Appendix

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Shortcut Commands

Basic Operations

F2	Rename
Del	Delete
Ctrl+C	Copy
Ctrl+F	Text search
Ctrl+V	Paste
Ctrl+X	Cut
Ctrl+Y	Reverts the last "undone" operation
Ctrl+Z	Reverts the last operation
Slow Double Click	Rename

Import Operations

Ctrl+Shift+B	Import Benchmarks
Ctrl+Shift+I	Import Resources
Ctrl+Shift+R	Import Raw Resources
Ctrl+Shift+S	Import from Solution

Scene

F5	Refresh Scene
F7	Compile a Shader
Ctrl+2	New 2D Scene
Ctrl+3	New 3D Scene
Ctrl+E	Node rendering enabled
Ctrl+L	Do Layout

Double Click	Activate Item
Ctrl+, (OemComma)	Go to previous element
Ctrl+Shift + F5	Enable active rendering
Ctrl+. (OemPeriod)	Go to next element

Manipulation Operations

Q	Select Edit Mode
R	Rotate Edit Mode
S	Scale Edit Mode
T	Translate Edit Mode
Escape	Clear Selection
Click+Tab	Select the next element from all the objects that are pointed by the mouse cursor
Click+Shift+Tab	Select the previous element from all the objects that are pointed by the mouse cursor
Tab	Select next element on the same group
Shift+Tab	Select previous element on the same group
Left Mouse Button Click	Select object. Clear selection if no object is found at cursor position
Left Mouse Button Drag	Manipulate Selected Object. Rotate camera if no object is selected

Animation

Del	Delete
Ctrl+K	Move timeline to selected keyframe
Ctrl+F5	Start Animation
Ctrl+Break	Stop Animation

Camera

A	Zoom to scene
F	Zoom to selected objects

O	Orient camera to selected object
Ctrl+1	Reset Camera
Ctrl+Left Mouse Button	Rotate Camera
Ctrl+Alt+Left Mouse Button Drag	Zoom Camera
Ctrl+Shift+Left Mouse Button Drag	Pan Camera
Middle Mouse Button (Wheel) Drag	Pan Camera
Middle Mouse Button (Wheel) Rotate	Zoom Camera

Display

F3	Edit Sequence Number
F12	Save screenshot image for previewed displays
Ctrl+D	New Display
Ctrl+R	New Render Target

SCML Editor

Ctrl+M	Commit changes
Ctrl+Shift+M	Discard changes

Solution

Ctrl+G	Generate Asset Library
Ctrl+S	Save Solution
Ctrl+N	New Solution
Ctrl+O	Open Solution
Ctrl+W	Close Solution
Ctrl+P	Open Preferences Dialog

Additional Info

F1	Help
Ctrl+H	Hot Keys

Properties Overview

Common

Category	Property	Property description
General Properties		
Asset	Symbolic Name	Symbolic names are translated to Ids in Candera, so they must be valid C++ identifiers. C++ identifiers can contain letters, numbers, and underscores. They must start with either a letter or an underscore.
	Export Always	Generates this item in the asset even if it is not referenced by other included items.
General	Import Path	The path to the imported artifacts that serve as source.
	Name	The name of the object.
	Full Name	Each item in a solution is uniquely identified by its fully qualified name.
	Status	The status of the element regarding import and updates.
	Category	Category in which this item belongs.
	Description	Description of this item.

Preserve Formatting Scope	Indicated the scope for the Preserve SCML Document Formatting property
Preserve Formatting	The formatting of the SCML documents will be preserved only if it is set to true, otherwise the formatting will be reset when the solution is saved
Icon	Icon of this item.
URI	The URI (HTTP/file server path) can be configured. If a valid URI is entered, clicking on it will launch a web browser and display the link. If the entered text is longer than the width of the text box, it will be right-justified.
Is Locked	Indicates if this item is locked.
Visibility	Controls the visibility of SCL library items and folders. Library items will be visible if their visibility is Public or if it is Inherited and none of their ancestor folders have Private visibility. Folders will be visible if they have any library item descendent which is visible.

NodeAttachment

Shares properties with: General Properties

General	IsEncapsulated	Indicates if the item is encapsulated.
	IsInstanceSharingEnabled	Indicate if a node attachment should be shared.
	SharedInstanceId	Indicate which shared instance of the node attachment to use.

UniformSetter

Shares properties with: NodeAttachment

Uniform Setter	Enable Auto Activation	Specifies if the activation flags should be determined when the asset is generated based on the uniform shader params which are used.
	Enable ModelMatrix4	Specifies if uniform shader parameter ModelMatrix4 is calculated and passed to shader or not.
	Enable ModelMatrix3	Specifies if uniform shader parameter ModelMatrix3 is calculated and passed to shader or not.
	Enable NormalModelMatrix4	Specifies if the uniform shader parameter NormalModelMatrix4 is calculated and passed to the shader or not.
	Enable NormalModelMatrix3	Specifies if uniform shader parameter NormalModelMatrix3 is calculated and passed to shader or not.
	Enable ModelViewMatrix4	Specifies if uniform shader parameter ModelViewMatrix4 is calculated and passed to shader or not.
	Enable ModelViewMatrix3	Specifies if uniform shader parameter ModelViewMatrix3 is calculated and passed to shader or not.
	Enable NormalModelViewMatrix3	Specifies if uniform shader parameter NormalModelViewMatrix3 is calculated and passed to shader or not.
	Enable ProjectionMatrix4	Specifies if uniform shader parameter ProjectionMatrix4 is calculated and passed to shader or not.
	Enable ViewProjectionMatrix4	Specifies if the uniform shader parameter ViewProjectionMatrix4 is calculated and passed to the shader or not.
	Enable ModelViewProjectionMatrix4	Specifies if uniform shader parameter ModelViewProjectionMatrix4 is calculated and passed to shader or not.

Enable Camera LookAtVector	Specifies if uniform shader parameter CameraLookAtVector is calculated and passed to shader or not.
Enable Camera Position	Specifies if uniform shader parameter CameraPosition is calculated and passed to shader or not.
Enable Lights Activation	Specifies if activation of light parameters is enabled or not. If enabled then all parameters needed for light calculation and stored in the active light objects are passed to the current appearance's shader.
Enable Material Activation	Specifies if activation of material uniforms is enabled or not. If enabled then all material parameters stored in the current appearances material are passed to the current appearance's shader.
Enable Texture Activation	Specifies if activation of textures is enabled or not. If enabled then the appropriate uniforms are set for all textures stored in the current appearance.
Enable Texel Size Activation	Specifies if activation of texel size is enabled or not. If enabled then the appropriate uniforms are set for all textures stored in the current appearance.
Enable Point Sprite Activation	Specifies if activation of point sprites is enabled or not. If enabled then point sprite uniforms are passed to the current appearance's shader.
Enable Morphing Mesh Activation	Specifies if activation of morphing mesh uniforms is enabled or not. If enabled then morphing mesh uniforms are passed to the current appearance's shader.
Enable Canvas Activation	Specifies if uniform shader parameters CanvasSize and CanvasPivot are passed to the shader

Enable Skinning Mesh Activation	Specifies if activation of skinning mesh uniforms is enabled or not. If enabled, then skinning mesh uniforms are passed to the current appearance's shader.
Light Coordinate Space	Coordinate space used for lighting calculations.

SCFolder		
General	Visible in Imports panel	Display this folder in the Imports panel.
	Name	The name of the object.
	Full Name	Each item in a solution is uniquely identified by its fully qualified name.
	Status	The status of the element regarding import and updates.
	Category	Category in which this item belongs.
	Description	Description of this item.
	Preserve Formatting Scope	Indicated the scope for the Preserve SCML Document Formatting property
	Preserve Formatting	The formatting of the SCML documents will be preserved only if it is set to true, otherwise the formatting will be reset when the solution is saved
	Icon	Icon of this item.

