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Subject: Re: [RFC][PATCH 2.6.22-rc5] System V IPC: new IPC\_SETID command to modify an ID

Posted by [Cedric Le Goater](#) on Tue, 19 Jun 2007 14:14:32 GMT

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Pierre Peiffer wrote:

> This patch adds a new IPC\_SETID command to the System V IPCs set of  
> commands, which allows to change the ID of an existing IPC.  
>  
> This command can be used through the semctl/shmctl/msgctl API, with the new  
> ID passed as the third argument for msgctl and shmctl (instead of a  
> pointer) and through the fourth argument for semctl.  
>  
> To be successful, the following rules must be respected:  
> - the IPC exists  
> - the user must be allowed to change the IPC attributes regarding the IPC  
> permissions.  
> - the new ID must satisfy the ID computation rule.  
> - the entry (in the kernel internal table of IPCs) corresponding to the new  
> ID must be free.

That's an interesting way to reset the ids of sysv ipcs during a restart (after a checkpoint) and we're looking for ways to do that among other things.

How does it fit openvz ? Is it something openvz could use ?

thanks,

C.

> Signed-off-by: Pierre Peiffer <pierre.peiffer@bull.net>  
>  
> ---  
> include/linux/ipc.h | 9 ++++++  
> ipc/msg.c | 16 +++++++  
> ipc/sem.c | 15 +++++++  
> ipc/shm.c | 36 +++++++  
> ipc/util.c | 60  
> +++++++  
> ipc/util.h | 1  
> security/selinux/hooks.c | 3 ++  
> 7 files changed, 136 insertions(+), 4 deletions(-)  
>  
> Index: b/include/linux/ipc.h  
> ======  
> --- a/include/linux/ipc.h  
> +++ b/include/linux/ipc.h

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> @@ -35,10 +35,11 @@ struct ipc_perm
>   * Control commands used with semctl, msgctl and shmctl
>   * see also specific commands in sem.h, msg.h and shm.h
> */
> -#define IPC_RMID 0 /* remove resource */
> -#define IPC_SET 1 /* set ipc_perm options */
> -#define IPC_STAT 2 /* get ipc_perm options */
> -#define IPC_INFO 3 /* see ipcs */
> +#define IPC_RMID 0 /* remove resource */
> +#define IPC_SET 1 /* set ipc_perm options */
> +#define IPC_STAT 2 /* get ipc_perm options */
> +#define IPC_INFO 3 /* see ipcs */
> +#define IPC_SETID 4 /* set ipc ID */
>
> /*
>   * Version flags for semctl, msgctl, and shmctl commands
> Index: b/ipc/msg.c
> =====
> --- a/ipc/msg.c
> +++ b/ipc/msg.c
> @@ -491,6 +491,7 @@ asmlinkage long sys_msgctl(int msqid, in
>     if (copy_msqid_from_user(&setbuf, buf, version))
>         return -EFAULT;
>     break;
> + case IPC_SETID:
> + case IPC_RMID:
>     break;
> default:
> @@ -553,6 +554,21 @@ asmlinkage long sys_msgctl(int msqid, in
>     msg_unlock(msq);
>     break;
> }
> + case IPC_SETID:
> + {
> +     int nid = (int)buf;
> +
> +     err = ipc_mvid(&msg_ids(ns), msq->q_id,
> +                   nid, ns->msg_ctlmni);
> +
> +     if (err)
> +         goto out_unlock_up;
> +
> +     msq->q_id = nid;
> +     msq->q_ctime = get_seconds();
> +     msg_unlock(msq);
> +     break;
> + }
> + case IPC_RMID:

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>     freeque(ns, msq, msqid);
>     break;
> Index: b/ipc/sem.c
> =====
> --- a/ipc/sem.c
> +++ b/ipc/sem.c
> @@ -908,6 +908,20 @@ static int semctl_down(struct ipc_namesp
>         sem_unlock(sma);
>         err = 0;
>         break;
> +    case IPC_SETID:
> +    {
> +        int nid = (int)arg.val;
> +        err = ipc_mvid(&sem_ids(ns), semid,
> +                       nid, ns->sc_semmni);
> +
> +        if (err)
> +            goto out_unlock;
> +
> +        sma->sem_id = nid;
> +        sma->sem_ctime = get_seconds();
> +        sem_unlock(sma);
> +        break;
> +    }
> +    default:
> +        sem_unlock(sma);
> +        err = -EINVAL;
> @@ -950,6 +964,7 @@ asmlinkage long sys_semctl (int semid, i
>         return err;
>     case IPC_RMID:
>     case IPC_SET:
> +    case IPC_SETID:
> +        mutex_lock(&sem_ids(ns).mutex);
> +        err = semctl_down(ns, semid, semnum, cmd, version, arg);
> +        mutex_unlock(&sem_ids(ns).mutex);
> Index: b/ipc/util.c
> =====
> --- a/ipc/util.c
> +++ b/ipc/util.c
> @@ -327,6 +327,66 @@ found:
> }
>
> /**
> + * ipc_mvid - move an IPC identifier
> + * @ids: IPC identifier set
> + * @oldid: ID of the IPC permission set to move
> + * @newid: new ID of the IPC permission set to move
> + * @size: new size limit for the id array

