



key new features
XSI® version 4.0



SOFTIMAGE | XSI®

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XSI® version 4.0

released by **Softimage Research & Development**
and **Product Management**

note: * indicates a feature not in XSI Essentials
** indicates a feature not in XSI Foundation

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UI – Selection – Preferences

Selection Tools

Wildcards

The new wildcard pattern search now supports more flexible and standard searches with any combination of:

- ? to match any one character
- * to match any number of characters
- [] to match the set of characters in this group
- The wildcard search in the MCP name field is now also accessible from the explorer where it can be used to query items by name.
- The wildcard search in the MCP name field is now scoped to search from under the scene root, so it will not find nodes that do not belong to the scene. In the explorer, however, the search is made from the starting point that corresponds to the current scope, which provides project wide matching.

Selection Filters

- Using the SDK, you can write your own filters for the selection types of scene nodes. This can be done via scripting or C++.
- There are a number of new filters built-in:
 - Component Filters
 - Border Edge
 - Border Point
 - Triangle
 - Object Filters
 - Object with Animation
 - Object with Custom Property
 - Object with Marking Set
 - Object with Synoptic View
 - Object with Function Curve Animation
 - Object with Expression
 - Object with Constraint
 - Object with Mixer Animation
 - Object with Shapes
 - Object with Custom Operators
 - Object with Dynamics
 - Dynamic Constraint objects
 - Property Filters
 - Local Material

Skeleton Selection Behavior

- A new method for selecting skeleton chains (available under preferences) specifies the right mouse button function for selecting either the chain or the whole tree.

Miscellaneous Selection Improvements

- New options under the Explorer's context menu:
 - Select Layers/Group Members
 - Select Components from clusters
- Drag & Drop now works on unselectable objects.
- By using the explorer, it is now possible to select components on unselectable objects.

General Desktop

Version Info

- The version number of XSI and any QFEs that are installed are displayed on the application title bar.

Linux Support

- XSI v.4.0 is now certified to be used on Redhat Linux 9.0 and Redhat Enterprise Edition 3.0.

Recent Work

- New Access under the "File" menu to recent scenes and models.

“Application” Menu

- A new menu called "Application" streamlines access to:
 - Toolbars
 - Shelves
 - Layouts
 - Custom Properties
 - Views
 - Filters
 - Commands (including functions to install, edit and delete)

Preferences

- Completely reorganized so that it can be easily edited by the user or with the SDK.
- Preferences can be multi level and can be set by the user, factory or workgroup (if present).
- Easy editing
 - New containers to the preferences make it easier to find the correct settings. The main categories are:
 - Tools
 - Commands
 - Editors
 - Custom
 - General
- Easily work with multiple preference sets via the new Preferences menu.
- Preferences are now saved incrementally to an ascii file for easy editing.

- Custom preferences
 - Use the SDK to add custom preferences for your tools.
- Object Model (OM) additions for accessing preferences in the SDK.

Relational Views

- A new type of multi-pane view that is similar to framesets in HTML.
- Unlimited views
 - Relational views can any number of separate views, e.g. an Explorer, Render Tree, etc.
- Layouts as Relational Views
 - All the layouts in XSI are defined as relational views, giving you a consistent and powerful way of customizing the UI.
 - See the Layouts section for more new features and improvements.
- Relations
 - Each view or pane in a Relational View can be linked to the other views by setting simple relationships to drive their properties.
 - Simple relations can be used, such as selection. For example, an explorer can drive a Function Curve Editor based on the selected object.
 - Complex relations with full debugging can be created by adding scripting to the Relational View.
 - Relation functions:
 - Selection: Driven pane updates on a change of selection.
 - Selection Filter: Similar to Selection, but only if the object matches the filter chosen.
 - Selection Func: Custom code to update the view via data about the selected object.
 - Selection Procedure: Full scripting control.

Editing

- A new UI has been created for designing Relation Views.
- All Relational Views are stored as XML for simple external editing.
 - Drag & Drop Relational Views or assign them to keyboard shortcuts.
 - Sample Relational Views
- The Object Viewer is a scene Explorer combined with a 3D view that only shows the selected object.
- The Six Object Viewer is a scene Explorer that based on the selection of six 3-D views for multiple camera angles.
- The Image Clip Explorer allows you to select a clip in the Explorer to view in the Clip Viewer.
- With the Material and Texture Explorer, easily view the materials and textures used by the selected object.
- The Thumbnail Viewer shows thumbnails for scene elements.
- The Script Editor Dual Pane gives two script editors side by side.
- The shape Explorer provides easy access to the shapes that are available for use on the selected object.
- The SDK Explorer is a Net View that shows all of the Object Model information for the selected object or scene element.

Views

- Described using the Relational View system.
- Floating views can now be minimized.
- Access floating views under the "Window" Menu.
- View cycling using the Cntrl+Tab shortcut.

