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Subject: [patch 0/3][netns] fix and wipeout timewait sockets  
Posted by [Daniel Lezcano](#) on Mon, 24 Sep 2007 13:29:35 GMT  
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Denis Lunev spotted that using a reference to the network namespace with the timewait sockets will be a waste of time because they are pointless while we will remove the network stack at network namespace exit.

The following patches do the following:

- fix missing network namespace reference in timewait socket
- do some changes in timewait socket code to prepare the next patch, especially split code taking a lock
- do the effective timewait socket cleanup at network namespace exit.

The following code is a test program which creates 100 timewait sockets.

```
#include <stdio.h>
#include <string.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <sys/poll.h>
#include <netinet/in.h>
#include <netinet/tcp.h>
#include <arpa/inet.h>

#include <unistd.h>

#define MAXCONN 100

int client(int *fds)
{
    int i;
    struct sockaddr_in addr;

    close(fds[1]);

    memset(&addr, 0, sizeof(addr));

    addr.sin_family = AF_INET;
    addr.sin_port = htons(10000);
    addr.sin_addr.s_addr = inet_addr("127.0.0.1");

    if (read(fds[0], &i, sizeof(i)) == -1) {
        perror("read");
    }
}
```

```

        return 1;
    }

    for (i = 0; i < MAXCONN; i++) {
        int fd = socket(PF_INET, SOCK_STREAM, 0);
        if (fd == -1) {
            perror("socket");
            return 1;
        }

        if (connect(fd, (const struct sockaddr *)&addr, sizeof(addr))) {
            perror("connect");
            return 1;
        }
    }

    return 0;
}

int server(int *fds)
{
    int i, fd, fdpoll[MAXCONN];
    struct sockaddr_in addr;
    socklen_t socklen = sizeof(addr);

    close(fds[0]);

    fd = socket(PF_INET, SOCK_STREAM, 0);
    if (fd == -1) {
        perror("socket");
        return 1;
    }

    memset(&addr, 0, sizeof(addr));

    addr.sin_family = AF_INET;
    addr.sin_port = htons(10000);
    addr.sin_addr.s_addr = inet_addr("127.0.0.1");

    if (bind(fd, (const struct sockaddr *)&addr, sizeof(addr))) {
        perror("bind");
        return 1;
    }

    if (listen(fd, MAXCONN)) {
        perror("listen");
        return 1;
    }
}

```

```

    if (write(fds[1], &i, sizeof(i)) == -1) {
        perror("write");
        return 1;
    }

    for (i = 0; i < MAXCONN; i++) {
        int f = accept(fd, (struct sockaddr *)&addr, &socklen);
        if (f == -1) {
            perror("accept");
            return 1;
        }
        fdpoll[i] = f;
    }

    return 0;
}

int main(int argc, char *argv[])
{
    int fds[2];
    int pid;

    if (pipe(fds)) {
        perror("pipe");
        return 1;
    }

    pid = fork();
    if (pid == -1) {
        perror("fork");
        return 1;
    }

    if (!pid)
        return client(fds);
    else
        return server(fds);
}

--

```

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Subject: [patch 3/3][netns] remove timewait sockets at cleanup  
Posted by [Daniel Lezcano](#) on Mon, 24 Sep 2007 13:29:38 GMT  
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From: Daniel Lezcano <dlezcano@fr.ibm.com>

Denis Lunev spotted that if we take a reference to the network namespace with the timewait sockets, we will need to wait for their expiration to have the network namespace freed. This is a waste of time, the timewait sockets are for avoiding to receive a duplicate packet from the network, if the network namespace is freed, the network stack is removed, so no chance to receive any packets from the outside world.

This patchset remove/destroy the timewait sockets when the network namespace is freed.

Signed-off-by: Daniel Lezcano <dlezcano@fr.ibm.com>

---  
net/core/net\_namespace.c | 55 +++  
1 file changed, 55 insertions(+)

