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Subject: [PATCH] iptables 32bit compat layer  
Posted by [Mishin Dmitry](#) on Thu, 23 Mar 2006 10:24:33 GMT  
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This patch extends current iptables compatibility layer in order to get 32bit iptables to work on 64bit kernel. Current layer is insufficient due to alignment checks both in kernel and user space tools.

Patch is for current net-2.6.17 with addition of move of ipt\_entry\_{match|target} definitions to xt\_entry\_{match|target}.

Signed-off-by: Dmitry Mishin <dim@openvz.org>  
Acked-off-by: Kirill Korotaev <dev@openvz.org>

--  
Thanks,  
Dmitry.

```
diff --git a/include/linux/netfilter/x_tables.h b/include/linux/netfilter/x_tables.h
index ad72a4f..9d4fa6d 100644
--- a/include/linux/netfilter/x_tables.h
+++ b/include/linux/netfilter/x_tables.h
@@ -142,6 +142,12 @@ struct xt_counters_info
#define ASSERT_WRITE_LOCK(x)
#include <linux/netfilter_ipv4/listhelp.h>

+#ifdef CONFIG_COMPAT
+#define COMPAT_TO_USER 1
+#define COMPAT_FROM_USER -1
+#define COMPAT_CALC_SIZE 0
+#endif
+
+ struct xt_match
+ {
+     struct list_head list;
@@ -175,6 +181,9 @@ struct xt_match
void (*destroy)(const struct xt_match *match, void *matchinfo,
unsigned int matchinfosize);

+ /* Called when userspace align differs from kernel space one */
+ int (*compat)(void *match, void **dstptr, int *size, int convert);
+
+ /* Set this to THIS_MODULE if you are a module, otherwise NULL */
+ struct module *me;

@@ -220,6 +229,9 @@ struct xt_target
void (*destroy)(const struct xt_target *target, void *targinfo,
unsigned int targinfosize);
```

```

+ /* Called when userspace align differs from kernel space one */
+ int (*compat)(void *target, void **dstptr, int *size, int convert);
+
+ /* Set this to THIS_MODULE if you are a module, otherwise NULL */
+ struct module *me;

@@ -314,6 +326,61 @@ extern void xt_proto_fini(int af);
extern struct xt_table_info *xt_alloc_table_info(unsigned int size);
extern void xt_free_table_info(struct xt_table_info *info);

#ifdef CONFIG_COMPAT
#include <net/compat.h>
+
+struct compat_xt_entry_match
+{
+ union {
+ struct {
+ u_int16_t match_size;
+ char name[XT_FUNCTION_MAXNAMELEN - 1];
+ u_int8_t revision;
+ } user;
+ u_int16_t match_size;
+ } u;
+ unsigned char data[0];
+};
+
+struct compat_xt_entry_target
+{
+ union {
+ struct {
+ u_int16_t target_size;
+ char name[XT_FUNCTION_MAXNAMELEN - 1];
+ u_int8_t revision;
+ } user;
+ u_int16_t target_size;
+ } u;
+ unsigned char data[0];
+};
+
+/* FIXME: this works only on 32 bit tasks
+ * need to change whole approach in order to calculate align as function of
+ * current task alignment */
+
+struct compat_xt_counters
+{
+ u_int32_t cnt[4];
+};

```

```

+
+struct compat_xt_counters_info
+{
+ char name[XT_TABLE_MAXNAMELEN];
+ compat_uint_t num_counters;
+ struct compat_xt_counters counters[0];
+};
+
+#define COMPAT_XT_ALIGN(s) (((s) + (__alignof__(struct compat_xt_counters)-1)) \
+ & ~(__alignof__(struct compat_xt_counters)-1))
+
+extern void xt_compat_lock(int af);
+extern void xt_compat_unlock(int af);
+extern int xt_compat_match(void *match, void **dstptr, int *size, int convert);
+extern int xt_compat_target(void *target, void **dstptr, int *size,
+ int convert);
+
+#endif /* CONFIG_COMPAT */
+#endif /* __KERNEL__ */

#endif /* _X_TABLES_H */
diff --git a/include/linux/netfilter_ipv4/ip_tables.h b/include/linux/netfilter_ipv4/ip_tables.h
index 56eebc6..9e11e32 100644
--- a/include/linux/netfilter_ipv4/ip_tables.h
+++ b/include/linux/netfilter_ipv4/ip_tables.h
@@ -312,5 +312,23 @@ extern unsigned int ipt_do_table(struct
void *userdata);

#define IPT_ALIGN(s) XT_ALIGN(s)
+
+#ifdef CONFIG_COMPAT
+#include <net/compat.h>
+
+struct compat_ip_entry
+{
+ struct ipt_ip ip;
+ compat_uint_t nfcache;
+ u_int16_t target_offset;
+ u_int16_t next_offset;
+ compat_uint_t comefrom;
+ struct compat_xt_counters counters;
+ unsigned char elems[0];
+};
+
+#define COMPAT_IPT_ALIGN(s) COMPAT_XT_ALIGN(s)
+
+#endif /* CONFIG_COMPAT */
+#endif /* __KERNEL__ */

```

```

#endif /* _IPTABLES_H */
diff --git a/net/compat.c b/net/compat.c
index 13177a1..6a7028e 100644
--- a/net/compat.c
+++ b/net/compat.c
@@ -476,8 +476,7 @@ asmlinkage long compat_sys_setsockopt(in
 int err;
 struct socket *sock;

- /* SO_SET_REPLACE seems to be the same in all levels */
- if (optname == IPT_SO_SET_REPLACE)
+ if (level == SOL_IPV6 && optname == IPT_SO_SET_REPLACE)
     return do_netfilter_replace(fd, level, optname,
        optval, optlen);

diff --git a/net/ipv4/netfilter/ip_tables.c b/net/ipv4/netfilter/ip_tables.c
index 39705f9..9149b24 100644
--- a/net/ipv4/netfilter/ip_tables.c
+++ b/net/ipv4/netfilter/ip_tables.c
@@ -24,6 +24,7 @@
#include <linux/module.h>
#include <linux/icmp.h>
#include <net/ip.h>
+#include <net/compat.h>
#include <asm/uaccess.h>
#include <linux/mutex.h>
#include <linux/proc_fs.h>
@@ -799,17 +800,11 @@ get_counters(const struct xt_table_info
 }
}

-static int
-copy_entries_to_user(unsigned int total_size,
- struct ipt_table *table,
- void __user *userptr)
+static inline struct xt_counters * alloc_counters(struct ipt_table *table)
{
- unsigned int off, num, countersize;
- struct ipt_entry *e;
+ unsigned int countersize;
     struct xt_counters *counters;
     struct xt_table_info *private = table->private;
- int ret = 0;
- void *loc_cpu_entry;

/* We need atomic snapshot of counters: rest doesn't change
   (other than comefrom, which userspace doesn't care
@@ -818,13 +813,32 @@ copy_entries_to_user(unsigned int total_

```

```

counters = vmalloc_node(countersize, numa_node_id());

if (counters == NULL)
- return -ENOMEM;
+ return ERR_PTR(-ENOMEM);

/* First, sum counters... */
write_lock_bh(&table->lock);
get_counters(private, counters);
write_unlock_bh(&table->lock);

+ return counters;
+}
+
+static int
+copy_entries_to_user(unsigned int total_size,
+ struct ipt_table *table,
+ void __user *userptr)
+{
+ unsigned int off, num;
+ struct ipt_entry *e;
+ struct xt_counters *counters;
+ struct xt_table_info *private = table->private;
+ int ret = 0;
+ void *loc_cpu_entry;
+
+ counters = alloc_counters(table);
+ if (IS_ERR(counters))
+ return PTR_ERR(counters);
+
+ /* choose the copy that is on our node/cpu, ...
+  * This choice is lazy (because current thread is
+  * allowed to migrate to another cpu)
+  */
@@ -884,44 +898,899 @@ copy_entries_to_user(unsigned int total_
return ret;
}

#ifdef CONFIG_COMPAT
+struct compat_delta {
+ struct compat_delta *next;
+ u_int16_t offset;
+ short delta;
+};
+
+static struct compat_delta *compat_offsets = NULL;
+
+static int compat_add_offset(u_int16_t offset, short delta)
+{

