
Subject: Re: Dynamically allocate the loopback device
Posted by [Benjamin Thery](#) on Fri, 24 Aug 2007 13:22:27 GMT
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Kirill Korotaev wrote:

> Acked-By: Kirill Korotaev <dev@sw.ru>

Acked-by: Benjamin Thery <benjamin.thery@bull.net>

Looks good to me.

Compiled and tested on i386.

>

> dlezcano@fr.ibm.com wrote:

>> From: Daniel Lezcano <dlezcano@fr.ibm.com>

>>

>> Doing this makes loopback.c a better example of how to do a

>> simple network device, and it removes the special case

>> single static allocation of a struct net_device, hopefully

>> making maintenance easier.

>>

>> Signed-off-by: Eric W. Biederman <ebiederm@xmission.com>

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

>> ---

>> drivers/net/loopback.c | 63 ++++++-----

>> include/linux/netdevice.h | 2 +-

>> net/core/dst.c | 8 ++--

>> net/decnet/dn_dev.c | 4 +-

>> net/decnet/dn_route.c | 14 ++++----

>> net/ipv4/devinet.c | 6 ++--

>> net/ipv4/ipconfig.c | 6 ++--

>> net/ipv4/ipvs/ip_vs_core.c | 2 +-

>> net/ipv4/route.c | 18 +++++-----

>> net/ipv4/xfrm4_policy.c | 2 +-

>> net/ipv6/addrconf.c | 15 +++++---

>> net/ipv6/ip6_input.c | 2 +-

>> net/ipv6/netfilter/ip6t_REJECT.c | 2 +-

>> net/ipv6/route.c | 15 +++-----

>> net/ipv6/xfrm6_policy.c | 2 +-

>> net/xfrm/xfrm_policy.c | 4 +-

>> 16 files changed, 89 insertions(+), 76 deletions(-)

>>

>> diff --git a/drivers/net/loopback.c b/drivers/net/loopback.c

>> index 5106c23..3642aff 100644

>> --- a/drivers/net/loopback.c

>> +++ b/drivers/net/loopback.c

>> @@ -199,44 +199,57 @@ static const struct ethtool_ops loopback_ethtool_ops = {

