

Release Notes for Modo 10.1v1

Release Date

15 June 2016

System Requirements

Officially Supported Operating Systems

- Mac OS X 10.9.x, 10.10.x, and 10.11.x
- Windows 7, Windows 8, and Windows 10 (64-bit only)
- Linux 64-bit operating system (RHEL 5.4+)

Minimum Hardware Requirements

- Intel processor(s), Core i3 or higher
- 10 GB disk space available for full content installation
- At least 4 GB RAM
- Display with 1280 x 800 pixel resolution
- Internet connection for product activation and online videos access
- The **Advanced** viewport mode requires an NVIDIA or AMD graphics card with at least 512 MB of graphics memory and drivers that support OpenGL 3.2 or higher

Recommended System Requirements



NOTE: This information is our best recommendation for the average user. Requirements vary by usage, and individual users may have different requirements from those listed here.

- 2.5+ Ghz quad-core processor
- 250+ GB disk space available for caching and temporary files, SSD is preferable
- 16 GB RAM with additional virtual memory*
- Display with 1920 x 1080 pixel resolution
- An NVIDIA or AMD graphics card with the latest drivers

- 2+ GB of graphics memory
- OpenGL 4.4 or higher support

*The use of virtual memory improves stability and helps prevent data loss on large projects.

Tested Workstation Hardware

The configurations listed below are those that The Foundry have tested with Modo 10.0v1. Due to the constantly changing nature and wide variety of computer hardware available in the market, The Foundry is unable to officially certify hardware. The list below can be used as a recommendation and does not guarantee that it meets your particular needs.

Please download and install the latest graphics driver from the NVIDIA or AMD websites. Make sure that you are using 8.982.8.1 drivers or higher for AMD cards.

If you encounter any issues, please contact support@thefoundry.co.uk.

Tested Workstation Hardware	
Apple	<ul style="list-style-type: none"> • MacPro4, 1 • MacPro5, 1 • iMac13, 2 • MacBookPro10, 1
Dell	<ul style="list-style-type: none"> • Dell T1700 • Dell T3610 • Dell T3620 • Dell T5810 • Dell T7610 • Dell T7910 • Dell Precision Rack 7910 • Dell Precision 5510 • Dell Precision 7710 • Dell M2800 • Dell M6800
HP	<ul style="list-style-type: none"> • HP Z440 • HP Z600

Tested GPU Hardware	
AMD Prosumer Graphics Cards	<ul style="list-style-type: none"> • Radeon™ HD 1900 XT • Radeon™ HD 2400 XT • Radeon™ HD 2600 Pro • Radeon™ HD 3870
AMD Enterprise Graphics Cards	<ul style="list-style-type: none"> • FirePro™ W4170 • FirePro™ W5000 • FirePro™ W8000 • FirePro™ W2100 • FirePro™ W5100 • FirePro™ W4100 • FirePro™ W7100 • FirePro™ W8100 • FirePro™ W9100
NVIDIA Prosumer Graphics Cards	<ul style="list-style-type: none"> • Geforce GTX 680 • Geforce GTX Titan • Geforce GT 650M
NVIDIA Enterprise Graphics Cards	<ul style="list-style-type: none"> • Quadro® K6000 • Quadro® K5000 • Quadro® K4000 • Quadro® K2000 • Quadro® K600 • Quadro® K5200 • Quadro® K4200 • Quadro® K2200 • Quadro® K1200 • Quadro® K620 • Quadro® M5000 • Quadro® M4000

New Features

Modo 10.1 introduces a powerful, flexible, and robust new procedural modeling system that works side-by-side with Modo's best-in-class direct modeling toolset. With Modo 10.1, artists can iterate more freely with the ability to manipulate modeling operations at any time in a flexible layer stack. Create infinite variations using procedural operations that can be driven by textures, falloffs, or dynamically changing inputs; and easily accommodate change requirements with the ability to edit selections and swap out input meshes after the fact. New curve tools, constraints, deformers, and enhancements to the MeshFusion toolset complete the Modo 10.1 modeling updates.

Mesh Operations

At the heart of the procedural toolset are mesh operations. These are single layers within the procedural stack that are evaluated to modify the input mesh in some way. The operation can be simple, such as setting a material tag, or can be complex, such as filling a closed curve with polygons. The mesh operations are layered on top of each other in the procedural stack, and the stack is evaluated from the bottom up, passing the modified mesh from one operation to the next.

In addition to the new mesh operations, a subset of existing tools also have procedural equivalents.