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> +
> + * Move an entry in the IPC arrays from the 'oldid' place to the
> + * 'newid' place. The seq number of the entry is updated to match the
> + * 'newid' value.
> +
> + * Called with the list lock and ipc_ids.mutex held.
> + */
> +
> +int ipc_mvid(struct ipc_ids *ids, int oldid, int newid, int size)
> +{
> +    struct kern_ipc_perm *p;
> +    int old_lid = oldid % SEQ_MULTIPLIER;
> +    int new_lid = newid % SEQ_MULTIPLIER;
> +
> +    if ((new_lid >= size) ||
> +        newid != (new_lid + (newid/SEQ_MULTIPLIER)*SEQ_MULTIPLIER))
> +        return -ERANGE;
> +
> +    size = grow_ary(ids,size);
> +
> +    BUG_ON(old_lid >= ids->entries->size);
> +
> +    p = ids->entries->p[old_lid];
> +
> +    if (!p)
> +        return -ENXIO;
> +
> +    /*
> +     * but not the seq number.
> +     */
> +    if (new_lid != old_lid) {
> +
> +        if (ids->entries->p[new_lid])
> +            return -EBUSY;
> +
> +        ids->entries->p[new_lid] = p;
> +
> +        ids->entries->p[old_lid] = NULL;
> +
> +        if (new_lid > ids->max_id)
> +            ids->max_id = new_lid;
> +        if (old_lid == ids->max_id) {
> +            do {
> +                --old_lid;
> +            } while (ids->entries->p[old_lid] == NULL);
> +            ids->max_id = old_lid;
> +        }
> +

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> +
> +
> +     p->seq = newid/SEQ_MULTIPLIER;
> +     return 0;
> +
> +
> +/***
> * ipc_rmid - remove an IPC identifier
> * @ids: identifier set
> * @id: Identifier to remove
> Index: b/IPC/util.h
> =====
> --- a/IPC/util.h
> +++ b/IPC/util.h
> @@ -63,6 +63,7 @@ int ipc_findkey(struct ipc_ids* ids, key
> int ipc_addid(struct ipc_ids* ids, struct kern_ipc_perm* new, int size);
>
> /* must be called with both locks acquired. */
> +int ipc_mvid(struct ipc_ids *ids, int oldid, int newid, int size);
> struct kern_ipc_perm* ipc_rmid(struct ipc_ids* ids, int id);
>
> int ipcperms (struct kern_ipc_perm *ipcp, short flg);
> Index: b/security/selinux/hooks.c
> =====
> --- a/security/selinux/hooks.c
> +++ b/security/selinux/hooks.c
> @@ -4152,6 +4152,7 @@ static int selinux_msg_queue_msgctl(stru
>         perms = MSGQ__GETATTR | MSGQ__ASSOCIATE;
>         break;
>     case IPC_SET:
> +    case IPC_SETID:
>         perms = MSGQ__SETATTR;
>         break;
>     case IPC_RMID:
> @@ -4300,6 +4301,7 @@ static int selinux_shm_shmctl(struct shm
>         perms = SHM__GETATTR | SHM__ASSOCIATE;
>         break;
>     case IPC_SET:
> +    case IPC_SETID:
>         perms = SHM__SETATTR;
>         break;
>     case SHM_LOCK:
> @@ -4411,6 +4413,7 @@ static int selinux_sem_semctl(struct sem
>         perms = SEM__DESTROY;
>         break;
>     case IPC_SET:
> +    case IPC_SETID:
>         perms = SEM__SETATTR;

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>      break;
>    case IPC_STAT:
> Index: b/ipc/shm.c
> =====
> --- a/ipc/shm.c
> +++ b/ipc/shm.c
> @@ -809,6 +809,42 @@ asmlinkage long sys_shmctl (int shmid, i
>      break;
>    }
>
> +  case IPC_SETID:
> +
> +  {
> +    int nid = (int)buf;
> +    mutex_lock(&shm_ids(ns).mutex);
> +    shp = shm_lock(ns, shmid);
> +    err = -EINVAL;
> +    if(shp == NULL)
> +      goto out_up;
> +    err = shm_checkid(ns, shp,shmid);
> +    if(err)
> +      goto out_unlock_up;
> +    err = audit_ipc_obj(&(shp->shm_perm));
> +    if (err)
> +      goto out_unlock_up;
> +
> +    err = -EPERM;
> +    if (current->euid != shp->shm_perm.uid &&
> +        current->euid != shp->shm_perm.cuid &&
> +        !capable(CAP_SYS_ADMIN))
> +      goto out_unlock_up;
> +
> +    err = security_shm_shmctl(shp, cmd);
> +    if (err)
> +      goto out_unlock_up;
> +
> +    err = ipc_mvid(&shm_ids(ns), shp->id,
> +                  nid, ns->shm_ctlmni);
> +
> +    if (err)
> +      goto out_unlock_up;
> +
> +    shp->id = nid;
> +    shp->shm_ctim = get_seconds();
> +    break;
> +  }
> +
> default:
>   err = -EINVAL;

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>      goto out;  
>
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Containers@lists.linux-foundation.org  
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