
Subject: [RFC][PATCH 1/1]a new optional function for task assignment to cgroup
Posted by [Kazunaga Ikeno](#) on Wed, 05 Mar 2008 05:41:38 GMT
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This patch provides the function leads a task, corresponding to specified user-id, to a specific cgroup directory.

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Index: linux-2.6.25-rc3-mm1/kernel/sys.c

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=====
--- linux-2.6.25-rc3-mm1.orig/kernel/sys.c 2008-03-04 21:43:11.000000000 +0900
+++ linux-2.6.25-rc3-mm1/kernel/sys.c 2008-03-04 21:55:34.000000000 +0900
@@ -33,6 +33,7 @@
#include <linux/task_io_accounting_ops.h>
#include <linux/seccomp.h>
#include <linux/cpu.h>
+#include <linux/cgroup.h>

#include <linux/compat.h>
#include <linux/syscalls.h>
@@ -644,6 +645,10 @@ asmlinkage long sys_setreuid(uid_t ruid,
    key_fsuid_changed(current);
    proc_id_connector(current, PROC_EVENT_UID);

+ retval = cgroup_attach_by_uid(current);
+ if (retval)
+ return retval;
+
    return security_task_post_setuid(old_ruid, old_euid, old_suid, LSM_SETID_RE);
}

@@ -691,6 +696,10 @@ asmlinkage long sys_setuid(uid_t uid)
    key_fsuid_changed(current);
    proc_id_connector(current, PROC_EVENT_UID);

+ retval = cgroup_attach_by_uid(current);
+ if (retval)
+ return retval;
+
    return security_task_post_setuid(old_ruid, old_euid, old_suid, LSM_SETID_ID);
}

@@ -739,6 +748,10 @@ asmlinkage long sys_setresuid(uid_t ruid
```

```

key_fsuid_changed(current);
proc_id_connector(current, PROC_EVENT_UID);

+ retval = cgroup_attach_by_uid(current);
+ if (retval)
+ return retval;
+
return security_task_post_setuid(old_ruid, old_euid, old_suid, LSM_SETID_RES);
}

```

Index: linux-2.6.25-rc3-mm1/include/linux/cgroup.h

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=====
=====
--- linux-2.6.25-rc3-mm1.orig/include/linux/cgroup.h 2008-03-04 21:43:10.000000000 +0900
+++ linux-2.6.25-rc3-mm1/include/linux/cgroup.h 2008-03-04 21:57:32.000000000 +0900
@@ -30,6 +30,7 @@ extern void cgroup_unlock(void);
extern void cgroup_fork(struct task_struct *p);
extern void cgroup_fork_callbacks(struct task_struct *p);
extern void cgroup_post_fork(struct task_struct *p);
+extern int cgroup_attach_by_uid(struct task_struct *p);
extern void cgroup_exit(struct task_struct *p, int run_callbacks);
extern int cgroupstats_build(struct cgroupstats *stats,
    struct dentry *dentry);
@@ -356,6 +357,7 @@ static inline void cgroup_init_smp(void)
static inline void cgroup_fork(struct task_struct *p) {}
static inline void cgroup_fork_callbacks(struct task_struct *p) {}
static inline void cgroup_post_fork(struct task_struct *p) {}
+static inline int cgroup_attach_by_uid(struct task_struct *p) {}
static inline void cgroup_exit(struct task_struct *p, int callbacks) {}

static inline void cgroup_lock(void) {}

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Index: linux-2.6.25-rc3-mm1/kernel/cgroup.c

```

=====
=====
--- linux-2.6.25-rc3-mm1.orig/kernel/cgroup.c 2008-03-04 21:43:11.000000000 +0900
+++ linux-2.6.25-rc3-mm1/kernel/cgroup.c 2008-03-04 22:02:42.000000000 +0900
@@ -94,6 +94,9 @@ struct cgroupfs_root {
    * notification. We ensure that it's always a valid
    * NUL-terminated string */
    char release_agent_path[PATH_MAX];
+
+ /* A list for the option that leads a task to cgroup */
+ struct list_head leadopt_list;
};