Assign Selection Set

The procedural Assign Selection Set mesh operation stores a collection of mesh elements - vertices, edges, and polygons - in a selection set, so they can be re-used at a later stage in the procedural evaluation. This can be useful for operating on the same set of mesh elements across a series of operations, or to store a selection for later use.

Curve Fill

The procedural Curve Fill mesh operation fills closed curves with quads. External curves are filled, and internal curves can be used to cut holes in the closed shape. The operation provides two filling methods: grid and paving. The grid method creates quads aligned to a world axis, whereas the paving method fills a closed curve from the outside in, attempting to maintain a nice border around the edge of the filled shape. Settings are provided, allowing control over the fill density, polygon type, and UVs.

Curve Rebuild

This mesh operation rebuilds an existing curve, placing new vertices at fixed spacing along the curve. The vertex spacing can either be controlled using a fixed point count, or a spacing distance along the curve.

Material Tag

This mesh operation sets the material tag on all marked polygons on a procedural mesh. These tagged polygons can then be used in the **Shader Tree** to mask textures and shaders.

Merge Meshes

This operation merges multiple mesh items into a single procedural layer. An option to maintain the world transform, it transforms the merged mesh by its world transform.

Transform UV Map

This operation transforms a specified UV map on a procedural mesh item. You can manipulate the tiling, position, and rotation of the UV map.

Freeze

This mesh operation rasterizes non-face type polygons into face polygons. This is useful for converting text polygons into regular polygons, which can then be used with other procedural tools.

Edges to Curves

The Edges to Curves operation converts edges into a series of curves of various types. The operation can either create multiple disconnected curves for each edge, or it can create one continuous curve from a series of connected edges. When combined with the Select by Border selection operation, the Edges to Curves operation can be used to easily convert a polygon island into a curve outline to be used with the Curve Fill mesh operation.

Lace Geometry

This operation extrudes a profile shape along a guide curve. The profile shape can either be provided by a custom mesh, a content preset, or a pre-defined shape, such as a circle, square, or rectangle. As

the name suggests, this operation is useful for creating geometry, such as laces on a shoe.

Spline Primitives

The Spline Primitive tools allow simple spline shapes to be created, both procedurally and non-procedurally. You can create a series of shapes, such as Circles, Stars, Squares, Rectangles, and so on.

Sub-tools

Content Preset

The Content Preset sub-tool allows procedural tools to utilize content preset files to modulate the shape that they create.

Path Generator

The Path Generator sub-tool provides a curve path for other tools, such as the Sweep Effector, to sweep along.

Path Segment Generator

The Path Segment Generator generates particles along a curve from the Path Generator. This feeds into a Sweep Effector to perform operations, such as a Curve Extrude.

Pen Generator

The Pen Generator provides a polyline to tools, such as the Sweep Effector tool, allowing a linear sweep from point to point with sharp, well-defined angles at corners.

Selection Operations

Selection Operations exist within the procedural stack and are special items, which can be associated with a mesh operation in the selection graph. They are evaluated per element to determine if a specific element should be modified by a procedural operation.

The following selection operations are available:

- **Select by Border** - This selection operation selects all mesh elements of the specified type, around the border of a polygon island.

- **Select by Falloff** - This selection operation selects all mesh elements of the specified type, based on the weight of a falloff item. A threshold channel is provided, allowing you to specify the minimum weight that is required for the element to be selected. The associated falloff can be any of the standard falloff item types, and can also be textured for further control of the effect.
- **Select by Index** - This selection operation allows element selection to be specified by element index. The selection can be defined either by a list of indices separated by commas, a range of numbers separated by a hyphen, or a combination of the two. When creating a procedural operation, if you have an element selection using the traditional Modo selection tools, a Select By Index item is automatically created and populated with the indices of the selected elements. Commands are also provided to allow elements to be added and removed from the procedural selection, using the traditional Modo selection tools.
- **Select by Range** - This operation selects all elements within a particular range. You can define a start index, an end index, and a step amount. If the index of an element is within the specified range, then it is selected. The step control allows you to skip certain elements in the range. For example, if the step value is 2, every other element index within the range is selected. If the step value is 3, every third element within the range is selected.
- **Select by Selection Set** - This operation allows an existing selection set to be used to define a procedural selection. This selection set can either be defined procedurally using the **Assign Selection Set** mesh operation, or it can be defined on the base mesh, using the traditional selection set commands.
- **Selection Operators** - These are a special class of selection operations that allow more technically-minded users to build complex selection rules using the Modo rigging toolset. On each selection operator, the information about the element is provided as an output channel, for example on the Polygon Selection Operator, information such as the position, normal, area, and index is provided as a channel, and a single input channel called Select allows the selection state to be driven by a rig. When the selection is evaluated, the rig is evaluated per element and is provided with the properties of that element. You can set up complex rigs using channel modifiers to determine the selection state, using the element properties we provide, to create unique and interesting selection rules that can be shared with other users.

