Get started with Graphics Analyzer

Version 1.0

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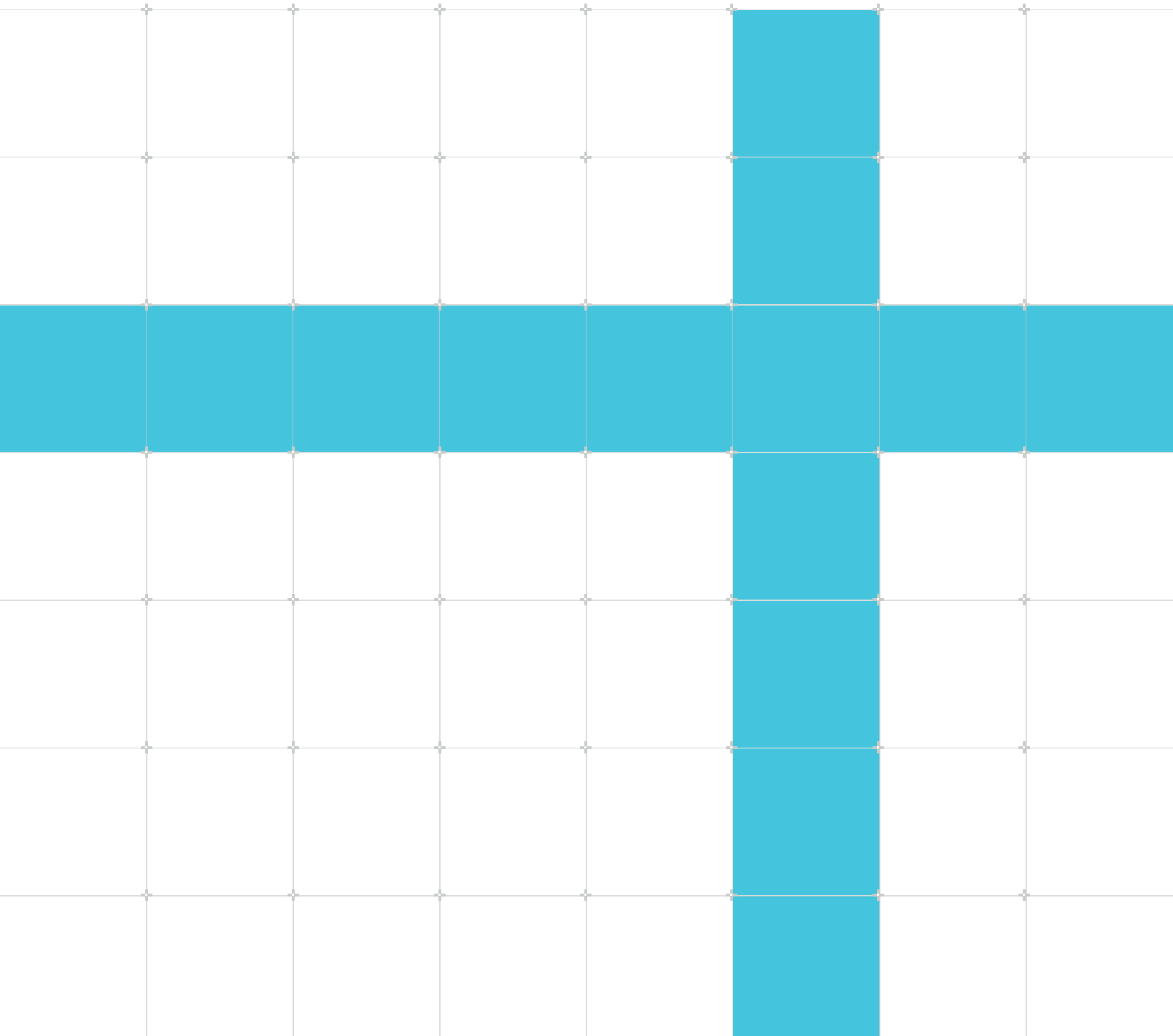

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Release information

Document history

Issue	Date	Confidentiality	Change
0100-00	1 January 2021	Non-Confidential	Initial release

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Contents

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1. Overview

This tutorial describes how to use Arm Graphics Analyzer to capture a graphics trace of a debuggable application running on an Android device with a Mali GPU.

