
Subject: [PATCH 06/29] task containersv11 add procfs interface
Posted by [Paul Menage](#) on Tue, 11 Sep 2007 19:52:45 GMT
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Add:

/proc/cgroups - general system info

/proc/*/cgroup - per-task cgroup membership info

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```
fs/proc/base.c      |  7 +
include/linux/cgroup.h |  2
kernel/cgroup.c     | 132 ++++++++++++++++++++++++++++++++
3 files changed, 141 insertions(+)
```

```
diff -puN fs/proc/base.c~task-cgroupsv11-add-procfs-interface fs/proc/base.c
--- a/fs/proc/base.c~task-cgroupsv11-add-procfs-interface
+++ a/fs/proc/base.c
@@ -67,6 +67,7 @@
 #include <linux/mount.h>
 #include <linux/security.h>
 #include <linux/ptrace.h>
+#include <linux/cgroup.h>
 #include <linux/cpuset.h>
 #include <linux/audit.h>
 #include <linux/poll.h>
@@ -2051,6 +2052,9 @@ static const struct pid_entry tgid_base_
 #ifdef CONFIG_CPUSETS
 REG("cpuset", S_IRUGO, cpuset),
#endif
+#ifdef CONFIG_CGROUPS
+REG("cgroup", S_IRUGO, cgroup),
#endif
```

```

INF("oom_score", S_IRUGO, oom_score),
REG("oom_adj", S_IRUGO|S_IWUSR, oom_adjust),
#endif CONFIG_AUDITSYSCALL
@@ -2340,6 +2344,9 @@ static const struct pid_entry tid_base_s
#endif CONFIG_CPUSETS
REG("cpuset", S_IRUGO, cpuset),
#endif
+##ifdef CONFIG_CGROUPS
+ REG("cgroup", S_IRUGO, cgroup),
+##endif
INF("oom_score", S_IRUGO, oom_score),
REG("oom_adj", S_IRUGO|S_IWUSR, oom_adjust),
#endif CONFIG_AUDITSYSCALL
diff -puN include/linux/cgroup.h~task-cgroups11-add-procfs-interface include/linux/cgroup.h
--- a/include/linux/cgroup.h~task-cgroups11-add-procfs-interface
+++ a/include/linux/cgroup.h
@@ -29,6 +29,8 @@ extern void cgroup_fork(struct task_s
extern void cgroup_fork_callbacks(struct task_struct *p);
extern void cgroup_exit(struct task_struct *p, int run_callbacks);

+extern struct file_operations proc_cgroup_operations;
+
/* Per-subsystem/per-cgroup state maintained by the system. */
struct cgroup_subsys_state {
/* The cgroup that this subsystem is attached to. Useful
diff -puN kernel/cgroup.c~task-cgroups11-add-procfs-interface kernel/cgroup.c
--- a/kernel/cgroup.c~task-cgroups11-add-procfs-interface
+++ a/kernel/cgroup.c
@@ -33,6 +33,7 @@
#include <linux/mutex.h>
#include <linux/mount.h>
#include <linux/pagemap.h>
+##include <linux/proc_fs.h>
#include <linux/rcupdate.h>
#include <linux/sched.h>
#include <linux/seq_file.h>
@@ -247,6 +248,7 @@ static int cgroup_mkdir(struct inode
static int cgroup_rmdir(struct inode *unused_dir, struct dentry *dentry);
static int cgroup_populate_dir(struct cgroup *cont);
static struct inode_operations cgroup_dir_inode_operations;
+static struct file_operations proc_cgroupstats_operations;

static struct inode *cgroup_new_inode(mode_t mode, struct super_block *sb)
{
@@ -1576,6 +1578,7 @@ int __init cgroup_init(void)
{
int err;
int i;

```

```

+ struct proc_dir_entry *entry;

for (i = 0; i < CGROUP_SUBSYS_COUNT; i++) {
    struct cgroup_subsys *ss = subsys[i];
@@ -1587,10 +1590,139 @@ int __init cgroup_init(void)
    if (err < 0)
        goto out;

+ entry = create_proc_entry("cgroups", 0, NULL);
+ if (entry)
+     entry->proc_fops = &proc_cgroupstats_operations;
+
out:
    return err;
}

