Admincamp 2017

Der Wal in der Kiste – Docker 101

Ulrich Krause

18.09 – 21.09.2017
Gelsenkirchen

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Agenda

- IBM PINK
- Docker
  - Warum Docker?
  - Grundsätzliches zur Funktionsweise
  - Installation (Linux, Windows, Raspberry Pi)
  - Container / Virtual machines
  - Images & Container / Wichtige CLI commands
  - Docker Registry / Hub
  - Domino & Docker ?
- Kubernetes
- IBM Spectrum Conductor for Containers / IBM Cloud private

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Über: Ulrich Krause

- Lotus Notes und Domino seit 1993
- Entwickler / Administrator
- IBM Champion 2010 – 2016
- OpenNTF Contributor
- Let‘s Encrypt 4 Domino (LE4D)
- Entwickler bei midpoints GmbH

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Think Pink – The Future of IBM Connections

- There are no closed code repositories – Any IBMer can pull down code and edit it
- Customers can join sprint reviews
- Pink will still embrace things from the past – capabilities will not be sunset
- There will be a single code base that will not have versions, CRs, fixpacks etc.
- Pink allows your data to stay where you want it – e.g. profiles could stay on premises but wikis could be in the cloud
- Fault tolerance will be built into the platform, e.g. automatically restart services it recognizes are down
- Pink is cognitive – it will be everywhere
- It will be API driven – APIs will be available for everything, no feature will be available without an API

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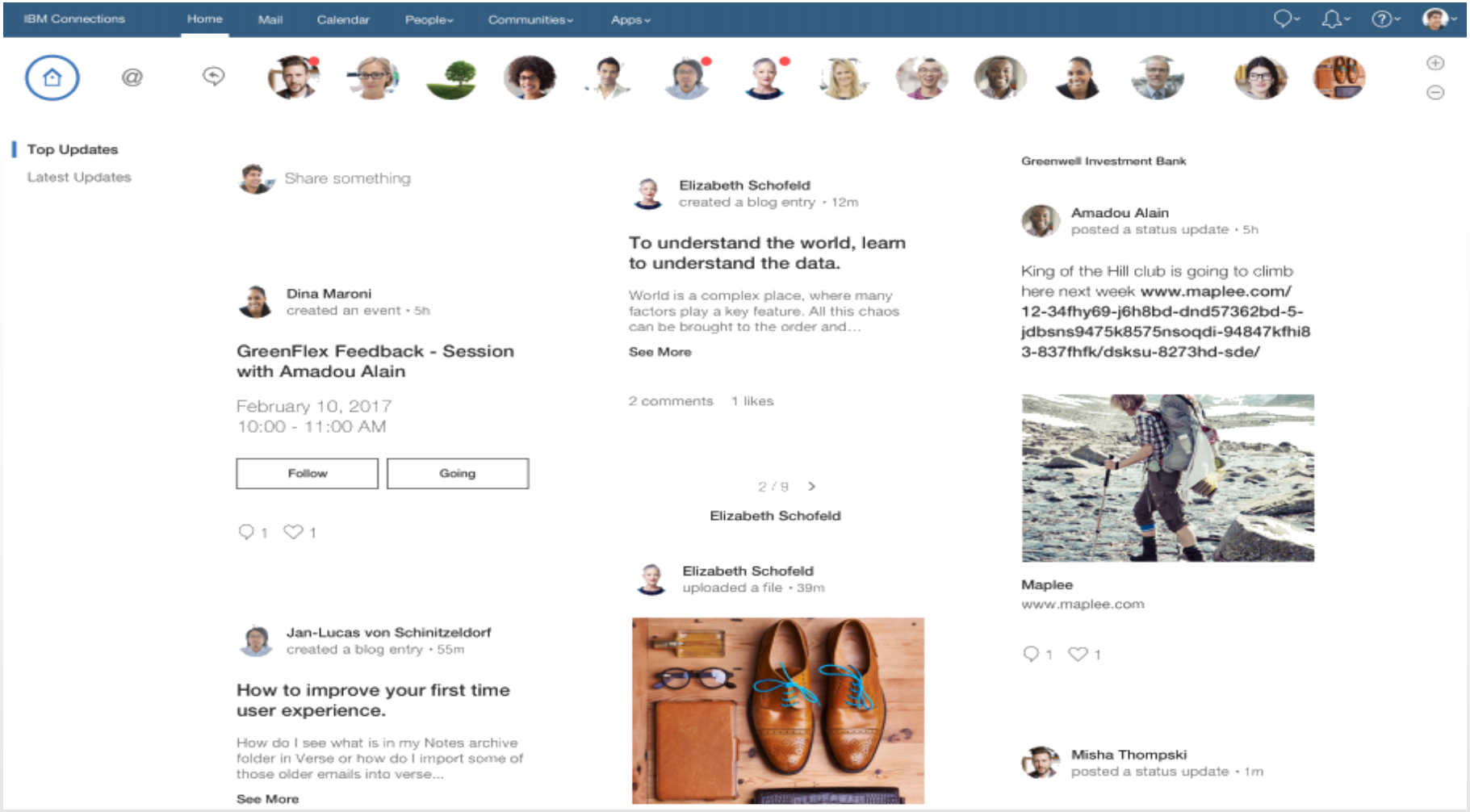
Connections 6 – The beginnings of Pink

- To move to Pink, you must first be on Connections 6.
- Orient Me



Technology Behind Pink

- Modern CI-CD framework
- StrongLoop / IBM API Connect (node.js/express)
- SWIFT / Go
- React.js
- MongoDB
- Redis
- Nginx
- **Docker**
- No WebSphere, Java, Rational etc.

- All components are open source

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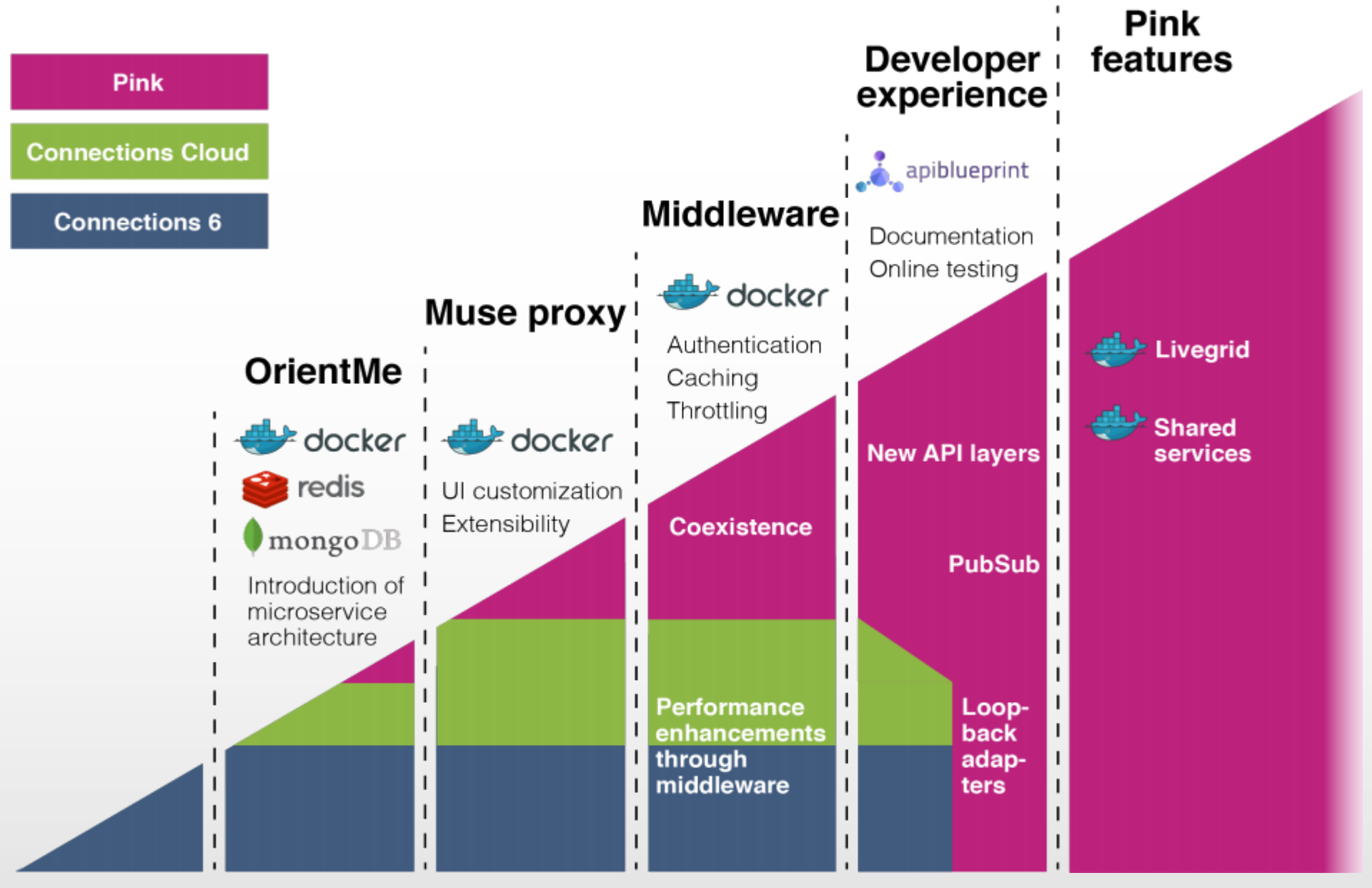
Codebase


Pink
Connections Cloud
Connections 6
OrientMe
docker
redis
mongoDB
Introduction of microservice architecture
Muse proxy
docker
UI customization
Extensibility
Middleware
docker
Authentication
Caching
Throttling
Coexistence
Performance enhancements through middleware
Developer experience
apiblueprint
Documentation
Online testing
New API layers
PubSub
Loop-back adap-ters
Pink features
Livegrid
Shared services

Think Pink – The Future of IBM Connections

- Webcast:
  - http://www-01.ibm.com/support/docview.wss?uid=swg27049476
- All you need to know about Orient Me
  - https://www.slideshare.net/soccnx/all-you-need-to-know-about-orient-me
- Install Orient Me 6.0.0.1
  - https://www.ibm.com/support/knowledgecenter/en/SSYGQH_6.0.0/admin/install/c_install_orient_me_homepage.html
- Starting the Pink story by installing Orient Me
  - https://www.bea-services.de/blog/starting-the-pink-story-by-installing-orient-me

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Matrix from hell (Transportation)

	?	?	?	?	?	?	?
	?	?	?	?	?	?	?
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	?	?	?	?	?	?	?
							

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Malcolm McLean, http://www.mehrcontainerfuerdeutschland.de/geschichte-und-geschichten/malcolm-mclean-eine-vision-bewegt-die-welt/


WORKED FINE IN DEV
OPS PROBLEM NOW
memegenerator.net

Matrix from hell (Software Deployment)

Java	JKD 1.8.14 - Win32	JKD 1.8.1 - Lnx-64	JDK 1.7-patch UNX
Ruby	2.2.2 rvm	2.2.1 nat MRI	2.1.0 rubinius
Node.JS	4.0 win	4.0 Linux	4.0 Linux
MySQL	5.5 win	5.0 Linux	5.0 Linux
	Dev-Env.	Test-Env.	Prod-Env.

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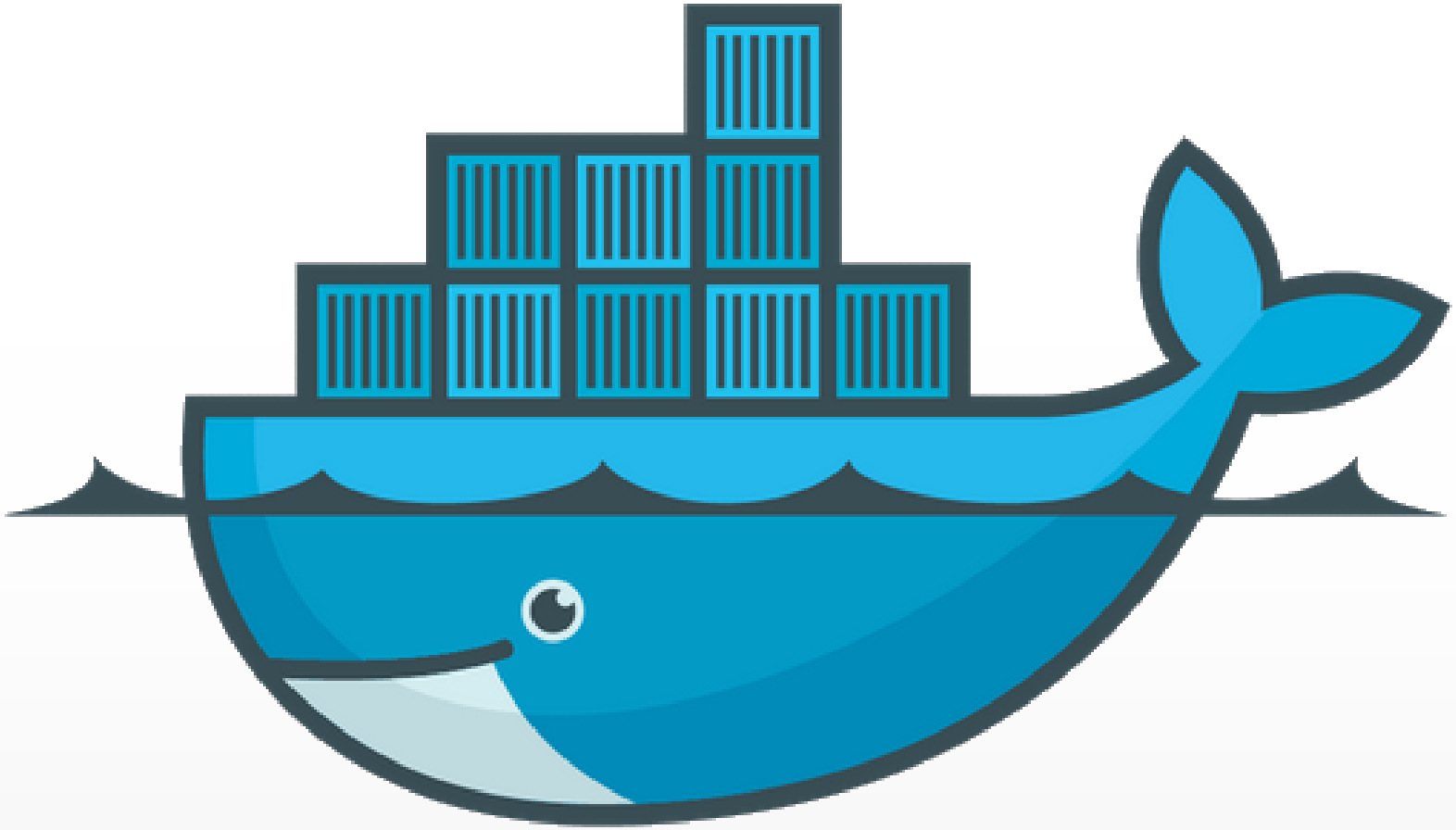

docker

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History of Container Technology