Is Locked	Indicates if this item is locked.	
Visibility	Controls the visibility of SCL library items and folders. Library items will be visible if their visibility is Public or if it is Inherited and none of their ancestor folders have Private visibility. Folders will be visible if they have any library item descendent which is visible.	
GridLayout Shares properties with: General Properties		
Layouter	Row Count	Number of rows.
	Column Count	Number of columns.
Scope		
General	Name	The name of the object.
	Full Name	Each item in a solution is uniquely identified by its fully qualified name.
	Status	The status of the element regarding import and updates.
	Category	Category in which this item belongs.
	Description	Description of this item.
	Preserve Formatting Scope	Indicated the scope for the Preserve SCML Document Formatting property

Preserve Formatting	The formatting of the SCML documents will be preserved only if it is set to true, otherwise the formatting will be reset when the solution is saved	
Icon	Icon of this item.	
Is Locked	Indicates if this item is locked.	
Visibility	Controls the visibility of SCL library items and folders. Library items will be visible if their visibility is Public or if it is Inherited and none of their ancestor folders have Private visibility. Folders will be visible if they have any library item descendent which is visible.	
Scope	Bits	Bits
Shader Shares properties with: General Properties		
Shader	Type	The type of shader.
Display Shares properties with: General Properties		
Asset	Candera Type Name	Type of the item as it is defined in Candera.
Display	Id	The unique ID of the display as required by drivers to identify potential multiple displays (typically 0 to N).
	X Resolution	The resolution of the display in x-dimension, used for preview and simulation purposes
	Y Resolution	The resolution of the display in y-dimension, used for preview and simulation purposes

Aspect Ratio	Aspect ratio of the display	
Editing Utilities	Preview Border Scope	Configures the preview border for this object. It can be used from the global preferences.
	Preview Border Color	Configures the preview border color for this object.It can be used from the global preferences.
Bitmap Shares properties with: General Properties		
Bitmap	Bitmap Profile	Configures how this bitmap is converted before the asset is generated.
	Enable Mipmapping	If checked, a mipmap chain for the texture is generated automatically. Each mipmap level describes a certain level-of-detail for a texture image. The highest resolution is at mipmap level 0. Each subsequent mipmap level has half width and height of its predecessor. In order to support mipmapping the bitmap's width and height must be a power of 2 (n^2), e.g. 2, 4, 8, 16 ,32, etc. Width and height may be different, e.g.: 256x128.
	Mipmap Levels	The number of mipmap levels. Each mipmap level describes a certain level-of-detail for a texture image. The highest resolution is at mipmap level 0. Each subsequent mipmap level has half width and height of its predecessor.
	Memory Pool	The memory pool used to read the image from. VideoMemory will store the image in Video RAM, ClientMemory will store the image in System RAM.

RenderTarget

Shares properties with: General Properties

Asset	Candera Type Name	Type of the item as it is defined in Candera.
Editing Utilities	Preview Border Scope	Configures the preview border for this object. It can be used from the global preferences.
	Preview Border Color	Configures the preview border color for this object.It can be used from the global preferences.
Render Target	Type	The kind of the render target.
	Display	The display of the render target

RenderOrderBin

Shares properties with: General Properties

Render Order Bin	Protected	Protected render order bin are maintained by Candera and cannot be deleted or removed.
	Rank	Order number of the bin list of render order bins. All nodes assigned to a render order bin with smaller rank are rendered before nodes of a render order bin with greater rank.
	Enable Sorting	Enables or disables the sorting of this bin according to the order criterion set.
	Sort Criterion	The order criterion specifies according to which sorting criteria the nodes in a render order bin are sorted.
	Batch Order Criterion	The batch order criterion specifies according to which sorting criteria the nodes in a render order bin are sorted.

Distance Function	Determines how the distance from camera to any node is calculated.	
ShaderProgram Shares properties with: General Properties		
Shader	Fragment Shader	A fragment shader is a shader program that is executed on the graphic processing unit to perform complex per-pixel effects. The fragment shader can be chosen out of listed fragment shaders in Shader panel.
	Vertex Shader	A vertex shader is a shader program that is executed on the graphic processing unit to perform complex per-vertex effects. Vertex shader can be chosen out of listed vertex shaders in Shader panel.
	Max Instance Count	Determines the maximum number of instances that this shader can be used with in a batch draw (instanced)
Widget Shares properties with: General Properties		
Asset	Candera Type Name	Type of the item as it is defined in Candera.
VertexBuffer Shares properties with: General Properties		
Vertex Buffer	Is Indexed	Changes the buffer type to index array. SceneComposer will automatically select the appropriate index size.
	Enable Cache Optimization	Enables the vertex cache optimization.

Position	Configures the precision of the attribute in Asset.
Position Transformed	Configures the precision of the attribute in Asset.
Normal	Configures the attribute in Asset. For imported attributes it is possible to regenerate them, remove them and change their float precision. For attributes which are not present in import it is possible to generate them.
TextureCoordinate	Configures the precision of the attribute in Asset.
Color	Configures the precision of the attribute in Asset.
Blend Weight	Configures the precision of the attribute in Asset.
Blend Index	Configures the precision of the attribute in Asset.
Point Size	Configures the precision of the attribute in Asset.
Tangent	Configures the attribute in Asset. For imported attributes it is possible to regenerate them, remove them and change their float precision. For attributes which are not present in import it is possible to generate them.
BiNormal	Configures the attribute in Asset. For imported attributes it is possible to regenerate them, remove them and change their float precision. For attributes which are not present in import it is possible to generate them.
TesselationFactor	Configures the precision of the attribute in Asset.
Fog	Configures the precision of the attribute in Asset.

Depth	Configures the precision of the attribute in Asset.
Sample	Configures the precision of the attribute in Asset.
Custom	Configures the precision of the attribute in Asset.

Scene3D

Category	Property	Property description
Node3D Shares properties with: General Properties		
General	ScriptComponentCollection	NodeObject_ScripComponentCollection PropertyTooltip
	AppearanceCollection	The collection of appearances.
Item	Render Benchmark	Set the render measure value of this Node, which is a benchmark related to rendering time, typically calculated by external tool and utilized by a camera render strategy.
	Node Preview Type	Node preview type allows the user to change the representation of the solid objects in the SceneEditor. There are two modes available: normal (solid) and wireframe (line representation). Wireframe mode applies for meshes, morphing meshes, planar shadows and billboards.

Alpha Value	Defines the local alpha transparency value between 0 and 1 for the node. The effective alpha value is combined with the materials alpha value of the node.	
Enable Rendering	Defines if node is rendered or not at both, design-time and run-time. If disabled, also descendants are not rendered.	
Scope Mask	Assigns node to scope(s) specified. If specified recursively, this setting is applied to all descendants as well. A scope forms conceptual groups independent of the scene graph hierarchy used e.g. for visibility and light culling. Visibility Culling: Node is rendered only if in same scope of camera. Light culling: Node is illuminated only if in same scope as light.	
Local Bounding Shapes	Bounding Sphere	Sets the center and radius values. Bounding spheres are defined by a node's center and radius. Selecting *Auto* will calculate the node's radius and center in object coordinate space. Selecting *Edit* will use the values entered by the user. Selecting *Disabled* will disable the bounding sphere intersection test.
	Bounding Box	Sets the minimum and maximum boundary values. Bounding boxes are defined by a node's minimum and maximum boundaries. Selecting *Auto* will calculate the boundary values in object coordinate space. Selecting *Edit* will use the values entered by the user. Selecting *Disabled* will disable the bounding box intersection test.
	Center	Display condition: Bounding Sphere is set to *Auto* or *Edit*. Specifies the center of the bounding sphere in object coordinate space. Editable when set to *Edit*. When set to *Auto*, an automatically computed value is shown. When set to *Disabled*, it is not displayed.

Radius	Display condition: Bounding Sphere is set to *Auto* or *Edit*. Specifies the radius of the bounding sphere. Editable when set to *Edit*. When set to *Auto*, an automatically computed value is shown. When set to *Disabled*, it is not displayed.	
Min Bounds	Display condition: Bounding Box is set to *Auto* or *Edit*. Specifies the minimum boundary vector of the bounding box in object coordinate space. Editable when set to *Edit*. When set to *Auto*, an automatically computed value is shown. When set to *Disabled*, it is not displayed.	
Max Bounds	Display condition: Bounding Box is set to *Auto* or *Edit*. Specifies the maximum boundary vector of the bounding box in object coordinate space. Editable when set to *Edit*. When set to *Auto*, an automatically computed value is shown. When set to *Disabled*, it is not displayed.	
Enable Intersection Test	Specifies whether to enable intersection tests for this node when you select *Intersection Test* in SceneComposer and when an intersection test is executed. If you disable this option, intersection tests are also disabled for all descendant nodes under this node.	
Transformations	Generic Transformation	Local generic transformation matrix multiplied with local position, scale and rotation. It can be used for transformations that can not be expressed using the component form.
	Position	Position of the object in local coordinate space.
	Rotation	Rotation of the object in local coordinate space.
	Scale	Scale factor of the object in local coordinate space.

