



# Mali OpenGL ES 2.0 SDK for Linux on ARM 1.0.0 Release Note

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## Abstract

This document contains notes relating to the version 1.0.0 of the Mali OpenGL ES 2.0 SDK for Linux on ARM. This release is an EAC quality release.

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- A concise explanation of your comments.

General suggestion for additions and improvements are also welcome.

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# 1 PREFACE

This document contains general release information about the Mali OpenGL ES 2.0 SDK for Linux on ARM 1.0.0 EAC deliverables and covers the following topics:

- Deliverables summary.
- Details of external tools required.
- Build instructions.
- Known issues.

## 2 PRODUCT DELIVERABLES

### 2.1 Parts

#### 2.1.1 Windows

The Windows release of Mali OpenGL ES 2.0 SDK for Linux on ARM is made available via a Microsoft Installer Package,

```
Mali_OpenGL_ES_2_0_SDK_for_Linux_on_ARM_vm.vn.vp.vr_Win32.msi
```

Where `vm` is the major version number, `vn` is the minor version number, `vp` is a patch level and `vr` is the build number of the package.

#### 2.1.2 Linux

The Linux release of Mali OpenGL ES 2.0 SDK for Linux on ARM is made available via a gzipped tar archive,

```
Mali_OpenGL_ES_2_0_SDK_for_Linux_on_ARM_vm.vn.vp.vr_Linux.tar.gz
```

Where `vm` is the major version number, `vn` is the minor version number, `vp` is a patch level and `vr` is the build number of the package.

## 3 DOCUMENTATION

Additional documentation for the Mali OpenGL ES 2.0 SDK for Linux on ARM is available from <http://www.malideveloper.com/>. This documentation comprises:

### 3.1 Mali OpenGL ES 2.0 SDK for Linux on ARM Errata

Document Number: PR538-PRDC-012975

This document describes the errata discovered in the implementation of the Mali OpenGL ES 2.0 SDK for Linux on ARM, categorised by level of severity. Each description includes:

- a description of where the implementation deviates from the specification,
- the conditions under which erroneous behaviour occurs,
- the implications of the erratum with respect to typical applications,
- the application and limitations of a work-around where possible,
- the status of corrective action.

### 3.2 Mali OpenGL ES 2.0 SDK for Linux on ARM User Guide

Document Number: ARM DUI 0607A

The integration guide provides user information for the Mali OpenGL ES 2.0 SDK for Linux on ARM. It describes how to install and operate the Mali OpenGL ES 2.0 SDK for Linux on ARM.

### 3.3 Release Note

This document contains general release information about the Mali OpenGL ES 2.0 SDK for Linux on ARM product.

## 4 REFERENCE PLATFORM

ARM Limited recommends the use of the same platforms that were used to develop and test the Mali OpenGL ES 2.0 SDK for Linux on ARM. This section lists the additional hardware and software that is required.

The Mali OpenGL ES 2.0 SDK for Linux on ARM is capable of running some sample applications with the OpenGL ES Emulator software. For more information on this, see the OpenGL ES Emulator Release Note and the OpenGL ES Emulator User Guide, available from <http://www.malideveloper.com/>.

### 4.1 The reference platforms

#### 4.1.1 Development platform

The development reference platform for the Mali OpenGL ES 2.0 SDK for Linux on ARM is an x86 PC running Microsoft Windows XP SP3 or Ubuntu 10.04 LTS. An NVIDIA GeForce 210 graphics card using driver version 197.45 (Windows) and 195.36.15 (Linux) is recommended in order to run the sample applications with OpenGL ES Emulator.

#### 4.1.2 Target platform

The target reference platform for running the sample applications on Linux running on an ARM device (with a Mali GPU) is the Telechips TCC8900 development board. More information about this platform is available from <http://www.malideveloper.com/>.

### 4.2 Installing the system on the reference platform

To install the SDK on the reference platform, the following are required:

- For Windows, an up to date version of Windows Installer is needed. This should be kept up-to-date by your operating system and separate installation is highly unlikely to be necessary.
- For Linux, a version of GNU tar 1.13 or greater is required.

## 5 INSTALLATION

### 5.1 Installation Procedure

On Windows, installation is achieved via the Windows Installer mechanism. Run the installer package and follow the on-screen instructions. On Linux, installation is performed via extracting the gzipped tarball to a location on disk.

For complete installation information on both platforms, consult the Mali OpenGL ES 2.0 SDK for Linux on ARM User Guide.

### 5.2 Directory Structure

By default, the Mali OpenGL ES 2.0 SDK for Linux on ARM will install the following files:

- Sample applications (sources and assets).
- Development libraries and header files.
- OpenGL ES Emulator libraries.
- CMake project files.
- Visual Studio project files (Windows only).
- Scripts to build the example applications.

For a complete list of the installed components, consult the Mali OpenGL ES 2.0 SDK for Linux on ARM User Guide.