- Chroot circa 1982
- FreeBSD Jails circa 2000
- Solaris Zones circa 2004
- Meiosys - MetaClusters with Checkpoint/Restore 2004-05
- Linux OpenVZ circa 2005 (not in mainstream Linux)
- AIX WPARs circa 2007
- LXC circa 2008
- Systemd-nspawn circa 2010-2013
- **Docker** circa 2013
  - built on LXC
  - moved to libcontainer (March 2014)

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Google Trends

docker
Search term

LXC
Search term

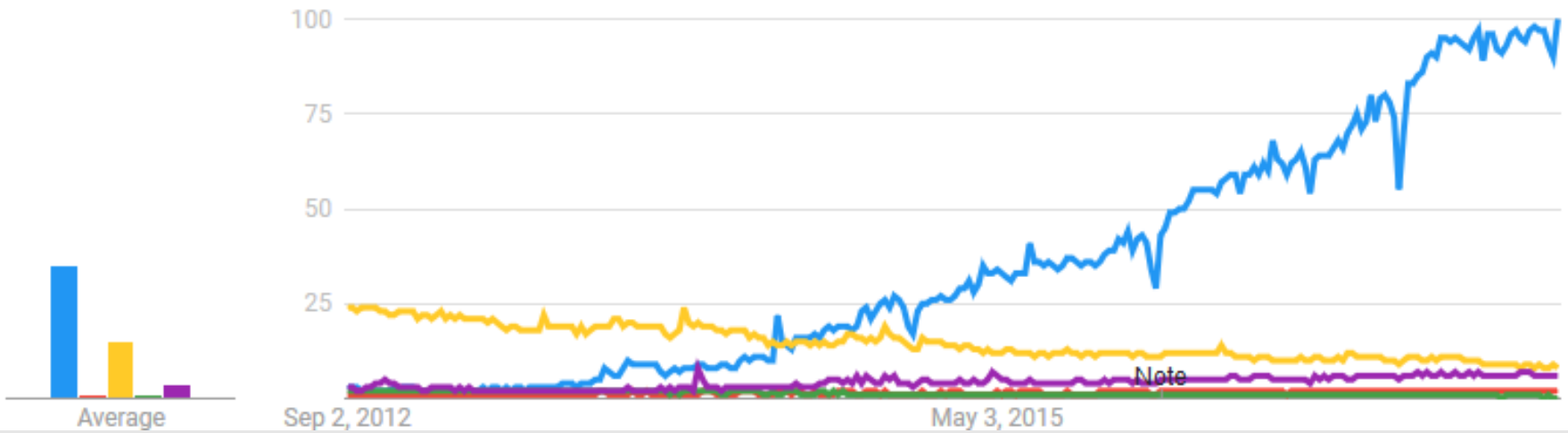
FreeBSD
Search term

OpenVZ
Search term

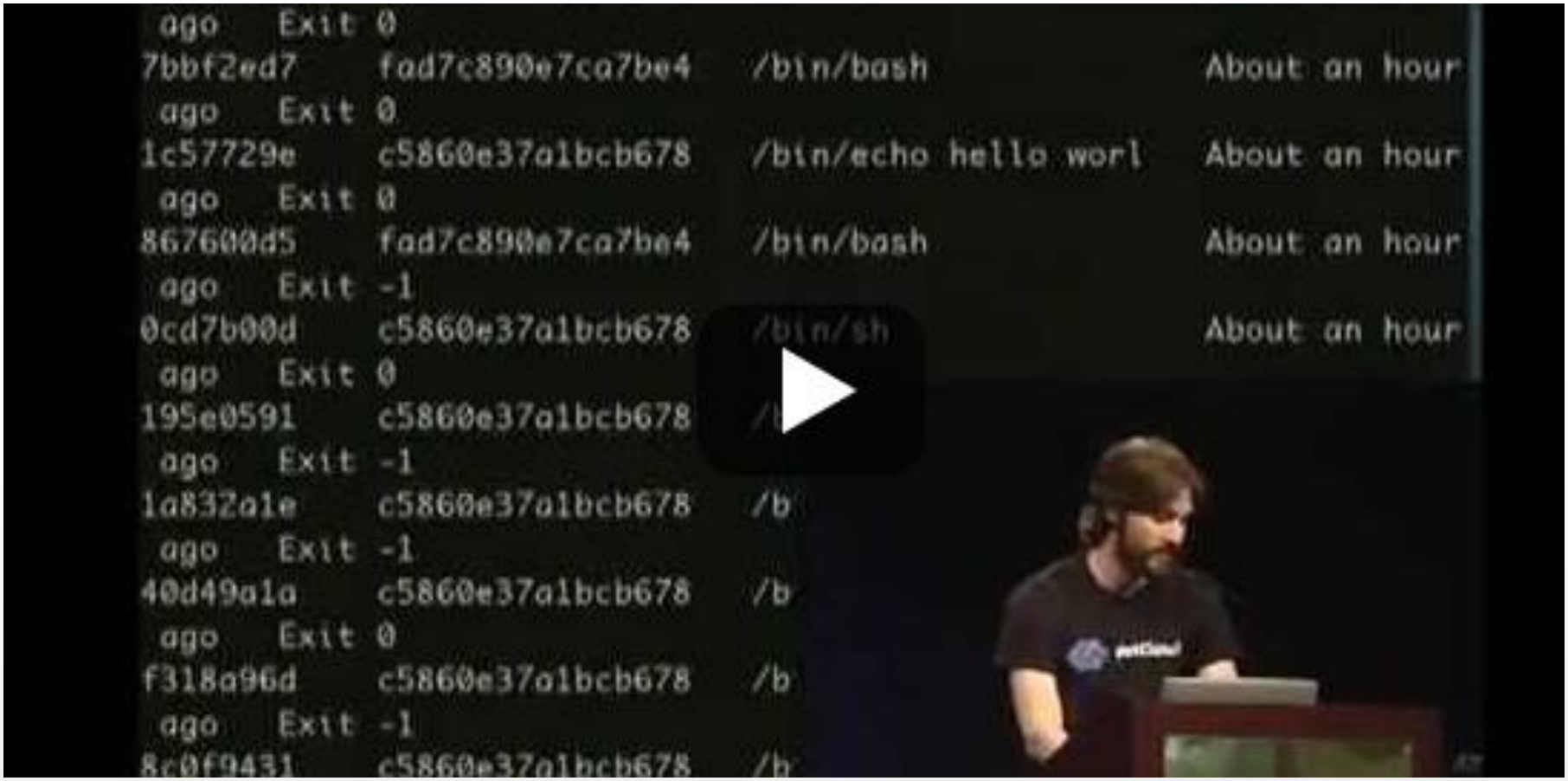
systemd
Search term

Worldwide ▾ Past 5 years ▾ All categories ▾ Web Search ▾

Interest over time



Solomon Hykes: The future of Linux containers



https://www.youtube.com/watch?v=wW9CAH9nSLs

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Was ist Docker

Docker INC	▪ Docker, Inc is the company behind development of Docker software, an open-source project that automates the deployment of code inside software containers.
Docker Engine	▪ is the part of Docker which creates and runs Docker containers
Docker Hub	▪ Docker Hub ist ein Online-Dienst, der eine Registry für Docker-Images und Repositories beinhaltet. ▪ Die Registry teilt sich in einen öffentlichen und einen privaten Teil auf.

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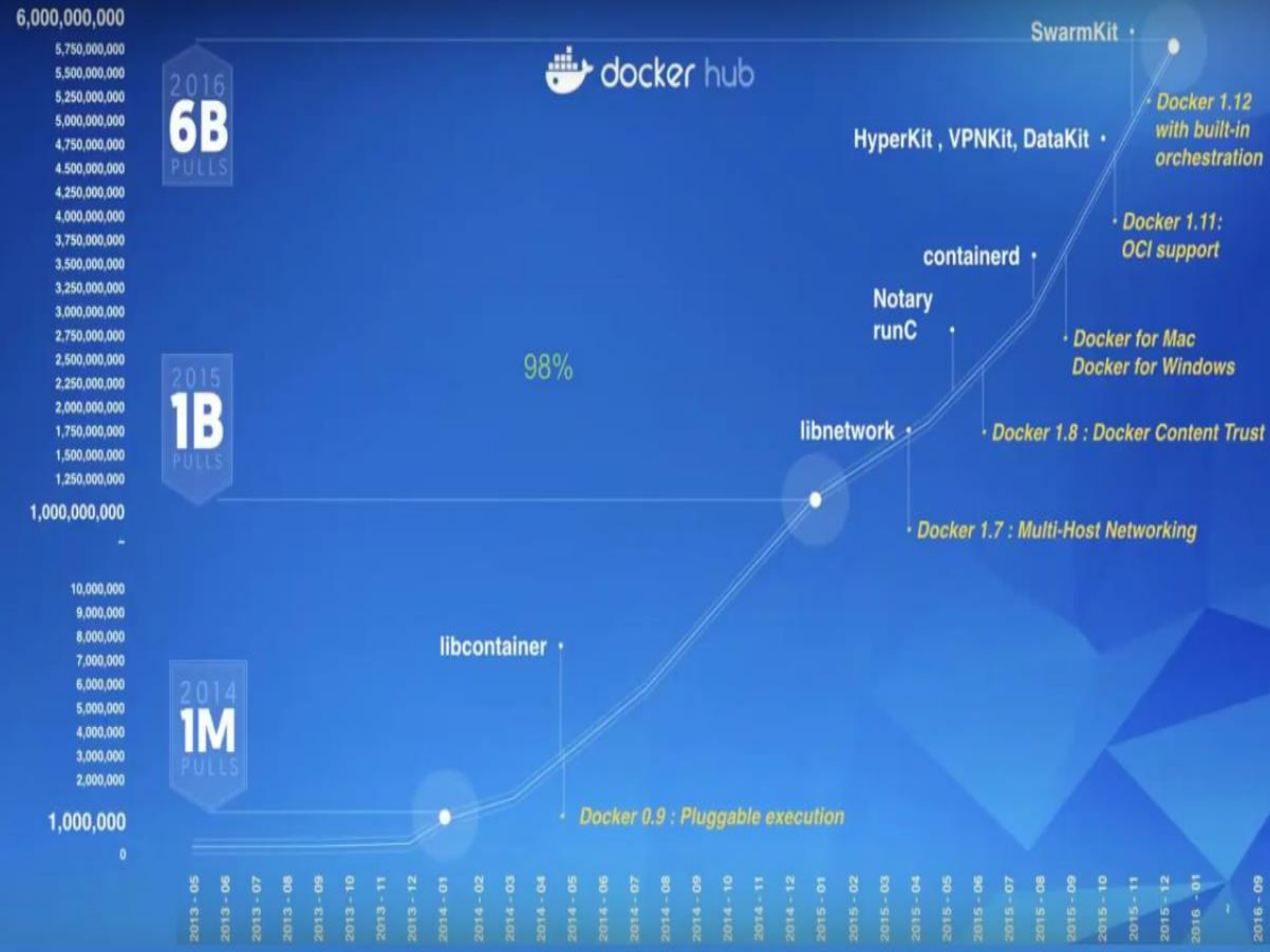
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2016
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2015
1B
PULLS
2014
1M
PULLS
docker hub
98%
SwarmKit
Docker 1.12 with built-in orchestration
HyperKit , VPNKit, DataKit
Docker 1.11: OCI support
containerd
Notary
runC
Docker for Mac
Docker for Windows
libnetwork
Docker 1.8 : Docker Content Trust
Docker 1.7 : Multi-Host Networking
libcontainer
Docker 0.9 : Pluggable execution
2013 - 05
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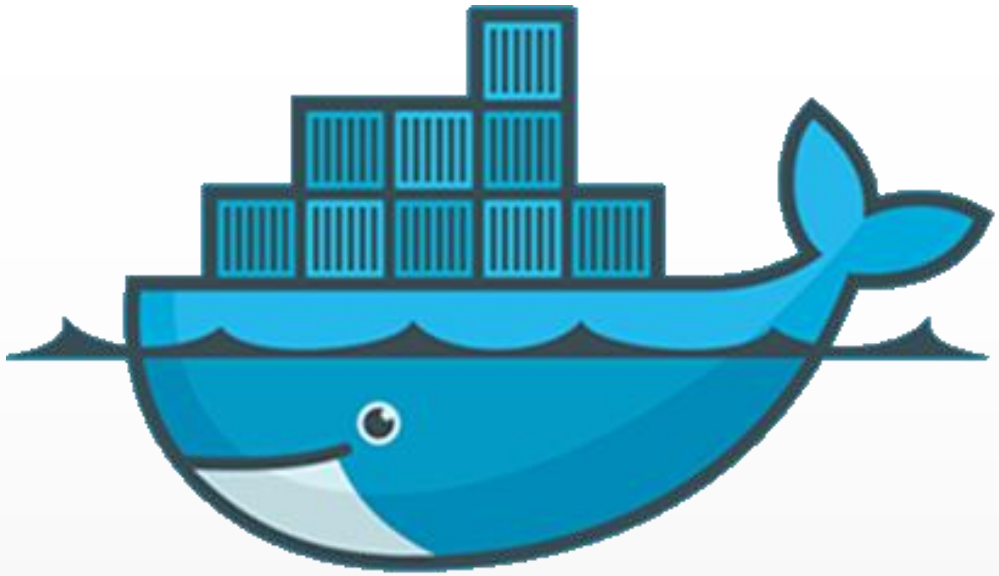
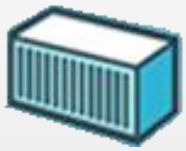
2015 - 10
2015 - 11
2015 - 12
2016 - 01
2016 - 09