Scene3D Shares properties with: General Properties		
Editing Utilities	Editor Clear Color Scope	Scene editor clear color scope
	Editor Clear Color	Indicates the background color used with the scene editor camera.
	Editor Profile	The Editor Profile associated to the scene
Scene	Theme	The theme.
StereoCamera Shares properties with: Node3D		
Stereo Camera	Left Eye	Left Eye
	Right Eye	Right Eye
	Eye Separation	Eye Separation
	Convergence Distance	Convergence Distance
Mesh Shares properties with: Node3D		

Item	Render Order Bin	Name of the render order bin the node is assigned to. If no name is specified, the node is assigned automatically either to opaque or transparent render order bin, depending if node has blending enabled or not.
	Render Order Rank	Defines the render order rank. The node is sorted by rank if assigned to a render order bin having "Criterion" property set to "Render Order Rank" and "Sorting" enabled.
Mesh	Vertex Buffer	Identifies the vertex buffer which provides model geometry data for this element.
PlanarShadow Shares properties with: Mesh		
PlanarShadow	Light	Sets the light associated to this PlanarShadow object. The shadow's projection is influenced by exactly one light. Thus, multiple shadow casts of one geometry induced by multiple lights consequently require multiple PlanarShadow objects.
	Alignment Node	Sets the Node to which the shadow's receiving Plane is aligned. If a node is set the Plane orientation is interpreted as being in object space. If no node is set (node is null), the Plane orientation is interpreted as being in world space. Note: By default no alignment node is set.
	Plane Direction	The direction of the plane used to project the shadow onto.

Plane Distance	The distance of the plane used to project the shadow onto.
Is Auto Vertex Buffer Enabled	Enables or disables automatic parent vertex buffer usage. If this property is enabled then every time an ancestor of this PlanarShadow is removed or added, the vertex buffer of the parent node is taken for rendering, even if it was set manually in between. If automatic setting of vertex buffer is disabled, then the vertex buffer is assumed to be set manually and will not be overwritten. Note: In both cases, if a VertexBuffer object is set manually after Uploading the PlanarShadow, and if the parent vertex buffer gets auto assigned, the caller has to take care that the PlanarShadow object gets unloaded and uploaded manually.

BlendLodStrategy

Shares properties with: General Properties

Level Of Detail	Enable Depth Bias	Enables depth bias for transparent objects during blend transition to avoid Z-fighting artifacts for coplanar surfaces.
	Opaque Render Order Bin	Sets render order bin assignment for LOD levels, if they are rendered opaquely. Per default no explicit bin is set, which means each opaque LOD node is automatically assigned to render order bin with name RenderOrder::OpaqueBinName.
	Transparent Render Order Bin	Sets render order bin assignment for LOD levels, if they are rendered transparently during blend transition. Per default no explicit bin is set, which means each transparent LOD node is automatically assigned to render order bin with name RenderOrder::TransparentBinName.

MorphItem Shares properties with: General Properties		
Morph	Vertex Buffer	Vertex Buffer
	Morph Weight	Weight of the Sub-VertexBuffer, passed as a uniform to the Shader.
LodNode Shares properties with: Node3D		
Level Of Detail	Strategy	Configures the LodNode's visual appearance according to the criterion value.
	Criterion	The criterion returns a value used to calculate the appropriate level-of-detail (LOD) level of a LodNode.
	Preview Type	Configures how preview of the LodNode is done. For CriterionSimulation the LodNode is rendered using the CriterionSimulationValue. For OninSkin all levels which have Preview Enabled are rendered.
	Criterion Simulation Value	If preview type is CriterionSimulation this value is used to render the LodNode.
Camera Shares properties with: Node3D		

Camera	Look-at Direction	Defines the direction vector the camera looks alongside in the local coordinate space.
	Up Direction	Defines the local up-vector of this camera in the local coordinate space in order to define the orientation of the camera looking alongside the look-at vector.
	Viewport	The viewport describes an rectangle area that is updated within the associated render target. The viewport is in normalized coordinates but may exceed that range [0..1] and therefore the render target's boundaries. The viewport distorts the render output if the aspect ratio of the camera does not match the viewports aspect ratio.
	Viewport Px	The size in pixels of the viewport. This property is editable only if the camera is linked to a render target which has width and height greater than zero.
	Clear Depth Buffer	Defines if the camera shall clear the depth buffer before rendering with the clear color defined.
	Depth Clear Value	If "Clear Depth Buffer" property is enabled, the depth buffer is cleared to the given level before camera is rendered. The area cleared is defined by the viewport.
	Clear Stencil Buffer	Determines whether or not the stencil buffer is cleared after rendering.

Stencil Clear Value	StencilClearValue
ScissorRectangle	The scissor rectangle specifies a rectangular region within the Camera's RenderTarget. The scissor rectangles width and height must be greater than 0. A scissor rectangle that intersects the RenderTarget is allowed. If scissoring is enabled (see IsScissoringIsEnabled) pixels outside of the intersection area of viewport and scissor rectangle are clipped.
Scissor Rectangle Px	The size in pixels of the scissor rectangle. This property is editable only if the camera is linked to a render target which has width and height greater than zero.
Sequence Number	Defines the position of the camera in the sequence of concurrently rendered cameras. A camera with lower sequence number is rendered before a camera with higher sequence number.
Viewing Frustum Culling	Defines if viewing frustum culling is enabled or not. If enabled, objects outside of the viewing frustum are culled before rendering. This typically increases performance and should only be disabled if all objects are known to be in viewing frustum.
Projection	Defines the type of projection used by this camera. Perspective projection: natural projection; objects appear smaller upon increasing distance. Orthographic projection: parallel projection; objects appear the same, regardless of distance. Generic projection: a freely customizable projection matrix.

Near Plane	Defines the distance from the camera to the near clipping plane of the viewing frustum in world space coordinates. Objects that are in front of the near clipping plane are discarded. Objects that intersect the near clipping plane are clipped.
Far Plane	Defines the distance from the camera to the far clipping plane of the viewing frustum in world space coordinates. Objects that are behind the far clipping plane are discarded. Objects that intersect the far clipping plane are clipped.
Field of View	Field of view (FoV) specifies the angle of viewing volume to determine the equal-sided left, right, top and bottom clip planes (comparable to zoom lenses).
Aspect Ratio	The aspect ratio of width to height of the captured scene. If the render output shall not be stretched, the aspect ratio matches the viewport's or render target's aspect ratio
Width	The width of captured area
Height	The height of captured area.
Projection Matrix	Generic projection matrix that defines how objects in world space coordinates are projected into homogeneous clip space coordinates.
Render Strategy	The render strategy affects only the processing of that camera and its captured nodes. It is used to determine if rendering shall proceed, pause, or stop for a given node in a Camera's render pass. Occlusion culling render strategy applies only to OpenGLES 3.0 platforms

Benchmark Threshold	Sets the threshold for the accumulated Node's render benchmark values. When the sum of the nodes exceeds the threshold this render strategy prompts the class Renderer to pause or stop the camera render pass, according to the render pass action set for threshold.	
Query type	Query Type provides a hint to the driver to either use an accurate method (AnySamplesPassed) or a faster approximation (AnySamplesPassedConservative) for determining occlusion	
ReflectionCamera Shares properties with: Camera		
Camera	Mirror Plane Direction	Direction of the vector normal to the mirror plane for the reflection.
	Mirror Plane Distance	Distance of the mirror plane to the camera
Appearance Shares properties with: NodeAttachment		
Appearance	Shader Program	The shader program. Shader programs are configured in Shader panel and can be applied by dragging and dropping on the appearance node.
General	Material	The material.
	RenderMode	The render mode associated.

