

Scalability

Equalizer is a framework to develop parallel OpenGL applications. This approach delivers optimal performance, in contrast to other solutions operating on the OpenGL command stream.

Equalizer provides a comprehensive set of algorithms to parallelize the rendering of large data sets. Multiple graphics cards, processor cores and computers can be combined to render a single view. Equalizer distributes the rendering task across the available resources (decomposition) and assembles the results on the final view (recomposition).

Equalizer supports task decomposition using sort-first (2D), sort-last (DB), pixel and stereo compounds.

www.equalizergraphics.com
info@equalizergraphics.com



Equalizer is a product of Eyescale Software GmbH.

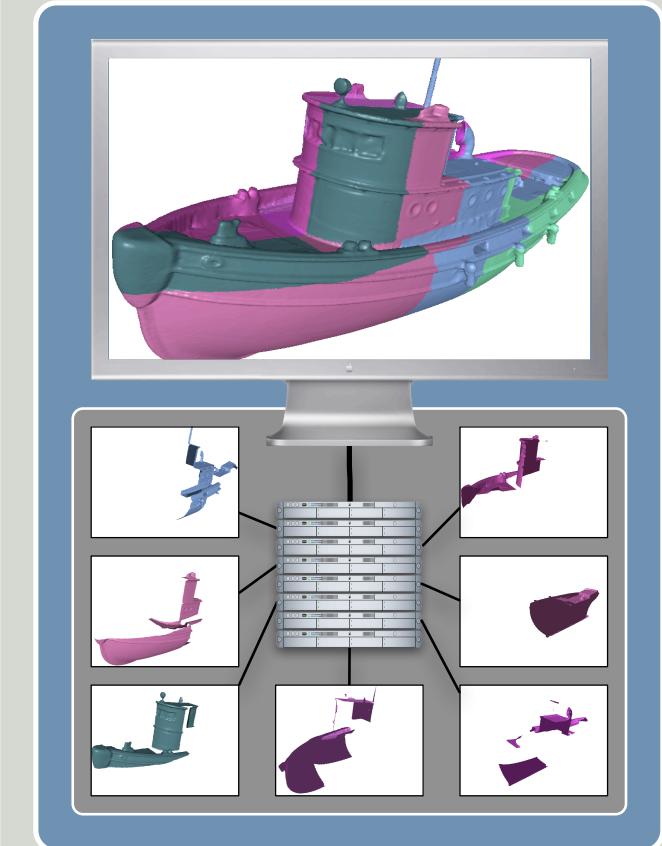
www.eyescale.ch
info@eyescale.ch

Contributors:

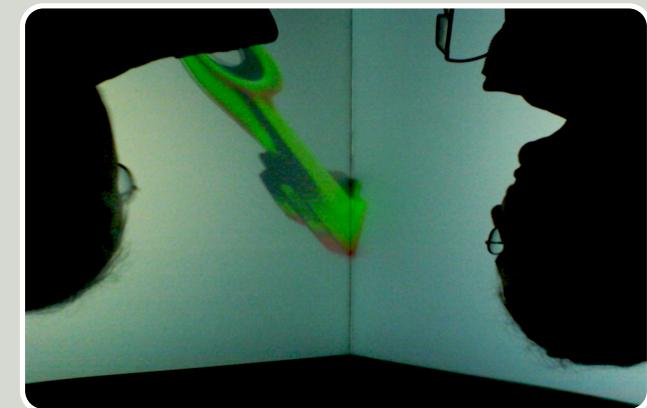


Equalizer

Parallel Rendering



Equalizer is an open source project providing a minimally invasive programming interface and resource management system for parallel, scalable OpenGL® applications. It allows an application to run unmodified on any visualization system, from a simple workstation to large scale graphics clusters and multi-GPU workstations. Consulting and support is available from Eyescale Software GmbH.



The developer amends these entities by implementing application porting by providing a default implementation for each task, which implements the typical use case.

The developer facilitates application-specific task methods. Equalizer facilitates application porting by providing a default implementation for each task, which implements the typical use case.

