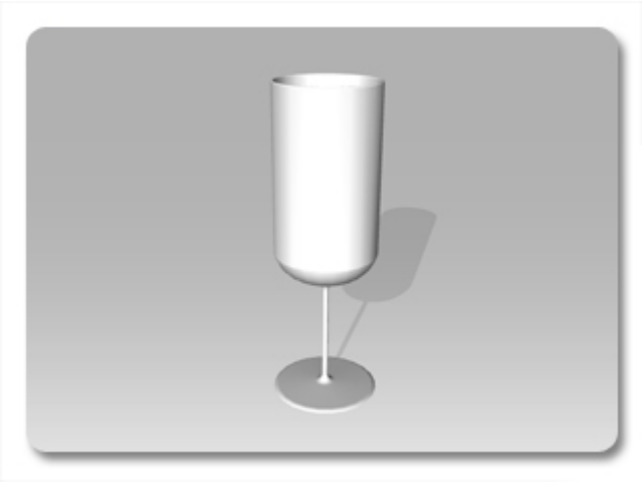


Diffuse and Reflection maps modified in iClone

Opacity

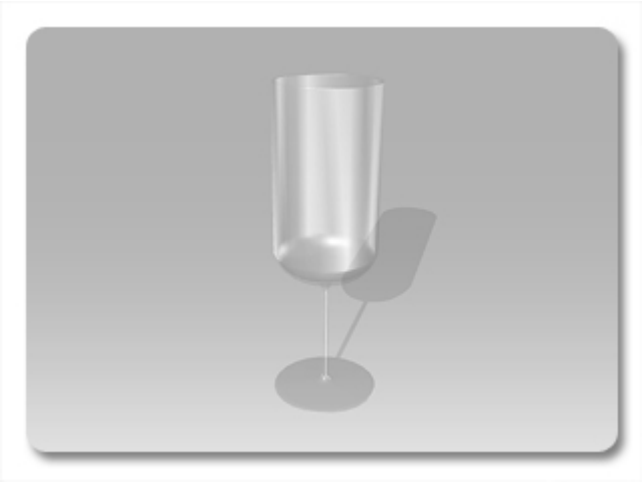
You may specify the transparent level directly in 3DXchange instead of using transparent mapping in iClone.

1. Select the node to be transparent.



2. Check the **Opacity** box.

3. Adjust the number to get the desired result.



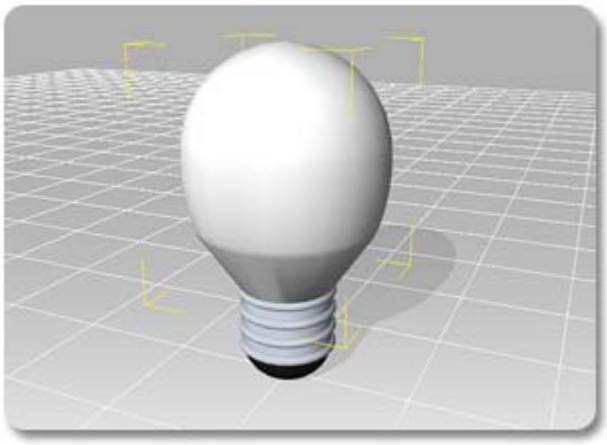
Note:

- You may also specify the **Specularity** to create glass, plastic or rubber looks.

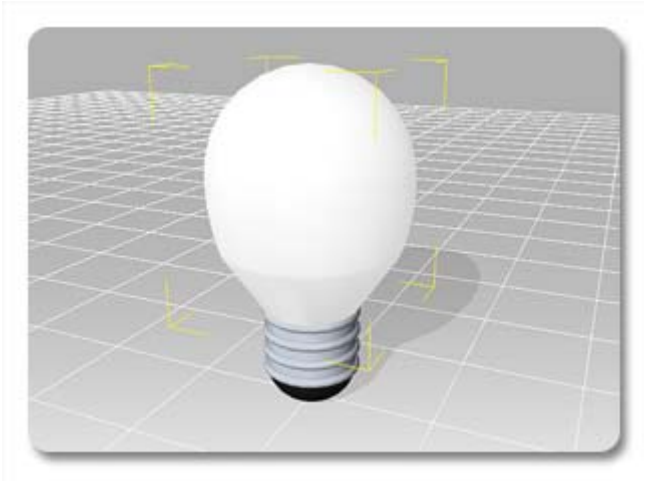
Self Illumination

3DXchange allows you to create props, accessories, 3D scenes possessing the level of the ability to receive light effects in iClone.

1. Select the desired mesh node.

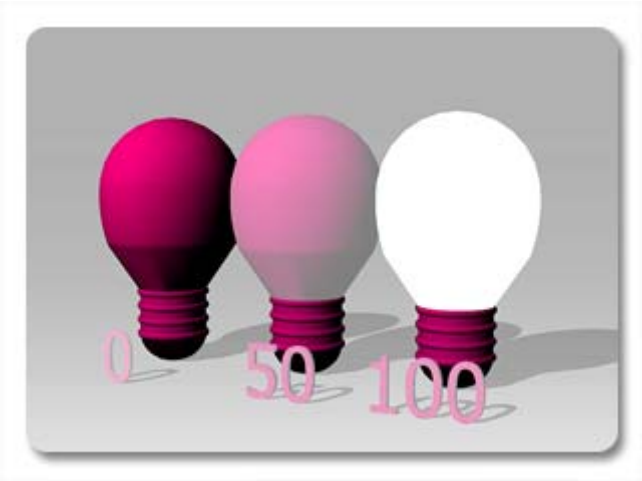


2. Check **Self Illumination**, and increase the value of **self illumination**.



3. Export to **iClone** and apply to the scene.

   Modify the light to check the result.