Build, Ship & Run applications anywhere



docker

Build



Ship

Run

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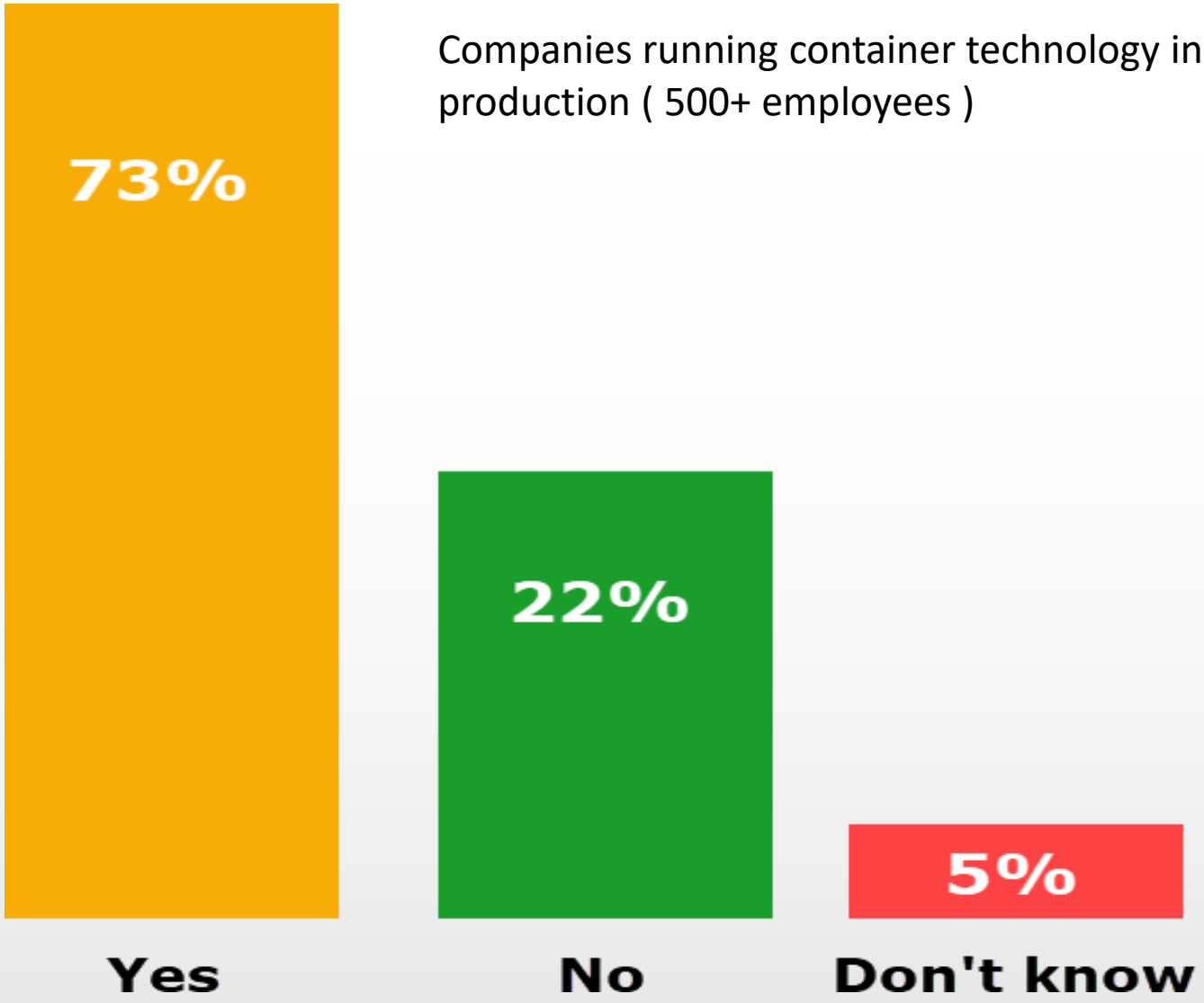
Companies running container technology



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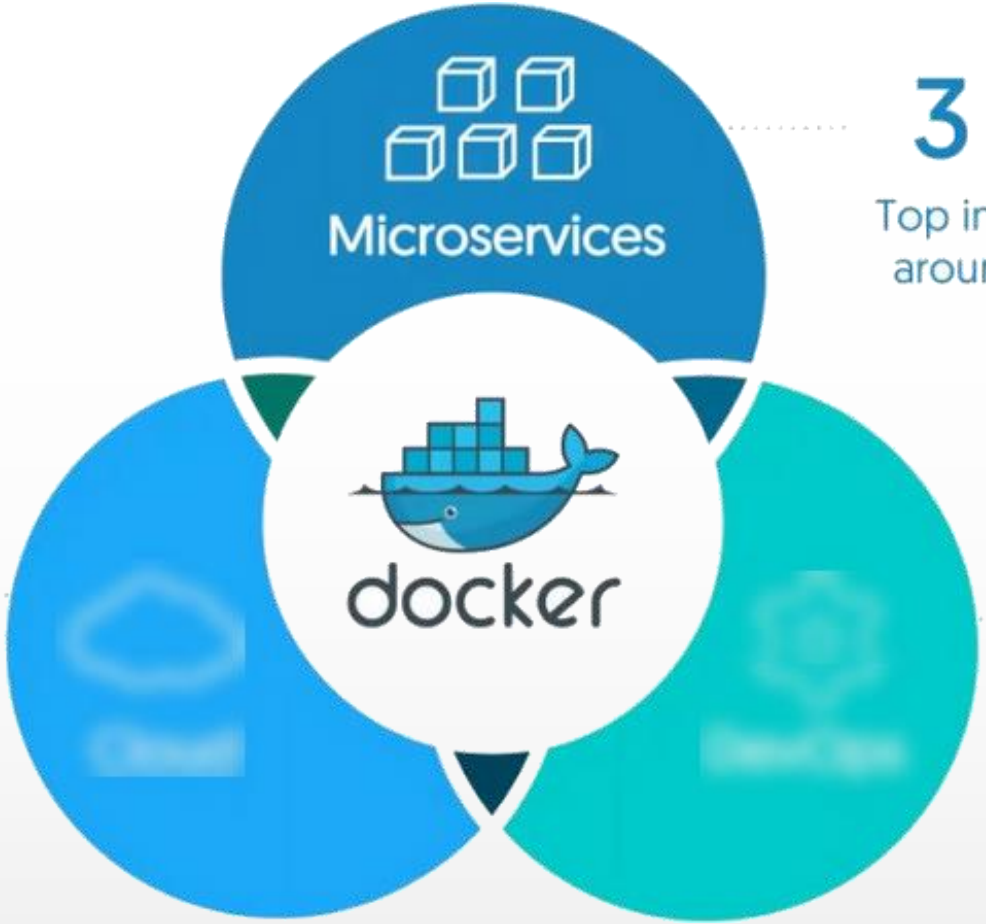
Driving force behind Initiatives



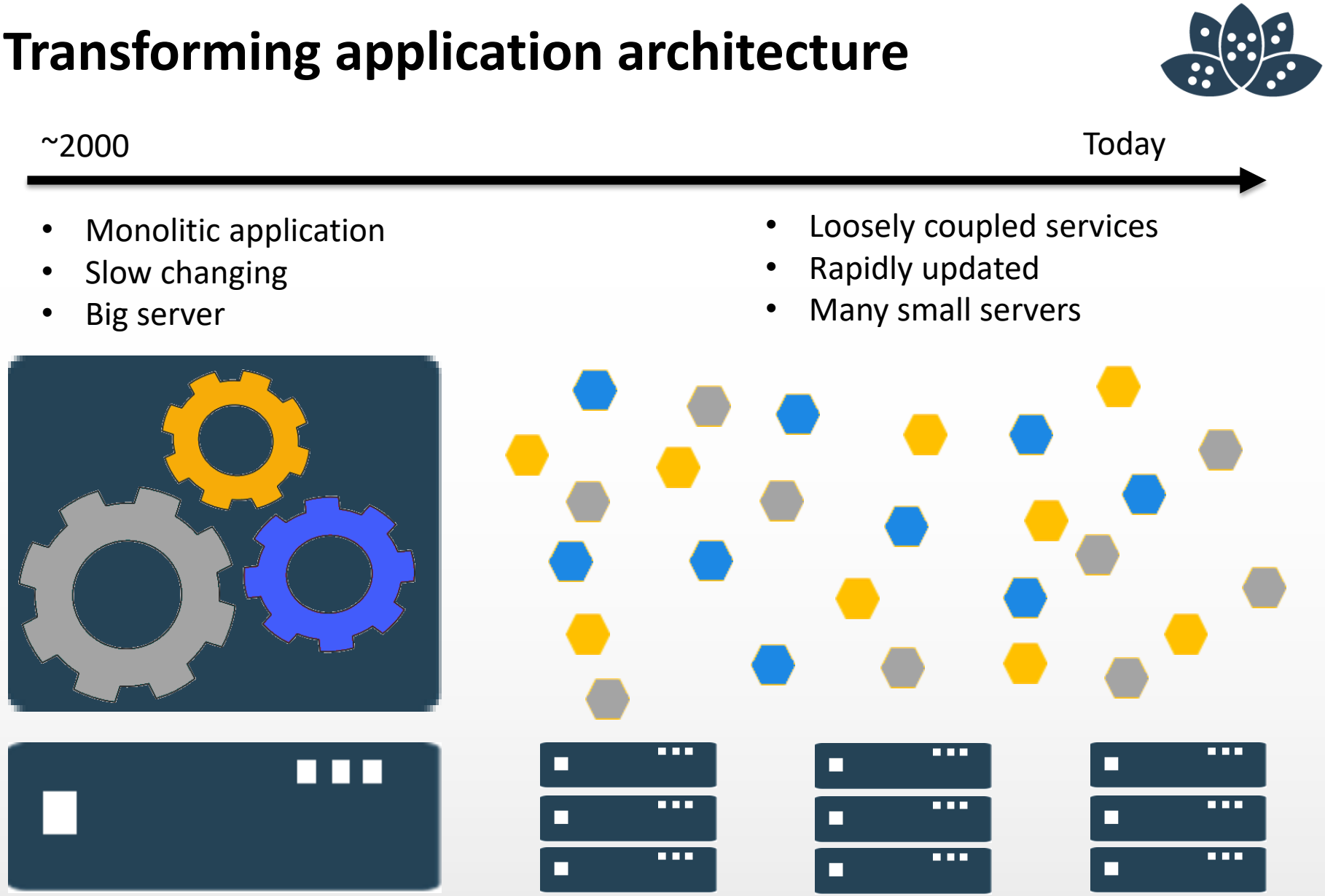
3 out 4

Top initiatives revolve around applications

80%

44%

Transforming application architecture



Microservices

- Microservices are like Minions working together: small services when organized to do work together can result in large applications that are scalable, understandable, and maintainable.

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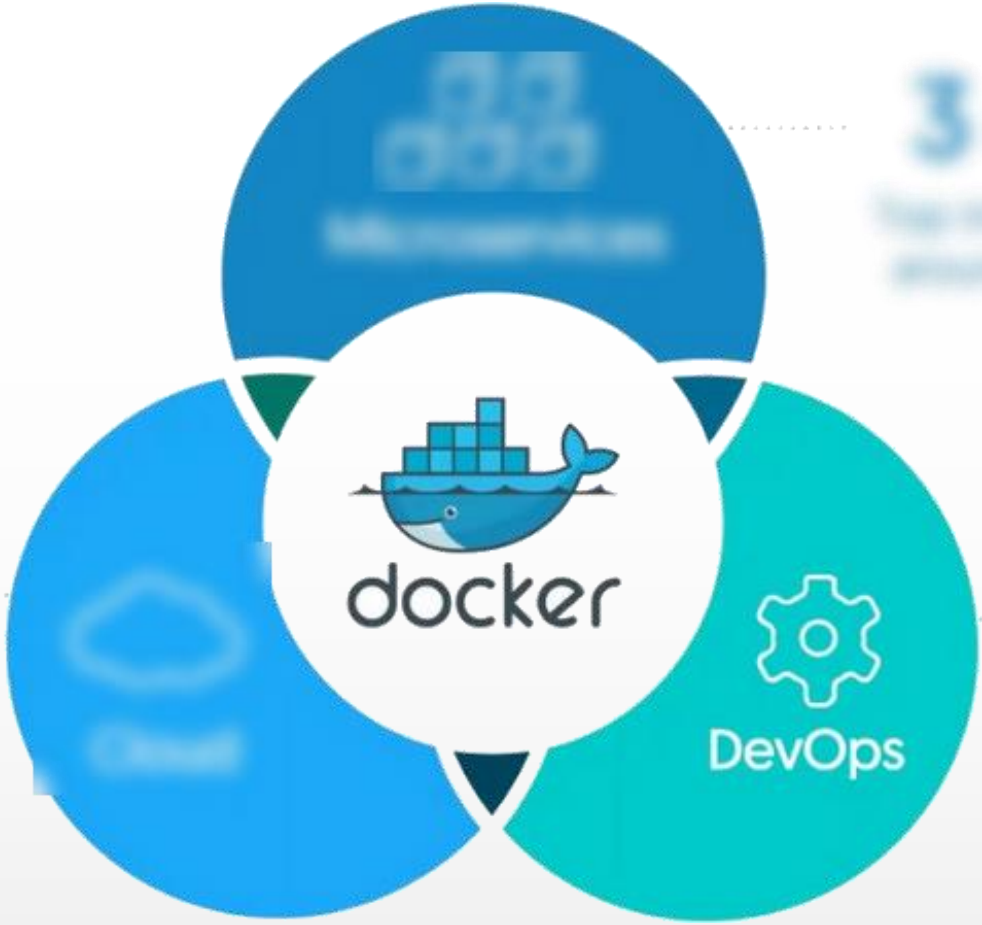
"do one thing and do it well"

Driving force behind Initiatives



3 out 4

44%

Looking to adopt DevOps

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WORKED FINE IN DEV
OPS PROBLEM NOW
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DevOps

DevOps ist ein Kunstwort aus den Begriffen Development und IT Operations.

DevOps soll durch gemeinsame Anreize, Prozesse und Werkzeuge eine effektivere und effizientere Zusammenarbeit der Bereiche **Dev, Ops** und **QA** ermöglichen.

