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Subject: Re: How to query mount propagation state?

Posted by [serue](#) on Mon, 16 Apr 2007 19:16:00 GMT

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Quoting Ram Pai (linuxram@us.ibm.com):

> On Mon, 2007-04-16 at 12:34 +0200, Miklos Szeredi wrote:

> > Currently one of the difficulties with mount propagations is that  
> > there's no way to know the current state of the propagation tree.

> >

> > Has anyone thought about how this info could be queried from  
> > userspace?

>

> I am attaching two patches that I had done way back in Oct 2006  
> with Al Viro. I had sent these patches to Al Viro. But I forgot to  
> follow them up, I guess so did Al Viro.

>

> The first patch disambiguates multiple mount-instances of the same  
> filesystem (or part of the same filesystem), by introducing a new  
> interface /proc/mounts\_new.

>

> The second patch introduces a new proc interface that exposes all the  
> propagation trees within a namespace. It does not show propagated  
> mounts residing in a different namespace (for privacy reasons). Maybe  
> one could modify the patch a little, to allow it; if the user has  
> root privileges.

>

> RP

>

> PS: Sorry these are attachments instead of inline patches. I am scared  
> of inlining in evolution. If needed I can send inline patches through  
> mutt.

>

> >

> > Thanks,

> > Miklos

> This patch disambiguates multiple mount-instances of the same  
> filesystem (or part of the same filesystem), by introducing a new  
> interface /proc/mounts\_new. The interface has the following format.

>

> -----

> FSID mntpt root-dentry fstype fs-options

> -----

>

> NOTE: root-dentry is the path to the dentry w.r.t to the root dentry of the  
> same filesystem.

>

> for example: lets say we attempt the following commands

```

> mount --bind /var /mnt
> mount --bind /mnt/tmp /tmp1
>
> 'cat /proc/mounts' shows the following:
> /dev/root /mnt ext2 rw 0 0
> /dev/root /tmp1 ext2 rw 0 0
>
> NOTE: The above mount entries, do not indicate that /tmp1 contains the same
> directory tree as /var/tmp.
>
> But 'cat /proc/mounts_new' shows us the following:
> 0x6200 /mnt /var ext2 rw 0 0
> 0x6200 /tmp1 /var/tmp ext2 rw 0 0
>
> The above entries clearly indicates that /var/tmp directory of the ext2
> filesystem with fsid=0x6200 is the directory tree that resides under /tmp1
>
> Signed-off-by: Ram Pai <linuxram@us.ibm.com>
>
> ---
> fs/dcache.c          | 53 ++++++
> fs/namespace.c       | 35 ++++++
> fs/proc/base.c       | 32 ++++++
> fs/proc/proc_misc.c  | 1
> fs/seq_file.c        | 77 ++++++
> include/linux/dcache.h | 1
> include/linux/seq_file.h | 1
> 7 files changed, 172 insertions(+), 28 deletions(-)
>
> Index: linux-2.6.17.10/fs/proc/base.c
> =====
> --- linux-2.6.17.10.orig/fs/proc/base.c
> +++ linux-2.6.17.10/fs/proc/base.c
> @@ -104,6 +104,7 @@ enum pid_directory_inos {
>  PROC_TGID_MAPS,
>  PROC_TGID_NUMA_MAPS,
>  PROC_TGID_MOUNTS,
> + PROC_TGID_MOUNTS_NEW,
>  PROC_TGID_MOUNTSTATS,
>  PROC_TGID_WCHAN,
> #ifdef CONFIG_MMU
> @@ -145,6 +146,7 @@ enum pid_directory_inos {
>  PROC_TID_MAPS,
>  PROC_TID_NUMA_MAPS,
>  PROC_TID_MOUNTS,
> + PROC_TID_MOUNTS_NEW,
>  PROC_TID_MOUNTSTATS,
>  PROC_TID_WCHAN,

