Docker Container Isolation using User Namespaces and Seccomp 13 December 2016

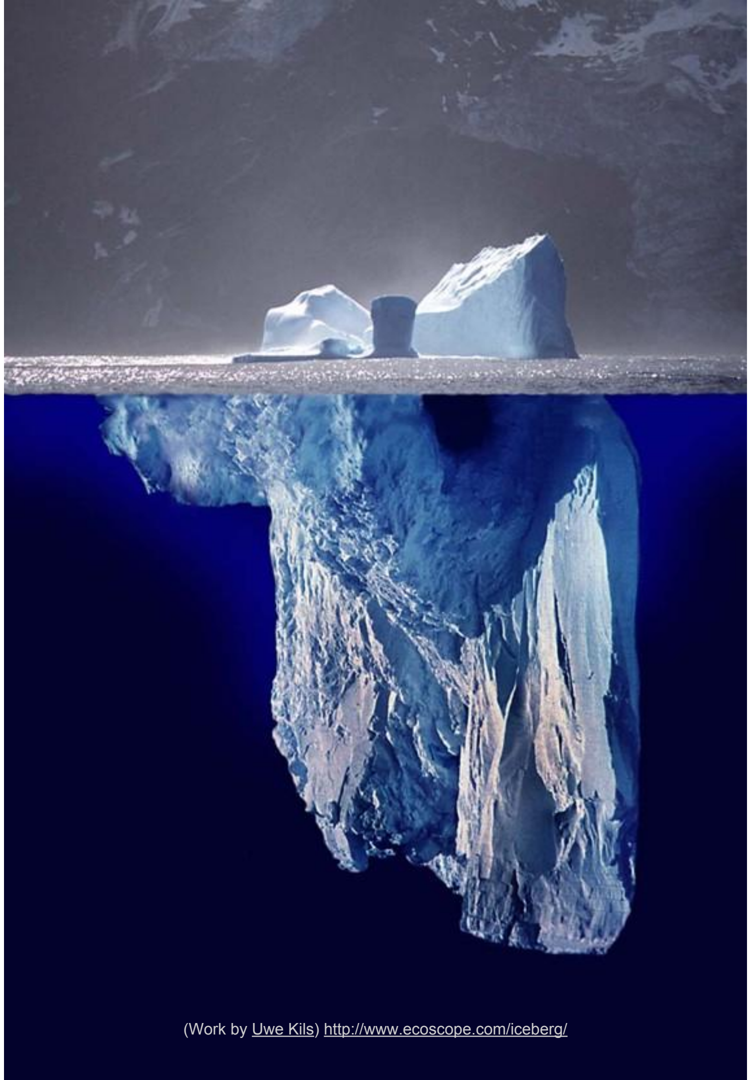
Paul Novarese
Technical Account Manager
Docker, Inc.
pvn@docker.com
@pvn

Agenda

- Preliminaries
- Container Security Considerations
- Containment
- Namespaces
- What is Seccomp?
- Demos?

"CONTAINER"
"SECURITY"
memegenerator.net

The Iceberg



(Work by Uwe Kils) http://www.ecoscope.com/iceberg/

Your code

Someone else’s code

Containment

- namespaces -> what you can see
- cgroups -> what you can use
- seccomp -> what you can do

