Subject: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by Stanislav Kinsbursky on Tue, 03 Jul 2012 12:58:57 GMT

v3:
1) rebased on 3.5-rc3 kernel.

v2: destruction of currently processing transport added:
1) Added marking of currently processing transports with XPT_CLOSE on per-net
   shutdown. These transports will be destroyed in svc_xprt_enqueue() (instead of
   enqueueing).
2) newly created temporary transport in svc_recv() will be destroyed, if it's
   "parent" was marked with XPT_CLOSE.
3) spin_lock(&serv->sv_lock) was replaced by spin_lock_bh() in
   svc_close_net(&serv->sv_lock).

Service sv_tempsocks and sv_permsocks lists are accessible by tasks with
different network namespaces, and thus per-net service destruction must be
protected.
These lists are protected by service sv_lock. So lets wrap list manipulations
with this lock and move transports destruction outside wrapped area to prevent
deadlocks.

Signed-off-by: Stanislav Kinsbursky <skinsbursky@parallels.com>

---
net/sunrpc/svc_xprt.c | 56 ++++++++++++++++++++++++++++++++++++++++++++++---
1 files changed, 52 insertions(+), 4 deletions(-)

diff --git a/net/sunrpc/svc_xprt.c b/net/sunrpc/svc_xprt.c
index 88f2bf6..4af2114 100644
--- a/net/sunrpc/svc_xprt.c
+++ b/net/sunrpc/svc_xprt.c
@@ -320,6 +320,7 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
 struct svc_pool *pool;
 struct svc_rqst*rqstp;
 int cpu;
+int destroy = 0;

 if (!svc_xprt_has_something_to_do(xprt))
 return;
@@ -320,6 +320,7 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
 struct svc_pool *pool;
 struct svc_rqst*rqstp;
 int cpu;
+int destroy = 0;

 if (xprt != NULL)
 return;
@@ -320,6 +320,7 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
 struct svc_pool *pool;
 struct svc_rqst*rqstp;
 int cpu;
+int destroy = 0;

 pool->sp_stats.packets++;

+/*
+ * Check transport close flag. It could be marked as closed on per-net
+ * service shutdown.
/* Mark transport as busy. It will remain in this state until
 * the provider calls svc_xprt_received. We update XPT_BUSY
 * atomically because it also guards against trying to enqueue
 @@ -374,6 +386,8 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)

 out_unlock:
 spin_unlock_bh(&pool->sp_lock);
+if (destroy)
+svc_delete_xprt(xprt);
 }
 EXPORT_SYMBOL_GPL(svc_xprt_enqueue);
@@ -714,6 +728,13 @@ int svc_recv(struct svc_rqst *rqstp, long timeout)
 __module_get(newxpt->xpt_class->xcl_owner);
 svc_check_conn_limits(xprt->xpt_server);
 spin_lock_bh(&serv->sv_lock);
+if (test_bit(XPT_CLOSE, &xprt->xpt_flags)) {
+dprintk("svc_recv: found XPT_CLOSE on listener\n");
+set_bit(XPT_DETACHED, &newxpt->xpt_flags);
+spin_unlock_bh(&pool->sp_lock);
+svc_delete_xprt(newxpt);
+goto out_closed;
+}
 set_bit(XPT_TEMP, &newxpt->xpt_flags);
 list_add(&newxpt->xpt_list, &serv->sv_tempsocks);
 serv->sv_tmpcnt++;
@@ -739,6 +760,7 @@ int svc_recv(struct svc_rqst *rqstp, long timeout)
 len = xprt->xpt_ops->xpo_recvfrom(rqstp);
 dprintk("svc: got len=%d\n", len);
 }
+out_closed:
 svc_xprt_received(xprt);

 /* No data, incomplete (TCP) read, or accept() */
@@ -936,6 +958,7 @@ static void svc_clear_pools(struct svc_serv *serv, struct net *net)
 struct svc_pool *pool;
 struct svc_xprt *xprt;
 struct svc_xprt *tmp;
+struct svc_rqst *rqstp;
 int i;
for (i = 0; i < serv->sv_nrpools; i++) {
    list_del_init(&xprt->xpt_ready);
}

+list_for_each_entry(rqstp, &pool->sp_all_threads, rq_all) {
    if (rqstp->rq_xprt && rqstp->rq_xprt->xpt_net == net)
        set_bit(XPT_CLOSE, &rqstp->rq_xprt->xpt_flags);
}
spin_unlock_bh(&pool->sp_lock);
}

-static void svc_clear_list(struct list_head *xprt_list, struct net *net)
+static void svc_clear_list(struct list_head *xprt_list, struct net *net,
+    struct list_head *kill_list)
{
    struct svc_xprt *xprt;
    struct svc_xprt *tmp;
    list_for_each_entry_safe(xprt, tmp, xprt_list, xpt_list) {
        if (xprt->xpt_net != net)
            continue;
        svc_delete_xprt(xprt);
        list_move(&xprt->xpt_list, kill_list);
        set_bit(XPT_DETACHED, &xprt->xpt_flags);
    }
    BUG_ON(xprt->xpt_net == net);
}