```

```

+ struct compat_delta *tmp;
+
+ tmp = kmalloc(sizeof(struct compat_delta), GFP_KERNEL);
+ if (!tmp)
+ return -ENOMEM;
+ tmp->offset = offset;
+ tmp->delta = delta;
+ if (compat_offsets) {
+ tmp->next = compat_offsets->next;
+ compat_offsets->next = tmp;
+ } else {
+ compat_offsets = tmp;
+ tmp->next = NULL;
+ }
+ return 0;
+}
+
+static void compat_flush_offsets(void)
+{
+ struct compat_delta *tmp, *next;
+
+ if (compat_offsets) {
+ for(tmp = compat_offsets; tmp; tmp = next) {
+ next = tmp->next;
+ kfree(tmp);
+ }
+ compat_offsets = NULL;
+ }
+}
+
+static short compat_calc_jump(u_int16_t offset)
+{
+ struct compat_delta *tmp;
+ short delta;
+
+ for(tmp = compat_offsets, delta = 0; tmp; tmp = tmp->next)
+ if (tmp->offset < offset)
+ delta += tmp->delta;
+ return delta;
+}
+
+struct compat_ipt_standard_target
+{
+ struct compat_xt_entry_target target;
+ compat_int_t verdict;
+};
+
+#define IPT_ST_OFFSET (sizeof(struct ipt_standard_target) - \

```

```

+ sizeof(struct compat_ipt_standard_target))
+
+struct compat_ipt_standard
+{
+ struct compat_ipt_entry entry;
+ struct compat_ipt_standard_target target;
+};
+
+static int compat_ipt_standard_fn(void *target,
+ void **dstptr, int *size, int convert)
+{
+ struct compat_ipt_standard_target compat_st, *pcompat_st;
+ struct ipt_standard_target st, *pst;
+ int ret;
+
+ ret = 0;
+ switch (convert) {
+ case COMPAT_TO_USER:
+ pst = (struct ipt_standard_target *)target;
+ memcpy(&compat_st.target, &pst->target,
+ sizeof(struct ipt_entry_target));
+ compat_st.verdict = pst->verdict;
+ if (compat_st.verdict > 0)
+ compat_st.verdict -=
+ compat_calc_jump(compat_st.verdict);
+ compat_st.target.u.user.target_size =
+ sizeof(struct compat_ipt_standard_target);
+ if (__copy_to_user(*dstptr, &compat_st,
+ sizeof(struct compat_ipt_standard_target)))
+ ret = -EFAULT;
+ *size -= IPT_ST_OFFSET;
+ *dstptr += sizeof(struct compat_ipt_standard_target);
+ break;
+ case COMPAT_FROM_USER:
+ pcompat_st =
+ (struct compat_ipt_standard_target *)target;
+ memcpy(&st.target, &pcompat_st->target,
+ sizeof(struct ipt_entry_target));
+ st.verdict = pcompat_st->verdict;
+ if (st.verdict > 0)
+ st.verdict += compat_calc_jump(st.verdict);
+ st.target.u.user.target_size =
+ sizeof(struct ipt_standard_target);
+ memcpy(*dstptr, &st,
+ sizeof(struct ipt_standard_target));
+ *size += IPT_ST_OFFSET;
+ *dstptr += sizeof(struct ipt_standard_target);
+ break;

```

```

+ case COMPAT_CALC_SIZE:
+ *size += IPT_ST_OFFSET;
+ break;
+ default:
+ ret = -ENOPROTOOPT;
+ break;
+ }
+ return ret;
+}
+
+static inline int
+compat_calc_match(struct ipt_entry_match *m, int * size)
+{
+ if (m->u.kernel.match->compat)
+ m->u.kernel.match->compat(m, NULL, size, COMPAT_CALC_SIZE);
+ else
+ xt_compat_match(m, NULL, size, COMPAT_CALC_SIZE);
+ return 0;
+}
+
+static int compat_calc_entry(struct ipt_entry *e, struct xt_table_info *info,
+ void *base, struct xt_table_info *newinfo)
+{
+ struct ipt_entry_target *t;
+ u_int16_t entry_offset;
+ int off, i, ret;
+
+ off = 0;
+ entry_offset = (void *)e - base;
+ IPT_MATCH_ITERATE(e, compat_calc_match, &off);
+ t = ipt_get_target(e);
+ if (t->u.kernel.target->compat)
+ t->u.kernel.target->compat(t, NULL, &off, COMPAT_CALC_SIZE);
+ else
+ xt_compat_target(t, NULL, &off, COMPAT_CALC_SIZE);
+ newinfo->size -= off;
+ ret = compat_add_offset(entry_offset, off);
+ if (ret)
+ return ret;
+
+ for (i = 0; i < NF_IP_NUMHOOKS; i++) {
+ if (info->hook_entry[i] && (e < (struct ipt_entry *)
+ (base + info->hook_entry[i])))
+ newinfo->hook_entry[i] -= off;
+ if (info->underflow[i] && (e < (struct ipt_entry *)
+ (base + info->underflow[i])))
+ newinfo->underflow[i] -= off;
+ }

```

```

+ return 0;
+}
+
+static int compat_table_info(struct xt_table_info *info,
+ struct xt_table_info *newinfo)
+{
+ void *loc_cpu_entry;
+ int i;
+
+ if (!newinfo || !info)
+ return -EINVAL;
+
+ memset(newinfo, 0, sizeof(struct xt_table_info));
+ newinfo->size = info->size;
+ newinfo->number = info->number;
+ for (i = 0; i < NF_IP_NUMHOOKS; i++) {
+ newinfo->hook_entry[i] = info->hook_entry[i];
+ newinfo->underflow[i] = info->underflow[i];
+ }
+ loc_cpu_entry = info->entries[raw_smp_processor_id()];
+ return IPT_ENTRY_ITERATE(loc_cpu_entry, info->size,
+ compat_calc_entry, info, loc_cpu_entry, newinfo);
+}
+
+static int get_info(void __user *user, int *len, int compat)
+{
+ char name[IPT_TABLE_MAXNAMELEN];
+ struct ipt_table *t;
+ int ret;
+
+ if (*len != sizeof(struct ipt_getinfo)) {
+ duprintf("length %u != %u\n", *len,
+ (unsigned int)sizeof(struct ipt_getinfo));
+ return -EINVAL;
+ }
+
+ if (copy_from_user(name, user, sizeof(name)) != 0)
+ return -EFAULT;
+
+ name[IPT_TABLE_MAXNAMELEN-1] = '\0';
+
+#ifdef CONFIG_COMPAT
+ if (compat)
+ xt_compat_lock(AF_INET);
+#endif
+ t = try_then_request_module(xt_find_table_lock(AF_INET, name),
+ "iptables_%s", name);
+ if (t && !IS_ERR(t)) {