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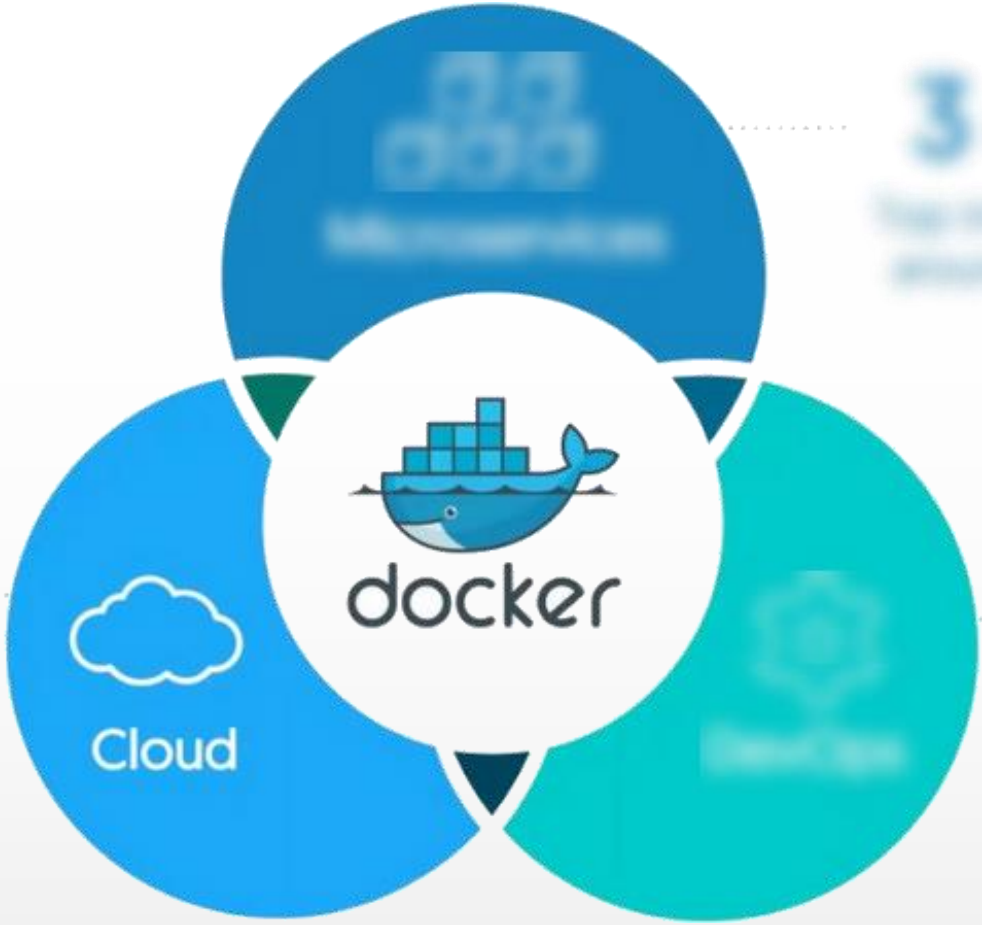
Driving force behind Initiatives



80%

Docker is central to cloud strategy

3 out 4

44%

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Top 10 applications running in containers

NGINX

elasticsearch

etcd

redis

PostgreSQL

mongoDB.

MySQL

fluentd

RabbitMQ

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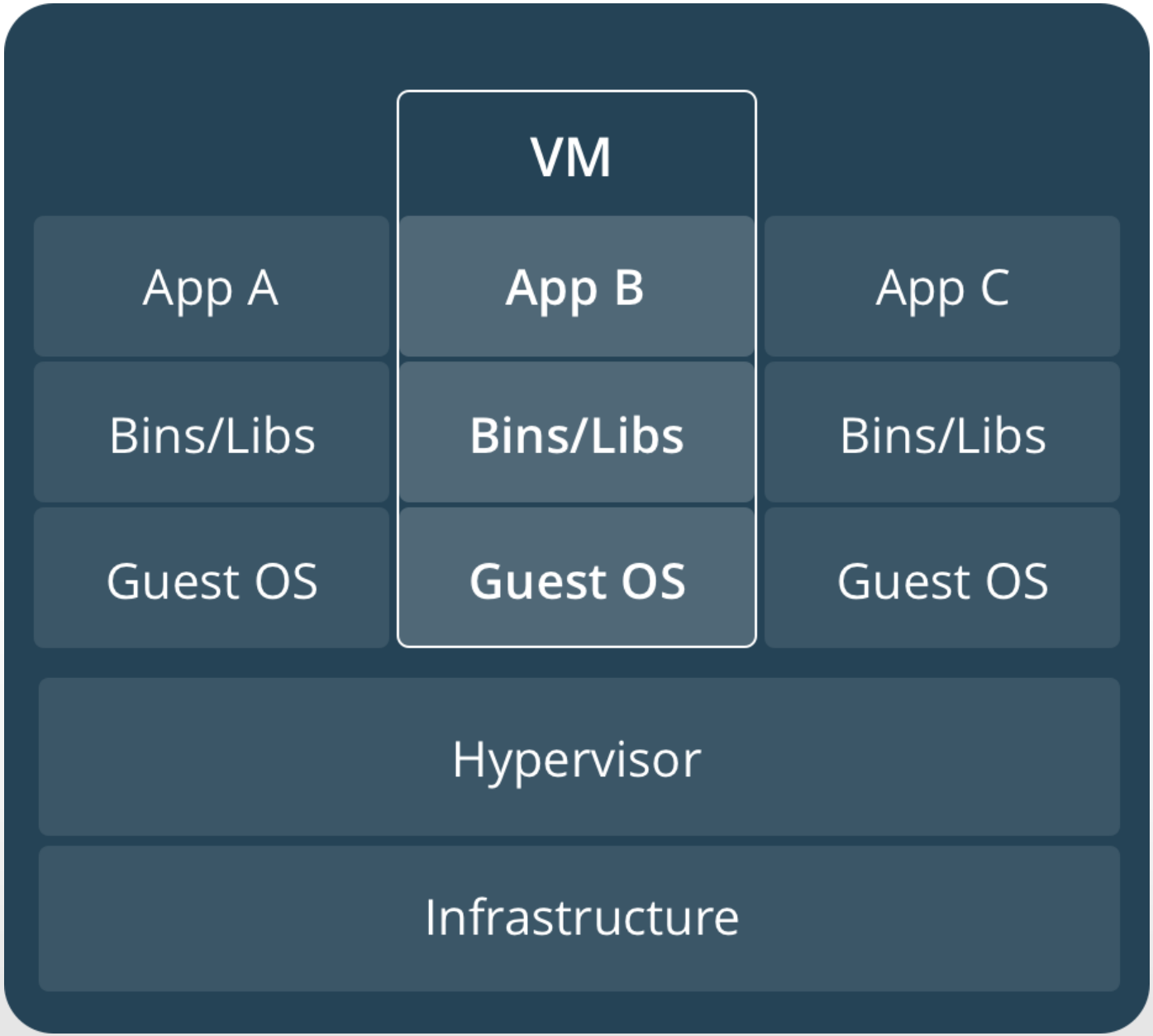
VM vs. Container



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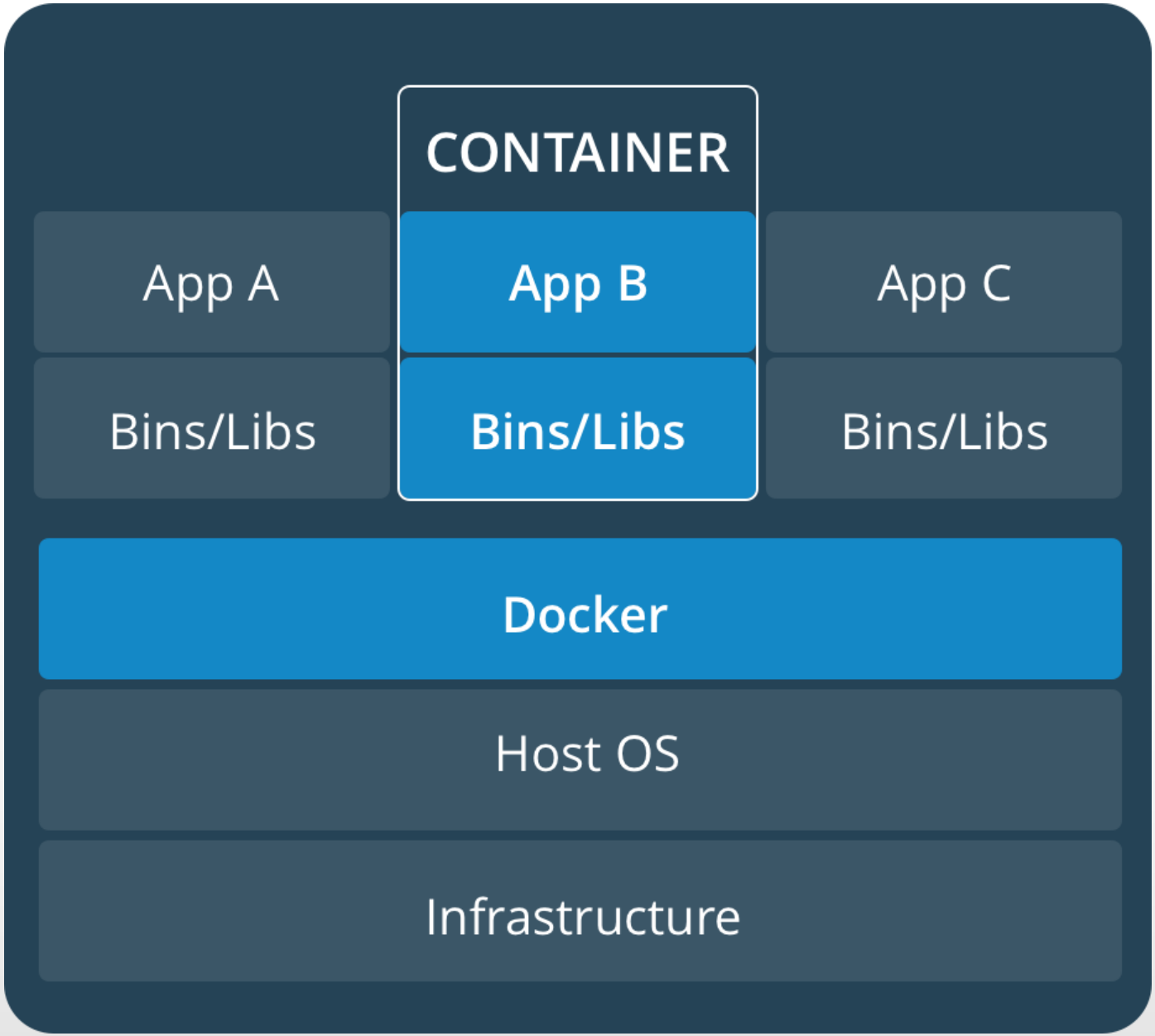
https://faszination-kleben-dichten.de/aussergewohnliches/skurrile-reisemobile-caravaning-der-etwas-anderen-art/

VM vs. Container



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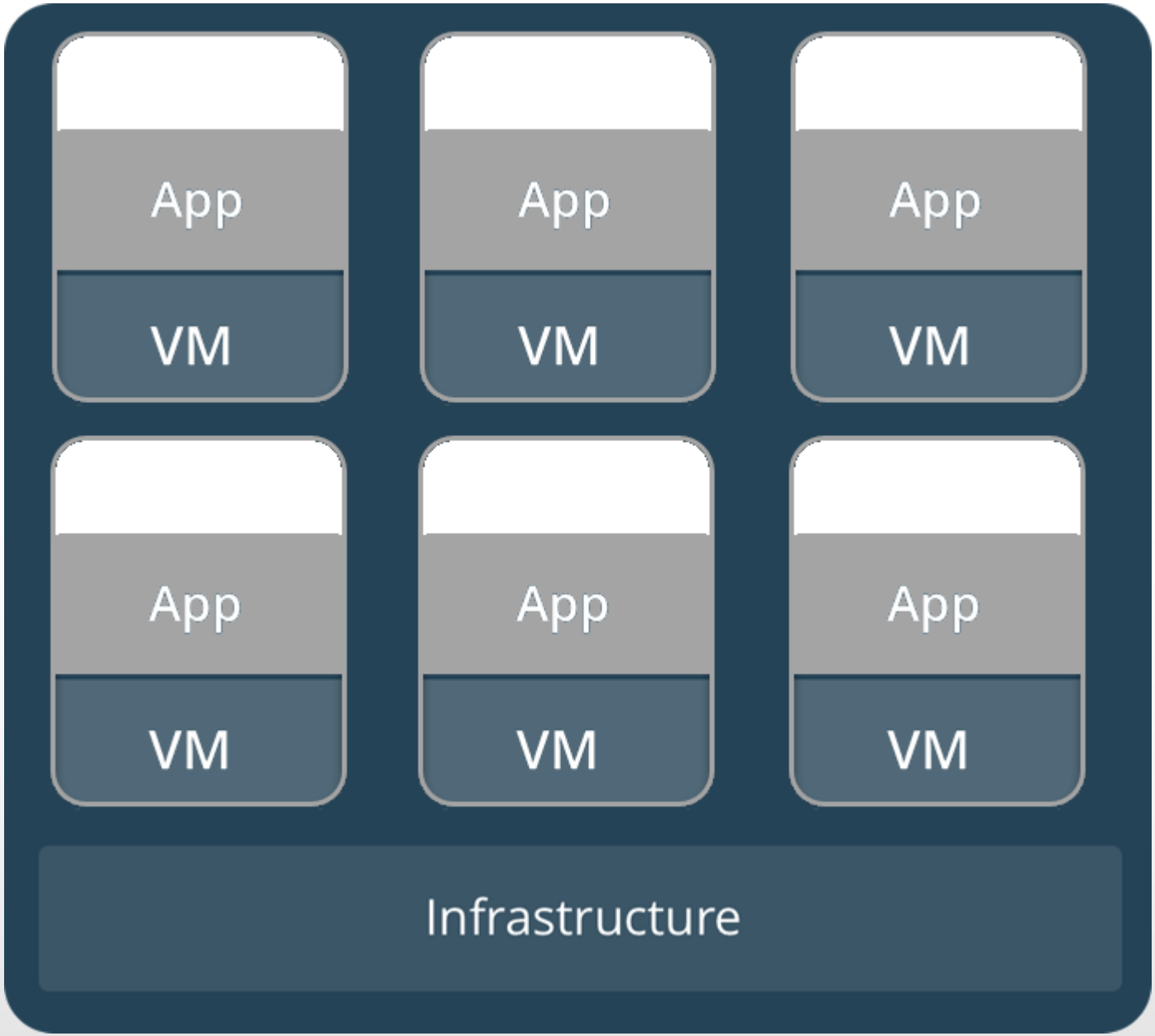
Container

https://upload.wikimedia.org/wikipedia/commons/d/db/Mercedes-Benz_O404_Rotel_Tours_2.jpg

