
Subject: Re: [RFC][patch 1/3] network container subsystem
Posted by [Benjamin Thery](#) on Wed, 05 Sep 2007 11:50:13 GMT
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dlezcano@fr.ibm.com wrote:

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

>

> This patch creates the network container subsystem.

> It consists for the moment on a single file "network.ipv4".

>

> The interface is pretty simple:

>

> To add an IP address to the container:

>

> echo add AB12FFFF > network.ipv4

>

> To remove this IP address:

> -----

>

> echo del AB12FFFF > network.ipv4

>

> To list the addresses:

> -----

>

> cat network.ipv4

>

> The parameter is an IPV4 address in the hexa format. The parsing of a dotted-decimal

> parameter is totally painful. If this format hurts someone, I can change it to a dotted

> format at the risk of having something buggy.

I think passing ipv4 addresses in hexa form is painful :)

Why not use something like this:

```
__be32 addr;
```

```
unsigned int a, b, c, d;
```

```
if (sscanf (buffer, "%u.%u.%u.%u", &a, &b, &c, &d) == 4) {
```

```
    if (a < 256 && b < 256 && c < 256 && d < 256) {
```

```
        addr = htonl (a<<24 | b<<16 | c<<8 | d);
```

```
    return 0;
```

```
    }
```

```
}
```

```
return -EINVAL;
```

>

> This patch by itself does nothing more than adding/removing elements from a list.

>

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

```

>
> ---
> include/linux/container_subsys.h | 4
> init/Kconfig | 8 +
> kernel/Makefile | 1
> kernel/container_network.c | 285 ++++++
> 4 files changed, 298 insertions(+)
>
> Index: 2.6-mm/include/linux/container_subsys.h
> =====
> --- 2.6-mm.orig/include/linux/container_subsys.h
> +++ 2.6-mm/include/linux/container_subsys.h
> @@ -30,3 +30,7 @@
> #endif
>
> /* */
> +
> +#ifdef CONFIG_CONTAINER_NETWORK
> +SUBSYS(network)
> +#endif
> Index: 2.6-mm/init/Kconfig
> =====
> --- 2.6-mm.orig/init/Kconfig
> +++ 2.6-mm/init/Kconfig
> @@ -326,6 +326,14 @@
> Provides a simple Resource Controller for monitoring the
> total CPU consumed by the tasks in a container
>
> +config CONTAINER_NETWORK
> + bool "Network container subsystem"
> + depends on CONTAINERS && SECURITY_NETWORK
> + help
> + Provides a network controller to isolate network traffic
> +
> + Say N if unsure
> +
> config CPUSETS
> bool "Cpuset support"
> depends on SMP && CONTAINERS
> Index: 2.6-mm/kernel/Makefile
> =====
> --- 2.6-mm.orig/kernel/Makefile
> +++ 2.6-mm/kernel/Makefile
> @@ -43,6 +43,7 @@
> obj-$(CONFIG_CPUSETS) += cpuset.o
> obj-$(CONFIG_CONTAINER_CPUACCT) += cpu_acct.o
> obj-$(CONFIG_CONTAINER_NS) += ns_container.o
> +obj-$(CONFIG_CONTAINER_NETWORK) += container_network.o

```

```

> obj-$(CONFIG_IKCONFIG) += configs.o
> obj-$(CONFIG_STOP_MACHINE) += stop_machine.o
> obj-$(CONFIG_AUDIT) += audit.o auditfilter.o
> Index: 2.6-mm/kernel/container_network.c
> =====
> --- /dev/null
> +++ 2.6-mm/kernel/container_network.c
> @@ -0,0 +1,285 @@
> +/*
> + * container_network.c - container network subsystem
> + *
> + * Copyright 2006, 2007 IBM Corp
> + */
> +
> +#include <linux/module.h>
> +#include <linux/container.h>
> +#include <linux/fs.h>
> +#include <linux/uaccess.h>
> +#include <linux/ctype.h>
> +#include <linux/list.h>
> +#include <linux/spinlock.h>
> +
> +struct network {
> + struct container_subsys_state css;
> + struct list_head ipv4_list; /* store the IPV4 addresses */
> + rwlock_t ipv4_list_lock;
> +};
> +
> +struct ipv4_list {
> + __be32 address;
> + struct list_head list;
> +};

