
Subject: [patch -mm 1/4] mqueue namespace : add struct mq_namespace
Posted by [Cedric Le Goater](#) on Wed, 28 Nov 2007 16:37:29 GMT
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From: Cedric Le Goater <clg@fr.ibm.com>

This patch adds a struct mq_namespace holding the common attributes of the mqueue namespace.

The current code is modified to use the default mqueue namespace object 'init_mq_ns' and to prepare the ground for futur dynamic objects.

A new option CONFIG_MQ_NS protects configuration not using namespaces.

Signed-off-by: Cedric Le Goater <clg@fr.ibm.com>

```
---  
include/linux/mq_namespace.h | 67 ++++++  
init/Kconfig                 | 9 +++  
ipc/Makefile                 | 1  
ipc/mq_namespace.c           | 23 ++++++  
ipc/mqueue.c                 | 103 ++++++-----  
5 files changed, 155 insertions(+), 48 deletions(-)
```

Index: 2.6.24-rc3-mm2/include/linux/mq_namespace.h

```
=====
```

```
--- /dev/null  
+++ 2.6.24-rc3-mm2/include/linux/mq_namespace.h  
@@ -0,0 +1,67 @@  
+#ifndef _LINUX_MQ_NAMESPACE_H  
+#define _LINUX_MQ_NAMESPACE_H  
+  
+#include <linux/kref.h>  
+  
+struct vfsmount;  
+  
+struct mq_namespace {  
+ struct kref kref;  
+ struct vfsmount *mnt;  
+  
+ unsigned int queues_count;  
+ unsigned int queues_max;  
+ unsigned int msg_max;  
+ unsigned int msgsize_max;  
+};  
+  
+extern struct mq_namespace init_mq_ns;
```

```

+
+/* default values */
+#define DFLT_QUEUESMAX 256 /* max number of message queues */
+#define DFLT_MSGMAX 10 /* max number of messages in each queue */
+#define HARD_MSGMAX (131072/sizeof(void *))
+#define DFLT_MSGSIZEMAX 8192 /* max message size */
+
+#ifdef CONFIG_POSIX_MQUEUE
+#define INIT_MQ_NS(ns) .ns = &init_mq_ns,
+#else
+#define INIT_MQ_NS(ns)
+#endif
+
+#if defined(CONFIG_POSIX_MQUEUE) && defined(CONFIG_MQ_NS)
+static inline struct mq_namespace *get_mq_ns(struct mq_namespace *ns)
+{
+ if (ns)
+ kref_get(&ns->kref);
+ return ns;
+}
+
+extern struct mq_namespace *copy_mq_ns(unsigned long flags,
+ struct mq_namespace *old_ns);
+extern void free_mq_ns(struct kref *kref);
+
+static inline void put_mq_ns(struct mq_namespace *ns)
+{
+ if (ns)
+ kref_put(&ns->kref, free_mq_ns);
+}
+
+#else
+
+static inline struct mq_namespace *get_mq_ns(struct mq_namespace *ns)
+{
+ return ns;
+}
+
+static inline struct mq_namespace *copy_mq_ns(unsigned long flags,
+ struct mq_namespace *old_ns)
+{
+ return old_ns;
+}
+
+static inline void put_mq_ns(struct mq_namespace *ns) { }
+
+#endif /* CONFIG_POSIX_MQUEUE */
+

