
Subject: Re: [PATCH v4 02/11] memcg: document cgroup dirty memory interfaces
Posted by [Wu Fengguang](#) on Sat, 30 Oct 2010 03:02:49 GMT

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On Sat, Oct 30, 2010 at 05:35:50AM +0800, Greg Thelen wrote:

> >> +A cgroup may contain more dirty memory than its dirty limit. This is possible
> >> +because of the principle that the first cgroup to touch a page is charged for
> >> +it. Subsequent page counting events (dirty, writeback, nfs_unstable) are also
> >> +counted to the originally charged cgroup.
> >> +
> >> +Example: If page is allocated by a cgroup A task, then the page is charged to
> >> +cgroup A. If the page is later dirtied by a task in cgroup B, then the cgroup A
> >> +dirty count will be incremented. If cgroup A is over its dirty limit but cgroup
> >> +B is not, then dirtying a cgroup A page from a cgroup B task may push cgroup A
> >> +over its dirty limit without throttling the dirtying cgroup B task.
> >
> > It's good to document the above "misbehavior". But why not throttling
> > the dirtying cgroup B task? Is it simply not implemented or makes no
> > sense to do so at all?
>
> Ideally cgroup B would be throttled. Note, even with this misbehavior,
> the system dirty limit will keep cgroup B from exceeding system-wide
> limits.

Yeah. And I'm OK with the current behavior, since

- 1) it does not impact the global limits
- 2) the common memcg usage (the workload you cared) seems don't share pages between memcg's a lot

So I'm OK to improve it in future when there comes a need.

> The challenge here is that when the current system increments dirty
> counters using `account_page_dirtied()` which does not immediately check
> against dirty limits. Later `balance_dirty_pages()` checks to see if any
> limits were exceeded, but only after a batch of pages may have been
> dirtied. The task may have written many pages in many different memcg.
> So checking all possible memcg that may have been written in the mapping
> may be a large set. I do not like this approach.

Me too.

> `memcontrol.c` can easily detect when memcg other than the current task's
> memcg is charged for a dirty page. It does not record this today, but
> it could. When such a foreign page dirty event occurs the associated
> memcg could be linked into the dirtying `address_space` so that
> `balance_dirty_pages()` could check the limits of all foreign memcg. In
> the common case I think the task is dirtying pages that have been
> charged to the task's cgroup, so the `address_space`'s `foreign_memcg` list

> would be empty. But when such foreign memcg are dirtied
> balance_dirty_pages() would have access to references to all memcg that
> need dirty limits checking. This approach might work. Comments?

It still introduce complexities of maintaining the foreign memcg <=>
task mutual links.

Another approach may to add a parameter "struct page *page" to
balance_dirty_pages(). Then balance_dirty_pages() can check the memcg
that is associated with the _current_ dirtied page. It may not catch
all foreign memcg's, but should work fine with good probability
without introducing new data structure.

Thanks,
Fengguang

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Containers@lists.linux-foundation.org
<https://lists.linux-foundation.org/mailman/listinfo/containers>