void svc_close_net(struct svc_serv *serv, struct net *net)
{
    struct svc_xprt *xprt, *tmp;
    LIST_HEAD(kill_list);
    /*
     * Protect the lists, since they can be by tasks with different network
     * namespace contexts.
     */
    spin_lock_bh(&serv->sv_lock);
    svc_close_list(&serv->sv_tempsocks, net);
    svc_close_list(&serv->sv_permsocks, net);
    svc_xprt_enqueue will not add new entries without taking the
* sp_lock and checking XPT_BUSY.
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-svc_clear_list(&serv->sv_tempsocks, net);
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+svc_clear_list(&serv->sv_permsocks, net, &kill_list);
+
+spin_unlock_bh(&serv->sv_lock);
+
+/*
 + * Destroy collected transports.
 + * Note: transports has been marked as XPT_DETACHED on svc_clear_list(),
 + * so no need to protect against list_del() in svc_delete_xprt().
 + */
+list_for_each_entry_safe(xprt, tmp, &kill_list, xpt_list)
+svc_delete_xprt(xprt);
}

/*

Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by bfields on Tue, 24 Jul 2012 19:40:37 GMT

On Tue, Jul 03, 2012 at 04:58:57PM +0400, Stanislav Kinsbursky wrote:
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That worries me:

- Why did we originally defer close until svc_recv?
- Are we sure there's no risk to performing it immediately in
  svc_enqueue? Is it safe to call from the socket callbacks and
  wherever else we call svc_enqueue?

And in the past I haven't been good at testing for problems
here--instead they tend to show up when a use somewhere tries shutting
down a server that's under load.

I'll look more closely. Meanwhile you could split out that change as a
separate patch and convince me why it's right....
2) newly created temporary transport in svc_recv() will be destroyed, if it's
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different network namespaces, and thus per-net service destruction must be
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These lists are protected by service sv_lock. So let's wrap list manipulations
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Signed-off-by: Stanislav Kinsbursky <skinsbursky@parallels.com>
the provider calls svc_xprt_received. We update XPT_BUSY atomically because it also guards against trying to enqueue.

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@@ -374,6 +386,8 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
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> out_unlock:
> spin_unlock_bh(&pool->sp_lock);
> +if (destroy)
> +svc_delete_xprt(xprt);
> }
> EXPORT_SYMBOL_GPL(svc_xprt_enqueue);
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> @@ -714,6 +728,13 @@ int svc_recv(struct svc_rqst *rqstp, long timeout)
> __module_get(newxpt->xpt_class->xcl_owner);
> svc_check_conn_limits(xprt->xpt_server);
> spin_lock_bh(&serv->sv_lock);
> +if (test_bit(XPT_CLOSE, &xprt->xpt_flags)) {
> +dprintf("svc_recv: found XPT_CLOSE on listener\n");
> +set_bit(XPT_DETACHED, &newxpt->xpt_flags);
> +spin_unlock_bh(&pool->sp_lock);
> +svc_delete_xprt(newxpt);
> +goto out_closed;
> +}
> set_bit(XPT_TEMP, &newxpt->xpt_flags);
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> }
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> @@ -936,6 +958,7 @@ static void svc_clear_pools(struct svc_serv *serv, struct net *net)
> struct svc_pool *pool;
> struct svc_xprt *xprt;
> struct svc_xprt *tmp;
> +struct svc_rqst *rqstp;
> int i;
>
> for (i = 0; i < serv->sv_nrpools; i++) {
> @@ -947,11 +970,16 @@ static void svc_clear_pools(struct svc_serv *serv, struct net *net)
> +if (rqstp->rq_xprt && rqstp->rq_xprt->xpt_net == net)
> +set_bit(XPT_CLOSE, &rqstp->rq_xprt->xpt_flags);
> +set_bit(XPT_CLOSE, &rqstp->rq_xprt->xpt_flags);
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```
> +}
> spin_unlock_bh(&pool->sp_lock);
> }
>
> -static void svc_clear_list(struct list_head *xprt_list, struct net *net)
> +static void svc_clear_list(struct list_head *xprt_list, struct net *net,
> + struct list_head *kill_list)
> {
>   struct svc_xprt *xprt;
>   struct svc_xprt *tmp;
>   @@ -959,7 +987,8 @@ static void svc_clear_list(struct list_head *xprt_list, struct net *net)
>   list_for_each_entry_safe(xprt, tmp, xprt_list, xpt_list) {
>     if (xprt->xpt_net != net)
>       continue;
> -   svc_delete_xprt(xprt);
> +   list_move(&xprt->xpt_list, kill_list);
> +   set_bit(XPT_DETACHED, &xprt->xpt_flags);
>   }
>   list_for_each_entry(xprt, xprt_list, xpt_list)
>     BUG_ON(xprt->xpt_net == net);
> @@ -967,6 +996,15 @@ static void svc_clear_list(struct list_head *xprt_list, struct net *net)
>
> void svc_close_net(struct svc_serv *serv, struct net *net)
> {
>   struct svc_xprt *xprt, *tmp;
> +LIST_HEAD(kill_list);
> +
> +/*
> + * Protect the lists, since they can be by tasks with different network
> + * namespace contexts.
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> +spin_lock_bh(&serv->sv_lock);
> +
> svc_close_list(&serv->sv_tempsocks, net);
> svc_close_list(&serv->sv_permsocks, net);
>
> @@ -976,8 +1014,18 @@ void svc_close_net(struct svc_serv *serv, struct net *net)
> * svc_xprt_enqueue will not add new entries without taking the
> * sp_lock and checking XPT_BUSY.
> */
> -svc_clear_list(&serv->sv_tempsocks, net);
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> +svc_clear_list(&serv->sv_tempsocks, net, &kill_list);
> +svc_clear_list(&serv->sv_permsocks, net, &kill_list);
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> +spin_unlock_bh(&serv->sv_lock);
> +


