

## DTraceToolkit in MacOS X

18 Feb 2008

*I originally posted this at <http://bdgregg.blogspot.com/2008/02/dtracetoolkit-in-macos-x.html>.*

Apple included DTrace in MacOS X 10.5 (Leopard), released in October 2007. It's great to have DTrace available in MacOS X for its powerful application and kernel performance analysis. To think that there is now another kernel we can examine using DTrace is exciting – it's like discovering a new planet in the solar system.

Apart from kernel analysis, DTrace also improves general usability by answering every day questions like: why are my disks rattling? or why does my browser keep hanging? Although, your average user may not write DTrace scripts to answer these questions themselves (it's better if they do), but instead use prewritten scripts.

MacOS X includes a collection of DTrace scripts in **/usr/bin**, mostly from the [DTraceToolkit](#):

```
leopard# grep -l DTrace /usr/bin/*
/usr/bin/bitesize.d
/usr/bin/cpuwalk.d
/usr/bin/creatbyproc.d
/usr/bin/dappprof
/usr/bin/dapptrace
/usr/bin/diskhits
/usr/bin/dispqlen.d
/usr/bin/dtruss
/usr/bin/errinfo
/usr/bin/execsnoop
/usr/bin/fddist
/usr/bin/filebyproc.d
/usr/bin/hotspot.d
/usr/bin/httpdstat.d
/usr/bin/iofile.d
/usr/bin/iofileb.d
/usr/bin/iopattern
/usr/bin/iopending
/usr/bin/iosnoop
/usr/bin/iotop
/usr/bin/kill.d
/usr/bin/lastwords
/usr/bin/loads.d
/usr/bin/newproc.d
/usr/bin/opensnoop
/usr/bin/pathopens.d
/usr/bin/pidpersec.d
/usr/bin/plockstat
/usr/bin/priclass.d
/usr/bin/pridist.d
/usr/bin/procsystime
/usr/bin/runocc.d
/usr/bin/rwbypid.d
/usr/bin/rwbytype.d
/usr/bin/rwsnoop
/usr/bin/sampleproc
/usr/bin/seeksize.d
/usr/bin/setuids.d
/usr/bin/sigdist.d
/usr/bin/syscallbypid.d
/usr/bin/syscallbyproc.d
/usr/bin/syscallbysysc.d
/usr/bin/topsyscall
/usr/bin/topsysproc
/usr/bin/weblatency.d
```

That's 44 DTraceToolkit scripts, plus plockstat from Solaris 10. While the DTraceToolkit now has over 200 scripts, it makes sense to pick out the most useful scripts for inclusion in /usr/bin.

Popular scripts such as iosnoop can now be run by MacOS X users:

```
leopard# iosnoop
  UID  PID D   BLOCK  SIZE      COMM PATHNAME
  501   130 R 31987472 40960    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R  7879952  8192    Terminal ??/SearchManager.nib/keyedobjects.nib
  501   130 R 32132304 12288    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32132528  4096    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32047696 12288    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32132592  4096    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32131512 12288    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32033296 12288    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32044488  4096    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32045064  4096    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32131344  4096    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32048680 16384    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32132544  8192    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32049296 12288    Terminal ??/dyld/dyld_shared_cache_i386
   -1    0 W 32482848 86016   kernel_task ??/vm/swapfile2
   -1    0 W 32483040 135168   kernel_task ??/vm/swapfile2
  501   130 R 32044672  4096    Terminal ??/dyld/dyld_shared_cache_i386
  501   130 R 32132656 12288    Terminal ??/dyld/dyld_shared_cache_i386
[...]
```

The man pages are conveniently included in `/usr/share/man`.

I had been making preparations in the latest DTraceToolkit (0.99) for MacOS X DTrace, such as putting an "OS" field into the man pages and figuring out how to support different versions of the same script (tcpsnoop\_snv, etc). Hopefully many scripts will run on both Solaris and MacOS X (especially if they use stable providers), however, I expect there will be some that are specific to each. Now that QNX DTrace also exists, there is additional need for identifying OS specifics in the DTraceToolkit.

It's been great news for DTrace, Sun, and Apple. Apple have not only gained the best performance and debugging tool available, but also the existing DTrace community.