You can also watch a video of this tutorial: Android graphics tracing with Graphics Analyzer on YouTube

Before you begin

On your host machine:

1. Download and install the Arm Mobile Studio package appropriate to your host platform (Windows, Linux, or macOS).
2. Install Android Debug Bridge (ADB). ADB is available with the Android SDK platform tools.
3. Edit your `PATH` environment variable to add the path to the Android SDK platform tools directory.

You can also set the path to Android Debug Bridge in Graphics Analyzer. Select Edit > Preferences and select Browse in the Path to ADB field to locate the `adb` executable.

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2. Configure your device

Set up the device on which yoiu wamnt to run the analysis.

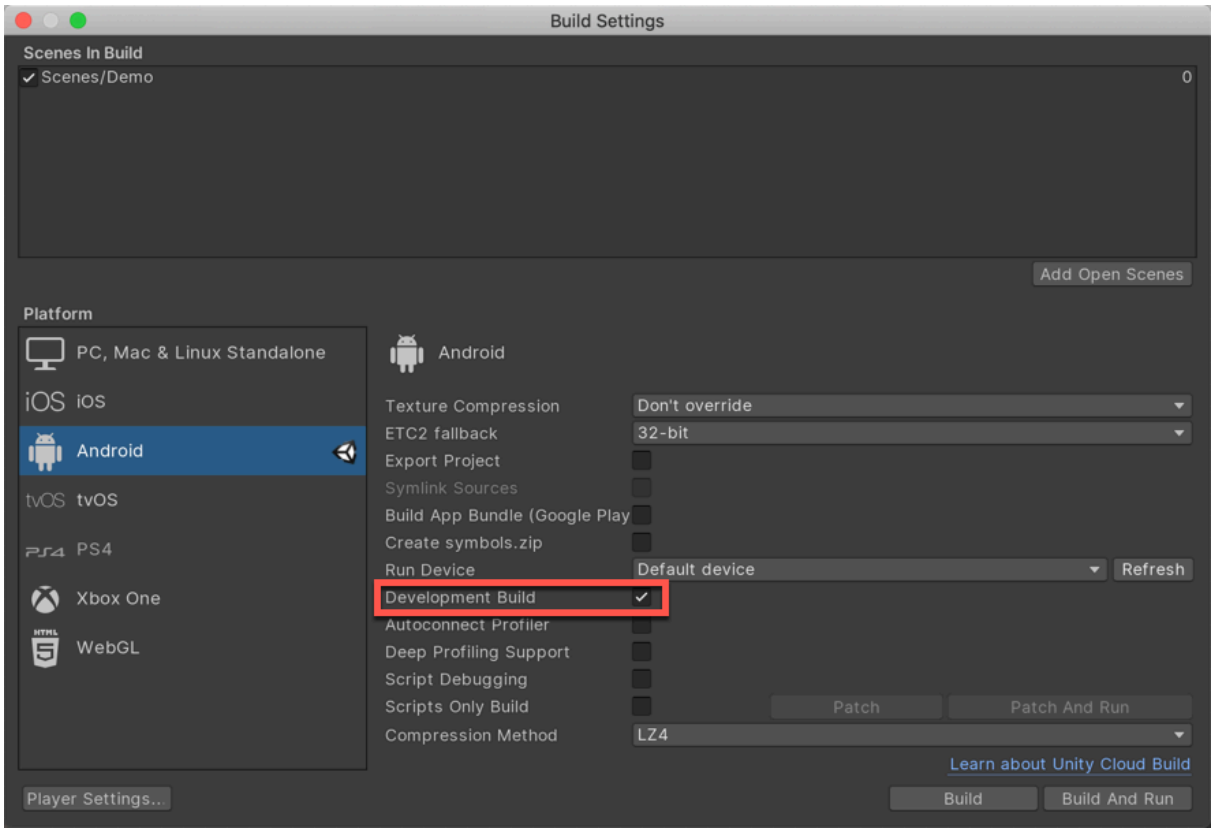
Procedure

1. Ensure Developer Mode is enabled, then enable USB Debugging using Settings > Developer options.
2. Connect the device to your host machine. To test the connection, run the `adb devices` command in a terminal window on the host, which should return the ID of your device.

```
adb devices
List of devices attached
ce12345abcdf1a1234       device
```

   If `adb devices` does not work, check that you have installed Android Debug Bridge correctly, see Before you begin.
3. The device must be able to use TCP/IP on port 5002 to communicate with the host. Make sure that this port is not in use. The application you want to trace must be debuggable. For example, in Unity applications, select the Development Build checkbox in the Build Settings when you build your application.