> /*
> + * Destroy collected transports.
> + * Note: tranports has been marked as XPT_DETACHED on svc_clear_list(),
> + * so no need to protect against list_del() in svc_delete_xprt().
> + */
> +
> + list_for_each_entry_safe(xprt, tmp, &kill_list, xpt_list)
> + svc_delete_xprt(xprt);
> }
> }
> */
>

Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by Neil Brown on Tue, 31 Jul 2012 05:28:48 GMT
View Forum Message <> Reply to Message

On Tue, 24 Jul 2012 15:40:37 -0400 "J. Bruce Fields" <bfields@fieldses.org> wrote:

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> >
> > That worries me:
> >
> > - Why did we originally defer close until svc_recv?

I don't think there was any obscure reason - it was just the natural place to do it. In svc_recv we are absolutely sure that the socket is idle. There are a number of things we might want to do, so we find the highest-priority one and do it. "state machine" pattern?

> - Are we sure there's no risk to performing it immediately in
> svc_enqueue? Is it safe to call from the socket callbacks and
> wherever else we call svc_enqueue?

The latter point is the one I'd want to see verified. If svc_xprt_enqueue gets called in 'bh' content, and calls svc_delete_xprt which then calls svc_deferred_dequeue and that takes ->xpt_lock - does that mean that all lock/unlock of ->xpt_lock needs to be changed to use the _bh variants?
NeilBrown

> And in the past I haven't been good at testing for problems here--instead they tend to show up when a use somewhere tries shutting down a server that's under load.
>
> I'll look more closely. Meanwhile you could split out that change as a separate patch and convince me why it's right....
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     int cpu;
 > +    int destroy = 0;
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> > if (!svc_xprt_has_something_to_do(xprt))
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> @@ -338,6 +339,17 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
> > pool->sp_stats.packets++;
+ * Check transport close flag. It could be marked as closed on per-net
+ * service shutdown.
+ */
+ if (test_bit(XPT_CLOSE, &xprt->xpt_flags)) {
+ /* Don't enqueue transport if it has to be destroyed. */
+ dprintk("svc: transport %p have to be closed\n", xprt);
+ +destroy++;
+ +goto out_unlock;
+ +}
+ /* Mark transport as busy. It will remain in this state until
+ * the provider calls svc_xprt_received. We update XPT_BUSY
+ * atomically because it also guards against trying to enqueue
+ @@ -374,6 +386,8 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
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++ continue;
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++ +list_for_each_entry(rqstp, &pool->sp_all_threads, rq_all) {
++ +if (rqstp->rq_xprt && rqstp->rq_xprt->xpt_net == net)
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++ +}
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+ */
+list_for_each_entry_safe(xprt, tmp, &kill_list, xpt_list)
+svsvc_delete_xprt(xprt);
}
+
+/*

Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by bfields on Thu, 16 Aug 2012 19:29:03 GMT

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> here--instead they tend to show up when a use somewhere tries shutting
> down a server that's under load.
>
> I'll look more closely. Meanwhile you could split out that change as a
> separate patch and convince me why it's right....

Looking back at this:

- adding the sv_lock looks like the right thing to do anyway
  independent of containers, because svc_age_temp_xprs may
  still be running.

- I'm increasingly unhappy about sharing rpc servers between
  network namespaces. Everything would be easier to understand
  if they were independent. Can we figure out how to do that?

> --b.

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> "parent" was marked with XPT_CLOSE.
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     return;
@@ -338,6 +339,17 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
pool->sp_stats.packets++;