>> .get_rx_csum = always_on,

```

>> };
>>
>> -/*
>> - * The loopback device is special. There is only one instance and
>> - * it is statically allocated. Don't do this for other devices.
>> - */
>> -struct net_device loopback_dev = {
>> - .name = "lo",
>> - .get_stats = &get_stats,
>> - .mtu = (16 * 1024) + 20 + 20 + 12,
>> - .hard_start_xmit = loopback_xmit,
>> - .hard_header = eth_header,
>> - .hard_header_cache = eth_header_cache,
>> - .header_cache_update = eth_header_cache_update,
>> - .hard_header_len = ETH_HLEN, /* 14 */
>> - .addr_len = ETH_ALEN, /* 6 */
>> - .tx_queue_len = 0,
>> - .type = ARPHRD_LOOPBACK, /* 0x0001*/
>> - .rebuild_header = eth_rebuild_header,
>> - .flags = IFF_LOOPBACK,
>> - .features = NETIF_F_SG | NETIF_F_FRAGLIST
>> +static void loopback_setup(struct net_device *dev)
>> +{
>> + dev->get_stats = &get_stats;
>> + dev->mtu = (16 * 1024) + 20 + 20 + 12;
>> + dev->hard_start_xmit = loopback_xmit;
>> + dev->hard_header = eth_header;
>> + dev->hard_header_cache = eth_header_cache;
>> + dev->header_cache_update = eth_header_cache_update;
>> + dev->hard_header_len = ETH_HLEN; /* 14 */
>> + dev->addr_len = ETH_ALEN; /* 6 */
>> + dev->tx_queue_len = 0;
>> + dev->type = ARPHRD_LOOPBACK; /* 0x0001*/
>> + dev->rebuild_header = eth_rebuild_header;
>> + dev->flags = IFF_LOOPBACK;
>> + dev->features = NETIF_F_SG | NETIF_F_FRAGLIST
>> #ifdef LOOPBACK_TSO
>>     | NETIF_F_TSO
>> #endif
>>     | NETIF_F_NO_CSUM | NETIF_F_HIGHDMA
>> -     | NETIF_F_LLTX,
>> - .ethtool_ops = &loopback_ethtool_ops,
>> -};
>> +     | NETIF_F_LLTX;
>> + dev->ethtool_ops = &loopback_ethtool_ops;
>> +}
>>
>> /* Setup and register the loopback device. */

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```

>> static int __init loopback_init(void)
>> {
>> - int err = register_netdev(&loopback_dev);
>> + struct net_device *dev;
>> + int err;
>> +
>> + err = -ENOMEM;
>> + dev = alloc_netdev(0, "lo", loopback_setup);
>> + if (!dev)
>> + goto out;
>> +
>> + err = register_netdev(dev);
>> + if (err)
>> + goto out_free_netdev;
>>
>> + err = 0;
>> + loopback_dev = dev;
>> +
>> +out:
>> if (err)
>>   panic("loopback: Failed to register netdevice: %d\n", err);
>> -
>> return err;
>> +out_free_netdev:
>> + free_netdev(dev);
>> + goto out;
>> };
>>
>> -module_init(loopback_init);
>> +fs_initcall(loopback_init);
>>
>> +struct net_device *loopback_dev;
>> EXPORT_SYMBOL(loopback_dev);
>> diff --git a/include/linux/netdevice.h b/include/linux/netdevice.h
>> index 8d12f02..7cd0641 100644
>> --- a/include/linux/netdevice.h
>> +++ b/include/linux/netdevice.h
>> @@ -680,7 +680,7 @@ struct packet_type {
>> #include <linux/interrupt.h>
>> #include <linux/notifier.h>
>>
>> -extern struct net_device loopback_dev; /* The loopback */
>> +extern struct net_device *loopback_dev; /* The loopback */
>> extern struct list_head dev_base_head; /* All devices */
>> extern rwlock_t dev_base_lock; /* Device list lock */
>>
>> diff --git a/net/core/dst.c b/net/core/dst.c
>> index c6a0587..ad8549e 100644

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>> --- a/net/core/dst.c
>> +++ b/net/core/dst.c
>> @@ -236,13 +236,13 @@ static inline void dst_ifdown(struct dst_entry *dst, struct net_device
*dev,
>> if (!unregister) {
>> dst->input = dst->output = dst_discard;
>> } else {
>> - dst->dev = &loopback_dev;
>> - dev_hold(&loopback_dev);
>> + dst->dev = loopback_dev;
>> + dev_hold(dst->dev);
>> dev_put(dev);
>> if (dst->neighbour && dst->neighbour->dev == dev) {
>> - dst->neighbour->dev = &loopback_dev;
>> + dst->neighbour->dev = loopback_dev;
>> dev_put(dev);
>> - dev_hold(&loopback_dev);
>> + dev_hold(dst->neighbour->dev);
>> }
>> }
>> }
>> diff --git a/net/decnet/dn_dev.c b/net/decnet/dn_dev.c
>> index fa6604f..9fea83e 100644
>> --- a/net/decnet/dn_dev.c
