

NAME

procstat - get detailed process information

SYNOPSIS

procstat [--libxo] [-h] [-M *core*] [-N *system*] [-w *interval*] *command* [*pid* ... | *core* ...]

procstat [--libxo] -a [-h] [-M *core*] [-N *system*] [-w *interval*] *command*

procstat [--libxo] [-h] [-M *core*] [-N *system*] [-w *interval*] [-b | -c | -e | -f [-C] | -i [-n] | -j [-n] | -k [-k] | -l | -r [-H] | -s | -S | -t | -v | -x] [*pid* ... | *core* ...]

procstat [--libxo] -a [-h] [-M *core*] [-N *system*] [-w *interval*] [-b | -c | -e | -f [-C] | -i [-n] | -j [-n] | -k [-k] | -l | -r [-H] | -s | -S | -t | -v | -x]

procstat [--libxo] -L [-h] [-M *core*] [-N *system*] [-w *interval*] *core* ...

pargs [--libxo] *pid* ...

penv [--libxo] *pid* ...

pwdx [--libxo] *pid* ...

DESCRIPTION

procstat utility displays detailed information about the processes identified by the *pid* arguments, or if the **-a** flag is used, all processes. It can also display information extracted from a process core file, if the core file is specified as the argument.

The **pargs**, **penv** and **pwdx** utilities display the arguments, environment, and current working directory, respectively of the process specified by *pid* argument. They mimic the behavior of Solaris utilities of the same names.

If the **--libxo** flag is specified the output is generated via libxo(3) in a selection of different human and machine readable formats. See `xo_parse_args(3)` for details on command line arguments.

The following commands are available for **procstat**:

advlock

Print information about advisory locks on files. All three types of locks are listed, BSD-style lockf(2), POSIX-style fcntl(2) *F_SETLK*, and remote lockd(8) locks used by NFSv3.

Note that neither the **-a** option nor *pid* list can be used to limit the display of the locks, mostly because some types of locks do not have local (or any) owning processes.

basic Print basic process statistics (this is the default).

binary | **-b**

Display binary information for the process.

Substring commands are accepted.

argument(s) | **-c**

Display command line arguments for the process.

Substring commands are accepted.

environment | **-e**

Display environment variables for the process.

Substring commands are accepted.

file(s) | *fd(s)* | **-f**

Display file descriptor information for the process.

If the **-C** subcommand flag is used then additional capability information is printed.

signal(s) | **-i**

Display signal pending and disposition information for the process.

If the **-n** subcommand option is used, the signal numbers are shown instead of signal names.

Substring commands are accepted.

tsignal(s) | **-j**

Display signal pending and blocked information for the process's threads.

If the **-n** subcommand option is used, the signal numbers are shown instead of signal names.

Substring commands are accepted.

kstack | **-k**

Display the stacks of kernel threads in the process, excluding stacks of threads currently running on a CPU and threads with stacks swapped to disk.

If the **-v** subcommand option is used (or the command flag is repeated), function offsets as well as function names are printed.

rlimit | **-l**

Display resource limits for the process.

ptlwpinfo | **-L**

Display LWP info for the process pertaining to its signal driven exit.

rusage | **-r**

Display resource usage information for the process.

If the **-v** (or **-H**) subcommand flag is used then per-thread statistics are printed, rather than per-process statistics. The second field in the table will list the thread ID to which the row of information corresponds.

credential(s) | **-s**

Display security credential information for the process.

Substring commands are accepted.

cpuset | *cs* | **-S**

Display the cpuset information for the thread.

thread(s) | **-t**

Display thread information for the process.

vm | **-v**

Display virtual memory mappings for the process.

auxv | **-x**

Display ELF auxiliary vector for the process.

pargs Display arguments for the process.

penv Display environment variables for the process.

pwdx Display current working directory for the process.

All options generate output in the format of a table, the first field of which is the process ID to which the row of information corresponds. The **-h** flag may be used to suppress table headers.

The **-w** flag may be used to specify a wait interval at which to repeat the printing of the requested process information. If the **-w** flag is not specified, the output will not repeat.

Information for VM, file descriptor, and cpuset options is available only to the owner of a process or the

superuser. A cpuset value displayed as -1 means that the information is either invalid or not available.