Containment

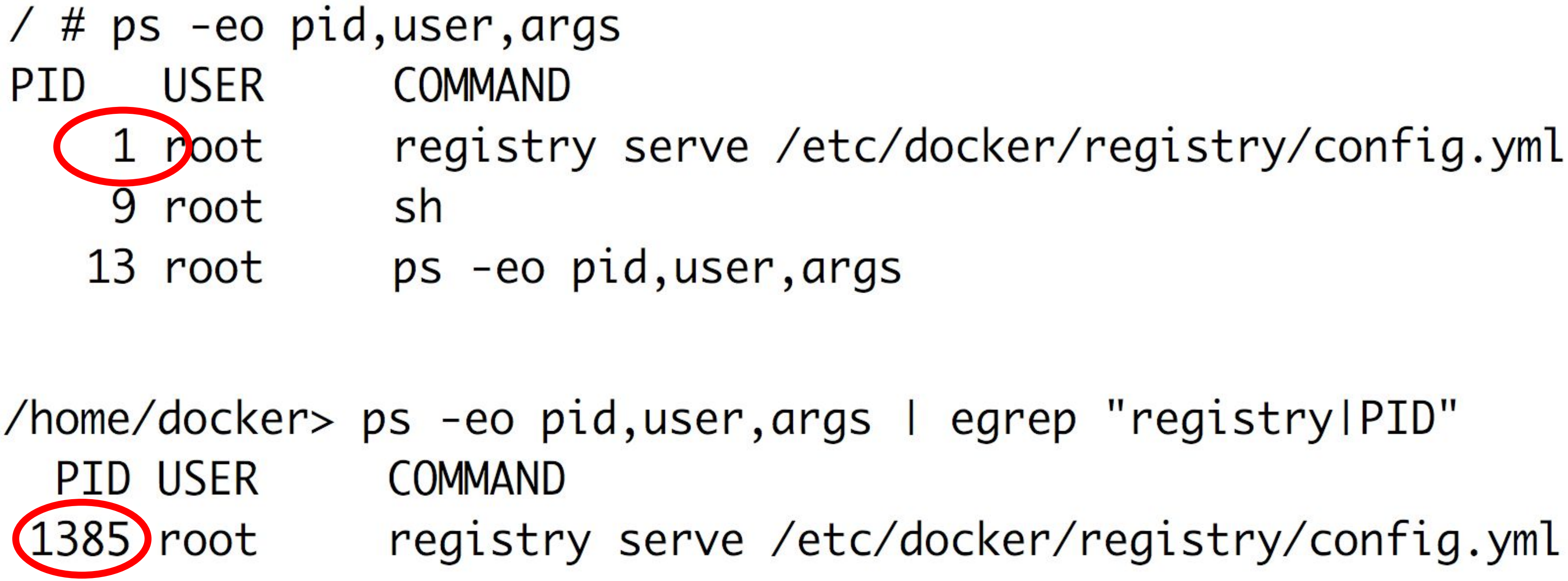
...applications deployed in containers are **more secure** than applications deployed on the bare OS because **even if a container is cracked** they **greatly limit the damage** of a successful compromise...

https://www.gartner.com/doc/3375717/secure-docker-containers-operation

Namespaces

https://www.flickr.com/photos/arthurtlabar/4275756092/

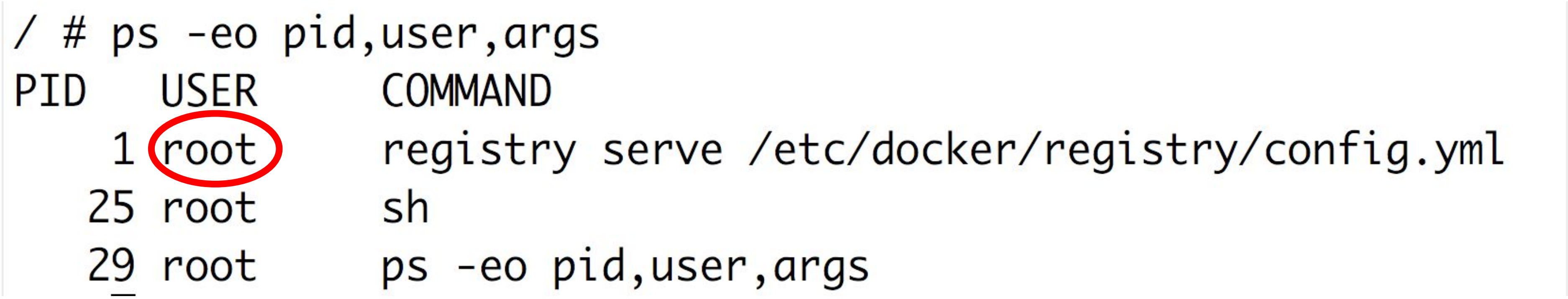
Namespaces



```
/ # ps -eo pid,user,args
PID   USER     COMMAND
    1 root     registry serve /etc/docker/registry/config.yml
    9 root     sh
   13 root     ps -eo pid,user,args
```

```
/home/docker> ps -eo pid,user,args | egrep "registry|PID"
  PID USER     COMMAND
 1385 root     registry serve /etc/docker/registry/config.yml
```