Light bulbs with various values of **Self Illumination** in iClone
(Custom Light = Red)

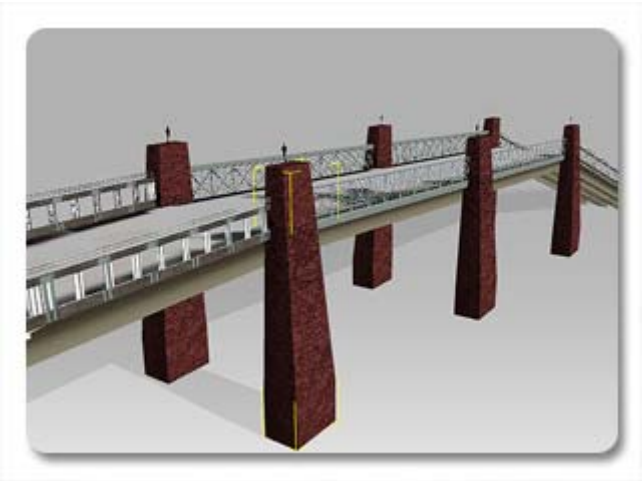
Note:

- The **Pixel Shader** must be turned on to view the effect.
- This feature facilitates you to create sky, sun or moon object which are not effected by the light.

More About SKP, Color, Specularity, Opacity and Self Illumination

If there are several faces of different mesh nodes that use one same texture map in an SKP file, they will be modified altogether as you select one of the node and adjust its **Color**, **Specularity**, **Opacity**, and **Self Illumination**.

The piers are applied with one same texture image



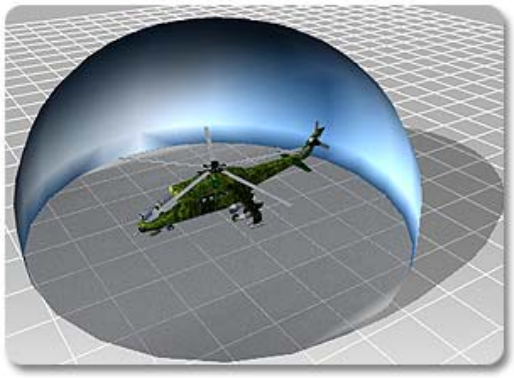
The color of the pier selected is modified;
The others using the same texture are also modified

Shadow

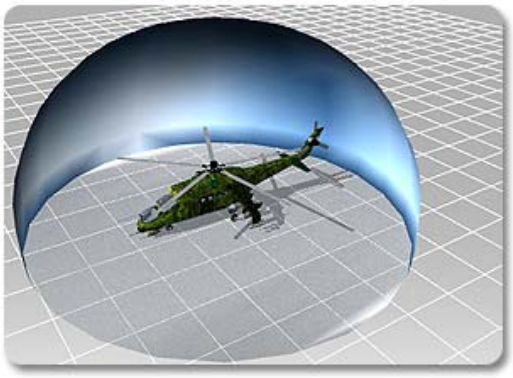
Though every entity in the real world casts and receives shadow, it is obvious that casting and receiving shadows must be defined in the 3D world so that some main objects or characters are not intensively shaded by the others, such as the dome acting as the sky. In 3DXchange, it is possible to decide the casting and receiving shadow attributes by simply check on / off the corresponding boxes.

- **Cast Shadow** - Determines whether the objects cast shadows in iClone. Basically, all the props, accessories, or 3D scenes shall cast shadow. Therefore, this box is checked for all the editable nodes in the tree view by default. Uncheck off the box to prevent the objects from casting shadows.

    1. Select the object node that you wish to cast a shadow in the tree view.
    2. Check the **Cast Shadow** box.
    3. Export to iClone and apply it to the scene.
        - The dome in the illustration imitates the 3D environment. The faces of it hence have the normals inward.
        - Since the dome casts a shadow, all the nodes inside of it are shaded and receive no light.
        - Turn off the shadow of the dome in 3DXchange, so the light passes through its mesh and all the nodes in it are able to cast a shadow.



3D Scene casts shadow



3D Scene shadow turned off

- **Receive Shadow** - Determines whether the objects receive shadows in iClone. Normally, all the props, accessories, or 3D scenes receive shadows. Therefore, this box is checked for all the editable nodes in the tree view by default. Check the box to prevent the objects from receiving shadows.

    1. Select the object node that you decide should receive shadows in the tree view.
    2. Check the **Receive Shadow** box.
    3. Export to iClone and apply it to the scene.
        - The dome in the illustration imitates the 3D environment. The faces of it hence have the normals inward.
        - Since the dome in the left illustration receives a shadow, the shadow cast by the airship is received by the dome.
        - Turn off the **Receive Shadow** attribute of the dome in 3DXchange, the shadows cast by any object in the scene will not be projected on the dome.

