

Re: Serious compatibility breakage in -current.

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*Source:* <http://unix.derkeiler.com/Mailing-Lists/FreeBSD/current/2007-11/msg01659.html>

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- *From:* Bakul Shah <[bakul@xxxxxxxxxxxxxx](mailto:bakul@xxxxxxxxxxxxxx)>
  - *Date:* Thu, 29 Nov 2007 09:26:52 -0800
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On Thu, Nov 29, 2007 at 02:26:11AM -0800, Carl Shapiro wrote:

Developers,

FreeBSD 7 has changed the protection violation signal from SIGBUS to SIGSEGV. Unfortunately, when an old binary is run on a current FreeBSD system, protection violations cause a SIGSEGV to be delivered to the executable instead of the anticipated SIGBUS. Binaries compiled on older versions of FreeBSD are not prepared to handle SIGSEGV in response to page protection violations.

One consequence of this change is that applications that handle page protection violations, such as the CMUCL Lisp compiler have broken. CMUCL binaries compiled for FreeBSD 4, FreeBSD 5, and FreeBSD 6 crash on -current. Investments FreeBSD users have in binaries that handle page protection violations, such as things that link against Boehm-GC, are lost forever. This significantly increases the cost of an upgrade to FreeBSD 7.

The switch from SIGBUS to SIGSEGV is well motivated. However, it is not clear that consideration was given to binaries running under compat{4,5,6}x. One would expect the compat infrastructure to translate protection violation signals from SIGSEGV to SIGBUS while executing older binaries. This would ensure that the applications that establish SIGBUS handlers to catch protection violations continue to work.

Among the open source operating systems the FreeBSD project has one of the best traditions of supporting old binaries. It would truly be a shame for this tradition to abruptly end as of the next major release. As a developer who supports several versions of FreeBSD through binary compatibility anything that can help us avoid breakage as of the next FreeBSD release would be appreciated.

Thanks,

Carl (and the many FreeBSD users of CMUCL)

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I can confirm that FreeBSD-6 binary of the CMUCL 19d does not work. It is interesting that sbcl has no problems on RELENG\_7.

May be sbcl was trapping both SIGBUS and SIGSEGV? Anyway we find this in their commit log:

Sep 26 2007 11:42 sa2c 1.0.10.4: Use variable for SIG\_MEMORY\_FAULT on FreeBSD When SIGBUS is signalled on FreeBSD 7, or SIGSEGV is signalled on FreeBSD 6 or earlier, it's very hard to debug if both of the signals are hooked for GC.

Instead to hook both signals, define SIG\_MEMORY\_FAULT as variable and set it at startup. [Details]

So they worked around (but it still won't help any old binaries). There were some messages about this change on PLT Scheme mailing list as well. Unfortunately they don't complain here!

See for example:

<http://list.cs.brown.edu/pipermail/plt-scheme/2007-November/021272.html>

Here is the relevant excerpt:

A quick and correct response! Indeed it seems like FreeBSD 7 has changed the behavior to be SIGSEGV instead of SIGBUS.

And they have the same problem (old binaries won't work). I wonder if there are other ports that use GC of some sort are broken by this change.

Please, try the patch below and report whether it is enough to fix cmucl and any other regressions.

That patch will fix the problem. Also note that the same change is required on i386.

The /\* XXX hack \*/ comment in the original -7 code seems to indicate the change to override the signal value returned by page\_pfault() was not fully thought through. So I believe your unbreaking change should be incorporated in the 7 release.

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freebsd-current@xxxxxxxxxxxxx mailing list

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