```

```

> #ifdef CONFIG_MMU
> @@ -203,6 +205,7 @@ static struct pid_entry tgid_base_stuff[
> E(PROC_TGID_ROOT, "root", S_IFLNK|S_IRWXUGO),
> E(PROC_TGID_EXE, "exe", S_IFLNK|S_IRWXUGO),
> E(PROC_TGID_MOUNTS, "mounts", S_IFREG|S_IRUGO),
> + E(PROC_TGID_MOUNTS_NEW, "mounts_new", S_IFREG|S_IRUGO),
> E(PROC_TGID_MOUNTSTATS, "mountstats", S_IFREG|S_IRUSR),
> #ifdef CONFIG_MMU
> E(PROC_TGID_SMAPS, "smaps", S_IFREG|S_IRUGO),
> @@ -246,6 +249,7 @@ static struct pid_entry tid_base_stuff[
> E(PROC_TID_ROOT, "root", S_IFLNK|S_IRWXUGO),
> E(PROC_TID_EXE, "exe", S_IFLNK|S_IRWXUGO),
> E(PROC_TID_MOUNTS, "mounts", S_IFREG|S_IRUGO),
> + E(PROC_TID_MOUNTS_NEW, "mounts_new", S_IFREG|S_IRUGO),
> #ifdef CONFIG_MMU
> E(PROC_TID_SMAPS, "smaps", S_IFREG|S_IRUGO),
> #endif
> @@ -692,13 +696,13 @@ static struct file_operations proc_smmaps
> };
> #endif
>
> -extern struct seq_operations mounts_op;
> struct proc_mounts {
> struct seq_file m;
> int event;
> };
>
> -static int mounts_open(struct inode *inode, struct file *file)
> +static int __mounts_open(struct inode *inode, struct file *file,
> + struct seq_operations *mounts_op)
> {
> struct task_struct *task = proc_task(inode);
> struct namespace *namespace;
> @@ -716,7 +720,7 @@ static int mounts_open(struct inode *ino
> p = kmalloc(sizeof(struct proc_mounts), GFP_KERNEL);
> if (p) {
> file->private_data = &p->m;
> - ret = seq_open(file, &mounts_op);
> + ret = seq_open(file, mounts_op);
> if (!ret) {
> p->m.private = namespace;
> p->event = namespace->event;
> @@ -729,6 +733,16 @@ static int mounts_open(struct inode *ino
> return ret;
> }
>
> +extern struct seq_operations mounts_op, mounts_new_op;
> +static int mounts_open(struct inode *inode, struct file *file)

```

```

> +{
> + return (__mounts_open(inode, file, &mounts_op));
> +}
> +static int mounts_new_open(struct inode *inode, struct file *file)
> +{
> + return __mounts_open(inode, file, &mounts_new_op);
> +}
> +
> static int mounts_release(struct inode *inode, struct file *file)
> {
> struct seq_file *m = file->private_data;
> @@ -763,6 +777,14 @@ static struct file_operations proc_mount
> .poll = mounts_poll,
> };
>
> +static struct file_operations proc_mounts_new_operations = {
> + .open = mounts_new_open,
> + .read = seq_read,
> + .llseek = seq_lseek,
> + .release = mounts_release,
> + .poll = mounts_poll,
> +};
> +
> extern struct seq_operations mountstats_op;
> static int mountstats_open(struct inode *inode, struct file *file)
> {
> @@ -1799,6 +1821,10 @@ static struct dentry *proc_pident_lookup
> case PROC_TGID_MOUNTS:
> inode->i_fop = &proc_mounts_operations;
> break;
> + case PROC_TID_MOUNTS_NEW:
> + case PROC_TGID_MOUNTS_NEW:
> + inode->i_fop = &proc_mounts_new_operations;
> + break;
> #ifdef CONFIG_MMU
> case PROC_TID_SMAPS:
> case PROC_TGID_SMAPS:
> Index: linux-2.6.17.10/fs/dcache.c
> =====
> --- linux-2.6.17.10.orig/fs/dcache.c
> +++ linux-2.6.17.10/fs/dcache.c
> @@ -1477,6 +1477,59 @@ char * d_path(struct dentry *dentry, str
> return res;
> }
>
> +static inline int prepend(char **buffer, int *buflen, const char *str,
> + int namelen)
> +{