3D Scene receives shadow

Receive Shadow turned off

Note:

- You may want to change the shadow mode to **Self Cast Shadow** in the modify page of the light settings to see the casting and receiving result.
- The **Receive Shadow** is supported only by graphics cards with NVIDIA chipsets.

Normal

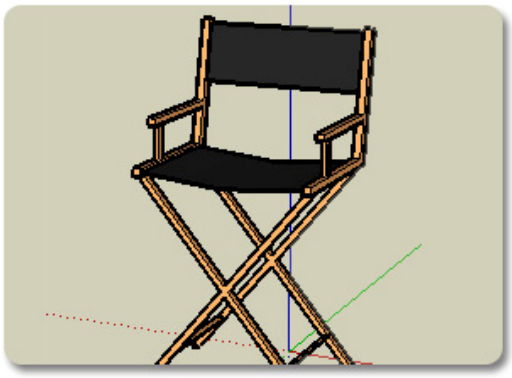
In this section, the document covers the concept of normal, the methods to adjust the normal and how to smooth the surfaces by means of setting the angle of the normals.

The Concept of Normal

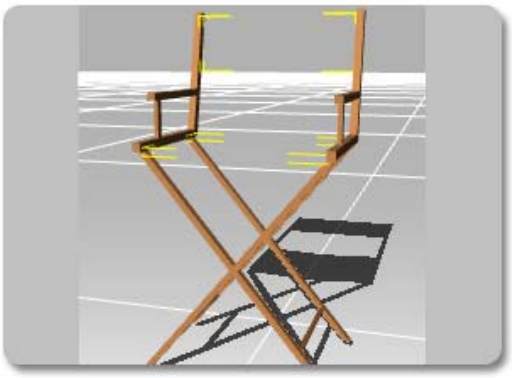
A normal in the 3D world refers to the vector that is perpendicular to a surface. A face or polygon contains only one normal direction. The normal indicates the front and back sides of faces. The front faces (polygons with normal) will be rendered and then appear in the 3D programs while the back faces do not. Therefore, if you turn the camera to the back faces, they look transparent and you can see everything beyond.

Flipping the Normal

Sometimes you may import 3DS, OBJ, or VNS files with objects that disappear or look odd. This might be caused by the incorrect normal direction. For example, you might be able to see the inside of a box without being covered by the outside of the box, no matter how you adjust the perspective of the camera. You can use the **Flip** feature to rotate the faces inside out.



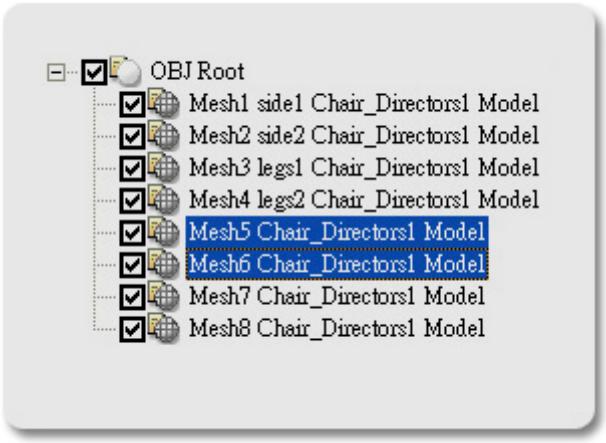
Model in Sketchup Pro



Reversed faces disappear in iClone 3DXchange

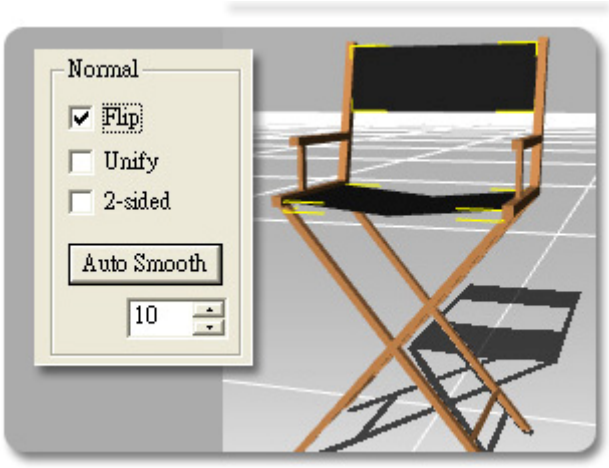
To flip normal, please follow the steps:

1. Select the mesh nodes that looked odd in the tree view.



Reserved faces selected

2. Check the **Flip** box.



Faces flipped

See Unifying the Normal if some of the faces still fail to be rendered along with others, which cause holes or cavities on the surface of the objects.

Tips:

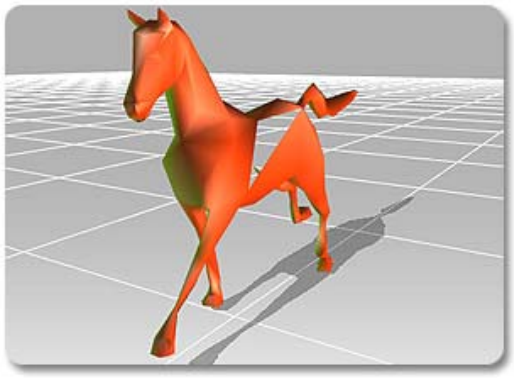
- This feature is useful especially when you desire to create a doom-like environment or terrain in which the camera shoots the scene.