Layouts

- All layouts are defined using a structure that is similar to Relational Views.
- Resolution Independence
 - Single layout for all resolutions.
 - Panes can be sized either by percentage or pixels.
- Dual/Multi-screen Support
 - Specify on which monitor the different views are to appear.
- Autohide Panels
 - Parts of the interface can be set to autohide when not in use and to then reappear when the mouse enters the activation area.
- Editing
 - Layout editing is done using the Relational View tools.
 - Full support for view switchers with custom bitmaps.
 - Use all of the relations available from the Relational Views.
- Sample Layouts
 - Dual "Standard & Animation"
 - The left screen is the standard layout, and the right is the three main animation editors (Mixer, Dopesheet & FCurve Editor).
 - Dual "Standard & Compositing"
 - The left screen is the standard layout, and the right is the compositing UI.
 - Dual "Standard - Views & Shelves"
 - The left screen is the standard layout, and the right is a mixture of views and shelves.
 - Autohide
 - Standard layout with the autohiding of the toolbar and MCP.
 - Compositing
 - Standard compositing layout.

Toolbars & Shelves

- Toolbars have been expanded to include the concept of a Shelf.
- Shelves can be used for:
 - driven views as part of a Relational View
 - Browser view that creates a shelf from a folder on the system
 - As a toolbar for storing scripts as in previous versions of XSI
- Multiple Tabs are allowed on shelves.
- Can use environment variables to create shelves.
- Drag & Drop Creation.
- Fully Scriptable for integration in Layouts and Relational Views.
- Sample Shelves:
 - The Application Shelf points to the XSI system folder to display Layouts, Views, Toolbars.
 - The Shader Presets Shelf shows all of the shaders that are available in XSI.

- The Project Shelf is a shelf for the Sample Project.
- (My) Project Shelf reads all of the data in the current project, such as animation, shapes, textures, models, scenes, or expressions.
- (My) Media Shelf picks up a media stored in the users My Pictures or My Videos folders.

Scene Explorer

- New Scope Menu
 - Updated to manage the new Application structure.
 - Can now set a default scope in the preferences.
 - New Scopes
 - Simulation Environment
 - Commands
 - Animation
 - Audio
 - Images
 - Materials
 - Models
- General Sorting
 - The explorer can now be sorted either by the order of creation, alphabetically, type or used. You can use combinations of these as well.
- Parameter Sorting
 - Parameters can now be sorted using the same filters as in the general sort.
- Reorder Tool
 - By using the "i" hotkey, you can manually set a node's position, which remains static even if a resort is performed.
- Filters
 - All of the filters are available for use in the explorer for further specification of objects to show.
- Querying
 - A new name field provides the ability to search the explorer in its current scope and filter.
 - Recent Search menu.
- Parameter Coloring
 - Users can now set the color of parameters via a simple context menu, and the colors are shown in:
 - Explorer
 - FCurve Editor (the curve)
 - Dopesheet (the key)

Other Editors & Views

- XSI Explorer has new views:
 - Property Editor
 - Image Clip Viewer
 - Texture Editor
- Object View
 - Access to scene cameras and spot lights with the option to modify them.
 - Set Default view.
 - Many new attributes are now available via scripting.
- 3D Views in the View Manager
 - Isolate Selected Object shows only the selected object.

On-Screen Parameter Editing

- Greatly improved display of parameters:
 - Set the font and size of on-screen text.
 - Ability to key the parameter directly.
 - Features:
 - Left click and drag to edit values using a virtual slider.
 - Double click to type values or toggle Boolean.
 - Animation divots are displayed for direct editing.
 - Display multiple properties.
 - Overall better performance.

Thumbnails

- Users can now set thumbnails for many scene elements by using either an image on a disk or the render region.
- Used in:
 - Render Tree
 - Shelves
 - Browser
 - Mixer
- Preference to change the default thumbnail size.

Other

- Capture codecs now persist during a session.
- Parameter Bracketing has been moved from Netview to under the Animate menu.

Modeling

XSI has a unique **structured operator stack** that allows users to control the evaluation order of modeling, deformations, and shape animation. At any stage, the user can make changes to the base geometry or to the result. All changes can **propagate attributes, such as textures and UVs**. Even merging or symmetrizing objects will **preserve shape animation**. After deforms are applied, the user can **relax** the geometry or can apply **smooth painting** and **polygon reduction with controllable levels of detail**.

Deformation Authoring & Operator Stack

- Construction Modes
 - Four modes are available:
 - Modeling
 - Shape Modeling
 - Animation
 - Secondary Shape Modeling
 - Depending on the current mode or operator, it is inserted into the correct point in the stack.
 - Allows for truly non-linear work by returning to any of the modes at any stage in the production, for example, adding an extra arm to a fully enveloped character with shapes is as simple as switching to modeling mode.
- Markers in the Operator Stack
 - The new construction modes are shown in the Explorer under the object.
- Viewing Construction modes
 - Views can be set to sync with the current construction mode or to show the result of the whole stack.
- Automatic mode switching
 - A preference that lets XSI choose where it is best to store the operator that you are applying.

