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Subject: Re: [PATCH (resubmit)] Fix inet\_diag.ko register vs rcv race

Posted by [Herbert Xu](#) on Mon, 03 Dec 2007 04:56:22 GMT

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On Thu, Nov 29, 2007 at 04:01:25PM +0300, Pavel Emelyanov wrote:

```
>
> @@ -863,13 +861,13 @@ int inet_diag_register(const struct inet_diag_handler *h)
> if (type >= INET_DIAG_GETSOCK_MAX)
> goto out;
>
> - spin_lock(&inet_diag_register_lock);
> + mutex_lock(&inet_diag_mutex);
> err = -EEXIST;
> if (inet_diag_table[type] == NULL) {
> inet_diag_table[type] = h;
> err = 0;
> }
> - spin_unlock(&inet_diag_register_lock);
> + mutex_unlock(&inet_diag_mutex);
```

Actually this causes a dead-lock when the handlers are built as modules because we try to load them with that mutex held.

I've fixed it with this patch on top.

Cheers,

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commit d523a328fb0271e1a763e985a21f2488fd816e7e

Author: Herbert Xu <[herbert@gondor.apana.org.au](mailto:herbert@gondor.apana.org.au)>

Date: Mon Dec 3 15:51:25 2007 +1100

[INET]: Fix inet\_diag dead-lock regression

The inet\_diag register fix broke inet\_diag module loading because the loaded module had to take the same mutex that's already held by the loader in order to register the new handler.

This patch fixes it by introducing a separate mutex to protect the handling of handlers.

Signed-off-by: Herbert Xu <[herbert@gondor.apana.org.au](mailto:herbert@gondor.apana.org.au)>

diff --git a/net/ipv4/inet\_diag.c b/net/ipv4/inet\_diag.c

index 6b3fffb..e468e7a 100644

--- a/net/ipv4/inet\_diag.c

+++ b/net/ipv4/inet\_diag.c

@@ -51,6 +51,29 @@ static struct sock \*idiagnl;

#define INET\_DIAG\_PUT(skb, attrtype, attrlen) \  
RTA\_DATA(\_\_RTA\_PUT(skb, attrtype, attrlen))

+static DEFINE\_MUTEX(inet\_diag\_table\_mutex);

+

+static const struct inet\_diag\_handler \*inet\_diag\_lock\_handler(int type)

+{

+#ifdef CONFIG\_KMOD

+ if (!inet\_diag\_table[type])

+ request\_module("net-pf-%d-proto-%d-type-%d", PF\_NETLINK,

+ NETLINK\_INET\_DIAG, type);

+#endif

+

+ mutex\_lock(&inet\_diag\_table\_mutex);

+ if (!inet\_diag\_table[type])

+ return ERR\_PTR(-ENOENT);

+

+ return inet\_diag\_table[type];

+}

+

+static inline void inet\_diag\_unlock\_handler(

+ const struct inet\_diag\_handler \*handler)

+{

+ mutex\_unlock(&inet\_diag\_table\_mutex);

+}

+

static int inet\_csk\_diag\_fill(struct sock \*sk,

struct sk\_buff \*skb,

int ext, u32 pid, u32 seq, u16 nlmsg\_flags,

@@ -235,9 +258,12 @@ static int inet\_diag\_get\_exact(struct sk\_buff \*in\_skb,

struct inet\_hashinfo \*hashinfo;

const struct inet\_diag\_handler \*handler;

- handler = inet\_diag\_table[nlh->nlmsg\_type];

- BUG\_ON(handler == NULL);

+ handler = inet\_diag\_lock\_handler(nlh->nlmsg\_type);

+ if (!handler)

+ return -ENOENT;

+

hashinfo = handler->idiag\_hashinfo;