Unifying the Normal

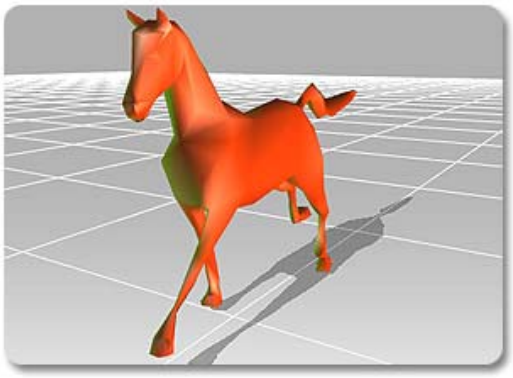
If you use the **Flip** function and you still fail to mend the holes or cavities on the surface, you might need to apply the feature in this section. Unifying the normal adjusts all the normals outward or inward so the holes on the surface can be fixed.

To unify the normals, please follow the steps below:

1. Select the mesh nodes that have holes on the surface.
2. Check the **Unify** box.



Before Unify



After Unify

If the holes still exist, it may be that the holes are designed to be there or the faces of the holes could have been deleted before exported from the source 3D application.

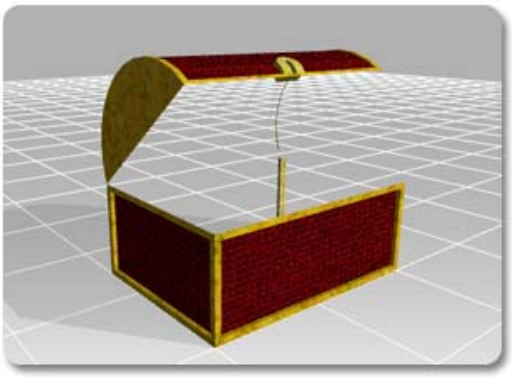
Pease apply the **2-sided** feature if the problem remains.

2-Sided

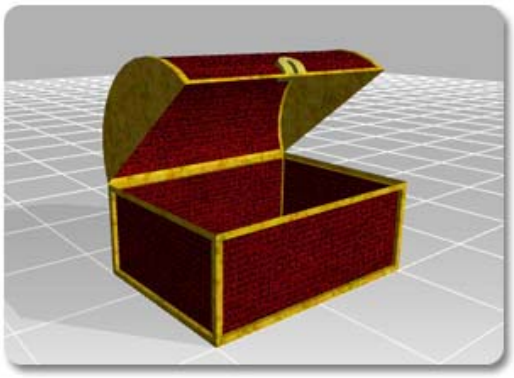
This is the fast but resource-consuming method to fix the hole or break problems on the surfaces of mesh nodes. If you ever use **Flip** and **Unify** features but the problem remains, you can take **2-sided** as the resolution. Usually, faces are only visible from the front. If you apply the **2-sided** function, the holes on the surface turn out to be visible because the surface will generate normals on both sides by 3DXchange. However, this function can slow down rendering since it renders both front and back sides of a face to ensure that your model is free from hole problems.

To use the 2-sided normals, please follow the steps below:

1. Select the mesh nodes that have holes on the surface.
2. Check the **2-sided** box.



Before 2-Sided
(The faces with normal outward are transparent)



After 2-Sided

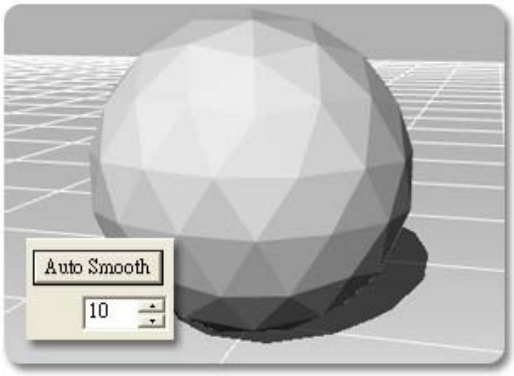
Auto-Smoothing Mesh Nodes

In the 3D virtual world, each model is composed of numerous small planar faces, also know as polygons. Usually, a simple model can have thousands of faces, which can consume the resources of the operating system tremendously. Therefore, to downsize the number of the faces and remove the ridges on models simultaneously may turn out to be critical for system performance.

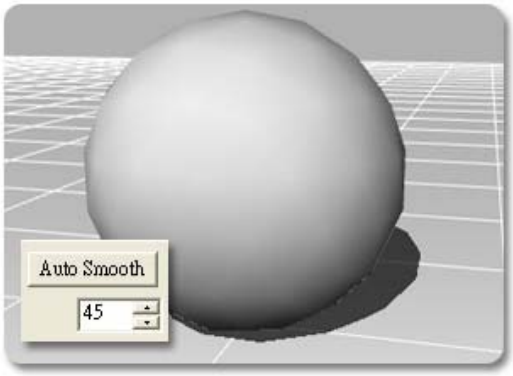
3DXchange introduces an attribute, taking advantages of the concepts of normal, to smooth the surfaces of models automatically. You can specify an angle value to ensure that the serially connected faces with an angle (generated by two normals) under this value will be taken as of one surface, and consequently, these faces are applied to the smoothing algorithm to be smoothed by the software.