Resources (VM)



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Resources (Container)

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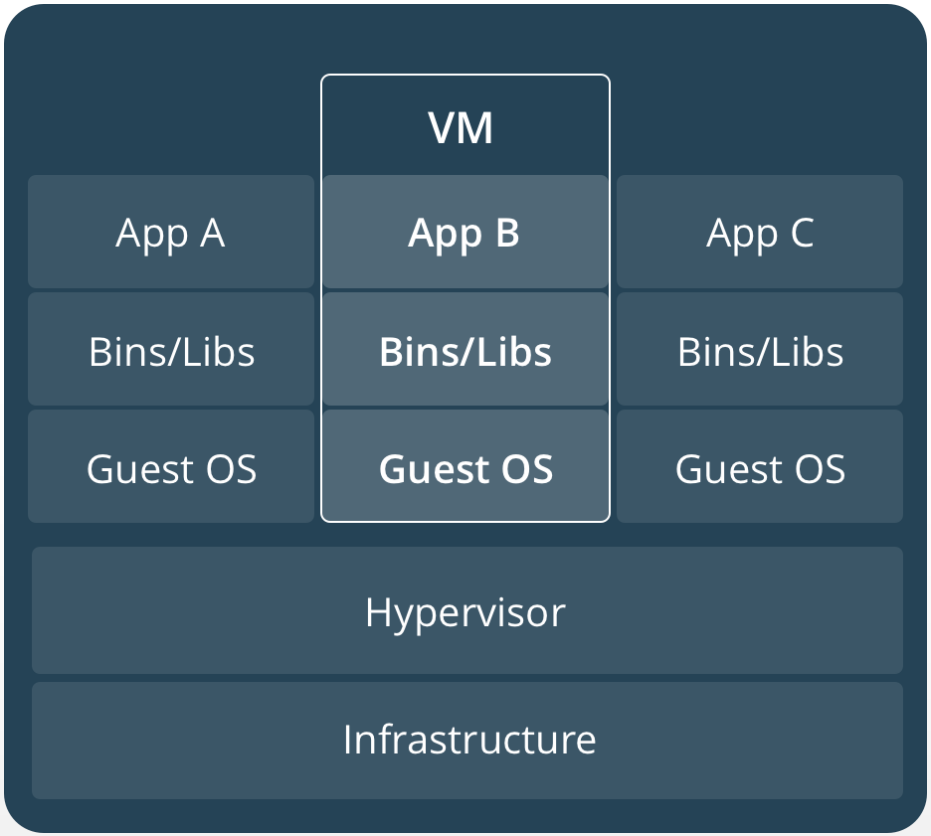
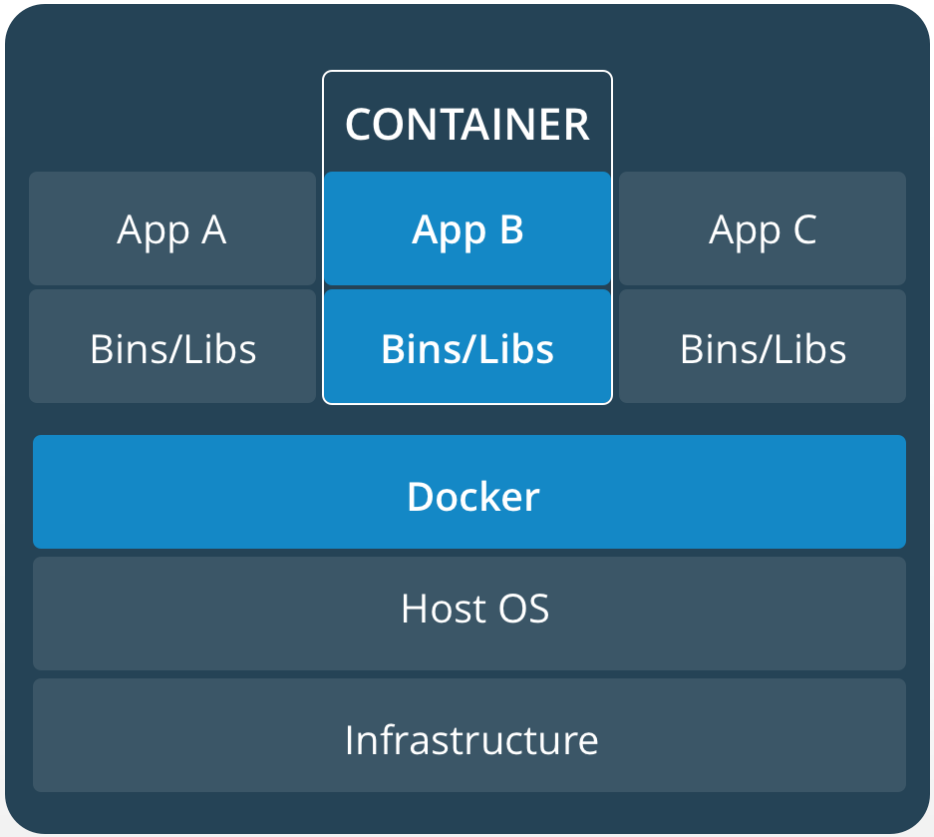
VM vs. Container

VM vs. Container





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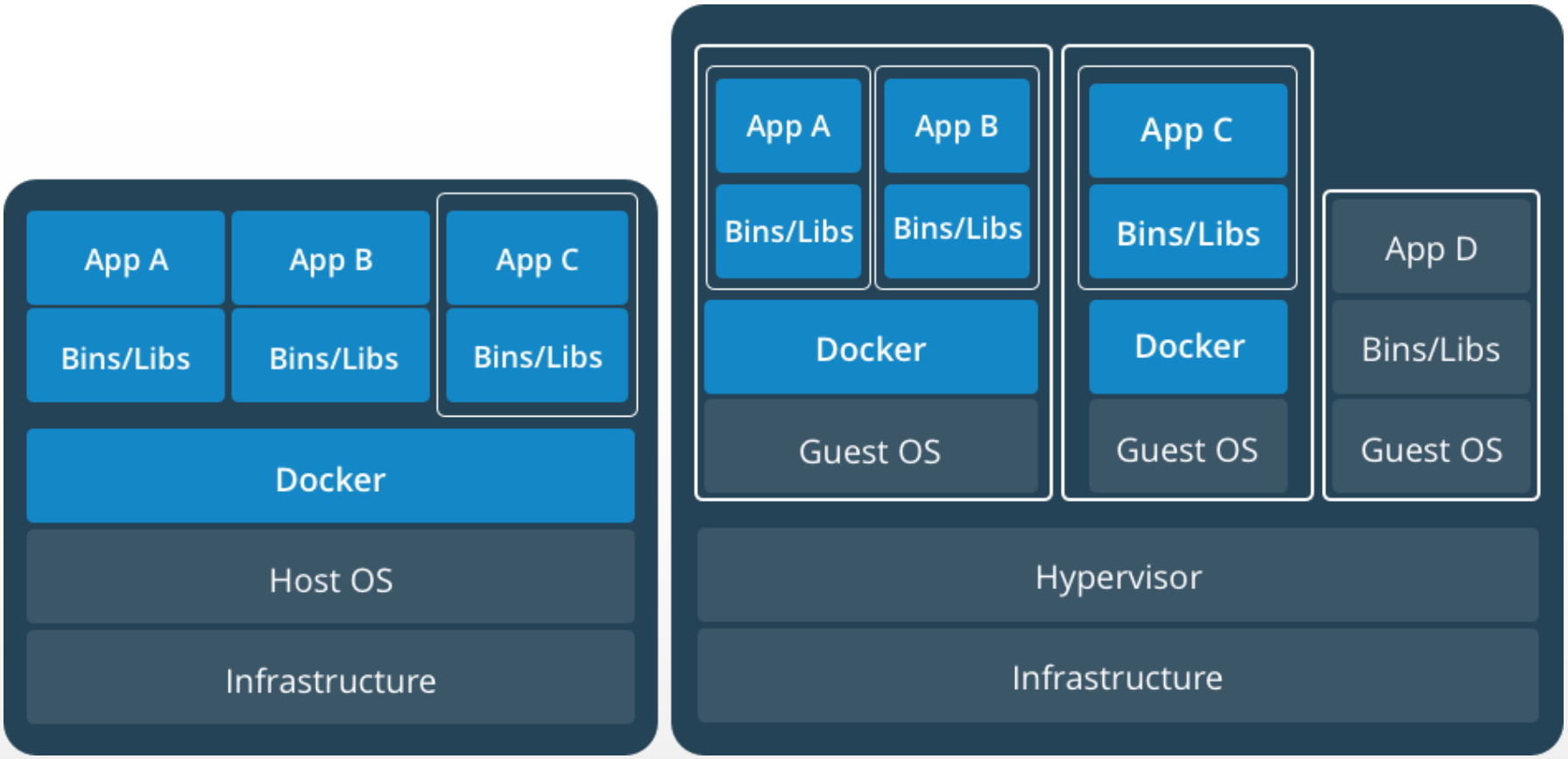
Containers and Virtual Machines Together



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What is a container?

Linux CGroups

Linux Namespace

Docker Image

Lifecycle

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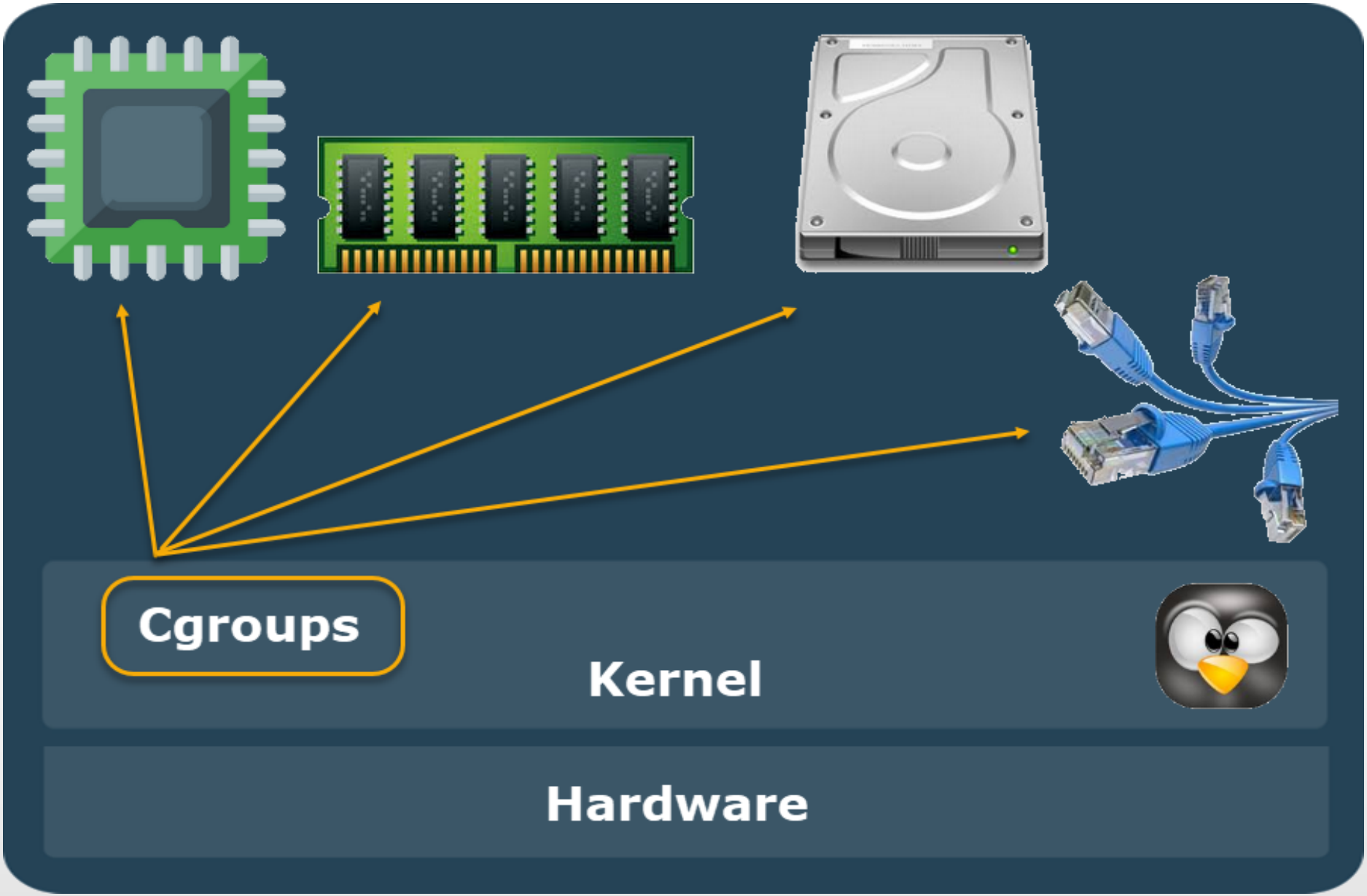
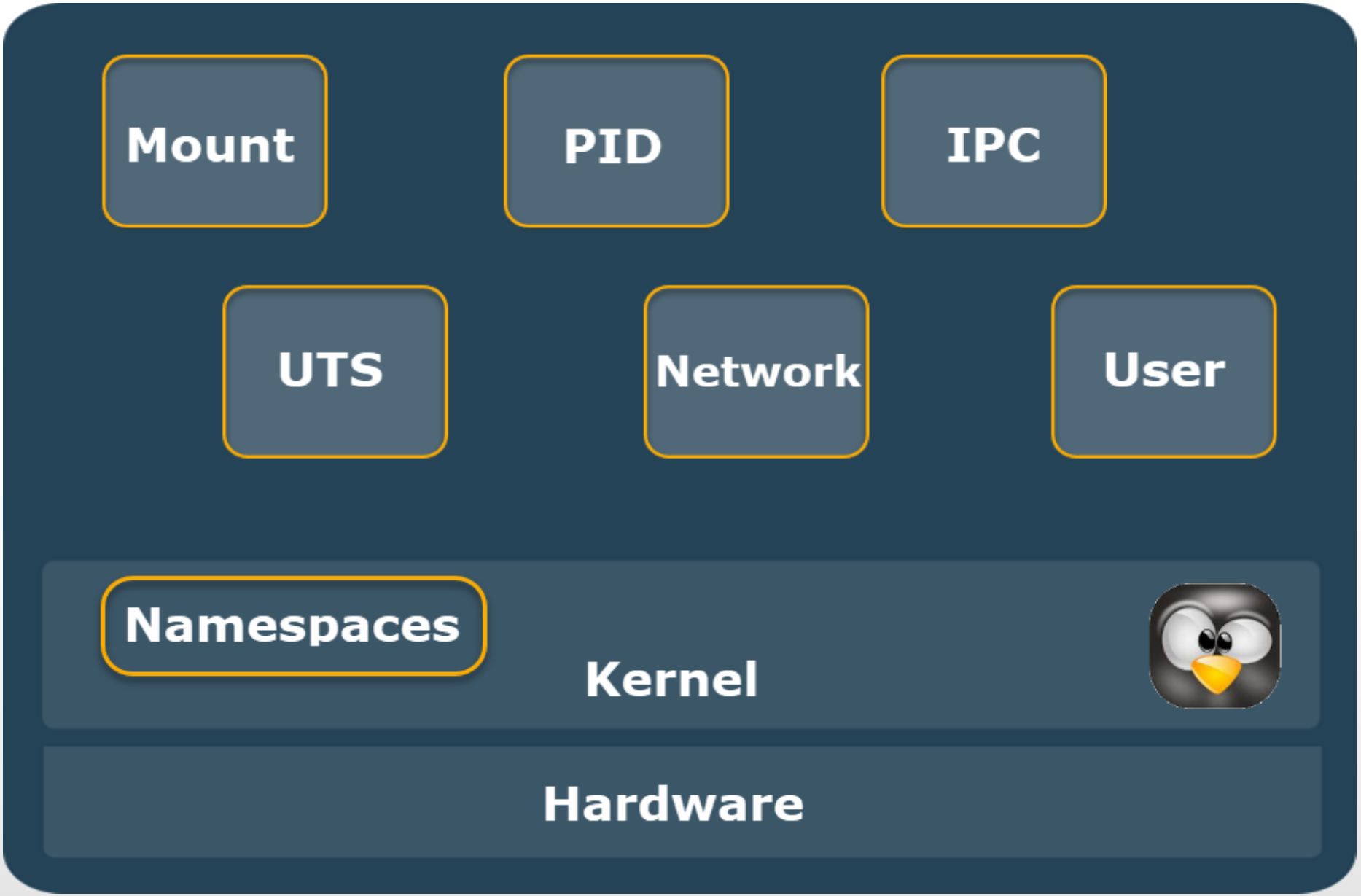
Linux Cgroups (Resource Control)