```

```

+ struct ipt_getinfo info;
+ struct xt_table_info *private = t->private;
+
+#ifdef CONFIG_COMPAT
+ if (compat) {
+ struct xt_table_info tmp;
+ ret = compat_table_info(private, &tmp);
+ compat_flush_offsets();
+ private = &tmp;
+ }
+#endif
+ info.valid_hooks = t->valid_hooks;
+ memcpy(info.hook_entry, private->hook_entry,
+ sizeof(info.hook_entry));
+ memcpy(info.underflow, private->underflow,
+ sizeof(info.underflow));
+ info.num_entries = private->number;
+ info.size = private->size;
+ strcpy(info.name, name);
+
+ if (copy_to_user(user, &info, *len) != 0)
+ ret = -EFAULT;
+ else
+ ret = 0;
+
+ xt_table_unlock(t);
+ module_put(t->me);
+ } else
+ ret = t ? PTR_ERR(t) : -ENOENT;
+#ifdef CONFIG_COMPAT
+ if (compat)
+ xt_compat_unlock(AF_INET);
+#endif
+ return ret;
+}
+
+static int
+get_entries(struct ipt_get_entries __user *uptr, int *len)
+{
+ int ret;
+ struct ipt_get_entries get;
+ struct ipt_table *t;
+
+ if (*len < sizeof(get)) {
+ duprintf("get_entries: %u < %d\n", *len,
+ (unsigned int)sizeof(get));
+ return -EINVAL;
+ }

```

```

+ if (copy_from_user(&get, uptr, sizeof(get)) != 0)
+ return -EFAULT;
+ if (*len != sizeof(struct ipt_get_entries) + get.size) {
+ duprintf("get_entries: %u != %u\n", *len,
+ (unsigned int)(sizeof(struct ipt_get_entries) +
+ get.size));
+ return -EINVAL;
+ }
+
+ t = xt_find_table_lock(AF_INET, get.name);
+ if (t && !IS_ERR(t)) {
+ struct xt_table_info *private = t->private;
+ duprintf("t->private->number = %u\n",
+ private->number);
+ if (get.size == private->size)
+ ret = copy_entries_to_user(private->size,
+ t, uptr->entrytable);
+ else {
+ duprintf("get_entries: I've got %u not %u!\n",
+ private->size,
+ get.size);
+ ret = -EINVAL;
+ }
+ module_put(t->me);
+ xt_table_unlock(t);
+ } else
+ ret = t ? PTR_ERR(t) : -ENOENT;
+
+ return ret;
+}
+
+static int
+__do_replace(const char *name, unsigned int valid_hooks,
+ struct xt_table_info *newinfo, unsigned int num_counters,
+ void __user *counters_ptr)
+{
+ int ret;
+ struct ipt_table *t;
+ struct xt_table_info *oldinfo;
+ struct xt_counters *counters;
+ void *loc_cpu_old_entry;
+
+ ret = 0;
+ counters = vmalloc(num_counters * sizeof(struct xt_counters));
+ if (!counters) {
+ ret = -ENOMEM;
+ goto out;
+ }

```

```

+
+ t = try_then_request_module(xt_find_table_lock(AF_INET, name),
+     "iptables_%s", name);
+ if (!t || IS_ERR(t)) {
+     ret = t ? PTR_ERR(t) : -ENOENT;
+     goto free_newinfo_counters_untrans;
+ }
+
+ /* You lied! */
+ if (valid_hooks != t->valid_hooks) {
+     duprintf("Valid hook crap: %08X vs %08X\n",
+         valid_hooks, t->valid_hooks);
+     ret = -EINVAL;
+     goto put_module;
+ }
+
+ oldinfo = xt_replace_table(t, num_counters, newinfo, &ret);
+ if (!oldinfo)
+     goto put_module;
+
+ /* Update module usage count based on number of rules */
+ duprintf("do_replace: oldnum=%u, initnum=%u, newnum=%u\n",
+     oldinfo->number, oldinfo->initial_entries, newinfo->number);
+ if ((oldinfo->number > oldinfo->initial_entries) ||
+     (newinfo->number <= oldinfo->initial_entries))
+     module_put(t->me);
+ if ((oldinfo->number > oldinfo->initial_entries) &&
+     (newinfo->number <= oldinfo->initial_entries))
+     module_put(t->me);
+
+ /* Get the old counters. */
+ get_counters(oldinfo, counters);
+ /* Decrease module usage counts and free resource */
+ loc_cpu_old_entry = oldinfo->entries[raw_smp_processor_id()];
+ IPT_ENTRY_ITERATE(loc_cpu_old_entry, oldinfo->size, cleanup_entry, NULL);
+ xt_free_table_info(oldinfo);
+ if (copy_to_user(counters_ptr, counters,
+     sizeof(struct xt_counters) * num_counters) != 0)
+     ret = -EFAULT;
+ vfree(counters);
+ xt_table_unlock(t);
+ return ret;
+
+ put_module:
+ module_put(t->me);
+ xt_table_unlock(t);
+ free_newinfo_counters_untrans:
+ vfree(counters);

```

```

+ out:
+ return ret;
+}
+
+static int
+do_replace(void __user *user, unsigned int len)
+{
+ int ret;
+ struct ipt_replace tmp;
+ struct xt_table_info *newinfo;
+ void *loc_cpu_entry;
+
+ if (copy_from_user(&tmp, user, sizeof(tmp)) != 0)
+ return -EFAULT;
+
+ /* Hack: Causes ipchains to give correct error msg --RR */
+ if (len != sizeof(tmp) + tmp.size)
+ return -ENOPROTOOPT;
+
+ /* overflow check */
+ if (tmp.size >= (INT_MAX - sizeof(struct xt_table_info)) / NR_CPUS -
+ SMP_CACHE_BYTES)
+ return -ENOMEM;
+ if (tmp.num_counters >= INT_MAX / sizeof(struct xt_counters))
+ return -ENOMEM;
+
+ newinfo = xt_alloc_table_info(tmp.size);
+ if (!newinfo)
+ return -ENOMEM;
+
+ /* choose the copy that is our node/cpu */
+ loc_cpu_entry = newinfo->entries[raw_smp_processor_id()];
+ if (copy_from_user(loc_cpu_entry, user + sizeof(tmp),
+ tmp.size) != 0) {
+ ret = -EFAULT;
+ goto free_newinfo;
+ }
+
+ ret = translate_table(tmp.name, tmp.valid_hooks,
+ newinfo, loc_cpu_entry, tmp.size, tmp.num_entries,
+ tmp.hook_entry, tmp.underflow);
+ if (ret != 0)
+ goto free_newinfo;
+
+ duprintf("ip_tables: Translated table\n");
+
+ ret = __do_replace(tmp.name, tmp.valid_hooks,
+ newinfo, tmp.num_counters,

```

```

+     tmp.counters);
+ if (ret)
+ goto free_newinfo_untrans;
+ return 0;
+
+ free_newinfo_untrans:
+ IPT_ENTRY_ITERATE(loc_cpu_entry, newinfo->size, cleanup_entry, NULL);
+ free_newinfo:
+ xt_free_table_info(newinfo);
+ return ret;
+}
+
+/* We're lazy, and add to the first CPU; overflow works its fey magic
+ * and everything is OK. */
+static inline int
+add_counter_to_entry(struct ipt_entry *e,
+     const struct xt_counters addme[],
+     unsigned int *i)
+{
+ #if 0
+ duprintf("add_counter: Entry %u %lu/%lu + %lu/%lu\n",
+     *i,
+     (long unsigned int)e->counters.pcnt,
+     (long unsigned int)e->counters.bcnc,
+     (long unsigned int)addme[*i].pcnt,
+     (long unsigned int)addme[*i].bcnc);
+ #endif
+
+ ADD_COUNTER(e->counters, addme[*i].bcnc, addme[*i].pcnt);
+
+ (*i)++;
+ return 0;
+}
+
+static int
+do_add_counters(void __user *user, unsigned int len, int compat)
+{
+     unsigned int i;
+     struct xt_counters_info tmp;
+     struct xt_counters *paddc;
+     unsigned int num_counters;
+     char *name;
+     int size;
+     void *ptmp;
+     struct ipt_table *t;
+     struct xt_table_info *private;
+     int ret = 0;
+     void *loc_cpu_entry;