+ err = -EINVAL;

if (req->idiag\_family == AF\_INET) {

sk = inet\_lookup(hashinfo, req->id.idiag\_dst[0],

```

@@ -255,11 +281,12 @@ static int inet_diag_get_exact(struct sk_buff *in_skb,
}
#endif
else {
- return -EINVAL;
+ goto unlock;
}

+ err = -ENOENT;
+ if (sk == NULL)
- return -ENOENT;
+ goto unlock;

err = -ESTALE;
if ((req->id.idiag_cookie[0] != INET_DIAG_NOCOOKIE ||
@@ -296,6 +323,8 @@ out:
else
sock_put(sk);
}
+unlock:
+ inet_diag_unlock_handler(handler);
return err;
}

@@ -678,8 +707,10 @@ static int inet_diag_dump(struct sk_buff *skb, struct netlink_callback
*cb)
const struct inet_diag_handler *handler;
struct inet_hashinfo *hashinfo;

- handler = inet_diag_table[cb->nlh->nlmsg_type];
- BUG_ON(handler == NULL);
+ handler = inet_diag_lock_handler(cb->nlh->nlmsg_type);
+ if (!handler)
+ goto no_handler;
+
hashinfo = handler->idiag_hashinfo;

s_i = cb->args[1];
@@ -743,7 +774,7 @@ skip_listen_ht:
}

if (!(r->idiag_states & ~(TCPF_LISTEN | TCPF_SYN_RECV)))
- return skb->len;
+ goto unlock;

for (i = s_i; i < hashinfo->ehash_size; i++) {
struct inet_ehash_bucket *head = &hashinfo->ehash[i];
@@ -805,6 +836,9 @@ next_dying:

```

```

done:
    cb->args[1] = i;
    cb->args[2] = num;
+unlock:
+ inet_diag_unlock_handler(handler);
+no_handler:
    return skb->len;
}

@@ -816,15 +850,6 @@ static int inet_diag_rcv_msg(struct sk_buff *skb, struct nlmsghdr *nlh)
    nlmsg_len(nlh) < hdrlen)
    return -EINVAL;

-#ifdef CONFIG_KMOD
- if (inet_diag_table[nlh->nlmsg_type] == NULL)
-     request_module("net-pf-%d-proto-%d-type-%d", PF_NETLINK,
-         NETLINK_INET_DIAG, nlh->nlmsg_type);
-#endif
-
- if (inet_diag_table[nlh->nlmsg_type] == NULL)
-     return -ENOENT;
-
    if (nlh->nlmsg_flags & NLM_F_DUMP) {
        if (nlmsg_attrlen(nlh, hdrlen)) {
            struct nlattr *attr;
@@ -861,13 +886,13 @@ int inet_diag_register(const struct inet_diag_handler *h)
    if (type >= INET_DIAG_GETSOCK_MAX)
        goto out;

- mutex_lock(&inet_diag_mutex);
+ mutex_lock(&inet_diag_table_mutex);
    err = -EEXIST;
    if (inet_diag_table[type] == NULL) {
        inet_diag_table[type] = h;
        err = 0;
    }
- mutex_unlock(&inet_diag_mutex);
+ mutex_unlock(&inet_diag_table_mutex);
out:
    return err;
}

@@ -880,9 +905,9 @@ void inet_diag_unregister(const struct inet_diag_handler *h)
    if (type >= INET_DIAG_GETSOCK_MAX)
        return;

- mutex_lock(&inet_diag_mutex);
+ mutex_lock(&inet_diag_table_mutex);
    inet_diag_table[type] = NULL;

```

```
- mutex_unlock(&inet_diag_mutex);
+ mutex_unlock(&inet_diag_table_mutex);
}
EXPORT_SYMBOL_GPL(inet_diag_unregister);

@@ -897,7 +922,7 @@ static int __init inet_diag_init(void)
    goto out;

    idiagnl = netlink_kernel_create(&init_net, NETLINK_INET_DIAG, 0,
-   inet_diag_rcv, &inet_diag_mutex, THIS_MODULE);
+   inet_diag_rcv, NULL, THIS_MODULE);
    if (idiagnl == NULL)
        goto out_free_table;
    err = 0;
```

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