To auto-smooth mesh nodes, please follow the steps:

1. Select the mesh node that you desire to smooth.
2. Click the up / down arrow to increase / decrease the value of the angle. You may also key in the value into the edit box.
3. Click on the **Auto Smooth** button.
4. (Optional) If the smoothing doesn't seem to work, please check the **Weld Vertex** box and click **Auto Smooth** again.



Un-smoothed Surface



Smoothed Surface

Note:

- **Weld Vertex** will weld together vertices which will keep your geometry intact and allow smoothing to be preserved. When two faces share the same vertex, which cause the smooth fail, please check **Weld Vertex** box.

Export

This is the most important feature for the 3DXchange. You may load 3DS, OBJ, or VNS files and then export them into VNS files for iClone. The exported files can be prop, accessory or 3D scene VNS files. 3DXchange automatically puts the exported file into the iClone asset folders according to your settings. Alternatively, you may change the path for storing the files into your desired folders.

Tips:

- 3DXchange directs the path to pre-installed iClone corresponding custom folders by default:

  C:\Documents and Settings\All Users\Documents\Reallusion\Custom\iClone 2 Custom\...

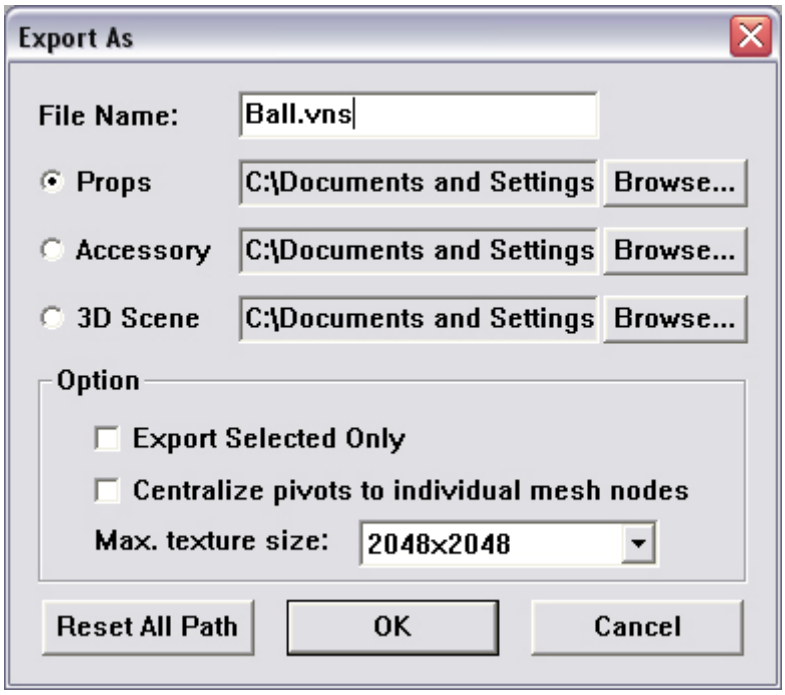
  Alternatively, you can click the **Browse...** button if you desire to export the VNS files to any other target folders.

- You may click **Reset Path** button if you desire to export the iClone files into the default path.

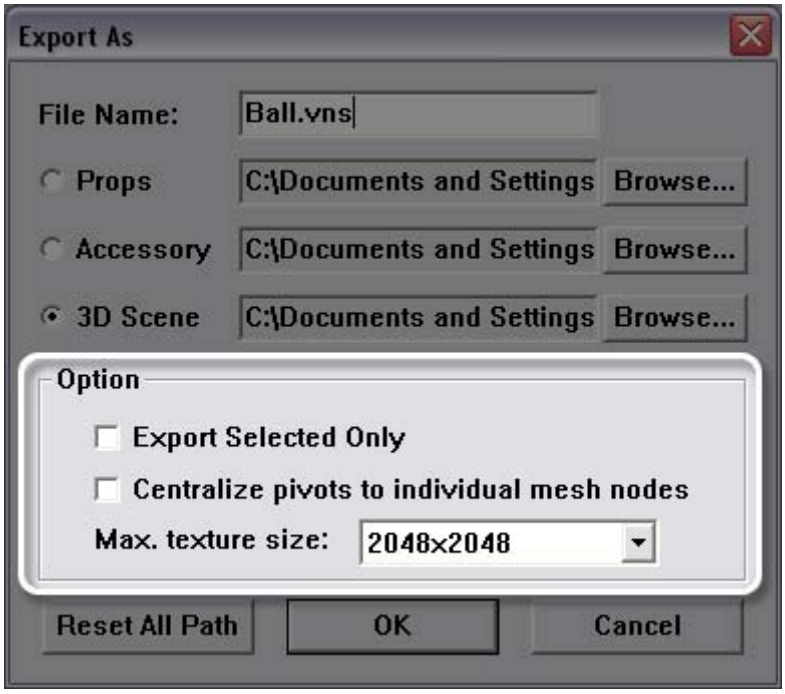
Exporting VNS Files

To export prop/accessory/3D scene files, please follow the steps below:

1. Click the **Export** button in the **Tool Bar** or select the **File / Export... (Ctrl + E)** item in the main menu.
2. In the **Export As** dialog box, key in the file name.
3. Click the desired radio button. You can accept the default path or click the **Browse...** button if you desire to export the VNS files to any other target folders.
4. Use the **Max. texture size** drop down list to specify the size of the texture maps for exporting.
5. Click **OK** button to export the scene as a VNS file.