```

```

+#ifdef CONFIG_COMPAT
+ struct compat_xt_counters_info compat_tmp;
+
+ if (compat) {
+ ptmp = &compat_tmp;
+ size = sizeof(struct compat_xt_counters_info);
+ } else
+#endif
+ {
+ ptmp = &tmp;
+ size = sizeof(struct xt_counters_info);
+ }
+
+ if (copy_from_user(ptmp, user, size) != 0)
+ return -EFAULT;
+
+#ifdef CONFIG_COMPAT
+ if (compat) {
+ num_counters = compat_tmp.num_counters;
+ name = compat_tmp.name;
+ } else
+#endif
+ {
+ num_counters = tmp.num_counters;
+ name = tmp.name;
+ }
+
+ if (len != size + num_counters * sizeof(struct xt_counters))
+ return -EINVAL;
+
+ paddc = vmalloc_node(len - size, numa_node_id());
+ if (!paddc)
+ return -ENOMEM;
+
+ if (copy_from_user(paddc, user + size, len - size) != 0) {
+ ret = -EFAULT;
+ goto free;
+ }
+
+ t = xt_find_table_lock(AF_INET, name);
+ if (!t || IS_ERR(t)) {
+ ret = t ? PTR_ERR(t) : -ENOENT;
+ goto free;
+ }
+
+ write_lock_bh(&t->lock);
+ private = t->private;
+ if (private->number != num_counters) {

```

```

+ ret = -EINVAL;
+ goto unlock_up_free;
+ }
+
+ i = 0;
+ /* Choose the copy that is on our node */
+ loc_cpu_entry = private->entries[raw_smp_processor_id()];
+ IPT_ENTRY_ITERATE(loc_cpu_entry,
+ private->size,
+ add_counter_to_entry,
+ paddc,
+ &i);
+ unlock_up_free:
+ write_unlock_bh(&t->lock);
+ xt_table_unlock(t);
+ module_put(t->me);
+ free:
+ vfree(paddc);
+
+ return ret;
+}
+
+#ifdef CONFIG_COMPAT
+struct compat_ip_t_replace {
+ char name[IPT_TABLE_MAXNAMELEN];
+ u32 valid_hooks;
+ u32 num_entries;
+ u32 size;
+ u32 hook_entry[NF_IP_NUMHOOKS];
+ u32 underflow[NF_IP_NUMHOOKS];
+ u32 num_counters;
+ compat_uptr_t counters; /* struct ipt_counters * */
+ struct compat_ip_t_entry entries[0];
+};
+
+static inline int compat_copy_match_to_user(struct ip_t_entry_match *m,
+ void __user **dstptr, compat_uint_t *size)
+{
+ if (m->u.kernel.match->compat)
+ return m->u.kernel.match->compat(m, dstptr, size,
+ COMPAT_TO_USER);
+ else
+ return xt_compat_match(m, dstptr, size, COMPAT_TO_USER);
+}
+
+static int compat_copy_entry_to_user(struct ip_t_entry *e,
+ void __user **dstptr, compat_uint_t *size)
+{

```

```

+ struct ipt_entry_target __user *t;
+ struct compat_ip_entry __user *ce;
+ u_int16_t target_offset, next_offset;
+ compat_uint_t origsize;
+ int ret;
+
+ ret = -EFAULT;
+ origsize = *size;
+ ce = (struct compat_ip_entry __user *)*dstptr;
+ if (__copy_to_user(ce, e, sizeof(struct ipt_entry)))
+ goto out;
+
+ *dstptr += sizeof(struct compat_ip_entry);
+ ret = IPT_MATCH_ITERATE(e, compat_copy_match_to_user, dstptr, size);
+ target_offset = e->target_offset - (origsize - *size);
+ if (ret)
+ goto out;
+ t = ipt_get_target(e);
+ if (t->u.kernel.target->compat)
+ ret = t->u.kernel.target->compat(t, dstptr, size,
+ COMPAT_TO_USER);
+ else
+ ret = xt_compat_target(t, dstptr, size, COMPAT_TO_USER);
+ if (ret)
+ goto out;
+ ret = -EFAULT;
+ next_offset = e->next_offset - (origsize - *size);
+ if (__put_user(target_offset, &ce->target_offset))
+ goto out;
+ if (__put_user(next_offset, &ce->next_offset))
+ goto out;
+ return 0;
+out:
+ return ret;
+}
+
+static inline int
+compat_check_calc_match(struct ipt_entry_match *m,
+ const char *name,
+ const struct ipt_ip *ip,
+ unsigned int hookmask,
+ int *size, int *i)
+{
+ struct ipt_match *match;
+
+ match = try_then_request_module(xt_find_match(AF_INET, m->u.user.name,
+ m->u.user.revision),
+ "ipt_%s", m->u.user.name);

```

```

+ if (IS_ERR(match) || !match) {
+   duprintf("compat_check_calc_match: `%s' not found\n",
+     m->u.user.name);
+   return match ? PTR_ERR(match) : -ENOENT;
+ }
+ m->u.kernel.match = match;
+
+ if (m->u.kernel.match->compat)
+   m->u.kernel.match->compat(m, NULL, size, COMPAT_CALC_SIZE);
+ else
+   xt_compat_match(m, NULL, size, COMPAT_CALC_SIZE);
+
+ (*i)++;
+ return 0;
+}
+
+static inline int
+check_compat_entry_size_and_hooks(struct ipt_entry *e,
+  struct xt_table_info *newinfo,
+  unsigned int *size,
+  unsigned char *base,
+  unsigned char *limit,
+  unsigned int *hook_entries,
+  unsigned int *underflows,
+  unsigned int *i,
+  const char *name)
+{
+  struct ipt_entry_target *t;
+  struct ipt_target *target;
+  u_int16_t entry_offset;
+  int ret, off, h, j;
+
+  duprintf("check_compat_entry_size_and_hooks %p\n", e);
+  if ((unsigned long)e % __alignof__(struct compat_ipt_entry) != 0
+    || (unsigned char *)e + sizeof(struct compat_ipt_entry) >= limit) {
+    duprintf("Bad offset %p, limit = %p\n", e, limit);
+    return -EINVAL;
+  }
+
+  if (e->next_offset < sizeof(struct compat_ipt_entry) +
+    sizeof(struct compat_xt_entry_target)) {
+    duprintf("checking: element %p size %u\n",
+      e, e->next_offset);
+    return -EINVAL;
+  }
+
+  if (!ip_checkentry(&e->ip)) {
+    duprintf("ip_tables: ip check failed %p %s.\n", e, name);

