CRYTEK®

CRYENGINE® 3

ACHIEVE YOUR VISION

CryENGINE® 3
The Maximum Game Development Solution

CryENGINE® 3 is the first Xbox 360™, PlayStation® 3, MMO, DX9 and DX10 all-in-one game development solution that is next-gen ready – with scalable computation and graphics technologies. With CryENGINE® 3 you can start the development of your next generation games today.

CryENGINE® 3 is the only solution that provides multi-award winning graphics, physics and AI out of the box. The complete game engine suite includes the famous CryENGINE® 3 Sandbox™ editor, a production-proven, 3rd generation tool suite designed and built by AAA developers.

CryENGINE® 3 delivers everything you need to create your AAA games.

XBOX 360

PLAYSTATION 3

NEXT GEN ready

MMO

PC

CRYENGINE® 3   CRYENGINE® 3

CryENGINE® 3 Sandbox™
The Ultimate Game Creation Toolset

CryENGINE®3 Sandbox™ gives developers full control over their multi-platform creations in real-time. It features many improved efficiency tools to enable the fastest development of game environments and game-play available on PC, PlayStation®3 and Xbox 360™. All features of CryENGINE®3 games (without exception) can be produced and played immediately with Crytek's "What You See Is What You Play" (WYSIWYP) system!

CryENGINE®3 Sandbox™ was introduced in 2001 as the world's first editor featuring WYSIWYP technology. Since then Crytek have continued to improve and enhance the CryENGINE®3 Sandbox™ tools; and now the 3rd generation, fully integrated CryENGINE®3 Sandbox™ editor brings WYSIWYP functionality to a whole new level. WYSIWYP is now possible on PlayStation®3 and Xbox 360™; enhanced production tools and development efficiencies will give your team more time to create AAA multi-platform game content.

INTEGRATED CryENGINE® 3 SANDBOX™ EDITOR

Simultaneous WYSIWYP on all Platforms

CryENGINE®3 Sandbox™ now enables real-time editing of multi-platform game environments; simultaneously making changes across platforms from CryENGINE®3 Sandbox™ running on PC, without loading or baking delays. The ability to edit anything within the integrated CryENGINE®3 Sandbox™ and simultaneously play on multiple platforms vastly reduces the time to build compelling content for cross-platform products.
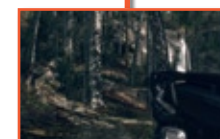
CryENGINE®3 Sandbox™
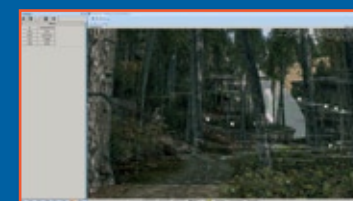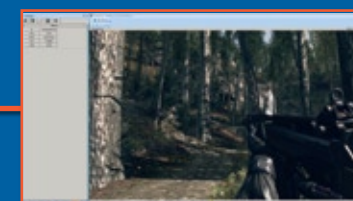
Edit Realtime   Play Realtime

Xbox 360™ Play Realtime   PlayStation®3 Play Realtime   Next Gen Play Realtime

Hot-Update for all Platforms

Changes can be made to original art asset sources (using standard art tools) for CryENGINE®3 Sandbox™ on PC, then CryENGINE®3 immediately and automatically converts, compresses and optimizes the content, then updates the output to all supported platforms. Developers can instantly see the effect of lighting, material and modeling changes within moments on any supported platform.

Cross-platform development has never been so easy!

Flow Graph

The CryENGINE® 3 simple visual editing system gives designers an intuitive interface to create and control events, triggers and other game logic. This allows designers to build complex levels without needing to write a single script.

Integrated Vegetation & Terrain Cover Generation System

CryENGINE® 3 vegetation behaves according to natural rules about the desirable and allowable ground slope, surface altitude and allowable plant density, at run-time. Vegetation placement tools automatically create realistic, natural environments in a fraction of the time of traditional hand-placed systems, but still grant the freedom to position individual elements to achieve the perfect look.

Integrated Vegetation & Terrain Cover Generation System

Advanced Terrain System with Integrated Voxel Objects Technology

CryENGINE® 3 features the only terrain tool system that enables the creation of stunning concave environmental features in real-time, allowing designers to place overhanging cliffs, caves or tunnels seamlessly in their levels.