+/*
+ * proc_cgroup_show()
+ * - Print task's cgroup paths into seq_file, one line for each hierarchy
+ * - Used for /proc/<pid>/cgrou.
+ * - No need to task_lock(tsk) on this tsk->cgroup reference, as it
+ *   doesn't really matter if tsk->cgroup changes after we read it,
+ *   and we take cgroup_mutex, keeping attach_task() from changing it
+ *   anyway. No need to check that tsk->cgroup != NULL, thanks to
+ *   the_top_cgroup_hack in cgroup_exit(), which sets an exiting tasks
+ *   cgroup to top_cgroup.
+ */
+
+/* TODO: Use a proper seq_file iterator */
+static int proc_cgroup_show(struct seq_file *m, void *v)
+{
+    struct pid *pid;
+    struct task_struct *tsk;
+    char *buf;
+    int retval;
+    struct cgroupfs_root *root;
+
+    retval = -ENOMEM;
+    buf = kmalloc(PAGE_SIZE, GFP_KERNEL);
+    if (!buf)
+        goto out;
+
+    retval = -ESRCH;
+    pid = m->private;
+    tsk = get_pid_task(pid, PIDTYPE_PID);
+    if (!tsk)
+        goto out_free;
+

```

```

+ retval = 0;
+
+ mutex_lock(&cgroup_mutex);
+
+ for_each_root(root) {
+ struct cgroup_subsys *ss;
+ struct cgroup *cont;
+ int subsys_id;
+ int count = 0;
+
+ /* Skip this hierarchy if it has no active subsystems */
+ if (!root->actual_subsys_bits)
+ continue;
+ for_each_subsys(root, ss)
+ seq_printf(m, "%s%s", count++ ? "," : "", ss->name);
+ seq_putc(m, ':');
+ get_first_subsys(&root->top_cgroup, NULL, &subsys_id);
+ cont = task_cgroup(tsk, subsys_id);
+ retval = cgroup_path(cont, buf, PAGE_SIZE);
+ if (retval < 0)
+ goto out_unlock;
+ seq_puts(m, buf);
+ seq_putc(m, '\n');
+
+ }
+
+out_unlock:
+ mutex_unlock(&cgroup_mutex);
+ put_task_struct(tsk);
+out_free:
+ kfree(buf);
+out:
+ return retval;
+}
+
+static int cgroup_open(struct inode *inode, struct file *file)
+{
+ struct pid *pid = PROC_I(inode)->pid;
+ return single_open(file, proc_cgroup_show, pid);
+}
+
+struct file_operations proc_cgroup_operations = {
+ .open = cgroup_open,
+ .read = seq_read,
+ .llseek = seq_llseek,
+ .release = single_release,
+};
+
+/* Display information about each subsystem and each hierarchy */

```

```

+static int proc_cgroupstats_show(struct seq_file *m, void *v)
+{
+ int i;
+ struct cgroupfs_root *root;
+
+ mutex_lock(&cgroup_mutex);
+ seq_puts(m, "Hierarchies:\n");
+ for_each_root(root) {
+ struct cgroup_subsys *ss;
+ int first = 1;
+ seq_printf(m, "%p: bits=%lx cgroups=%d (", root,
+ root->subsys_bits, root->number_of_cgroups);
+ for_each_subsys(root, ss) {
+ seq_printf(m, "%s%s", first ? "" : ", ", ss->name);
+ first = false;
+ }
+ seq_putc(m, ')');
+ if (root->sb) {
+ seq_printf(m, " s_active=%d",
+ atomic_read(&root->sb->s_active));
+ }
+ seq_putc(m, '\n');
+ }
+ seq_puts(m, "Subsystems:\n");
+ for (i = 0; i < CGROUP_SUBSYS_COUNT; i++) {
+ struct cgroup_subsys *ss = subsys[i];
+ seq_printf(m, "%d: name=%s hierarchy=%p\n",
+ i, ss->name, ss->root);
+ }
+ mutex_unlock(&cgroup_mutex);
+ return 0;
+}
+
+static int cgroupstats_open(struct inode *inode, struct file *file)
+{
+ return single_open(file, proc_cgroupstats_show, 0);
+}
+
+static struct file_operations proc_cgroupstats_operations = {
+ .open = cgroupstats_open,
+ .read = seq_read,
+ .llseek = seq_llseek,
+ .release = single_release,
+};
+
/***
 * cgroup_fork - attach newly forked task to its parents cgroup.
 * @tsk: pointer to task_struct of forking parent process.

```

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Containers mailing list

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