Namespaces



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/ # ps -eo pid,user,args
PID   USER     COMMAND
    1 root     registry serve /etc/docker/registry/config.yml
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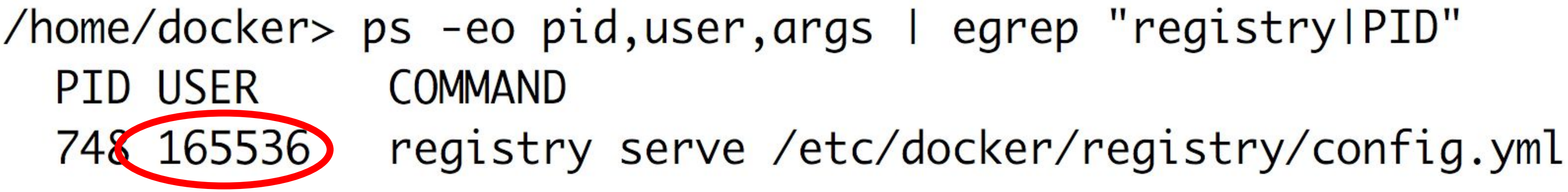
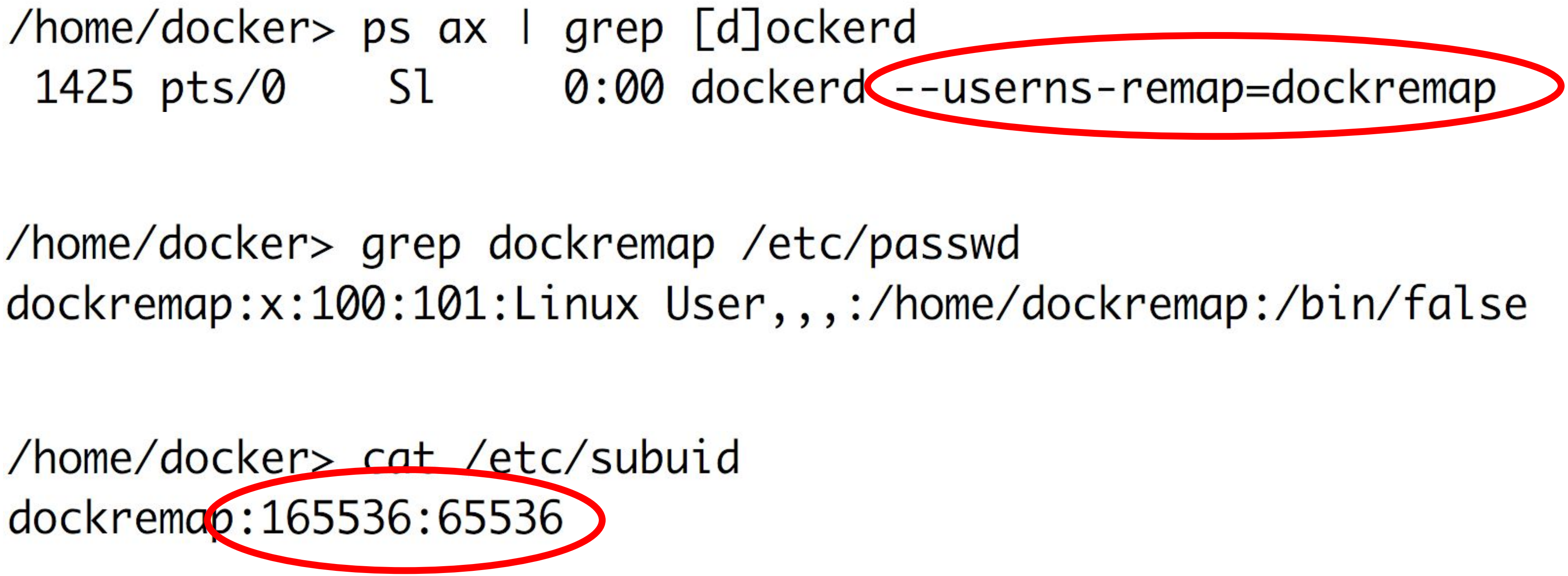


```
/home/docker> ps -eo pid,user,args | egrep "registry|PID"
  PID USER     COMMAND
  748 165536   registry serve /etc/docker/registry/config.yml
```