Real Time Soft Particle System & Integrated FX Editor

CryENGINE® 3 simplifies the creation of extremely complex explosion, fire, smoke and other special effects using next generation soft particles, which in turn can be affected by: collisions with any other objects, forces such as wind or gravity and can interact with lights and shadows.

Dedicated Road & River Tools

All worlds have paths, roads and rivers, so CryENGINE® 3 features a dedicated toolset to enable instantaneous smoothing and leveling of terrain and application of materials, based on the placement of roads and river networks.

Dedicated Road Tool

Dedicated Vehicle Creator

The CryENGINE® 3 vehicle toolset allows easy creation of any vehicle type, with intuitive control over vehicle characteristics, including defining component damage and damage effects, passenger positions and functions, weapon hard-points and turrets, engine and physics parameters as well as vehicle specific special effects.

CryENGINE® 3 Next Generation Real-Time Graphics

The CryENGINE® 3 renderer provides seamless support for both indoor and outdoor environments on current platforms; and our multi-core and future-proof graphics technology ensure that CryENGINE® 3 is next-gen ready.

CryENGINE® technology is world famous for its award winning rendering and CryENGINE® 3 is no exception. CryENGINE® 3 is the fastest, high-end renderer in the world, with new features specifically designed for console platforms.

Benchmark-setting graphical performance, near-photorealism in indoor and wide-open outdoor environments and extra-ordinary real-time special effects are some of the hallmarks of CryENGINE® technology. With CryENGINE® 3, scalability across multiple platforms is a further evolution to enable great looking games – regardless of the target platform.

NEXT GENERATION REAL-TIME GRAPHICS

Multi-Core Support

To get the most out of modern multi-core processor architectures, CPU intensive subsystems of CryENGINE®3 such as graphics, physics, AI, networking and sound have been optimized to support multiple processors.

Real-time Dynamic Global Illumination

CryENGINE®3 features a novel real-time dynamic global illumination solution, fully optimised for current and next generation platforms. For the first time – without pre-computation or geometric limits – you can experience light-bounces, colour bleeding and specular effects in a real-time game engine – unified for all static and dynamic objects.

Deferred Lighting

The CryENGINE®3 unique deferred lighting solution allows the rendering of a vast amount of light sources with per pixel shading efficiently; and simplifies engine performance tuning across multiple platforms.

Deferred Lighting

State-of-the-Art Lighting & Shadows

Natural Lighting & Dynamic Soft Shadows

CryENGINE®3 features near-reality natural lighting at low-cost on multiple platforms; and creates soft shadows that dynamically respond to natural movements in real time. High-resolution, perspective correct and volumetric smooth-shadow implementations are also included in CryENGINE®3.

Volumetric, Layer & View Distance Fogging

Clouds, smoke, visible gases and fog banks are all rendered realistically, allowing physical phenomena, such as; ground-hugging; realistic reduction in visibility and contrast, and interaction with dynamic lights and shadows.

Volumetric, Layer & View Distance Fogging

Normal Maps & Parallax Occlusion Maps

CryENGINE®3 includes parallax occlusion mapping, for all supported platforms, to give a sense of depth to a surface texture applied to a polygon, to achieve realistic levels of detail without needing hi-poly models, for example the relief surface structure of a brick wall or a cobblestone street.

Normal and Parallax Occlusion Maps

Screen Space Ambient Occlusion

Screen Space Ambient Occlusion

First pioneered by Crytek in 2005 and now used in most high quality graphics engines, SSAO provides a real time simulation of ambient light occlusion, to provide the real darkening of edges and corners as in the natural world. This high performance solution creates a low overhead on all platforms, with a very high quality result. CryENGINE®3 provides improved visual functionality alongside the fastest implementation of SSAO available on Xbox 360™, PlayStation®3 and PC.
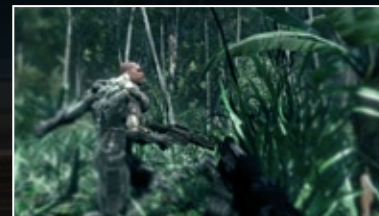
Uber Shader Technology

CryENGINE®3 shaders are written once in a high level language, then compiled automatically to each platform. The shader output is optimized based on the artists' settings and the 3D environment in which the shader is used. This creates high performance unique effects, such as: "cloaking", wet, muddy, and frozen surfaces, which can be layered together and combined with other shaders, such as: metal, glass and other visual effects. CryENGINE®3 supports real time per-pixel lighting, bumpy reflections, refractions, volumetric glow effects and animated textures to simulate windows, bullet holes, shiny surfaces and many other effects. CryENGINE®3 also takes advantage of the unified shader architecture of current and next-gen hardware. The combination of deferred lighting and this technology allows CryENGINE®3 to avoid the traditional shortcomings of Uber Shaders alone.