Options



Export Selected Only

Check this box to export the selected node only. It facilitates you to export desired node more easily.

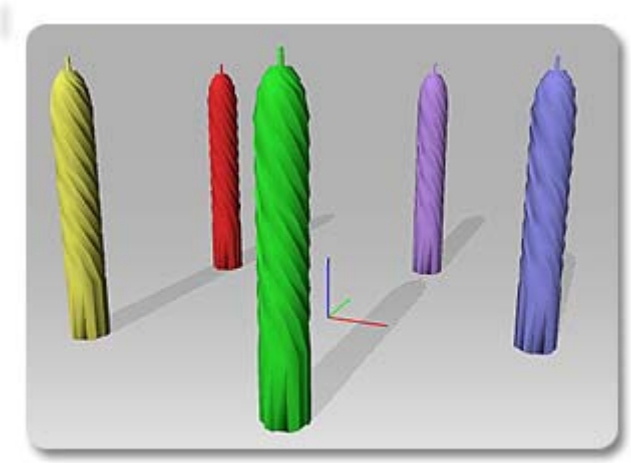
Centralize pivots to individual mesh nodes

Some 3D applications may export files with all the mesh nodes pivots set to the origin of the scene. This can cause the particles in iClone to fail to be attached to the target node correctly. You must attach and move the particle to the desired position.

To solve this problem, you may check **Centralize pivots to individual mesh nodes** box when you export VNS files by means of 3DXchange.

Uncheck "Centralize pivots to individual mesh nodes"

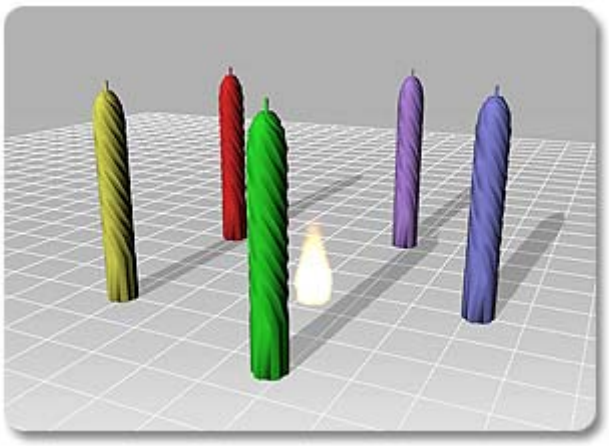
1. Import OBJ files with five nodes.



(In 3DXchange)

2. Export and uncheck the "Centralize pivots..." box.

3. Apply the new prop in iClone and attach 5 fire particles to these five nodes. Since the pivots of the nodes are all set to the origin, the particles are also attached to the origin.

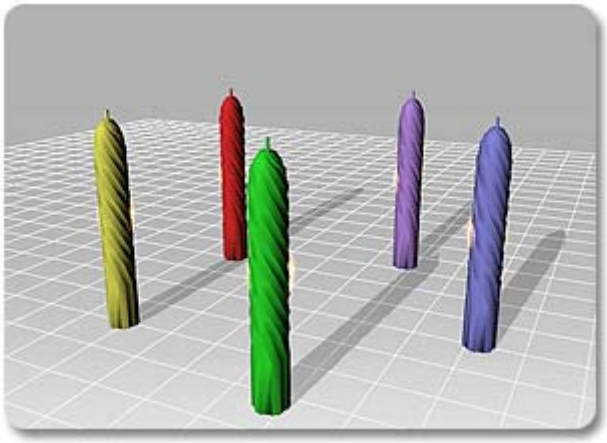


(In iClone)

- **Check "Centralize pivots to individual mesh nodes"**

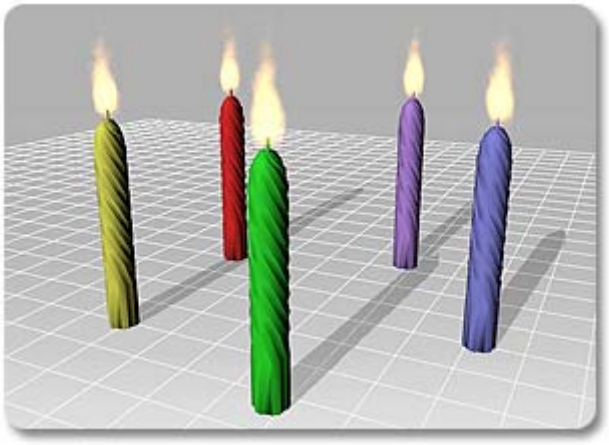
    1. Import the same OBJ file again.
    2. Export and check the "Centralize pivots..." box.
    3. Apply the new prop in iClone and attach 5 fire particles to these five nodes.

        Since the pivots are adjusted back to the center of the mesh nodes, the particles are attached to the center of the candles.



(In iClone)

4. Adjust the Y-transition of the particles.



(In iClone)

Note:

- If the node of the source 3DS files contain motion clips, checking this box can cause the motion clips to be removed.
- When the imported file has skin bone nodes, this function will be disabled to prevent these nodes from being excluded accidentally.