```

```

+ return -EINVAL;
+ }
+
+ off = 0;
+ entry_offset = (void *)e - (void *)base;
+ j = 0;
+ ret = IPT_MATCH_ITERATE(e, compat_check_calc_match, name, &e->ip,
+ e->comefrom, &off, &j);
+ if (ret != 0)
+ goto out;
+
+ t = ipt_get_target(e);
+ target = try_then_request_module(xt_find_target(AF_INET,
+ t->u.user.name,
+ t->u.user.revision),
+ "ipt_%s", t->u.user.name);
+ if (IS_ERR(target) || !target) {
+ duprintf("check_entry: `%s' not found\n", t->u.user.name);
+ ret = target ? PTR_ERR(target) : -ENOENT;
+ goto out;
+ }
+ t->u.kernel.target = target;
+
+ if (t->u.kernel.target->compat)
+ t->u.kernel.target->compat(t, NULL, &off, COMPAT_CALC_SIZE);
+ else
+ xt_compat_target(t, NULL, &off, COMPAT_CALC_SIZE);
+ *size += off;
+ ret = compat_add_offset(entry_offset, off);
+ if (ret)
+ goto out;
+
+ /* Check hooks & underflows */
+ for (h = 0; h < NF_IP_NUMHOOKS; h++) {
+ if ((unsigned char *)e - base == hook_entries[h])
+ newinfo->hook_entry[h] = hook_entries[h];
+ if ((unsigned char *)e - base == underflows[h])
+ newinfo->underflow[h] = underflows[h];
+ }
+
+ /* Clear counters and comefrom */
+ e->counters = ((struct ipt_counters) { 0, 0 });
+ e->comefrom = 0;
+
+ (*i)++;
+ return 0;
+out:
+ IPT_MATCH_ITERATE(e, cleanup_match, &j);

```

```

+ return ret;
+}
+
+static inline int compat_copy_match_from_user(struct ipt_entry_match *m,
+ void **dstptr, compat_uint_t *size, const char *name,
+ const struct ipt_ip *ip, unsigned int hookmask)
+{
+ struct ipt_entry_match *dm;
+ struct ipt_match *match;
+ int ret;
+
+ dm = (struct ipt_entry_match *)*dstptr;
+ match = m->u.kernel.match;
+ if (match->compat)
+ match->compat(m, dstptr, size, COMPAT_FROM_USER);
+ else
+ xt_compat_match(m, dstptr, size, COMPAT_FROM_USER);
+
+ ret = xt_check_match(match, AF_INET, dm->u.match_size - sizeof(*dm),
+ name, hookmask, ip->proto,
+ ip->invflags & IPT_INV_PROTO);
+ if (ret)
+ return ret;
+
+ if (m->u.kernel.match->checkentry
+ && !m->u.kernel.match->checkentry(name, ip, match, dm->data,
+ dm->u.match_size - sizeof(*dm),
+ hookmask)) {
+ duprintf("ip_tables: check failed for '%s'.\n",
+ m->u.kernel.match->name);
+ return -EINVAL;
+ }
+ return 0;
+}
+
+static int compat_copy_entry_from_user(struct ipt_entry *e, void **dstptr,
+ unsigned int *size, const char *name,
+ struct xt_table_info *newinfo, unsigned char *base)
+{
+ struct ipt_entry_target *t;
+ struct ipt_target *target;
+ struct ipt_entry *de;
+ unsigned int origsize;
+ int ret, h;
+
+ ret = 0;
+ origsize = *size;
+ de = (struct ipt_entry *)*dstptr;

```

```

+ memcpy(de, e, sizeof(struct ipt_entry));
+
+ *dstptr += sizeof(struct compat_ip_t_entry);
+ ret = IPT_MATCH_ITERATE(e, compat_copy_match_from_user, dstptr, size,
+ name, &de->ip, de->comefrom);
+ if (ret)
+ goto out;
+ de->target_offset = e->target_offset - (origsize - *size);
+ t = ipt_get_target(e);
+ target = t->u.kernel.target;
+ if (target->compat)
+ target->compat(t, dstptr, size, COMPAT_FROM_USER);
+ else
+ xt_compat_target(t, dstptr, size, COMPAT_FROM_USER);
+
+ de->next_offset = e->next_offset - (origsize - *size);
+ for (h = 0; h < NF_IP_NUMHOOKS; h++) {
+ if ((unsigned char *)de - base < newinfo->hook_entry[h])
+ newinfo->hook_entry[h] -= origsize - *size;
+ if ((unsigned char *)de - base < newinfo->underflow[h])
+ newinfo->underflow[h] -= origsize - *size;
+ }
+
+ t = ipt_get_target(de);
+ target = t->u.kernel.target;
+ ret = xt_check_target(target, AF_INET, t->u.target_size - sizeof(*t),
+ name, e->comefrom, e->ip.proto,
+ e->ip.invflags & IPT_INV_PROTO);
+ if (ret)
+ goto out;
+
+ ret = -EINVAL;
+ if (t->u.kernel.target == &ipt_standard_target) {
+ if (!standard_check(t, *size))
+ goto out;
+ } else if (t->u.kernel.target->checkentry
+ && !t->u.kernel.target->checkentry(name, de, target,
+ t->data, t->u.target_size - sizeof(*t),
+ de->comefrom)) {
+ duprintf("ip_tables: compat: check failed for '%s'.\n",
+ t->u.kernel.target->name);
+ goto out;
+ }
+ ret = 0;
+out:
+ return ret;
+}
+

```

```

static int
-get_entries(const struct ipt_get_entries *entries,
-   struct ipt_get_entries __user *uptr)
+translate_compat_table(const char *name,
+ unsigned int valid_hooks,
+ struct xt_table_info **pinfo,
+ void **pentry0,
+ unsigned int total_size,
+ unsigned int number,
+ unsigned int *hook_entries,
+ unsigned int *underflows)
{
+ unsigned int i;
+ struct xt_table_info *newinfo, *info;
+ void *pos, *entry0, *entry1;
+ unsigned int size;
  int ret;
- struct ipt_table *t;

- t = xt_find_table_lock(AF_INET, entries->name);
- if (t && !IS_ERR(t)) {
-   struct xt_table_info *private = t->private;
-   duprintf("t->private->number = %u\n",
-     private->number);
-   if (entries->size == private->size)
-     ret = copy_entries_to_user(private->size,
-       t, uptr->entrytable);
-   else {
-     duprintf("get_entries: I've got %u not %u!\n",
-       private->size,
-       entries->size);
-     ret = -EINVAL;
+   info = *pinfo;
+   entry0 = *pentry0;
+   size = total_size;
+   info->number = number;
+
+ /* Init all hooks to impossible value. */
+ for (i = 0; i < NF_IP_NUMHOOKS; i++) {
+   info->hook_entry[i] = 0xFFFFFFFF;
+   info->underflow[i] = 0xFFFFFFFF;
+ }
+
+ duprintf("translate_compat_table: size %u\n", info->size);
+ i = 0;
+ xt_compat_lock(AF_INET);
+ /* Walk through entries, checking offsets. */
+ ret = IPT_ENTRY_ITERATE(entry0, total_size,

```

```

+ check_compat_entry_size_and_hooks,
+ info, &size, entry0,
+ entry0 + total_size,
+ hook_entries, underflows, &i, name);
+ if (ret != 0)
+ goto out_unlock;
+
+ ret = -EINVAL;
+ if (i != number) {
+ duprintf("translate_compat_table: %u not %u entries\n",
+ i, number);
+ goto out_unlock;
+ }
+
+ /* Check hooks all assigned */
+ for (i = 0; i < NF_IP_NUMHOOKS; i++) {
+ /* Only hooks which are valid */
+ if (!(valid_hooks & (1 << i)))
+ continue;
+ if (info->hook_entry[i] == 0xFFFFFFFF) {
+ duprintf("Invalid hook entry %u %u\n",
+ i, hook_entries[i]);
+ goto out_unlock;
+ }
- module_put(t->me);
- xt_table_unlock(t);
- } else
- ret = t ? PTR_ERR(t) : -ENOENT;
+ if (info->underflow[i] == 0xFFFFFFFF) {
+ duprintf("Invalid underflow %u %u\n",
+ i, underflows[i]);
+ goto out_unlock;
+ }
+ }
+
+ ret = -ENOMEM;
+ newinfo = xt_alloc_table_info(size);
+ if (!newinfo)
+ goto out_unlock;
+
+ newinfo->number = number;
+ for (i = 0; i < NF_IP_NUMHOOKS; i++) {
+ newinfo->hook_entry[i] = info->hook_entry[i];
+ newinfo->underflow[i] = info->underflow[i];
+ }
+ entry1 = newinfo->entries[raw_smp_processor_id()];
+ pos = entry1;
+ size = total_size;