Figure 2-1: Build settings dialog with Development Build checkbox selected and highlighted



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3. Capture a trace

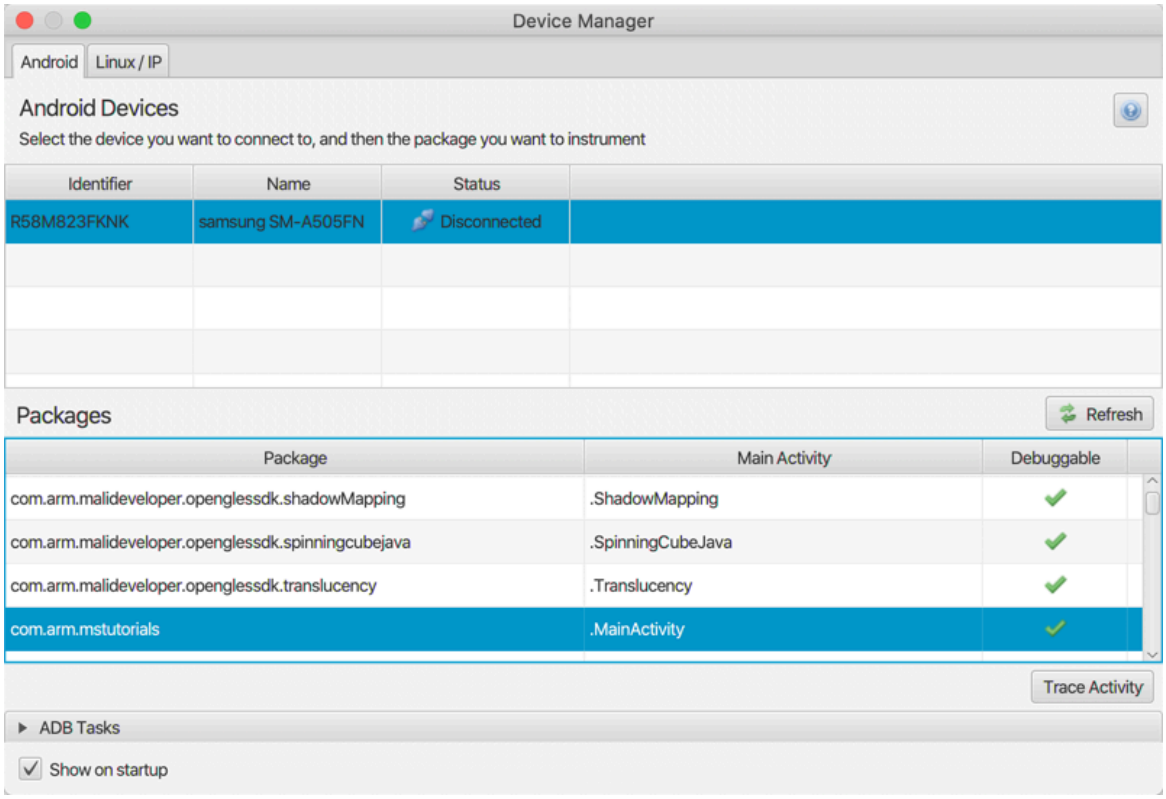
Connect to your device and start the capture in Graphics Analyzer.

1. Launch Graphics Analyzer:
   - On Windows, open the Windows Start menu, navigate to the Arm Mobile Studio folder, and select the Graphics Analyzer shortcut.
   - On macOS, use Spotlight to search for Graphics Analyzer or go to the `<install_directory>/graphics_analyzer/gui` folder, and double-click the `Graphics Analyzer.app` file.
   - On Linux, navigate to the location where you extracted the package, go to the `graphics_analyzer/gui` directory, and run the aga file.

   ```
   cd <install_directory>/graphics_analyzer/gui
   ./aga
   ```

2. Select Open the Device Manager from the Debug menu.
   a. Select your connected device from the list of Android devices.
   b. Select the application you want to debug
   c. Select Trace Activity.

