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Subject: [-mm PATCH 7/8] Memory controller OOM handling (v2)

Posted by [Balbir Singh](#) on Fri, 06 Jul 2007 05:22:32 GMT

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Out of memory handling for containers over their limit. A task from the container over limit is chosen using the existing OOM logic and killed.

TODO:

1. As discussed in the OLS BOF session, consider implementing a user space policy for OOM handling.

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

---

```
include/linux/memcontrol.h | 1 +
mm/memcontrol.c            | 1 +
mm/oom_kill.c              | 42 ++++++-----
3 files changed, 40 insertions(+), 4 deletions(-)
```

```
diff -puN include/linux/memcontrol.h~mem-control-out-of-memory include/linux/memcontrol.h
--- linux-2.6.22-rc6/include/linux/memcontrol.h~mem-control-out-of-memory 2007-07-05
18:49:35.000000000 -0700
```

```
+++ linux-2.6.22-rc6-balbir/include/linux/memcontrol.h 2007-07-05 18:49:35.000000000 -0700
```

```
@ @ -33,6 +33,7 @ @ extern unsigned long mem_container_isola
```

```
    int mode, struct zone *z,
    struct mem_container *mem_cont,
    int active);
```

```
+extern void mem_container_out_of_memory(struct mem_container *mem);
```

```
#else /* CONFIG_CONTAINER_MEM_CONT */
```

```
static inline void mm_init_container(struct mm_struct *mm,
```

```
diff -puN mm/memcontrol.c~mem-control-out-of-memory mm/memcontrol.c
```

```
--- linux-2.6.22-rc6/mm/memcontrol.c~mem-control-out-of-memory 2007-07-05
```

```
18:49:35.000000000 -0700
```

```
+++ linux-2.6.22-rc6-balbir/mm/memcontrol.c 2007-07-05 18:49:35.000000000 -0700
```

```
@ @ -266,6 +266,7 @ @ int mem_container_charge(struct page *pa
```

```
    if (res_counter_check_under_limit(&mem->res))
        continue;
```

```
+ mem_container_out_of_memory(mem);
```

```
    goto free_mp;
```

```
}
```

```
diff -puN mm/oom_kill.c~mem-control-out-of-memory mm/oom_kill.c
```

```
--- linux-2.6.22-rc6/mm/oom_kill.c~mem-control-out-of-memory 2007-07-05 18:49:35.000000000
-0700
```

```
+++ linux-2.6.22-rc6-balbir/mm/oom_kill.c 2007-07-05 18:49:35.000000000 -0700
```

```
@ @ -24,6 +24,7 @ @
```

```

#include <linux/cpuset.h>
#include <linux/module.h>
#include <linux/notifier.h>
+#include <linux/memcontrol.h>

int sysctl_panic_on_oom;
/* #define DEBUG */
@@ -47,7 +48,8 @@ int sysctl_panic_on_oom;
 *   of least surprise ... (be careful when you change it)
 */

-unsigned long badness(struct task_struct *p, unsigned long uptime)
+unsigned long badness(struct task_struct *p, unsigned long uptime,
+ struct mem_container *mem)
{
    unsigned long points, cpu_time, run_time, s;
    struct mm_struct *mm;
@@ -60,6 +62,13 @@ unsigned long badness(struct task_struct
    return 0;
}

#ifdef CONFIG_CONTAINER_MEM_CONT
+ if (mem != NULL && mm->mem_container != mem) {
+   task_unlock(p);
+   return 0;
+ }
#endif
+
/*
 * The memory size of the process is the basis for the badness.
 */
@@ -204,7 +213,8 @@ static inline int constrained_alloc(stru
 *
 * (not docbooked, we don't want this one cluttering up the manual)
 */
-static struct task_struct *select_bad_process(unsigned long *ppoints)
+static struct task_struct *select_bad_process(unsigned long *ppoints,
+ struct mem_container *mem)
{
    struct task_struct *g, *p;
    struct task_struct *chosen = NULL;
@@ -258,7 +268,7 @@ static struct task_struct *select_bad_pr
    if (p->oomkilladj == OOM_DISABLE)
        continue;

-   points = badness(p, uptime.tv_sec);
+   points = badness(p, uptime.tv_sec, mem);
    if (points > *ppoints || !chosen) {

```

```

    chosen = p;
    *ppoints = points;
@@ -372,6 +382,30 @@ static int oom_kill_process(struct task_
    return oom_kill_task(p);
}

#ifdef CONFIG_CONTAINER_MEM_CONT
+void mem_container_out_of_memory(struct mem_container *mem)
+{
+ unsigned long points = 0;
+ struct task_struct *p;
+
+ container_lock();
+ rcu_read_lock();
+retry:
+ p = select_bad_process(&points, mem);
+ if (PTR_ERR(p) == -1UL)
+ goto out;
+
+ if (!p)
+ p = current;
+
+ if (oom_kill_process(p, points, "Memory container out of memory"))
+ goto retry;
+out:
+ rcu_read_unlock();
+ container_unlock();
+}
+#endif
+
+static BLOCKING_NOTIFIER_HEAD(oom_notify_list);

int register_oom_notifier(struct notifier_block *nb)
@@ -444,7 +478,7 @@ retry:
    * Rambo mode: Shoot down a process and hope it solves whatever
    * issues we may have.
    */
- p = select_bad_process(&points);
+ p = select_bad_process(&points, NULL);

    if (PTR_ERR(p) == -1UL)
        goto out;
--
Warm Regards,
Balbir Singh
Linux Technology Center

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IBM, ISTL

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Containers mailing list

Containers@lists.linux-foundation.org

<https://lists.linux-foundation.org/mailman/listinfo/containers>

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