Enabling userns remapping

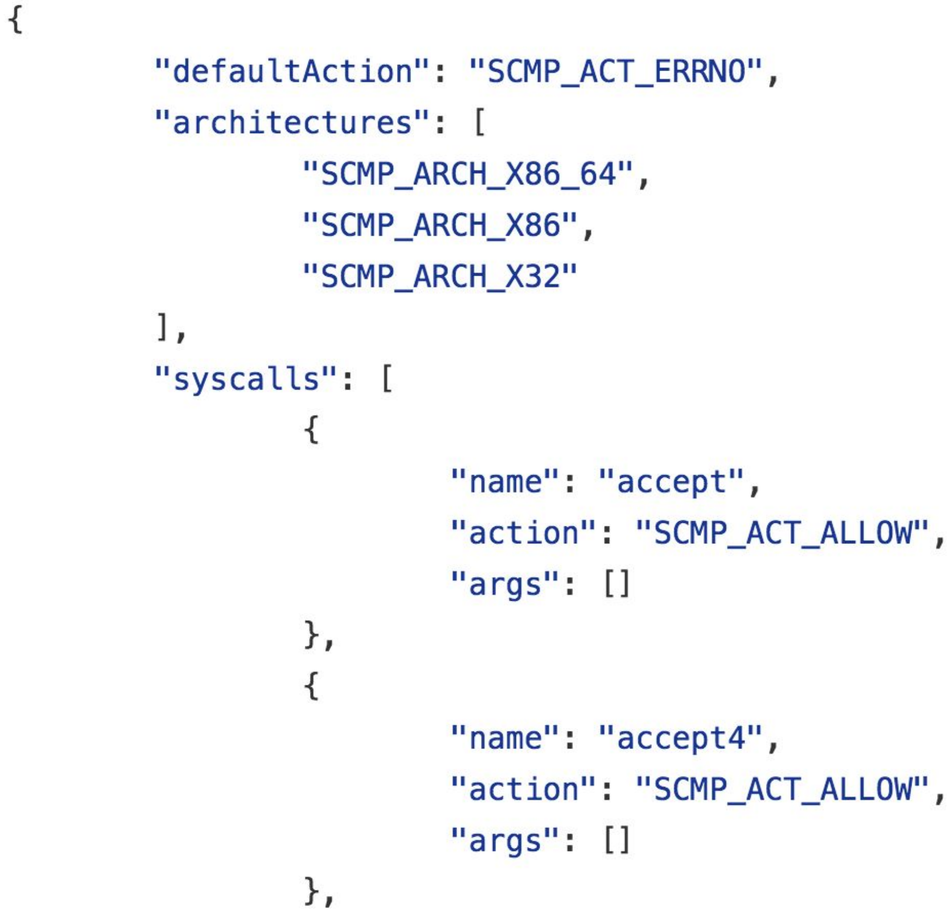


```
/home/docker> ps ax | grep [d]ockerd
 1425 pts/0    Sl     0:00 dockerd --userns-remap=dockremap

/home/docker> grep dockremap /etc/passwd
dockremap:x:100:101:Linux User,,,:/home/dockremap:/bin/false

/home/docker> cat /etc/subuid
dockremap:165536:65536
```

seccomp

Photo Credit: Institute for a Resource-Based Economy (IRBE) https://www.flickr.com/photos/toollibrary/14427641289