```

```
+#endif /* _LINUX_MQ_H */
Index: 2.6.24-rc3-mm2/ipc/mqueue.c
```

```
-----
--- 2.6.24-rc3-mm2.orig/ipc/mqueue.c
```

```
+++ 2.6.24-rc3-mm2/ipc/mqueue.c
```

```
@@ -31,6 +31,7 @@
```

```
#include <linux/mutex.h>
```

```
#include <linux/nsproxy.h>
```

```
#include <linux/pid.h>
```

```
+#include <linux/mq_namespace.h>
```

```
#include <net/sock.h>
```

```
#include "util.h"
```

```
@@ -46,13 +47,6 @@
```

```
#define STATE_PENDING 1
```

```
#define STATE_READY 2
```

```
/* default values */
```

```
#define DFLT_QUEUESMAX 256 /* max number of message queues */
```

```
#define DFLT_MSGMAX 10 /* max number of messages in each queue */
```

```
#define HARD_MSGMAX (131072/sizeof(void*))
```

```
#define DFLT_MSGSIZEMAX 8192 /* max message size */
```

```
-
```

```
-
```

```
struct ext_wait_queue { /* queue of sleeping tasks */
```

```
    struct task_struct *task;
```

```
    struct list_head list;
```

```
@@ -87,12 +81,18 @@ static void remove_notification(struct m
```

```
static spinlock_t mq_lock;
```

```
static struct kmem_cache *mqueue_inode_cachep;
```

```
-static struct vfsmount *mqueue_mnt;
```

```
-static unsigned int queues_count;
```

```
-static unsigned int queues_max = DFLT_QUEUESMAX;
```

```
-static unsigned int msg_max = DFLT_MSGMAX;
```

```
-static unsigned int msgsize_max = DFLT_MSGSIZEMAX;
```

```
+struct mq_namespace init_mq_ns = {
```

```
+ .kref = {
```

```
+ .refcount = ATOMIC_INIT(2),
```

```
+ },
```

```
+ .mnt = NULL,
```

```
+ .queues_count = 0,
```

```
+ .queues_max = DFLT_QUEUESMAX,
```

```
+ .msg_max = DFLT_MSGMAX,
```

```
+ .msgsize_max = DFLT_MSGSIZEMAX,
```

```
+};
```

```
+
```

```

static struct ctl_table_header * mq_sysctl_table;

@@ -235,6 +235,7 @@ static void mqueue_delete_inode(struct i
    struct user_struct *user;
    unsigned long mq_bytes;
    int i;
+ struct mq_namespace *mq_ns = &init_mq_ns;

    if (S_ISDIR(inode->i_mode)) {
        clear_inode(inode);
@@ -255,7 +256,7 @@ static void mqueue_delete_inode(struct i
    if (user) {
        spin_lock(&mq_lock);
        user->mq_bytes -= mq_bytes;
- queues_count--;
+ mq_ns->queues_count--;
        spin_unlock(&mq_lock);
        free_uid(user);
    }
@@ -267,20 +268,22 @@ static int mqueue_create(struct inode *d
    struct inode *inode;
    struct mq_attr *attr = dentry->d_fsdata;
    int error;
+ struct mq_namespace *mq_ns = &init_mq_ns;

    spin_lock(&mq_lock);
- if (queues_count >= queues_max && !capable(CAP_SYS_RESOURCE)) {
+ if (mq_ns->queues_count >= mq_ns->queues_max &&
+ !capable(CAP_SYS_RESOURCE)) {
        error = -ENOSPC;
        goto out_lock;
    }
- queues_count++;
+ mq_ns->queues_count++;
    spin_unlock(&mq_lock);

    inode = mqueue_get_inode(dir->i_sb, mode, attr);
    if (!inode) {
        error = -ENOMEM;
        spin_lock(&mq_lock);
- queues_count--;
+ mq_ns->queues_count--;
        goto out_lock;
    }

@@ -570,7 +573,7 @@ static void remove_notification(struct m
    info->notify_owner = NULL;

```

```

}

-static int mq_attr_ok(struct mq_attr *attr)
+static int mq_attr_ok(struct mq_namespace *mq_ns, struct mq_attr *attr)
{
    if (attr->mq_maxmsg <= 0 || attr->mq_msgsize <= 0)
        return 0;
@@ -578,8 +581,8 @@ static int mq_attr_ok(struct mq_attr *at
    if (attr->mq_maxmsg > HARD_MSGMAX)
        return 0;
    } else {
- if (attr->mq_maxmsg > msg_max ||
- attr->mq_msgsize > msgsize_max)
+ if (attr->mq_maxmsg > mq_ns->msg_max ||
+ attr->mq_msgsize > mq_ns->msgsize_max)
        return 0;
    }
    /* check for overflow */
@@ -595,8 +598,9 @@ static int mq_attr_ok(struct mq_attr *at
/*
 * Invoked when creating a new queue via sys_mq_open
 */
-static struct file *do_create(struct dentry *dir, struct dentry *dentry,
- int oflag, mode_t mode, struct mq_attr __user *u_attr)
+static struct file *do_create(struct mq_namespace *mq_ns, struct dentry *dir,
+ struct dentry *dentry, int oflag, mode_t mode,
+ struct mq_attr __user *u_attr)
{
    struct mq_attr attr;
    int ret;
@@ -606,7 +610,7 @@ static struct file *do_create(struct den
    if (copy_from_user(&attr, u_attr, sizeof(attr)))
        goto out;
    ret = -EINVAL;
- if (!mq_attr_ok(&attr))
+ if (!mq_attr_ok(mq_ns, &attr))
        goto out;
    /* store for use during create */
    dentry->d_fsdata = &attr;
@@ -618,33 +622,34 @@ static struct file *do_create(struct den
    if (ret)
        goto out;

- return dentry_open(dentry, mqueue_mnt, oflag);
+ return dentry_open(dentry, mq_ns->mnt, oflag);

out:
    dput(dentry);