>> +++ b/net/decnet/dn_dev.c
>> @@ -868,10 +868,10 @@ last_chance:
>> rv = dn_dev_get_first(dev, addr);
>> read_unlock(&dev_base_lock);
>> dev_put(dev);
>> - if (rv == 0 || dev == &loopback_dev)
>> + if (rv == 0 || dev == loopback_dev)
>> return rv;
>> }
>> - dev = &loopback_dev;
>> + dev = loopback_dev;
>> dev_hold(dev);
>> goto last_chance;
>> }
>> diff --git a/net/decnet/dn_route.c b/net/decnet/dn_route.c
>> index a4a6209..8c04ebc 100644
>> --- a/net/decnet/dn_route.c
>> +++ b/net/decnet/dn_route.c
>> @@ -883,7 +883,7 @@ static int dn_route_output_slow(struct dst_entry **pprt, const struct
flowi *old
>> .scope = RT_SCOPE_UNIVERSE,
>> } },
>> .mark = oldflp->mark,
>> - .iif = loopback_dev.ifindex,

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>> + .iif = loopback_dev->ifindex,
>> .oif = oldflp->oif };
>> struct dn_route *rt = NULL;
>> struct net_device *dev_out = NULL, *dev;
>> @@ -900,7 +900,7 @@ static int dn_route_output_slow(struct dst_entry **pprt, const struct
flowi *old
>>     "dn_route_output_slow: dst=%04x src=%04x mark=%d"
>>     " iif=%d oif=%d\n", dn_ntohs(oldflp->fld_dst),
>>     dn_ntohs(oldflp->fld_src),
>> -     oldflp->mark, loopback_dev.ifindex, oldflp->oif);
>> +     oldflp->mark, loopback_dev->ifindex, oldflp->oif);
>>
>> /* If we have an output interface, verify its a DECnet device */
>> if (oldflp->oif) {
>> @@ -953,7 +953,7 @@ source_ok:
>>     err = -EADDRNOTAVAIL;
>>     if (dev_out)
>>         dev_put(dev_out);
>> - dev_out = &loopback_dev;
>> + dev_out = loopback_dev;
>>     dev_hold(dev_out);
>>     if (!fl.fld_dst) {
>>         fl.fld_dst =
>> @@ -962,7 +962,7 @@ source_ok:
>>         if (!fl.fld_dst)
>>             goto out;
>>     }
>> - fl.oif = loopback_dev.ifindex;
>> + fl.oif = loopback_dev->ifindex;
>>     res.type = RTN_LOCAL;
>>     goto make_route;
>> }
>> @@ -1008,7 +1008,7 @@ source_ok:
>>     if (dev_out)
>>         dev_put(dev_out);
>>     if (dn_dev_islocal(neigh->dev, fl.fld_dst)) {
>> -     dev_out = &loopback_dev;
>> +     dev_out = loopback_dev;
>>         res.type = RTN_LOCAL;
>>     } else {
>>         dev_out = neigh->dev;
>> @@ -1029,7 +1029,7 @@ source_ok:
>> /* Possible improvement - check all devices for local addr */
>> if (dn_dev_islocal(dev_out, fl.fld_dst)) {
>>     dev_put(dev_out);
>> - dev_out = &loopback_dev;
>> + dev_out = loopback_dev;
>>     dev_hold(dev_out);

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>> res.type = RTN_LOCAL;
>> goto select_source;
>> @@ -1065,7 +1065,7 @@ select_source:
>> fl.fld_src = fl.fld_dst;
>> if (dev_out)
>> dev_put(dev_out);
>> - dev_out = &loopback_dev;
>> + dev_out = loopback_dev;
>> dev_hold(dev_out);
>> fl.oif = dev_out->ifindex;
>> if (res.fi)
>> diff --git a/net/ipv4/devinet.c b/net/ipv4/devinet.c
>> index 5b77bda..808f529 100644
>> --- a/net/ipv4/devinet.c
>> +++ b/net/ipv4/devinet.c
>> @@ -203,7 +203,7 @@ static void inetdev_destroy(struct in_device *in_dev)
>> ASSERT_RTNL();
>>
>> dev = in_dev->dev;
>> - if (dev == &loopback_dev)
>> + if (dev == loopback_dev)
>> return;
>>
>> in_dev->dead = 1;
>> @@ -1058,7 +1058,7 @@ static int inetdev_event(struct notifier_block *this, unsigned long
event,
>> in_dev = inetdev_init(dev);
>> if (!in_dev)
>> return notifier_from_errno(-ENOMEM);
>> - if (dev == &loopback_dev) {
>> + if (dev == loopback_dev) {
>> IN_DEV_CONF_SET(in_dev, NOXFRM, 1);
>> IN_DEV_CONF_SET(in_dev, NOPOLICY, 1);
>> }
>> @@ -1074,7 +1074,7 @@ static int inetdev_event(struct notifier_block *this, unsigned long
event,
>> case NETDEV_UP:
>> if (dev->mtu < 68)
>> break;
>> - if (dev == &loopback_dev) {
>> + if (dev == loopback_dev) {
>> struct in_ifaddr *ifa;
>> if ((ifa = inet_alloc_ifa()) != NULL) {
>> ifa->ifa_local =
>> diff --git a/net/ipv4/ipconfig.c b/net/ipv4/ipconfig.c
