
Subject: [-mm PATCH 3/8] Memory controller accounting setup (v2)

Posted by [Balbir Singh](#) on Fri, 06 Jul 2007 05:21:18 GMT

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

Signed-off-by: Balbir Singh <balbir@linux.vnet.ibm.com>

```
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 2007-07-05
13:45:17.000000000 -0700
```

```
+++ linux-2.6.22-rc6-balbir/include/linux/memcontrol.h 2007-07-05 13:45:17.000000000 -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 2007-07-05
13:45:17.000000000 -0700
+++ linux-2.6.22-rc6-balbir/include/linux/mm_types.h 2007-07-05 13:45:17.000000000 -0700
@@ -5,6 +5,7 @@
#include <linux/threads.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 2007-07-05
13:45:17.000000000 -0700
+++ linux-2.6.22-rc6-balbir/include/linux/sched.h 2007-07-05 13:45:17.000000000 -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 kioctx *ioctx_list;
#ifdef 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 2007-07-05 13:45:17.000000000
-0700
+++ linux-2.6.22-rc6-balbir/kernel/fork.c 2007-07-05 13:45:17.000000000 -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 2007-07-05
13:45:17.000000000 -0700
+++ linux-2.6.22-rc6-balbir/mm/memcontrol.c 2007-07-05 13:45:17.000000000 -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,
};
```

—

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Warm Regards,
Balbir Singh
Linux Technology Center
IBM, ISTL

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