

## Fixed

- (Shaders) Water ripples are not generated when shooting at or entities collide with Ocean surface (CE-217).
- (Shaders) Water sss was not taking into account fog color neither sun intensity anymore (CE-628).
- (Shaders) Eyeball is rendered as opaque object to avoid sorting issues with the tear layer (CE-3022).
- (Shaders) Fixed generic SSS support in Illum shader (CE-3023).
- (Shaders) Fix for shader compile error: SParticleVertex.blendTC needs to be float4.
- (Rendering) Ensure that light projector textures don't get downscaled in low spec and are not streamed, otherwise they won't work with tiled shading (CE-3231).
- (Rendering) Revived radial/directional blur and merged into regular motion blur (CE 3249).
- (Rendering) Fix dissolve for vegetation.
- (Rendering) Render shadow casters inside vis areas into static shadow map.
- (Rendering) Fixed specular target not being bound for ambient pass (CE-3207).
- (Rendering) Enabled BC1 compression for LightProjector preset so that texture will work with tiled shading (CE-3231).
- (Rendering) Fixed probe box clipping in tiled shading (could have caused NaNs).
- (Rendering) Fix static shadow map when e\_StreamCgf=1: Don't consider collision and raycast proxies as shadow casters.
- (Rendering) Update streaming status on designer objects so they will get rendered into static shadow map.
- (Rendering) Don't globally overwrite shader specified cull mode for point lights. Enable back face culling for sun shadows (CE-3001).
- (Rendering) Fixed vertex color support for eyes so that the specular overlay can be masked properly.
- (Rendering) Fix for sampler mismatch in fog shadows (CE-1186).
- (Rendering) Potential crash in dependency of r\_MSAA CVar accessed in r\_AntialiasingMode callback (CE-3375).
- (Rendering) Disabled depth clip for stencil passes so geometry beyond far plane is handled correctly.
- (Audio) Fixed where we lost the audio listener on a view.
- (Audio) Fixed footstep sound culling distance by checking actor against listener instead of actor against client.
- (Audio) Fixed sound obstruction so delayed playback works again.
- (Statoscope) Datagroup a - need metrics (CE-3215).
- (Statoscope) DataGroup g - Unknown stat tracked needs explanation (CE-3226).
- (Statoscope) Datagroup e (ef\_lists) broken (CE-3217).
- (Statoscope) datagroup broken (CE-3185).
- (Statoscope) Screenshot capture - fullscreen 1080p = bad screenshot (CE-1701).
- (Statoscope) Crash when e\_statoscopeScreenshotCapturePeriod is set in system.cfg.
- (Statoscope) ArtProfile - NumLightingDrawcalls - incorrect stat (CE-3250).
- (Statoscope) Default the log destination to 1 (socket logging) (CE-3208).
- (AISystem) Crash when creating a new level in Sandbox while AI/Physics is active fixed (CE-3094)
- (AISystem) Out-of-bounds access in InterpolatedPath.
- (AISystem) Fixed AI alertness level not being set in MBT.
- (Material) Fix for material editor causing crash when texture slot didn't contain fullstop (nearest\_cubemap).
- (Material) Hiding Environment map slot for PBR based shaders (CE-1711).
- (CryDesigner) Switched data format of designer from xml text to xml encoded Binary.
- (CryDesigner) Fixed a bug on a crash happening when entering edit mode (CE-3207).
- (CryDesigner) Fixed a bug on areasolid having physical data (CE-3207).
- (CryDesigner) Fixed a crash bug happening when entering the pivot tool.
- (CryDesigner) Fixed creation of invisible designer object after clicking "Designer" button during creating a primitive shape.
- (CryDesigner) Fixed a bug related to plunging into the infinite loop when switching a designer mode after undoing.
- (CryDesigner) Fixed a bug of the Extrude Tool about incorrectly dealing with the side regions in extruding and not deleting opposite regions.
- (CryDesigner) Fixed a bug of some regions disappearing after drawing lines between inner parts in a region.
- (CryDesigner) Fixed a bug in the Move Tool omitting a vertex between an another edge.
- (CryDesigner) Improved a way of editing in 2D viewport (CE-2479).
- (CryDesigner) Got the manipulator for selected elements (Vertices, Edges or Faces) to be invisible when the empty space is selected (CE-3418).
- (CryDesigner) Fixed a bug so that empty designer is not allowed to be cloned.
- (Trackview) Fix delete sequence always throwing an exception.
- (Trackview) Fix sequence renaming by context menu (CE-2976).
- (Trackview) Fix infinite loop when renaming entity that is in sequence.
- (Trackview) Crash during shutdown if trackview sequence is active.
- (Scaleform) Crash when UIElement is invalid in material editor.
- (Scaleform) UI disappeared when hitting return.
- (Scaleform) UIElements are not updated in the renderer (CE-3152).
- (Scaleform) Stall during level unload.
- (Scaleform) Changed logic for in-game mission display.
- (Game) Assert failed when jumping rapidly - caused by camera shake.
- (Game) Timedemo crashing the editor (CE-3073).
- (Game) Need to restart before doing a second timedemo.
- (Game) Added check to prevent AI from receiving health regeneration (CE-772).
- (Ropes) Some rope attachment serialization fixes.
- (Ropes) Rope slicing sometimes not detaching tied objects (CE-3328).
- (Ropes) recounting issue with subdivided ropes (CE-3122).
- (Ropes) Potential mem corruption in rope serialization (CE-3122).
- (Particles) bOrientToVelocity and TurbulenceSpeed/Size combination, fCameraOffset, connected-particle tiling with negative texture frequency.
- (Particles) Make sure particle don't creep during 0 steps (CE-3103).
- (Particles) Fixed incorrect emitter location during the first frame when using the mannequin ParticleEffect proc clip.
- (Particles) Fixed particle effects created from the dedicated Mannequin proc clip ignoring the given reference joint name (CE-3162).
- (Physics) Editing water level not affecting the physics immediately (CE-1073).
- (Editor) Objects: Better link visualization.
- (Editor) Generated a name of GeomEntity type based on a mesh file name (CE-2370).
- (Mannequin) Fixed Gizmo manipulations in the Mannequin editor not triggering a modification of the database being updated.
- (Assets) Forest: Fixed cave solid using incorrect material, fixed broken cover surface entities.