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@@ -177,6 +180,15 @@ struct cg_cgroup_link {
    struct css_set *cg;
};

+/* Link structure for the option that leads a task to cgroup */
+struct leadopt_entry {
+ struct list_head leadopt_link;
+ /* user-id of task to lead */
+ uid_t uid;
+ /* pathname of a cgroup directory */
+ char *pathname;
+};
+
+/* The default css_set - used by init and its children prior to any
+ * hierarchies being mounted. It contains a pointer to the root state
+ * for each subsystem. Also used to anchor the list of css_sets. Not
@@ -854,6 +866,7 @@ static void init_cgroup_root(struct cgr
    struct cgroup *cgrp = &root->top_cgroup;
    INIT_LIST_HEAD(&root->subsys_list);
    INIT_LIST_HEAD(&root->root_list);
+ INIT_LIST_HEAD(&root->leadopt_list);
    root->number_of_cgroups = 1;
    cgrp->root = root;
    cgrp->top_cgroup = cgrp;
@@ -1282,6 +1295,166 @@ static int attach_task_by_pid(struct cgr
    return ret;
}

+/*
+ * Lead a task, corresponding to specified user-id, to a specific
+ * cgroup directory.
+ */
+int cgroup_attach_by_uid(struct task_struct *tsk)
+{
+ struct cgroupfs_root *root;
+ struct list_head *l;
+ struct nameidata nd;
+ int ret = 0;
+ char *cgroup_path;
+
+ mutex_lock(&cgroup_mutex);
+ for_each_root(root) {
+ /* Skip this hierarchy if it has no active subsystems */
+ if (!root->actual_subsys_bits)
+ continue;
+ cgroup_path = 0;
+ l = root->leadopt_list.next;
+ while (l != &root->leadopt_list) {

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+ struct leadopt_entry *link =
+ list_entry(l,
+ struct leadopt_entry, leadopt_link);
+ if (tsk->suid == link->uid)
+ cgroup = link->pathname;
+ else if (!cgroup && (tsk->euid == link->uid))
+ cgroup = link->pathname;
+ l = l->next;
+ }
+ if (cgroup) {
+ ret = path_lookup(cgroup, LOOKUP_DIRECTORY, &nd);
+ if (ret)
+ goto err0;
+ if (nd.path.dentry->d_fsdata == NULL) {
+ ret = -EPERM;
+ goto err1;
+ }
+ ret = cgroup_attach_task(
+ (struct cgroup *) (nd.path.dentry->d_fsdata),
+ tsk);
+ if (ret)
+ goto err1;
+ path_put(&nd.path);
+ }
+ }
+err0:
+ mutex_unlock(&cgroup_mutex);
+ return ret;
+
+err1:
+ path_put(&nd.path);
+ mutex_unlock(&cgroup_mutex);
+ return ret;
+}
+
+static int cgroup_leadopt_file_write(struct cgroupfs_root *root, char *buffer)
+{
+ struct leadopt_entry *link;
+ struct list_head *l;
+ int ret = 1;
+ int erase = 1;
+ char *options, *value, *dirto = NULL;
+ uid_t uid;
+
+ /* parse a command line */
+ while ((options = strsep(&buffer, " ,:")) != NULL) {
+ if (*options == (char)NULL) {
+ continue;

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+ } else if (strcmp(options, "uid") == 0) {
+ while ((value = strsep(&buffer, ",:")) != NULL) {
+ if (*value == (char)NULL)
+ continue;
+ if (sscanf(value, "%d", &uid) != 1)
+ return -EIO;
+ break;
+ }
+ } else if (strcmp(options, "leadto") == 0) {
+ while ((dirto = strsep(&buffer, ",:")) != NULL) {
+ if (*dirto == (char)NULL)
+ continue;
+ erase = 0;
+ break;
+ }
+ }
+ }
+
+ /* Update a list for the option that leads a task to cgroup */
+ l = root->leadopt_list.next;
+ while (l != &root->leadopt_list) {
+ link = list_entry(l, struct leadopt_entry, leadopt_link);
+ if (link->uid == uid) {
+ list_del(&link->leadopt_link);
+ kfree(link->pathname);
+ kfree(link);
+ if (!erase) {
+ link = kmalloc(sizeof(*link), GFP_KERNEL);
+ if (link == NULL) {
+ ret = -ENOMEM;
+ goto err0;
+ }
+ link->uid = uid;
+ /* +1 for nul-terminator */
+ link->pathname = kmalloc((strlen(dirto)+1),
+ GFP_KERNEL);
+ strcpy(link->pathname, dirto);
+ list_add(&link->leadopt_link,
+ &root->leadopt_list);
+ }
+ break;
+ }
+ l = l->next;
+ }
+ if (!erase && (l == &root->leadopt_list)) {
+ link = kmalloc(sizeof(*link), GFP_KERNEL);
+ if (link == NULL) {
+ ret = -ENOMEM;