```

Can we use "struct in_addr" instead of __be32?
(may be you don't want to include in.h?)

```

> +
> +static struct network top_network = {
> + .ipv4_list = LIST_HEAD_INIT(top_network.ipv4_list),
> + .ipv4_list_lock = __RW_LOCK_UNLOCKED(top_network.ipv4_list_lock),
> +};
> +
> +struct container_subsys network_subsys;
> +
> +enum container_filetype {
> + FILE_IPV4,
> +};

```

```

> +
> +static inline struct network *container_network(struct container *container)
> +{
> + return container_of(
> + container_subsys_state(container, network_subsys_id),
> + struct network, css);
> +}
> +
> +static struct container_subsys_state *network_create(struct container_subsys *ss,
> + struct container *container)
> +{
> + struct network *network;
> +
> + /* Don't let anybody do that */
> + if (!capable(CAP_NET_ADMIN))
> + return ERR_PTR(-EPERM);
> +
> + /* The current container is the initial container */
> + if (!container->parent)
> + return &top_network.css;
> +
> + network = kzalloc(sizeof(*network), GFP_KERNEL);
> + if (!network)
> + return ERR_PTR(-ENOMEM);
> +
> + INIT_LIST_HEAD(&network->ipv4_list);
> + network->ipv4_list_lock = __RW_LOCK_UNLOCKED(network->ipv4_list_lock);
> +
> + return &network->css;
> +}
> +
> +static void network_destroy(struct container_subsys *ss,
> + struct container *container)
> +{
> + struct network *network;
> + struct ipv4_list *entry, *next;
> + struct list_head *l;
> + rwlock_t *lock;
> +
> + network = container_network(container);
> + l = &network->ipv4_list;
> + lock = &network->ipv4_list_lock;
> +
> + /* flush the ipv4 list */
> + write_lock(lock);
> + list_for_each_entry_safe(entry, next, l, list) {
> + list_del(&entry->list);
> + kfree(entry);

```

```

> + }
> + write_unlock(lock);
> +
> + kfree(network);
> +}
> +
> +static int network_add_ipv4_address(struct container *container, __be32 address)
> +{
> + struct ipv4_list *entry;
> + struct network *network;
> +
> + entry = kmalloc(sizeof(*entry), GFP_KERNEL);
> + if (!entry)
> + return -ENOMEM;
> + entry->address = address;
> +
> + network = container_network(container);
> + write_lock(&network->ipv4_list_lock);
> + list_add(&entry->list, &network->ipv4_list);
> + write_unlock(&network->ipv4_list_lock);
> +
> + return 0;
> +}
> +
> +static int network_del_ipv4_address(struct container *container, __be32 address)
> +{
> + struct ipv4_list *entry;
> + struct network *network;
> + int ret = 0;
> +
> + network = container_network(container);
> + write_lock(&network->ipv4_list_lock);
> + list_for_each_entry(entry, &network->ipv4_list, list) {
> + if (entry->address != address)
> + continue;
> +
> + list_del(&entry->list);
> + goto out_free;
> + }
> + ret = -EINVAL;
> +out:
> + write_unlock(&network->ipv4_list_lock);
> + return ret;
> +
> +out_free:
> + kfree(entry);
> + goto out;
> +}

```

```

> +
> +static int network_parse_ipv4_address(struct container *container, char *buffer)
> +{
> + int len = strlen(buffer);
> + char *addr;
> + __be32 address;
> +
> + /* remove trailing left space */