>> index c5b2470..3ec7690 100644
>> --- a/net/ipv4/ipconfig.c
>> +++ b/net/ipv4/ipconfig.c

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>> @@ -189,11 +189,11 @@ static int __init ic_open_devs(void)
>>   rtnl_lock();
>>
>>   /* bring loopback device up first */
>>   - if (dev_change_flags(&loopback_dev, loopback_dev.flags | IFF_UP) < 0)
>>   -   printk(KERN_ERR "IP-Config: Failed to open %s\n", loopback_dev.name);
>>   + if (dev_change_flags(loopback_dev, loopback_dev->flags | IFF_UP) < 0)
>>   +   printk(KERN_ERR "IP-Config: Failed to open %s\n", loopback_dev->name);
>>
>>   for_each_netdev(dev) {
>>   -   if (dev == &loopback_dev)
>>   +   if (dev == loopback_dev)
>>       continue;
>>   if (user_dev_name[0] ? !strcmp(dev->name, user_dev_name) :
>>       (!(dev->flags & IFF_LOOPBACK)) &&
>> diff --git a/net/ipv4/ipvs/ip_vs_core.c b/net/ipv4/ipvs/ip_vs_core.c
>> index f005a2f..7450326 100644
>> --- a/net/ipv4/ipvs/ip_vs_core.c
>> +++ b/net/ipv4/ipvs/ip_vs_core.c
>> @@ -961,7 +961,7 @@ ip_vs_in(unsigned int hooknum, struct sk_buff **pskb,
>>   * ... don't know why 1st test DOES NOT include 2nd (?)
>>   */
>>   if (unlikely(skb->pkt_type != PACKET_HOST
>>   || skb->dev == &loopback_dev || skb->sk)) {
>>   +   || skb->dev == loopback_dev || skb->sk)) {
>>   IP_VS_DBG(12, "packet type=%d proto=%d daddr=%d.%d.%d.%d ignored\n",
>>   skb->pkt_type,
>>   ip_hdr(skb)->protocol,
>> diff --git a/net/ipv4/route.c b/net/ipv4/route.c
>> index c7ca94b..4f13385 100644
>> --- a/net/ipv4/route.c
>> +++ b/net/ipv4/route.c
>> @@ -1404,8 +1404,8 @@ static void ipv4_dst_ifdown(struct dst_entry *dst, struct net_device
>> *dev,
>> {
>>   struct rtable *rt = (struct rtable *) dst;
>>   struct in_device *idev = rt->idev;
>>   - if (dev != &loopback_dev && idev && idev->dev == dev) {
>>   -   struct in_device *loopback_idev = in_dev_get(&loopback_dev);
>>   + if (dev != loopback_dev && idev && idev->dev == dev) {
>>   +   struct in_device *loopback_idev = in_dev_get(loopback_dev);
>>   if (loopback_idev) {
>>   rt->idev = loopback_idev;
>>   in_dev_put(idev);
>> @@ -1557,7 +1557,7 @@ static int ip_route_input_mc(struct sk_buff *skb, __be32 daddr,
>> __be32 saddr,
>> #endif
>>   rth->rt_iif =

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>> rth->fl.iif = dev->ifindex;
>> - rth->u.dst.dev = &loopback_dev;
>> + rth->u.dst.dev = loopback_dev;
>> dev_hold(rth->u.dst.dev);
>> rth->idev = in_dev_get(rth->u.dst.dev);
>> rth->fl.oif = 0;
>> @@ -1814,7 +1814,7 @@ static int ip_route_input_slow(struct sk_buff *skb, __be32 daddr,
__be32 saddr,
>> if (res.type == RTN_LOCAL) {
>> int result;
>> result = fib_validate_source(saddr, daddr, tos,
>> - loopback_dev.ifindex,
>> + loopback_dev->ifindex,
>> dev, &spec_dst, &itag);
>> if (result < 0)
>> goto martian_source;
>> @@ -1881,7 +1881,7 @@ local_input:
>> #endif
>> rth->rt_iif =
>> rth->fl.iif = dev->ifindex;
>> - rth->u.dst.dev = &loopback_dev;
>> + rth->u.dst.dev = loopback_dev;
>> dev_hold(rth->u.dst.dev);
>> rth->idev = in_dev_get(rth->u.dst.dev);
>> rth->rt_gateway = daddr;
>> @@ -2151,7 +2151,7 @@ static int ip_route_output_slow(struct rtable **rp, const struct flowi
*oldflp)
>> RT_SCOPE_UNIVERSE),
>> },
>> .mark = oldflp->mark,
>> - .iif = loopback_dev.ifindex,
>> + .iif = loopback_dev->ifindex,
>> .oif = oldflp->oif };
>> struct fib_result res;
>> unsigned flags = 0;
>> @@ -2245,9 +2245,9 @@ static int ip_route_output_slow(struct rtable **rp, const struct flowi
*oldflp)
>> fl.fl4_dst = fl.fl4_src = htonl(INADDR_LOOPBACK);
>> if (dev_out)
>> dev_put(dev_out);
>> - dev_out = &loopback_dev;
>> + dev_out = loopback_dev;
>> dev_hold(dev_out);
>> - fl.oif = loopback_dev.ifindex;
>> + fl.oif = loopback_dev->ifindex;
>> res.type = RTN_LOCAL;
>> flags |= RTCF_LOCAL;
>> goto make_route;