High Dynamic Range (HDR) Lighting

Eye Adaptation & High Dynamic Range (HDR) Lighting

Eye Adaptation is used to simulate the human eye's adaptation to sudden or extreme changes in lighting conditions, like dark indoor environments suddenly transitioning to bright sunny outdoor environments, while HDR allows scenes with extreme brightness and contrast ranges to be more realistically rendered.

Pristine Motion Blur & Depth of Field

Motion Blur can be applied to individual objects (object based motion blur) and to an entire scene (screen based motion blur); Depth of Field effects can be defined easily with the multi-platform WYSIWYP editor. CryENGINE®3 now implements the highest quality for these effects at a low performance cost, across all supported platforms.

Depth of Field

CryENGINE® 3 REALISTIC CHARACTERS

Character Animation System

Our new character animation system considerably advances the state of the art in real-time character animation. A dedicated character editor allows animations to be previewed inside of CryENGINE®3 Sandbox™, for all supported platforms, while our extremely powerful animation tools allow animators to visually define the states and transitions of a character to ensure realism is achieved in concert with aesthetic quality.
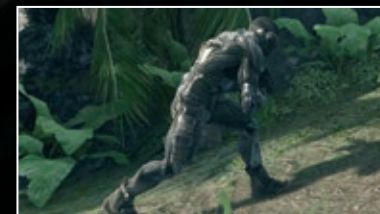
Character Animation System

Character Individualization System

CryENGINE®3 uses an innovative attachment system for skinned, animated, or physicalized elements to be attached to the skeleton or mesh of a character. With this system it is even possible to replace entire body parts such as heads, hands, or upper and lower body – in real-time. A multi-platform, hardware-based, shape deformation system also allows flexible variation of the character meshes, supporting manual and procedurally generation to ensure a small memory footprint. An additional variation system, based on shaders can be used for dirt, decals for clothes, and camouflage shaders for the skin.

Parametric Skeletal Animation

Parametric Skeletal Animation

By blending example-motions based on user-defined parameters, CryENGINE®3 delivers responsive interactive control over a character with a focus on believability. Characters in CryENGINE®3 can follow paths where the direction and speed changes smoothly or suddenly, move uphill or downhill and react to changing scenarios on-the-fly – dynamically blending animations to create a believable and realistic, yet dynamic and game-controlled representation of movement.

Procedural Motion Warping & High-End IK Solutions

Procedural algorithms like CCD-IK, analytic IK, example-based IK or physical simulations are used to augment pre-authored animations to avoid the typical computer-generated look that is often exhibited when combining artificial and captured animations. The CryENGINE®3 scalable and cross-platform warping technique preserves the style and the content of the base motion, despite the transformations complying with the ever-changing constraints.

Procedural Motion Warping and High-End IK

Unique Dedicated Facial Animation Editor

The powerful Facial Animation editing tool within CryENGINE®3 Sandbox™ uses audio waveform analysis technology to extract phonemes (and other key features of speech) to animate facial features and provide convincing lip-sync. The sophisticated yet convenient user interface allows expressions to be defined and combined, then animated quickly and intuitively to multiple models across multiple platforms. The CryENGINE®3 video tracking tool captures movements from an actor's face and these movements are transferred directly to the facial model in the editor, where the expressions can be com-bined with the lip sync and/or further edited by an animator.

Subsurface Scattering

Simulates the diffusion and diffraction of light transmit-ted through translucent objects, like ice and jade. The CryENGINE®3 unified solution can be used on in-game assets such as trees and plants or to create realistic human skin.

