
Subject: [PATCH 2/4] BIO tracking take2
Posted by [Hirokazu Takahashi](#) on Tue, 20 May 2008 12:02:37 GMT
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Hi,

This patch is for cleaning up the code of the cgroup memory subsystem to remove a lot of "#ifdef"s.

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```
diff -dpr linux-2.6.26-rc2.cg1/mm/memcontrol.c linux-2.6.26-rc2/mm/memcontrol.c
--- linux-2.6.26-rc2.cg1/mm/memcontrol.c 2008-05-19 12:33:32.000000000 +0900
+++ linux-2.6.26-rc2/mm/memcontrol.c 2008-05-19 12:34:16.000000000 +0900
@@ -228,6 +228,47 @@ struct mem_cgroup *mem_cgroup_from_task(
    struct mem_cgroup, css);
}

+static inline void get_mem_cgroup(struct mem_cgroup *mem)
+{
+ css_get(&mem->css);
+}
+
+static inline void put_mem_cgroup(struct mem_cgroup *mem)
+{
+ css_put(&mem->css);
+}
+
+static inline void set_mem_cgroup(struct page_cgroup *pc,
+                     struct mem_cgroup *mem)
+{
+ pc->mem_cgroup = mem;
+}
+
+static inline void clear_mem_cgroup(struct page_cgroup *pc)
+{
+ struct mem_cgroup *mem = pc->mem_cgroup;
+ res_counter_uncharge(&mem->res, PAGE_SIZE);
+ pc->mem_cgroup = NULL;
+ put_mem_cgroup(mem);
+}
+
+static inline struct mem_cgroup *get_mem_page_cgroup(struct page_cgroup *pc)
+{
+ struct mem_cgroup *mem = pc->mem_cgroup;
+ css_get(&mem->css);
```

```

+ return mem;
+}
+
+/* This could be called in an RCU-protected section. */
+static inline struct mem_cgroup *mm_get_mem_cgroup(struct mm_struct *mm)
+{
+ struct mem_cgroup *mem;
+
+ mem = mem_cgroup_from_task(rcu_dereference(mm->owner));
+ get_mem_cgroup(mem);
+ return mem;
+}
+
static void __mem_cgroup_remove_list(struct mem_cgroup_per_zone *mz,
    struct page_cgroup *pc)
{
@@ -278,6 +319,26 @@ static void __mem_cgroup_move_lists(stru
}
}

+static inline void mem_cgroup_add_page(struct page_cgroup *pc)
+{
+ struct mem_cgroup_per_zone *mz = page_cgroup_zoneinfo(pc);
+ unsigned long flags;
+
+ spin_lock_irqsave(&mz->lru_lock, flags);
+ __mem_cgroup_add_list(mz, pc);
+ spin_unlock_irqrestore(&mz->lru_lock, flags);
+}
+
+static inline void mem_cgroup_remove_page(struct page_cgroup *pc)
+{
+ struct mem_cgroup_per_zone *mz = page_cgroup_zoneinfo(pc);
+ unsigned long flags;
+
+ spin_lock_irqsave(&mz->lru_lock, flags);
+ __mem_cgroup_remove_list(mz, pc);
+ spin_unlock_irqrestore(&mz->lru_lock, flags);
+}
+
int task_in_mem_cgroup(struct task_struct *task, const struct mem_cgroup *mem)
{
    int ret;
@@ -317,6 +378,36 @@ void mem_cgroup_move_lists(struct page *
    unlock_page_cgroup(page);
}