Workflow

Preset Browser

The **Add Item** button of the **Procedural** panel allows you to add items to your scene through the **Preset Browser**, instead of a dropdown menu. The **Preset Browser** also gives you searching capability, and different viewing options for the familiar item types.

Curve Particle Generator

The Curve Particle Generator allows you to generate particles along a curve. Additional controls allow you to control which way the particles are pointing, how many particles to generate, the particle size parameter, and to slide the particles along the curve.

Freeze Mesh Operations

Modo provides an option to freeze the stack up until a certain point. Everything above the selected mesh operation is maintained, but the selection operation and all items below it are baked into the mesh, becoming uneditable. A second option provides a Duplicate and Freeze method, which duplicates the stack and freezes the mesh up to a particular layer. This is useful if you want to freeze the stack, but maintain a copy as a backup.

Particle Modifier Enhancements

The Particle Generator has a new option to have the particles it creates center around its location, rather than having particles start at its location and expand only in the positive axis direction. The Particle Look At Modifier has also been given a new additional option, which allows you to specify an explicit X,Y,Z direction for the particles to point towards.

UV Constraint

The UV Constraint modifier allows item position and rotation to be constrained to a position on the surface of a mesh, defined by its UV coordinate. You can specify a position on a target UV map, as well as an optional UDIM, and the modifier outputs a position matrix and a rotation matrix for a corresponding surface position in world space.

Push Influence

The new Push Influence deformer pushes geometry along its surface normal, providing the effect of inflating the mesh. The push amount can be modulated by distance, as well as using a falloff to modulate the push amount per vertex.

Texture Falloff

A Texture Falloff allows you to use a texture to attenuate the effect of a tool, for example, a bevel.

Texturable Falloffs

Falloff items now expose a texture input in the **Schematic** viewport and **Mesh Operations** stack, allowing textures to be connected directly to the falloff, rather than requiring you to use the complex FX tree section of the **Shader Tree**.

B-Spline Curves

A new B-Spline polygon type has been introduced that provides a much nicer interpolation between points, and is simpler to manipulate than Bezier curves. A weight option is provided on each point to control the weighting of the B-Spline knot.

MeshFusion

Strips

Improvements have been made to the systems that create Strips, the geometry that connects the surfaces of a Fusion Model.

Strip Density

Along with the new density properties, the UI has been enhanced to improve how all strip properties are edited. This includes improved stepper controls (offering easier control with complex models that respond slowly to edits). Variable density along the strip has been enhanced to automatically adapt to curvature and corner requirements.

Strip Corners

New Strip Corner properties have been added to strip items, individually controlling rounding and densities. Internal systems have been created to smoothly reconcile disparate strip densities meeting at any given corner. A new UI has also been added to set these properties, including conveniences for propagating settings and compensating for density changes to maintain rounding.

MeshFusion Schematic

Schematic Editing

Inactive input channels have been added to Fusion operation nodes, matching each node's normal input channels. Right-click context menus for links and the operation nodes have been added to support activating/deactivating links (including conveniences like toggling, activating/deactivating all, deactivating all except the clicked link).

Schematic Drag&Drop

Scripted methods have been added supporting 3D viewport drag and drop Schematic Fusion editing.

Feature Enhancements

- The Qbic Browser has been enhanced to better support its use with Schematic Fusion models, and offers broader, better-organized placement options.
- Mesh Preset placement has been improved and expanded, including options to add multiple copies of the preset mesh as either individual meshes or combined into a single mesh (each method has advantages for subsequent Fusion modeling/editing goals). More thorough support has been added for placement based on selected target mesh elements (vertices, edges, and polygons). Schematic fusing support has also been added.

Main Bug Fixes

This is a list of the most important bug fixes. For a full list, see [The Foundry Community site](#).

- Bezier tool: Changes behavior to create straight segments with clicks.
- The default turn speed of the Game Input Mode was 2.0 instead of 1.0.
- The absolute input mode was enabled when using the Game Input Mode, which caused issues on systems set up to use tablet input.
- The Generator Particle Modifier had no **Center** option.
- The up vector was incorrect when the Look At Particle Modifier was set to **Planar**. The Target channel had no **Direction** option, so there was no way to set an explicit vector to define the direction.
- Unreal and IBL Roughness did not work correctly. No reflection type was initialized for Unreal and Unity materials.