- **Channel** - a viewport within a window

- **Window** - an OpenGL drawable

- **Pipe** - a graphics card and rendering thread

- **Node** - a single computer in the cluster

Equalizer provides a minimally invasive programming interface. Most of the application is unmodified, only the rendering framework is modularized and plugged into the Equalizer framework. For this task, common graphic entities are abstracted by C++ classes, for example:

Parallel Programming Interface

A display wall running an Equalizer-based terrain rendering application



Major Features

Runtime Configurability: An Equalizer application can run on any configuration clusters, from laptops to large scale visualization clusters, without recompilation. The application is configurable flexibly at runtime using an external configuration file.

Scalable GPU Workstations: Multi-GPU workstations are an affordable way to potentially render more data faster. View across multiple graphics cards, processors and scale the rendering performance and display size.

Scalable Rendering: Parallelizes the rendering of a potentially complex scene to render more data faster.

Virtual Reality Installations: Use passive or active stereo rendering with head tracking, both supported by Equalizer.

Display Walls: One of the common uses for visualizations is rendering code is executed locally on a node for each display.

Display Clusters: Typically one instance of the application runs on many different ways without any modification, for example:

The Equalizer framework abstracts the runtime configuration from the application code. This allows an application to be deployed in many different ways without any modification, for example:

Use Cases

Support for Immersive Environments: Equalizer supports both active and passive stereo rendering, as well as head tracking, which is required for Virtual Reality installations.

Distributed Execution: Equalizer applications can be written to support cluster-based execution. The task of distributing the application data is facilitated by the support for versioned, distributed objects.

Single-View Multiple Displays: A single render of multiple GPUs, GPUs and computers to scale the rendering performance and visual quality of a single or multiple views.

Runtime Scalability: An Equalizer application can use multiple CPUs, GPUs and computers to scale the rendering performance and visual quality of a single or multiple views.

Fast Path for Scalable OpenGL Applications: Equalizer provides the natural parallel execution model to exploit the parallelism of multi-core, multi-GPU workstations and graphic clusters.

Parallel Rendering Know-How: Equalizer contains 10+ years of experience in parallel scalable rendering, easily integrated in your application.

Major Benefits

Open standard for parallel rendering

GPL license: commercial and open source use

Clusters and Multi-GPU workstations

Minimally invasive: easy porting

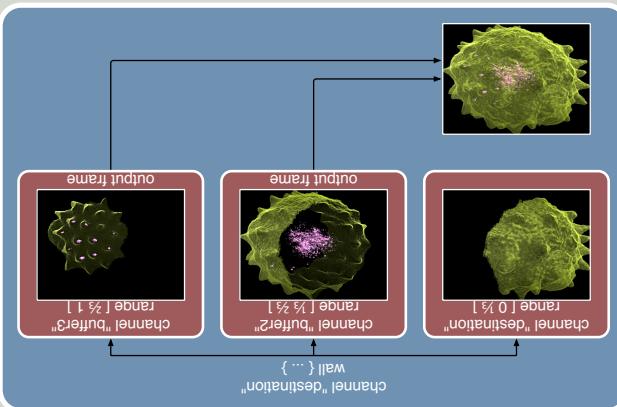
Portable: 32 and 64 bit, little- and big-endian

Interconnects: Ethernet, InfiniBand

OS Support: Linux, Windows XP and Mac OS X

Compatibility

Data base decomposition applied to volume rendering using three graphics cards



The configuration flexibility allows to deploy Equalizer applications in many, often unforeseen environments.

Development environment supports both active and passive stereo rendering, as well as head tracking, which is required for Virtual Reality installations.

Feature-Rich Framework: Equalizer contains state-of-the-art scalable rendering algorithms, and its open

Fast Path for Scalable OpenGL Applications: Equalizer provides the natural parallel execution model to exploit the parallelism of multi-core, multi-

GPU workstations and graphic clusters.

Parallel Rendering Know-How: Equalizer contains 10+ years of experience in parallel scalable rendering, easily integrated in your application.

Major Benefits