Selection (for Modeling)

- Select Adjacent Components
 - Works on clusters and selected components.
- Selection Filters
 - Filters update depending on the selection; for example, polygon filters are only shown on polygon meshes.
- New Range/Loop selection mode
 - Pressing Alt on the keyboard in component mode gives the following options:
 - Select Range between two components
 - Select Loop
- Samples Selection (aka Lollipops)
 - Show the sample bisectors for easy selection.
 - Fully configurable display options.
 - Mirrors functionality of the Texture Editor.

Polygon Meshes

- Disconnect Components
 - Disconnect polygons, edges and vertices from the mesh.
- Extract Polygons
 - There are two modes for extracting polygons from a mesh while preserving UVs and Materials:

- Keep source polygons
 - Delete source polygons
- Extrude Polygons along Axis/Curve
 - Complete rewrite for better performance.
 - New Inset option for uniform scaling.
 - The Duplicate option creates separate polygons along the extrusion.
 - Expanded merge options for merging all, adjacent only or none.
- Inset Polygons
 - Move the contour of the selected polygons while maintaining its shape.
- Offset Polygons
 - Offsets the contour of the selected polygons while maintaining its shape.
- Polygon Reduction **
 - Completely new.
 - Can be applied to meshes or components.
 - Preserves and propagates textures, material boundaries, Normals, UVs, weightmaps.
 - Volume based edge collapse metric.
 - Preserves volume.
 - Option for Quads only.
 - Automatic and custom symmetry.
 - Built-in LOD system with built-in caching.
 - Modulate via a weight map.
 - Smooth Edge Collapse reduces the popping effect by slowly dissolving edges in stages.
 - Use existing vertex positions.
- Slice Polygons
 - Slice a mesh or selection of polygons using an implicit object.
 - Multiple slices.
 - Built-in disconnect, delete above, delete below, and edge loop functions.
 - Snap to existing points within a tolerance.
- Knife Tool
 - Interactive version of the slice polygons tool.
 - Option available to connect to an implicit grid.
 - Interactive drawing of the slice plane.
- Dice Polygons
 - Divides the geometry using a lattice structure divided in x,y and z.
 - Options available for disconnecting the edges.
- Add Edge Tool
 - Add points inside polygons.
 - Use to easily add points inside of a polygon or on a polygon's surface:
 - Create interior triangles by pressing the Alt modifier
 - Draw edges at specified angles
 - Perpendicular edges
- Beveling Update
 - Improved results.
 - Better rounding.
 - Hard edges can be created automatically.
 - Interior bevels.
- 3-D Text
 - Now available on Linux.
 - Same improved beveling.
 - Automatic creation of clusters for the front and back of the text.
- Filter Points
 - Filter points can weld multiple points at once within a tolerance.

- Weld Points to Target
 - Select components are welded to a selected point on the mesh.
 - Works with multiple points.
- Extract Curve from Polygon Mesh
- All polygon operators now transfer clusters and materials.

Generators

- Polygon Mesh Generators
 - Create Polygon meshes directly from curves.
 - Loft, Revolution Around Curve, Revolution Around Axis, Birail, 4 sided.
- NURBS to Mesh now uses the NURBS control hull.
- Generators from Curves
 - You can now specify local or global space.
- Generator Inputs
 - All generators have the ability to hide or delete the generating objects/curves.

Attribute Transfer

- All generators and operators preserve UVs, Weightmaps, Vertex Colors and shapes.
- Automatic transfers are present with customizable templates.

Subdivision Surfaces

- Direct Editing
 - Points can now be edited directly on the subdivision surface.
 - You can change the subdivision level while in component mode.
- XSI-Doo-Sabin
 - New Subdivision algorithm with enhancements when working with creases.
- Linear Subdivision
 - Simple linear interpolation of the vertices that is great for character animation.

Curves & Surfaces

- Improved Curve Editing
 - New Drawing Tool with a context menu:
 - Exit Tool
 - Open/Close
 - Invert
 - Append
 - Start New Curve
- Better SDK access to curve creation

Deforms

- Smooth **
 - Works on meshes, Nurbs, Hair, Particles.
 - Drivable via weightmaps.
 - Restrict curvature to concave or convex.

- Create custom filters and falloffs.
- Relax **
 - Subset of Smooth that aligns components.
- Symmetry Maps update correctly when the geometry is deleted.
- Quick stretch can be locked in local or global axis along X/Y/Z.

Visual Cues/Display

- Normals
 - Choose between Polygon and Vertex Normal display.
 - Show normals on selected components only.
 - Show Boundaries is now on by default.

