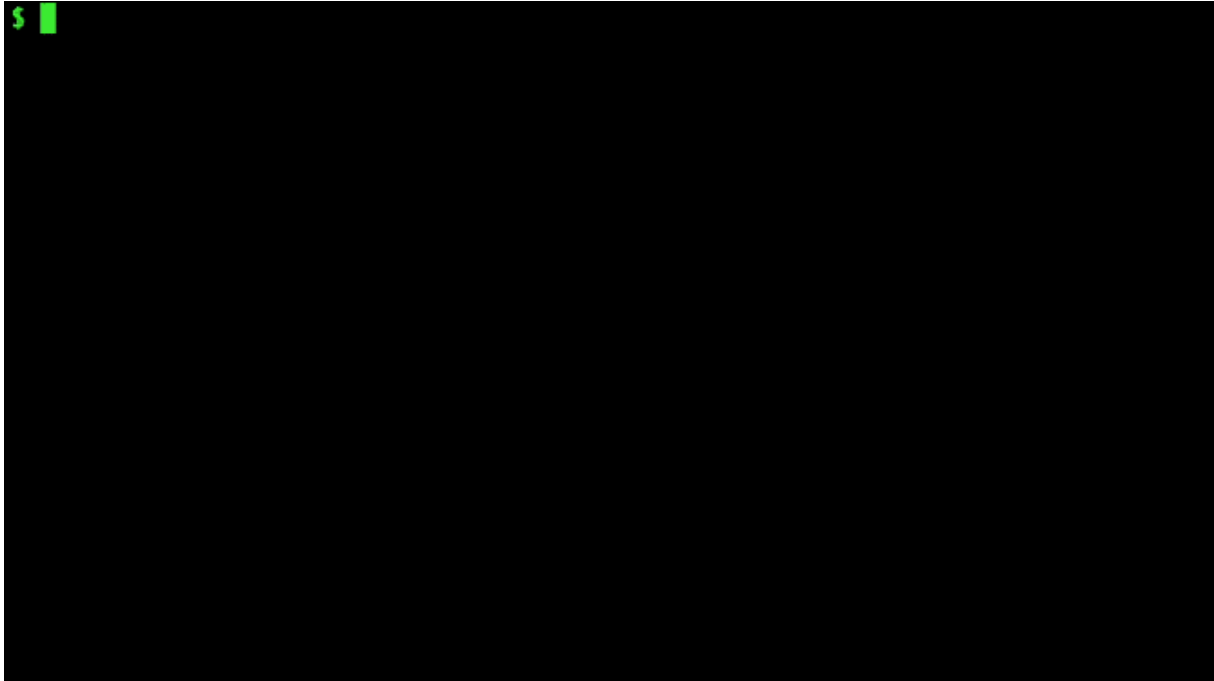

Nanoscope

An extremely accurate Android method tracing tool.



Overview

Nanoscope is a method tracing tool optimized for extreme accuracy. The tool's overhead has been measured at around ~20 nanoseconds per method (on a Nexus 6P). To achieve this performance, the interesting pieces of Nanoscope are implemented as a fork of AOSP. For this reason, **you'll need to use the Nanoscope Emulator or a device running the Nanoscope OS in order to make use of this tool.** The entrypoint for launching the Nanoscope emulator, provisioning a device with the custom OS, and starting/stopping tracing is the [nanoscope](#) command-line tool described below.

For more information on motivation and architecture, check out our [blog post](#) and the [wiki](#).

Installation

Install the [nanoscope](#) command

```
1 $ brew tap uber/nanoscope
2 $ brew install nanoscope
```

Nanoscope Emulator / Devices

Nanoscope only works with the Nanoscope Emulator or with a device that's running the Nanoscope OS.

Launch Nanoscope Emulator

```
1 # Prerequisites
2 #   - $ANDROID_HOME environment variable is set
3 #   - macOS
4
5 $ nanoscope emulator
```

Flash ADB-connected phone with the Nanoscope OS

If you want to use Nanoscope with a real device, you can execute the following command to replace your stock Android OS with the Nanoscope OS.

IMPORTANT: This will only work with a Nexus 6P - do not attempt to flash any other device

IMPORTANT: This command installs a custom operating system onto the device. There is no way to undo this operation.

```
1 # Prerequisites
2 #   - Nexus 6p is the only supported device at this time
3 #   - OEM Unlocking is enabled (Settings -> Developer Options -> OEM
4   unlocking)
5 #   - Device is connected via ADB
6
7 $ nanoscope flash
```

Usage

Start tracing on ADB-connected device

```
1 $ nanoscope start
2 Tracing... (Press ENTER to stop)
```

Startup tracing

```
1 $ nanoscope start --package=com.example.app
2 Tracing... (Press ENTER to stop)
```

It's necessary to specify the application package if you want to start tracing before running the app.

Extensions

In addition to method tracing, Nanoscope can generate additional information about executing application (e.g. CPU utilization for a given thread, number of page faults, object allocation information). You can enable this additional functionality by using `--ext` parameter with `nanoscope start` command. It is also necessary to change the kernel setting of Nexus 6P as follows:

```
1 $ adb shell "echo -1 >/proc/sys/kernel/perf_event_paranoid"
```

Please note that extended functionality DOES NOT work on emulators (and is therefore not included in our emulator release). Additional information about this Nanoscope extension can be found [here](#).

Upgrade

Client

```
1 $ brew update && brew upgrade nanoscope
```

OS

```
1 $ brew update && brew upgrade nanoscope
2 $ nanoscope flash
```

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```