UniformSetter	Uniform setter.
Textures	The collection of textures.

PointSprite

Shares properties with: Node3D

Item	Render Order Bin	Name of the render order bin the node is assigned to. If no name is specified, the node is assigned automatically either to opaque or transparent render order bin, depending if node has blending enabled or not.
	Render Order Rank	Defines the render order rank. The node is sorted by rank if assigned to a render order bin having "Criterion" property set to "Render Order Rank" and "Sorting" enabled.
Point Sprite	Point Size	Defines the size in pixels of this point sprite
	Point Size Scale A	Defines the point size scale factor A in relation to the cameras distance. The effective size is calculated as follows: pointSize * SquareRoot(1.0 / (A + B*D + C*D*D)) where D is the distance to the camera and A, B, C are the point size scale factors.
	Point Size Scale B	Defines the point size scale factor B in relation to the cameras distance. The effective size is calculated as follows: pointSize * SquareRoot(1.0 / (A + B*D + C*D*D)) where D is the distance to the camera and A, B, C are the point size scale factors.

Point Size Scale C	Defines the point size scale factor C in relation to the cameras distance. The effective size is calculated as follows: pointSize * SquareRoot(1.0 / (A + B*D + C*D*D)) where D is the distance to the camera and A, B, C are the point size scale factors.	
Billboard Shares properties with: Node3D		
Billboard	Alignment	The alignment of the billboard regarding all cameras which renders the billboard.
	Width	Defines the billboard's total width (the horizontal center of the Billboard is at width/2).
	Height	Defines the billboard's total height (the vertical center of the Billboard is at height/2).
	Bottom Left UV	The texture coordinate which corresponds to the bottom left vertex.
	Top Left UV	The texture coordinate which corresponds to the top left vertex.
	Bottom Right UV	The texture coordinate which corresponds to the bottom right vertex.
	Top Right UV	The texture coordinate which corresponds to the top right vertex.

Item	Render Order Bin	Name of the render order bin the node is assigned to. If no name is specified, the node is assigned automatically either to opaque or transparent render order bin, depending if node has blending enabled or not.
	Render Order Rank	Defines the render order rank. The node is sorted by rank if assigned to a render order bin having "Criterion" property set to "Render Order Rank" and "Sorting" enabled.
Light Shares properties with: Node3D		
Light	Type	The kind of this light emitting source: Ambient light: illuminates the scene from all directions. The light intensity is the same everywhere in the scene. Position and direction of an ambient light source have no effect. Directional light: corresponds to sunlight in the real world. Illuminates all objects in the scene from the same direction, and with a constant intensity. Position and attenuation of a directional light source have no effect. Point light: casts equal omnidirectional illumination from the position of the light source. The intensity of light coming from a point light source can diminish with distance. The direction of a point light has no effect. Spot light: casts a light cone from a position centered around a direction. A spot light has both a direction and a position. The type of a light source can be changed at any time. This might be useful for switching to a simpler lighting model. Illumination is enabled, if light has rendering enabled and if the node is in the same scope as the light.
	Ambient Color	Defines the ambient color component that illuminates the ambient color component of the material.

Diffuse Color	Illuminates the diffuse color component of the material. Ignored if type of light is Ambient.
Specular Color	Defines the specular color component that illuminates the specular color component of the material. Ignored if type of light is Ambient.
Direction	Defines the direction of the light. Ignored if type of light is Ambient or Point.
Range	The range from light to geometry in world space where illumination is applied. Ignored if type of light is Ambient or Directional.
Intensity	The intensity factor for the diffuse color of the light. Ignored if type of light is Ambient.
Constant Attenuation Factor	Defines the constant attenuation factor of the light. The attenuation equation is: 1 / (constant + (linear * distance) + (quadratic * distance^2)). Ignored if type of light is Ambient or Directional.
Linear Attenuation Factor	Defines the linear attenuation factor of the light. The attenuation equation is: 1 / (constant + (linear * distance) + (quadratic * distance^2)). Ignored if type of light is Ambient or Directional.
Quadratic Attenuation Factor	Defines the quadratic attenuation factor of the light. The attenuation equation is: 1 / (constant + (linear * distance) + (quadratic * distance^2)). Ignored if type of light is Ambient or Directional.
Spot Angle	Defines the spot angle of the light cone in degrees. Ignored if type of light is Ambient, Directional, or Point.

Spot Exponent	The distribution of the light within the spot light cone. Ignored if type of light is Ambient, Directional, or Point.
Enable Attenuation	Enables or disables the attenuation of light. The greater the distance of an object's geometry to the light the less illumination is applied. Ignored if type of light is Ambient or Directional.

Material

Shares properties with: NodeAttachment

Material	Ambient Color	Defines the ambient color of the material illuminated by ambient component of light.
	Diffuse Color	Defines the diffuse color of the material that is lit by the diffuse component of light. The diffuse alpha value represents the alpha value of the entire material. Alpha values of other material color components are ignored.
	Emissive Color	Defines the emissive color of material, which is a self-illuminating color component not influenced by light. Emissive color does not illuminate other materials in the environment as light does.
	Specular Color	Defines the specular color of the material illuminated by the specular component of light.
	Specular Power	Defines the shininess of the material for specular highlights.

RenderMode

Shares properties with: NodeAttachment

Render Mode	Culling	Set culling mode which determines the side of polygon to remove before rasterization. Typically enabled for opaque objects in order to save processing time.
	Winding	Specifies which face of a polygon is considered a front face for culling
	Color Write Enabled	Enable or disable writing of the incoming fragment's color value into color buffer.
	Enable Depth Write	Enables or disables writing of the incoming fragment's depth value to depth buffer.
	Enable Depth Test	Enables or disables the test of the incoming fragement's depth value. If disabled then also the depth write is disabled.
	Depth Comparison	Defines the depth test comparison function to determine which source depth value passes the depth test. The source pixel is compared to the destination pixel using the given comparison function. Example: If the comparison function is 'Less', then the depth test is passed if the source pixel has a smaller depth value than the destination pixel. In case of comparison function 'Never', the depth test will never pass; in case of 'Always', the test passes always.

Depth Bias Scale Factor	Specifies a scale factor that is used to determine how much bias can be applied to primitives.
Depth Bias Units	Defines a constant depth offset used to determine how much bias can be applied to primitives.
Enable Blending	Enables or disables blending.
Blend Color	Defines a constant blending color that can be used in blending equations, if a constant color blend factor is selected.
RGB Source Blend Factor	Specifies the source RGB fragment coefficient in blending equation
RGB Destination Blend Factor	Specifies the destination RGB fragment coefficient in blending equation
RGB Blend Operation	Defines operation how RGB values are blended. The blending equation is as follows: ("RGB Source" * "RGB Source Blend Factor") (+"RGB Blend Operation"+) ("RGB Destination" * "RGB Destination Blend Factor").
Alpha Source Blend Factor	Specifies the source alpha fragment coefficient in blending equation
Alpha Destination Blend Factor	Specifies the destination alpha fragment coefficient in blending equation
Alpha Blend Operation	Defines operation how alpha values are blended. The blending equation is as follows: (SourceAlpha * SourceBlendFactorAlpha) (+BlendOperationAlpha+) (DestAlpha * DestBlendFactorAlpha).

Enable Stencil Test	Enable or disable the stencil test against the stencil buffer.	
Stencil Back	Comparison Function	A comparison function specifies how the source (new) data is compared against the destination (existing) data before passing the comparison operations (storing the data).
	Value	Set stencil function and reference value for stencil testing.
	Mask	Set the write mask applied to values written into the stencil buffer.
	Stencil Fail	Set stencil operations applied to the stencil buffer for the next condition: The fragment fails the stencil test. (Subsequent depth test and other tests will not be applied.)
	Depth Fail	Set stencil operations applied to the stencil buffer for the next condition: The fragment fails the depth test after the stencil test passed.
	Depth Pass	Set stencil operations applied to the stencil buffer for the next condition: The fragment passes both the stencil and depth test.
	Write Mask	Write mask applied to values written into the stencil buffer.
Stencil Front	Comparison Function	A comparison function specifies how the source (new) data is compared against the destination (existing) data before passing the comparison operations (storing the data).

