

---

Subject: Re: containers development plans (July 10 version)

Posted by [serge](#) on Thu, 12 Jul 2007 18:45:00 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Quoting Kirill Korotaev (dev@sw.ru):

> Serge E. Hallyn wrote:

> > (If you missed earlier parts of this thread, you can catch earlier parts of

> > this thread starting at

> > <https://lists.linux-foundation.org/pipermail/containers/2007-July/005860.html>)

> >

> > Thanks for all the recent feedback. I particularly added a lot from Paul

> > Menage and Cedric.

> >

> > We are trying to create a roadmap for the next year of

> > 'container' development, to be reported to the upcoming kernel

> > summit. Containers here is a bit of an ambiguous term, so we are

> > taking it to mean all of:

> >

> > 1. namespaces

> >       kernel resource namespaces to support resource isolation

> >       and virtualization for virtual servers and application

> >       checkpoint/restart.

> > 2. task containers framework

> >       the task containers (or, as Paul Jackson suggests, resource

> >       containers) framework by Paul Menage which especially

> >       provides a framework for subsystems which perform resource

> >       accounting and limits.

> > 3. checkpoint/restart

> >

> > A (still under construction) list of features we expect to be worked on

> > next year looks like this:

> >

> > 1. completion of ongoing namespaces

> >       pid namespace

> >       merge two patchsets

>       sukadev@ and Pavel already agreed and will resend it soon

> >       clone\_with\_pid()

> >       kthread cleanup

> >       especially nfs

> >       autofs

> >       af\_unix credentials (stores pid\_t?)

> >       net namespace

> >       ro bind mounts

>

> IMHO ro bind mounts are not related to namespaces anyhow, but ok if you guys want to mention it.

Hmm, yes it's more for the "userspace containers" - meaning the

userspace usage of namespaces. But I'm not sure it's worth breaking that out.

```
> > sysvipc
> > "set identifier" syscall
>
> the last one is related to checkpointing, so plz move it from here...
```

It started under checkpointing, but I'll move it back :)

```
> > 2. continuation with new namespaces
> > devpts, console, and ttydrivers
> > user
> > time
> > namespace management tools
> > namespace entering (using one of:)
> > bind_ns()
> > ns container subsystem
> > (vs refuse this functionality)
> > multiple /sys mounts
> > break /sys into smaller chunks?
> > shadow dirs vs namespaces
> > multiple proc mounts
> > likely need to extend on the work done for pid namespaces
> > i.e. other /proc files will need some care
>
> different statistics virtualization here in /proc for top and other tools
>
> > 3. any additional work needed for virtual servers?
> > i.e. in-kernel keyring usage for cross-namespace permissions, etc
> > nfs and rpc updates needed?
> > general security fixes
>
> what is meant by "general security fixes"?
```

I think it means "we haven't thought it through enough" :)

For instance, something needs to be done to be able to hand partial capabilities to admins in a container/virtual server. We've talked about doing this using the in-kernel keyring, but we are far from consensus or patches, and this will have to be solved.

```
> what I see additionally:
> - device access controls (e.g. root in container should not have access to /dev/sda by default)
```

Yes, that kind of falls under the above, but I'll add it separately.

```
> - filesystems access controls
```

ditto.

```
> > 4. task containers functionality
> >     base features
> >         virtualized containerfs mounts
> >             to support vserver mgmnt of sub-containers
> >         locking cleanup
> >         control file API simplification
> >         control file prefixing with subsystem name
> >     specific containers
> >         usespace RBCE to provide controls for
> >             users
> >             groups
> >             pgrp
> >             executable
> >         split cpusets into
> >             cpuset
> >             memset
> >         network
> >             connect/bind/accept controller using iptables
> >         network flow id control
> >         usespace per-container OOM handler
```

```
>
> I don't see much about resource management here at all.
> We need resource controls for a lot of stuff like
> - RSS
> - kernel memory and different parameters like number of tasks
> - disk quota
> - disk I/O
> - CPU fairness
> - CPU limiting
> - container aware OOM
>
> imho it is all related and should be discussed.
```

```
> > 5. checkpoint/restart
> >     memory c/r
> >         (there are a few designs and prototypes)
> >         (though this may be ironed out by then)
> >         per-container swapfile?
> >         overall checkpoint strategy (one of:)
> >             in-kernel
> >             userspace-driven
> >             hybrid
> >         overall restart strategy
> >         use freezer API
> >         use suspend-to-disk?
```

> >  
> > In the list of stakeholders, I try to guess based on past comments and  
> > contributions what \*general\* area they are most likely to contribute in.  
> > I may try to narrow those down later, but am just trying to get something  
> > out the door right now before my next computer breaks.

> >  
> > Stakeholders:  
> >     Eric Biederman  
> >         everything  
> >     google  
> >         containers  
> >     ibm  
> >         everything  
> >     kerlabs  
> >         checkpoint/restart  
> >     openvz  
> >         everything  
> >     osdl (Masahiko Takahashi?)  
> >         checkpoint/restart  
> >     Linux-VServer  
> >         namespaces+containers  
> >     zap project  
> >         checkpoint/restart  
> >     planetlab  
> >         everything  
> >     hp  
> >         ?  
> >     XtreemOS  
> >         checkpoint/restart  
> >  
> > Is anyone else still missing from the list?  
> >  
> > thanks,  
> > -serge  
> >

thanks Kirill,

-serge

---