Subsurface Scattering

Advanced Modular AI System

Realistically rendered and animated characters require state of the art AI systems to intelligently respond to the game environment and maintain the illusion of realism. CryENGINE®3 **features powerful, scalable and flexible AI technology to handle character behaviours with modular sensory systems (such as sight and hearing); and fully support the complex requirements of the character locomotion system.** AI in CryENGINE®3 **requires no additional middleware and is fully integrated for your game within** CryENGINE®3 Sandbox™, **with WYSIWYP functionality on all platforms.**

Designer-Friendly AI Editing System

CryENGINE®3 Sandbox™ enables designers to control basic AI behaviours using the Flow-Graph visual scripting system, placing most AI gameplay control in their hands. Simple LUA scripting enhances the variability of these behaviors, creating more complex AI responses and even extend-ing state machine behaviors. This combination of systems enables the creation of any AI behaviour through an extremely simple WYSIWYP pipeline.

Dynamic Path Finding

Advanced 2D and 3D algorithms allow the AI navigation paths to be modified in real time in res-ponse to events which may create, modify or destroy existing paths, a critical feature for creating believable AI in a highly interactive and destructible environment.

Automated Nagivation Mesh Generation

CryENGINE®3 will feature an automated navigation mesh generation for AI pathfinding unlike most waypoint-based systems, generating paths and information about the vicinity. The system is unified for indoor and outdoor areas and generated automatically, within volumes placed by designers. Generated nav-mesh supports multi-storey surfaces (such as floors in a building), special moves (jumps, climbing etc.) and adapts itself in real-time to dynamic obstacles.

CryENGINE® 3
Realistic Infinite Worlds

CryENGINE®2 introduced incredibly interactive photo-realistic worlds, with huge natural environments that responded to player input and game events as if in the real world. From naturally frozen nature to fully destructible vegetation and buildings, players saw the game world as near real for the first time.

CryENGINE®3 continues with this benchmark level of interactive realism in worlds limited in size only by the development budget; thanks to intelligent streaming of game data.

# REALISTIC INFINITE WORLDS

Natural World Effects

CryENGINE®3 features the most natural looking environments available in real-time – adding enhanced natural lighting to our existing large scale natural world representations.

CGI Quality Time of Day System

Time of day dynamically changes during a game mission to reflect sun/moon position, lighting and atmospheric conditions over any predefined day/night cycle, from a blue and foggy morning sunrise to a fiery orange sunset to a clear cold moonlit night. Create visually rich time of day simulation for your game world or its locations; and achieve the most realistic or creatively surreal settings.
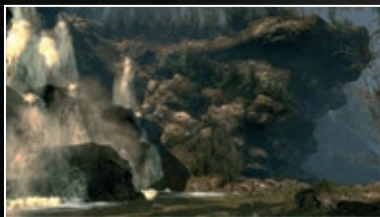
Natural World Effects
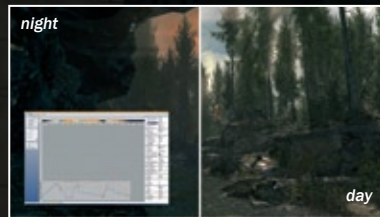
CGI Quality Time of Day System

High Quality 3D Water

Crytek has spearheaded the creation of realistic, real-time 3D water in games, with X-Isle, Far Cry and Crysis over the past 10 years. CryENGINE®3 water and ocean surfaces can be modified due to wind and wave direction, generating soft shoreline effects automatically where the water meets the shore or bank, depending on the shoreline contour and water depth, while caustics simulation creates the most realistic looking moving shadows and highlights in underwater environments available in real-time 3D.

Dynamic Volumetric Light Beams & Light Shaft Effects

These are used to create visually stunning light beams and shadows when light intersects with solid, highly detailed geometry, and to generate god ray phenomena in skies, on earth and through water.

Streaming

Game levels rarely fit into memory of most hardware platforms, so streaming content is often required. With the CryENGINE®3 scalable streaming solution, data is clustered for fast access, platform-specific features are utilized and data content is prepared and compressed for optimal streaming. CryENGINE®3 utilizes multiple CPUs and schedules access based on dynamic priorities, to deliver an efficient and scalable multiplatform streaming solution.

High Quality 3D Water

Dynamic Volumentric Light Beams & Light Shaft Effects

Integrated Multi-threaded High Performance Physics Engine

CryENGINE®3 physics can be applied to almost everything in a game world, including buildings, props, trees and vegetation, to realistically model reactions to forces such as: wind currents, explosions, gravity, friction and collisions with other objects, without the need of external middleware.

