
Subject: [-mm PATCH 3/7] Memory controller accounting setup

Posted by [Balbir Singh](#) on Wed, 04 Jul 2007 22:21:49 GMT

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

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```
include/linux/memcontrol.h | 32 ++++++-----+
include/linux/mm_types.h  |  4 +++
include/linux/sched.h    |  4 +++
kernel/fork.c           | 10 ++++++-
mm/memcontrol.c         | 47 ++++++-----+
5 files changed, 91 insertions(+), 6 deletions(-)
```

```
diff -puN include/linux/memcontrol.h~mem-control-accounting-setup include/linux/memcontrol.h
--- linux-2.6.22-rc6/include/linux/memcontrol.h~mem-control-accounting-setup 2007-07-04
15:05:24.000000000 -0700
+++ linux-2.6.22-rc6-balbir/include/linux/memcontrol.h 2007-07-04 15:05:24.000000000 -0700
@@ -15,5 +15,37 @@
#ifndef _LINUX_MEMCONTROL_H
#define _LINUX_MEMCONTROL_H

+struct mem_container;
+struct meta_page;
+
+#
+#ifdef CONFIG_CONTAINER_MEM_CONT
+
+extern void mm_init_container(struct mm_struct *mm, struct task_struct *p);
+extern void mm_free_container(struct mm_struct *mm);
+extern void page_assign_meta_page(struct page *page, struct meta_page *mp);
+extern struct meta_page *page_get_meta_page(struct page *page);
+
+#
+#else /* CONFIG_CONTAINER_MEM_CONT */
+static inline void mm_init_container(struct mm_struct *mm,
+        struct task_struct *p)
+{
+}
+
+static inline void mm_free_container(struct mm_struct *mm)
+{
+}
+
+static inline void page_assign_meta_page(struct page *page,
+        struct meta_page *mp)
```

```

+{
+}
+
+static inline struct meta_page *page_get_meta_page(struct page *page)
+{
+    return NULL;
+}
+
+#endif /* CONFIG_CONTAINER_MEM_CONT */
+
#endif /* _LINUX_MEMCONTROL_H */

diff -puN include/linux/mm_types.h~mem-control-accounting-setup include/linux/mm_types.h
--- linux-2.6.22-rc6/include/linux/mm_types.h~mem-control-accounting-setup 2007-07-04
15:05:24.000000000 -0700
+++ linux-2.6.22-rc6-balbir/include/linux/mm_types.h 2007-07-04 15:05:24.000000000 -0700
@@ -5,6 +5,7 @@
#include <linux/thread.h>
#include <linux/list.h>
#include <linux/spinlock.h>
+#include <linux/memcontrol.h>

struct address_space;

@@ -83,6 +84,9 @@ struct page {
    unsigned int gfp_mask;
    unsigned long trace[8];
#endif
+#ifdef CONFIG_CONTAINER_MEM_CONT
+    struct meta_page *meta_page;
#endif
};

#endif /* _LINUX_MM_TYPES_H */
diff -puN include/linux/sched.h~mem-control-accounting-setup include/linux/sched.h
--- linux-2.6.22-rc6/include/linux/sched.h~mem-control-accounting-setup 2007-07-04
15:05:24.000000000 -0700
+++ linux-2.6.22-rc6-balbir/include/linux/sched.h 2007-07-04 15:05:24.000000000 -0700
@@ -87,6 +87,7 @@ struct sched_param {
#include <linux/timer.h>
#include <linux/hrtimer.h>
#include <linux/task_io_accounting.h>
+#include <linux/memcontrol.h>

#include <asm/processor.h>

@@ -416,6 +417,9 @@ struct mm_struct {
/* aio bits */

```

```

rwlock_t ioctx_list_lock;
struct ioctx *ioctx_list;
#ifndef CONFIG_CONTAINER_MEM_CONT
+ struct mem_container *mem_container;
#endif
};

struct sighand_struct {
diff -puN kernel/fork.c~mem-control-accounting-setup kernel/fork.c
--- linux-2.6.22-rc6/kernel/fork.c~mem-control-accounting-setup 2007-07-04 15:05:24.000000000
-0700
+++ linux-2.6.22-rc6-balbir/kernel/fork.c 2007-07-04 15:05:24.000000000 -0700
@@ -330,7 +330,7 @@ static inline void mm_free_pgd(struct mm

#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);
@@ -347,11 +347,14 @@ static struct mm_struct * mm_init(struct
    mm->ioctx_list = NULL;
    mm->free_area_cache = TASK_UNMAPPED_BASE;
    mm->cached_hole_size = ~0UL;
+ mm_init_container(mm, p);

if (likely(!mm_alloc_pgd(mm))) {
    mm->def_flags = 0;
    return mm;
}
+
+ mm_free_container(mm);
    free_mm(mm);
    return NULL;
}
@@ -366,7 +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;
}
@@ -380,6 +383,7 @@ void fastcall __mmdrop(struct mm_struct
{
    BUG_ON(mm == &init_mm);

```

```

mm_free_pgd(mm);
+ mm_free_container(mm);
destroy_context(mm);
free_mm(mm);
}
@@ -500,7 +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~mem-control-accounting-setup mm/memcontrol.c
--- linux-2.6.22-rc6/mm/memcontrol.c~mem-control-accounting-setup 2007-07-04
15:05:24.000000000 -0700
+++ linux-2.6.22-rc6-balbir/mm/memcontrol.c 2007-07-04 15:05:24.000000000 -0700
@@ -15,6 +15,7 @@
#include <linux/res_counter.h>
#include <linux/memcontrol.h>
#include <linux/container.h>
+#include <linux/mm.h>

struct container_subsys mem_container_subsys;

@@ -33,6 +34,13 @@ struct mem_container {
    * the counter to account for memory usage
    */
    struct res_counter res;
+ /*
+  * Per container 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;
};

/*
@@ -54,6 +62,31 @@ static inline struct mem_container *mem_
css);
}

+void mm_init_container(struct mm_struct *mm, struct task_struct *p)
+{
+ struct mem_container *mem;
+

```

```

+ mem = mem_container_from_cont(task_container(p,
+   mem_container_subsys_id));
+ css_get(&mem->css);
+ mm->mem_container = mem;
+}
+
+void mm_free_container(struct mm_struct *mm)
+{
+ css_put(&mm->mem_container->css);
+}
+
+void page_assign_meta_page(struct page *page, struct meta_page *mp)
+{
+ page->meta_page = mp;
+}
+
+struct meta_page *page_get_meta_page(struct page *page)
+{
+ return page->meta_page;
+}
+
static ssize_t mem_container_read(struct container *cont, struct cftype *cft,
  struct file *file, char __user *userbuf, size_t nbytes,
  loff_t *ppos)
@@ -89,13 +122,21 @@ static struct cftype mem_container_failc
 .read = mem_container_read,
};

+static struct mem_container init_mem_container;
+
static int mem_container_create(struct container_subsys *ss,
  struct container *cont)
{
  struct mem_container *mem;

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

  res_counter_init(&mem->res);

```

```
@@ -137,5 +178,5 @@ struct container_subsys mem_container_su
 .create = mem_container_create,
 .destroy = mem_container_destroy,
 .populate = mem_container_populate,
- .early_init = 0,
+ .early_init = 1,
};

-
```

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