- (Assets) Turret: Added in Mannequin setup and audio.
- (Assets) Fixed shading issue with concrete\_beam assets.
- (Assets) Fixed Light projector textures not being set to 512x512px and using the LightProjector preset.
- (Assets) Numerous material/texture fixes for missing content.
- (Assets) Numerous PBS-related tweaks to Materials/Textures.
- (JobManager) Profiler doesn't show main/render thread information (CE-2935).
- Fix deadlocks if number of job threads is greater than number of frames in Alembic.
- When resizing to a larger terrain size, only manipulate the area that matches the size of previous heightmap and leave the rest of the area with zero height (CE-3166).
- Disabled async dips for PC (Editor may crash when opening character editor in CCryDeviceContextWrapper::PSSetShaderResources) (CE-3147).
- Fixed access to 0-entry arrays.
- Fix crash in alembic compiler when color array is missing.
- Handle light volume hash collisions. Fix light volume index calculation.
- Fixed int overflow when biasing.
- Fixed assert in SSAO blur (CE-3042).
- Scale depth values in r\_deferredshadingdebug 1 (CE-2114).
- Fixed texture stream thrashing due to double advancement of far zone round id.
- Fix wrong LOD calculation in character texture streaming.
- Ensure precache lod is clamped to available lods.
- Pivot distance was wrong for streaming, uses adjusted bbox distance, real fix is to precache +1/-1 LODs everywhere.
- Crash on level load when path contains special characters.
- Fixed issues with duplicate CVars registered in config files and code (CE-3198).
- Potential fix for printf validation fatal error.
- Fixed restarting the Editor with the character editor open causing in-game textures to appear low res (CE-3195).
- Fixed NaN check in SSRRaytrace (D3D11 define is not existing any more) (CE-3199).
- Breakable joint assignment issue (CE-2576).
- Fixed problem with multi-part living entities.
- Fixed contact stability problems with small breakable chunks.
- Fixed problem with character aux physics and bones' rotational velocity estimation.
- CHitDeathReactions Found more than one tag in container (CE-1359).
- Fixed Rope on Light in starting Ruin. Had FrictionPull set to max (100). Reduced down to 2.
- Fixed missing material warning in HUD.
- Fixed getControlVal() for listbox items. Now returns the value specified when item was created instead of the caption. to get caption, use GetListboxItemCaption.

## Added

- (AISystem) Added AIActionSequence-compatible flow node to approach and enter vehicles.
- (AISystem) Added AISequence-compatible flow node "AISequence:WeaponDrawFromInventory".
- (AISystem) Added AISequence-compatible nodes for drawing and holstering the weapon.
- (Flowgraph) Exposed "FileName" to DecalPlacer entity via Flowgraph.
- Added toolbar icons for animation import panel and animation compression editor.
- Added Snow.lua script for use with Snow entity.

## Deleted

- (Entity) Hide obsolete ShootingTarget entity.
- (Entity) Set RigidBody entity to invisible. RigidBody is obsolete as users should always use RigidBodyEx instead.
- (Entity) Hiding ParticleEffect entity from entity list. Deprecated method of adding PFX to level. Use Particle Editor or Particle Effect button in rollupbar (CE-1205).
- (Entity) Remove unused TowerSearchLight entity and code.
- (FlowGraph) Hide obsolete nodes: Image:Glittering, Image:Global, Image:Glow, Image:DistantRain, Image:HUDHitEffect, Image:Scratches. Fixed bug with Image:Condensation node not being properly set in Obsolete category (CE-296).
- Delete unused ZeroG/GravitySphere lua script. Note the GravitySphere script inside Entities/Physics remains functional (CE-873).