```

```

- mntput(mqueue_mnt);
+ mntput(mq_ns->mnt);
  return ERR_PTR(ret);
}

/* Opens existing queue */
-static struct file *do_open(struct dentry *dentry, int oflag)
+static struct file *do_open(struct mq_namespace *mq_ns, struct dentry *dentry,
+ int oflag)
{
  static int oflag2acc[O_ACCMODE] = { MAY_READ, MAY_WRITE,
    MAY_READ | MAY_WRITE };

  if ((oflag & O_ACCMODE) == (O_RDWR | O_WRONLY)) {
    dput(dentry);
- mntput(mqueue_mnt);
+ mntput(mq_ns->mnt);
    return ERR_PTR(-EINVAL);
  }

  if (permission(dentry->d_inode, oflag2acc[oflag & O_ACCMODE], NULL)) {
    dput(dentry);
- mntput(mqueue_mnt);
+ mntput(mq_ns->mnt);
    return ERR_PTR(-EACCES);
  }

- return dentry_open(dentry, mqueue_mnt, oflag);
+ return dentry_open(dentry, mq_ns->mnt, oflag);
}

asmlinkage long sys_mq_open(const char __user *u_name, int oflag, mode_t mode,
@@ -654,6 +659,7 @@ asmlinkage long sys_mq_open(const char _
  struct file *filp;
  char *name;
  int fd, error;
+ struct mq_namespace *mq_ns = &init_mq_ns;

  error = audit_mq_open(oflag, mode, u_attr);
  if (error != 0)
@@ -666,13 +672,13 @@ asmlinkage long sys_mq_open(const char _
  if (fd < 0)
    goto out_putname;

- mutex_lock(&mqueue_mnt->mnt_root->d_inode->i_mutex);
- dentry = lookup_one_len(name, mqueue_mnt->mnt_root, strlen(name));
+ mutex_lock(&mq_ns->mnt->mnt_root->d_inode->i_mutex);
+ dentry = lookup_one_len(name, mq_ns->mnt->mnt_root, strlen(name));

```

```

if (IS_ERR(dentry)) {
    error = PTR_ERR(dentry);
    goto out_err;
}
- mntget(mqueue_mnt);
+ mntget(mq_ns->mnt);

if (oflag & O_CREAT) {
    if (dentry->d_inode) { /* entry already exists */
@@ -680,12 +686,12 @@ asmlinkage long sys_mq_open(const char _
        error = -EEXIST;
        if (oflag & O_EXCL)
            goto out;
- filp = do_open(dentry, oflag);
+ filp = do_open(mq_ns, dentry, oflag);
    } else {
- error = mnt_want_write(mqueue_mnt);
+ error = mnt_want_write(mq_ns->mnt);
        if (error)
            goto out;
- filp = do_create(mqueue_mnt->mnt_root, dentry,
+ filp = do_create(mq_ns, mq_ns->mnt->mnt_root, dentry,
            oflag, mode, u_attr);
    }
} else {
@@ -693,7 +699,7 @@ asmlinkage long sys_mq_open(const char _
    if (!dentry->d_inode)
        goto out;
    audit_inode(name, dentry);
- filp = do_open(dentry, oflag);
+ filp = do_open(mq_ns, dentry, oflag);
}

if (IS_ERR(filp)) {
@@ -707,13 +713,13 @@ asmlinkage long sys_mq_open(const char _

out:
    dput(dentry);
- mntput(mqueue_mnt);
+ mntput(mq_ns->mnt);
out_putfd:
    put_unused_fd(fd);
out_err:
    fd = error;
out_upsem:
- mutex_unlock(&mqueue_mnt->mnt_root->d_inode->i_mutex);
+ mutex_unlock(&mq_ns->mnt->mnt_root->d_inode->i_mutex);
out_putname:

```

```

    putname(name);
    return fd;
@@ -725,14 +731,15 @@ asmlinkage long sys_mq_unlink(const char
    char *name;
    struct dentry *dentry;
    struct inode *inode = NULL;
+ struct mq_namespace *mq_ns = &init_mq_ns;

    name = getname(u_name);
    if (IS_ERR(name))
        return PTR_ERR(name);

- mutex_lock_nested(&mqueue_mnt->mnt_root->d_inode->i_mutex,
+ mutex_lock_nested(&mq_ns->mnt->mnt_root->d_inode->i_mutex,
    I_MUTEX_PARENT);
- dentry = lookup_one_len(name, mqueue_mnt->mnt_root, strlen(name));
+ dentry = lookup_one_len(name, mq_ns->mnt->mnt_root, strlen(name));
    if (IS_ERR(dentry)) {
        err = PTR_ERR(dentry);
        goto out_unlock;
@@ -746,16 +753,16 @@ asmlinkage long sys_mq_unlink(const char
    inode = dentry->d_inode;
    if (inode)
        atomic_inc(&inode->i_count);
- err = mnt_want_write(mqueue_mnt);
+ err = mnt_want_write(mq_ns->mnt);
    if (err)
        goto out_err;
    err = vfs_unlink(dentry->d_parent->d_inode, dentry);
- mnt_drop_write(mqueue_mnt);
+ mnt_drop_write(mq_ns->mnt);
out_err:
    dput(dentry);

out_unlock:
- mutex_unlock(&mqueue_mnt->mnt_root->d_inode->i_mutex);
+ mutex_unlock(&mq_ns->mnt->mnt_root->d_inode->i_mutex);
    putname(name);
    if (inode)
        iput(inode);
@@ -1204,14 +1211,14 @@ static int msg_maxsize_limit_max = INT_M
static ctl_table mq_sysctls[] = {
    {
        .procname = "queues_max",
- .data = &queues_max,
+ .data = &init_mq_ns.queues_max,
        .maxlen = sizeof(int),
        .mode = 0644,

