

Darwin debugging for the Linux developer

These technical notes are meant to explain to a Linux developer what are the equivalents to debug certain things over Darwin.

Key differences from Linux

Linux tool	macOS equivalent	Purpose
<code>strace</code>	<code>dtruss</code> (1), strace-macos	System call tracing
<code>perf</code>	<code>sample</code> , <code>spindump</code> , Instruments (2)	Performance profiling
<code>ss</code>	<code>netstat -nv</code>	Socket statistics
<code>iostat</code>	<code>iostat -Id</code>	Disk I/O statistics
<code>lsof</code>	<code>lsof</code>	Open file listings
<code>/proc</code>	<code>vmmap</code> , <code>heap</code> , <code>lsof</code>	Process/memory information
<code>blktrace</code>	<code>fs_usage -wf filesys</code>	Trace real-time IO activity

(1): `dtruss` is unavailable on systems with System Integrity Protection enabled (SIP). Lix CI machines have SIP enabled.

(2): Instruments is a graphical application that requires a remote desktop and cannot be used over SSH.

Getting flamegraphs out of `sample`

Combine <https://github.com/brc7/flamegraph-sample/blob/master/stackcollapse-sample.py> with <https://speedscope.app/>.

Inspecting memory allocations

`heap` can give a list of allocations sorted by sizes when it can recognize the type in-memory (doesn't always work for everything).

`iostat` tips

`iostat -Id` on macOS will return as the first row the cumulative data *SINCE* the first boot.

`xfrs` := IO operations per second.

Listing file descriptors

`/proc` doesn't exist on macOS, therefore, `lsOF` is the only thing that can list file descriptors and let you understand the relationships.

Tracing network activity

`fs_usage -wf network` can trace real-time network activity on file descriptors.

Checking Internet quality

`networkQuality -v` will dump an Apple-infrastructure Internet connection check for bandwidth and latency.

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