```

```

> + if ((*buflen -= namelen) < 0)
> + return 1;
> + *buffer -= namelen;
> + memcpy(*buffer, str, namelen);
> + return 0;
> +}
> +
> +/*
> + * write full pathname into buffer and return start of pathname.
> + * If @vfsmnt is not specified return the path relative to the
> + * its filesystem's root.
> + */
> +char * dentry_path(struct dentry *dentry, char *buf, int buflen)
> +{
> + char * end = buf+buflen;
> + char * retval;
> +
> + spin_lock(&dcache_lock);
> + prepend(&end, &buflen, "\0", 1);
> + if (!IS_ROOT(dentry) && d_unhashed(dentry)) {
> + if (prepend(&end, &buflen, "//deleted", 10))
> + goto Elong;
> + }
> + /* Get '/' right */
> + retval = end-1;
> + *retval = '/';
> +
> + for (;;) {
> + struct dentry * parent;
> + if (IS_ROOT(dentry))
> + break;
> +
> + parent = dentry->d_parent;
> + prefetch(parent);
> +
> + if (prepend(&end, &buflen, dentry->d_name.name,
> + dentry->d_name.len) ||
> + prepend(&end, &buflen, "/", 1))
> + goto Elong;
> +
> + retval = end;
> + dentry = parent;
> + }
> + spin_unlock(&dcache_lock);
> + return retval;
> +Elong:
> + spin_unlock(&dcache_lock);
> + return ERR_PTR(-ENAMETOOLONG);

```

```

> +}
> +
> /*
>  * NOTE! The user-level library version returns a
>  * character pointer. The kernel system call just
> Index: linux-2.6.17.10/fs/seq_file.c
> =====
> --- linux-2.6.17.10.orig/fs/seq_file.c
> +++ linux-2.6.17.10/fs/seq_file.c
> @@ -338,38 +338,75 @@ int seq_printf(struct seq_file *m, const
> }
> EXPORT_SYMBOL(seq_printf);
>
> -int seq_path(struct seq_file *m,
> -    struct vfsmount *mnt, struct dentry *dentry,
> +static inline char *mangle_path(char *s, char *p, char *esc)
> +{
> + while (s <= p) {
> + char c = *p++;
> + if (!c) {
> + return s;
> + } else if (!strchr(esc, c)) {
> + *s++ = c;
> + } else if (s + 4 > p) {
> + break;
> + } else {
> + *s++ = '\\';
> + *s++ = '0' + ((c & 0300) >> 6);
> + *s++ = '0' + ((c & 070) >> 3);
> + *s++ = '0' + (c & 07);
> + }
> + }
> + return NULL;
> +}
> +
> +/*
> + * return the absolute path of 'dentry' residing in mount 'mnt'.
> + */
> +int seq_path(struct seq_file *m, struct vfsmount *mnt, struct dentry *dentry,
> +    char *esc)
> + {
> + char *p = NULL;
> + if (m->count < m->size) {
> + char *s = m->buf + m->count;
> + char *p = d_path(dentry, mnt, s, m->size - m->count);
> + p = d_path(dentry, mnt, s, m->size - m->count);
> + if (!IS_ERR(p)) {
> + while (s <= p) {

```

```

> - char c = *p++;
> - if (!c) {
> -     p = m->buf + m->count;
> -     m->count = s - m->buf;
> -     return s - p;
> - } else if (!strchr(esc, c)) {
> -     *s++ = c;
> - } else if (s + 4 > p) {
> -     break;
> - } else {
> -     *s++ = '\\';
> -     *s++ = '0' + ((c & 0300) >> 6);
> -     *s++ = '0' + ((c & 070) >> 3);
> -     *s++ = '0' + (c & 07);
> - }
> + s = mangle_path(s, p, esc);
> + if (s) {
> +     p = m->buf + m->count;
> +     m->count = s - m->buf;
> +     return s - p;
> }
> }
> }
> m->count = m->size;
> - return -1;
> + return p == ERR_PTR(-ENAMETOOLONG) ? 0 : -1;
> }
> +
> EXPORT_SYMBOL(seq_path);
>
> +/*
> + * returns the path of the 'dentry' from the root of its filesystem.
> + */
> +int seq_dentry(struct seq_file *m, struct dentry *dentry, char *esc)
> +{
> + char *p = NULL;
> + if (m->count < m->size) {
> +     char *s = m->buf + m->count;
> +     p = dentry_path(dentry, s, m->size - m->count);
> +     if (!IS_ERR(p)) {
> +         s = mangle_path(s, p, esc);
> +         if (s) {
> +             p = m->buf + m->count;
> +             m->count = s - m->buf;
> +             return s - p;
> +         }
> +     }
> + }
> + }
> + }

