
Subject: [RFC][PATCH 1/2] Virtualization of UTS
Posted by [dev](#) on Fri, 24 Mar 2006 17:31:19 GMT
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This patch introduces utsname namespace in system, which allows to have different utsnames on the host.
Introduces config option CONFIG_UTS_NS and uts_namespace structure for this.

<http://git.openvz.org/?p=linux-2.6-openvz-ms;a=commitdiff;h=216bb5e42c7eef7f1ed361244a60b1496e8bdf63>

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Kirill

```
--- a/include/linux/init_task.h
+++ b/include/linux/init_task.h
@@ -3,6 +3,7 @@

#include <linux/file.h>
#include <linux/rcupdate.h>
+#include <linux/utsname.h>

#define INIT_FDTABLE \
{ \
@@ -72,6 +73,12 @@

extern struct group_info init_groups;

#ifdef CONFIG_UTS_NS
#define INIT_UTS_NS .uts_ns = &init_uts_ns,
#else
#define INIT_UTS_NS
#endif
+
+/*
+ * INIT_TASK is used to set up the first task table, touch at
+ * your own risk!. Base=0, limit=0x1fffff (=2MB)
@@ -121,6 +128,7 @@ extern struct group_info init_groups;
 .journal_info = NULL, \
 .cpu_timers = INIT_CPU_TIMERS(tsk.cpu_timers), \
 .fs_excl = ATOMIC_INIT(0), \
+ INIT_UTS_NS \
}
```

--- a/include/linux/sched.h

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+++ b/include/linux/sched.h
@@ -688,6 +688,7 @@ static inline void prefetch_stack(struct

struct audit_context; /* See audit.c */
struct mempolicy;
+struct uts_namespace;

struct task_struct {
    volatile long state; /* -1 unrunnable, 0 runnable, >0 stopped */
@@ -802,6 +803,9 @@ struct task_struct {
    struct files_struct *files;
    /* namespace */
    struct namespace *namespace;
+ifdef CONFIG_UTS_NS
+ struct uts_namespace *uts_ns;
+endif
    /* signal handlers */
    struct signal_struct *signal;
    struct sighand_struct *sighand;
--- a/include/linux/utsname.h
+++ b/include/linux/utsname.h
@@ -30,7 +30,36 @@ struct new_utsname {
    char domainname[65];
};

+ifdef CONFIG_UTS_NS
+#include <asm/atomic.h>
+
+struct uts_namespace {
+ atomic_t cnt;
+ struct new_utsname name;
+};
+
+extern struct uts_namespace *create_uts_ns(void);
+extern struct uts_namespace *clone_uts_ns(void);
+extern void free_uts_ns(struct uts_namespace *ns);
+
+static inline void get_uts_ns(struct uts_namespace *ns)
+{
+ atomic_inc(&ns->cnt);
+}
+
+static inline void put_uts_ns(struct uts_namespace *ns)
+{
+ if (atomic_dec_and_test(&ns->cnt))
+ free_uts_ns(ns);
+}
+

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+#define system_utsname (current->uts_ns->name)
+extern struct uts_namespace init_uts_ns;
+#else
+#define get_uts_ns(ns) do { } while (0)
+#define put_uts_ns(ns) do { } while (0)
+extern struct new_utsname system_utsname;
+#endif

extern struct rw_semaphore uts_sem;
#endif
--- a/init/version.c
+++ b/init/version.c
@@ -17,6 +17,51 @@

int version_string(LINUX_VERSION_CODE);

#ifdef CONFIG_UTS_NS
+struct uts_namespace init_uts_ns = {
+ .cnt = ATOMIC_INIT(1),
+ .name = {
+ .sysname = UTS_SYSNAME,
+ .nodename = UTS_NODENAME,
+ .release = UTS_RELEASE,
+ .version = UTS_VERSION,
+ .machine = UTS_MACHINE,
+ .domainname = UTS_DOMAINNAME,
+ },
+};
+
+struct uts_namespace *create_uts_ns(void)
+{
+ struct uts_namespace *ns;
+
+ ns = kmalloc(sizeof(struct uts_namespace), GFP_KERNEL);
+ if (ns == NULL)
+ return NULL;
+
+ memset(&ns->name, 0, sizeof(ns->name));
+ atomic_set(&ns->cnt, 1);
+ return ns;
+}
+
+struct uts_namespace *clone_uts_ns(void)
+{
+ struct uts_namespace *ns, *cur;
+
+ ns = kmalloc(sizeof(struct uts_namespace), GFP_KERNEL);
+ if (ns == NULL)