```



```

>> @@ -2292,7 +2292,7 @@ static int ip_route_output_slow(struct rtable **rp, const struct flowi
*oldflp)
>>     fl.fl4_src = fl.fl4_dst;
>>     if (dev_out)
>>         dev_put(dev_out);
>> - dev_out = &loopback_dev;
>> + dev_out = loopback_dev;
>>     dev_hold(dev_out);
>>     fl.oif = dev_out->ifindex;
>>     if (res.fi)
>> diff --git a/net/ipv4/xfrm4_policy.c b/net/ipv4/xfrm4_policy.c
>> index 4ff8ed3..29ab3de 100644
>> --- a/net/ipv4/xfrm4_policy.c
>> +++ b/net/ipv4/xfrm4_policy.c
>> @@ -306,7 +306,7 @@ static void xfrm4_dst_ifdown(struct dst_entry *dst, struct net_device
*dev,
>>
>>     xdst = (struct xfrm_dst *)dst;
>>     if (xdst->u.rt.idev->dev == dev) {
>> - struct in_device *loopback_iddev = in_dev_get(&loopback_dev);
>> + struct in_device *loopback_iddev = in_dev_get(loopback_dev);
>>     BUG_ON(!loopback_iddev);
>>
>>     do {
>> diff --git a/net/ipv6/addrconf.c b/net/ipv6/addrconf.c
>> index 91ef3be..d806f89 100644
>> --- a/net/ipv6/addrconf.c
>> +++ b/net/ipv6/addrconf.c
>> @@ -2399,7 +2399,7 @@ static int addrconf_ifdown(struct net_device *dev, int how)
>>
>>     ASSERT_RTNL();
>>
>> - if (dev == &loopback_dev && how == 1)
>> + if (dev == loopback_dev && how == 1)
>>     how = 0;
>>
>>     rt6_ifdown(dev);
>> @@ -4203,16 +4203,19 @@ int __init addrconf_init(void)
>>     * device and it being up should be removed.
>>     */
>>     rtnl_lock();
>> - if (!ipv6_add_dev(&loopback_dev))
>> + if (!ipv6_add_dev(loopback_dev))
>>     err = -ENOMEM;
>>     rtnl_unlock();
>>     if (err)
>>         return err;
>>

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>> - ip6_null_entry.rt6i_iddev = in6_dev_get(&loopback_dev);
>> + ip6_null_entry.u.dst.dev = loopback_dev;
>> + ip6_null_entry.rt6i_iddev = in6_dev_get(loopback_dev);
>> #ifdef CONFIG_IPV6_MULTIPLE_TABLES
>> - ip6_prohibit_entry.rt6i_iddev = in6_dev_get(&loopback_dev);
>> - ip6_blk_hole_entry.rt6i_iddev = in6_dev_get(&loopback_dev);
>> + ip6_prohibit_entry.u.dst.dev = loopback_dev;
>> + ip6_prohibit_entry.rt6i_iddev = in6_dev_get(loopback_dev);
>> + ip6_blk_hole_entry.u.dst.dev = loopback_dev;
>> + ip6_blk_hole_entry.rt6i_iddev = in6_dev_get(loopback_dev);
>> #endif
>>
>> register_netdevice_notifier(&ipv6_dev_notf);
>> @@ -4267,7 +4270,7 @@ void __exit addrconf_cleanup(void)
>>     continue;
>>     addrconf_ifdown(dev, 1);
>> }
>> - addrconf_ifdown(&loopback_dev, 2);
>> + addrconf_ifdown(loopback_dev, 2);
>>
>> /*
>>  * Check hash table.
>> diff --git a/net/ipv6/ip6_input.c b/net/ipv6/ip6_input.c
>> index 30a5cb1..15d7910 100644
>> --- a/net/ipv6/ip6_input.c
>> +++ b/net/ipv6/ip6_input.c
>> @@ -86,7 +86,7 @@ int ipv6_rcv(struct sk_buff *skb, struct net_device *dev, struct
packet_type *pt
>>  *