```

```

> + m->count = m->size;
> + return p == ERR_PTR(-ENAMETOOLONG) ? 0 : -1;
> +}
> +
> +EXPORT_SYMBOL(seq_dentry);
> +
> static void *single_start(struct seq_file *p, loff_t *pos)
> {
>     return NULL + (*pos == 0);
> Index: linux-2.6.17.10/fs/proc/proc_misc.c
> =====
> --- linux-2.6.17.10.orig/fs/proc/proc_misc.c
> +++ linux-2.6.17.10/fs/proc/proc_misc.c
> @@ -675,6 +675,7 @@ void __init proc_misc_init(void)
>     create_proc_read_entry(p->name, 0, NULL, p->read_proc, NULL);
>
>     proc_symlink("mounts", NULL, "self/mounts");
> + proc_symlink("mounts_new", NULL, "self/mounts_new");
>
>     /* And now for trickier ones */
>     entry = create_proc_entry("kmsg", S_IRUSR, &proc_root);
> Index: linux-2.6.17.10/fs/namespace.c
> =====
> --- linux-2.6.17.10.orig/fs/namespace.c
> +++ linux-2.6.17.10/fs/namespace.c
> @@ -349,7 +349,7 @@ static inline void mangle(struct seq_fil
>     seq_escape(m, s, "\t\n\\");
> }
>
> -static int show_vfsmnt(struct seq_file *m, void *v)
> +static int show_options(struct seq_file *m, void *v)
> {
>     struct vfsmount *mnt = v;
>     int err = 0;
> @@ -372,10 +372,6 @@ static int show_vfsmnt(struct seq_file *
>     };
>     struct proc_fs_info *fs_infol;
>
>     - mangle(m, mnt->mnt_devname ? mnt->mnt_devname : "none");
>     - seq_putc(m, ' ');
>     - seq_path(m, mnt, mnt->mnt_root, "\t\n\\");
>     - seq_putc(m, ' ');
>     mangle(m, mnt->mnt_sb->s_type->name);
>     seq_puts(m, mnt->mnt_sb->s_flags & MS_RDONLY ? " ro" : " rw");
>     for (fs_infol = fs_info; fs_infol->flag; fs_infol++) {
> @@ -392,6 +388,28 @@ static int show_vfsmnt(struct seq_file *
>     return err;
> }

```

```

>
> +static int show_vfsmnt(struct seq_file *m, void *v)
> +{
> + struct vfsmount *mnt = v;
> + mangle(m, mnt->mnt_devname ? mnt->mnt_devname : "none");
> + seq_putc(m, ' ');
> + seq_path(m, mnt, mnt->mnt_root, "\t\n\\");
> + seq_putc(m, ' ');
> + return show_options(m, v);
> +}
> +
> +static int show_vfsmnt_new(struct seq_file *m, void *v)
> +{
> + struct vfsmount *mnt = v;
> + seq_printf(m, "0x%x", new_encode_dev(mnt->mnt_sb->s_dev));
> + seq_putc(m, ' ');
> + seq_path(m, mnt, mnt->mnt_root, "\t\n\\");
> + seq_putc(m, ' ');
> + seq_dentry(m, mnt->mnt_root, "\t\n\\");
> + seq_putc(m, ' ');
> + return show_options(m, v);
> +}
> +
> struct seq_operations mounts_op = {
> .start = m_start,
> .next = m_next,
> @@ -399,6 +417,13 @@ struct seq_operations mounts_op = {
> .show = show_vfsmnt
> };
>
> +struct seq_operations mounts_new_op = {
> + .start = m_start,
> + .next = m_next,
> + .stop = m_stop,
> + .show = show_vfsmnt_new
> +};
> +
> static int show_vfsstat(struct seq_file *m, void *v)
> {
> struct vfsmount *mnt = v;
> Index: linux-2.6.17.10/include/linux/dcache.h
> =====
> --- linux-2.6.17.10.orig/include/linux/dcache.h
> +++ linux-2.6.17.10/include/linux/dcache.h
> @@ -281,6 +281,7 @@ extern struct dentry * d_hash_and_lookup
> extern int d_validate(struct dentry *, struct dentry *);
>
> extern char * d_path(struct dentry *, struct vfsmount *, char *, int);

