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Subject: [PATCH] net: Fix race when opening a proc file while a network namespace is exiting.

Posted by [ebiederm](#) on Wed, 12 Sep 2007 16:24:34 GMT

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The problem: `proc_net` files remember which network namespace they are against but do not remember hold a reference count (as that would pin the network namespace). So we currently have a small window where the reference count on a network namespace may be incremented when opening a `/proc` file when it has already gone to zero.

To fix this introduce `maybe_get_net` and `get_proc_net`.

`maybe_get_net` increments the network namespace reference count only if it is greater than zero, ensuring we don't increment a reference count after it has gone to zero.

`get_proc_net` handles all of the magic to go from a `proc` inode to the network namespace instance and call `maybe_get_net` on it.

`PROC_NET` the old accessor is removed so that we don't get confused and use the wrong helper function.

Then I fix up the callers to use `get_proc_net` and handle the case where `get_proc_net` returns `NULL`. In that case I return `-ENXIO` because effectively the network namespace has already gone away so the files we are trying to access don't exist anymore.

Signed-off-by: Eric W. Biederman <[ebiederm@xmission.com](mailto:ebiederm@xmission.com)>

---  
fs/proc/proc\_net.c | 6 ++++++  
include/linux/proc\_fs.h | 5 +----  
include/net/net\_namespace.h | 12 ++++++++  
net/core/dev.c | 6 +++++-  
net/core/dev\_mcast.c | 6 +++++-  
net/netlink/af\_netlink.c | 6 +++++-  
net/wireless/wext.c | 6 +++++-  
7 files changed, 39 insertions(+), 8 deletions(-)

```
diff --git a/fs/proc/proc_net.c b/fs/proc/proc_net.c
index 358930a..85cc8e8 100644
--- a/fs/proc/proc_net.c
+++ b/fs/proc/proc_net.c
@@ -51,6 +51,12 @@ void proc_net_remove(struct net *net, const char *name)
 }
 EXPORT_SYMBOL_GPL(proc_net_remove);

+struct net *get_proc_net(const struct inode *inode)
```

```

+{
+ return maybe_get_net(PDE_NET(PDE(inode)));
+}
+EXPORT_SYMBOL_GPL(get_proc_net);
+
static struct proc_dir_entry *proc_net_shadow;

static struct dentry *proc_net_shadow_dentry(struct dentry *parent,
diff --git a/include/linux/proc_fs.h b/include/linux/proc_fs.h
index 5964670..20741f6 100644
--- a/include/linux/proc_fs.h
+++ b/include/linux/proc_fs.h
@@ -270,10 +270,7 @@ static inline struct net *PDE_NET(struct proc_dir_entry *pde)
    return pde->parent->data;
}

-static inline struct net *PROC_NET(const struct inode *inode)
-{
- return PDE_NET(PDE(inode));
-}
+struct net *get_proc_net(const struct inode *inode);

struct proc_maps_private {
    struct pid *pid;
diff --git a/include/net/net_namespace.h b/include/net/net_namespace.h
index fac42db..dda03f3 100644
--- a/include/net/net_namespace.h
+++ b/include/net/net_namespace.h
@@ -39,6 +39,18 @@ static inline struct net *get_net(struct net *net)
    return net;
}

+static inline struct net *maybe_get_net(struct net *net)
+{
+ /* Used when we know struct net exists but we
+  * aren't guaranteed a previous reference count
+  * exists. If the reference count is zero this
+  * function fails and returns NULL.
+  */
+ if (!atomic_inc_not_zero(&net->count))
+   net = NULL;
+ return net;
+}
+
static inline void put_net(struct net *net)
{
    if (atomic_dec_and_test(&net->count))
diff --git a/net/core/dev.c b/net/core/dev.c

```

```

index a22a95d..f119dc0 100644
--- a/net/core/dev.c
+++ b/net/core/dev.c
@@ -2446,7 +2446,11 @@ static int dev_seq_open(struct inode *inode, struct file *file)
    res = seq_open(file, &dev_seq_ops);
    if (!res) {
        seq = file->private_data;
-   seq->private = get_net(PROC_NET(inode));
+   seq->private = get_proc_net(inode);
+   if (!seq->private) {
+       seq_release(inode, file);
+       res = -ENXIO;
+   }
    }
    return res;
}
diff --git a/net/core/dev_mcast.c b/net/core/dev_mcast.c
index 1c4f619..896b0ca 100644
--- a/net/core/dev_mcast.c
+++ b/net/core/dev_mcast.c
@@ -246,7 +246,11 @@ static int dev_mc_seq_open(struct inode *inode, struct file *file)
    res = seq_open(file, &dev_mc_seq_ops);
    if (!res) {
        seq = file->private_data;
-   seq->private = get_net(PROC_NET(inode));
+   seq->private = get_proc_net(inode);
+   if (!seq->private) {
+       seq_release(inode, file);
+       res = -ENXIO;
+   }
    }
    return res;
}
diff --git a/net/netlink/af_netlink.c b/net/netlink/af_netlink.c
index 3029f86..dc9f8c2 100644
--- a/net/netlink/af_netlink.c
+++ b/net/netlink/af_netlink.c
@@ -1859,7 +1859,11 @@ static int netlink_seq_open(struct inode *inode, struct file *file)

    seq = file->private_data;
    seq->private = iter;
-   iter->net = get_net(PROC_NET(inode));
+   iter->net = get_proc_net(inode);
+   if (!iter->net) {
+       seq_release_private(inode, file);
+       return -ENXIO;
+   }
    return 0;

```

```
}

diff --git a/net/wireless/wext.c b/net/wireless/wext.c
index e8b3409..85e5f9d 100644
--- a/net/wireless/wext.c
+++ b/net/wireless/wext.c
@@ -678,7 +678,11 @@ static int wireless_seq_open(struct inode *inode, struct file *file)
     res = seq_open(file, &wireless_seq_ops);
     if (!res) {
         seq = file->private_data;
-        seq->private = get_net(PROC_NET(inode));
+        seq->private = get_proc_net(inode);
+        if (!seq->private) {
+            seq_release(inode, file);
+            res = -ENXIO;
+        }
     }
     return res;
 }
--
1.5.3.rc6.17.g1911
```

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

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