XBOX 360.   PLAYSTATION 3   AMD   (intel)

Interactive & Destructible Environments

All environments in CryENGINE®3 can be dynamically physicalized, regardless of their nature (wood, steel, concrete, natural vegetation, cloth, etc.). This allows procedural destruction of as much of the environment as the game requires. All broken objects or parts can be interactive, with realistic properties such as mass, buoyancy, etc. applied to the debris.

Interactive and Destructible Environments

Advanced Rope Physics

Bendable vegetation which responds to wind, rain or character movement, realistically interactive rope bridges, and physically driven creature tentacle animations are just some of the uses to which we've put our rope physics technology.

Advanced Rope Physics

CryENGINE® 3
Achieve Your Vision At Maximum Speed

In 1999 Crytek started to work with a novice team on ambitious games that no existing technology could deliver. Concentrating our efforts on CryENGINE® as much as our games, we improved as developers. Great tools make great developers!

The benchmarks that Crytek set for graphics performance and quality are matched by the performance and quality of the development tools our internal teams and engine licensees all utilize.

CryENGINE® 3 features many innovations to accelerate development and ensure teams are able to maximise their own creativity without delays or painful development processes multi-platform game content.

Performance Analysis Tools

Powerful instrumentation features allow the developer to analyse engine performance in real time, create detailed memory usage reports, and run automated walkthroughs of each level to get consistent test results from build to build.

CPU Frame Time Analyser

Art Scene Budget Analyser

Memory Map Analyser

### CryENGINE® 3 Sandbox™ Development Layers

In a similar fashion to most professional art programs, CryENGINE® 3 Sandbox™ features a layers system allowing controlled separation of a game level. By locking any elements into (up to) 256 layers, each can be worked on in parallel, exported, imported and merged. This system allows an entire team of developers to simultaneously make changes on a single level, without concern of impacting colleagues' work. Such unequalled parallel control of levels; local, layered source control of assets; and clearly organised level data management materially increases development progress.

Polybump™

Polybump™, the CryENGINE® 3 normal map creation tool has again been enhanced to take advantage of multicore hardware and 64-bit operating systems.

Polybump™
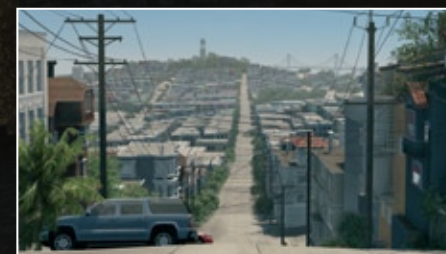
Hi-res offline rendering for any scene

Crytek developed Polybump™ in 2001 and shipped Far Cry in March 2004, as the first game ever to feature normal mapping, powered by Polybump™. Polybump™ can be used as either as a standalone utility, or fully integrated with other tools, such as 3ds Max®. Polybump™ creates a high quality surface description that allows quick extraction of surface features like normal maps (tangent-space or object-space), displacement maps, non-occluded area direction, accessibility and other properties. The extracted information can be used to render Low poly models with surface detail almost indistinguishable from higher-poly models at high-render speeds. The data is stored in a intermediate file format so it can be exported in different ways without doing the computation again. Even very high polygon counts (e.g. 10 million triangles) are processed quickly with the improved Polybump™ technology.

Offline Rendering

Creating streaming videos or still images from within the game is made easier by the inclusion of specific console commands which can output a scene at any arbitrary screen resolution and/or aspect ratio, including generating auto-stitched panoramic views for use on 360 degree projection video displays. Creating marketing material becomes a matter of a single button-press!

Resource Compiler

Resource Compiler Assets are compiled from their original formats to an optimized platform dependent one by the resource compiler at project build time. This allows making global changes (e.g. mip-map computation, mesh stripification) to the output data depending on presets and target platforms without affecting the final level loading times, or requiring developers to keep multiple versions of assets on hand for different platforms.

SOUND AND MUSIC

The sound system in CryENGINE®3 offers many features and improvements with its data-driven concept which guaranties a flawless and low-risk audio development. Each sound carries its own specification with it, so sound designers are in full control of the dynamic behaviour and the final quality of the sound.