```

```

> +extern char * dentry_path(struct dentry *, char *, int);
>
> /* Allocation counts.. */
>
> Index: linux-2.6.17.10/include/linux/seq_file.h
> =====
> --- linux-2.6.17.10.orig/include/linux/seq_file.h
> +++ linux-2.6.17.10/include/linux/seq_file.h
> @@ -43,6 +43,7 @@ int seq_printf(struct seq_file *, const
> __attribute__((format(printf,2,3)));
>
> int seq_path(struct seq_file *, struct vfsmount *, struct dentry *, char *);
> +int seq_dentry(struct seq_file *, struct dentry *, char *);
>
> int single_open(struct file *, int (*)(struct seq_file *, void *), void *);
> int single_release(struct inode *, struct file *);
>
> This patch introduces a new proc interface that exposes all the propagation
> trees within the namespace.
>
> It walks through each off the mounts in the namespace, and prints the following information.
>
> mount-id: a unique mount identifier
> dev-id : the unique device used to identify the device containing the filesystem
> path-from-root: mount point of the mount from /
> path-from-root-of-its-sb: path from its own root dentry.
> propagation-flag: SHARED, SLAVE, UNBINDABLE, PRIVATE
> peer-mount-id: the mount-id of its peer mount (if this mount is shared)
> master-mount-id: the mount-id of its master mount (if this mount is slave)
>
> Using the above information one could easily write a script that can
> draw all the propagation trees in the namespace.
>
>
> Example:
> Here is a sample output of cat /proc/$$/mounts_propagation
>
> 0xa917800 0x1 // PRIVATE
> 0xa917200 0x6200 // PRIVATE
> 0xa917180 0x3 /proc / PRIVATE
> 0xa917f80 0xa /dev/pts / PRIVATE
> 0xa917100 0x6210 /mnt / SHARED peer:0xa917100
> 0xa917f00 0x6210 /tmp /1 SLAVE master:0xa917100
> 0xa917900 0x6220 /mnt/2 / SHARED peer:0xa917900
>
> line 5 indicates that the mount with id 0xa917100 is mounted at /mnt is shared
> and it is the only mount in its peer group.
>

```

```

> line 6 indicates that the mount with id 0xa917f00 is mounted at /tmp, its
> root is the dentry 1 present under its root directory. This mount is a
> slave mount and its master is the mount with id 0xa917100.
>
> line 7 indicates that the mount with id 0xa917900 is mounted at /mnt/2, its
> root is the dentry / of its filesystem. This mount is a
> shared and it is the only mount in its peer group.
>
> one could write a script which runs through these lines and draws 4
> individual satellite mounts and two propagation trees, the first propagation
> tree has a shared mount and a slave mount. and the second propagation tree has
> just one shared mount.
>
>
> Signed-off-by: Ram Pai <linuxram@us.ibm.com>
> ---
> fs/namespace.c | 42 ++++++++++++++++++++++++++++++++++++++++++++++++++++++
> fs/pnode.c     |  6 +-----
> fs/pnode.h     |  6 ++++++
> fs/proc/base.c | 22 +++++++++++++++++++++++++++++++++++++-
> 4 files changed, 69 insertions(+), 7 deletions(-)
>
> Index: linux-2.6.17.10/fs/namespace.c
> =====
> --- linux-2.6.17.10.orig/fs/namespace.c
> +++ linux-2.6.17.10/fs/namespace.c
> @@ -410,6 +410,41 @@ static int show_vfsmnt_new(struct seq_file
>  return show_options(m, v);
>  }
>
> +static int show_vfsmnt_propagation(struct seq_file *m, void *v)
> +{
> + struct vfsmount *mnt = v;
> + seq_printf(m, "0x%x", (int)mnt);
> + seq_putc(m, ' ');
> + seq_printf(m, "0x%x", new_encode_dev(mnt->mnt_sb->s_dev));
> + seq_putc(m, ' ');
> + seq_path(m, mnt, mnt->mnt_root, "\t\n\\");
> + seq_putc(m, ' ');
> + seq_dentry(m, mnt->mnt_root, "\t\n\\");
> + seq_putc(m, ' ');
> +
> + if (IS_MNT_SHARED(mnt)) {
> + seq_printf(m, "%s ", "SHARED");
> + if (IS_MNT_SLAVE(mnt)) {
> + seq_printf(m, "%s ", "SLAVE");
> + }
> + } else if (IS_MNT_SLAVE(mnt)) {