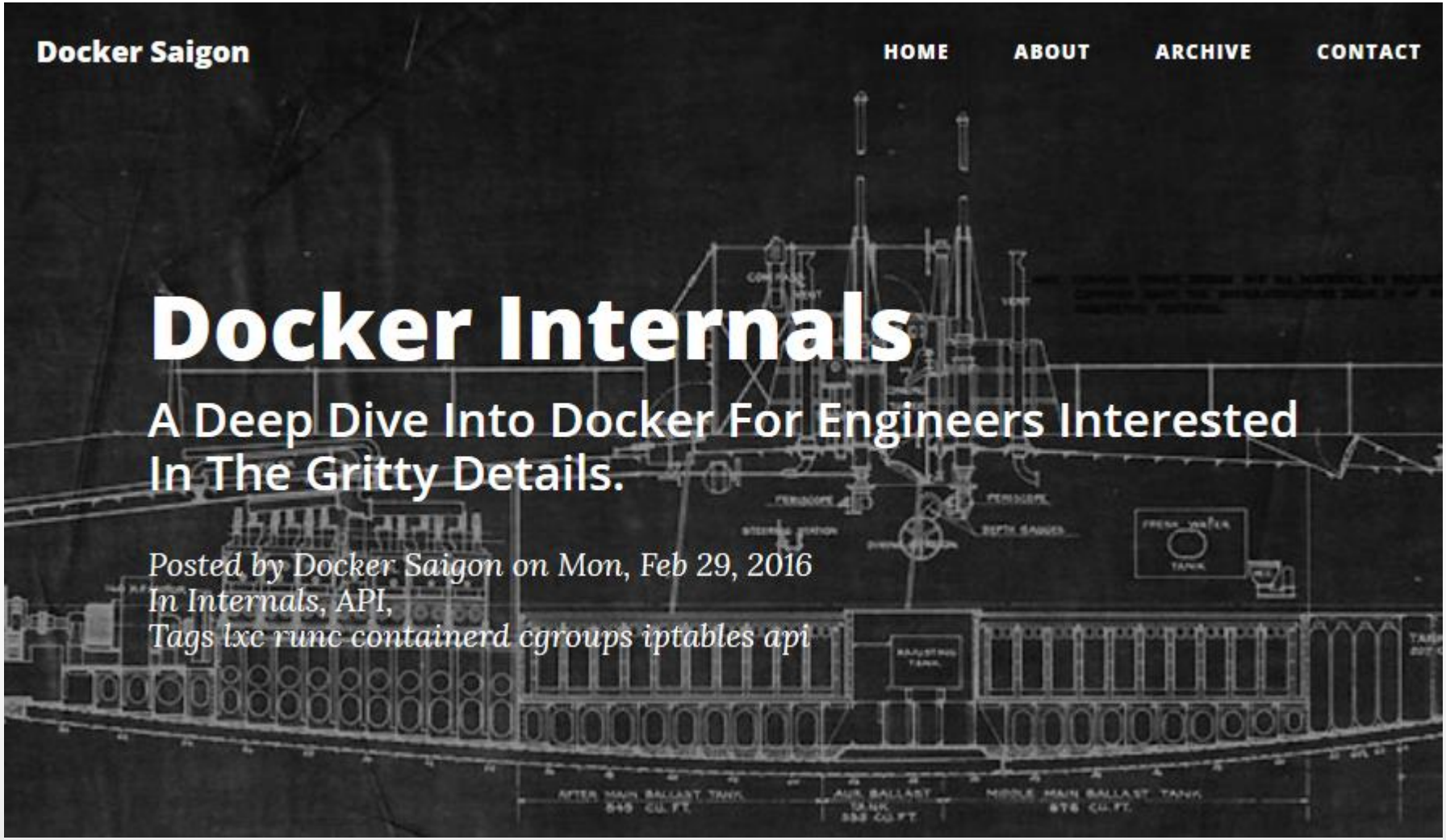
Linux Namespaces (Process isolation)



Linux Namespaces (Process isolation)

Namespaces	Functionality	What does it mean?
Mount	Isolate the set of FS mount points seen by processes	/tmp in container can be different in ns' Remount '/' read only within namespace
PID (process ID)	Process can have same PID in different NS (include PID1)	Process in NS can't see/interact with process outside All processes are visable in 'root' PID NS
Network	Isolate the networking stack: ip addr, routes, netfilter iptable rules	Each NS has its own private loopback IF Commonly used with virtual ethernet IF pair
UTS	Set a different host and domain names for NS	No impact to the rest of the system Useful when combined with Network NS
IPC	Private inter-process communication environment: message queues, semaphores, shared memory	Resources are only accessible within the Namespace

Docker Technical Deep Dive



http://docker-saigon.github.io/post/Docker-Internals/

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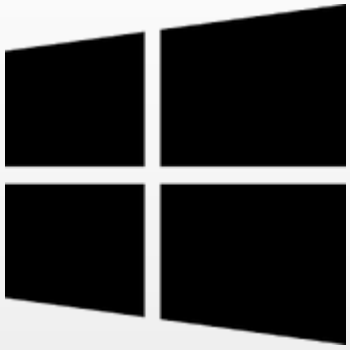
Docker is available for …



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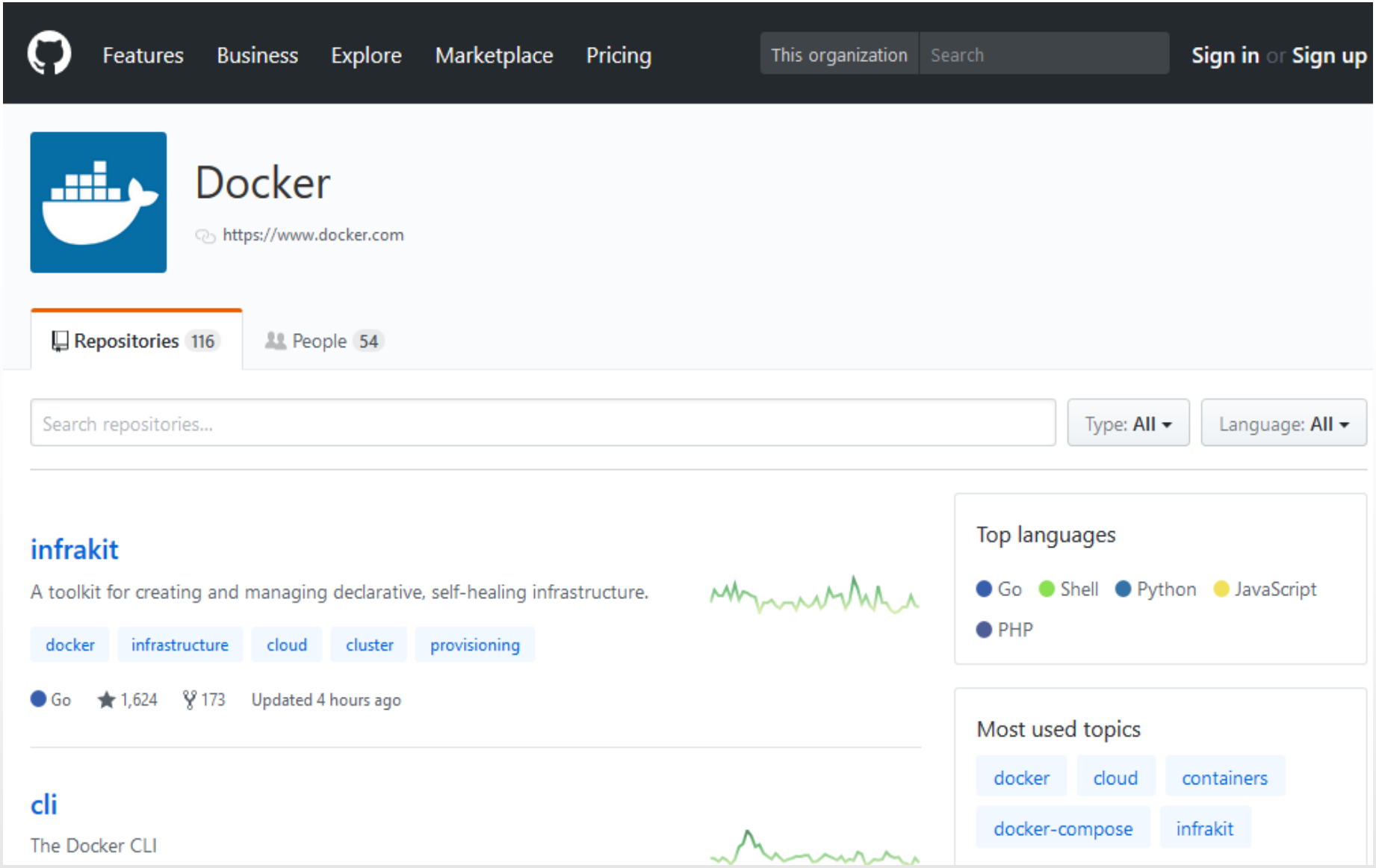
https://github.com/docker



Install Docker on Linux (RHEL 7)

```
curl -sSL https://get.docker.com/ | sh

systemctl enable docker

systemctl start docker
```

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Package Manager For Windows

Install Chocolatey

```
@echo off
SET DIR=%~dp0%

%systemroot%\System32\WindowsPowerShell\v1.0\powershell.exe
-NoProfile -ExecutionPolicy Bypass -Command "((new-object
net.webclient).DownloadFile
('https://chocolatey.org/install.ps1','install.ps1'))"

%systemroot%\System32\WindowsPowerShell\v1.0\powershell.exe
-NoProfile -ExecutionPolicy Bypass -Command "&
'%DIR%install.ps1' %*"
SET PATH=%PATH%;%ALLUSERSPROFILE%\chocolatey\bin
```

https://chocolatey.org/installchocolatey.cmd

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Chocolatey Packages

Home | About | Compare | Packages | Upload | Docs | Forum* | Shop* | Search Packages

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Chocolatey 0.10.7

By: ferventcoder gep13

```
C:\> choco install chocolatey
```

Chocolatey is a package manager for Windows (like apt-get but for Windows). It was designed to be a decentralized framework for quickly installing applications and tools that you need. It is built on the NuGet infrastructure currently using PowerShell as its focus for delivering packages from the distros to your door, err computer. Chocolatey is b... More information

77,070,047 downloads | Tags nuget apt-get machine repository chocolatey

Flash Player Plugin 26.0.0.131

By: William chocolatey purity

```
C:\> choco install flashplayerplugin
```

The Adobe Flash Player is freeware software for viewing multimedia, executing Rich Internet Applications, and streaming video and audio, content created on the Adobe Flash platform. ## Notes - This vendor versions software only by the latest major version so `-version` parameter wich targets specific minor version will always install latest minor... More information

5,886,051 downloads | Tags adobe flash player plugin freeware cross-platform browser admin

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Install Docker

- Docker for Windows (Stable)
  17.6.0.12627

```
choco install -y docker-for-windows

choco upgrade -y docker-for-windows

choco uninstall -y docker-for-windows
```