Value	Set stencil function and reference value for stencil testing.
Mask	Set the write mask applied to values written into the stencil buffer.
Stencil Fail	Set stencil operations applied to the stencil buffer for the next condition: The fragment fails the stencil test. (Subsequent depth test and other tests will not be applied.)
Depth Fail	Set stencil operations applied to the stencil buffer for the next condition: The fragment fails the depth test after the stencil test passed.
Depth Pass	Set stencil operations applied to the stencil buffer for the next condition: The fragment passes both the stencil and depth test.
Write Mask	Write mask applied to values written into the stencil buffer.

Texture

Shares properties with: NodeAttachment

Texture	Texture type	Texture type.
	Image	Identifies the bitmap or texture render target which provides pixel data for this texture.

Positive X Image	The image associated to the PositiveX face of this cube map texture.
Negative X Image	The image associated to the NegativeX face of this cube map texture.
Positive Y Image	The image associated to the PositiveY face of this cube map texture.
Negative Y Image	The image associated to the NegativeY face of this cube map texture.
Positive Z Image	The image associated to the PositiveZ face of this cube map texture.
Negative Z Image	The image associated to the NegativeZ face of this cube map texture.
Magnification Filter	Filter used for up-scaling texture (texture is bigger than image source). Linear filter provides higher quality be less performance.
Minification Filter	Filter used for down-scaling texture (texture is smaller than image source). Linear filter provides higher quality be less performance.
Mipmap Filter	Filter used for applying mipmaps. Linear filter provides higher quality be less performance.

Wrap Mode U	Sets wrap mode for texture coordinate U (x-dimension). Repeat: If texture coordinate is less zero or greater 1 the texture is repeated. MirroredRepeat: If texture coordinate is less zero or greater 1 the texture is repeated mirrored contiguously. ClampToEdge: If texture coordinate is less zero or greater 1 the textures adjacent border pixel is drawn. In order to support repeated wrapping, the bitmap's width and height must be a power of 2 (n^2), like e.g. 2, 4, 8, 16 ,32, etc. Width and height can be different, e.g.: 256x128.	
Wrap Mode V	Sets wrap mode for texture coordinate V (y-dimension). Repeat: If texture coordinate is less zero or greater 1 the texture is repeated. MirroredRepeat: If texture coordinate is less zero or greater 1 the texture is repeated mirrored contiguously. ClampToEdge: If texture coordinate is less zero or greater 1 the textures adjacent border pixel is drawn. In order to support repeated wrapping, the bitmap's width and height must be a power of 2 (n^2), like e.g. 2, 4, 8, 16 ,32, etc. Width and height can be different, e.g.: 256x128.	
Anisotropy	Set the maximum degree of anisotropy. Anisotropic texture filtering is a view-dependent, adaptive filter technique to increase texture quality. The higher the degree of anisotropy, the higher the quality.	
Enable False Color Mipmap	If checked, mipmap-levels are visualized by colors, otherwise attached textures are rendered.	
Transformations	Generic Transformation	Local generic transformation matrix multiplied with local position, scale and rotation. It can be used for transformations that can not be expressed using the component form.
	Position	Position of the object in local coordinate space.

Rotation	Rotation of the object in local coordinate space.
Scale	Scale factor of the object in local coordinate space.

Scene2D

Category	Property	Property description
Node2D Shares properties with: General Properties		
Item	Alpha Value	Defines the local alpha transparency value between 0 and 1 for the node. The effective alpha value is combined with the materials alpha value of the node.
	Enable Rendering	Defines if node is rendered or not at both, design-time and run-time. If disabled, also descendants are not rendered.
	Scope Mask	Assigns node to scope(s) specified. If specified recursively, this setting is applied to all descendants as well. A scope forms conceptual groups independent of the scene graph hierarchy used e.g. for visibility and light culling. Visibility Culling: Node is rendered only if in same scope of camera. Light culling: Node is illuminated only if in same scope as light.
Scene2D Shares properties with: General Properties		
Editing Utilities	Horizontal Guidelines	The horizontal guidelines displayed in the render panel. Drag a new one from the ruler. Drag an existing one outside the panel to remove it.
	Vertical Guidelines	The vertical guidelines displayed in the render panel. Drag a new one from the ruler. Drag an existing one outside the panel to remove it.
	Design Master Scope	Configures the design master image for this scene. It can be used from the global preferences or any other bitmap from the solution.
	Design Master Image	Bitmap used as background during scene editing.

Design Master Position	The position of the design master image.	
Design Master Transparency	The transparency of the design master image.	
Editor Clear Color Scope	Scene editor clear color scope	
Editor Clear Color	Indicates the background color used with the scene editor camera.	
Editor Profile	The Editor Profile associated to the scene	
Scene	Theme	The theme.
RenderNode2D Shares properties with: Node2D		
2D Render Node	Enable Snap To Device Pixel	Enable or disable snapping of translation to device pixels.
Effect Shares properties with: General Properties		
Asset	Candera Type Name	Type of the item as it is defined in Candera.
Effect	Effect Type	The type of the effect
	Brush Type	The type of the brush
	Combined	Effect is a combination of simple effects.
Camera2D Shares properties with: Node2D		
Camera	Viewport	The viewport describes an rectangular area that is updated within the associated render target. The viewport position and size are given in pixels.

ScissorRectangle	The scissor rectangle specifies a rectangular region within the Camera's RenderTarget. The scissor rectangles position and size are given in pixels. A scissor rectangle that intersects the RenderTarget is allowed. If scissoring is enabled (see IsScissoringIsEnabled) pixels outside of the intersection area of viewport and scissor rectangle are clipped.
Sequence Number	Defines the position of the camera in the sequence of concurrently rendered cameras. A camera with lower sequence number is rendered before a camera with higher sequence number.

Group2D Shares properties with: Node2D		
Layouter	Layout	The layout.

Animations

Category	Property	Property description
Animation Shares properties with: General Properties		
General	Play direction	Play direction
	Repeat Mode	Repeat mode
	Speed Factor	Increase animation speed
	Repeat Times	Set the number of times the animation is repeated. Repeat means that after the animation is ended, it will be played again. The default value is 1, meaning the animation does no repeat. The value 0 has the meaning of infinite playback. This property has no effect in SceneComposer.

AnimationGroup Shares properties with: General Properties		
General	Speed Factor	Increase animation speed
	Repeat Times	Set the number of times the animation is repeated. Repeat means that after the animation is ended, it will be played again. The default value is 1, meaning the animation does no repeat. The value 0 has the meaning of infinite playback. This property has no effect in SceneComposer.
AnimatedProperty Shares properties with: General Properties		
General	Interpolation	The type of the interpolation.
AnimableProperty		
General	Name	The name of the object.
	Full Name	Each item in a solution is uniquely identified by its fully qualified name.
	Status	The status of the element regarding import and updates.
	Category	Category in which this item belongs.
	Description	Description of this item.
	Preserve Formatting Scope	Indicated the scope for the Preserve SCML Document Formatting property
	Preserve Formatting	The formatting of the SCML documents will be preserved only if it is set to true, otherwise the formatting will be reset when the solution is saved
	Icon	Icon of this item.
	Is Locked	Indicates if this item is locked.

Visibility	Controls the visibility of SCL library items and folders. Library items will be visible if their visibility is Public or if it is Inherited and none of their ancestor folders have Private visibility. Folders will be visible if they have any library item descendent which is visible.

Reported Problems

Reported Problems

	Problem	Applied to	Severity	Description
1	Theme Interface Not Implemented	Theme Entry	Error	A composite theme entry does not fulfil the interface (An anchor or composite property from the interface is not present in the composite; The instance sharing flag of a an node attachment assigned to a theme entry does not match the one in the master theme).
2	ShaderCompiler	Shader/Shader Program	Error/Warning/Info	Information obtained from shader compiler.
3	DRT Used As Texture	Texture	Error	Display Render Target is used as texture.
4	TRT2D Used as Texture	Texture	Error	Texture render target 2D is used as texture for a node in 3D scene.
5	MipMapTextureInvalidBitmapSize	Texture	Warning	The size of a bitmap used for a mipmap texture is not a power of 2.
6	DeviceCapabilitiesTextureInvalidBitmapSize	Texture	Warning	The size of a bitmap used for a texture exceeds the capabilities of the simulation/target device.
7	Scene has no light	Scene 3D	Warning	The scene does not contain any Light object.
8	Morph Item Vertex Count Invalid	MorphMesh	Error	The Morph Items associated to a Morphing Mesh does not have the same value for Vertex Count property.