>>  * BTW, when we send a packet for our own local address on a
>>  * non-loopback interface (e.g. ethX), it is being delivered
>>  * via the loopback interface (lo) here; skb->dev = &loopback_dev.
>> + * via the loopback interface (lo) here; skb->dev = loopback_dev.
>>  * It, however, should be considered as if it is being
>>  * arrived via the sending interface (ethX), because of the
>>  * nature of scoping architecture. --yoshfuji
>> diff --git a/net/ipv6/netfilter/ip6t_REJECT.c b/net/ipv6/netfilter/ip6t_REJECT.c
>> index 2f487cd..5086053 100644
>> --- a/net/ipv6/netfilter/ip6t_REJECT.c
>> +++ b/net/ipv6/netfilter/ip6t_REJECT.c
>> @@ -167,7 +167,7 @@ static inline void
>> send_unreach(struct sk_buff *skb_in, unsigned char code, unsigned int hooknum)
>> {
>>     if (hooknum == NF_IP6_LOCAL_OUT && skb_in->dev == NULL)
>> - skb_in->dev = &loopback_dev;
>> + skb_in->dev = loopback_dev;
>>
>>     icmpv6_send(skb_in, ICMPV6_DEST_UNREACH, code, 0, NULL);

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>> }
>> diff --git a/net/ipv6/route.c b/net/ipv6/route.c
>> index 55ea80f..3f5c65f 100644
>> --- a/net/ipv6/route.c
>> +++ b/net/ipv6/route.c
>> @@ -137,7 +137,6 @@ struct rt6_info ip6_null_entry = {
>> .dst = {
>> .__refcnt = ATOMIC_INIT(1),
>> .__use = 1,
>> - .dev = &loopback_dev,
>> .obsolete = -1,
>> .error = -ENETUNREACH,
>> .metrics = { [RTAX_HOPLIMIT - 1] = 255, },
>> @@ -163,7 +162,6 @@ struct rt6_info ip6_prohibit_entry = {
>> .dst = {
>> .__refcnt = ATOMIC_INIT(1),
>> .__use = 1,
>> - .dev = &loopback_dev,
>> .obsolete = -1,
>> .error = -EACCES,
>> .metrics = { [RTAX_HOPLIMIT - 1] = 255, },
>> @@ -183,7 +181,6 @@ struct rt6_info ip6_blk_hole_entry = {
>> .dst = {
>> .__refcnt = ATOMIC_INIT(1),
>> .__use = 1,
>> - .dev = &loopback_dev,
>> .obsolete = -1,
>> .error = -EINVAL,
>> .metrics = { [RTAX_HOPLIMIT - 1] = 255, },
>> @@ -223,8 +220,8 @@ static void ip6_dst_ifdown(struct dst_entry *dst, struct net_device
>> *dev,
>> struct rt6_info *rt = (struct rt6_info *)dst;
>> struct inet6_dev *idev = rt->rt6i_idev;
>>
>> - if (dev != &loopback_dev && idev != NULL && idev->dev == dev) {
>> - struct inet6_dev *loopback_idev = in6_dev_get(&loopback_dev);
>> + if (dev != loopback_dev && idev != NULL && idev->dev == dev) {
>> + struct inet6_dev *loopback_idev = in6_dev_get(loopback_dev);
>> if (loopback_idev != NULL) {
>> rt->rt6i_idev = loopback_idev;
>> in6_dev_put(idev);
>> @@ -1187,12 +1184,12 @@ int ip6_route_add(struct fib6_config *cfg)
>> if ((cfg->fc_flags & RTF_REJECT) ||
>> (dev && (dev->flags&IFF_LOOPBACK) && !(addr_type&IPV6_ADDR_LOOPBACK))) {
>> /* hold loopback dev/idev if we haven't done so. */
>> - if (dev != &loopback_dev) {
>> + if (dev != loopback_dev) {
>> if (dev) {