```

```

+ ret = IPT_ENTRY_ITERATE(entry0, total_size,
+ compat_copy_entry_from_user, &pos, &size,
+ name, newinfo, entry1);
+ compat_flush_offsets();
+ xt_compat_unlock(AF_INET);
+ if (ret)
+ goto free_newinfo;
+
+ ret = -ELOOP;
+ if (!mark_source_chains(newinfo, valid_hooks, entry1))
+ goto free_newinfo;
+
+ /* And one copy for every other CPU */
+ for_each_cpu(i)
+ if (newinfo->entries[i] && newinfo->entries[i] != entry1)
+ memcpy(newinfo->entries[i], entry1, newinfo->size);
+
+ *pinfo = newinfo;
+ *pentry0 = entry1;
+ xt_free_table_info(info);
+ return 0;

+free_newinfo:
+ xt_free_table_info(newinfo);
+out:
+ return ret;
+out_unlock:
+ xt_compat_unlock(AF_INET);
+ goto out;
}

static int
-do_replace(void __user *user, unsigned int len)
+compat_do_replace(void __user *user, unsigned int len)
{
+ int ret;
- struct ipt_replace tmp;
- struct ipt_table *t;
- struct xt_table_info *newinfo, *oldinfo;
- struct xt_counters *counters;
- void *loc_cpu_entry, *loc_cpu_old_entry;
+ struct compat_ipt_replace tmp;
+ struct xt_table_info *newinfo;
+ void *loc_cpu_entry;

+ if (copy_from_user(&tmp, user, sizeof(tmp)) != 0)
+ return -EFAULT;
@@ -949,151 +1818,201 @@ do_replace(void __user *user, unsigned int len)

```

```

    goto free_newinfo;
}

- counters = vmalloc(tmp.num_counters * sizeof(struct xt_counters));
- if (!counters) {
- ret = -ENOMEM;
+ ret = translate_compat_table(tmp.name, tmp.valid_hooks,
+     &newinfo, &loc_cpu_entry, tmp.size,
+     tmp.num_entries, tmp.hook_entry, tmp.underflow);
+ if (ret != 0)
    goto free_newinfo;
- }

- ret = translate_table(tmp.name, tmp.valid_hooks,
-     newinfo, loc_cpu_entry, tmp.size, tmp.num_entries,
-     tmp.hook_entry, tmp.underflow);
- if (ret != 0)
- goto free_newinfo_counters;
+ duprintf("compat_do_replace: Translated table\n");

- duprintf("ip_tables: Translated table\n");
+ ret = __do_replace(tmp.name, tmp.valid_hooks,
+     newinfo, tmp.num_counters,
+     compat_ptr(tmp.counters));
+ if (ret)
+ goto free_newinfo_untrans;
+ return 0;

- t = try_then_request_module(xt_find_table_lock(AF_INET, tmp.name),
-     "iptables_%s", tmp.name);
- if (!t || IS_ERR(t)) {
- ret = t ? PTR_ERR(t) : -ENOENT;
- goto free_newinfo_counters_untrans;
- }
+ free_newinfo_untrans:
+ IPT_ENTRY_ITERATE(loc_cpu_entry, newinfo->size, cleanup_entry, NULL);
+ free_newinfo:
+ xt_free_table_info(newinfo);
+ return ret;
+}

- /* You lied! */
- if (tmp.valid_hooks != t->valid_hooks) {
- duprintf("Valid hook crap: %08X vs %08X\n",
-     tmp.valid_hooks, t->valid_hooks);
- ret = -EINVAL;
- goto put_module;
- }

```

```

+static int
+compat_do_ipt_set_ctl(struct sock *sk, int cmd, void __user *user,
+ unsigned int len)
+{
+ int ret;

- oldinfo = xt_replace_table(t, tmp.num_counters, newinfo, &ret);
- if (!oldinfo)
- goto put_module;
+ if (!capable(CAP_NET_ADMIN))
+ return -EPERM;

- /* Update module usage count based on number of rules */
- duprintf("do_replace: oldnum=%u, initnum=%u, newnum=%u\n",
- oldinfo->number, oldinfo->initial_entries, newinfo->number);
- if ((oldinfo->number > oldinfo->initial_entries) ||
-     (newinfo->number <= oldinfo->initial_entries))
- module_put(t->me);
- if ((oldinfo->number > oldinfo->initial_entries) &&
-     (newinfo->number <= oldinfo->initial_entries))
- module_put(t->me);
+ switch (cmd) {
+ case IPT_SO_SET_REPLACE:
+ ret = compat_do_replace(user, len);
+ break;

- /* Get the old counters. */
- get_counters(oldinfo, counters);
- /* Decrease module usage counts and free resource */
- loc_cpu_old_entry = oldinfo->entries[raw_smp_processor_id()];
- IPT_ENTRY_ITERATE(loc_cpu_old_entry, oldinfo->size, cleanup_entry, NULL);
- xt_free_table_info(oldinfo);
- if (copy_to_user(tmp.counters, counters,
- sizeof(struct xt_counters) * tmp.num_counters) != 0)
- ret = -EFAULT;
- vfree(counters);
- xt_table_unlock(t);
- return ret;
+ case IPT_SO_SET_ADD_COUNTERS:
+ ret = do_add_counters(user, len, 1);
+ break;
+
+ default:
+ duprintf("do_ipt_set_ctl: unknown request %i\n", cmd);
+ ret = -EINVAL;
+ }

- put_module:

```

```

- module_put(t->me);
- xt_table_unlock(t);
- free_newinfo_counters_untrans:
- IPT_ENTRY_ITERATE(loc_cpu_entry, newinfo->size, cleanup_entry, NULL);
- free_newinfo_counters:
- vfree(counters);
- free_newinfo:
- xt_free_table_info(newinfo);
  return ret;
}

```

```

-/* We're lazy, and add to the first CPU; overflow works its fey magic
- * and everything is OK. */

```

```

-static inline int
-add_counter_to_entry(struct ipt_entry *e,
-   const struct xt_counters addme[],
-   unsigned int *i)
+struct compat_ipt_get_entries
{
-#if 0
- duprintf("add_counter: Entry %u %lu/%lu + %lu/%lu\n",
-   *i,
-   (long unsigned int)e->counters.pcnt,
-   (long unsigned int)e->counters.bcnc,
-   (long unsigned int)addme[*i].pcnt,
-   (long unsigned int)addme[*i].bcnc);
-#endif
+ char name[IPT_TABLE_MAXNAMELEN];
+ compat_uint_t size;
+ struct compat_ipt_entry entrytable[0];
+};

```

```

- ADD_COUNTER(e->counters, addme[*i].bcnc, addme[*i].pcnt);
+static int compat_copy_entries_to_user(unsigned int total_size,
+   struct ipt_table *table, void __user *userptr)
+{
+ unsigned int off, num;
+ struct compat_ipt_entry e;
+ struct xt_counters *counters;
+ struct xt_table_info *private = table->private;
+ void __user *pos;
+ unsigned int size;
+ int ret = 0;
+ void *loc_cpu_entry;

- (*i)++;
- return 0;
+ counters = alloc_counters(table);