Texturing

Texture Layers

- New method for applying multiple textures to objects using compositing techniques.
- Editing
 - New view called "Texture Layer Editor". **
 - Photoshop style control of mental ray®.
 - Supports color and scalar ports on shaders.
 - Apply layers to Material and Illumination nodes.
 - Works with local materials on clusters.
 - Create layers from images or procedurals.
 - Layers can be collapsed or expanded for full details.
 - Each port has controls over the opacity, invert and alpha.
 - Can be combined with a full Render Tree shader as a base layer.
 - Create layers from presets.
 - Drag & Drop creation of layers.
 - Reorder layers.
 - Fully exposed in the SDK.
- Render Tree Compatibility
 - Mirrored fully in the Render Tree interface and marked by a small L.
 - Workflow also available in the Render Tree.

Texture Editor

UV Unwrapping automatically creates artist-friendly, manageable **UV islands**. With connectivity tabs and **new island healing**, UV stitching takes only seconds. XSI also includes new visual feedback and selection of **UV samples** for easy UV selection, as well as new automated **Cubic Texture Mapping**.

- Display
 - New options to show:
 - Highlighting of overlaps
 - Highlighting of odd overlaps
 - Highlighting of texel coverage
- Improved Contour Stretch Subprojection
 - Control the tension of the unwrapped UVs.
 - Smooth the contours of the UVs.
 - Deviation specifies the amount of distortion when moving from 3-D to 2-D space.
 - Clamp forces the corners of the UVs to map to the corners of the texture.
 - Interior smoothing of UVs.
- Sample Display
 - View polynode bisectors for the easy selection of single UVs when overlapping.
 - Move tool now works with polynode bisectors/samples.
- Homogeneous Camera Projections
 - Greatly reduced distortion when using camera texture coordinates.
- **UV Unwrapping**
 - Pre-Smoothing.
 - Concavity options.
 - Spacing options.
 - Angle grouping tolerance for island creation.

- Island Heal
 - A new tool to heal between UVs by matching the scaling and translation of boundaries.
- Connectivity Tabs
 - Highlight UV boundaries that share the same edge on the model, thereby allowing for the easy identification of matching UVs.
- Improved Relax Tool
 - Can distort the boundary.
 - Triangle flipping is prevented.
- Manipulation
 - Use the Alt key when rotating to preserve the UV aspect ratio on non-square textures.

Material & Texture Explorer

- Simple interface built using Relation Views to show all the materials in the scene with their Render Tree and small shader ball.
- Easily edit materials in a single interface.

Conversion Shaders

- Improved Access
 - Many of the conversion nodes in the Render Tree are now transparent to the user if accessing materials via their property pages.
 - Context menu for inserting conversion shaders between any two nodes.
 - Supports:
 - Invert, Color to Scalar.
- Rendertree Simplification
 - Right-click on any connection in the Render Tree to insert a conversion node.

Texture Projections

- Cubic Mapping
 - Now available as a projection and subprojection.
 - Choose the division of the UVs based on normals or positions.
 - Cubic maps can be planar or spherical.
 - Choose and customize the layouts of the six UV islands.
- Spatial Projections
 - New widget in the 3-D view for manipulation and animation.
- Automatic Unwrapping
 - New Angle based unwrapping provided as an extension of Unique UV projects.
 - Built-in relax and smooth for better results.
 - Use selected edges to define the cutting of the UVs.

Render Map

- Improved SDK access.

Render Tree

- Improved Node Rearranging
 - Rearrange sub-trees.
 - Reduced overlaps.

Textures & Images

- Texture Proxies
 - Automatically create, for interactive work, low resolution versions of textures that are swapped out at render time.
 - Makes working with many large textures extremely easy.
- .Map files
 - Images can now be automatically converted into Mental Images' .map format for improved rendering performance with large textures.
- Clip FX now work on floating point images.

De-interlacing / field support for video textures

- Image sources that refer to video can now be told to use fields in the correct order (even, odd and none).

Animation

This new concept, known as **timeline-based editing**, has allowed us to **dock several animation editors together** in such a way that they will share the same master timeline and thus be completely visually synchronized together. This makes it easier to work with multiple editors on animation data, especially for synchronization work. With new **neutral pose and transform pivots**, you can access multiple inputs to the same parameters to **create animation layers**.

Transforms & SRT Manipulation

- Transform Pivot and Offset, Neutral Pose
 - Transform pivots provides an extra control layer to an object's neutral pose.
 - All local transforms now occur around the pivot.
 - Can be used on chains.
 - Can be deactivated for old behavior.
- SRT Manipulators
 - Translate and Scale manipulators can now show extended axes.
 - Disable planes as an option.
 - Options for the style of Rotation with no flipping:
 - Linear
 - Ball
- Manipulator Pivots
 - Pivots are now the same across all transform tools on the same object.

