Subject: [PATCH 22/28] [MULTI 1/6] Changes in data structures for multilevel model

Posted by Pavel Emelianov on Fri, 15 Jun 2007 16:24:25 GMT View Forum Message <> Reply to Message

This patch opens the multilevel model patches.

The multilevel model idea is basically the same as for the flat one, but in this case task may have many virtual pids - one id for each sub-namespace this task is visible in. The struct pid carries the list of pid_number-s and two hash tables are used to find this number by numerical id and by struct pid.

The struct pid doesn't need the numerical ids any longer. Instead it has a single linked list of struct pid_number-s which are hashed for quick search and have the numerical id.

```
Signed-off-by: Pavel Emelianov < xemul@openvz.org>
1 files changed, 31 insertions(+)
--- ./include/linux/pid.h.multdatast 2007-06-15 15:23:00.000000000 +0400
+++ ./include/linux/pid.h 2007-06-15 15:32:15.000000000 +0400
@@ -50,9 +50,33 @@ enum pid type
 * id must be used.
 */
+/*
+ * multilevel pid namespaces
+ * each task may belong to any number of namespaces and thus struct pid do
+ * not carry the number any longer, instead if this struct pid has a list of
+ * pid_number-s each belonging to one namespace. two hashes are used to find
+ * the number - by the numerical id and by the struct pid this nr belongs to.
+ * this allows for creating namespaces of infinite nesting, but has slight
+ * performance problems.
+ */
+struct pid number
+{
+ int nr;
+ struct pid_namespace *ns;
+ struct pid *pid;
```

```
+ struct hlist_node pid_chain;
+ struct hlist node nr chain;
+ struct pid_number *next;
+};
struct pid
 atomic_t count;
+#ifdef CONFIG_PID_NS_MULTILEVEL
+ struct pid number *pid nrs;
+#else
/* Try to keep pid chain in the same cacheline as nr for find pid */
 int nr;
 struct hlist_node pid_chain;
@@ -65,11 +89,18 @@ struct pid
 struct pid_namespace *ns;
 struct hlist_node vpid_chain;
#endif
+#endif
/* lists of tasks that use this pid */
 struct hlist_head tasks[PIDTYPE_MAX];
 struct rcu head rcu;
};
+#ifdef CONFIG_PID_NS_MULTILEVEL
+/* small helper to iterate over the pid's numbers */
+#define for_each_pid_nr(nr, pid) \
+ for (nr = pid->pid_nrs; nr != NULL; nr = nr->next)
+#endif
extern struct pid init struct pid;
struct pid_link
Containers mailing list
Containers@lists.linux-foundation.org
```

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