- Double-clicking an Assembly preset didn't add it to the current group in the **Schematic**.
- Unity and Unreal materials generated incorrect Image Based Lighting (IBL) textures due to the diffuse roughness not being 0.0.
- Unreal Material: There was no GLSL clearcoat shader. Clearcoat caused black edges. The shading model didn't have an option to switch between standard shading and clearcoat shading for the **Advanced** viewport. Clearcoat was applied twice for Unreal material, which caused energy issues.
- Improvements have been made to Unreal Screen-Space Reflections.
- BUG ID 14371 - Render outputs were not working correctly with Item masks and Instances.
- BUG ID 36261 - Foreground and background alphas were not working properly with Parametric Ink.
- BUG ID 36430 - Color Picker: HSV numeric values greater than 360 became 300 instead of 359.999.
- BUG ID 37130 - **Shader Tree**: Layer and Group masks could cause halos and fringing around them.
- BUG ID 37272 - Some materials were not evaluated in fur layers when using multiple fur layers.
- BUG ID 37643 - Vertex Illumination Baking didn't work with offset geometry.
- BUG ID 38235 - Items imported through FBX didn't respect the viewport visibility settings.
- BUG ID 38624 - Brush Blending Mode didn't function correctly with RGBA images.
- BUG ID 41160 - Preview: there was no option to save to layered images when rendering an animation.
- BUG ID 41732 - Changing fur spacing caused the fur width to change.
- BUG ID 41913 - Fur rendered differently than it displayed in GL.
- BUG ID 42480 - The gamma applied to images using image ink changed after saving and reloading the scene.
- BUG ID 43236 - Windows only: Modo didn't have support for multiple processor groups, so it couldn't fully utilize systems with more than 64 processors.
- BUG ID 43399 - Fur was tapering to absolute length, not parametric length.
- BUG ID 44062 - When painting, the first click when painting on an image map was delayed.
- BUG ID 44077 - In Full Resolution mode, clicking in Preview did not select materials in the **Shader Tree**.
- BUG ID 46509 - Image maps created at the root level could not be duplicated.
- BUG ID 46707 - Implicit UV textures on area lights were not supported.
- BUG ID 47572 - Bezier Deformer: deformation popping occurred on animated meshes.
- BUG ID 47829 - **Topology** layout: Active mesh has been set to **Shaded** mode to improve the visibility with color correction and transparency. The default rig lights have been made brighter to match the original **Topology** layout (MODO 601).
- BUG ID 47857 - Preview: Layered EXR could be saved with incorrect channel names.
- BUG ID 48117 - Use Clip UDIM was not working for UDIM 1001.

- BUG ID 48448 - **Item List:** Layer visibility icons didn't update if a layer's parent group was made invisible.
- BUG ID 48639 - Rendering animations to some formats didn't save the alpha channel.
- BUG ID 48734 - Fur: Vector maps and Weight maps couldn't be used together.
- BUG ID 48765 - Preview: Right-clicking did not show the light contributions.
- BUG ID 48979 - RayGL synchronous update mode was grainy.
- BUG ID 49038 - Area lights blocked indirect environment light with Environment Important Sampling (EIS) enabled, and Preview and Final render did not match.
- BUG ID 49435 - Renders using EIS sometimes produced NaNs.
- BUG ID 49594 - Images saved from Preview did not have an alpha channel if **Render All Outputs** was disabled.
- BUG ID 49603 - The Spline Effector's visibility state didn't work.
- BUG ID 49673 - Deferred Meshes: Items that support instancable interfaces now include automatic instancing. Render memory use was high when using instances of deferred meshes.
- BUG ID 49897 - Double-sided meshes were not displaying correctly in the **Default** viewport.
- BUG ID 49916 - Auto-added Alpha render outputs (used for border expansion) were saved when baking render outputs using bake items.
- BUG ID 49960 - Camera Matcher: The origin position derived from the line length control landed off camera.
- BUG ID 50376 - OBJ I/O: The Importer failed to load files that other applications could load, due to it containing non-standard OBJ elements.
- BUG ID 50395 - Bake Wizard: Bake items couldn't save each UDIM clip after baking, only all at the end.
- BUG ID 50509 - Game Export: The texture sub-path wasn't changing in the **FBX Export > PBR XML** preset settings.
- BUG ID 50608 - Particle Modifiers: Tries to maintain particle IDs from source items when multiple sources are connected.
- BUG ID 50620 - Volumes driven by OpenVDB could not be scaled.
- BUG ID 50634 - Editing the material of an invisible item made it show in Preview.
- BUG ID 50696 - De-selecting certain image map layers in the **Shader Tree** wasn't updating in GL.
- BUG ID 50786 - Mac OS X only: The Render window remained in focus and on top of other windows even when switching to another application.
- BUG ID 50958 - Vertex Maps: Subdivision Weight Map values could not be cleared from vertices in Catmull-Clark polygons.
- BUG ID 50972 - Game Export: Relative paths were being used when disabled.
- BUG ID 50991 - Bump and Displacement were not affected by nodal shading.
- BUG ID 50995 - FBX I/O: The UV Distortion map was exported.

