
Subject: [PATCH 24/33] memory controller accounting setup v7
Posted by [Paul Menage](#) on Mon, 17 Sep 2007 21:03:31 GMT
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From: Pavel Emelianov <xemul@openvz.org>
(container->cgroup renaming by Paul Menage <menage@google.com>)

Basic setup routines, the mm_struct has a pointer to the cgroup that it belongs to and the page has a page_cgroup associated with it.

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```
include/linux/memcontrol.h | 36 ++++++
include/linux/mm_types.h   |  6 +++
include/linux/sched.h      |  1
kernel/fork.c              | 11 +++++-
mm/memcontrol.c            | 57 ++++++
5 files changed, 104 insertions(+), 7 deletions(-)
```

diff -puN include/linux/memcontrol.h~memory-controller-accounting-setup-v7

include/linux/memcontrol.h

--- a/include/linux/memcontrol.h~memory-controller-accounting-setup-v7

+++ a/include/linux/memcontrol.h

@@ -3,6 +3,9 @@

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*

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@@ -17,5 +20,38 @@

#ifndef _LINUX_MEMCONTROL_H

#define _LINUX_MEMCONTROL_H

+struct mem_cgroup;

+struct page_cgroup;

+

+#ifdef CONFIG_CGROUP_MEM_CONT

+

+extern void mm_init_cgroup(struct mm_struct *mm, struct task_struct *p);

+extern void mm_free_cgroup(struct mm_struct *mm);

+extern void page_assign_page_cgroup(struct page *page,

```

+ struct page_cgroup *pc);
+extern struct page_cgroup *page_get_page_cgroup(struct page *page);
+
+##else /* CONFIG_CGROUP_MEM_CONT */
+static inline void mm_init_cgroup(struct mm_struct *mm,
+ struct task_struct *p)
+{
+}
+
+static inline void mm_free_cgroup(struct mm_struct *mm)
+{
+}
+
+static inline void page_assign_page_cgroup(struct page *page,
+ struct page_cgroup *pc)
+{
+}
+
+static inline struct page_cgroup *page_get_page_cgroup(struct page *page)
+{
+ return NULL;
+}
+
+##endif /* CONFIG_CGROUP_MEM_CONT */
+
+##endif /* _LINUX_MEMCONTROL_H */

```

diff -puN include/linux/mm_types.h~memory-controller-accounting-setup-v7

include/linux/mm_types.h

--- a/include/linux/mm_types.h~memory-controller-accounting-setup-v7

+++ a/include/linux/mm_types.h

```

@@ -83,6 +83,9 @@ struct page {
+ void *virtual; /* Kernel virtual address (NULL if
+ not kmapped, ie. highmem) */
+##endif /* WANT_PAGE_VIRTUAL */
+##ifdef CONFIG_CGROUP_MEM_CONT
+ unsigned long page_cgroup;
+##endif
+};

```

```

/*
@@ -214,6 +217,9 @@ struct mm_struct {
+ /* aio bits */
+ rwlock_t ioctx_list_lock;
+ struct kiocx *ioctx_list;
+##ifdef CONFIG_CGROUP_MEM_CONT
+ struct mem_cgroup *mem_cgroup;
+##endif

```

```

};

#endif /* _LINUX_MM_TYPES_H */
diff -puN include/linux/sched.h~memory-controller-accounting-setup-v7 include/linux/sched.h
--- a/include/linux/sched.h~memory-controller-accounting-setup-v7
+++ a/include/linux/sched.h
@@ -88,6 +88,7 @@ struct sched_param {

#include <asm/processor.h>

+struct mem_cgroup;
+struct exec_domain;
+struct futex_pi_state;
+struct bio;
diff -puN kernel/fork.c~memory-controller-accounting-setup-v7 kernel/fork.c
--- a/kernel/fork.c~memory-controller-accounting-setup-v7
+++ a/kernel/fork.c
@@ -51,6 +51,7 @@
#include <linux/random.h>
#include <linux/tty.h>
#include <linux/proc_fs.h>
+#include <linux/memcontrol.h>

#include <asm/pgtable.h>
#include <asm/pgalloc.h>
@@ -329,7 +330,7 @@ __cacheline_aligned_in_smp DEFINE_SPINLO

#include <linux/init_task.h>

-static struct mm_struct * mm_init(struct mm_struct * mm)
+static struct mm_struct * mm_init(struct mm_struct * mm, struct task_struct *p)
{
    atomic_set(&mm->mm_users, 1);
    atomic_set(&mm->mm_count, 1);
@@ -346,11 +347,14 @@ static struct mm_struct * mm_init(struct
    mm->iocx_list = NULL;
    mm->free_area_cache = TASK_UNMAPPED_BASE;
    mm->cached_hole_size = ~0UL;
+ mm_init_cgroup(mm, p);

    if (likely(!mm_alloc_pgdp(mm))) {
        mm->def_flags = 0;
        return mm;
    }
+
+ mm_free_cgroup(mm);
    free_mm(mm);
    return NULL;

```