```

```

> + seq_printf(m, "%s ", "SLAVE");
> + } else if (IS_MNT_UNBINDABLE(mnt)) {
> + seq_printf(m, "%s ", "UNBINDABLE");
> + } else {
> + seq_printf(m, "%s ", "PRIVATE");
> + }
> +
> + if (IS_MNT_SHARED(mnt)) {
> + seq_printf(m, "peer:0x%x ", (int)next_peer(mnt));

```

Ok, so if the sequence of events was

```

mount --make-shared /mnt
(some user logs in and gets a cloned namespace, so his /mnt
becomes the next peer of /mnt)
mount --bind /mnt /tmp
(some other user logs in and gets cloned namespace...)

```

or some such sequence of events, we could lose all information about /mnt and /tmp being peers, right? Should a new `next_peer_in_same_namespace(mnt)` be used rather than `next_peer()`?

Somewhat similarly,

```

> + }
> + if (IS_MNT_SLAVE(mnt)) {
> + seq_printf(m, "master:0x%x ", (int)mnt->mnt_master);

```

Should we for privacy reasons not print out the address `mnt->mnt_master` is in a different namespace (perhaps if `!CAP_SYS_ADMIN`)?

Otherwise I like this.

thanks,  
-serge

```

> + }
> + seq_puts(m, "\n");
> + return 0;
> + }
> +
> struct seq_operations mounts_op = {
> .start = m_start,
> .next = m_next,
> @@ -424,6 +459,13 @@ struct seq_operations mounts_new_op = {
> .show = show_vfsmnt_new
> };
>

```

```

> +struct seq_operations mounts_propagation_op = {
> + .start = m_start,
> + .next = m_next,
> + .stop = m_stop,
> + .show = show_vfsmnt_propagation
> +};
> +
> static int show_vfsstat(struct seq_file *m, void *v)
> {
>     struct vfsmount *mnt = v;
> Index: linux-2.6.17.10/fs/proc/base.c
> =====
> --- linux-2.6.17.10.orig/fs/proc/base.c
> +++ linux-2.6.17.10/fs/proc/base.c
> @@ -105,6 +105,7 @@ enum pid_directory_inos {
>     PROC_TGID_NUMA_MAPS,
>     PROC_TGID_MOUNTS,
>     PROC_TGID_MOUNTS_NEW,
> + PROC_TGID_MOUNTS_PROPAGATION,
>     PROC_TGID_MOUNTSTATS,
>     PROC_TGID_WCHAN,
> #ifdef CONFIG_MMU
> @@ -146,6 +147,7 @@ enum pid_directory_inos {
>     PROC_TID_MAPS,
>     PROC_TID_NUMA_MAPS,
>     PROC_TID_MOUNTS,
> + PROC_TID_MOUNTS_PROPAGATION,
>     PROC_TID_MOUNTS_NEW,
>     PROC_TID_MOUNTSTATS,
>     PROC_TID_WCHAN,
> @@ -206,6 +208,7 @@ static struct pid_entry tgid_base_stuff[
>     E(PROC_TGID_EXE, "exe", S_IFLNK|S_IRWXUGO),
>     E(PROC_TGID_MOUNTS, "mounts", S_IFREG|S_IRUGO),
>     E(PROC_TGID_MOUNTS_NEW, "mounts_new", S_IFREG|S_IRUGO),
> + E(PROC_TGID_MOUNTS_PROPAGATION, "mounts_propagation", S_IFREG|S_IRUGO),
>     E(PROC_TGID_MOUNTSTATS, "mountstats", S_IFREG|S_IRUSR),
> #ifdef CONFIG_MMU
>     E(PROC_TGID_SMAPS, "smaps", S_IFREG|S_IRUGO),
> @@ -250,6 +253,7 @@ static struct pid_entry tid_base_stuff[]
>     E(PROC_TID_EXE, "exe", S_IFLNK|S_IRWXUGO),
>     E(PROC_TID_MOUNTS, "mounts", S_IFREG|S_IRUGO),
>     E(PROC_TID_MOUNTS_NEW, "mounts_new", S_IFREG|S_IRUGO),
> + E(PROC_TID_MOUNTS_PROPAGATION, "mounts_propagation", S_IFREG|S_IRUGO),
> #ifdef CONFIG_MMU
>     E(PROC_TID_SMAPS, "smaps", S_IFREG|S_IRUGO),
> #endif
> @@ -733,7 +737,7 @@ static int __mounts_open(struct inode *i
>     return ret;