Intuitive control over player-driven music logic

Hierarchical area shapes for ambience sounds

Data-driven Sound System

Complex sounds can be easily created and delivered with studio quality while supporting any available surround sound speaker configuration up to 7.1. Multi-platform compatibility, improved data streaming, and individual performance optimization for Xbox 360™ or PlayStation®3 are guaranteed by the included sound library FMOD Ex®.
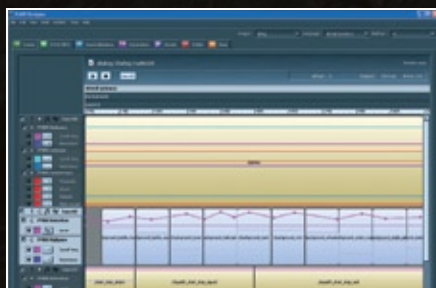
In Game Mixing & Profiling

Integrated editor functionality and advanced sound specification tools ensure the WYSIWYP method. Turn around times of only a few seconds constantly guarantee a well mixed game in every development stage. Reviewing and polishing the game audio through network auditioning and profiling it on any target platform is easy and possible at any time.
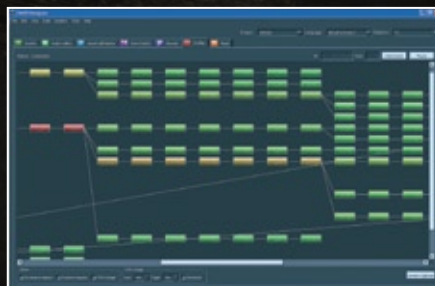
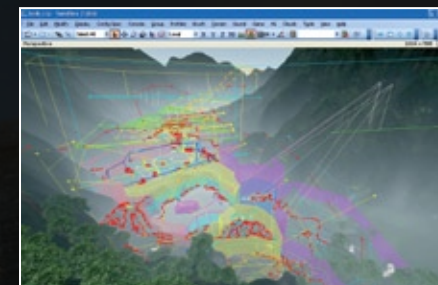*Network audition with runtime profiling*

Dynamic Sounds & Interactive Music

With minimal coding effort sounds can automatically react in a complex manner to parameters like distance, time-of-day, or battle noise using real time DSP effects. This technique provides non-repetitive and responsive audio feedback in an interactive and physicalized game world. The customizable music system reacts to any desired game event in order to give the player an interactive and movie-like emotional experience.
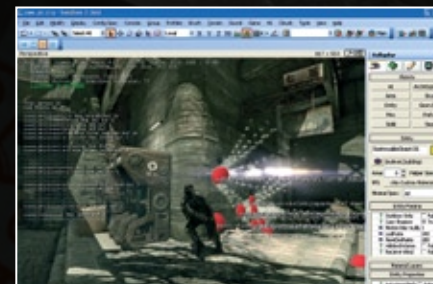
Real time DSP effects for voice processing

Environmental Audio

Sound designers can create a dense sound impression by accurately reproducing sounds from nature, with seamless blending between different environments sweetened with oneshot sounds ontop. New technology allows an ambience sound to be directional in the distance and then to open up into a surround mix the closer the player gets.


Key frame Accurate Sounds in Animations

In CryENGINE®3 sounds can now be triggered by adding them directly onto blended animations to improve implementation of all foley effects, allowing for example, limping characters over several walk cycles. Adding audio assets onto animation attachments increases character individualization efficiently.

Animation-controlled sounds and foley effects

Sound Moods

Audio mixes can be defined to match any gameplay situation. Not only volume and pitch are controllable but also DSP effects like filters and equalizers can be added. In-game the audio mix blends into the predefined sound moods in real-time and mimics the current environmental effect, for example, when driving inside a tank.
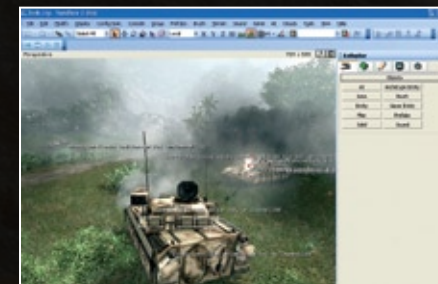
Sound moods change the mix matching the game

CryENGINE® 3
Maximum Support – Delivered to Your Door

Crytek will set the benchmark for engine support, delivering the best experience to developers to match the players' experience of a CryENGINE® 3 game!

