



NVIDIA®

NVIDIA Scene Graph (NVSG) 2.1

The NVIDIA® Scene Graph (NVSG) Software Development Kit is an object-oriented programming library for creating scene graph-based applications. NVSG 2.1 provides a comprehensive set of C++ classes that developers can easily combine and extend to create fast and reliable graphics applications. These classes constitute a hierarchy of objects that can be used to represent three-dimensional geometries—their size, position, and orientation, and their visual appearance.

NVSG is available free to NVIDIA developers at <http://developer.nvidia.com>.

What Is a Scene Graph?

Basically, a scene graph is a reusable, hierarchical data structure that describes the objects in a 3D scene—their size, position, orientation, visible properties, and relationships with one another. Scene graphs can be used to display virtual scenes for a variety of purposes, including game engines, computer-aided design (CAD), scientific and commercial visualization, training, simulation, and modeling.

NVSG is not a complete application engine—it is a component of such products. NVSG focuses on representing the 3D scene and enabling its efficient rendering. Other components of the engine, such as physics models, are not included. Since different customers have different requirements, this gives you maximum flexibility in customizing your engine to meet the specific needs of your application.

Why Use NVSG?

Performance. NVSG maximizes the performance of your NVIDIA graphics hardware by reducing the amount of data and by grouping related data sets. NVSG's hierarchical structure allows the culling of objects and their

related data not needed for rendering the scene. And it allows data to be sorted so that related objects are rendered at the same time.

Productivity. NVSG manages the graphics hardware for your application, reducing the amount of OpenGL programming required.

Portability. NVSG handles the lower-level tasks of rendering and transferring data, so porting your application to another platform can be as simple as recompiling the code.

Scalability. NVSG is designed to work seamlessly with complex hardware configurations, such as graphics clusters or NVIDIA SLI™ technology (multi-GPU architecture). This lets you focus on developing your application, while NVSG takes care of the hardware interface.

Shading. NVSG takes advantage of modern GPU shading by fully integrating Cg/CgFX, abstracting the low-level work required to organize and deliver the shader data to the GPU.





Technology Features

Superb Image Quality

- C++ scene graph API
- High performance
- Optimized memory management
- Scalable with SLI
- Cluster-aware
- Frame-based animation supported:
 - Camera animation
 - Skin/bone animation
 - Object animation
- Easy to use and extend
- Full shader support for the latest GPUs via CgFX 1.4
- Vertex array, display list, and VBO support
- Both frustum and occlusion culling supported
- Tree optimizer
- Orthographic camera and Perspective camera support
- Multiple camera manipulators:
 - Trackball manipulator
 - Flight manipulator
 - Walk manipulator
 - Animation manipulator
- Multipass antialiasing (MPAA): seamless integration of Software FSAA with Hardware FSAA
- Shadow support (shadow maps)
- Level of detail (LOD) handling

- Stereo support
- Picking/selecting (ray intersection)
- Tree searching
- Multipass rendering:
 - Shader-level (multipass effects)
 - Geometry-level
 - Scene-level
- Multithreading safe (object and tree locking with single writer/multiple readers)
- Asymmetric and overlapping viewing frusti for clusters
- Multiple file format support:
 - NBF (import/export)
 - NVSG (import/export)
 - VRML/WRL (import only)
 - NVB (import only)
 - ...others via plug-in
- Multiple texture format support:
 - BMP
 - DDS
 - JPG
 - GIF
 - HDR-HDRI Vertical Cross
 - OpenEXR
 - PNG
 - RGB
 - TGA
 - TIF
 - ...others via plug-in

- Multiple Platform Support
 - Windows 2000/XP 32-bit
 - Windows XP x86_64 64-bit
 - Linux 32-bit
 - Linux x86_64 64-bit
 - Fourth-generation graphics board (such as NVIDIA Quadro®)



nVIDIA

NVIDIA Corporation | 2701 San Tomas Expressway | Santa Clara, CA 95050 | T 408.486.2000 | F 408.486.2200 | www.nvidia.com

© 2005 NVIDIA Corporation. NVIDIA, the NVIDIA logo, NVIDIA Quadro, NVIDIA Scene Graph, SLI, and NVSG are trademarks and/or registered trademarks of NVIDIA Corporation in the United States and other countries. Image courtesy Real Time Technology. All rights reserved. All company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. Features, pricing, availability, and specifications are subject to change without notice.