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+ return NULL;
+
+ cur = current->uts_ns;
+ memcpy(&ns->name, &cur->name, sizeof(cur->name));
+ atomic_set(&ns->cnt, 1);
+ return ns;
+}
+
+void free_uts_ns(struct uts_namespace *ns)
+{
+ kfree(ns);
+}
+#else
struct new_utsname system_utsname = {
    .sysname = UTS_SYSNAME,
    .nodename = UTS_NODENAME,
@@ -27,6 +72,7 @@ struct new_utsname system_utsname = {
};

EXPORT_SYMBOL(system_utsname);
+#endif

const char linux_banner[] =
    "Linux version " UTS_RELEASE " (" LINUX_COMPILE_BY "@"
--- a/kernel/exit.c
+++ b/kernel/exit.c
@@ -107,6 +107,7 @@ repeat:
    spin_unlock(&p->proc_lock);
    proc_pid_flush(proc_dentry);
    release_thread(p);
+ put_uts_ns(p->uts_ns);
    put_task_struct(p);

    p = leader;
--- a/kernel/fork.c
+++ b/kernel/fork.c
@@ -1192,6 +1192,7 @@ static task_t *copy_process(unsigned lon
    }
    attach_pid(p, PIDTYPE_TGID, p->tgid);
    attach_pid(p, PIDTYPE_PID, p->pid);
+ get_uts_ns(p->uts_ns);

    nr_threads++;
    total_forks++;
--- a/kernel/sysctl.c
+++ b/kernel/sysctl.c
@@ -229,12 +229,18 @@ static ctl_table root_table[] = {
    { .ctl_name = 0 }

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};

#ifdef CONFIG_UTS_NS
#define sysctl_system_utsname (init_uts_ns.name)
#else
#define sysctl_system_utsname (system_utsname)
#endif
+
static ctl_table kern_table[] = {
{
    .ctl_name = KERN_OSTYPE,
    .procname = "ostype",
-   .data = system_utsname.sysname,
-   .maxlen = sizeof(system_utsname.sysname),
+   .data = sysctl_system_utsname.sysname,
+   .maxlen = sizeof(sysctl_system_utsname.sysname),
    .mode = 0444,
    .proc_handler = &proc_doutsstring,
    .strategy = &sysctl_string,
@@ -242,8 +248,8 @@ static ctl_table kern_table[] = {
{
    .ctl_name = KERN_OSRELEASE,
    .procname = "osrelease",
-   .data = system_utsname.release,
-   .maxlen = sizeof(system_utsname.release),
+   .data = sysctl_system_utsname.release,
+   .maxlen = sizeof(sysctl_system_utsname.release),
    .mode = 0444,
    .proc_handler = &proc_doutsstring,
    .strategy = &sysctl_string,
@@ -251,8 +257,8 @@ static ctl_table kern_table[] = {
{
    .ctl_name = KERN_VERSION,
    .procname = "version",
-   .data = system_utsname.version,
-   .maxlen = sizeof(system_utsname.version),
+   .data = sysctl_system_utsname.version,
+   .maxlen = sizeof(sysctl_system_utsname.version),
    .mode = 0444,
    .proc_handler = &proc_doutsstring,
    .strategy = &sysctl_string,
@@ -260,8 +266,8 @@ static ctl_table kern_table[] = {
{
    .ctl_name = KERN_NODENAME,
    .procname = "hostname",
-   .data = system_utsname.nodename,
-   .maxlen = sizeof(system_utsname.nodename),
+   .data = sysctl_system_utsname.nodename,

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+ .maxlen = sizeof(sysctl_system_utsname.nodename),
  .mode = 0644,
  .proc_handler = &proc_doutsstring,
  .strategy = &sysctl_string,
@@ -269,8 +275,8 @@ static ctl_table kern_table[] = {
{
  .ctl_name = KERN_DOMAINNAME,
  .procname = "domainname",
- .data = system_utsname.domainname,
- .maxlen = sizeof(system_utsname.domainname),
+ .data = sysctl_system_utsname.domainname,
+ .maxlen = sizeof(sysctl_system_utsname.domainname),
  .mode = 0644,
  .proc_handler = &proc_doutsstring,
  .strategy = &sysctl_string,
```