Binary Information

Display the process ID, command, and path to the process binary:

PID process ID
COMM command
OSREL osreldate for process binary
PATH path to process binary (if available)

Command Line Arguments

Display the process ID, command, and command line arguments:

PID process ID
COMM command
ARGS command line arguments (if available)

Environment Variables

Display the process ID, command, and environment variables:

PID process ID
COMM command
ENVIRONMENT environment variables (if available)

File Descriptors

Display detailed information about each file descriptor referenced by a process, including the process ID, command, file descriptor number, and per-file descriptor object information, such as object type and file system path. By default, the following information will be printed:

PID process ID
COMM command
FD file descriptor number or cwd/root/jail
T file descriptor type
V vnode type

FLAGS

file descriptor flags

REF file descriptor reference count

OFFSET

file descriptor offset

PRO network protocol

NAME

file path or socket addresses (if available)

The following file descriptor types may be displayed:

e POSIX semaphore

E eventfd

f fifo

h shared memory

k kqueue

m

message queue

P process descriptor

p pipe

s socket

t pseudo-terminal master

v vnode

The following vnode types may be displayed:

- not a vnode

b block device

c character device

d directory

f fifo

l symbolic link

r regular file

s socket

x revoked device

The following file descriptor flags may be displayed:

r read

w write

a append
 s async
 f fsync
 n non-blocking
 d direct I/O
 l lock held

If the **-C** flag is specified, the vnode type, reference count, and offset fields will be omitted, and a new capabilities field will be included listing capabilities, as described in `cap_rights_limit(2)`, present for each capability descriptor.

The following network protocols may be displayed (grouped by address family):

AF_INET, AF_INET6

ICM IPPROTO_ICMP; see `icmp(4)`.
 IP? unknown protocol.
 RAW IPPROTO_RAW; see `ip(4)`.
 SCT IPPROTO_SCTP; see `sctp(4)`.
 TCP IPPROTO_TCP; see `tcp(4)`.
 UDP IPPROTO_UDP; see `udp(4)`.

AF_LOCAL

UDD IPPROTO_UDP; see `udp(4)`.
 UDS IPPROTO_TCP; see `tcp(4)`.
 UD? unknown protocol.

AF_DIVERT

IPD Divert socket; see `divert(4)`.
 ? unknown address family.

Signal Disposition Information

Display signal pending and disposition for a process:

PID process ID
 COMM
 command

SIG signal name

FLAGS

process signal disposition details, three symbols

P if signal is pending in the global process queue; - otherwise.

I if signal delivery disposition is SIG_IGN; - otherwise.

C if the signal will be caught; - otherwise.

If **-n** switch is given, the signal numbers are shown instead of signal names.

Thread Signal Information

Display signal pending and blocked for a process's threads:

PID process ID

TID thread ID

COMM

command

SIG signal name

FLAGS

thread signal delivery status, two symbols

P if signal is pending for the thread, - otherwise

B if signal is blocked in the thread signal mask, - if not blocked

The **-n** switch has the same effect as for the **-i** switch: the signal numbers are shown instead of signal names.

Kernel Thread Stacks

Display kernel thread stacks for a process, allowing further interpretation of thread wait channels. If the **-k** flag is repeated, function offsets, not just function names, are printed.

This feature requires **options STACK** or **options DDB** to be compiled into the kernel.

PID process ID

TID thread ID

COMM

command

TDNAME

thread name

KSTACK

kernel thread call stack

Resource Limits

Display resource limits for a process:

PID process ID
COMM
command
RLIMIT
resource limit name
SOFT soft limit
HARD
hard limit

Resource Usage

Display resource usage for a process. If the **-H** flag is specified, resource usage for individual threads is displayed instead.