IK Chains & Bones

- IK Error Tolerance
 - New parameter to prevent errors in IK when working with large chains.
- IK/FK Blending
 - Improved to make it smoother and less prone to flipping.
- IK/FK Ghosting
 - Ghosting in the viewports shows the contribution on the object from IK and FK.

New Animation Guides & Rigs **

XSI further extends the character creation and control possibilities with the new **Character Development Kit**. The CDK includes all new biped and quadruped guides and rigs as well as a **new dog leg rig**. The CDK includes a new **spring-based tail-maker** as well as **control splines for deformations**. These high-level creation tools make building sophisticated rigs easier and faster.

- Extend the guide and rigs by creating rigging components:
 - Head
 - Tail
 - Hip
 - Spine
 - Arm
 - Hand
 - Leg
 - Foot
 - Dog Leg
 - Belly

- Thigh
 - Rig Icon
 - Joint Compression
 - Joint Roll
 - Control Spline
- Guides
 - Guides have been extended with these new components.
 - New Dog Leg Guide.
 - Better control over fingers.
- Quadruped Rigs now have shadow hierarchies.
- Control Splines
 - Useful for facial setups and skin sliding.

Interface & Workflow

- Ghosting
 - New display mode.
 - Activated on objects, layers, and groups.
 - Different draw types are available:
 - Object
 - Point
 - Pose
 - Velocity
 - Motion Trail
 - Options to choose the number of frames with keyframe and static frame highlighting.
 - Customizable color.

Timeline-Based Editing

- Multiple animation editors (mixer, FCurve editor, dopesheet) can now share a single synced master timeline.
- Playback, zooming and panning is linked via the timeline.
- Pre-built Relation Views:
 - Timeline Mix Dop Fcv (3 editors - mixer, dopesheet, fcurve editor)
 - Timeline Mix Dop (mixer + dopesheet)
 - Timeline Mix Fcv (mixer + fcurve editor)
 - Timeline Dop Fcv (dopesheet + fcurve editor)
- All part of an effort to sync all the animation capabilities of XSI.

Animator Audio tools

New non-linear audio synchronization tools and controls are designed as part of the **timeline-based editing** framework. New **vari-speed** and **real-time speed controls** give sample level playback and precision. New **markers for phonemes and emotions** and waveform display in the animation editor mean easier lip-syncing.

- Full control over time control and offsets.
- Scrubbing improvements
 - Smooth playback when scrubbing with different modes:
 - Direct sync to frame
 - Real-time playback

- Variable speed
 - User defined rate
 - Multiple scrubbing modes using the shift key.
 - Quick Loop works with audio for focused playback.
- **Mixer clip markers**
 - Phoneme setup.
 - Markers can be set at different display levels to prevent overlaps.
- Phoneme Key Display in dopesheet

Function Curve Animation & FCurve Editor

- Audio Waveform and Markers
 - Display an audio waveform in the FCurve Editor.
 - Configurable display for waveforms.
 - Markers from the Animation Mixer are now shared with the FCurve Editor.
- Drag & Drop audio for the display of New Autokey Modes:
 - on any value change
 - on existing fcurves only
 - on existing key frames only
- Quaternion Editing and Interpolation of rotations
 - Bi-direction conversion of Euler rotations to Quaternion.
 - Allows for the editing of the quaternion curves in the FCurve Editor.
 - Quaternions can now be stored in Actions.
- Performance Improvements when working with many fcurves.
- Slopes
 - Mirrored slopes around key frames.
 - Orient Slope to next/previous key.
- Selection
 - Improved picking in the FCurve Editor.
 - Auto-Framing of fcurves based on selection.
- Editing
 - Insert keys with the snap to frame enabled.
 - Scale using a pivot.
- Muted FCurves
 - FCurves that are muted are also shown in the FCurve Editor.
 - Activate and Deactivate fcurves inside the FCurve Editor.
- Animation Tree
 - Filter to show locked parameters.
 - Improved filtering when working with Animation Clips from the Mixer.
- Parameter Coloring - see the UI Section.
- Time-Based Editing compatible.

Dopesheet

- Phoneme Key Display
 - Use markers to define phonemes on the timeline.
 - Threshold controls the size of each phoneme as they are displayed between key frames.
- Time-Based Editing compatible.
- Easy editing
 - The Cntrl key can be used to quickly move key frames.
 - Drag & Drop objects to open them in the Dopesheet.