```

```

+ if (IS_ERR(counters))
+ return PTR_ERR(counters);
+
+ /* choose the copy that is on our node/cpu, ...
+ * This choice is lazy (because current thread is
+ * allowed to migrate to another cpu)
+ */
+ loc_cpu_entry = private->entries[raw_smp_processor_id()];
+ pos = userptr;
+ size = total_size;
+ ret = IPT_ENTRY_ITERATE(loc_cpu_entry, total_size,
+ compat_copy_entry_to_user, &pos, &size);
+ if (ret)
+ goto free_counters;
+
+ /* ... then go back and fix counters and names */
+ for (off = 0, num = 0; off < size; off += e.next_offset, num++) {
+ unsigned int i;
+ struct ipt_entry_match m;
+ struct ipt_entry_target t;
+
+ ret = -EFAULT;
+ if (copy_from_user(&e, userptr + off,
+ sizeof(struct compat_ipt_entry)))
+ goto free_counters;
+ if (copy_to_user(userptr + off +
+ offsetof(struct compat_ipt_entry, counters),
+ &counters[num], sizeof(counters[num])))
+ goto free_counters;
+
+ for (i = sizeof(struct compat_ipt_entry);
+ i < e.target_offset; i += m.u.match_size) {
+ if (copy_from_user(&m, userptr + off + i,
+ sizeof(struct ipt_entry_match)))
+ goto free_counters;
+ if (copy_to_user(userptr + off + i +
+ offsetof(struct ipt_entry_match, u.user.name),
+ m.u.kernel.match->name,
+ strlen(m.u.kernel.match->name) + 1))
+ goto free_counters;
+ }
+
+ if (copy_from_user(&t, userptr + off + e.target_offset,
+ sizeof(struct ipt_entry_target)))
+ goto free_counters;
+ if (copy_to_user(userptr + off + e.target_offset +
+ offsetof(struct ipt_entry_target, u.user.name),
+ t.u.kernel.target->name,

```

```

+ strlen(t.u.kernel.target->name) + 1))
+ goto free_counters;
+ }
+ ret = 0;
+free_counters:
+ vfree(counters);
+ return ret;
}

static int
-do_add_counters(void __user *user, unsigned int len)
+compat_get_entries(struct compat_ipt_get_entries __user *uptr, int *len)
{
- unsigned int i;
- struct xt_counters_info tmp, *paddc;
+ int ret;
+ struct compat_ipt_get_entries get;
  struct ipt_table *t;
- struct xt_table_info *private;
- int ret = 0;
- void *loc_cpu_entry;

- if (copy_from_user(&tmp, user, sizeof(tmp)) != 0)
- return -EFAULT;

- if (len != sizeof(tmp) + tmp.num_counters*sizeof(struct xt_counters))
+ if (*len < sizeof(get)) {
+ duprintf("compat_get_entries: %u < %u\n",
+ *len, (unsigned int)sizeof(get));
  return -EINVAL;
+ }

- paddc = vmalloc_node(len, numa_node_id());
- if (!paddc)
- return -ENOMEM;
+ if (copy_from_user(&get, uptr, sizeof(get)) != 0)
+ return -EFAULT;

- if (copy_from_user(paddc, user, len) != 0) {
- ret = -EFAULT;
- goto free;
+ if (*len != sizeof(struct compat_ipt_get_entries) + get.size) {
+ duprintf("compat_get_entries: %u != %u\n", *len,
+ (unsigned int)(sizeof(struct compat_ipt_get_entries) +
+ get.size));
+ return -EINVAL;
}

```

```

- t = xt_find_table_lock(AF_INET, tmp.name);
- if (!t || IS_ERR(t)) {
+ xt_compat_lock(AF_INET);
+ t = xt_find_table_lock(AF_INET, get.name);
+ if (t && !IS_ERR(t)) {
+ struct xt_table_info *private = t->private;
+ struct xt_table_info info;
+ duprintf("t->private->number = %u\n",
+ private->number);
+ ret = compat_table_info(private, &info);
+ if (!ret && get.size == info.size) {
+ ret = compat_copy_entries_to_user(private->size,
+ t, uptr->entrytable);
+ } else if (!ret) {
+ duprintf("compat_get_entries: I've got %u not %u!\n",
+ private->size,
+ get.size);
+ ret = -EINVAL;
+ }
+ compat_flush_offsets();
+ module_put(t->me);
+ xt_table_unlock(t);
+ } else
ret = t ? PTR_ERR(t) : -ENOENT;
- goto free;
- }

- write_lock_bh(&t->lock);
- private = t->private;
- if (private->number != paddc->num_counters) {
- ret = -EINVAL;
- goto unlock_up_free;
- }
+ xt_compat_unlock(AF_INET);
+ return ret;
+}

- i = 0;
- /* Choose the copy that is on our node */
- loc_cpu_entry = private->entries[raw_smp_processor_id()];
- IPT_ENTRY_ITERATE(loc_cpu_entry,
- private->size,
- add_counter_to_entry,
- paddc->counters,
- &i);
- unlock_up_free:
- write_unlock_bh(&t->lock);
- xt_table_unlock(t);

```

```

- module_put(t->me);
- free:
- vfree(paddc);
+static int
+compat_do_ipt_get_ctl(struct sock *sk, int cmd, void __user *user, int *len)
+{
+ int ret;

+ switch (cmd) {
+ case IPT_SO_GET_INFO:
+ ret = get_info(user, len, 1);
+ break;
+ case IPT_SO_GET_ENTRIES:
+ ret = compat_get_entries(user, len);
+ break;
+ default:
+ duprintf("compat_do_ipt_get_ctl: unknown request %i\n", cmd);
+ ret = -EINVAL;
+ }
return ret;
}
+#endif

static int
do_ipt_set_ctl(struct sock *sk, int cmd, void __user *user, unsigned int len)
@@ -1109,7 +2028,7 @@ do_ipt_set_ctl(struct sock *sk, int cmd,
break;

case IPT_SO_SET_ADD_COUNTERS:
- ret = do_add_counters(user, len);
+ ret = do_add_counters(user, len, 0);
break;

default:
@@ -1129,65 +2048,13 @@ do_ipt_get_ctl(struct sock *sk, int cmd,
return -EPERM;

switch (cmd) {
- case IPT_SO_GET_INFO: {
- char name[IPT_TABLE_MAXNAMELEN];
- struct ipt_table *t;
-
- if (*len != sizeof(struct ipt_getinfo)) {
- duprintf("length %u != %u\n", *len,
- sizeof(struct ipt_getinfo));
- ret = -EINVAL;
- break;
- }

```

```

-
- if (copy_from_user(name, user, sizeof(name)) != 0) {
-   ret = -EFAULT;
-   break;
- }
- name[IPT_TABLE_MAXNAMELEN-1] = '\0';
-
- t = try_then_request_module(xt_find_table_lock(AF_INET, name),
-   "iptables_%s", name);
- if (t && !IS_ERR(t)) {
-   struct ipt_getinfo info;
-   struct xt_table_info *private = t->private;
-
-   info.valid_hooks = t->valid_hooks;
-   memcpy(info.hook_entry, private->hook_entry,
-     sizeof(info.hook_entry));
-   memcpy(info.underflow, private->underflow,
-     sizeof(info.underflow));
-   info.num_entries = private->number;
-   info.size = private->size;
-   memcpy(info.name, name, sizeof(info.name));
-
-   if (copy_to_user(user, &info, *len) != 0)
-     ret = -EFAULT;
-   else
-     ret = 0;
-   xt_table_unlock(t);
-   module_put(t->me);
- } else
-   ret = t ? PTR_ERR(t) : -ENOENT;
- }
- break;
-
- case IPT_SO_GET_ENTRIES: {
-   struct ipt_get_entries get;
+ case IPT_SO_GET_INFO:
+   ret = get_info(user, len, 0);
+   break;

-   if (*len < sizeof(get)) {
-     duprintf("get_entries: %u < %u\n", *len, sizeof(get));
-     ret = -EINVAL;
-   } else if (copy_from_user(&get, user, sizeof(get)) != 0) {
-     ret = -EFAULT;
-   } else if (*len != sizeof(struct ipt_get_entries) + get.size) {
-     duprintf("get_entries: %u != %u\n", *len,
-       sizeof(struct ipt_get_entries) + get.size);
-     ret = -EINVAL;