- BUG ID 51001 - Vertex Illumination Baking ignored GI and gave incorrect values.
- BUG ID 51022 - Edge Slice: the multi-slice option was creating holes in the mesh in some circumstances.
- BUG ID 51070 - The Bake Wizard did not have a viewport group, and couldn't be added to layouts.
- BUG ID 51205 - Motion Vector didn't support cylindrical and spherical cameras.
- BUG ID 51207 - Baking to Render Outputs with an animated environment was not updating after frame 1.
- BUG ID 51325 - Game Export: the script ignored the Export PBR setting if there was an Unreal or Unity Material in a group.
- BUG ID 51344 - A memory leak occurred when assigning image clips to shaders.
- BUG ID 51389 - Vertex Illumination Baking: baking errors occurred on rigged/skinned meshes.
- BUG ID 51426 - Reflections did not work in orthographic views.
- BUG ID 51485 - Bake Wizard: The cage value was not set on the bake item.
- BUG ID 51502 - Unreal Material: The default specular has been changed from 100% to 50%.
- BUG ID 51524 - Windows only: In Preview, not all processors were used if there were more than 64.
- BUG ID 51543 - The **Advanced** viewport often displayed environment reflections and lighting incorrectly.
- BUG ID 51549 - In the Occlusion Processing Texture, convexity and concavity could not be represented differently, due to the lack of a Curvature option.
- BUG ID 51557 - Unreal Material: Roughness was incorrect in the **Advanced** viewport compared to Unreal Engine and Preview.
- BUG ID 51558 - The Screen-Space Reflections in the **Advanced** viewport did not default to off.
- BUG ID 51598 - Replica Mirror: The BG meshes Effector option was not working.
- BUG ID 51649 - Render Pass groups were disabled when first loading a scene.
- BUG ID 51676 - Subdividing certain shapes created polygons with flipped normals.
- BUG ID 51679 - MeshFusion: Fusions caused jagged meshes when strip widths were reduced.
- BUG ID 51843 - The **Apply to Item instances** channel has been added to the shader group to control the behavior with instances, which is necessary, because without it the behavior is ambiguous. The new channel defaults to enabled.
- BUG ID 51901 - Mesh Paint: Normals were flipped in some cases, when painting geometry in **Item** mode.
- BUG ID 52092 - Linear Falloff: Several fields were missing from the **Properties** panel.
- BUG ID 56826 - The default value of the Texture Offset Amplitude was 1 instead of 0.
- BUG ID 57134 - Network Rendering: The Render window didn't show the last frame rendered, if rendered on a slave.

Known Issues and Workarounds

This section covers known issues and gives workarounds for them, where appropriate.

Advanced Viewport

- BUG ID 51554 - Artifacts may appear on surfaces when environment lighting is used in some scenes.
- BUG ID 51124 - Clearcoat displays incorrectly (dark), when used with Image Based Lighting (IBL).
- BUG ID 50104 - Meshes may display all black in some layouts when using environment lighting. As a workaround, use the **Model**, **UV**, **Topo**, or **Paint** layouts.
- BUG ID 50810 - Anisotropic texture filtering is lower quality than in the **Default** viewport.
- BUG ID 50629 - Changing the **Default View Colorspace (System > Preferences > Rendering > Color Management)** with the **Advanced** viewport visible can lead to instability.
- BUG ID 50364 - Visible seams or vertical lines of noise appear when using environment textures.
- BUG ID 49643 - Image Based Lighting (IBL) reflections are blurry.
- BUG ID 49598 - Spurious diagonal lines of bad pixels may appear in the **Advanced** viewport with some AMD cards.
- BUG ID 46995 - Ambient Occlusion display in the **Advanced** viewport is affected by selected item wireframes.

You can disable **Show Selection** in the **Visibility** options or disable wireframe drawing on the active mesh layers.

Assemblies

- BUG ID 36452 - Assemblies exported from the **Item List** context menu result in poor visual layout of nodes on import.

As a workaround, you can save assemblies from the **Schematic** viewport.

