

## Re: ten thousand small processes

**Source:** <http://unix.derkeiler.com/Mailing-Lists/FreeBSD/performance/2003-06/0100.html>

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**From:** Marcel Moolenaar ([marcel\\_at\\_xcllnt.net](mailto:marcel_at_xcllnt.net))

**Date:** 06/26/03

Date: Wed, 25 Jun 2003 21:38:30 -0700  
To: "D. J. Bernstein" <[djb@cr.yp.to](mailto:djb@cr.yp.to)>

On Thu, Jun 26, 2003 at 02:50:29AM -0000, D. J. Bernstein wrote:

> *Jon Mini writes:*

> > *I'm sorry, but you are way off here. First of all, caches are \*much  
> > larger\* than the size of the processes you are talking about.*

>

> *I'm sorry, but you are being misled by a naive model of CPU performance.*

> *On a typical Pentium in our department, the following program becomes*

> *three times faster when SPACING is changed from 4096 to 128:*

*\*snip\**

> > *From an asm programmer's perspective, when FreeBSD decides to spread a*

> *small program's variables between*

>

> *\* the beginning of a data page,*

> *\* the beginning of a bss page,*

> *\* the beginning of a malloc mmap page,*

> *\* the beginning of a heap page,*

> *\* the beginning of the next heap page,*

> *\* the beginning of yet another heap page,*

>

> *et cetera, it is actively trying (with varying degrees of success) to*

> *damage cache performance in exactly the same way that this program does.*

Just curious: do you happen to know if the performance hit is caused by the second order effect of having the spacing be a multiple of the cache associativity, thereby resulting in thrashing of a few cache lines, and that compacting the code results in a more uniform cache placement?

In other words: is it (sec) the spacing that counts or the interaction of a particular "distance" with cache placement?

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