## Optimization

- (SSE) Enabled on 64bit.
- (Config) Update all PC configurations with better performance CVars.
- Additional motion blur optimizations.
- Use r\_motionBlurQuality 0 on low specs.
- Geometry cache SSE3 code path for PC.
- Ocean rendering optimization: Fixed wrong flag usage, disabled deprecated matrixes usage to prevent redundant CBs update (CE-3101).

## Refactored

- (Common) ZeroInit<>.
- Reviving grain params through common grain rendering (CE-296).
- Rollback change which removed Terrain Occlusion / Sky Brightening from TOD/Terrain Texture Generation dialog (CE-3230).
- Move geom cache hit test to CGeomCacheEntity.
- Tiny cleanup in ShadowMaskGen.cfx.
- Disabled deprecated light clipvolumes (LightShape) geometry. Feature is not compatible with tiled shading/latest engine updates - from 3.6 only clipboxes (LightBox) will be supported.
- PBR related shader cleanups: Renamed gloss to specular where appropriate. Removed gloss in specular alpha option.

- Adjusted nearest probe picking to better fit how probes are setup now (use layers rather than global probe and check against OBB).

## Tweak

- (Renderer) Removed vegetation profiler left overs.
- (Shaders) Use red channel instead of green channel for eye specular overlay texture.
- (Audio) Add sound obstruction data to surface type instead of relying on the pierceability. Renamed some variables to suit.
- (Audio) Turn off max obstruction radius scaling by default.
- (Audio) Set max obstruction level to full (1.f).
- (RC) ImageCompiler: removed CUDA, nvtt, ATI Compress.
- (Particles) Emitters created through the ParticleEffect procedural clip are immediately created with the correct location, instead of waiting for the attachment update.
- (CryDesigner) Added a routine to delete the existing binary files, DesignerObjects.dat and DesignerMeshes.dat as they're no longer needed/used.
- (CryDesigner) Removed the items in the Preference related to saving designer data as binary form.
- (CryDesigner) Added a routine to getting total polygon count of a designer object.
- (CryDesigner) Improved the Extrude tool for boundary edges created with pulling not to remain.
- (CryDesigner) Improved the box creation tool so that union operation can be applied to the result regions.
- (CryDesigner) Improved the Extrude tool for boundary edges created with pulling not to remain.
- (CryDesigner) Made the selection of elements correct and more sensitive
- (CryDesigner) Removed "Separate" check box in the primitive creation panel.
- (CryDesigner) Changed a destination buffer for decoding base64 type from std::vector to array.
- (Editor) Added secondary outputs to MissionStateListener FG node.
- (Editor) reworked reload script functions in editor (CE-1451).
- (Statoscope) e\_statoscopeEnabled=0 by default to avoid log spamming
- (Flowgraph) Blacklist obsolete nodes: AI:Anim/Ex, AI:Goto/SpeedStance, AI:Interested/InterestingEntity, AI:ShootAt, AI:WeaponDraw/Holster/Select. Use replacement AISequence nodes instead (CE-2964). Cleaned out Rem/Ren entries from Blacklist no longer required.
- (Assets) Updated PFX libraries: Removed some duplicates, updated lighting settings, moved some unnecessary children pfx to parent.
- (Assets) Forest: Lowered ropes FrictionPull from 100 to 1 (CE-3258). Removed subdivision on Ropes and increased segment count (CE-3258). Decrease LOD ratio for noticeably popping objects.
- (UIActions) Cleaned SP\_Objectives setup with new Secondary output ports. Added in IsMultiplayer check for scoreboard/objectives to only display in their appropriate mode (CE-3336).
- Adjusted default probe falloff to 0.3.
- Removed unnecessary attachment update call in the ParticleEffect procedural clip.
- Player characters always have high streaming priority.
- Removed bAll parameter in CObjectArchive::CObjectArchive().
- Fixed missing type when only including "PixelFormat.h".
- Adjusted error-message for incompatible texture-format for tiled-shading (CE-3253).
- Cleaned up sketch mode configs.

## New Feature

- (Audio) Introduced audio obstruction offset on SoundEventSpots.
- (AISystem) "crouch" stance is now also supported in movements (CE-3310).
- (Lobby) Steam Invite friends.
- (Renderer) Displayinfo compact mode (r\_DisplayInfo 3: fps - ms).
- (Particles) Comment, Inheritance, System.Default effect.
- (Particles) Optionally disable surface alignment for particles (CE-3103).
- (Editor) Rotate objects during creation and cloning with CTRL + mouse scrollwheel.
- (Editor) Option to show mesh statistics on mouse over.