```

May be "leading space" is better than "trailing left space" :)

```

> + while(isspace(*buffer))
> +   buffer++;
> +
> + /* remove trailing right space */
> + while(isspace(buffer[len - 1]))
> +   buffer[(len--) - 1] = 0;
> +
> + len = strlen(buffer);
> +   addr = memchr(buffer, ' ', len);
> + if (!addr)
> +   return -EINVAL;
> + *addr++ = 0;
> +
> + /* remove trailing left space again */
> + while(isspace(*addr))
> +   addr++;
> +
> + /* Shall I check if the address is setup on the host ? */
> + sscanf(addr, "%X", &address);
> +
> + if (!strcmp(buffer, "add"))
> +   return network_add_ipv4_address(container, address);
> + else if (!strcmp(buffer, "del"))
> +   return network_del_ipv4_address(container, address);
> +
> + return -EINVAL;
> +}
> +
> +static int network_fill_ipv4_address(struct container *container, char *buffer)
> +{
> + struct network *network;
> + struct ipv4_list *entry;
> + char *s = buffer;
> + network = container_network(container);
> +
> + read_lock(&network->ipv4_list_lock);

```

```
> + list_for_each_entry(entry, &network->ipv4_list, list)
> + s += sprintf(s, "%X\n", entry->address);
```

Pretty print:

```
s+= sprintf(s, NIPQUAD_FMT "\n", NIPQUAD(entry->address));
```

```
> + read_unlock(&network->ipv4_list_lock);
> +
> + return strlen(buffer);
> +}
> +
> +static ssize_t network_write(struct container *container,
> +    struct cftype *cft,
> +    struct file *file,
> +    const char __user *userbuf,
> +    size_t nbytes, loff_t *unused_ppos)
> +{
> + enum container_filetype type = cft->private;
> + char *buffer;
> + int retval = 0;
> +
> + if (!capable(CAP_NET_ADMIN))
> + return -EPERM;
> +
> + if (nbytes >= PATH_MAX)
> + return -E2BIG;
> +
> + buffer = kmalloc(nbytes + 1, GFP_KERNEL);
> + if (!buffer)
> + return -ENOMEM;
> +
> + if (copy_from_user(buffer, userbuf, nbytes)) {
> + retval = -EFAULT;
> + goto out_free;
> + }
> + buffer[nbytes] = 0;
> +
> + container_lock();
> + switch(type) {
> +
> + case FILE_IPV4:
> + retval = network_parse_ipv4_address(container, buffer);
> + break;
> +
> + default:
> + retval = -EINVAL;
```

```

> + break;
> + };
> + container_unlock();
> +
> +out_free:
> + if (!retval)
> +   retval = nbytes;
> +
> + kfree(buffer);
> + return retval;
> +}
> +
> +static ssize_t network_read(struct container *container,
> +    struct cftype *cft,
> +    struct file *file,
> +    char __user *userbuf,
> +    size_t nbytes, loff_t *ppos)
> +{
> + enum container_filetype type = cft->private;
> + char *page;
> + int retval;
> +
> + page = (char *)__get_free_page(GFP_TEMPORARY);
> + if (!page)
> +   return -ENOMEM;
> +
> + container_lock();
> + switch(type) {
> + case FILE_IPV4:
> +   retval = network_fill_ipv4_address(container, page);
> +   break;
> +
> + default:
> +   retval = -EINVAL;
> + };
> + container_unlock();
> +
> + retval = simple_read_from_buffer(userbuf, nbytes, ppos, page, retval);
> +
> + free_page((unsigned long)page);
> + return retval;
> +}
> +
> +static struct cftype files[] = {
> + {
> +   .name = "ipv4",
> +   .read = network_read,
> +   .write = network_write,

```

```
> + .private = FILE_IPV4,
> + },
> +};
> +
> +static int network_populate(struct container_subsys *ss, struct container *cont)
> +{
> + return container_add_files(cont, ss, files, ARRAY_SIZE(files));
> +}
> +
> +struct container_subsys network_subsys = {
> + .name = "network",
> + .create = network_create,
> + .destroy = network_destroy,
> + .populate = network_populate,
> + .subsys_id = network_subsys_id,
> + .can_attach = NULL,
> + .attach = NULL,
> + .fork = NULL,
> + .exit = NULL,
> +};
>
> -- _____ Containers mailing list
Containers@lists.linux-foundation.org https://lists.linux-foundation.org/mailman/listinfo/containers
```

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