```

```

- } else
- ret = get_entries(&get, user);
+ case IPT_SO_GET_ENTRIES:
+ ret = get_entries(user, len);
  break;
- }

  case IPT_SO_GET_REVISION_MATCH:
  case IPT_SO_GET_REVISION_TARGET: {
@@ -1335,6 +2202,9 @@ icmp_checkentry(const char *tablename,
static struct ipt_target ipt_standard_target = {
  .name = IPT_STANDARD_TARGET,
  .targetsize = sizeof(int),
#ifdef CONFIG_COMPAT
+ .compat = &compat_ipt_standard_fn,
#endif
};

static struct ipt_target ipt_error_target = {
@@ -1348,9 +2218,11 @@ static struct nf_sockopt_ops ipt_sockopt
  .set_optmin = IPT_BASE_CTL,
  .set_optmax = IPT_SO_SET_MAX+1,
  .set = do_ipt_set_ctl,
+ .compat_set = compat_do_ipt_set_ctl,
  .get_optmin = IPT_BASE_CTL,
  .get_optmax = IPT_SO_GET_MAX+1,
  .get = do_ipt_get_ctl,
+ .compat_get = compat_do_ipt_get_ctl,
};

static struct ipt_match icmp_matchstruct = {
diff --git a/net/netfilter/x_tables.c b/net/netfilter/x_tables.c
index 750b928..72b8928 100644
--- a/net/netfilter/x_tables.c
+++ b/net/netfilter/x_tables.c
@@ -36,6 +36,7 @@ struct xt_af {
  struct list_head match;
  struct list_head target;
  struct list_head tables;
+ struct semaphore compat_mutex;
};

static struct xt_af *xt;
@@ -266,6 +267,54 @@ int xt_check_match(const struct xt_match
}
EXPORT_SYMBOL_GPL(xt_check_match);

#ifdef CONFIG_COMPAT

```

```

+int xt_compat_match(void *match, void **dstptr, int *size, int convert)
+{
+ struct xt_match *m;
+ struct compat_xt_entry_match *pcompat_m;
+ struct xt_entry_match *pm;
+ u_int16_t msize;
+ int off, ret;
+
+ ret = 0;
+ m = ((struct xt_entry_match *)match)->u.kernel.match;
+ off = XT_ALIGN(m->matchsize) - COMPAT_XT_ALIGN(m->matchsize);
+ switch (convert) {
+ case COMPAT_TO_USER:
+ pm = (struct xt_entry_match *)match;
+ msize = pm->u.user.match_size;
+ if (__copy_to_user(*dstptr, pm, msize)) {
+ ret = -EFAULT;
+ break;
+ }
+ msize -= off;
+ if (put_user(msize, (u_int16_t *)*dstptr))
+ ret = -EFAULT;
+ *size -= off;
+ *dstptr += msize;
+ break;
+ case COMPAT_FROM_USER:
+ pcompat_m = (struct compat_xt_entry_match *)match;
+ pm = (struct xt_entry_match *)*dstptr;
+ msize = pcompat_m->u.user.match_size;
+ memcpy(pm, pcompat_m, msize);
+ msize += off;
+ pm->u.user.match_size = msize;
+ *size += off;
+ *dstptr += msize;
+ break;
+ case COMPAT_CALC_SIZE:
+ *size += off;
+ break;
+ default:
+ ret = -ENOPROTOOPT;
+ break;
+ }
+ return ret;
+}
+EXPORT_SYMBOL_GPL(xt_compat_match);
+#endif
+
+ int xt_check_target(const struct xt_target *target, unsigned short family,

```

```

    unsigned int size, const char *table, unsigned int hook_mask,
    unsigned short proto, int inv_proto)
@@ -295,6 +344,54 @@ int xt_check_target(const struct xt_targ
}
EXPORT_SYMBOL_GPL(xt_check_target);

```

```

#ifdef CONFIG_COMPAT
+int xt_compat_target(void *target, void **dstptr, int *size, int convert)
+{
+ struct xt_target *t;
+ struct compat_xt_entry_target *pcompat;
+ struct xt_entry_target *pt;
+ u_int16_t tsize;
+ int off, ret;
+
+ ret = 0;
+ t = ((struct xt_entry_target *)target)->u.kernel.target;
+ off = XT_ALIGN(t->targetsize) - COMPAT_XT_ALIGN(t->targetsize);
+ switch (convert) {
+ case COMPAT_TO_USER:
+ pt = (struct xt_entry_target *)target;
+ tsize = pt->u.user.target_size;
+ if (__copy_to_user(*dstptr, pt, tsize)) {
+ ret = -EFAULT;
+ break;
+ }
+ tsize -= off;
+ if (put_user(tsize, (u_int16_t *)*dstptr))
+ ret = -EFAULT;
+ *size -= off;
+ *dstptr += tsize;
+ break;
+ case COMPAT_FROM_USER:
+ pcompat = (struct compat_xt_entry_target *)target;
+ pt = (struct xt_entry_target *)*dstptr;
+ tsize = pcompat->u.user.target_size;
+ memcpy(pt, pcompat, tsize);
+ tsize += off;
+ pt->u.user.target_size = tsize;
+ *size += off;
+ *dstptr += tsize;
+ break;
+ case COMPAT_CALC_SIZE:
+ *size += off;
+ break;
+ default:
+ ret = -ENOPROTOOPT;
+ break;

```

```

+ }
+ return ret;
+}
+EXPORT_SYMBOL_GPL(xt_compat_target);
+#endif
+
struct xt_table_info *xt_alloc_table_info(unsigned int size)
{
    struct xt_table_info *newinfo;
@@ -365,6 +462,19 @@ void xt_table_unlock(struct xt_table *ta
}
EXPORT_SYMBOL_GPL(xt_table_unlock);

#ifdef CONFIG_COMPAT
+void xt_compat_lock(int af)
+{
+ down(&xt[af].compat_mutex);
+}
+EXPORT_SYMBOL_GPL(xt_compat_lock);
+
+void xt_compat_unlock(int af)
+{
+ up(&xt[af].compat_mutex);
+}
+EXPORT_SYMBOL_GPL(xt_compat_unlock);
+#endif

struct xt_table_info *
xt_replace_table(struct xt_table *table,
@@ -665,6 +775,9 @@ static int __init xt_init(void)

for (i = 0; i < NPROTO; i++) {
    init_MUTEX(&xt[i].mutex);
#ifdef CONFIG_COMPAT
+ init_MUTEX(&xt[i].compat_mutex);
+#endif
    INIT_LIST_HEAD(&xt[i].target);
    INIT_LIST_HEAD(&xt[i].match);
    INIT_LIST_HEAD(&xt[i].tables);

```

## File Attachments

1) [diff-ms-netfilter-ipt-compat-20060322](#), downloaded 721 times

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