Audio

- BUG ID 52242 - Windows only: The **.au** format doesn't load on Windows 10, due to the lack of DirectShow support, which Modo uses, for the format. As a workaround, convert the audio file to a different format, such as **.wav**. This bug will not be fixed.

Baking

- BUG ID 50671 - Baking displacement maps can cause UV seams to be visible, and the baked displacement map to show quilting effects and other render artifacts.

- BUG ID 49437 - The **Bake Channel Swizzling** option can't bake to texture alpha.

Color Management

- BUG ID 49244 - Windows only: With **Perform Color Correction** on, setting a default scene to a scene with a mesh that has a position channel crashes at launch.
Use **System > Reset Preferences** to reset to defaults or move/remove the default scene as a workaround.

Default Viewport

- RGBA textures only draw correctly in the **Advanced** viewport. In the **Default** viewport, any unsupported texture effect on an image map is drawn as diffuse color when the layer is selected in the **Shader Tree**.
- BUG ID 51881 - Weight maps are drawn incorrectly if a bump map is visible. As a workaround, use the shaded viewport style or disable the bump map.

Deformers

- BUG ID 50684 - In some cases, the Lattice deformer doesn't deform correctly.

Dynamics

- BUG ID 52068 - Windows only: Mesh Shatter: Using **Source** mode may not create shards correctly in some cases.

File and Image I/O

- BUG ID 50198 - Alembic does not export some surface items, including static meshes and procedural shatter items.
- BUG ID 49728 - Exporting selected layers (from the **Item List** context menu) to **.fbx** doesn't export instances unless the original mesh is also exported.
To resolve this, set the **.fbx** preference to **Export Selection** and use **Export As...**
- BUG ID 47230 - Alembic export of a mesh from a MODO 401 scene fails due to a custom channel called **inherit**.
- BUG ID 47036 - Color management in **.svg** images is not currently supported. This is a side-effect of a bug fix where the largest allowable image size (64k x 64k) was always used when color correction was enabled.
- BUG ID 46962 - Rendering **.svg** images used as stencil maps for displacement or for layer masking, can be very slow.

Fur

- BUG ID 35731 - Fur length textures can't be edited with the Stretch tool.
Use different fur length drivers, such as hair guides or vector vertex maps.

General

- BUG ID 49514 - Mac OS X only: Running `modo_cl` before running the UI Modo application breaks code signing.
As a workaround, start the UI version of Modo once, before running `modo_cl` on any system where you later intend to use the UI version.

Input Devices

- BUG ID 51741 - Modo sometimes becomes unresponsive when using the combination of a click-drag in a tree view (for example, when toggling the visibility of two successive items in the **Shader Tree**), followed immediately by a two-finger scroll gesture on some devices, including laptop trackpads and the Magic Mouse. As a workaround, avoid that specific combination of input events or change to a 3-button mouse (recommended to fully access all of Modo's features).
- BUG ID 35856 - Linux only: Plugging in a Wacom tablet while Modo is running can cause undesired movement. This cannot be fixed, due to a limitation of the hardware driver.
To avoid this, plug in the tablet before application startup or restart.

MeshFusion

- BUG ID 48669 - Linux only: MeshFusion objects set to **Airtight Final** may cause Modo to crash when the **Dup & Convert to Mesh** option is used.
If the **Dup & Convert to Mesh** button is not exposed through the **more (>>)** button, Modo doesn't crash. You can avoid clicking the **more (>>)** button by maximizing the form (**numpad 0**) and/or collapsing the other form sections by clicking on them.

Modeling

- BUG ID 52208 - Undoing Instance Clone tool actions sometimes causes Modo to crash.
- BUG ID 52126 - Toggling **Replace Source** and a Radial Array using a multi-res Catmull-Clark mesh may cause Modo to crash.
- BUG ID 52198 - Edge Bevel: Width mode does not work correctly.
- BUG ID 52184 - Edge Bevel: The **Edge Shape: Square** option doesn't update correctly in GL.
As a workaround, toggle **Sharp Corner** on and off to force a refresh.

- BUG ID 52140 - Morphs/Falloffs: Editing morphs with tools, which use the Screen or Selection falloffs does not work.

Network Rendering

- BUG ID 48325 - Scenes with image sequences rendered with Full Frames use the wrong image sequence number on slave machines.

As a workaround, use **File > Consolidate Scene**, then render the scene using a shared network folder (Preferences option under **Rendering > Network Rendering**).

- BUG ID 30318 - Network Rendering doesn't support Realflow particles.
- BUG ID 25636 - Frame passes are not supported.

Nodal Shading

- BUG ID 50642 - Nodal shading does not support UDIMs.