9	Group is Empty	Group	Info	The scene contains an empty group.
10	Camera Shared Sequence Number	Camera	Warning	The same sequence number is used by multiple cameras.
11	Camera Not linked to RT	Camera	Warning	Camera is not associated to a render target.
12	Empty name	Any item	Error	Name is empty.
13	Wrong template	Any item	Error	The template of an item does not match the item itself.
14	Dependency is missing	Any item	Error	Dependency is not found using its name.
15	Mandatory Dependency not set	Any item	Error	Mandatory Dependency is not set.
16	Camera Sequence number duplicate	Camera	Error	Multiple cameras using the same sequence number.
17	Widget property not found	Composite Property	Error	Widget property not found.
18	Composite property set to an internal node	Composite Property	Error	The composite property is set to node which is part of the composite.
19	Animated Shared node attachment	AnimatedProperty	Warning	A shared node attachment is animated.
20	Not Equal Channels and Mapping	Animated Property	Warning	Transformable channel not corespondig with curent channel mapping.
21	Channel Not Found In Template	Animated Property	Error	Defined channel not found in template channels.
22	Invalid text in document root	SCML	Error	The document root contains invalid text.
23	Invalid equals in tag	SCML	Error	SCML tag contains an invalid equal.
24	The start element was not closed	SCML	Error	
25	Expecting attribute value	SCML	Error	SCML attribute values was not set.

26	Found end tag instead of value	SCML	Error	End tag was found instead of attribute value.
27	Found start tag instead of value	SCML	Error	Start tag was found instead if attribute value.
28	Found double equals	SCML	Error	Double equal was found.
29	Found attribute name instead of value	SCML	Error	The attribute name was found instead of the attribute value.
30	Found text in closing tag	SCML	Error	The closing tag contains text.
31	Tag was not closed	SCML	Error	The tag was not closed.
32	Equals is expected before attribute value	SCML	Error	Equal is expected before atrribute value.
33	Found comment instead of value	SCML	Error	A comment was found instead of attribute value.
34	Unexpected closing tag	SCML	Error	Unexpected closing tag was found.
35	Element was not closed	SCML	Error	The element was not closed.
36	The following type was not found	SCML	Error	The type in the tag was not found.
37	The following property was not found	SCML	Error	The property from the attribute was not found on the object.
38	The following property element can have only one child	SCML	Error	The property can have only one child.
39	The following property element must have at least one child	SCML	Error	The property must have at least one child.
40	The following property element must not have attributes	SCML	Error	The property must not have any attributes.
41	The following property cannot be assigned from value	SCML	Error	The property cannot be assigned from the value field.
42	The collection property has been set	SCML	Error	The collection property has been set.
43	Found duplicate property	SCML	Error	A duplicate property was found.

44	The object type is incompatible with the content type	SCML	Error	The object type is incompatible with the content type.
45	IncompatibleType	SCML	Error	Incompatible type.
46	IncompatibleContentType	SCML	Error	Incompatible content type.
47	SimpleTypeCannotHaveContent	SCML	Error	Simple type cannot have content.
48	CannotConvertStringToValue	SCML	Error	Cannot convert string to value.
49	TagDoesNotAcceptContent	SCML	Error	The tag does not accept content.
50	CannotAddItemsToDictionary	SCML	Error	Items cannot be added to a dictionary.
51	MultipleAnimationInGroup	AnimationGroup	Error	AnimationGroup should have an Animation refered once.
52	AnimationGroupInvalideComposite	AnimationGroup	Error	AnimationGroup composite should be the same with the animation composite.
53	SharedNodeAttachmentModified	NodeAttachment	Warning	A shared node attachment is modified compared to its template. These modifications will be ignored.
54	OrphanRenderTarget	Render target	Error	Render target type is invalid or is not available in the current platform.
55	WidgetRequirementNotFulfilled	Widget	Error	A widget requirement is not fulfilled (a node with that name/type is not found as descendent of the widget node).
56	AnimationGroupInvalideComposite	AnimationGroup	Error	AnimationGroup composite should be the same with the animation composite.
57	NoDefaultShaderSet	Appearance	Error	Instance sharing is not supported for appearances.
58	PlanarShadowInvalidContent	PlanarShadow	Error	PlanarShadow does not support children.

59	PlanarShadowInvalidAutoVertexBuffer	PlanarShadow	Error	AutoVertexBuffer can be enabled only for planar shadows which are direct children of a mesh or billboard.
60	SkyBoxInvalidContent	SkyBox	Error	SkyBox does not support children.
61	SkyBoxInvalidParent	SkyBox	Error	SkyBox must be dirrect child of a camera.
62	SkyBoxNoCubeMapTexturee	SkyBox	Warning	The specified texture of a skybox must be a cube texture.

Troubleshooting

Troubleshooting

There are three known cases in which SceneComposer may not work:

- There is no Microsoft .NET Framework 3.5 installed on the machine. The application will not work if the Microsoft .NET Framework 4.0 is installed. Download and install Microsoft .NET Framework 3.5 to fix this problem.
- All the details related to the system requrirements in order to run the application can be found on the CGI Studio Documentation page: System Requirements and Preparation.
- The video card does not support rendering of OpenGL 2.0. To fix the problem, use a video card that supports OpenGL 2.0.
- If the Scene Composer process (process name: FTC.Launcher) remains running even after termination, in environments using an NVIDIA GPU, updating the graphics driver may resolve the issue when the process remains active.
  Please download the latest driver from the website below and perform a clean installation.
  https://www.nvidia.com/en-us/drivers/

Long Path Names - Limitations

When long path names are getting enabled in Windows, it allows the using of longer character limits. However, the feature still has limitations.

1. **Not all applications support long path names:** some older applications or those developed without considering long path names may still encounter issues, when handling paths exceeding the traditional 256-character Windows limit.
2. **Windows Explorer**: has still on some operations with limited functions (e.g. navigation works; however copy, rename or moving has some issues). Handling files via command line should work without issues or switching to an alternative file explorer, which supports long path names.
3. **Scene Composer:** Opening and saving solutions, as well as importing assets are working with long path names. However, native Windows dialogs, used by Scene Composer, still have issues with long path names (e.g. selecting new Solution location or renaming operations of the solution).

Recommandation is to either enable long path names, but create solutions within the 256-character Windows limit. This it would allow handling within Scene Composer and also allows that

imported resources may exceed the traditional limit within the solution format. The alternative is to consider the traditional Windows limitation and stay within the traditional 256-character limit. Please consider that the import of resources may reach the traditional limit.