Support locations through 2009

Real Developers, Real Support

CryENGINE® 3 support is delivered by a combination of our development, R&D teams and our specialist support team. Our support team is staffed by experienced Crytek game developers, lending their expertise of developing with CryENGINE® 3 Sandbox™ and CryENGINE® to our licensees. Crytek's support team also develops technology and assets for licensees and Crytek's game teams, to ensure direct experience of developing content for the latest features in CryENGINE® 3.

Extensive Training

Initially, licensees are offered the Crytek "Start Up" training week – delivered at the developers' own studio. This training is carried out by a specialist team of all-rounders from Crytek, to accelerate the initial use of the engine and ensure that the development project starts on the right track and prototyping can being rapidly.

A further week of training is offered to licensees at Crytek's HQ in Frankfurt, Germany. Licensees can spend a week at Crytek and literally be trained and work with the individual engineers who built CryENGINE® 3, enabling teams to utilise the full power of the engine at the lowest level.

Local Support

Through 2009 Crytek will establish local support facilities in all the major territories world-wide – US, China, Japan, UK and Korea, in addition to our HQ support centre in Frankfurt, Germany. This will ensure local time-zone and local language support for all our licensees – wherever they are in the world.

Innovative Support Portal

The Crytek Knowledge Network is available to licensees via www.cryengine3.com; and delivers rapid response to all developers' inquiries on using CryENGINE® 3 technology. Through 2009 Crytek will launch a new, innovative support portal, set to change the manner in which online support is delivered for game engine licensing communities.

Extensive Documentation & Tutorials

Crytek are constantly improving the documentation and information to assist developers in making new product on CryENGINE® 3. Now basing our documentation style and structure on proven academic and scientific delivery methods, Crytek will set the benchmark for middleware documentation and training materials. The new documentation will be made available throughout 2009 and will be localised into Korean, Chinese and Japanese.

CRYENGINE® 3

Renderer	Physics	Font
3D Engine	System	Animation
Network	Input	EntitySystem
Sound	Script	AI System

External applications integrated within CryENGINE® 3

| FMOD | Scaleform | Annosoft | CRI |

CryENGINE® 3 Sandbox™

Supported DCC Tools

- Autodesk® 3ds Max®
- Autodesk® Softimage® XSI
- Adobe® Photoshop®

Tools

- Resource Compiler
- CryExport Plugin
- CryTIF Plugin
- Polybump App/Plugin
- Photobump App

CRYENGINE® 3   CRYENGINE® 3

CryENGINE® IMPRESSIONS

Crytek are very proud of our talented modding community, numbering 70,000 modders at www.crymod.com. The following images from members of the community endorse our belief that great tools enable all developers to achieve their vision with CryENGINE® 3.
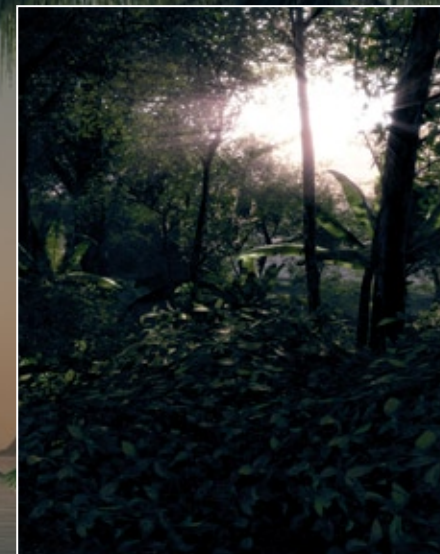
Outstanding Real Time Visuals
in a Video Game 2009
(Crysis Warhead)

Best Graphics
2008
(Crysis Warhead)

Best Graphics
Technology 2008
(Crysis Warhead)

Best PC Game E3
2008
(Crysis)

Best Graphics
2007
(Crysis)

Best Technology
2007
(Crysis)

Technical
Achievement 2007
(Crysis)

Best PC Game
2007
(Crysis)

Best Graphics,
Technical 2007
(Crysis)

Best PC Game E3
2007
(Crysis)

For more information please visit www.cryengine3.com
or contact us at cryengine@crytek.com