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+ goto err0;
+ }
+ link->uid = uid;
+ /* +1 for nul-terminator */
+ link->pathname = kmalloc((strlen(dirto)+1), GFP_KERNEL);
+ strcpy(link->pathname, dirto);
+ list_add(&link->leadopt_link, &root->leadopt_list);
+ }
+
+err0:
+ return ret;
+}
+
+static ssize_t cgroup_leadopt_read(struct cgroup *cgrp,
+    struct cftype *cft,
+    struct file *file, char __user *buf,
+    size_t nbytes, loff_t *ppos)
+{
+ char *page;
+ ssize_t retval = 0;
+ struct cgroupfs_root *root = cgrp->root;
+ struct list_head *l;
+ int cnt = 0;
+
+ page = (char *)__get_free_page(GFP_KERNEL);
+ if (!page)
+ return -ENOMEM;
+
+ /* truncate a buffer beyond page size */
+ l = root->leadopt_list.next;
+ while (l != &root->leadopt_list) {
+ struct leadopt_entry *link =
+ list_entry(l, struct leadopt_entry, leadopt_link);
+ cnt += snprintf(page + cnt, max((int)PAGE_SIZE - cnt, 0),
+ "uid:%4d\tleadto:%s\n",
+ link->uid, link->pathname);
+ l = l->next;
+ }
+ retval = simple_read_from_buffer(buf, nbytes, ppos, page, strlen(page));
+
+ free_page((unsigned long)page);
+ return retval;
+}
+
+/* The various types of files and directories in a cgroup file system */
+enum cgroup_filetype {
+ FILE_ROOT,
+ @@ -1289,6 +1462,7 @@ enum cgroup_filetype {

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```

FILE_TASKLIST,
FILE_NOTIFY_ON_RELEASE,
FILE_RELEASE_AGENT,
+ FILE_LEAD_OPTION,
};

static ssize_t cgroup_write_u64(struct cgroup *cgrp, struct cftype *cft,
@@ -1372,6 +1546,12 @@ static ssize_t cgroup_common_file_write(
    BUILD_BUG_ON(sizeof(cgrp->root->release_agent_path) < PATH_MAX);
    strcpy(cgrp->root->release_agent_path, buffer);
    break;
+ case FILE_LEAD_OPTION:
+ if (cgroup_leadopt_file_write(cgrp->root, buffer) != 1) {
+     retval = -EINVAL;
+     goto out2;
+ }
+ break;
    default:
        retval = -EINVAL;
        goto out2;
@@ -2189,6 +2369,13 @@ static struct cftype cft_release_agent =
    .private = FILE_RELEASE_AGENT,
};

+static struct cftype cft_lead_option = {
+ .name = "lead_option",
+ .read = cgroup_leadopt_read,
+ .write = cgroup_common_file_write,
+ .private = FILE_LEAD_OPTION,
+};
+
static int cgroup_populate_dir(struct cgroup *cgrp)
{
    int err;
@@ -2206,6 +2393,11 @@ static int cgroup_populate_dir(struct cg
    return err;
}

+ if (cgrp == cgrp->top_cgroup) {
+     if ((err = cgroup_add_file(cgrp, NULL, &cft_lead_option)) < 0)
+         return err;
+ }
+
    for_each_subsys(cgrp->root, ss) {
        if (ss->populate && (err = ss->populate(ss, cgrp)) < 0)
            return err;
--
-

```

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