



# OpenGL ES 2.0 Emulator Release Note

**Version 1.1**

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## **Abstract**

*This document contains notes relating to EAC release of OpenGL ES 2.0 Emulator version 1.1 supplied by ARM.*

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General suggestion for additions and improvements are also welcome.

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# 1 PREFACE

This document contains general release information about the OpenGL ES 2.0 Emulator version 1.1 deliverables and covers the following topics:

- Deliverables summary
- Details of external tools required
- Build instructions
- Changes and fixes in this release
- Known issues

## 1.1 Intended Audience

This document is written for developers who wish to use the OpenGL ES 2.0 Emulator to develop and run OpenGL ES 2.0 content on a PC. It assumes the reader is familiar with basic development tools such as MS Visual Studio and GNU GCC/GNU *make*.

## 1.2 References

This document refers to the following documents:

<i>Ref.</i>	<i>Document Number</i>	<i>Author(s)</i>	<i>Title</i>
[1]	PR389-PRDC-011100	ARM Limited	OpenGL ES 2.0 Emulator Errata
[2]	ARM DUI 05011A	ARM Limited	OpenGL ES 2.0 Emulator User Guide

## 1.3 Change Control

<b>Issue</b>	<b>Date</b>	<b>Change</b>
1.0	Aug 2008	Release note for EAC release of OpenGL ES 2.0 Emulator version 1.0
1.1	Sep 2009	Release note for EAC release of OpenGL ES 2.0 Emulator version 1.1

## 1.4 Glossary

The following terms are used in this document.

<b>TERM</b>	<b>MEANING</b>
RHEL	Red Hat Enterprise Linux
GCC	GNU Compiler Collection

## 2 PRODUCT DELIVERABLES

### 2.1 Files

The OpenGL ES 2.0 Emulator version 1.1 deliverables include the following:

<b>Deliverable Part Name</b>	<b>Description</b>
OpenGL_ES_2_0_Emulator_WinXP_v1.1.exe	Windows Installer for OpenGL ES 2.0 Emulator
OpenGL_ES_2_0_Emulator_RHEL4_v1.1.tgz	Linux Installer for OpenGL ES 2.0 Emulator
OpenGL_ES_2_0_Emulator_User_Guide.pdf	User Guide for OpenGL ES 2.0 Emulator
OpenGL_ES_2_0_Emulator_Release_Note.pdf	Release Note for OpenGL ES 2.0 Emulator
OpenGL_ES_2_0_Emulator_Errata.pdf	Errata for OpenGL ES 2.0 Emulator

**Table 1: Deliverables included in OpenGL ES 2.0 Emulator v1.1 EAC release**

## 3 DOCUMENTATION

Documents are supplied as “Adobe PDF” (Portable Document Format) files. These files are readable on most common computer platforms and operating systems using an appropriate file reader. A suitable file reader can be downloaded from the Adobe website at <http://www.adobe.com/>. Select “Acrobat” and download the reader for your computer platform/operating system.

### 3.1 OpenGL ES 2.0 Emulator Release Note

This document contains general release information about the OpenGL ES 2.0 Emulator version 1.1 product.

### 3.2 OpenGL ES 2.0 Emulator Errata

This document describes the errata discovered in the OpenGL ES 2.0 Emulator version 1.1 product, categorized by level of severity. Each description includes:

- where the implementation deviates from the specification
- the conditions under which erroneous behavior occurs
- the implications of the erratum with respect to typical applications
- the application and limitations of a work-around where possible

### 3.3 OpenGL ES 2.0 Emulator User Guide

This document provides information on how to install and use the OpenGL ES 2.0 Emulator version 1.1 product.

## 4 REQUIRED TOOLS

The OpenGL ES 2.0 Emulator has been tested on the platforms listed below. ARM recommends these platforms but the OpenGL ES 2.0 Emulator might also work with other graphics cards provided the drivers for the graphics card support OpenGL2.x with appropriate extensions. For a Linux platform, the drivers must also support GLX 1.4. Updating the drivers to the latest available version is a good idea.