Max. texture size

The **Max. texture size** decides the texture resolution shown in iClone. The higher the resolution the better result you get in iClone.

Original look in 3DXchange

Export 256 x 256 texture
Result in iClone

Export 1024 x 1024 texture
Result in iClone

Export 4096 x 4096 texture
Result in iClone

Tutorial

Please refer to http://www.reallusion.com/iclone/3dx_usecase.asp for more details.

Hotkey Table

The hotkeys for you to quickly invoke specific functions are listed below.

Global Hotkeys

Hotkey	Description
Ctrl + O	Open file
Ctrl + E	Export VNS file
Ctrl + G	Launch Google 3D House
Alt + G	Show / Hide grid
Ctrl + F1	Pixel Shader On/Off
F	3D Viewer Home
F5	Reload current file
F11	Enter / Leave full screen 3D viewer
F1	Help

Scene Tree Hotkeys

Hotkey	Description
Up Arrow Key	Select Previous Node
Down Arrow Key	Select Next Node
Left Arrow Key	Fold Tree
Right Arrow Key	Unfold Tree

Troubleshooting

Hints and Tips

- CTRL + F1: To switch to quick shader for speeding up the interaction.
- Align to Ground: To move object to the ground mapping to iClone root position.
- Hotkey F: To switch the 3D viewer to home position.
- Hotkey F5: Reload the file any time when you are editing.
- Texture Missing Error: Please copy all the texture files in the same folder of the source file.
- 3DS or OBJ: Import one of them if the other doesn't work well in 3DXchange. Please visit our web site for the import pipeline and forum.
- Missing UV: Please apply the UV type in iClone to generate UV. Refer to the Help file in iClone for more details.

Troubleshooting

For the latest troubleshooting information, visit the support section of our web site at http://www.reallusion.com/support.asp.

Frequently asked questions

Please visit our web site for the complete FAQ contents:
http://www.reallusion.com/iclone/3DX_faq.asp.

If you can't find the answer you desire, please fill in the form for further service:
http://www.reallusion.com/CusomerSupport/user/QForm.aspx.

Technical Support and Feedback

By purchasing iClone, you are eligible for premium support from our technical support team, should the need arise!

Please take a look at our support resources available from our website (http://www.reallusion.com/CustomerSuppoert/user/FAQList.aspx). In many cases this will be able to immediately answer your questions; if you have any comments or concerns about iClone, or you desire to contact our support team, please fill in the support form in www.reallusion.com/CustomerSupport/user/QForm.aspx.

Contacting Reallusion

Contact us:

Technical and Customer Service:
http://www.reallusion.com/CustomerSupport/user/FAQList.aspx

Reallusion forum:

http://forum.reallusion.com/

Reallusion Developer Center:

http://developer.reallusion.com/

Web:

http://www.reallusion.com/

Address:

Reallusion Inc.

2033 Gateway Place

Fifth Floor, San Jose

CA 95110

Appendix

Appendix A - Supported 3DS Import Parameters

Main Data Structure

Item Name	Parameter Name	Description
Key Frame Mesh (Object Node)	kfmesh3ds	Scene Tree and KeyFrame data
Mesh	mesh3ds	Triangle Mesh data
Material	material3ds	Material data

Supported Chart

1. **kfmesh3ds**

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
char3ds name[11]	Name of mesh	
char3ds parent[22]	Name of parent object	
ushort3ds flags1	flags field from node header	
ushort3ds flags2	flags2 field from node header	
Point3ds pivot	Object pivot point	
char3ds instance[11]	Object instance name	
point3ds boundmin	Minimum bounding box point for dummy objects	
point3ds boundmax	Maximum bounding box point for dummy objects	
ulong3ds npkeys	Number of position keys	
short3ds npflag	Loop control flag for position keys	
keyheader3ds *pkeys	Spline values for position keys	
point3ds *pos	Mesh position keys	
Ulong3ds nrkeys	Number of rotation keys	
short3ds nrflag	Loop control flag for rotation keys	
keyheader3ds *rkeys	Spline values for rotation keys	
rfrotkey3ds *rot	Rotation keys	
ulong3ds nskeys	Number of scaling keys	

short3ds nsflag keyheader3ds *skeys point3ds *scale	Loop control flag for scaling keys Spline values for scaling Mesh scaling keys	
ulong3ds nmkeys short3ds nmflag keyheader3ds *mkeys kfmorphkey3ds *morph	Number of morph keys Loop control flag for morph keys Spline values for morph keys Morph keys	
ulong3ds nhkeys short3ds nhflag keyheader3ds *hkeys float3ds msangle	Number of hide keys Loop control flag for hide keys Spline values for hide keys Morph smoothing group angle	

keyheader3ds

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
ulong3ds time	Key's frame position	
ushort3ds rflgs		
float3ds tension	Spline terms used flag	
float3ds continuity	flagged with 0 x 01	
float3ds bias	Flagged with 0 X 02	
float3ds easeto	Flagged with 0 x 04	
float3ds easefrom	Flagged with 0 x 08	
	Flagged with 0 x 10	

