Subject: [PATCH v3 05/28] memcg: Reclaim when more than one page needed.
Posted by Glauber Costa on Fri, 25 May 2012 13:03:25 GMT
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From: Suleiman Souhlal <ssouhlal@FreeBSD.org>

mem_cgroup_do_charge() was written before slab accounting, and expects
three cases: being called for 1 page, being called for a stock of 32 pages,
or being called for a hugepage. If we call for 2 pages (and several slabs
used in process creation are such, at least with the debug options I had),
it assumed it's being called for stock and just retried without reclaiming.

Fix that by passing down a minsize argument in addition to the csize.

And what to do about that (csize == PAGE_SIZE && ret) retry? If it's
needed at all (and presumably is since it's there, perhaps to handle
races), then it should be extended to more than PAGE_SIZE, yet how far?
And should there be a retry count limit, of what? For now retry up to
COSTLY_ORDER (as page_alloc.c does), stay safe with a cond_resched(),
and make sure not to do it if __GFP_NORETRY.

Signed-off-by: Suleiman Souhlal <suleiman@google.com>
Signed-off-by: Glauber Costa <glommer@parallels.com>
Reviewed-by: Kamezawa Hiroyuki <kamezawa.hiroyu@jp.fujitsu.com>
---
 mm/memcontrol.c | 18 ++++++++++-------
 1 files changed, 11 insertions(+), 7 deletions(-)

diff --git a/mm/memcontrol.c b/mm/memcontrol.c
index 248d80b..47d3979 100644
--- a/mm/memcontrol.c
+++ b/mm/memcontrol.c
@@ -2187,7 +2187,8 @@ enum {
 };

 static int mem_cgroup_do_charge(struct mem_cgroup *memcg, gfp_t gfp_mask,
-    unsigned int nr_pages, bool oom_check)
+   unsigned int nr_pages, unsigned int min_pages,
+   bool oom_check)
 {
  unsigned long csize = nr_pages * PAGE_SIZE;
  struct mem_cgroup *mem_over_limit;
@@ -2210,18 +2211,18 @@ static int mem_cgroup_do_charge(struct mem_cgroup *memcg,
gfp_t gfp_mask,
  } else
   mem_over_limit = mem_cgroup_from_res_counter(fail_res, res);
  /*
- * nr_pages can be either a huge page (HPAGE_PMD_NR), a batch

```
-  * of regular pages (CHARGE_BATCH), or a single regular page (1).
-  *
   * Never reclaim on behalf of optional batching, retry with a
   * single page instead.
   */
- if (nr_pages == CHARGE_BATCH)
+ if (nr_pages > min_pages)
   return CHARGE_RETRY;

  if (!(gfp_mask & __GFP_WAIT))
   return CHARGE_WOULDBLOCK;

+ if (gfp_mask & __GFP_NORETRY)
+  return CHARGE_NOMEM;
+
  ret = mem_cgroup_reclaim(mem_over_limit, gfp_mask, flags);
  if (mem_cgroup_margin(mem_over_limit) >= nr_pages)
   return CHARGE_RETRY;
@@ -2234,8 +2235,10 @@ static int mem_cgroup_do_charge(struct mem_cgroup *memcg, gfp_t
gfp_mask,
   * unlikely to succeed so close to the limit, and we fall back
   * to regular pages anyway in case of failure.
   */
- if (nr_pages == 1 && ret)
+ if (nr_pages <= (PAGE_SIZE << PAGE_ALLOC_COSTLY_ORDER) && ret) {
+  cond_resched();
   return CHARGE_RETRY;
+ }

  /*
   * At task move, charge accounts can be doubly counted. So, it's
@@ -2369,7 +2372,8 @@ again:
    nr_oom_retries = MEM_CGROUP_RECLAIM_RETRIES;
   }

-  ret = mem_cgroup_do_charge(memcg, gfp_mask, batch, oom_check);
+  ret = mem_cgroup_do_charge(memcg, gfp_mask, batch, nr_pages,
+      oom_check);
   switch (ret) {
   case CHARGE_OK:
    break;
--
1.7.7.6
```

Subject: Re: [PATCH v3 05/28] memcg: Reclaim when more than one page needed.

Posted by Christoph Lameter on Tue, 29 May 2012 14:19:02 GMT
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On Fri, 25 May 2012, Glauber Costa wrote:

> From: Suleiman Souhlal <ssouhlal@FreeBSD.org>
>
> mem_cgroup_do_charge() was written before slab accounting, and expects
> three cases: being called for 1 page, being called for a stock of 32 pages,
> or being called for a hugepage. If we call for 2 pages (and several slabs
> used in process creation are such, at least with the debug options I had),
> it assumed it's being called for stock and just retried without reclaiming.

Slab pages are allocated up to order 3 (PAGE_ALLOC_COSTLY_ORDER). That is
8 pages.

>   * unlikely to succeed so close to the limit, and we fall back
>   * to regular pages anyway in case of failure.
>   */
> - if (nr_pages == 1 && ret)
> + if (nr_pages <= (PAGE_SIZE << PAGE_ALLOC_COSTLY_ORDER) && ret) {
> + cond_resched();
>   return CHARGE_RETRY;
> + }
>
>   /*
>   * At task move, charge accounts can be doubly counted. So, it's

Ok. That looks correct.

Subject: Re: [PATCH v3 05/28] memcg: Reclaim when more than one page needed.
Posted by Christoph Lameter on Tue, 29 May 2012 14:20:16 GMT
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On Tue, 29 May 2012, Christoph Lameter wrote:

> >   * unlikely to succeed so close to the limit, and we fall back
> >   * to regular pages anyway in case of failure.
> >   */
> > - if (nr_pages == 1 && ret)
> > + if (nr_pages <= (PAGE_SIZE << PAGE_ALLOC_COSTLY_ORDER) && ret) {

Should this not be

  nr_pages <= 1 << PAGE_ALLOC_COSTLY_ORDER

Subject: Re: [PATCH v3 05/28] memcg: Reclaim when more than one page needed.
Posted by Glauber Costa on Tue, 29 May 2012 15:45:42 GMT
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On 05/29/2012 06:20 PM, Christoph Lameter wrote:
> On Tue, 29 May 2012, Christoph Lameter wrote:
>
>>> * unlikely to succeed so close to the limit, and we fall back
>>> * to regular pages anyway in case of failure.
>>> */
>>> - if (nr_pages == 1&& ret)
>>> + if (nr_pages<= (PAGE_SIZE<< PAGE_ALLOC_COSTLY_ORDER)&& ret) {
>
> Should this not be
>
> nr_pages<= 1<< PAGE_ALLOC_COSTLY_ORDER

I myself believe you are right.

Not sure if Suleiman had anything in mind that we're not seeing when he wrote this code?