
Subject: [PATCH 4/16] Change data structures for pid namespaces

Posted by [Pavel Emelianov](#) on Fri, 06 Jul 2007 08:05:00 GMT

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struct pid_namespace will have the kmem_cache to allocate the pids from, the parent, as they are hierarchical, and the level of nesting value.

struct pid will have a variable length array of pid_number-s one for each namespace this pid lives in. The level value shows the level of the namespace this pid lives in and thus - the number of elements in the numbers array.

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```
include/linux/init_task.h | 6 ++++++
include/linux/pid.h       | 9 ++++++++
include/linux/pid_namespace.h | 3 +++
kernel/pid.c              | 3 ++-
4 files changed, 20 insertions(+), 1 deletion(-)
```

```
diff -upr linux-2.6.22-rc4-mm2.orig/include/linux/pid.h linux-2.6.22-rc4-mm2-2/include/linux/pid.h
--- linux-2.6.22-rc4-mm2.orig/include/linux/pid.h 2007-06-14 12:14:29.000000000 +0400
+++ linux-2.6.22-rc4-mm2-2/include/linux/pid.h 2007-07-04 19:00:38.000000000 +0400
@@ -40,6 +40,13 @@ enum pid_type
 * processes.
 */
```

```
+struct pid_number {
+ /* Try to keep pid_chain in the same cacheline as nr for find_pid */
+ int nr;
+ struct pid_namespace *ns;
+ struct hlist_node pid_chain;
+};
+
+struct pid
+{
+ atomic_t count;
@@ -40,6 +40,8 @@ enum pid_type
 /* lists of tasks that use this pid */
 struct hlist_head tasks[PIDTYPE_MAX];
 struct rcu_head rcu;
+ int level;
+ struct pid_number numbers[1];
+};
```

```

extern struct pid init_struct_pid;
diff -upr linux-2.6.22-rc4-mm2.orig/include/linux/pid_namespace.h
linux-2.6.22-rc4-mm2-2/include/linux/pid_namespace.h
--- linux-2.6.22-rc4-mm2.orig/include/linux/pid_namespace.h 2007-06-14 12:14:29.000000000
+0400
+++ linux-2.6.22-rc4-mm2-2/include/linux/pid_namespace.h 2007-07-04 19:00:39.000000000
+0400
@@ -16,7 +15,10 @@ struct pidmap {
    struct kref kref;
    struct pidmap pidmap[PIDMAP_ENTRIES];
    int last_pid;
+ int level;
    struct task_struct *child_reaper;
+ struct kmem_cache *pid_cache;
+ struct pid_namespace *parent;
};

extern struct pid_namespace init_pid_ns;
diff -upr linux-2.6.22-rc4-mm2.orig/include/linux/init_task.h
linux-2.6.22-rc4-mm2-2/include/linux/init_task.h
--- linux-2.6.22-rc4-mm2.orig/include/linux/init_task.h 2007-06-14 12:14:29.000000000 +0400
+++ linux-2.6.22-rc4-mm2-2/include/linux/init_task.h 2007-07-04 19:00:38.000000000 +0400
@@ -91,6 +91,12 @@ extern struct group_info init_groups;
    { .first = &init_task.pids[PIDTYPE_SID].node }, \
    }, \
    .rcu = RCU_HEAD_INIT, \
+ .level = 0, \
+ .numbers = { { \
+ .nr = 0, \
+ .ns = &init_pid_ns, \
+ .pid_chain = { .next = NULL, .pprev = NULL }, \
+ }, } \
}

#define INIT_PID_LINK(type) \
diff -upr linux-2.6.22-rc4-mm2.orig/kernel/pid.c linux-2.6.22-rc4-mm2-2/kernel/pid.c
--- linux-2.6.22-rc4-mm2.orig/kernel/pid.c 2007-06-14 12:14:29.000000000 +0400
+++ linux-2.6.22-rc4-mm2-2/kernel/pid.c 2007-07-04 19:00:38.000000000 +0400
@@ -61,7 +62,8 @@ static inline int mk_pid(struct pid_name
    [ 0 ... PIDMAP_ENTRIES-1] = { ATOMIC_INIT(BITS_PER_PAGE), NULL }
},
    .last_pid = 0,
- .child_reaper = &init_task
+ .level = 0,
+ .child_reaper = &init_task,
};

EXPORT_SYMBOL_GPL(init_pid_ns);

```

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