To enable or disable open the Windows Registry and navigate to the following location:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem
```

To enable, create a new 32-bit DWORD value name *LongPathsEnabled* and set it to 1. To disable the support either remove the key or set to 0. Please note that other tools might have already enabled the long path name support (e.g. scripting languages).

Glossary

Glossary

Alpha channel	The alpha channel is an additional eight bits used with each pixel in a 32-bit graphics system that can represent 256 levels of translucency. Black and white represent opaque and fully transparent, while various gray levels represent levels of translucency.
Ambient light	Represents a pseudo light source which controls the amount of ambient light present in a scene.
Anti aliasing	Technique of adjusting pixel positions or setting pixel intensities so that there is a more gradual transition between the color of a line and the background color in order to give a smoother appearance.
Asset	A binary compact format file containing all the user defined artifacts: scenes, animations and all their constituents' parts (meshes, vertex buffers, textures, keyframes).
Aspect ratio	The aspect ratio of an image is the ratio of the width of the image to its height, expressed as two numbers separated by a colon.
Billboard	Square polygon that can be scaled, rotated, moved and textured.
Billboard2D	In SceneComposer is used as a flat square polygon always facing the camera that can't be scaled.
Blending	Technique that allows to adjust how one layer or color mixes with the colors in the layers below.
Clear color	The color used for the background. It is needed in order to clear the window to some background color before computer is starting to draw the scene.
Clear depth	Property specifying the value used to clear the depth buffer.
Clipping plane	A perpendicular plane to the camera that occupies the entire viewport, used in real-time rendering in order to prevent the renderer from calculating surfaces at an extreme distance from the viewer.
Culling	The process by which polygons (usually triangles) that are not facing the camera are not rendered.
Directional light	Type of light source described by a direction alone useful for modelling light sources that are effectively infinitely far away from the objects they illuminate.
Display render target	Represent a type of render target that addresses the rendering in a native surface of the graphic device.

Dithering	Dithering is the process of juxtaposing pixels of two colors to create the illusion that a third color is present.
Field of view (FOV)	Field of view specifies the angle of viewing volume to determine the equal-sided left, right, top and bottom clip planes (comparable to zoom lenses).
Fragment shader	Also known as pixel shader, is a type of shader that calculates the color of individual pixels.
Frustum (View frustum)	The three dimensional viewing area on the screen where everything is drawn to.
Interpolation	Interpolation refers to the process of generating intermediate frames between keyframes to give the appearance that the first image evolves smoothly into the next image.
Keyframe	A frame from an animated sequence, at which a significant animation event or change takes place.
LookAt Vector	Defines the direction vector the camera looks alongside in the local coordinate space.
Mipmapping	Mipmapping is a texturing technique used to reduce artifacts caused by mapping a large texture onto a small area in screen space.
Mipmap levels	Each MipMap level describes a certain level-of-detail for a texture image. The highest resolution is at MipMap level 0. Each subsequent MipMap level has half width and height of its predecessor.
Orthogonal	Orthogonal projection (or Orthographic projection) is a means of representing a three-dimensional object in two dimensions.
Perspective view	Represents an approximate representation, on a flat surface (e.g. the screen), of the image as it is seen by the eye.
Point light	Type of light source defined as a single point in space. It produces shadows with sharp edges and is a good replacement for extended and other computationally expensive light source.
Point Sprite	In SceneComposer the point sprite is displayed as a flat square polygon which is always facing the camera (screen-aligned). It can be textured and scaled to simulate perspective.
Render order bins	Containers for items that can be rendered, used to specify the order in which the items contained in one Bin are rendered relative to the ones from other Bins.
Render target	Render Target is an abstraction of a rendering surface. In the field of 3D computer graphics, it is a feature of modern graphics processing units (GPUs) that allows a 3D scene to be rendered to an intermediate memory buffer, or Render Target Texture (RTT). It can then be manipulated by shaders in order to apply additional effects to the final image before displaying it.

Shader	A shader is a software program that includes instructions on how the graphics processing unit (GPU) should render certain images on the screen.
Specular light	Specular lighting is the use of bright spot highlights to give visual clues for light source locations. Specular lighting is most commonly used to give light reflection off of metallic surfaces such as mirrors and highly polished/reflective metal surfaces. It is also used on other materials such as reflecting sunlight off of water.
