INTRINSIC ALCHEMY 2.5 GAMEDEVELOPMENT *AT-A-GLANCE*

Art Tools & Content Path

Designed to assist artists and engineers in the collaborative work involved in integrating models, animations, and art assets into the game program. Artists can view their work in real time, and engineers can extend the Importer Library and the exporter for customized control of game asset creation.

Art Tool Integration

- Alchemy Exporter and Alchemy Insight viewer fully integrated with 3ds max and Maya
- Shader and feature extensions for enhanced artist control
- Automated image resizing and filtering with Photoshop scripting

Exporters

- Direct export for 3ds max and Maya to PlayStation 2, Xbox, GAMECUBE
- Plug-ins for 3ds max 5.0 and Maya 4.5
- Export of 3ds max native skinning, and Character Studio
- Maya real-time inverse kinematics
- Multiple UVs from both 3ds max and Maya
- Alchemy Scriptable Shader GUI for 3ds max (coming soon for Maya)
- Native shader export (bump map, multi-texture, cartoon, shadow, self-shadow)
- Native xref support in 3ds max
- Built-in support for external asset references in 3ds max and Maya

Importer Library

- Built-in support for most popular 3D art elements
- Designed to facilitate development of additional exporters and loaders

Optimization & Tool Pipeline

Our tools provide platform-based asset database optimization and analysis, run-time performance statistics, and memory and event logging and tracking. Easily create or customize optimizations that integrate with the exporter tools. Choose your path to a fast IGB with a pipeline designed to fit your production model. Only Alchemy's tool pipeline is ready to take one asset database and make it perform on all current and next generation console platforms!

Tool Pipeline

- Alchemy Finalizer provides both hierarchical and graph views of scene and performance data while allowing for interactive use of the optimization framework
- Alchemy Optimizer provides batch use of Alchemy's optimization framework and can be automatically connected to Alchemy's export process and configured on a per asset basis
- Alchemy Insight Viewer provides run-time performance and visual effect analysis on all platforms
  - Accurate low-level CPU, VU1, and DMA metrics, including icache/dcache statistics
  - Real-time display of graphics metrics, including triangle counts and state changes
  - Alchemy Event Tracker for both memory and run-time event tracking
- Alchemy Event Viewer preview for visual display and GUI control of memory and event tracking and logging
- Alchemy Animation Producer provides scriptable compilation of animation databases from source animation assets

Optimizer Framework

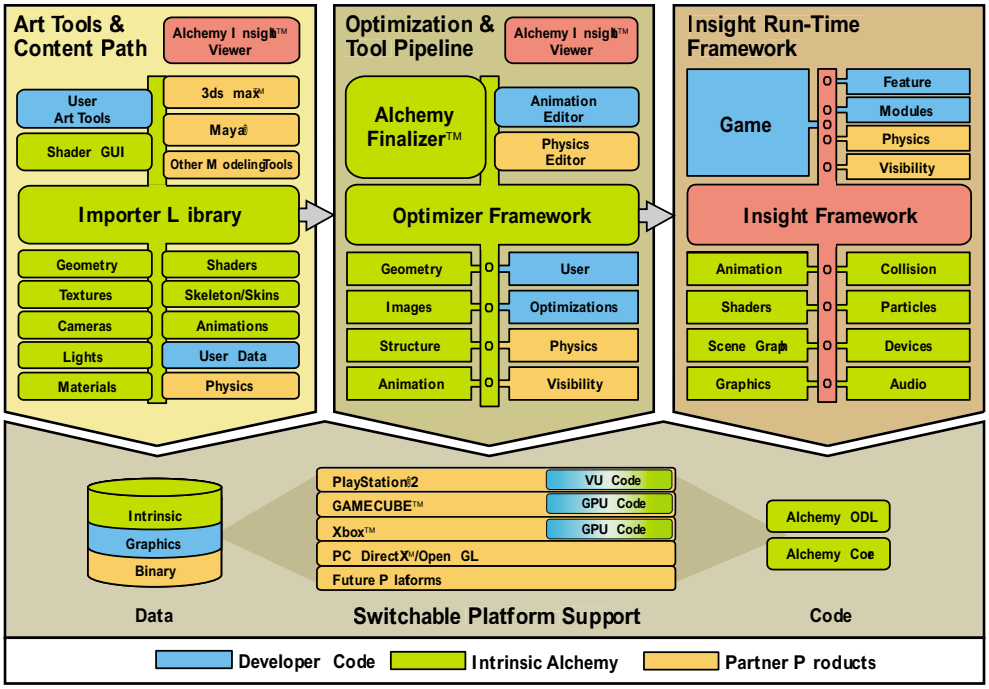
- Compiles data from the generic descriptive database format that comes from Alchemy exporter into a tuned, lean, platform-specific database
- Built-in library of hardware-specific configurable database optimizations—including triangle stripping, static state sorting, graph reorganization, graph compilation, texture format processing, animation optimization
- Exporter integration of all built-in and user-created optimizations
- Extensible framework for customized and user-created optimizations; you can add your own batch processing to Alchemy's optimization framework via a script file

Insight Run-Time Framework

The Alchemy Insight run-time framework is a data-driven architecture that allows orthogonal, data-driven components to be plugged into your game application. This run-time framework allows for simplified use of Alchemy's extensive set of run-time feature APIs.