## 6 BUILDING SAMPLE APPLICATIONS

### 6.1 Required Tools

To build sample applications of the Mali OpenGL ES 2.0 SDK for Linux on ARM on a desktop platform the following tools are required:

<i>Development platform</i>	<i>Target platform</i>	<i>Build system</i>
<b>Microsoft Windows</b>	<b>ARM Linux device</b>	<b>Visual Studio 2008 Command Prompt (through batch script)</b>
<ul style="list-style-type: none"> <li>• CMake v2.8.5.</li> <li>• GNU Toolchain for ARM Processors (Sourcery CodeBench Lite Edition for ARM).</li> <li>• Microsoft Visual Studio 2008 command prompt tools (NMake).</li> </ul> Build with: <code>build-arm-linux.bat</code>		
<b>Linux desktop</b>	<b>ARM Linux device</b>	<b>Command-line (through shell script)</b>
<ul style="list-style-type: none"> <li>• CMake v2.8.5.</li> <li>• GNU Toolchain for ARM Processors (Sourcery CodeBench Lite Edition for ARM).</li> <li>• GNU make version 3.80 or later.</li> </ul> Build with: <code>bash build-arm-linux.sh</code>		
<b>Microsoft Windows</b>	<b>Microsoft Windows (with OpenGL ES Emulator 1.3.0)</b>	<b>Visual Studio 2008 Command Prompt</b>
<ul style="list-style-type: none"> <li>• CMake v2.8.5.</li> <li>• Microsoft Visual Studio 2008 command prompt tools (NMake).</li> <li>• OpenGL ES Emulator 1.3.0 libraries.</li> </ul> Build with: <code>build-x86-win32.bat</code> from Visual Studio 2008 Command Prompt.		
<b>Linux desktop</b>	<b>Linux desktop (with OpenGL ES Emulator 1.3.0)</b>	<b>Command-line (through shell script)</b>
<ul style="list-style-type: none"> <li>• CMake v2.8.5.</li> <li>• GCC version 4.1.3 and GNU make version 3.80 or later.</li> <li>• OpenGL ES Emulator 1.3.0 libraries.</li> </ul> Build with: <code>bash build-x86-linux.sh</code>		
<b>Microsoft Windows</b>	<b>Microsoft Windows (with OpenGL ES Emulator 1.3.0)</b>	<b>Microsoft Visual Studio</b>
<ul style="list-style-type: none"> <li>• Microsoft Visual Studio 2008 or higher.</li> <li>• OpenGL ES Emulator 1.3.0 libraries.</li> </ul>		

<i>Development platform</i>	<i>Target platform</i>	<i>Build system</i>
<b>Microsoft Windows</b>	<b>Microsoft Windows (with OpenGL ES Emulator 1.3.0)</b>	<b>Eclipse CDT</b>
<ul style="list-style-type: none"> <li>• Eclipse CDT (C/C++ Development Tooling) 3.7.0 or higher.</li> <li>• CMake v2.8.5.</li> <li>• Cygwin 1.7 or later with GCC version 4.1.3 and GNU make version 3.80 or later.</li> <li>• OpenGL ES Emulator 1.3.0 libraries.</li> </ul>		
<b>Microsoft Windows</b>	<b>ARM Linux device</b>	<b>Eclipse CDT</b>
<ul style="list-style-type: none"> <li>• Eclipse CDT (C/C++ Development Tooling) 3.7.0 or higher.</li> <li>• CMake v2.8.5.</li> <li>• Cygwin 1.7 or later GNU make version 3.80 or later.</li> <li>• GNU Toolchain for ARM Processors (Sourcery CodeBench Lite Edition for ARM).</li> </ul>		
<b>Linux desktop</b>	<b>Linux desktop (with OpenGL ES Emulator 1.3.0)</b>	<b>Eclipse CDT</b>
<ul style="list-style-type: none"> <li>• Eclipse CDT (C/C++ Development Tooling) 3.7.0 or higher.</li> <li>• CMake v2.8.5.</li> <li>• GCC version 4.1.3 and GNU make version 3.80 or later.</li> <li>• OpenGL ES Emulator 1.3.0 libraries.</li> </ul>		
<b>Linux desktop</b>	<b>ARM Linux device</b>	<b>Eclipse CDT</b>
<ul style="list-style-type: none"> <li>• Eclipse CDT (C/C++ Development Tooling) 3.7.0 or higher.</li> <li>• CMake v2.8.5.</li> <li>• GNU make version 3.80 or later.</li> <li>• GNU Toolchain for ARM Processors (Sourcery CodeBench Lite Edition for ARM).</li> </ul>		

For information about building sample applications on your platform consult the Mali OpenGL ES 2.0 SDK for Linux on ARM User Guide.

## KNOWN ISSUES AND LIMITATIONS

### 6.2 Known Issues

The known issues affecting the Mali OpenGL ES 2.0 SDK for Linux on ARM are documented in the Mali OpenGL ES 2.0 SDK for Linux on ARM Errata document, available from <http://www.malideveloper.com>.

Any issues found subsequent to this release of the Mali OpenGL ES 2.0 SDK for Linux on ARM will be documented in new versions of the errata document.

### 6.3 Support

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

It should be noted that Support of the product will only be provided by ARM if such support is covered by a current contract with the recipient.

## 7 APPENDIX A: GLEE LIBRARY LICENSE

The OpenGL ES Emulator, which is included in the OpenGL ES SDK for Linux on ARM, Windows version, makes use of GLEE. The notice below is reproduced in accordance with the redistribution conditions of GLEE in binary form.

```
GLee
GL Easy Extension Library
Version 5.21
```

```
By Ben Woodhouse
http://elf-stone.com
```

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