Sport light	Type of source light defined by its position, the direction in which its pointing, and the width of the beam of light it produces. Spotlights are useful for creating dramatic localized lighting effects.
Texture Render target	Texture Render Targets represent textures that can be used in the scene to render into them.
UpVector	Defines the local up-vector of this camera in the local coordinate space in order to define the orientation of the camera looking alongside the look-at vector.
Vertex/Vertices	In geometry is a special kind of point which describes the corners or intersections of geometric shapes. In computer graphics it is used to define the corners of surfaces (typically triangles) in 3D models, where each such point is given as a vector.
Vertex buffer	Memory buffer that contains vertex data. All the vertices that form an object are stored in a special data array (vertex buffer) and then sent to the graphical device so that it can render the model.
Vertex shader	Is a type of shader that is run once for each vertex given to the graphics processor in order to calculate the position and other characteristics, such as color and texture coordinates, for each vertex.
View frustum culling	The process of removing objects that lie completely outside the viewing frustum from the rendering process. Rendering these objects would be a waste of time since they are not directly visible.
Viewport	A viewport is a region of the screen used to display a portion of the total image to be shown. In 3D computer graphics it refers to the 2D rectangle used to project the 3D scene to the position of a virtual camera.
Widget	Special items(external written programs) that allow the definition of custom behaviour for one or more existing items.
ZFar	Defines the distance to the near-depth clipping plane.
ZNear	Defines the distance to the far-depth clipping plane.

Widgets

How to Use a Widget

Widget: Concept

A widget adds dynamics to a static scene structure. It is linked to some parts of the scene graph and will be exported to the asset as a part of the scene.

SceneComposer is delivered with a default set of widgets, which can be extended with custom widgets by modifying SCHost.dll.

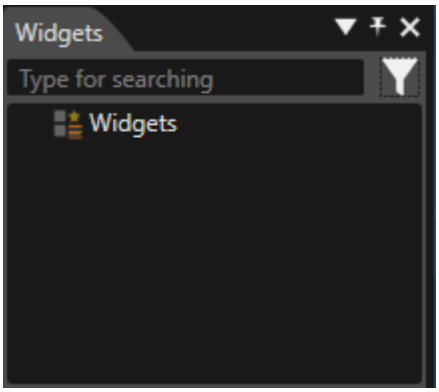
Widgets Panel

Widgets linked to a scene are organized in a widgets collection in the Widgets panel. Sorting is controlled by widget categories in the widget meta information.

Drag a widget from the Toolbox panel and drop it

- on a specific position in the Widgets panel or
- on a specific node part of the scene graph in the Scene Tree panel
- on a specific position in the Scene Editor panel.

In any case, the widget will then be listed in the Widgets panel, displaying all widgets linked to the given scene:



Sometimes it is necessary to group some widgets in the Widgets panel. To get this desired result a widget group has to be dragged from the Toolbox panel. After this first step, any widget can be dragged into the new group. The group can be renamed, deleted, cloned etc. If not visible, make

the Widgets panel visible by choosing the "View" > "Scene" > "Widgets" menu option.

Widget Properties

Select a widget and its properties will appear in the "Properties" panel of the main view.

- All widget properties are defined by the C++ implementation of the widget.
- SceneComposer provides type specific editors to configure those user-defined widget properties.

Update Widgets in all Scenes

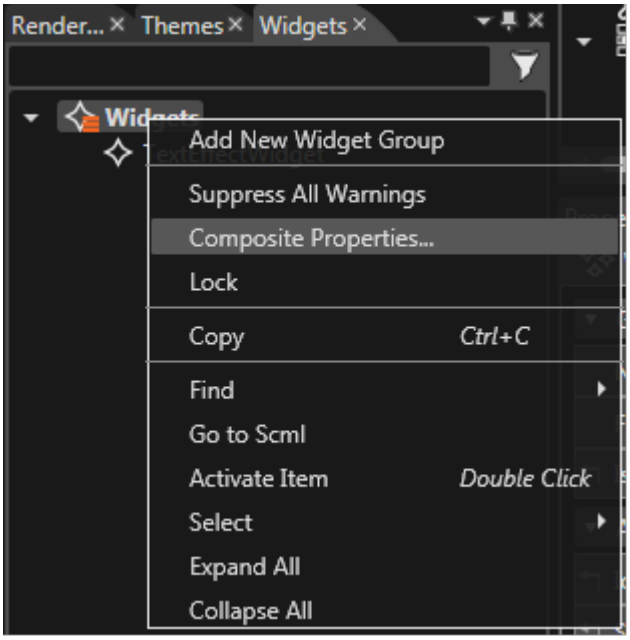
SceneComposer provides an option which enables updating widgets for all scenes (2D, 3D, composites, composite node internal widgets). The button for updating widgets for all scenes is placed on the Toolbar near the "Active Rendering" button.



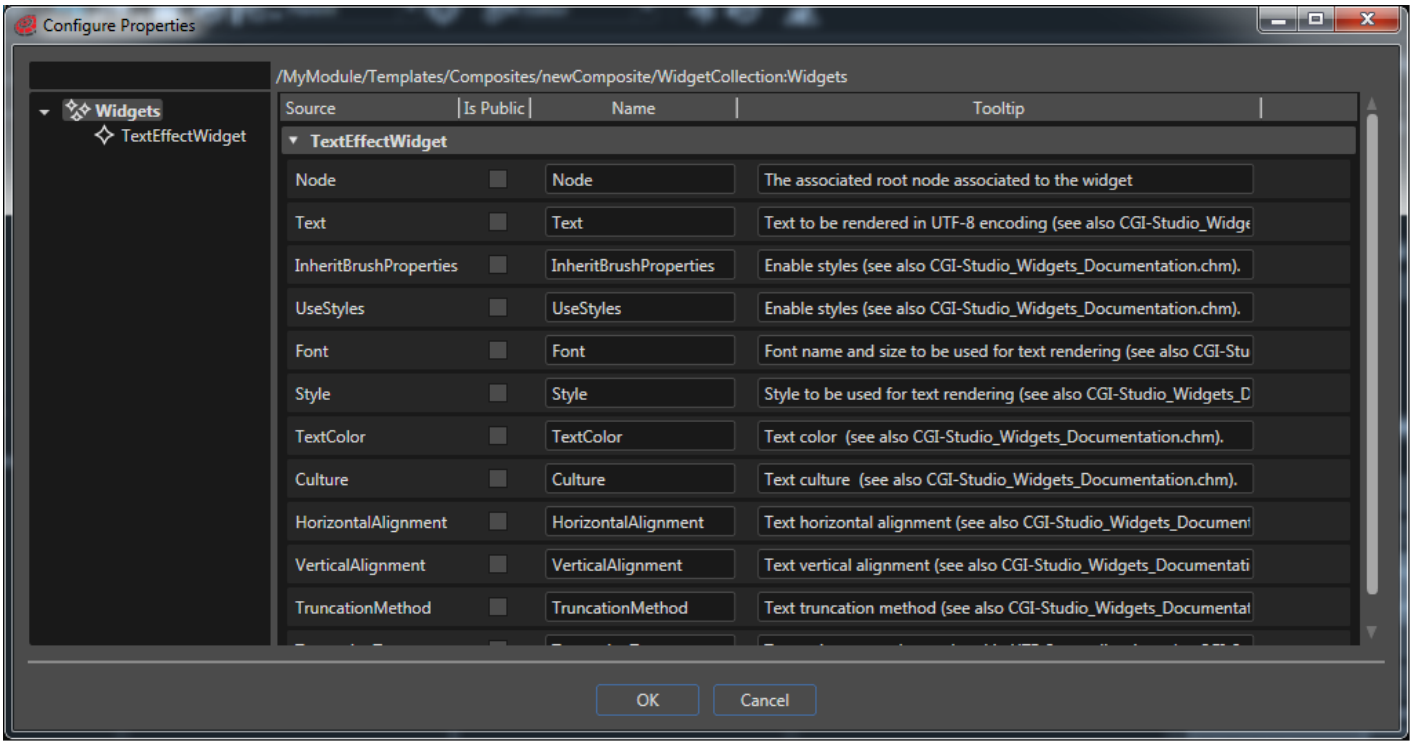
Widgets Using Controls

Widgets Using Controls

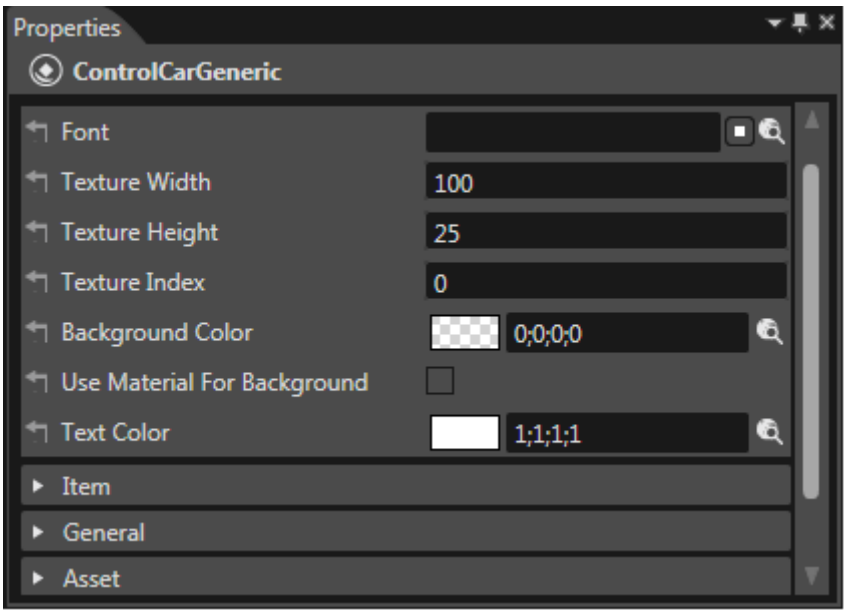
When a node from a control is set as value of a widget property, the option "Control Properties" becomes available in the context menu of the Widgets node.



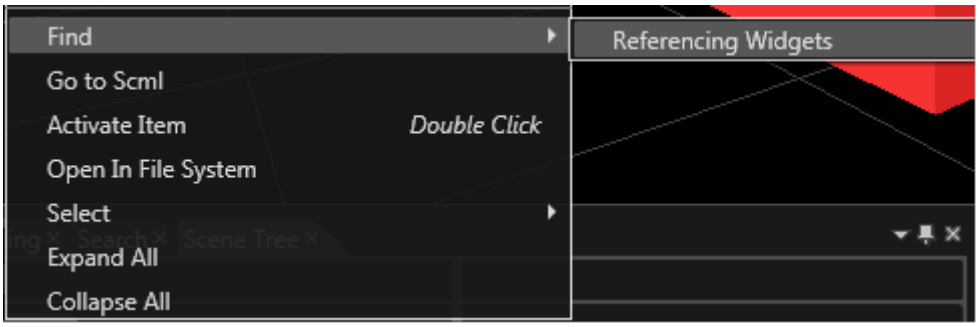
A new dialog "Configure Properties" opens where you can choose which properties of the widget should be available in the control. If necessary the user can use the fields available under the "Name" and "Tooltip" sections to introduce any useful piece of information. The values filled by the user in the "Configure Properties" dialog will be visible in the "Properties" panel.



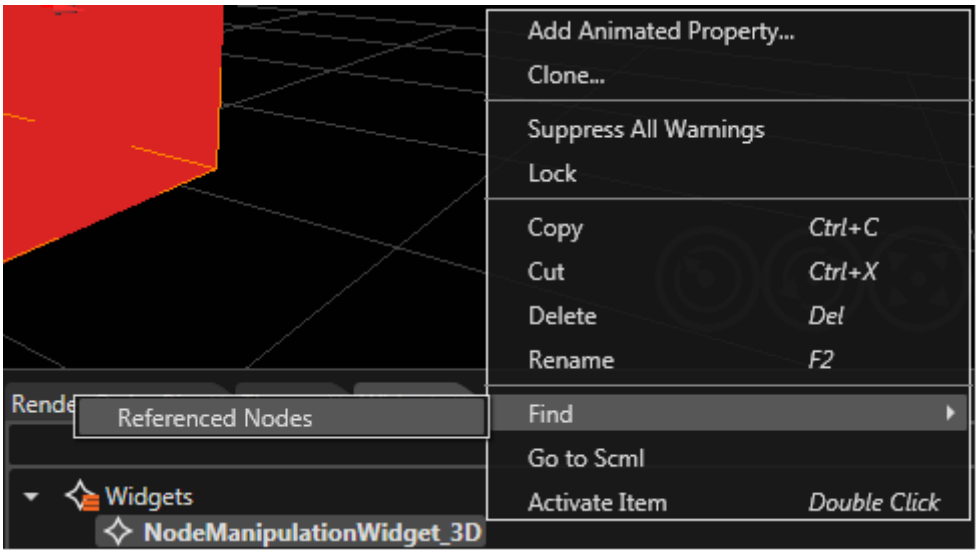
When the control is used in a new scene, the widget's properties selected in the "Configure Properties" dialog will be available as Control's Properties and they will be editable in the Properties panel.



It is possible to search nodes referred by a widget having property types "Node" and to search widgets which use a node or its descendents as widget properties. For convenience purpose this functionality is also offered as a context menu on widgets and nodes.



Any referencing widget can be found by using the context menu via Scene Tree.



If a node is referenced by a widget, the node can be found by using the context menu via Widgets panel.