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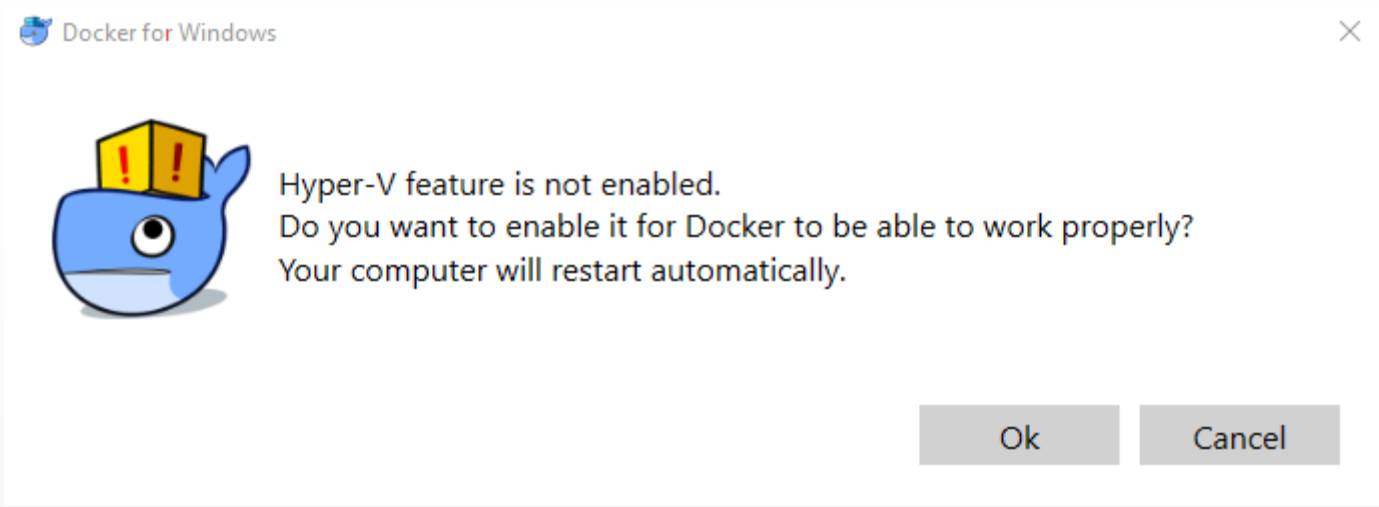
Docker on Windows 10



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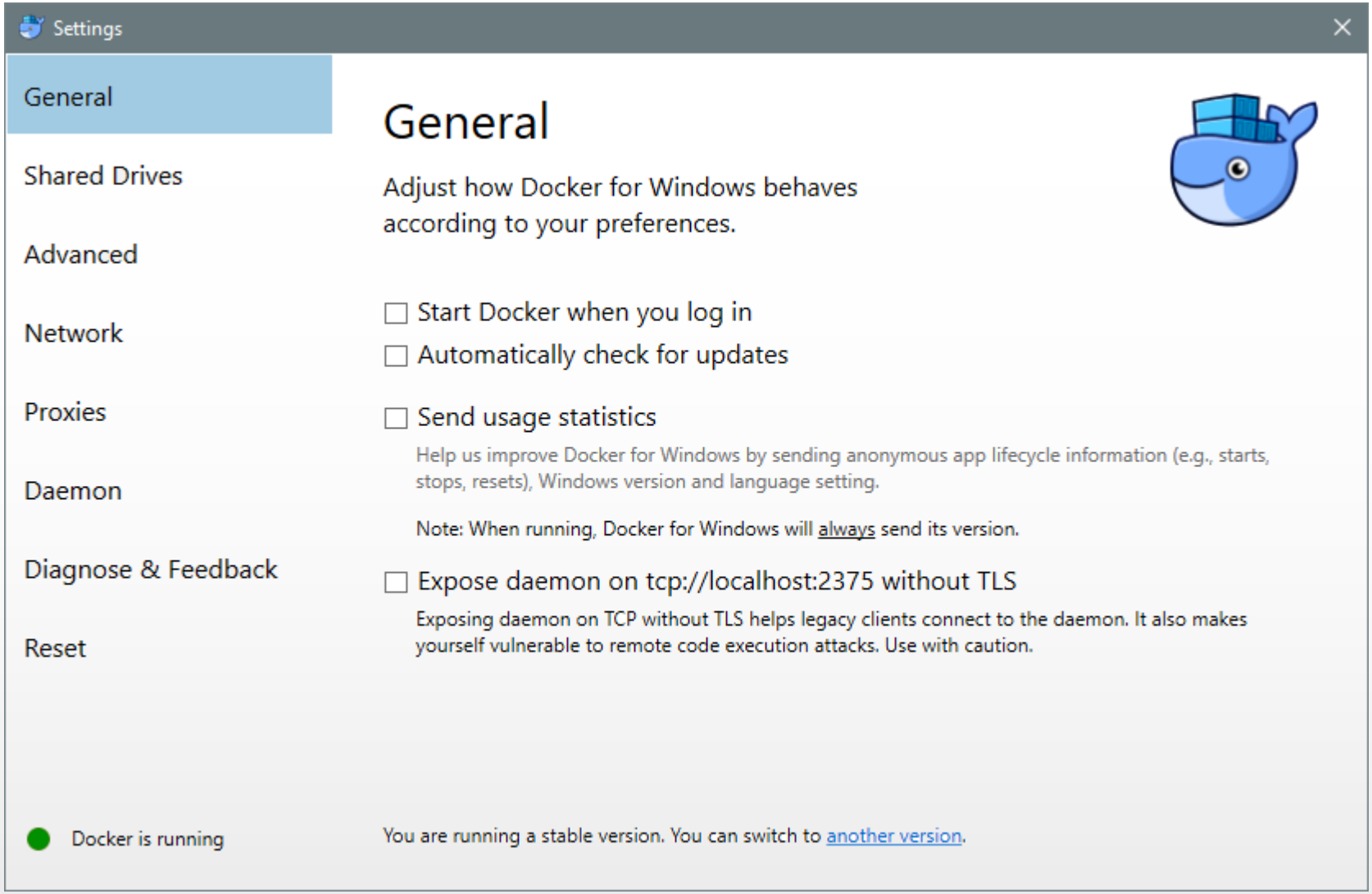
Docker Settings



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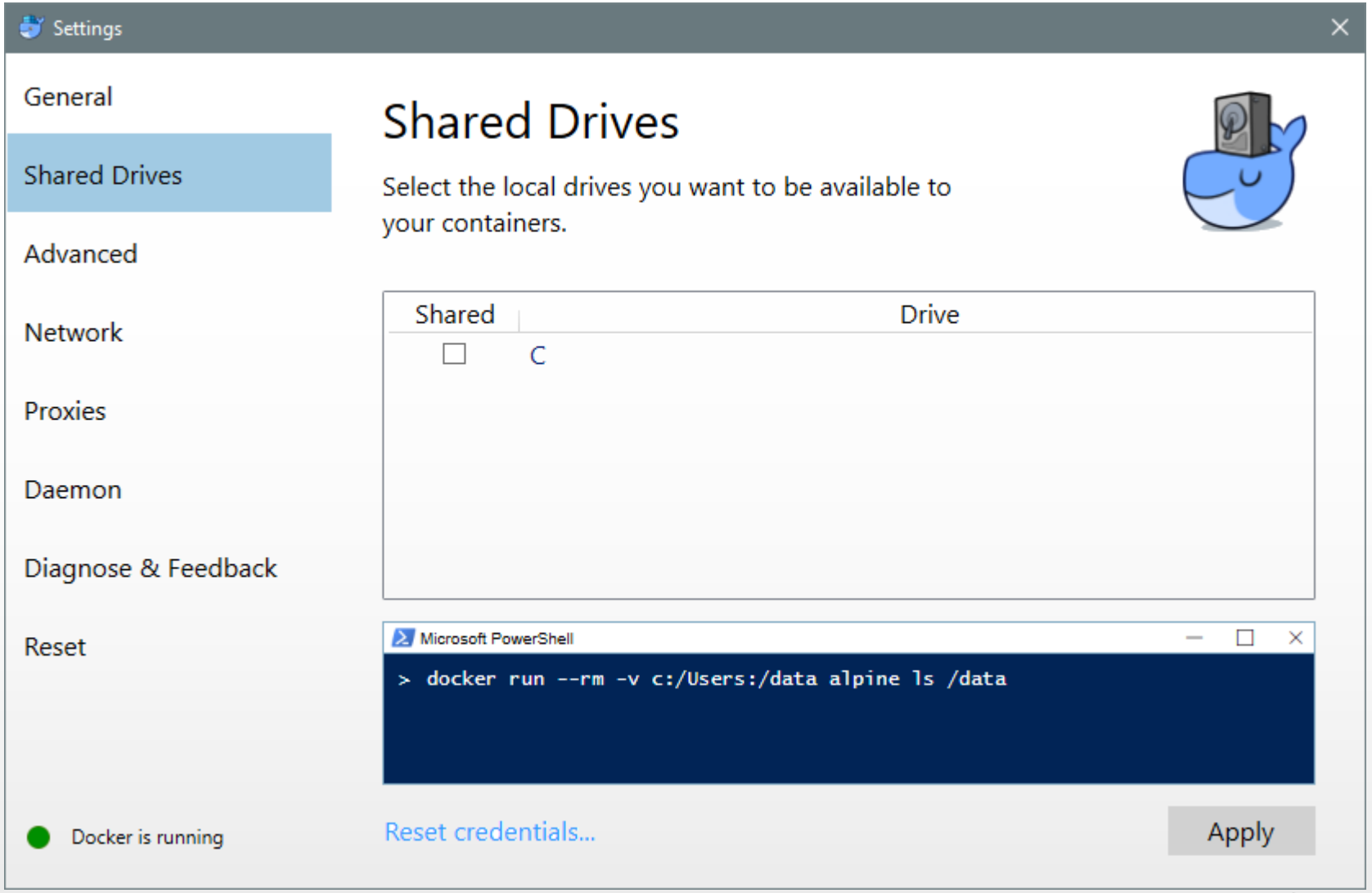
Docker Settings



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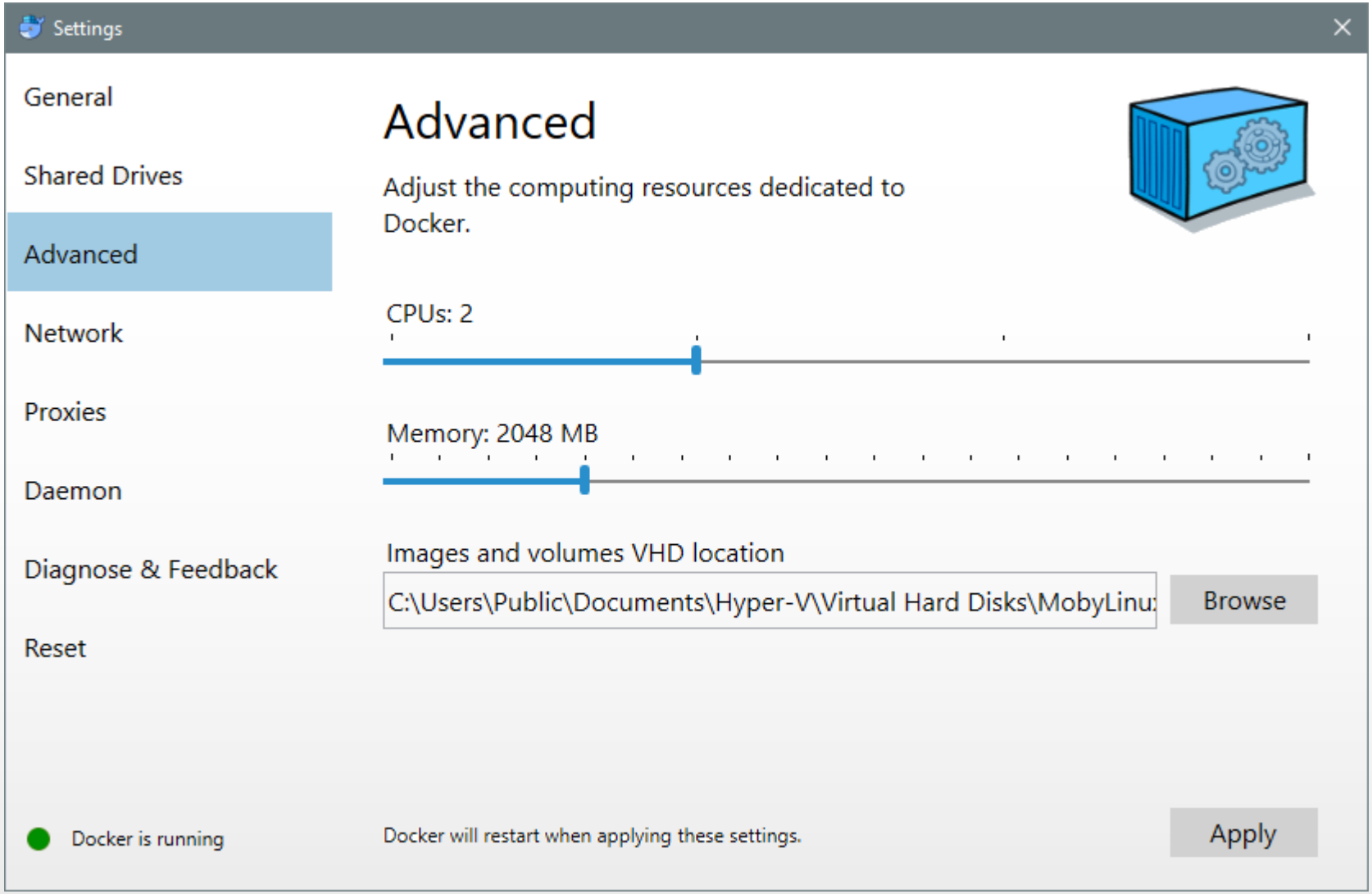
Docker Settings