```



```

.proc_handler = &proc_dointvec,
},
{
.procname = "msg_max",
- .data = &msg_max,
+ .data = &init_mq_ns.msg_max,
.maxlen = sizeof(int),
.mode = 0644,
.proc_handler = &proc_dointvec_minmax,
@@ -1220,7 +1227,7 @@ static ctl_table mq_sysctls[] = {
},
{
.procname = "msgsize_max",
- .data = &msgsize_max,
+ .data = &init_mq_ns.msgsize_max,
.maxlen = sizeof(int),
.mode = 0644,
.proc_handler = &proc_dointvec_minmax,
@@ -1266,13 +1273,13 @@ static int __init init_mqueue_fs(void)
if (error)
goto out_sysctl;

- if (IS_ERR(mqueue_mnt = kern_mount(&mqueue_fs_type))) {
- error = PTR_ERR(mqueue_mnt);
+ init_mq_ns.mnt = kern_mount(&mqueue_fs_type);
+ if (IS_ERR(init_mq_ns.mnt)) {
+ error = PTR_ERR(init_mq_ns.mnt);
goto out_filesystem;
}

/* internal initialization - not common for vfs */
- queues_count = 0;
spin_lock_init(&mq_lock);

```

return 0;

Index: 2.6.24-rc3-mm2/init/Kconfig

```
=====
--- 2.6.24-rc3-mm2.orig/init/Kconfig
```

```
+++ 2.6.24-rc3-mm2/init/Kconfig
```

```
@@ -426,6 +426,15 @@ config PID_NS
```

Unless you want to work with an experimental feature
say N here.

```
+config MQ_NS
```

```
+ bool "POSIX Message Queues namespace"
```

```
+ depends on NAMESPACES && POSIX_MQUEUE
```

```
+ help
```

```
+ Support for POSIX Message Queues namespaces. This allows
```

+ having different POSIX Message Queues filesystems containing
+ message queues with the same name. Yet another a building
+ block of containers.

+

config BLK_DEV_INITRD

bool "Initial RAM filesystem and RAM disk (initramfs/initrd) support"

depends on BROKEN || !FRV

Index: 2.6.24-rc3-mm2/ipc/Makefile

=====
--- 2.6.24-rc3-mm2.orig/ipc/Makefile

+++ 2.6.24-rc3-mm2/ipc/Makefile

@@ -8,4 +8,5 @@ obj-\$(CONFIG_SYSVIPC_SYSCTL) += ipc_sysc

obj_mq-\$(CONFIG_COMPAT) += compat_mq.o

obj-\$(CONFIG_POSIX_QUEUE) += mqueue.o msgutil.o \$(obj_mq-y)

obj-\$(CONFIG_IPC_NS) += namespace.o

+obj-\$(CONFIG_MQ_NS) += mq_namespace.o

Index: 2.6.24-rc3-mm2/ipc/mq_namespace.c

=====
--- /dev/null

+++ 2.6.24-rc3-mm2/ipc/mq_namespace.c

@@ -0,0 +1,23 @@

+/*

+ * Copyright (C) 2007 IBM Corporation

+ *

+ * Author: Cedric Le Goater <clg@fr.ibm.com>

+ *

+ * This program is free software; you can redistribute it and/or
+ * modify it under the terms of the GNU General Public License as
+ * published by the Free Software Foundation, version 2 of the
+ * License.

+ */

+

+#include <linux/mq_namespace.h>

+

+struct mq_namespace *copy_mq_ns(unsigned long flags,

+ struct mq_namespace *old_ns)

+{

+ BUG_ON(!old_ns);

+ return get_mq_ns(old_ns);

+}

+

+void free_mq_ns(struct kref *kref)

+{

+}

--

Containers mailing list
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