+static inline int mem_cgroup_try_to_allocate(struct mem_cgroup *mem,

```

```

+     gfp_t gfp_mask)
+{
+ unsigned long nr_retries = MEM_CGROUP_RECLAIM_RETRIES;
+
+ while (res_counter_charge(&mem->res, PAGE_SIZE)) {
+ if (!(gfp_mask & __GFP_WAIT))
+ return -1;
+
+ if (try_to_free_mem_cgroup_pages(mem, gfp_mask))
+ continue;
+
+ /*
+ * try_to_free_mem_cgroup_pages() might not give us a full
+ * picture of reclaim. Some pages are reclaimed and might be
+ * moved to swap cache or just unmapped from the cgroup.
+ * Check the limit again to see if the reclaim reduced the
+ * current usage of the cgroup before giving up
+ */
+ if (res_counter_check_under_limit(&mem->res))
+ continue;
+
+ if (!nr_retries--) {
+ mem_cgroup_out_of_memory(mem, gfp_mask);
+ return -1;
+ }
+ }
+ return 0;
+}
+
/*
 * Calculate mapped_ratio under memory controller. This will be used in
 * vmscan.c for determining we have to reclaim mapped pages.
@@ -517,7 +608,7 @@ static int mem_cgroup_force_empty(struct
if (mem_cgroup_disabled())
return 0;

- css_get(&mem->css);
+ get_mem_cgroup(mem);
/*
 * page reclaim code (kswapd etc..) will move pages between
 * active_list <-> inactive_list while we don't take a lock.
@@ -538,7 +629,7 @@ static int mem_cgroup_force_empty(struct
}
ret = 0;
out:
- css_put(&mem->css);
+ put_mem_cgroup(mem);
return ret;

```

```

}

@@ -825,10 +916,37 @@ struct cgroup_subsys mem_cgroup_subsys =


#else /* CONFIG_CGROUP_MEM_RES_CTLR */

+struct mem_cgroup;
+
+ static inline int mem_cgroup_disabled(void)
{
    return 1;
}
+
+static inline void mem_cgroup_add_page(struct page_cgroup *pc) {}
+static inline void mem_cgroup_remove_page(struct page_cgroup *pc) {}
+static inline void get_mem_cgroup(struct mem_cgroup *mem) {}
+static inline void put_mem_cgroup(struct mem_cgroup *mem) {}
+static inline void set_mem_cgroup(struct page_cgroup *pc,
+    struct mem_cgroup *mem) {}
+static inline void clear_mem_cgroup(struct page_cgroup *pc) {}
+
+static inline struct mem_cgroup *get_mem_page_cgroup(struct page_cgroup *pc)
+{
+    return NULL;
}
+
+static inline struct mem_cgroup *mm_get_mem_cgroup(struct mm_struct *mm)
+{
+    return NULL;
}
+
+static inline int mem_cgroup_try_to_allocate(struct mem_cgroup *mem,
+    gfp_t gfp_mask)
+{
+    return 0;
}
+
#endif /* CONFIG_CGROUP_MEM_RES_CTLR */