+/* Check transport close flag. It could be marked as closed on per-net
+ * service shutdown.
+ */
+if (test_bit(XPT_CLOSE, &xprt->xpt_flags)) {
+/* Don't enqueue transport if it has to be destroyed. */
+dprintf("svc: transport %p have to be closed\n", xprt);
+destroy++;
+goto out_unlock;
+
+ /* Mark transport as busy. It will remain in this state until
+ * the provider calls svc_xprt_received. We update XPT_BUSY
+ * atomically because it also guards against trying to enqueue
@@ -374,6 +386,8 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
>
 out_unlock:
 spin_unlock_bh(&pool->sp_lock);
+if (destroy)
+scc_delete_xprt(xprt);
>
 EXPORT_SYMBOL_GPL(svc_xprt_enqueue);
>
@@ -714,6 +728,13 @@ int svc_recv(struct svc_rqst *rqstp, long timeout)
>
 __module_get(newxpt->xpt_class->xcl_owner);
 svc_check_conn_limits(xprt->xpt_server);
 spin_lock_bh(&serv->sv_lock);
+if (test_bit(XPT_CLOSE, &xprt->xpt_flags)) {
+dprintf("svc_recv: found XPT_CLOSE on listener\n");
+set_bit(XPT_DETACHED, &newxpt->xpt_flags);
+spin_unlock_bh(&newxpt->xpt_flags);
+scc_delete_xprt(newxpt);
+goto out_closed;
+
 set_bit(XPT_TEMP, &newxpt->xpt_flags);
 list_add(&newxpt->xpt_list, &serv->sv_tempsocks);
 serv->sv_tmpcnt++;
@@ -739,6 +760,7 @@ int svc_recv(struct svc_rqst *rqstp, long timeout)
>
 len = xprt->xpt_ops->xpo_recvfrom(rqstp);
 dprintf("svc: got len=%d\n", len);
>
+out_closed:
 svc_xprt_received(xprt);
>
 /* No data, incomplete (TCP) read, or accept() */
static void svc_clear_pools(struct svc_serv *serv, struct net *net)
{
    struct svc_pool *pool;
    struct svc_xprt *xprt;
    struct svc_xprt *tmp;
    struct svc_rqst *rqstp;
    int i;
>
    for (i = 0; i < serv->sv_nrpo; i++) {
        continue;
    }
>
    list_del_init(&xprt->xpt_ready);
>
    +list_for_each_entry(rqstp, &pool->sp_all_threads, rq_all) {
        +if (rqstp->rq_xprt && rqstp->rq_xprt->xpt_net == net)
        +set_bit(XPT_CLOSE, &rqstp->rq_xprt->xpt_flags);
    }
>
    spin_unlock_bh(&pool->sp_lock);
>
    -static void svc_clear_list(struct list_head *xprt_list, struct net *net)
    +static void svc_clear_list(struct list_head *xprt_list, struct net *net,
        +struct list_head *kill_list)
    {
        struct svc_xprt *xprt;
        struct svc_xprt *tmp;
        @@ -959,7 +987,8 @@ static void svc_clear_list(struct list_head *xprt_list, struct net *net)
        +list_for_each_entry_safe(xprt, tmp, xprt_list, xpt_list) {
            +if (xprt->xpt_net != net)
            +continue;
            +svc_delete_xprt(xprt);
            +list_move(&xprt->xpt_list, kill_list);
            +set_bit(XPT_DETACHED, &xprt->xpt_flags);
        }
        BUG_ON(xprt->xpt_list == net);
    }
>
    void svc_close_net(struct svc_serv *serv, struct net *net)
    {
        +struct svc_xprt *xprt, *tmp;
        +LIST_HEAD(kill_list);
        +
        +/*
        + * Protect the lists, since they can be by tasks with different network
        + * namespace contexts.
        + */
    }

    +spin_lock_bh(&serv->sv_lock);
Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by Stanislav Kinsbursky on Mon, 20 Aug 2012 11:05:49 GMT

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16.08.2012 23:29, J. Bruce Fields
> On Tue, Jul 24, 2012 at 03:40:37PM -0400, J. Bruce Fields wrote:
>> On Tue, Jul 03, 2012 at 04:58:57PM +0400, Stanislav Kinsbursky wrote:
>>>> v3:
>>>> 1) rebased on 3.5-rc3 kernel.
>>>>
>>>> v2: destruction of currently processing transport added:
>>>> 1) Added marking of currently processing transports with XPT_CLOSE on per-net
>>>> shutdown. These transports will be destroyed in svc_xprt_enqueue() (instead of
>>>> enqueueing).
>>>>
>>> That worries me:
>>>
>>> - Why did we originally defer close until svc_recv?
The problem I was trying to solve is shutting down of transports in use. I.e. some transport was dequeued from pool in svc_recv() and some process called xpo_accept(), trying to create new socket, new transport and so on. How to shutdown such transports properly? The best idea I had was to check all such active transports (rqstp->rq_xprt) and mark the with XPT_CLOSE. So then new transport will be destroyed without adding to service lists. Probably, I've missed some points and would be glad to hear your opinion on this.

>> - Are we sure there's no risk to performing it immediately in
>>   svc_enqueue? Is it safe to call from the socket callbacks and
>>   wherever else we call svc_enqueue?
>>
>> And in the past I haven't been good at testing for problems
>> here--instead they tend to show up when a use somewhere tries shutting
>> down a server that's under load.
>>
>> I'll look more closely. Meanwhile you could split out that change as a
>> separate patch and convince me why it's right....
>
> Looking back at this:
>
> - adding the sv_lock looks like the right thing to do anyway
>   independent of containers, because svc_age_temp_xprts may
>   still be running.
>
> - I'm increasingly unhappy about sharing rpc servers between
>   network namespaces. Everything would be easier to understand
>   if they were independent. Can we figure out how to do that?

Could you, please, elaborate on your unhappiness? I.e. I don't like it too. But the problem here, is that rpc server is tied with kernel threads creation and destruction. And these threads can be only a part of initial pid namespace (because we have only one kthreadd). And we decided do not create new kernel thread per container when were discussing the problem last time.

>>
>> -b.
>>
>>> 2) newly created temporary transport in svc_recv() will be destroyed, if it's
>>> "parent" was marked with XPT_CLOSE.
>>> 3) spin_lock(&serv->sv_lock) was replaced by spin_lock_bh() in
>>> svc_close_net(&serv->sv_lock).
>>> Service sv_tempsocks and sv_permsocks lists are accessible by tasks with
>>> different network namespaces, and thus per-net service destruction must be
These lists are protected by service sv_lock. So let's wrap list manipulations with this lock and move transports destruction outside wrapped area to prevent deadlocks.