Insight Plug-in Architecture

- Alchemy Insight supports feature-based plug-ins—physics, visibility, networking, and more
- A feature plug-in consists of feature data structures and feature processing manager(s)
  - Feature data structures are set up offline to facilitate loading speed and data troubleshooting
  - Feature managers register scheduling dependencies with Insight and perform run-time processing
  - Features are truly data driven and can be added or removed from insight trivially
- Messaging system provides centralized communication for all game features, allowing for simplified feature integration and the ability to run the game without all of the features



Alchemy Run-time API

- Scene Graph
  - Multi-pass rendering architecture
  - Flexible sorting for transparency and efficiency
  - Layered above an extensible fine-grained attribute system
  - Advanced features include high-level shaders, animation support, visibility culling, occlusions culling, collision detection, intersection processing, visibility pre-processing, multi-resolution meshes
  - Extensible node types and traversal functions
  - Implementation tuned for each supported platform
  - High performance particle system API
- Shaders
  - New for 2.5: interpreted shader, designed for advanced vertex and pixel shading effects on cutting edge hardware; provides a flexible template for creating your own advanced shader effects
  - Complete integration, from modeling tools to hardware
  - Standard shaders include multi-texture, bump map, cartoon, environment map, hard shadows, reflections, projective texturing, self-shadow
- Animation
  - Flexible skin and bones character animation system
  - Hand-tuned vertex blending on all supported platforms
  - Efficient animation blending with transition specification
  - Full-body and partial animation for multiple skeletons
  - Keyframe optimization and compression
  - Swappable skin components for efficient data use
- Low-level Graphics
  - Polygon
  - Particles
  - Lighting and Materials
  - Image formats: .png, .tga, .bmp, .tif, .gif, .jpg, and .dds
  - CLUT textures
  - Multi-stage, multi-pass texture support
  - High-performance texture manager on PlayStation®2
- Devices
  - Display management: resolution, format, decoration, events
  - Device management: controller, joystick, mouse, keyboard, CD/DVD
- Sound
  - PCM support for PlayStation®2, Xbox and PC
  - Support for Sony .vag files
  - DirectSound support for DirectX®8.1
  - GAMECUBE ARAM memory management

Switchable Platform Support

The Intrinsic Alchemy Core acts as a highly optimized methodology for making one source code and asset database run efficiently and natively on multiple platforms with multiple compilers. Alchemy's core is based on a scalable and efficient reflective object model. For source code, all Alchemy based classes are specified in Alchemy's Object Declaration Language (ODL). Each class specified in ODL is automatically supported in the Intrinsic Graphics Binary (IGB) file format. Each class also has its Alchemy Core integration code automatically generated for each compiler and target platform. The Alchemy Core also provides fundamental multi-program interaction, resource management, and basic operating system services.

Alchemy Core Reflective Object Model

- All Alchemy features are developed as a "customer" to the Alchemy reflective object model
- Create custom objects that are automatically integrated with the entire Alchemy environment—possible only because of Alchemy's ODL specification and code generator
- Replace Alchemy object implementations with your own via Alchemy Core's class proxy system
- Take Alchemy object model updates for future platforms without having to rework custom objects
- Receive free new tools, like the Alchemy Event Tracker for memory analysis, logging, and debugging
- Enjoy the fast IGB binary data format with external references and asynchronous streaming for all native and custom Alchemy-derived classes

Object Declaration Language

- Automatic code generation facility to ease program development and assure consistency of object definition, life cycle, and management
- Allows the underlying object model to be implemented differently on each CPU/compiler combination to exploit unique system and compiler efficiencies
- Enforces real-time performance oriented use of C++ while providing far more run-time extensibility and control than normal C++ class systems

Intrinsic Graphics Binary (IGB) File Format

- Centralized updatable file format implementation with format versioning and compatibility
- Fast Binary File Format—No seeks, programmable sized block reads
- Automatic support for each class native or extended via ODL
- Support for external references and asynchronous streaming
- Optimized reading based on data-types across classes
- Tuned implementation for each platform
- Support for some forms of class versioning

System Services

- Process management, timers, alarms, synchronization, memory management, file access

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