Index: linux-2.6-netns/net/core/net\_namespace.c

```
=====
--- linux-2.6-netns.orig/net/core/net_namespace.c
+++ linux-2.6-netns/net/core/net_namespace.c
@@ -7,6 +7,7 @@
#include <linux/sched.h>
#include <linux/kallsyms.h>
#include <net/net_namespace.h>
+#include <net/tcp.h>

/*
 * Our network namespace constructor/destructor lists
@@ -59,6 +60,57 @@ static int pernet_debug_max=-1;
module_param(pernet_debug, int, S_IRUSR|S_IWUSR);
module_param(pernet_debug_max, int, S_IRUSR|S_IWUSR);

+/*
+ * This function is called when the network namespace is freed.
+ * It allows to wipe out all timewait sockets. They are useless
+ * because the network namespace will be destroyed and the network
+ * stack with it, so no risks to have a duplicate packet coming
+ * from the outside world.
+ */
+static void clean_up_timewait(struct net *net)
+{
+ struct inet_timewait_sock *tw;
+ struct sock *sk;
+ struct hlist_node *node, *tmp;
```

```

+ int h;
+
+ /* Browse the the established hash table */
+ for (h = 0; h < (tcp_hashinfo.ehash_size); h++) {
+     struct inet_ehash_bucket *head =
+         inet_ehash_bucket(&tcp_hashinfo, h);
+
+     /* Take the lock and disable bh */
+     write_lock_bh(&head->lock);
+
+     sk_for_each_safe(sk, node, tmp, &head->twchain) {
+
+         tw = inet_tws(sk);
+         if (tw->tw_net != net)
+             continue;
+
+         /* deschedule the timewait socket */
+         spin_lock(&tcp_death_row.death_lock);
+         if (inet_tws_del_dead_node(tw)) {
+             inet_tws_put(tw);
+             if (--tcp_death_row.tw_count == 0)
+                 del_timer(&tcp_death_row.tw_timer);
+         }
+         spin_unlock(&tcp_death_row.death_lock);
+
+         /* remove it from the established hash table */
+         __inet_tws_unhash(tw);
+
+         /* remove it from the bind hash table */
+         inet_tws_unbhash(tw, tcp_death_row.hashinfo);
+
+         /* last put */
+         inet_tws_put(tw);
+     }
+
+     write_unlock_bh(&head->lock);
+ }
+
+ static void cleanup_net(struct work_struct *work)
+ {
+     struct pernet_operations *ops;
+
+     @@ -96,6 +148,9 @@ static void cleanup_net(struct work_stru
+
+     mutex_unlock(&net_mutex);
+
+     /* The timewait sockets are pointless */
+     clean_up_timewait(net);

```

```
+
/* Ensure there are no outstanding rcu callbacks using this
 * network namespace.
 */
```

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Subject: Re: [patch 3/3][netns] remove timewait sockets at cleanup  
Posted by [ebiederm](#) on Wed, 26 Sep 2007 19:22:26 GMT  
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Daniel Lezcano <dlezcano@fr.ibm.com> writes:

```
> From: Daniel Lezcano <dlezcano@fr.ibm.com>
>
> Denis Lunev spotted that if we take a reference to the network namespace
> with the timewait sockets, we will need to wait for their expiration to
> have the network namespace freed. This is a waste of time, the timewait
> sockets are for avoiding to receive a duplicate packet from the network,
> if the network namespace is freed, the network stack is removed, so no
> chance to receive any packets from the outside world.
>
> This patchset remove/destroy the timewait sockets when the
> network namespace is freed.
```

This code is in the wrong place. Please do the register\_net\_subsys thing so we can keep the code in net/ipv4/inet\_timewait\_sock.c

This code just need to be an exit method.

Eric

---

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Subject: Re: [patch 0/3][netns] fix and wipeout timewait sockets  
Posted by [ebiederm](#) on Wed, 26 Sep 2007 19:24:14 GMT  
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Daniel Lezcano <dlezcano@fr.ibm.com> writes:

> Denis Lunev spotted that using a reference to the network namespace  
> with the timewait sockets will be a waste of time because they  
> are pointless while we will remove the network stack at network  
> namespace exit.

The patches look close and look like they are in the right general direction.

I haven't reviewed them closely yet, so I suspect there are a few more nits but generally they look good.

Please don't let me forget about this issue.

Thanks,  
Eric

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Subject: Re: [patch 3/3][netns] remove timewait sockets at cleanup  
Posted by [Daniel Lezcano](#) on Thu, 27 Sep 2007 08:36:17 GMT  
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Eric W. Biederman wrote:

> Daniel Lezcano <dlezcano@fr.ibm.com> writes:  
>  
>> From: Daniel Lezcano <dlezcano@fr.ibm.com>  
>>  
>> Denis Lunev spotted that if we take a reference to the network namespace  
>> with the timewait sockets, we will need to wait for their expiration to  
>> have the network namespace freed. This is a waste of time, the timewait  
>> sockets are for avoiding to receive a duplicate packet from the network,  
>> if the network namespace is freed, the network stack is removed, so no  
>> chance to receive any packets from the outside world.  
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>> This patchset remove/destroy the timewait sockets when the  
>> network namespace is freed.  
>  
> This code is in the wrong place. Please do the register\_net\_subsys  
> thing so we can keep the code in net/ipv4/inet\_timewait\_sock.c  
>  
> This code just need to be an exit method.

Thanks Eric, I will fix that.

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