Shape Animation & Shape Authoring

- Shape Explorer
 - A new Relational View for browsing the shapes that are available on a model.
- Shape Sources
 - Shapes can now store multi-frame data.
 - Bouncing, cycling and holding of shape clips.
- Duplicate Shapes
- Shapes now work with the Symmetrize Polygon operator.
- Normalize is turned off by default.
- Shape Clips now make use of connection mapping templates.
- Polygon reduction retains shape animation.**

Animation Mixer

Work with thousands of actions without the overhead. Action sources can now be **saved externally** and **shared between scenes**. They can be **offloaded** at any time or **referenced from an external file**. Multiple animators can all **use the same source simultaneously**. New **clip relations** can help control retiming. Clips can also be **partially offloaded**, giving astonishing control over huge data sets.

- Actions & sources
 - Actions now have a number of storage options:
 - Internal - saved with the scene
 - External - dotXSI text
 - External - dotXSI binary
 - External - native XSI format
 - Frames and frame ranges can be offloaded and trimmed.
 - Animation is not loaded unless it is needed.
 - Reload external animation sources.
- Infinite Clips
 - Any animation clip can be set to be infinite across the length of the scene.
- Importing/Exporting Actions
 - Sources can be imported/exported in dotXSI, .eani and .ani formats.
 - Reference Animation Sources.
- Source Sharing
 - Sources are shared between clips.
- Mixer UI
 - Time-Based Editing compatible.
 - Mixer can be driven as part of a layout or a Relational View.
- Markers
 - Markers can be added to clips.
 - Markers have a duration.
 - Types of Markers:
 - Phoneme
 - Event
 - Expression
 - Action
 - Custom
 - Multiple levels:
 - Markers can be set at different display levels to prevent overlaps.
- Texture & Image Clips
 - Edit image clips in the mixer.

- Clip Relations
 - Supports thumbnails.
 - Tie clips together with a time constraint for advanced editing.

Other

- Acclaim Import/Export.
- Generate full skeletons.

Rendering & Display

Material Libraries

Material Libraries allow all materials and shaders to be shared between objects and allow libraries to be **shared between scenes**. Material libraries are sources that are easily deployed via **contextual menus and the Material Explorer**. This new system **reduces memory use and scene complexity** and can be easily edited with instant visual shader feedback in a **shader view**.

- Materials are now stored in a Material Library structure.
- Support for multiple Material Libraries.
- Current Libraries contain newly created materials.
- Scene objects reference the Material Library.
- Materials can be shared/instanced onto multiple objects.
- Import/Export
 - via dotXSI
- Commands
 - Create Material
 - Remove Unused Materials
 - Create Library
 - Export Library
 - Import Library
- Assign Materials from the Library.

New XSI Graphics Synthesizer (Xgs)

- Display Callbacks
 - Used for scene level effects, such as fog.
- Display passes
 - Rendering passes that can act on the scene or on selected object, for example, shadows.
- Display Modes
 - Support for novel and custom display modes.
 - DX9 Mode, including HLSL.
- Real-time Shaders 2
 - A rewrite of the real-time shaders means that they now work with the Graphics Synthesizer.
- Meta Shaders
 - Shaders can now be used in multiple renderers using a common set of sliders.
 - Allows for the implementation of many shaders using NVIDIA's Cg.
- XGS plug-in SDK

Display Modes

- Animatable Depthcue color.
- XRay shading improvements.
- Texture repeating in viewports.
- Alpha channels used on textures.

Real-time Shaders

- Completely new architecture - see XGS.

Hardware Rendering

- New Rendering Options
 - You can now choose between mental ray and any of the OpenGL and DirectX display modes.
- Support for hardware shadows in viewports.

Avid Mojo™ Support

- XSI now supports Avid Mojo hardware for viewing a number of views on an output monitor without the need for ddr output.
- Available views
 - Any 3-D viewport
 - RenderView
 - FXTree
 - Flipbook

mental ray® Renderer

mental ray v.3.3 features wide ranging improvements and innovations, including **motion interpolation** with **late shutter-opening** for new high-speed motion blur. Quickly **preview final gathering** lighting using **fastlookup** and ensure artifact free results with precise **photon volume accuracy** control. **New bsp memory management options** and view dependent final gathering generation make rendering complex scenes faster and more efficient. Shadow map enhancements include **bias and detail shadow maps**. Enhancements to the leading toon shader in XSI include the **new hemispherical (fisheye) lens shader**.

- Integration of version 3.3
- Motion Blur interpolation
 - Creates smoother motion blur on rotating objects.
- Late shutter opening
 - Better control of the timing of the motion blur shutter.
- Intensity Clipping
 - **Maintain intensity for motion blurred RGB values above 1.0.**
- Final Gathering map fast lookup
 - Accelerates Final Gathering by storing more data.
- Photon Volume Accuracy
- mr Memory Management Options
 - Options to specify memory usage during rendering:
 - Unlimited
 - mental ray default (512)
 - Specified Limit (user)
- View dependent Final Gathering
 - Changes the units of the Final Gathering parameters from world space into screen/pixel space.
- Shadow Map Bias

