Subject: [PATCH 02/11] memcg: Reclaim when more than one page needed.
Posted by Glauber Costa on Mon, 25 Jun 2012 14:15:19 GMT
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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 or 3 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.

[v4: fixed nr pages calculation pointed out by Christoph Lameter]

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---
 mm/memcontrol.c | 23 ++++++++++++++++++-------
 1 file changed, 16 insertions(+), 7 deletions(-)

diff --git a/mm/memcontrol.c b/mm/memcontrol.c
index 9304db2..8e601e8 100644
--- a/mm/memcontrol.c
+++ b/mm/memcontrol.c
@@ -2158,8 +2158,16 @@ enum {
  CHARGE_OOM_DIE, /* the current is killed because of OOM */
 };

+/*
+ * We need a number that is small enough to be likely to have been
+ * reclaimed even under pressure, but not too big to trigger unnecessary
+ * retries
+ */
+#define NR_PAGES_TO_RETRY 2
+
 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;
@@ -2182,18 +2190,18 @@ 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;
@@ -2206,7 +2214,7 @@ 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 <= NR_PAGES_TO_RETRY && ret)
   return CHARGE_RETRY;

  /*
@@ -2341,7 +2349,8 @@ 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;
```

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1.7.10.2