

Dynamic Diagnostic Tools

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Dynamic Diagnostic Tools (on Unix)

- Process control
- Process activity
- Shared resources

Process Control

- **ps** lists (some) processes running on a machine
- To list your processes:
 - Solaris, System V: **ps -u username**
 - Solaris, BSD-style: **/usr/ucb/ps gx**
 - Linux: **ps gx**
- To terminate a process:
 - **kill pid**
- To terminate a process group:
 - **ps -ju your_username** to list process group ID's (pgid's)
 - **kill -pgid** (note the negative progress group ID)

Process Activity

- **top** shows useful information about each process
 - state (running, waiting for CPU, sleeping, *etc.*)
 - memory usage (total and resident)
 - CPU usage, both instantaneous (percentage) and cumulative
- load averages: 1.02, 0.98, 0.81 06:55:37
70 processes: 66 sleeping, 2 zombie, 2 on cpu
Memory: 1024M real, 15M free, 43M swap in use, 2007M swap

PID	UID	THR	PRI	NICE	SIZE	RES	STATE	TIME	CPU	COMM
20389	1046	1	0	10	33M	32M	cpu0	0:14	12.06%	ccfe
20401	1046	1	18	0	1528K	1232K	cpu2	0:00	0.19%	top_
19863	1046	1	18	10	4624K	4400K	sleep	0:03	0.03%	make
19304	0	1	58	0	2600K	2112K	sleep	0:02	0.03%	sshd
20388	1046	1	0	10	1088K	1008K	sleep	0:00	0.02%	CC
19307	1046	1	48	0	2120K	1776K	sleep	0:00	0.01%	bash

Process Activity, (cont'd)

- **truss** shows a processes's system calls (**strace** on Linux; **trace** on some older systems)
- memory access checkers, *e.g.*, Rational's Purify, NuMega's BoundsChecker, Parasoft's Insure++
- debuggers
- printouts, especially if well thought out, *e.g.*,

```
ACE_DEBUG ((LM_INFO, "Foo::f (); i = %d\n", i));
```

 - can disable with a compile-time switch
 - can set a debugging level
 - can output all built-in data types

Shared Resources

- **ipcs** lists shared memory segments, semaphores, and message queues
- **netstat** shows network connection and interface status
 - **netstat -f inet** lists TCP/IP sockets (**netstat -inet** on Linux)
 - **netstat -i** lists network interfaces used for TCP/IP
 - On Linux only, **-p** option shows which process owns each socket (for your own sockets, unless superuser)

For Further Information

- man pages
- many good textbooks, such as W. Richard Steven's *Advanced Programming in the UNIX[®] Environment*