

Ideas#

Ideas for improving the dedebuggability of the kernel that depends less on being able to reproduce the problem. Most of these ideas would be appropriate for -g versions only or run only during regression.

Kerdump#

A tool to be used by regression framework before it starts running any test to capture, and possibly validate, internal kernel states. For example:

1. dump numbers of free and inuse timers, processes, thread, and other kernel objects.
2. memory usage stats
3. validate vectors and lists

Output format would be simple to parse ascii to be collected by the regular regression framework.

Process/Thread Watchdog

- A debug mode where the kernel would report if specified processes or threads did not run in some specified time window. Reporting might be shutdown, trigger a kernel dump or log.
- it may be useful to extend the "on" command to start processes under the watchdog

Kernel Watchdog#

- A watchdog to detect kernel hangs. For example, INTR_LOCK() looping forever, excessive kernel-call preemption, or a processor hanging trying to enter the kernel.
- Would require a hardware timer.

Black Box recorder

- (Analogy from aircraft crash investigations). A logging system that saves logs over a reboot.
- would require a chunk of memory not reinitialized by reboot, which may not be possible with some bios-es.
- arranging every crashed regression to save a kernel dump would be preferable.

Improve current CRASH and shutdown messages#

- backtrace on CRASH message
- use a bigger stack dump in shutdown messages
- shutdown() that checks various pointers it's about to dereference so we don't cause another fault that truncates the shutdown output.

Automate regression to capture kernel debug information#

- run -g kernels normally
- automate capture and storage of kernel dumps and .sym files for every crash. Archive them and host them on a web server.
- Heck, why not have the regression framework run gdb on crash?

libmod_regress

- a great sounding name for which we don't have a clear list of ideas yet

- would be a means to optionally add lots of intrusive debug, logging, and fault insertion code into the kernel without using a lot of ifdefs.

Misc <#>

- save a source-code linenumber whenever we set the errno in the kernel or process manager. So we can tell which error path set that mysterious SIGBUS.

Discussion <#>