Painting/Sculpting

- BUG ID 52267 - Painting on multiple UDIMs doesn't work if they have overlapping edges.

As a workaround, when manually UVing or using Pack UVs, be sure to leave small gaps between the UDIM regions. Using Pack UVs with the **Tile** option with a **Gap** of 1% works well.

- BUG ID 41682 - Textures are not always updating in Preview/Render when painting on an image map.

You can save and reload the image to force the update.

- BUG ID 40701 - Image-based sculpting can cause meshes to tear in OpenGL.

Particles

- BUG ID 52185 - Curve Particle Generator: The **Point Count** setting generates one less point than the value entered.
- BUG ID 34925 - Re-opening scenes saved with large particle caches can cause problems.

To avoid such issues, delete the cache before closing Modo, or export the particles to **.csv** cache files or Realflow **.bin** files. You can do this by attaching one of those nodes to the Particle Simulation item in the **Schematic** viewport, and clicking **Cache Simulation**.

Presets

- BUG ID 36881 - Selecting a material mask, then double-clicking it to add an advanced preset (such as the car paint presets) loads the preset incorrectly.

Drag and drop the preset on the mesh in Preview or GL as a workaround.

Preview

- If a high poly mesh is not visible, the Preview baking output will be incorrect.
Reset Preview to fix the baking.
- BUG ID 52250 - Loading a progressive render into Preview with an alpha output active sometimes causes Modo to crash.
- BUG ID 52190 - Scrubbing or repeatedly clicking to change the time in the timeline may stop Preview from rendering with some scenes.
As a workaround, click the **Finished** button twice to pause and then unpause Preview.
- BUG ID 50923 - When assigning an existing material tag to a mesh or polygon selection, Preview may not update correctly.
Select **Reset Preview Render** from the **Preview** options dropdown.
- BUG ID 50156 - The background image sequence doesn't update when changing frames.
As a workaround, add keyframes to the start and end frames of the sequence in the camera's properties, even if the camera isn't animated.
- BUG ID 48724 - If Preview is open as a floating palette (**F8**) and then maximized (**numpad 0**), it may fail to update keyframed material color changes, when switching frames or rendering an animation.
As a workaround, avoid maximizing the embedded Preview viewport.
- BUG ID 48639 - Rendering to 16- or 32-bit OpenEXR or **.png** produces files without an alpha channel.
Save to one of the other formats.
- BUG ID 48581 - Progressive save does not always work correctly with multiple render outputs.

Procedurals

- BUG ID 52219 - UV Transform: Setting the target mesh to an instance may cause Modo to crash.
- BUG ID 52206 - GL/Ghosting: Using the **Show Indices** viewport settings with Ghosting enabled may cause Modo to crash.
- BUG ID 52188 - The Curve Rebuild mesh operation does not work with multiple curves in the same mesh.
- BUG ID 52149 - Curve Extrude mesh operation: The Path Segment Generator's **Align to Normal** option doesn't work when using a Bezier with zero-length tangents.
As a workaround, rotate the polygons to point toward the +Z before extruding or make sure there are no zero-length tangents.
- BUG ID 52144 - Edge weights are not maintained when using the procedural Bevel tool.
- BUG ID 51942 - The Freeze mesh operation doesn't update when the curve refinement angle is changed on a mesh.
As a workaround, toggle the visibility of the procedural mesh with the Freeze operation.

- BUG ID 50877 - The Curve Fill mesh operation can only pave curves created in the XY plane.
- BUG ID 49767 - Scenes which contain a UV constraint modifier driving texture properties may fail to load after saving, due to a modifier dependency loop.
- BUG ID 46512 - When rigged, Rock items and other procedurals do not display correctly in GL. This is a limitation of the feature and will not be fixed.

You can use Preview or RayGL to visualize the variations from rigging.

Projections

- BUG ID 49473 - Projections are incorrect if the projecting camera is set to **Vertical** film fit mode and the width is less than the height.
- BUG ID 49304 - Linux only: Selecting (**none**) for the camera's background image may lead to instability.
- BUG ID 43771 - Camera projections from non-render cameras show distortion in GL and baking. To avoid this, make sure that the projection camera has a film width to height ratio that matches the main render camera.

RayGL

- BUG ID 50404 - RayGL shows the color output of the baked map on the mesh without applying the texture effect.
- BUG ID 50070 - Baking textures in RayGL with Bake items can disregard the target mesh selection. RayGL in Bake mode can only have one texture rendered and then applied to all visible meshes. You can set **Preview** to **Current Bake Item** to see the selected texture.

