

JAVA 3D™ API

High-Performance, Interactive 3D Graphics



Key Feature Highlights

- Leverages object-oriented programming to ease development of interactive applications
- Takes advantage of existing hardware accelerators to deliver maximum performance
- Built with Java technology, an open standard for network programming
- Enables users to concentrate on content with a high level, scene-graph approach
- Provides access to the latest hardware technology and graphics features
- Utilizes a flexible viewing model, rendering to a range of display devices
- Employs multiprocessing to enhance system performance
- Creates an immersive environment through a wide variety of input devices
- Integrates 3D graphics and sound into real-world applications

Now, developers can easily incorporate high-quality, scalable, platform-independent 3D graphics into Java™ technology-based applications and applets. The Java 3D™ application programming interface (API) provides a set of object-oriented interfaces that support a simple, high-level programming model. This enables developers to build, render, and control the behavior of 3D objects and visual environments. By leveraging the inherent strengths of the Java language, Java 3D technology extends the concept of “Write Once, Run Anywhere™” to 3D graphics applications.

The Java 3D API takes advantage of existing hardware accelerators through low-level APIs such as OpenGL® and Direct3D. This allows applications written using the Java 3D API to run on any platform with a Java virtual machine (JDK™ version 1.2 or higher software) and OpenGL or Direct3D implementation. To accommodate a wide variety of file formats, runtime loaders are supported. The Java 3D API benefits developers in diverse markets including scientific visualization, animation, Web site design, simulations, virtual world construction, training, games, and design automation. As an integral part of the Java™ Media API, the Java 3D API makes it easier for programmers to integrate 2D and 3D graphics, video, audio, and image processing, as well as multimedia and visualization features, in a single application.

Simplifies 3D Graphics Application Development

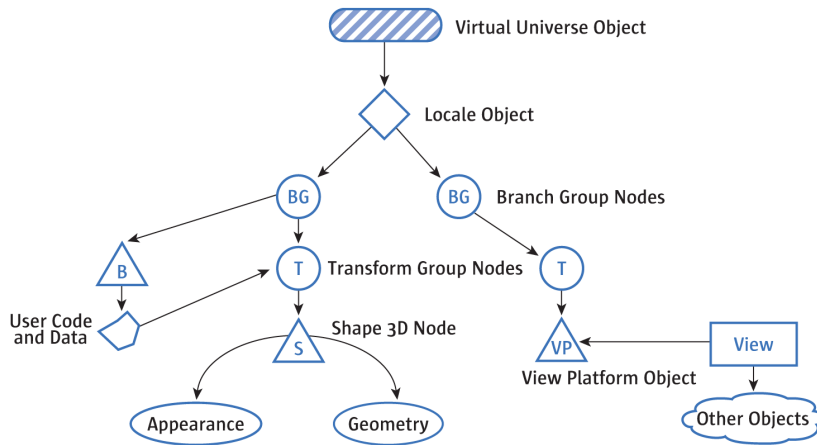
The Java 3D API incorporates a high-level, scene-graph model that helps developers focus on objects and scene composition. This speeds application development, because programmers do not need to design specific geometric shapes or write rendering code for the scene display.

Enables Visualization Over the Network

The Java platform was designed from the ground up as a networkcentric computing environment. It includes a full suite of Java enterprise APIs and technologies, such as the JavaBeans™ component, which enables objects to be exchanged over the network, regardless of the target platform. And Java 3D technology incorporates geometry compression, so very large 3D models can be rapidly downloaded over the network for remote viewing and manipulation, avoiding network bandwidth bottlenecks.

JAVA 3D™ API

Java 3D API Scene-Graph Model



Optimizes Performance

The Java 3D API simplifies the developer’s job by performing time consuming tasks such as scene-graph traversal and attribute state management. It also maximizes performance by tuning and scaling the applications scene graph to the underlying hardware. To further enhance performance, Java 3D technology provides three rendering modes:

- Immediate
- Retained
- Compiled-retained

Because implementations of the Java 3D API are layered to take advantage of the most appropriate rendering API, they can deliver native graphics acceleration on the OpenGL and Direct3D

platforms. By exploiting advanced features such as execution and view-frustum culling, along with multithreading, the Java 3D API delivers the high level of performance required to visualize and manipulate large 3D models.

Features

- The flexible viewing model utilizes a broad range of display devices including flat-screen, head-mounted, and stereo displays as well as caves and portals — without modifying the application
- Integrated 3D graphics and sound create a more exciting viewer experience
- Multiple levels of detail enable viewers to increase the resolution of near objects, improving application performance

- Support for continuous action devices, such as trackers used in immersive caves and portals, enhances the interaction of Java 3D applications
- Based on open standards, the Java 3D API specification was developed with input from leading technology vendors

Competitive Advantage

Because the Java 3D API is written for the Java platform, developers can freely mix it with other Java APIs in a single application. The easy-to-use Java language increases the productivity of programming staff. This reduces time to market, which — when combined with the advanced feature set of the Java 3D API — delivers a significant competitive advantage.

For More Information

To learn more about the Java 3D API, please visit our Web site at java.sun.com/products/java-media/3D.

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