```

```

>> dev_put(dev);
>> in6_dev_put(idev);
>> }
>> - dev = &loopback_dev;
>> + dev = loopback_dev;
>> dev_hold(dev);
>> idev = in6_dev_get(dev);
>> if (!idev) {
>> @@ -1896,13 +1893,13 @@ struct rt6_info *addrconf_dst_alloc(struct inet6_dev *idev,
>> if (rt == NULL)
>> return ERR_PTR(-ENOMEM);
>>
>> - dev_hold(&loopback_dev);
>> + dev_hold(loopback_dev);
>> in6_dev_hold(idev);
>>
>> rt->u.dst.flags = DST_HOST;
>> rt->u.dst.input = ip6_input;
>> rt->u.dst.output = ip6_output;
>> - rt->rt6i_dev = &loopback_dev;
>> + rt->rt6i_dev = loopback_dev;
>> rt->rt6i_idev = idev;
>> rt->u.dst.metrics[RTAX_MTU-1] = ipv6_get_mtu(rt->rt6i_dev);
>> rt->u.dst.metrics[RTAX_ADVMSS-1] = ipv6_advmss(dst_mtu(&rt->u.dst));
>> diff --git a/net/ipv6/xfrm6_policy.c b/net/ipv6/xfrm6_policy.c
>> index 3ec0c47..cc07216 100644
>> --- a/net/ipv6/xfrm6_policy.c
>> +++ b/net/ipv6/xfrm6_policy.c
>> @@ -375,7 +375,7 @@ static void xfrm6_dst_ifdown(struct dst_entry *dst, struct net_device
>> *dev,
>>
>> xdst = (struct xfrm_dst *)dst;
>> if (xdst->u.rt6i_idev->dev == dev) {
>> - struct inet6_dev *loopback_idev = in6_dev_get(&loopback_dev);
>> + struct inet6_dev *loopback_idev = in6_dev_get(loopback_dev);
>> BUG_ON(!loopback_idev);
>>
>> do {
>> diff --git a/net/xfrm/xfrm_policy.c b/net/xfrm/xfrm_policy.c
>> index c7b2503..ca37eec 100644
>> --- a/net/xfrm/xfrm_policy.c
>> +++ b/net/xfrm/xfrm_policy.c
>> @@ -1947,8 +1947,8 @@ static int stale_bundle(struct dst_entry *dst)
>> void xfrm_dst_ifdown(struct dst_entry *dst, struct net_device *dev)
>> {
>> while ((dst = dst->child) && dst->xfrm && dst->dev == dev) {
>> - dst->dev = &loopback_dev;
>> - dev_hold(&loopback_dev);

```

```
>> + dst->dev = loopback_dev;  
>> + dev_hold(dst->dev);  
>> dev_put(dev);  
>> }  
>> }  
>  
>
```

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

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