- BSP Tree Maximum Memory
 - Uses the maximum memory available for building the BSP tree.
- Separate BSP for Shadow Objects.
- Final Gathering Map Storage
 - Options to control how data is added to the Final Gathering map file (append, replace, or generate if the file does not exist).
- Detail Shadow Maps
 - Allows shadow maps to be used with transparent objects, picking up color changes as it marches the scene.
- Preview Final Gathering
 - New option allows you to see the Final Gathering before the image is rendered.

mental ray Shaders

- Bump map Generator
 - Improvements prevent artifacts in bump maps caused by discontinuous UVs.
- Toon Shaders
 - Ink can be drawn into output frame buffers (normal, depth, motion and tag).
 - Integrated fish eye lens in the ink shader.
- Fish Eye Lens Shader
 - Hemispherical lens shader with full control over lens center and horizontal/vertical distortion.
- Hair Shader
 - Many improvements in speed, quality and compatibility with other rendering effects.

Render Tree

- Thumbnail Display
 - Image clips can now be shown as thumbnails.
- Texture UV selection
 - UVs in texture nodes can now be change directly from the Render Tree.
- Metashaders

Overrides

- Complete revamp
 - More robustness, performance and functionality.
- Cluster Support
 - Overrides can be used on clusters.
- Better Workflow for adding and removing parameters from overrides.

Lights & Cameras

- Area Lights are Visible in Render.
- Cylindrical Area Light.

Regular OpenGL Display

- XRay Mode Improvements

- Wireframes are drawn on top of objects.

Render Options & Preferences

- Change the default image.
- Render Region default display type can be set.
- AAF/MXF Support
 - Create AAF and MXF files for compatibility with AVID products.

Custom Display Host

The Custom Display Host is a new framework for hosting custom viewers or **custom applications as views in XSI**, allowing interaction between XSI and the custom application. This way, **a game engine or foreign application** can easily be **embedded into XSI with minor modifications**. The CDH API allows the hosted application to receive and filter events as they occur in XSI. The custom view can also modify the XSI scene simultaneously.

- Custom Views
- Open View
 - Integrate custom tools that exchange data with XSI on notification.
 - For example, integrate a full game engine into XSI.

Simulation

Particles

- Per Particle Custom Parameters
 - Add custom data to a particle cloud for improved capabilities in particle scripting.
- Particle Goals
 - Create goal targets for particles using a number of modes:
 - Chase
 - Flee
 - Arrive
 - Hook's Law
 - Stick
 - Particles can target different parts of the goal object:
 - Surface
 - Points
 - Line/Edge
 - Volume
 - Center
 - Goals can be blended in weighting for multiple goal effects.
- Motion Blur on Particles
 - Deformed particle motion blur rendering.

Rigid Body Dynamics (RBD) **

Incredibly fast and interactive, XSI takes Rigid Body Dynamics to a new level. Optional **multiple** environments control forces, operators and constraints. Motor-driven hierarchies work seamlessly with dynamic constraints to allow articulated models to move autonomously in the simulation environment. Real-time interactivity means that, while playing-back, the user can interact with the simulation and add animation. All simulations can be blended in the animation mixer and layered using the advanced caching.

- Multiple Simulation Environments
 - The simulation environment acts as a container for the rigid body objects, constraints and forces.
 - Multiple simulation environments can be created.
- Rigid Body Objects
 - Animatable activeness.
 - Can be passive (no forces) or active (with forces).
 - Collision Types:
 - Bounding Box
 - Bounding Pill
 - Bounding Sphere
 - Actual Shape
- Forces
 - All Animatable.
 - Uses standard XSI forces as with Particles, Cloth and Soft bodies, expect Vortex and Drag.
 - Forces can be grouped in the environment.
- Constraints
 - Link two rigid bodies together using:

- Ball & Socket
 - Slider
 - Hinge
 - Fixed
- Dynamic Motors
 - Motor driven hierarchies.
 - Automated articulated models.
- Collisions
 - Adaptive substepping control over accuracy.
 - Works with subdivision surfaces.
- Dynamic Properties
 - Rigid Body Properties:
 - Friction and Elasticity
 - Collision Type
 - Inertial Properties:
 - Mass/density
 - Animatable
 - Initial State:
 - The state of the object at the start of the animation.
 - Create an initial state from animation.
 - Animatable
- Predictive Dynamics
 - Using animation ghosting with dynamics allows you to see the result of the simulation in the future for easy control and quick results.
- Advanced caching
 - Store multiple simulations.
 - Offload simulations to the animation mixer.