2. **mesh3ds**

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
char3ds name[11]	Object name	✓
byte3ds ishidden	Hidden object flag	✓
byte3ds isvislofter	Lofter visibility flag	✗
byte3ds ismatte	Matte object flag	✗
byte 3ds isnocast	Doesn't cast shadow's flag	✓
byte3ds isfast	Fast display flag	✗
byte3ds isnorcvshad	Doesn't receive shadows	✓
byte3ds isfrozen	Frozen object flag	✗
ushort3ds nvertices	Vertice count	✓
point3ds *vertexarray	List of vertices	✓
ushort3ds nvflags	Number of vertex flags	✗
ushort3ds *vflagarray	List of vertex flags	✗
ushort3ds ntextverts	Number of texture vertices	✓
textvert3ds *textarray	List of texture coordinates	✓
byte3ds usemapinfo	Boolean for use of mapping icon information	✗
mapinfo3ds map	Mapping icon info	✗
Float3ds locmatrix[12]	Object orientation matrix	✓

ushort3ds nfaces faced3ds *facearray ulong3ds *smootharray	Face count List of faces Smoothing group assignment list	
byte3ds useboxmap char3ds boxmap[6][17]	Boolean used to indicate the use of box mapping Material names used in box mapping	
ubyte3ds meshcolor	UI color assigned to the mesh	
ushort3ds nmats objmat3ds *matarray	Assigned materials count Material assignment list	
byte3ds useproc ulong3ds procsize char3ds procname[13] void3ds *procdata	Use animated stand-in flag Size of animated stand-in data Name of animated stand-in procedure Animated stand-in data	

3. **Material3ds**

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
char3ds name[17]	Name	✓
fcolor3ds ambient	Ambient light color	✓
fcolor3ds diffuse	Diffuse light color	✓
fcolor3ds specular	Specular light color	✓
float3ds shininess	Shininess factor	✓
float3ds shinstrength	Shininess strength	✓
float3ds blur	Blur factor	✗
float3ds transparency	Transparency factor	✓
float3ds transfalloff	Fall off factor	✗
float3ds selfillumpct	Self illumination percentage	✓
float3ds wiresize	Width of wireframe	✗
shadetype3ds shading	Shading type	✗
byte3ds useblur	Blurring flag	✗
byte3ds usefall	Transparency falloff flag	✗
byte3ds twosided	Two sided material flag	✓
byte3ds selfillum	Self illumination flag	✗
byte3ds additive	Additive transparency flag	✗
byte3ds usewire	Use wireframe rendering	✗
byte3ds usewireabs	Wire size is in units, not pixels	✗
byte3ds facemap	Face mapping switch	✗
byte3ds soften	Soften switch	✗

		
mapset3ds texture mapset3ds texture2 mapset3ds opacity mapset3ds bump mapset3ds specmap mapset3ds shinmap mapset3ds illummap rmapset3ds reflect	Texture map settings Second texture map settings Opacity map settings Bump map settings Specularity map settings Shininess map settings Self illumination map settings Reflection map settings	

mapset3ds

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
bitmap3ds map bitmap3ds mask	The map settings The mask settings	

bitmap3ds

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
char3ds name[13]	Bitmap file name	
float3ds percent tiletype3ds tiling byte3ds ignorealpha	Strength percentage Tile/Decal/Both	  
Filtertype3ds filter float3ds blur byte3ds mirror byte3ds negative float3ds uscale, vscale float3ds uoffset, voffset float3ds rotation	Pyramidal/Summed Area	
tinttype3ds source fcolor3ds tint1 fcolor3ds tint2 fcolor3ds redtint fcolor3ds greentint fcolor3ds bluetint	RGB/RGB Luma Tint/Alpha Tint/RGB Tint	
ulong3ds datasize void3ds *data	Size of procedural data Procedural data	 

Appendix B - Supported OBJ Import Parameters

Support principle: Support all the attributes related to **Polygon** only.

OBJ

Attribute Name	Description
F	Face
G	Group Name
MTLLIB	Material Library
O	Object Name
S	Smooth Group
USEMTL	Material Name
V	Vertex
VN	Vertex Normal
VT	Vertex Texture Coordinate

MTL

Attribute Name	Description
newmtl	Material Name
Ka	Ambient Color
Kd	Diffuse Color
Ks	Specular Color
d	Alpha
Tr	Alpha, the same as 'd'
Ns	Shiniess
map_Kd	Diffuse Texture Name
map_Bump bump	Bump Texture Name
map_D	Opacity Texture Name
Map_refl refl	Reflection Texture Name

Appendix C - Supported SKP Import Parameters

1. ISkpDocument

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
Layers	The layers for all mesh nodes	
CurrentCamera		
Description		

2. ISkpEntities

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
Edges Faces Vertices FrontUVPoint BackUVPoint VertexNormal	The material and the texture UV for the front face. The material and the texture UV for the back face.	     
Polyline3ds Images Texts		 

		
Groups ConstructionLines ConstructionPoints Dimensions		
Component SectionPlanes Mirror Object	The Component. The mesh nodes created by mirror.	

3. ISkpMaterial

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
Color Texture Alpha	The color of this material if it is a color. The texture of this material if it is a texture. The transparency.	

4. ISkpImage

 : Supported  : Unsupported  : Partial Supported

Data Name	Description	Supported
Path		
Width	The width of the image	
Height	The height of the image	
ZRotation	The rotation about the image's z-axis (or normal)	
Name	The name of the image (for the name of the mesh nodes)