Signed-off-by: Stanislav Kinsbursky <skinsbursky@parallels.com>

---

net/sunrpc/svc_xprt.c | 56 ++++++++++++++++++++++++++++++++++++++++++++++++---
1 files changed, 52 insertions(+), 4 deletions(-)

diff --git a/net/sunrpc/svc_xprt.c b/net/sunrpc/svc_xprt.c
index 88f2bf6..4af2114 100644
--- a/net/sunrpc/svc_xprt.c
+++ b/net/sunrpc/svc_xprt.c
@@ -320,6 +320,7 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
   	struct svc_pool *pool;
   	struct svc_rqst *rqstp;
   	int cpu;
+  	int destroy = 0;
>>>
>>>
if (!svc_xprt_has_something_to_do(xprt))
  return;
@@ -338,6 +339,17 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
>>>
>>> +/*
>>> +  * Check transport close flag. It could be marked as closed on per-net
>>> +  * service shutdown.
>>> +*/
>>> +if (test_bit(XPT_CLOSE, &xprt->xpt_flags)) {
>>> +  /* Don't enqueue transport if it has to be destroyed. */
>>> +  dprintf("svc: transport %p have to be closed\n", xprt);
>>> +  destroy++;
>>> +  goto out_unlock;
>>> +}
>>> +
>>> /* Mark transport as busy. It will remain in this state until
>>>  * the provider calls svc_xprt_received. We update XPT_BUSY
>>>  * atomically because it also guards against trying to enqueue
@@ -374,6 +386,8 @@ void svc_xprt_enqueue(struct svc_xprt *xprt)
>>>
>>> out_unlock:
>>> spin_unlock_bh(&pool->sp_lock);
>>> +if (destroy)
>>> +svc_delete_xprt(xprt);
>>> }
>>> EXPORT_SYMBOL_GPL(svc_xprt_enqueue);
int svc_recv(struct svc_rqst *rqstp, long timeout)
{
    __module_get(newxpt->xpt_class->xcl_owner);
    svc_check_conn_limits(xprt->xpt_server);
    spin_lock_bh(&serv->sv_lock);
    if (test_bit(XPT_CLOSE, &xprt->xpt_flags)) {
        printk("svc_recv: found XPT_CLOSE on listener\n");
        set_bit(XPT_DETACHED, &newxpt->xpt_flags);
        spin_unlock_bh(&pool->sp_lock);
        svc_delete_xprt(newxpt);
        goto out_closed;
    }
    set_bit(XPT_TEMP, &newxpt->xpt_flags);
    list_add(&newxpt->xpt_list, &serv->sv_tempsocks);
    serv->sv_tmpcnt++;

    len = xprt->xpt_ops->xpo_recvfrom(rqstp);
    printk("svc: got len=%d\n", len);
}

out_closed:
    svc_xprt_received(xprt);
/* No data, incomplete (TCP) read, or accept() */

static void svc_clear_pools(struct svc_serv *serv, struct net *net)
{
    struct svc_pool *pool;
    struct svc_xprt *xprt;
    struct svc_xprt *tmp;
    struct svc_rqst *rqstp;
    int i;

    for (i = 0; i < serv->sv_nrpoools; i++) {
        if (test_bit(XPT_TEMP, &newxpt->xpt_flags);
            list_add(&newxpt->xpt_list, &serv->sv_tempsocks);
            serv->sv_tmpcnt++;
        @-739,6 +760,7 @ int svc_recv(struct svc_rqst *rqstp, long timeout)
            len = xprt->xpt_ops->xpo_recvfrom(rqstp);
            printk("svc: got len=%d\n", len);
        } }
    spin_unlock_bh(&pool->sp_lock);
}

+static void svc_clear_list(struct list_head *xprt_list, struct net *net,
    struct list_head *kill_list)
{
    struct svc_xprt *xprt;
    ...
}
>>>   struct svc_xprt *tmp;
>>> @@@ -959,7 +987,8 @@ static void svc_clear_list(struct list_head *xprt_list, struct net *net)
>>>   list_for_each_entry_safe(xprt, tmp, xprt_list, xpt_list) {
>>>   if (xprt->xpt_net != net)
>>>     continue;
>>> -svc_delete_xprt(xprt);
>>> +list_move(&xprt->xpt_list, kill_list);
>>> +set_bit(XPT_DETACHED, &xprt->xpt_flags);
>>> }
>>> list_for_each_entry(xprt, xprt_list, xpt_list)
>>> BUG_ON(xprt->xpt_net == net);
>>> @@ -967,6 +996,15 @@ static void svc_clear_list(struct list_head *xprt_list, struct net *net)
>>>   }
>>> void svc_close_net(struct svc_serv *serv, struct net *net)
>>> {
>>> +struct svc_xprt *xprt, *tmp;
>>> +LIST_HEAD(kill_list);
>>> +/*
>>> + * Protect the lists, since they can be by tasks with different network
>>> + * namespace contexts.
>>> + */
>>> +spin_lock_bh(&serv->sv_lock);
>>> +
>>> +svc_close_list(&serv->sv_tempsocks, net);
>>> +svc_close_list(&serv->sv_permsocks, net);
>>> @@ -976,8 +1014,18 @@ void svc_close_net(struct svc_serv *serv, struct net *net)
>>>   * svc_xprt_enqueue will not add new entries without taking the
>>>   * sp_lock and checking XPT_BUSY.
>>>   */
>>> -svc_clear_list(&serv->sv_tempsocks, net);
>>> -svc_clear_list(&serv->sv_permsocks, net);
>>> +svc_clear_list(&serv->sv_tempsocks, net, &kill_list);
>>> +svc_clear_list(&serv->sv_permsocks, net, &kill_list);
>>> +
>>> +spin_unlock_bh(&serv->sv_lock);
>>> +
>>> +*/
>>> + * Destroy collected transports.
>>> + * Note: tranports has been marked as XPT_DETACHED on svc_clear_list(),
>>> + * so no need to protect againt list_del() in svc_delete_xprt().
>>> + */
>>> +list_for_each_entry_safe(xprt, tmp, &kill_list, xpt_list)
>>> +svc_delete_xprt(xprt);
>>> }
>>> */
On Mon, Aug 20, 2012 at 03:05:49PM +0400, Stanislav Kinsbursky wrote:  
> 16.08.2012 23:29, J. Bruce Fields  
> >Looking back at this:  
> >  
> >- adding the sv_lock looks like the right thing to do anyway  
> > independent of containers, because svc_age_temp_xprts may  
> > still be running.  
> >  
> >- I'm increasingly unhappy about sharing rpc servers between  
> > network namespaces. Everything would be easier to understand  
> > if they were independent. Can we figure out how to do that?  
> >  
> >Could you, please, elaborate on your your unhappiness?  