Hair/Fur * + **

- New Shader
 - Creates hairs as tubes when rendering with Geometry.
 - Emissive shading.
 - New gradient controls over shading.
- Motion Blur on Hair
- New hair chunk size control

Compositing * + **

Resolution independent compositing and paint for both **Linux and Windows**. The new paint features 60 Programmable User Brush (PUB) presets from **Avid Matador**. Vector based shape types include **Bezier B-Spline and Polyline**. Mix and match images in different size and bit depth. Use **magic wand**, rectangular and elliptical marquee, and lasso stencils. **Mask**, merge and clone across multiple image sources. The FX Tree employs a 2 and 4 point **2-D Tracking** and stabilization, as well as an advanced caching system. The FX Tree now uses a new architecture to calculate the optimal render regions and image memory allocation. SDK access via the UFO Plug-in architecture is now included in v.4.0.

Vector & Raster Paint

- World class Technology
 - The painting system has been built around the core of the Matador paint system.
 - Built-in Compositing layouts.
 - Fully Multi-threaded.
- Resolution Independence
 - Images in the compositing tree can be any size and bit depth.
 - Supports 8-bit and 16-bit paint, RGB, RGBA and A.
 - Unlimited undo/redo.
- Tools
 - Paint Color Selector.
 - Brush Properties.
- Brushes
 - Over 60 programmable brushes:
 - Color, Airbrush, Clone, Merge, Add, Blur, Darken, Lighten, Diffuse, Drag, Tint, Erasers.
 - Line Tool, Flood Fill Tool, Rectangle and Ellipse Tool
 - All brushes can paint with textures.
- Masks
 - Any FX Tree operator can be used as a paint mask with built-in inversion.
- Stencils
 - Photoshop-style stencil tools:
 - Magic Wand, Rectangular, Elliptical and Lasso.
 - Stencils persist between paint nodes.
- Merge/Clone
 - Any operator in the FX Tree can be used as a source for the merge and clone brushes.
- Vector Paint
 - Shape types:
 - Bezier
 - B-Spline
 - Polyline
 - Fully supports shape animation.
 - Fill, Outline or Both with available brushes.
- Wacom Support

2-D Tracking

- 2 and 4 point tracking.
- Stabilization.

UFO Plug-ins

- API for writing your own nodes for the FX Tree using C++.
- Fully compatible with Media Illusion plug-ins.

FX Viewer

- Proxy Resolution control.
- Image compare before and after using a region.

SDK & Data Management

A new level of customizability and control for all levels and types of production ensures easy workflow and increased productivity.

Scene Table of Contents (ToC)

- XML Based
 - Human Readable.
 - Post-load TOC script execution.

Project & Project Management

- Project List file
 - Single file containing a list of projects registered in XSI.
- Project List and Path Sorting
 - Sort the order of appearance of projects in the list according to a number of parameters.
- Force UNC
 - All sources and external links in the scene are forced to be set in UNC format.
- Multiple Workgroups

Locks & Tags

- Users can now lock parameters to prevent editing.
- Locks Information:
 - A Net View page gives details on the locked parameters.
- Lock Capabilities:
 - Lock topology/hierarchy
 - Lock Animation
 - Lock All
- Tags
 - A system for users to mark certain parameters as an alternative to Marking sets.

Script Editor

- Preferences:
 - Font size and type
 - Line numbers
 - Tab size
 - Auto Indent
 - Automatically Reload Externally Modified Scripts
 - Wrap around search
 - Show white space
 - Default margin
 - Copy/paste conforming
- Secondary editors
- Recent Scripts

Custom Plugins

- Automatic loading at startup.
- Self-Contained Plug-ins
 - Single files containing all of the code.

Custom Views

- Known as the Custom Display Host.
- Open View
 - Integrate custom tools that exchange data between XSI on notification.
 - For example, integrate a full game engine into XSI.

Custom Filters

- User Filters for Scene Data
 - Simplifies locating objects in scripting and normal usage (explorer, selection).
 - C++ Filter Class.

Custom Commands

- **Creation**
- **Editing**
- **Commands in toolbars**
- Argument handlers
- Custom command implementation embedded directly in the definition.

Custom Properties

- Layout OM
 - Full access to the layout of property pages.
 - Controls:
 - Text String
 - Integer Slider
 - Float Slider
 - Checkbox
 - Radio Button
 - Button
 - Folder Browser
 - Image
 - FCurve
 - Grid Data
 - Multi-line text
 - Color Widget
- Custom Property Wizard
 - Create complex property pages from an easy to use GUI.

Custom Menus

- Expanded Capabilities
 - Insert your custom commands into any XSI menu.

Custom Preferences

- Create custom preference properties to give you control over custom tools.

Custom operators

Addons

- XML packages for plug-ins.

SDK Explorer & Net View

- A simple Netview interface that gives complete Object Model (OM) information about the selected object.
- non-winhelp (html).

OM/C++ API

- New OM for Layouts & Views.
- New OM for Menus and Menu Items.
- New OM for Property page layouts.
- New OM for the Mixer.
- New OM for custom Filters.
- New OM for Plug-ins.
- New OM for Texture Layering.
- Node descriptor.
- Message Box.
- New OM Preferences.