

NAME

dead - crash analysis

SYNOPSIS

dead [*-smpcrbPMif*] crashfile [*file*]

DESCRIPTION

Dead produces formatted summaries of system tables from a crash dump. Rather than just print the contents of the system's tables, it attempts to put the information into a meaningful form while checking the consistency of pointers in the tables.

Dead can produce a memory map, a swap map, a list of the i-nodes that were open in the system (with fully qualified pathnames, including device name) and a list of the file descriptors that each process has open with the pathname of the corresponding file. In addition, it will analyze the block I/O buffering system to determine which buffers are on each device queue, which buffers are queued for I/O and which block devices are active. It can also retrieve the configuration table of the system.

All addresses in the system tables are printed in symbolic terms and the options can be used individually or in combination.

Dead assumes that the namelist for the crash dump is in *"/unix"* unless the *s* option is used, in which case a *file* name may be specified. There are several options:

- c** retrieves the configuration tables (*conf.c*) for character and block devices from the crash file. All entries in the tables are printed in symbolic form so that the printout closely resembles the contents of *conf.c*. The contents of the locations which specify the root and swap devices are also printed.
- r** prints the registers that were saved in low core by the crash dump routine when the dump was taken. The contents of the *K* register (*KISA6* or *KDSA6*) contains the address (in memory blocks) of the last process that ran.
- m** prints a memory map and swap map with process names. Since reentrant text is managed separately from the nonreentrant part of a process, there can be two entries for a reentrant process. Reentrant text has a *T* appended to the address field. The following fields are printed,

<i>Heading</i>	<i>Description</i>
ADDR	The address of an area in memory blocks (64 bytes).
SIZE	The size of the area in memory blocks.
PID	The process id.
NAME	The name of the process occupying the area, or if the memory space is not allocated, "Free" is printed.

The swap map is also printed with the *m* option in a similar manner, however, the address and size fields are in disk blocks (512 bytes).

- p** prints a summary of all of the processes in the crash file, their names and attempts to construct a symbolic name for the event on which a process is roadblocked.

<i>Heading</i>	<i>Description</i>
NO	The number (index) of the process table entry.
S	A letter encoding the state of the process: <ul style="list-style-type: none"> S Sleeping W Waiting R Ready

- I Idling
 Z Zombie - process exited, parent not yet notified.
 T Traced
- F The location of the process. It may be any of the following:
 D Swapped out
 M In memory
 L Locked in Memory
 S Scheduler bit set
- PID The unique process number.
- PRI The priority of the process; high numbers mean low priority
- UID Four characters of the user's id from the password file.
- EVENT A symbolic representation of the address that the process is roadblocked on (if any).
- NAME The file name of the process.
- M prints the names of the mounted file systems and the pathnames of the i-nodes that they are mounted on.
- i prints the contents of the *inode* table including an unambiguous pathname. The following fields are printed.
- | <i>Heading</i> | <i>Description</i> |
|----------------|--|
| # | The number of the i-node table entry in decimal. |
| FLAGS | Any special flags in the i-node are printed as follows,
D a directory
C a character device
B a block device
L a large file |
| ACCESS | The access control permissions for the file are printed in a manner similar to the <i>ls</i> command. Permissions are printed in the same order as for <i>ls</i> , i.e., owner, group, others.
s set user-ID bit on
g set group-ID bit on
r read permission
w write permission
x execute permission |
| INO | The number of the i-node. |
| UID | The name of the owner of the file, taken from the password file. |
| DEVICE | The pathname of the device on which the i-node resides. |
| PATHNAME | The pathname of the i-node if it can be found. Temporary files and pipes disappear when a system is rebooted, so some file names can not be found. Also, an i-node may be reallocated if a file is removed, so <i>dead</i> should be run relatively soon after a system is rebooted to insure that the pathnames are |

correct.

f prints the *file* table.

<i>Heading</i>	<i>Description</i>
#	The number of the file table entry.
MD	The <i>mode</i> used to open the file.
C	The number of instances of the file being open with the given <i>mode</i> . R read permission W write permission P a pipe N a named pipe
DEVICE	The pathname of the device on which the file resides.
PATHNAME	The pathname of the i-node which the <i>file</i> table references.

P prints a list of all of the processes in memory and the files that they have open. The id of the process is printed with its name, followed by a list of file descriptors that the process has open and the pathnames of the files that they reference.

<i>Heading</i>	<i>Description</i>
#	The file descriptor number.
F	The <i>mode</i> with which the <i>file</i> was opened (same as MD field for the f option).
IND	The number of the <i>file</i> table entry which this descriptor references.
DEVICE	The pathname of the device on which the i-node resides.
PATHNAME	The pathname of the i-node.

b prints a summary of the buffers in the I/O subsystem and the queues on which they reside. There are five classes of queues. The *Buffer Free List* is a queue containing all of the buffers that are available for allocation. The *Null Device Queue* is a queue of buffers that are allocated by the system for some special purpose and are not associated with any device (e.g., holding superblocks, holding arguments for an *exec* system call, I/O for special devices, etc.). Each device analyzed by the **b** option has a number of queues but only those queues that are nonempty are printed. The *Device Queue* links together all of the buffers that contain data that have been retrieved or written onto the given device. The *Device Queue* may actually be a number of mashed subqueues. In this case, every subqueue will be shown. Buffers on this queue may also appear on the *Buffer Free List*. The *Device I/O Queue* contains all of the buffers that are actually waiting to be read or written from the given device. If a block device is active when a system crashes, the I/O queue is marked as *ACTIVE*. A symbolic representation of the pointers associated with each queue and each buffer on a queue is printed, however, familiarity with the I/O system is required to be able to check them and space does not permit such an explanation here. The values printed are,

<i>Heading</i>	<i>Description</i>
BUF	The buffer number.
FLAGS	Any of the following R Read W Write

D I/O complete (done)
B Buffer busy
E Error
P Physical I/O
U Unibus map allocated
N Wanted by other processes
A Asynchronous write
L Delayed write
G Age
H Physio Buffer Header
S State

[MAJ,MIN]

Major and minor device numbers

BLOCK Logical block number

FILES

/unix system namelist
unixcore core image of unix crash
/etc/passwd password file
/usr/bin/ncheck

SEE ALSO

ncheck(1M), ps(1), sps(1)

BUGS

For the **P**, **M**, **i** and **f** options, *dead* runs *ncheck* to find the fully qualified pathname. This takes a bit of time.