```

}
@@ -365,7 +369,7 @@ struct mm_struct * mm_alloc(void)
    mm = allocate_mm();
    if (mm) {
        memset(mm, 0, sizeof(*mm));
- mm = mm_init(mm);
+ mm = mm_init(mm, current);
    }
    return mm;
}
@@ -379,6 +383,7 @@ void fastcall __mmdrop(struct mm_struct
{
    BUG_ON(mm == &init_mm);
    mm_free_pgd(mm);
+ mm_free_cgroup(mm);
    destroy_context(mm);
    free_mm(mm);
}
@@ -499,7 +504,7 @@ static struct mm_struct *dup_mm(struct t
    mm->token_priority = 0;
    mm->last_interval = 0;

- if (!mm_init(mm))
+ if (!mm_init(mm, tsk))
    goto fail_nomem;

    if (init_new_context(tsk, mm))
diff -puN mm/memcontrol.c~memory-controller-accounting-setup-v7 mm/memcontrol.c
--- a/mm/memcontrol.c~memory-controller-accounting-setup-v7
+++ a/mm/memcontrol.c
@@ -3,6 +3,9 @@
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+ * Author: Pavel Emelianov <xemul@openvz.org>
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 * it under the terms of the GNU General Public License as published by
 * the Free Software Foundation; either version 2 of the License, or
@@ -17,6 +20,7 @@
#include <linux/res_counter.h>
#include <linux/memcontrol.h>
#include <linux/cgroup.h>
+#include <linux/mm.h>

struct cgroup_subsys mem_cgroup_subsys;

```

```

@@ -35,6 +39,13 @@ struct mem_cgroup {
    * the counter to account for memory usage
    */
    struct res_counter res;
+ /*
+  * Per cgroup active and inactive list, similar to the
+  * per zone LRU lists.
+  * TODO: Consider making these lists per zone
+  */
+ struct list_head active_list;
+ struct list_head inactive_list;
};

/*
@@ -56,6 +67,37 @@ struct mem_cgroup *mem_cgroup_from
    css);
}

+static inline
+struct mem_cgroup *mem_cgroup_from_task(struct task_struct *p)
+{
+ return container_of(task_subsys_state(p, mem_cgroup_subsys_id),
+ struct mem_cgroup, css);
+}
+
+void mm_init_cgroup(struct mm_struct *mm, struct task_struct *p)
+{
+ struct mem_cgroup *mem;
+
+ mem = mem_cgroup_from_task(p);
+ css_get(&mem->css);
+ mm->mem_cgroup = mem;
+}
+
+void mm_free_cgroup(struct mm_struct *mm)
+{
+ css_put(&mm->mem_cgroup->css);
+}
+
+void page_assign_page_cgroup(struct page *page, struct page_cgroup *pc)
+{
+ page->page_cgroup = (unsigned long)pc;
+}
+
+struct page_cgroup *page_get_page_cgroup(struct page *page)
+{
+ return page->page_cgroup;
+}

```

```

+
static ssize_t mem_cgroup_read(struct cgroup *cont, struct cftype *cft,
    struct file *file, char __user *userbuf, size_t nbytes,
    loff_t *ppos)
@@ -91,14 +133,21 @@ static struct cftype mem_cgroup_files
},
};

+static struct mem_cgroup init_mem_cgroup;
+
static struct cgroup_subsys_state *
mem_cgroup_create(struct cgroup_subsys *ss, struct cgroup *cont)
{
    struct mem_cgroup *mem;

- mem = kzalloc(sizeof(struct mem_cgroup), GFP_KERNEL);
- if (!mem)
-     return -ENOMEM;
+ if (unlikely((cont->parent) == NULL)) {
+     mem = &init_mem_cgroup;
+     init_mm.mem_cgroup = mem;
+ } else
+     mem = kzalloc(sizeof(struct mem_cgroup), GFP_KERNEL);
+
+ if (mem == NULL)
+     return NULL;

    res_counter_init(&mem->res);
    return &mem->css;
@@ -123,5 +172,5 @@ struct cgroup_subsys mem_cgroup_su
    .create = mem_cgroup_create,
    .destroy = mem_cgroup_destroy,
    .populate = mem_cgroup_populate,
- .early_init = 0,
+ .early_init = 1,
};

-
--

```

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