It seems like you're having to do a lot of work on each individual rpc  
server (callback server, lockd, etc.) to make per-net startup/shutdown  
work. And then we still don't have it quite right (see the shutdown  
races).)  

In general whenever we have the opportunity to have entirely separate  
data structures, I'd expect that to simplify things: it should eliminate  
some locking and reference-counting issues.  

I.e. I don't like it too. But the problem here, is that rpc server  
is tied with kernel threads creation and destruction. And these  
threads can be only a part of initial pid namespace (because we have  
only one kthreadd). And we decided do not create new kernel thread  
per container when were discussing the problem last time.  

There really should be some way to create a kernel thread in a specific  
namespace, shouldn't there?  

Until we have that, could the threads be taught to fix their namespace  
on startup?
Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by Stanislav Kinsbursky on Mon, 20 Aug 2012 15:11:00 GMT

20.08.2012 18:56, J. Bruce Fields
> On Mon, Aug 20, 2012 at 03:05:49PM +0400, Stanislav Kinsbursky wrote:
>> 16.08.2012 23:29, J. Bruce Fields
>>> Looking back at this:
>>> - adding the sv_lock looks like the right thing to do anyway
>>> independent of containers, because svc_age_temp_xprs may
>>> still be running.
>>> - I'm increasingly unhappy about sharing rpc servers between
>>> network namespaces. Everything would be easier to understand
>>> if they were independent. Can we figure out how to do that?
>>>
>> Could you, please, elaborate on your your unhappiness?
>
> It seems like you're having to do a lot of work on each individual rpc
> server (callback server, lockd, etc.) to make per-net startup/shutdown
> work. And then we still don't have it quite right (see the shutdown
> races).)
>
> In general whenever we have the opportunity to have entirely separate
> data structures, I'd expect that to simplify things: it should eliminate
> some locking and reference-counting issues.
>
Agreed. But current solution still looks like the easies way to me to implement
desired functionality.

>> I.e. I don't like it too. But the problem here, is that rpc server
>> is tied with kernel threads creation and destruction. And these
>> threads can be only a part of initial pid namespace (because we have
>> only one kthreadd). And we decided do not create new kernel thread
>> per container when were discussing the problem last time.
>
> There really should be some way to create a kernel thread in a specific
> namespace, shouldn't there?
Kthreads support in a container is rather a "political" problem, than an implementation problem.

Currently, when you call kthread_create(), you add new job to kthreadd queue. Kthreadd is unique, starts right after init and lives in global initial environment. So, any kthread inherits namespaces from it. Of course, we can start one kthread per environment and change it's root or even network namespace in kthread function. But pid namespace of this kthread will remain global.

It looks like not a big problem, when we shutdown kthread by some variable. But what about killable nfsd kthreads?

1) We can't kill them from nested pid namespace.
2) How we will differ nfsd kthreads in initial pid namespace?

In OpenVZ we have kthreadd per pid namespace and it allows us to create kthreads (and thus services) per pid namespace.

> Until we have that, could the threads be taught to fix their namespace
> on startup?
> 
> Unfortunately, changing of pid namespace for kthreads doesn't look like an easy trick.

> --b.
> 

--
Best regards,
Stanislav Kinsbursky

---

Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by bfields on Mon, 20 Aug 2012 16:58:52 GMT

On Mon, Aug 20, 2012 at 07:11:00PM +0400, Stanislav Kinsbursky wrote:
> 20.08.2012 18:56, J. Bruce Fields
> >On Mon, Aug 20, 2012 at 03:05:49PM +0400, Stanislav Kinsbursky wrote:
> >>16.08.2012 23:29, J. Bruce Fields
> >>>Looking back at this:
> >>>
> >>>>> adding the sv_lock looks like the right thing to do anyway
> >>>>> independent of containers, because svc_age_temp_xperts may
> >>>>> still be running.
I'm increasingly unhappy about sharing rpc servers between network namespaces. Everything would be easier to understand if they were independent. Can we figure out how to do that?