static inline int page_cgroup_locked(struct page *page)
@@ -863,12 +981,7 @@ static int mem_cgroup_charge_common(stru
    struct mem_cgroup *memcg)
{
    struct page_cgroup *pc;
-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
    struct mem_cgroup *mem;
    - unsigned long flags;
    - unsigned long nr_retries = MEM_CGROUP_RECLAIM_RETRIES;

```

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- struct mem_cgroup_per_zone *mz;
-#endif /* CONFIG_CGROUP_MEM_RES_CTLR */

if (mem_cgroup_disabled())
    return 0;
@@ -912,50 +1025,18 @@ retry:
    mm = &init_mm;

    rcu_read_lock();
-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
-    mem = mem_cgroup_from_task(rcu_dereference(mm->owner));
-    /*
-     * For every charge from the cgroup, increment reference count
-     */
-    css_get(&mem->css);
-#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+    mem = mm_get_mem_cgroup(mm);
    rcu_read_unlock();
} else {
-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
    mem = memcg;
-    css_get(&memcg->css);
-#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+    get_mem_cgroup(mem);
}

-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
-    while (res_counter_charge(&mem->res, PAGE_SIZE)) {
-        if (!(gfp_mask & __GFP_WAIT))
-            goto out;
-
-        if (try_to_free_mem_cgroup_pages(mem, gfp_mask))
-            continue;
-
-        /*
-         * try_to_free_mem_cgroup_pages() might not give us a full
-         * picture of reclaim. Some pages are reclaimed and might be
-         * moved to swap cache or just unmapped from the cgroup.
-         * Check the limit again to see if the reclaim reduced the
-         * current usage of the cgroup before giving up
-        */
-        if (res_counter_check_under_limit(&mem->res))
-            continue;
-
-        if (!nr_retries--) {
-            mem_cgroup_out_of_memory(mem, gfp_mask);
-            goto out;
-        }
-
```

```

- }
#ifndef CONFIG_CGROUP_MEM_RES_CTLR
+ if (mem_cgroup_try_to_allocate(mem, gfp_mask) < 0)
+ goto out;

pc->ref_cnt = 1;
#ifndef CONFIG_CGROUP_MEM_RES_CTLR
- pc->mem_cgroup = mem;
#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+ set_mem_cgroup(pc, mem);
pc->page = page;
/*
 * If a page is accounted as a page cache, insert to inactive list.
@@ -974,29 +1055,19 @@ retry:
 * We take lock_page_cgroup(page) again and read
 * page->cgroup, increment refcnt.... just retry is OK.
 */
#ifndef CONFIG_CGROUP_MEM_RES_CTLR
- res_counter_uncharge(&mem->res, PAGE_SIZE);
- css_put(&mem->css);
#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+ clear_mem_cgroup(pc);
kmem_cache_free(page_cgroup_cache, pc);
goto retry;
}
page_assign_page_cgroup(page, pc);

#ifndef CONFIG_CGROUP_MEM_RES_CTLR
- mz = page_cgroup_zoneinfo(pc);
- spin_lock_irqsave(&mz->lru_lock, flags);
- __mem_cgroup_add_list(mz, pc);
- spin_unlock_irqrestore(&mz->lru_lock, flags);
#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+ mem_cgroup_add_page(pc);

unlock_page_cgroup(page);
done:
return 0;
out:
#ifndef CONFIG_CGROUP_MEM_RES_CTLR
- css_put(&mem->css);
#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+ put_mem_cgroup(mem);
kmem_cache_free(page_cgroup_cache, pc);
err:
return -ENOMEM;
@@ -1039,11 +1110,6 @@ int mem_cgroup_getref(struct page *page)
void mem_cgroup_uncharge_page(struct page *page)

```

```

{
    struct page_cgroup *pc;
-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
-    struct mem_cgroup *mem;
-    struct mem_cgroup_per_zone *mz;
-    unsigned long flags;
-#endif /* CONFIG_CGROUP_MEM_RES_CTLR */

    if (mem_cgroup_disabled())
        return;
@@ -1060,21 +1126,12 @@ void mem_cgroup_uncharge_page(struct pag
    VM_BUG_ON(pc->ref_cnt <= 0);

    if (--(pc->ref_cnt) == 0) {
-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
-        mz = page_cgroup_zoneinfo(pc);
-        spin_lock_irqsave(&mz->lru_lock, flags);
-        __mem_cgroup_remove_list(mz, pc);
-        spin_unlock_irqrestore(&mz->lru_lock, flags);
-#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+        mem_cgroup_remove_page(pc);

        page_assign_page_cgroup(page, NULL);
        unlock_page_cgroup(page);

-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
-        mem = pc->mem_cgroup;
-        res_counter_uncharge(&mem->res, PAGE_SIZE);
-        css_put(&mem->css);
-#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+        clear_mem_cgroup(pc);

        kmem_cache_free(page_cgroup_cache, pc);
        return;
@@ -1100,10 +1157,7 @@ int mem_cgroup_prepare_migration(struct
    lock_page_cgroup(page);
    pc = page_get_page_cgroup(page);
    if (pc) {
-#ifdef CONFIG_CGROUP_MEM_RES_CTLR
-        mem = pc->mem_cgroup;
-        css_get(&mem->css);
-#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+        mem = get_mem_page_cgroup(pc);
        if (pc->flags & PAGE_CGROUP_FLAG_CACHE)
            ctype = MEM_CGROUP_CHARGE_TYPE_CACHE;
    }
@@ -1111,9 +1165,7 @@ int mem_cgroup_prepare_migration(struct
    if (mem) {

```

```
ret = mem_cgroup_charge_common(newpage, NULL, GFP_KERNEL,
    ctype, mem);
#ifndef CONFIG_CGROUP_MEM_RES_CTLR
- css_put(&mem->css);
#endif /* CONFIG_CGROUP_MEM_RES_CTLR */
+ put_mem_cgroup(mem);
}
return ret;
}
```

Containers mailing list

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