Figure 3-1: Device Manager dialog showing selected device



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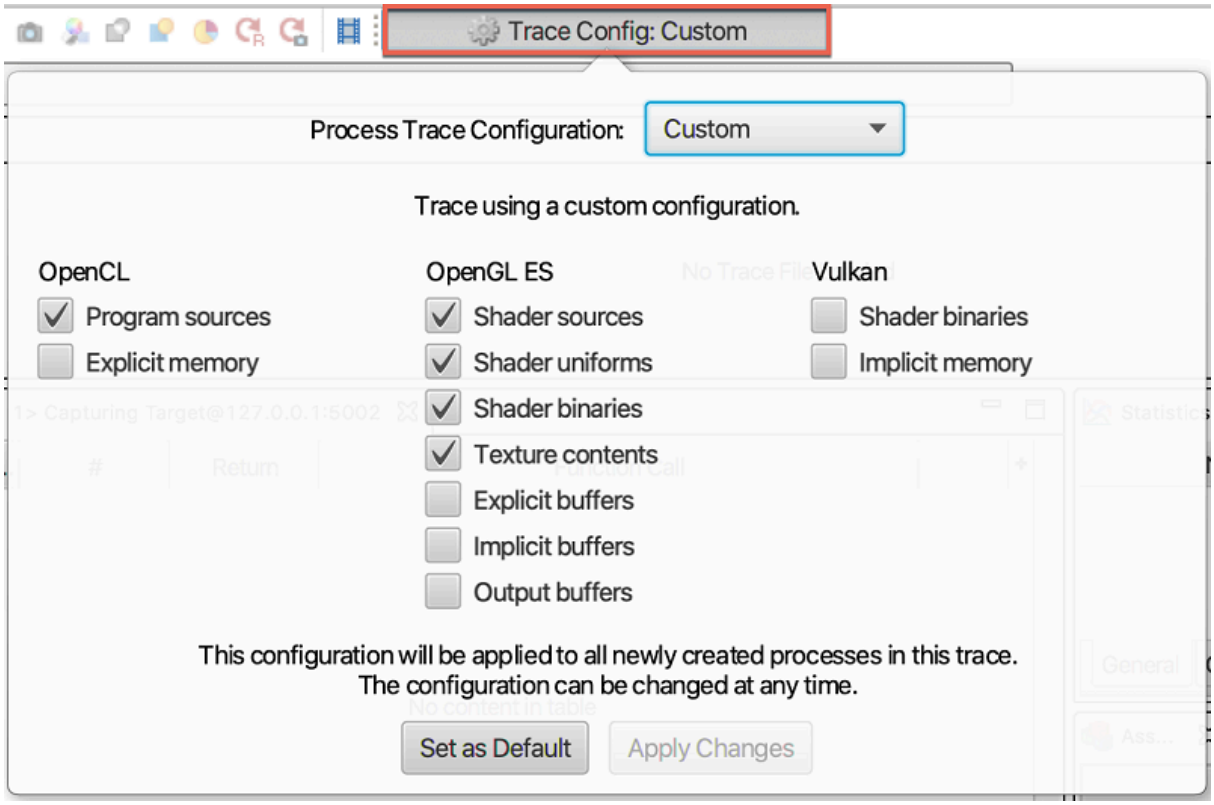
Graphics Analyzer connects to your device and installs the layer driver and daemon application that it uses to communicate with it.

3. Optionally, select Trace Config and select which API assets are captured. Only enable the asset types you need. The more asset types you enable, the slower the application will run, the more memory is required, and the generated trace file will be larger.

Figure 3-2: Process config dialog with custom trace config settings



4. Perform your test scenario on the device. Graphics Analyzer displays the trace data as it receives it from the device.
5. When you get to a problem area, use the pause, step and play buttons to locate a frame that you want to analyze more closely:

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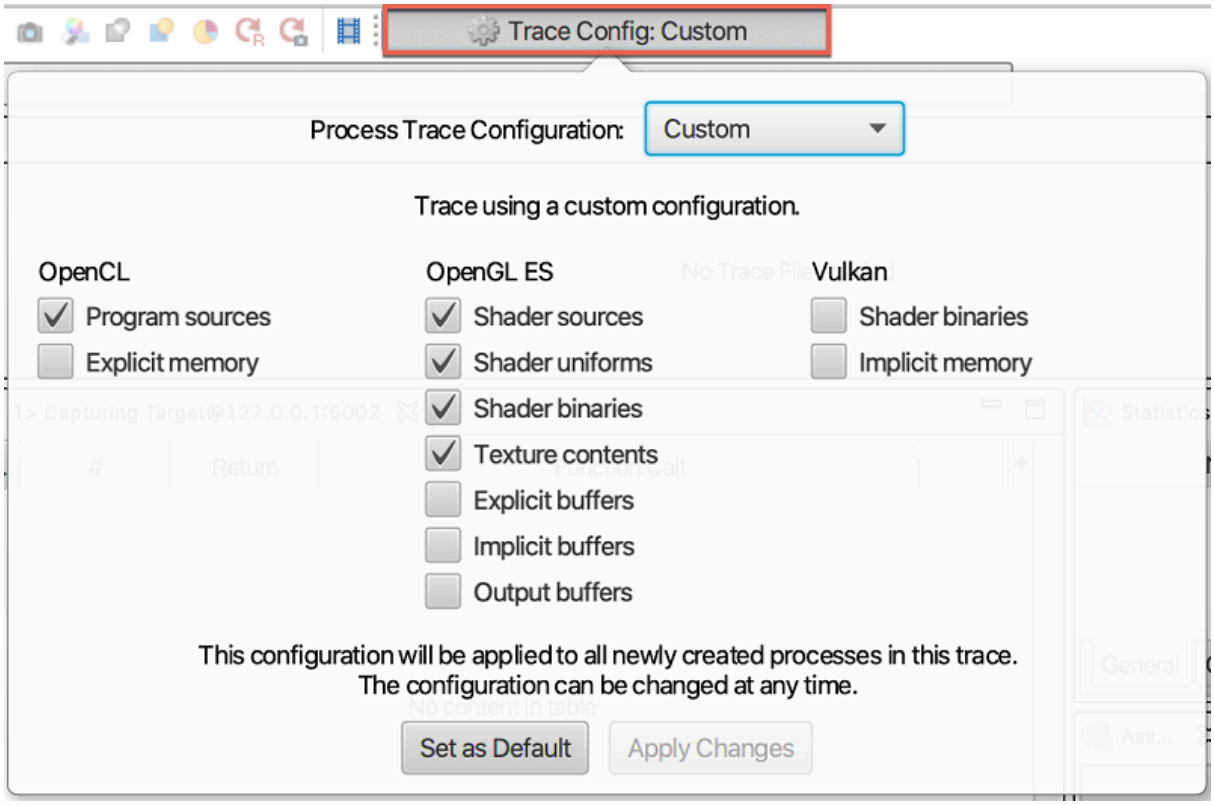
Figure 3-3: Analysis control buttons



6. Click the camera icon frame capture button to capture the frame buffer output at the current frame.
7. Optionally, capture extra frame data by enabling the following modes:
   - Overdraw
   - Shader
   - Fragment count

   Enable the mode, then click the camera icon frame capture button to collect the data.
8. To stop tracing, click .

   All the frames are listed in the Trace Outline view. The frames where you've captured extra data are shown with an icon, to identify the type of frame capture you performed.
9. To filter the frames to just those where you've captured extra data, use the Show Only Frames With Features Enabled option:

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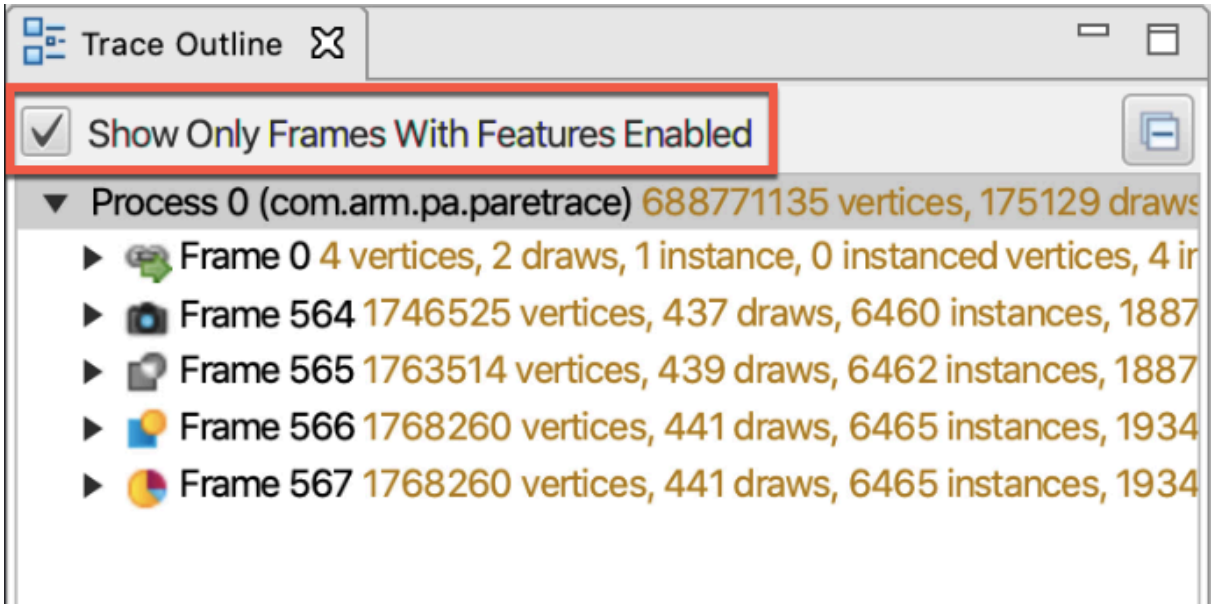
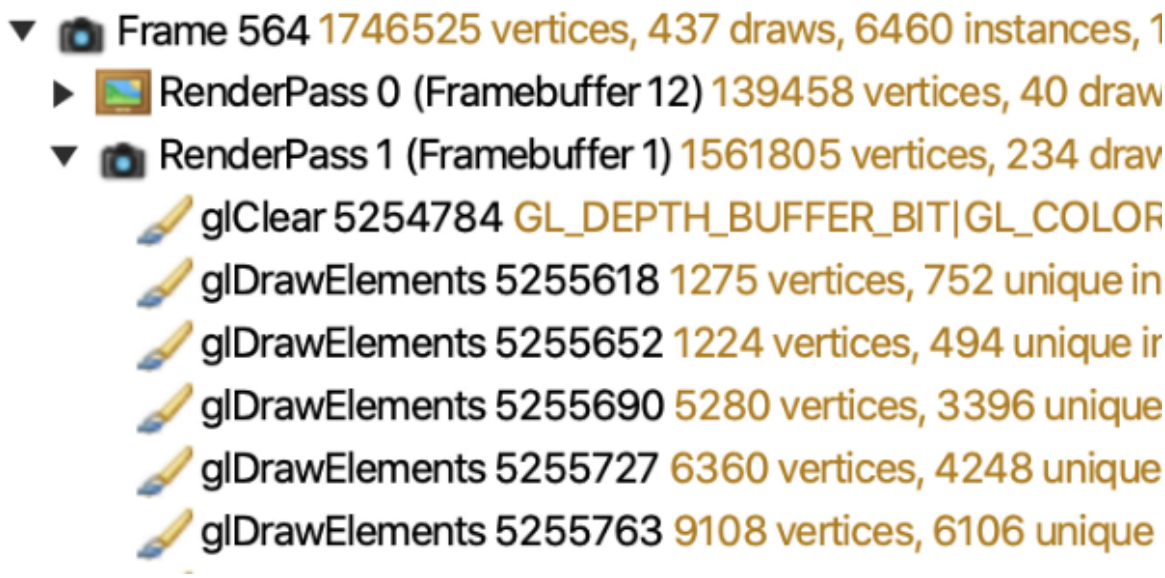
Figure 3-4: Trace Outline tab with Show Only Frames With Features Enabled option selected



10. Expand a frame to see the renderpasses and draw calls within it.

Figure 3-5: Expanded frame showing nested render passes and draw calls



11. Select frames, renderpasses and draw calls to explore their data. Refer to the Graphics Analyzer user guide information about the different data views.
12. Save or export the trace file, using options under the File menu.

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4. Related information

Useful information and shortcuts to next steps.

- About Graphics Analyzer
- Graphics Analyzer Documentation
- Download Arm Mobile Studio
- About Arm Mobile Studio

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