Could you, please, elaborate on your unhappiness?

It seems like you're having to do a lot of work on each individual rpc server (callback server, lockd, etc.) to make per-net startup/shutdown work. And then we still don't have it quite right (see the shutdown races.)

In general whenever we have the opportunity to have entirely separate data structures, I'd expect that to simplify things: it should eliminate some locking and reference-counting issues.

Agreed. But current solution still looks like the easiest way to me to implement desired functionality.

I don't like it too. But the problem here, is that rpc server is tied with kernel threads creation and destruction. And these threads can be only a part of initial pid namespace (because we have only one kthreadاذ). And we decided do not create new kernel thread per container when were discussing the problem last time.

There really should be some way to create a kernel thread in a specific namespace, shouldn't there?

Kthreads support in a container is rather a "political" problem, than an implementation problem.

Is there a mail thread somewhere with a summary of the objections?

Currently, when you call kthread_create(), you add new job to kthreadاذ queue. Kthreadاذ is unique, starts right after init and lives in global initial environment. So, any kthread inherits namespaces from it. Of course, we can start one kthread per environment and change it's root or even network namespace in kthread function. But pid namespace of this kthread will remain global.

OK. But the current implementation will leave all the server threads in the initial pid namespace, too.
It looks like not a big problem, when we shutdown kthread by some variable. But what about killable nfsd kthreads?

And we're stuck with that problem either way too, aren't we?

1) We can't kill them from nested pid namespace.
2) How we will differ nfsd kthreads in initial pid namespace?

I have to admit for my purposes I don't care too much about pid namespaces or about signalling server threads. It'd be nice to get those things right but it wouldn't bother me that much not to.

Another stupid idea: can we do our own implementation of something like kthreadadd just for the purpose of starting rpc server threads? It doesn't seem that complicated.

--b.

In OpenVZ we have kthreadadd per pid namespace and it allows us to create kthreads (and thus services) per pid namespace.

Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by Stanislav Kinsbursky on Tue, 21 Aug 2012 09:28:00 GMT

20.08.2012 20:58, J. Bruce Fields
> On Mon, Aug 20, 2012 at 07:11:00PM +0400, Stanislav Kinsbursky wrote:
> 20.08.2012 18:56, J. Bruce Fields
>>> On Mon, Aug 20, 2012 at 03:05:49PM +0400, Stanislav Kinsbursky wrote:
>>>> 16.08.2012 23:29, J. Bruce Fields
>>>>> Looking back at this:
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>>>>> still be running.
>>>>
>>>>> - I'm increasingly unhappy about sharing rpc servers between
>>>>> network namespaces. Everything would be easier to understand
>>>>> if they were independent. Can we figure out how to do that?
>>>>
>>>> Could you, please, elaborate on your your unhappiness?
>>>>
>>> It seems like you're having to do a lot of work on each individual rpc
>>> server (callback server, lockd, etc.) to make per-net startup/shutdown
>>> work. And then we still don't have it quite right (see the shutdown
In general whenever we have the opportunity to have entirely separate data structures, I'd expect that to simplify things: it should eliminate some locking and reference-counting issues.

Agreed. But current solution still looks like the easies way to me to implement desired functionality.

I.e. I don't like it too. But the problem here, is that rpc server is tied with kernel threads creation and destruction. And these threads can be only a part of initial pid namespace (because we have only one kthreadd). And we decided do not create new kernel thread per container when were discussing the problem last time.

There really should be some way to create a kernel thread in a specific namespace, shouldn't there?

Kthreads support in a container is rather a "political" problem, than an implementation problem.

Is there a mail thread somewhere with a summary of the objections?

I can't specify right now. Need to search over lkml history. That's all what I've found for now:

Currently, when you call kthread_create(), you add new job to kthreadd queue. Kthreadd is unique, starts right after init and lives in global initial environment. So, any kthread inherits namespaces from it.

Of course, we can start one kthread per environment and change it's root or even network namespace in kthread function. But pid namespace of this kthread will remain global.

OK. But the current implementation will leave all the server threads in the initial pid namespace, too.

It looks like not a big problem, when we shutdown kthread by some variable. But what about killable nfsd kthreads?

And we're stuck with that problem either way too, aren't we?
Yes, we are. But at least we are avoiding patching of task subsystem.

>> 1) We can't kill them from nested pid namespace.
>> 2) How we will differ nfsd kthreads in initial pid namespace?
>
> I have to admit for my purposes I don't care too much about pid
> namespaces or about signalling server threads. It'd be nice to get
> those things right but it wouldn't bother me that much not to.
>
> Another stupid idea: can we do our own implementation of something like
> kthreadd just for the purpose of starting rpc server threads? It
> doesn't seem that complicated.
>
Gm...
This idea is not stupid. If I understand you right, you suggest to implement a
service per network namespace (i.e. not only data, but also threads)?

> --b.
>
>> In OpenVZ we have kthreadd per pid namespace and it allows us to
>> create kthreads (and thus services) per pid namespace.