```

```

> }
>
> -extern struct seq_operations mounts_op, mounts_new_op;
> +extern struct seq_operations mounts_op, mounts_new_op, mounts_propagation_op;
> static int mounts_open(struct inode *inode, struct file *file)
> {
>     return (__mounts_open(inode, file, &mounts_op));
> @@ -742,6 +746,10 @@ static int mounts_new_open(struct inode
> {
>     return __mounts_open(inode, file, &mounts_new_op);
> }
> +static int mounts_propagation_open(struct inode *inode, struct file *file)
> +{
> +    return __mounts_open(inode, file, &mounts_propagation_op);
> +}
>
> static int mounts_release(struct inode *inode, struct file *file)
> {
> @@ -785,6 +793,14 @@ static struct file_operations proc_mount
>     .poll = mounts_poll,
> };
>
> +static struct file_operations proc_propagation_operations = {
> +    .open = mounts_propagation_open,
> +    .read = seq_read,
> +    .llseek = seq_lseek,
> +    .release = mounts_release,
> +    .poll = mounts_poll,
> +};
> +
> extern struct seq_operations mountstats_op;
> static int mountstats_open(struct inode *inode, struct file *file)
> {
> @@ -1825,6 +1841,10 @@ static struct dentry *proc_pident_lookup
>     case PROC_TGID_MOUNTS_NEW:
>         inode->i_fop = &proc_mounts_new_operations;
>         break;
> +    case PROC_TID_MOUNTS_PROPAGATION:
> +    case PROC_TGID_MOUNTS_PROPAGATION:
> +        inode->i_fop = &proc_propagation_operations;
> +        break;
> #ifdef CONFIG_MMU
>     case PROC_TID_SMAPS:
>     case PROC_TGID_SMAPS:
> Index: linux-2.6.17.10/fs/pnode.c
> =====
> --- linux-2.6.17.10.orig/fs/pnode.c
> +++ linux-2.6.17.10/fs/pnode.c

```

```

> @@ -11,12 +11,6 @@
> #include <linux/fs.h>
> #include "pnode.h"
>
> -/* return the next shared peer mount of @p */
> -static inline struct vfsmount *next_peer(struct vfsmount *p)
> -{
> - return list_entry(p->mnt_share.next, struct vfsmount, mnt_share);
> -}
> -
> static inline struct vfsmount *first_slave(struct vfsmount *p)
> {
> return list_entry(p->mnt_slave_list.next, struct vfsmount, mnt_slave);
> Index: linux-2.6.17.10/fs/pnode.h
> =====
> --- linux-2.6.17.10.orig/fs/pnode.h
> +++ linux-2.6.17.10/fs/pnode.h
> @@ -29,6 +29,12 @@ static inline void set_mnt_shared(struct
> mnt->mnt_flags |= MNT_SHARED;
> }
>
> +/* return the next shared peer mount of @p */
> +static inline struct vfsmount *next_peer(struct vfsmount *p)
> +{
> + return list_entry(p->mnt_share.next, struct vfsmount, mnt_share);
> +}
> +
> void change_mnt_propagation(struct vfsmount *, int);
> int propagate_mnt(struct vfsmount *, struct dentry *, struct vfsmount *,
> struct list_head *);

```

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