References

- BUG ID 44492 - If a scene that already contains references is referenced, the shading of the original references may not survive.
As a workaround, limit scenes with shading to one level of reference.
- BUG ID 41119 - Reloading a reference after replacing it with the same file can cause Modo to crash.

Rendering

- BUG ID 48978 - Mac OS X only: Rendering animations of scenes with deforming meshes uses more memory than it used to.
As a workaround, disable VBOs in Preferences.
- BUG ID 48348 - Artifacts may be present when rendering an animation to a layered image format. You can render to a non-layered format to avoid this.

- BUG ID 46468 - Additional (masked) alpha outputs are not saved when rendering animations. Since other render outputs do work, a remapped depth output with a very high maximum depth setting functions similarly to an alpha output.

Rigging

- BUG ID 27244 - Duplicating joints in a bound mesh retains influences from the original joint chain.

Shader Tree

- BUG ID 37858 - In the **Shader Tree**, choosing a group from **Add Layer > Image Map > (use clip browser)** fails.
To work around this issue, in the **Clip Browser**, choose a single image instead of the group, and then change to the image group using the Texture Layer's **Properties** tab.
- BUG ID 30947 - Layer masking displacement does not work unless you drag and drop the masking layer onto the displacement layer.

Unreal and Unity Materials

- BUG ID 51511 - When lit by area or dome lights, the color from the material under the Unreal or Unity material shows.
- BUG ID 50860 - Unreal Clearcoat does not display correctly in the **Advanced** viewport.
- BUG ID 50701 - Unreal material Ambient Occlusion does not bake correctly in Modo.
- BUG ID 50700 - There is no way to visualize the Unreal SubSurface Color effect in Modo.
- BUG ID 50451 - On some graphics cards, Unity material may cause flickering in the **Advanced** viewport when used with bump maps and shadows.

UI

- BUG ID 52141 - Backdrops: Timeline/animation performance degrades when more than one backdrop item is present in a scene.
As a workaround, disable visibility of additional backdrops when scrubbing the timeline.
- BUG ID 52124 - You're not able to select choices in a pop-up form menu button launched from inside of a popover (for example, when opened from a **more (>>)** button).
Expand the form or maximize it (**numpad-0**), so that the control can be accessed without first clicking the **more (>>)** button.
- BUG ID 52097 - Most options are missing from the **Layout > New Window** menu.
As a workaround, make sure that a non-main window is selected before selecting **Layout > New Window**.

- BUG ID 50459 - Linux only: Popover windows may not appear when clicked on some Linux distributions/Window managers.
As a workaround, click on the button that opens the popover multiple times.
- BUG ID 47659 - Windows only: Right-clicking in a text field and selecting **Copy** doesn't work.
- BUG ID 44896 - Dragging and dropping an image from the system into the **Clips** list doesn't work.
If the **Clips** list is empty, drop the image onto the bar at the top, otherwise drop it above or below other images in the list.
- BUG ID 43162 - Windows only: Setting a custom text size affects Modo's text drawing.
As a workaround, go to the compatibility settings by right-clicking the Modo shortcut or executable, and turn off font-scaling for the app.

Volumes

- BUG ID 52130 - The **Stretch Particle** option is not used by Render or Preview.

Developer Notes

Here are the changes relevant to developers.

Bug Fixes and Enhancements

- Cache System/SDK: A generalized COM-based caching system has been implemented, accessible from the SDK.
- Scripting: !app.quit used to save changed scenes.
- SDK: CLxQuaternion class has been added. ClxVector, ClxMatrix classes, and CLxBoundingBox have been updated. linear.cpp and orbitem to use updated CLx classes.
- SDK: There were no comments for the SDK for the IsProcedural method on the LayerService.
- SDK: MeshPolygons.new() didn't return a MeshPolygon object.
- SDK: The CLxMatrix class has been updated. CLxMatrix4 constructor has been added to take three vectors. CLxMatrix construct from vectors and Euler rotations now sets to identity matrix first. A determinant has been added to CLxMatrix().
- BUG ID 28300 - SDK: The Xcode project was missing newer SDK example projects.
- BUG ID 31401 - SDK: lxvertex.h, lx_vertex.hpp, and lxw_vertex.hpp were not included in the Xcode project.
- BUG ID 49410 - SDK: The ILxPolygon::IntersectRay thread was not safe.
- BUG ID 51546 - SDK: Adds stdio.h to fix compile error on linux.
- BUG ID 51761 - TD SDK: Initializing a Group item modified the scene.

- BUG ID 51790 - TD SDK: The `lxu.utils.ThreadBody()` thread state class has been added, where the `util` class makes the usage explicit, preventing a crash calling `lx.out` from a Python spawned thread.