### 4.1 Windows platform

- x86 PC with Microsoft® Windows XP™ Professional Service Pack 2
- Nvidia 8600 GT graphics card with driver version 169.21
- ATI Radeon HD 2600 Pro graphics card with driver version 8.3

### 4.2 Linux platform

- x86 PC with Red Hat Enterprise Linux release 4, revision 2.6.9-55.ELsmp
- Nvidia GeForce 8400 GS graphics card with driver version 180.44

ARM recommends RHEL 4 but the OpenGL ES 2.0 Emulator might also work with other flavors of Linux.

### 4.3 Tools Requirements

#### 4.3.1 Windows platform

In order to build OpenGL ES 2.0 applications for Windows using the OpenGL ES 2.0 Emulator, the following tool is recommended:

- Microsoft Visual Studio 2005

#### 4.3.2 Linux platform

In order to build OpenGL ES 2.0 applications for Linux using the OpenGL ES 2.0 Emulator, the following tools are recommended:

- GCC version 3.4.6
- GNU *make* version 3.80 or above

The build system for the example application is designed to work with GNU *make*. It has been run and tested on a Linux platform with GNU *make* 3.80. Versions equal to or greater than this should work correctly.

## 5 INSTALLATION

### 5.1 Installation Procedure

#### 5.1.1 Windows Installer

Download the Windows installer for OpenGL ES 2.0 Emulator (Part: OpenGL\_ES\_2\_0\_Emulator\_WinXP\_v1.1.exe). Refer to *OpenGL ES 2.0 Emulator User Guide* [2] for installation instructions.

#### 5.1.2 Linux Installer

Download the Linux installer for OpenGL ES 2.0 Emulator (Part: OpenGL\_ES\_2\_0\_Emulator\_RHEL4\_v1.1.tgz). Relocate the downloaded bundle to an appropriate location. Unpack the bundle using the following command:

```
# tar -xvzf OpenGL_ES_2_0_Emulator_RHEL4_v1.1.tgz
```

**Note** GNU *tar* version 1.16 or later should be used to untar the deliverables as many versions of *tar* have problems dealing with very long path names. To find the version of *tar* being used type `tar --version`.

The unpacked bundle directory will be

ARM/Mali\_Developer\_Tools/OpenGL\_ES\_2\_0\_Emulator\_RHEL4\_v1.1

It contains the following directories:

`bin`

This directory contains the OpenGL ES 2.0 Emulator libraries.

`example`

This directory contains an example application that can be run on the OpenGL ES 2.0 Emulator.

`include`

This directory is a placeholder for Khronos header files.

Refer to *OpenGL ES 2.0 Emulator User Guide* [2] for installation instructions.

## 6 BUILDING

This is a binary release. Build instructions for the example applications are documented in *OpenGL ES 2.0 Emulator User Guide* [2].

## 7 TESTING

The OpenGL ES 2.0 Emulator has been tested using the Khronos OpenGL ES 2.0 Conformance Tests. The conformance tests pass with some limited failures due to dependence on system components outside of the OpenGL ES 2.0 Emulator product. Limitations specific to graphics cards on the test platforms are listed in *OpenGL ES 2.0 Emulator User Guide* [2].

## 8 DIFFERENCES FROM PREVIOUS RELEASE

Notable changes since the last release include:

- Added Linux version of the OpenGL ES 2.0 Emulator. This did not exist earlier.

## 9 KNOWN ISSUES AND LIMITATIONS

Issues related to this release are documented in *OpenGL ES 2.0 Emulator Errata* [1](see section 3.2).

In addition to the errata, there are some general limitations that may not be obvious and which deserve mention. Such limitations are described in the *OpenGL ES 2.0 Emulator User Guide* [2].

Please contact [malidevelopers@arm.com](mailto:malidevelopers@arm.com) regarding any issues with the installation and content of this release.

## 10 GLEE GL EASY EXTENSION LIBRARY

The OpenGL ES 2.0 Emulator, Windows version, makes use of GLEE. The notice below is reproduced in accordance with the redistribution conditions of GLEE in binary form.

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GLee

GL Easy Extension Library

Version 5.21

By Ben Woodhouse

<http://elf-stone.com>

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