--
Best regards,
Stanislav Kinsbursky

Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net
shutdown
Posted by bfields on Tue, 21 Aug 2012 12:25:44 GMT
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On Tue, Aug 21, 2012 at 01:28:00PM +0400, Stanislav Kinsbursky wrote:
> 20.08.2012 20:58, J. Bruce Fields
> >On Mon, Aug 20, 2012 at 07:11:00PM +0400, Stanislav Kinsbursky wrote:
> >>Currently, when you call kthread_create(), you add new job to
> >>kthreadd queue. Kthreadd is unique, starts right after init and
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> >>namespaces from it.
> >>Of course, we can start one kthread per environment and change it's
> >>root or even network namespace in kthread function. But pid
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> >
> >OK. But the current implementation will leave all the server threads in
> >the initial pid namespace, too.
> >
It looks like not a big problem, when we shutdown kthread by some variable. But what about killable nfsd kthreads?

And we’re stuck with that problem either way too, aren't we?

Yes, we are. But at least we are avoiding patching of task subsystem.

1) We can't kill them from nested pid namespace.

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I have to admit for my purposes I don’t care too much about pid namespaces or about signalling server threads. It'd be nice to get those things right but it wouldn't bother me that much not to.

Another stupid idea: can we do our own implementation of something like kthreadd just for the purpose of starting rpc server threads? It doesn't seem that complicated.

Gm...

This idea is not stupid. If I understand you right, you suggest to implement a service per network namespace (i.e. not only data, but also threads)?

Some way or another, yes, entirely separate threads for the different namespaces would be clearer, I think.

And if we can't get them in the right pid namespaces, I'm not sure I care.

--b.

Subject: Re: [PATCH v3] SUNRPC: protect service sockets lists during per-net shutdown
Posted by bfields on Tue, 21 Aug 2012 19:06:46 GMT

On Thu, Aug 16, 2012 at 03:29:03PM -0400, J. Bruce Fields wrote:
Looking back at this:

adding the sv_lock looks like the right thing to do anyway
independent of containers, because svc_age_temp_xprts may still be running.

This is what I've been testing with.
commit 719f8bccc883e7992615f4d5625922e24995e2d98
Author: J. Bruce Fields <bfields@redhat.com>
Date:   Mon Aug 13 17:03:00 2012 -0400

svcrpc: fix xpt_list traversal locking on shutdown

Server threads are not running at this point, but svc_age_temp_xprts
still may be, so we need this locking.

Signed-off-by: J. Bruce Fields <bfields@redhat.com>

diff --git a/net/sunrpc/svc_xprt.c b/net/sunrpc/svc_xprt.c
index bac973a..e1810b9 100644
--- a/net/sunrpc/svc_xprt.c
+++ b/net/sunrpc/svc_xprt.c
@@ -917,16 +917,18 @@ void svc_close_xprt(struct svc_xprt *xprt)
 }
 EXPORT_SYMBOL_GPL(svc_close_xprt);

-static void svc_close_list(struct list_head *xprt_list, struct net *net)
+static void svc_close_list(struct svc_serv *serv, struct list_head *xprt_list, struct net *net)
 {
 struct svc_xprt *xprt;

+spin_lock(&serv->sv_lock);
 list_for_each_entry(xprt, xprt_list, xpt_list) {
 if (xprt->xpt_net != net)
 continue;
 set_bit(XPT_CLOSE, &xprt->xpt_flags);
 set_bit(XPT_BUSY, &xprt->xpt_flags);
 }
+spin_unlock(&serv->sv_lock);
 }

 static void svc_clear_pools(struct svc_serv *serv, struct net *net)
@@ -949,24 +951,28 @@ static void svc_clear_pools(struct svc_serv *serv, struct net *net)
 }
 }

-static void svc_clear_list(struct list_head *xprt_list, struct net *net)
+static void svc_clear_list(struct svc_serv *serv, struct list_head *xprt_list, struct net *net)
 {
 struct svc_xprt *xprt;


struct svc_xprt *tmp;
+LIST_HEAD(victims);
+
+spin_lock(&serv->sv_lock);
+list_for_each_entry_safe(xprt, tmp, xprt_list, xpt_list) {
+  if (xprt->xpt_net != net)
+    continue;
+  svc_delete_xprt(xprt);
+  list_move(&xprt->xpt_list, &victims);
+}
+list_for_each_entry_safe(xprt, tmp, &victims, xpt_list)
+  svc_delete_xprt(xprt);
+spin_unlock(&serv->sv_lock);
+
+list_for_each_entry_safe(xprt, tmp, &victims, xpt_list)
+  svc_delete_xprt(xprt);
}

void svc_close_net(struct svc_serv *serv, struct net *net)
{
-  svc_close_list(&serv->sv_tempsocks, net);
-  svc_close_list(&serv->sv_permsocks, net);
+  svc_close_list(serv, &serv->sv_tempsocks, net);
+  svc_close_list(serv, &serv->sv_permsocks, net);
  svc_clear_pools(serv, net);
  /*
@@ -974,8 +980,8 @@ void svc_close_net(struct svc_serv *serv, struct net *net)
 * svc_xprt_enqueue will not add new entries without taking the
 * sp_lock and checking XPT_BUSY.
 */
-  svc_clear_list(&serv->sv_tempsocks, net);
-  svc_clear_list(&serv->sv_permsocks, net);
+  svc_clear_list(serv, &serv->sv_tempsocks, net);
+  svc_clear_list(serv, &serv->sv_permsocks, net);
}
/*