PID process ID
TID thread ID (if **-H** is specified)
COMM command
RESOURCE resource name
VALUE current usage

Security Credentials

Display process credential information:

PID process ID
COMM
command
EUID effective user ID
RUID real user ID
SVUID
saved user ID
EGID effective group ID
RGID real group ID
SVGID
saved group ID
UMASK
file creation mode mask
FLAGS
credential flags

GROUPS

group set

The following credential flags may be displayed:

C capability mode

Thread Information

Display per-thread information, including process ID, per-thread ID, name, CPU, and execution state:

PID process ID

TID thread ID

COMM

command

TDNAME

thread name

CPU current or most recent CPU run on

PRI thread priority

STATE

thread state

WCHAN

thread wait channel

Virtual Memory Mappings

Display process virtual memory mappings, including addresses, mapping meta-data, and mapped object information:

PID process ID

START

starting address of mapping

END ending address of mapping

PRT protection flags

RES resident pages

PRES private resident pages

REF reference count

SHD shadow page count

FLAG

mapping flags

TP VM object type

The following protection flags may be displayed:

r read
w write
x execute

The following VM object types may be displayed:

-- none
dd dead
df default
dv device
md device with managed pages (GEM/TTM)
ph physical
sg scatter/gather
sw swap
vn vnode
gd guard (pseudo-type)

The following mapping flags may be displayed:

C copy-on-write
N needs copy
S one or more superpage mappings are used
D grows down (top-down stack)
U grows up (bottom-up stack)
W
 pages in this range are locked by mlock(2) or mlockall(2)

ELF Auxiliary Vector

Display ELF auxiliary vector values:

PID process ID
COMM
 command
AUXV
 auxiliary vector name
VALUE
 auxiliary vector value

Advisory Lock Information

RW Read/Write type, *RO* for read, *RW* for write lock
TYPE Type of the lock, one of *FLOCK* for flock(2), *FCNTL* for fcntl(2), *LOCKD* for remote
PID Process id of the owner, for *FCNTL* and remote types
SYSID
 Remote system id if applicable
FSID File system id where the locked file reside
RDEV
 rdev for the file system
INO Unique file identifier (inode number) of the locked file on the file system
START
 Start offset of the locked range
LEN Length of the locked range. Zero means till EOF
PATH
 If available, the path of the locked file

EXIT STATUS

The **procstat** utility exits 0 on success, and >0 if an error occurs.

EXAMPLES

Show binary information about the current shell:

```

$ procstat binary $$
  PID COMM          OSREL PATH
46620 bash          1201000 /usr/local/bin/bash

```

Same as above but showing information about open file descriptors:

```

$ procstat files $$
  PID COMM          FD T V FLAGS  REF  OFFSET PRO NAME
46620 bash          text v r r----- -  - - /usr/local/bin/bash
46620 bash          ctty v c rw----- -  - - /dev/pts/12
46620 bash          cwd v d r----- -  - - /tmp
46620 bash          root v d r----- -  - - /
46620 bash          0 v c rw----- 7 372071 - /dev/pts/12
46620 bash          1 v c rw----- 7 372071 - /dev/pts/12
46620 bash          2 v c rw----- 7 372071 - /dev/pts/12
46620 bash          255 v c rw----- 7 372071 - /dev/pts/12

```

Show the arguments used to launch init(8):

```
$ procstat arguments 1
PID COMM      ARGS
  1 init      /sbin/init --
```

Extract binary information from a core dump:

```
$ procstat binary core.36642
PID COMM      OSREL PATH
36642 top      1201000 /usr/bin/top
```

Trying to extract information from a core file generated in a different major FreeBSD version might show an error like this:

```
$ procstat mplayer.core
procstat: kinfo_proc structure size mismatch
procstat: procstat_getprocs()
```

SEE ALSO

fstat(1), ps(1), sockstat(1), cap_enter(2), cap_rights_limit(2), mlock(2), mlockall(2), libprocstat(3), libxo(3), signal(3), xo_parse_args(3), ddb(4), divert(4), icmp(4), ip(4), sctp(4), tcp(4), udp(4), stack(9)

AUTHORS

Robert N M Watson <rwatson@FreeBSD.org>.
libxo(3) support was added by Allan Jude <allanjude@FreeBSD.org>.
Juraj Lutter <juraj@lutter.sk> added the pargs, penv and pwdx functionality.

BUGS

The display of open file or memory mapping pathnames is implemented using the kernel's name cache. If a file system does not use the name cache, or the path to a file is not in the cache, a path will not be displayed.

procstat currently supports extracting data only from a live kernel, and not from kernel crash dumps.