seccomp profiles

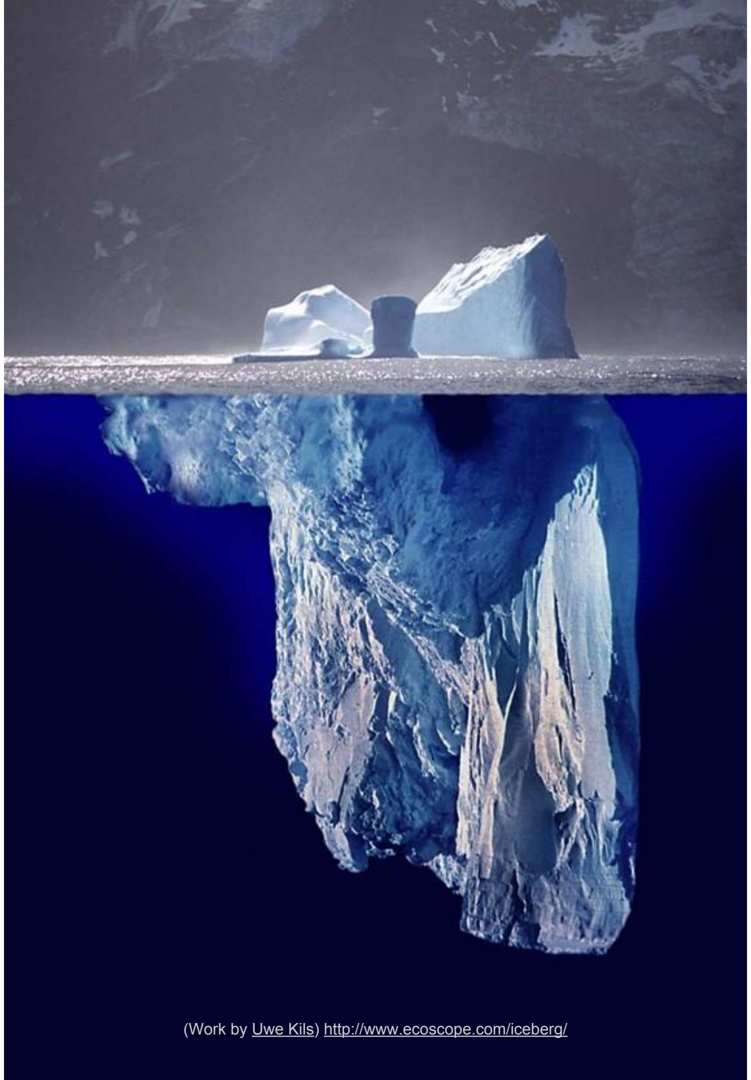


```
{
        "defaultAction": "SCMP_ACT_ERRNO",
        "architectures": [
                "SCMP_ARCH_X86_64",
                "SCMP_ARCH_X86",
                "SCMP_ARCH_X32"
        ],
        "syscalls": [
                {
                        "name": "accept",
                        "action": "SCMP_ACT_ALLOW",
                        "args": []
                },
                {
                        "name": "accept4",
                        "action": "SCMP_ACT_ALLOW",
                        "args": []
                },
```

How do I get it?

- You already have it!
- Default profile has been applied to containers since engine 1.10
- For custom profiles, pass **--security-opt** option on the command line.

The Iceberg (again)



(Work by Uwe Kils) http://www.ecoscope.com/iceberg/

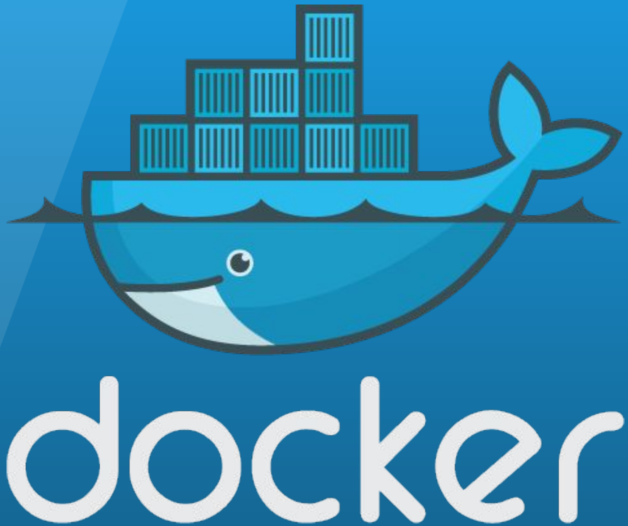
STOP TALKING
DEMO TIME
memegenerator.net
GET EXCITED
IT'S DEMO TIME
memegenerator.net
TIME FOR A LIVE DEMO
OULD GO WRONG?
memegenerator.net

Demo?

- A DIY demo is available
- https://twitter.com/pvn (it will be the pinned tweet)
- If you're reading this in the distant future and I've unpinned the tweet, try this URL instead: https://github.com/pvnovarese/2016-12-NOVA-Meetup
- Ping me with feedback!

Further Reading, References, etc

- The definitive presentation on userns support: https://events.linuxfoundation.org/sites/events/files/slides/User%20Namespaces%20-%20ContainerCon%202015%20-%2016-9-final_0.pdf
- Default seccomp profile: https://github.com/docker/docker/blob/master/profiles/seccomp/default.json
- Seccomp docs: https://github.com/docker/docker/blob/master/docs/security/seccomp.md
- Security non-events: https://docs.docker.com/engine/security/non-events/
- Gartner Report: How to Secure Docker Containers in Operation https://www.gartner.com/doc/3375717/secure-docker-containers-operation
- Your Software is Safer in Docker Containers: https://blog.docker.com/2016/08/software-security-docker-containers/



docker

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