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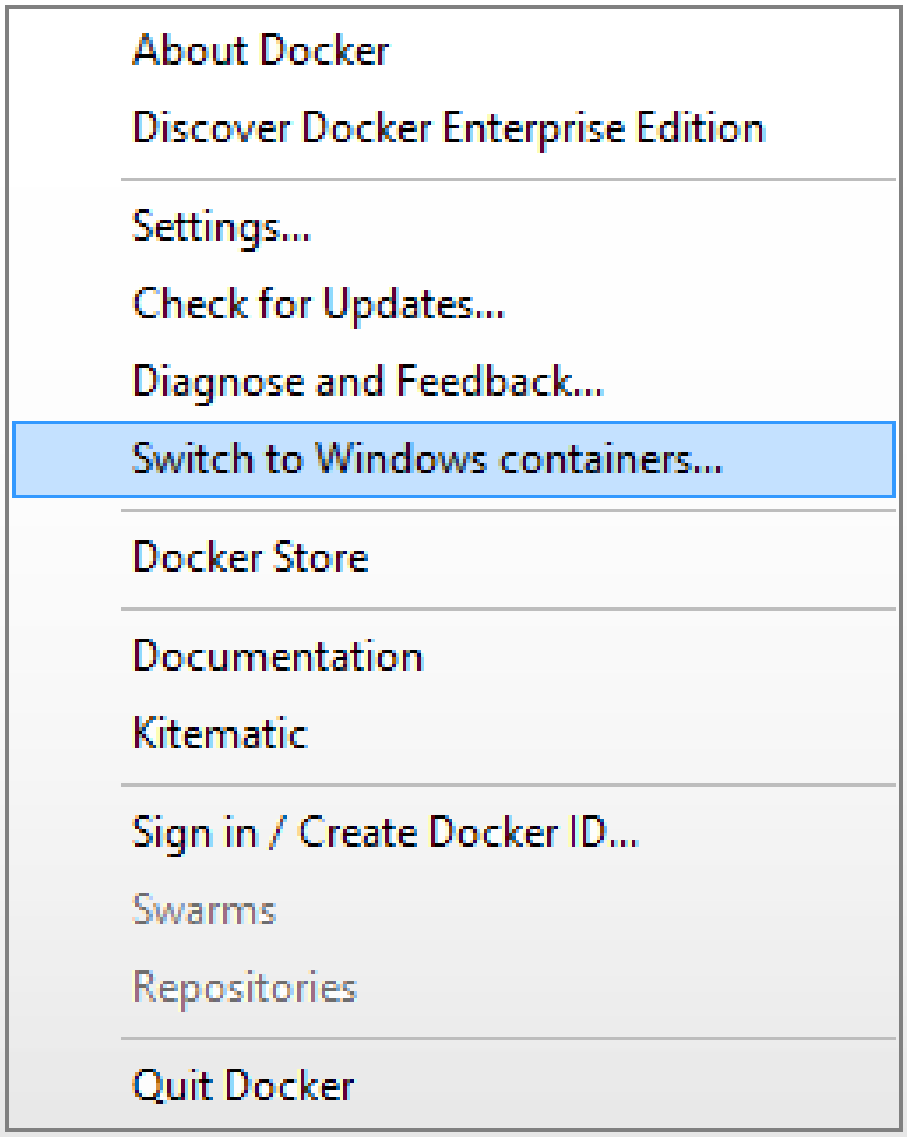
Using Windows Containers



https://stefanscherer.github.io/run-linux-**and**-windows-containers-on-windows-10/

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Check Docker Installation

```
docker version
Client:
 Version:      17.06.0-ce
 API version:  1.30
 Go version:   go1.8.3
 Git commit:   02c1d87
 Built:        Fri Jun 23 21:30:30 2017
 OS/Arch:      windows/amd64

Server:
 Version:      17.06.0-ce
 API version:  1.30 (minimum version 1.12)
 Go version:   go1.8.3
 Git commit:   02c1d87
 Built:        Fri Jun 23 21:51:55 2017
 OS/Arch:      linux/amd64
 Experimental: true
```

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Docker on Windows 2016

- Introduced at Microsoft Ignite Conference, Atlanta, 20-SEP-2016
  - https://blog.docker.com/2016/09/dockerforws2016/

- Docker Enterprise Edition for Windows Server is available for all Windows Server 2016 customers at no additional cost

- Consistent Docker user experience use the same commands as Docker for Linux environments

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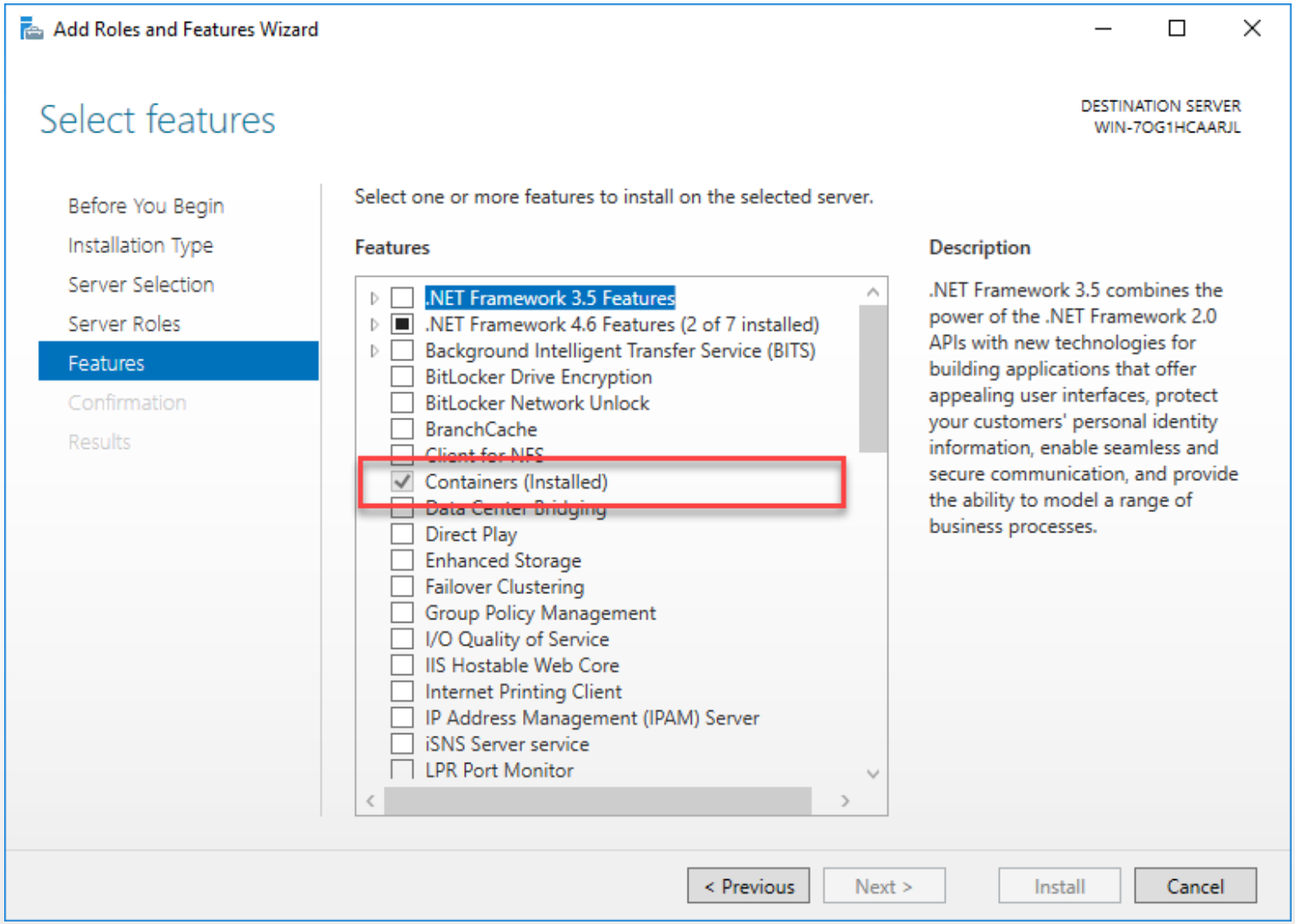
Docker on Windows 2016



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Docker on Windows 2016

```
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>docker run microsoft/sample-dotnet
'docker' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Administrator>
```

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Docker on Windows 2016

```
Install-PackageProvider -Name NuGet -MinimumVersion 2.8.5.201 -Force

Install-Module -Name DockerMsftProvider -Repository PSGallery -Force

Install-Package -Name docker -ProviderName DockerMsftProvider

Restart-Computer -Force
```

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Docker on Windows 2016

```
docker version
Client:
 Version:      17.03.1-ee-3
 API version:  1.27
 Go version:   go1.7.5
 Git commit:   3fcee33
 Built:        Thu Mar 30 19:31:22 2017
 OS/Arch:      windows/amd64

Server:
 Version:      17.03.1-ee-3
 API version:  1.27 (minimum version 1.24)
 Go version:   go1.7.5
 Git commit:   3fcee33
 Built:        Thu Mar 30 19:31:22 2017
 OS/Arch:      windows/amd64
 Experimental: false
```

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Docker on Windows 2016

```
PS C:\Users\Administrator> docker images
REPOSITORY              TAG                 IMAGE ID            CREATED             SIZE
microsoft/nanoserver    latest              6c367cf4cb98        2 months ago        1.02 GB
PS C:\Users\Administrator> _
```

SIZE
1.02 GB

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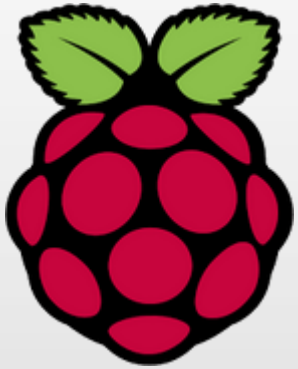
Docker on Raspberry Pi

- Update to Debian 8 (Jessie)
  - $ sudo sed -i 's/wheezy/jessie/' /etc/apt/sources.list
  - $ sudo sed -i 's/wheezy/jessie/' /etc/apt/sources.list.d/raspi.list
  - $ sudo apt-get update && sudo apt-get -y upgrade
  - $ sudo apt-get -y dist-upgrade
  - $ sudo reboot
  - $ sudo apt-get -y autoremove
  - $ sudo apt-get -y purge $(dpkg -l | awk '/^rc/ { print $2 }')
  - $ sudo reboot



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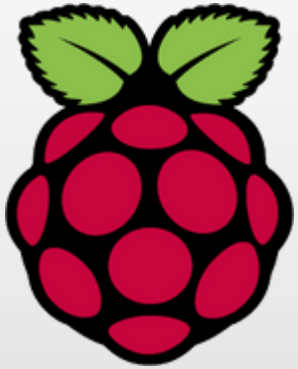
Docker on Raspberry Pi

- Install Docker

  - $ curl -ks https://packagecloud.io/install/repositories/Hypriot/Schatzkiste/script.deb.sh | sudo bash
  - $ sudo apt-get install docker-hypriot=1.10.3-1
  - $ sudo usermod -aG docker $(whoami)
  - $ sudo systemctl enable docker.service
  - $ sudo reboot



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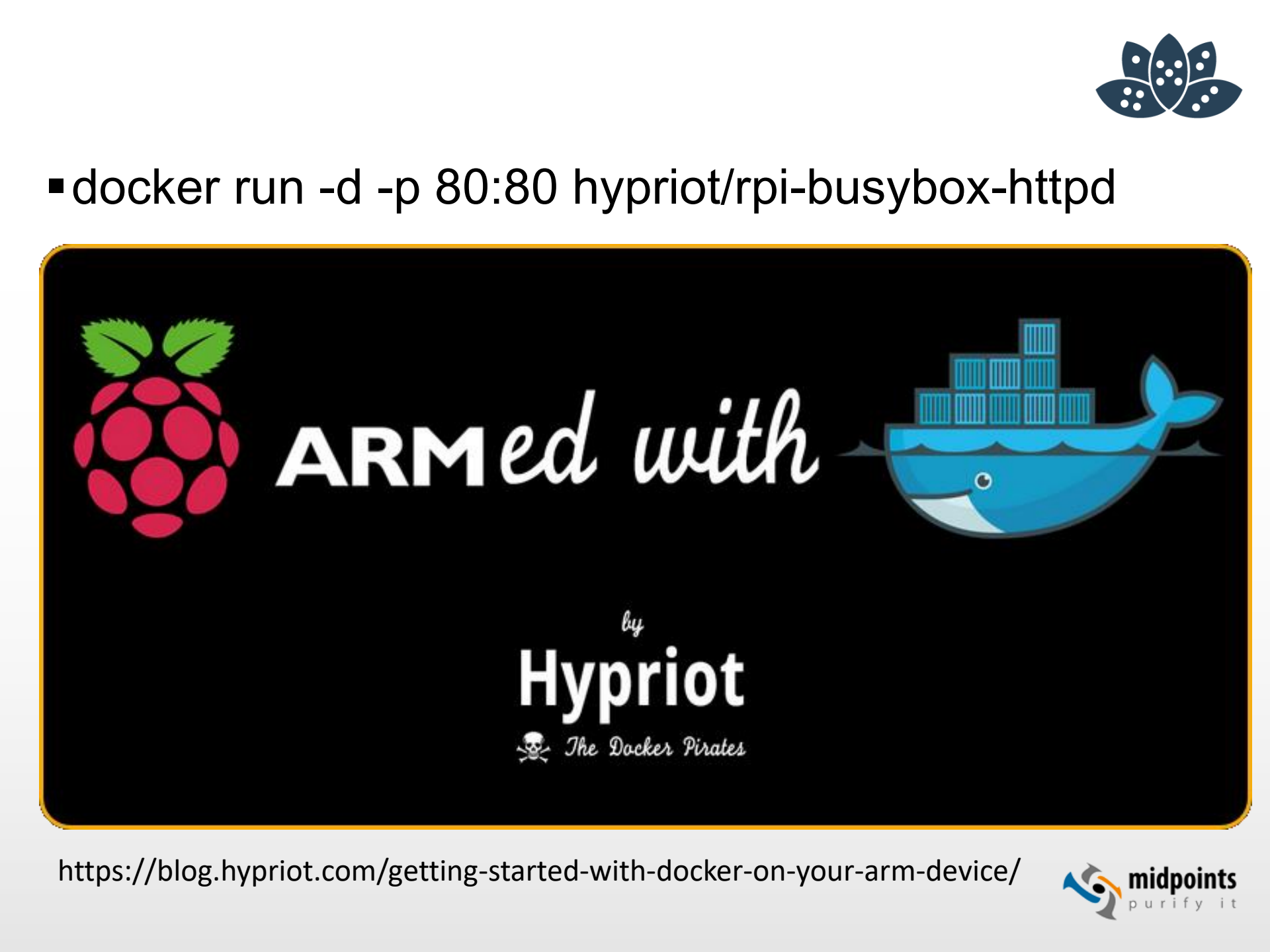

- docker run -d -p 80:80 hypriot/rpi-busybox-httpd

https://blog.hypriot.com/getting-started-with-docker-on-your-arm-device/

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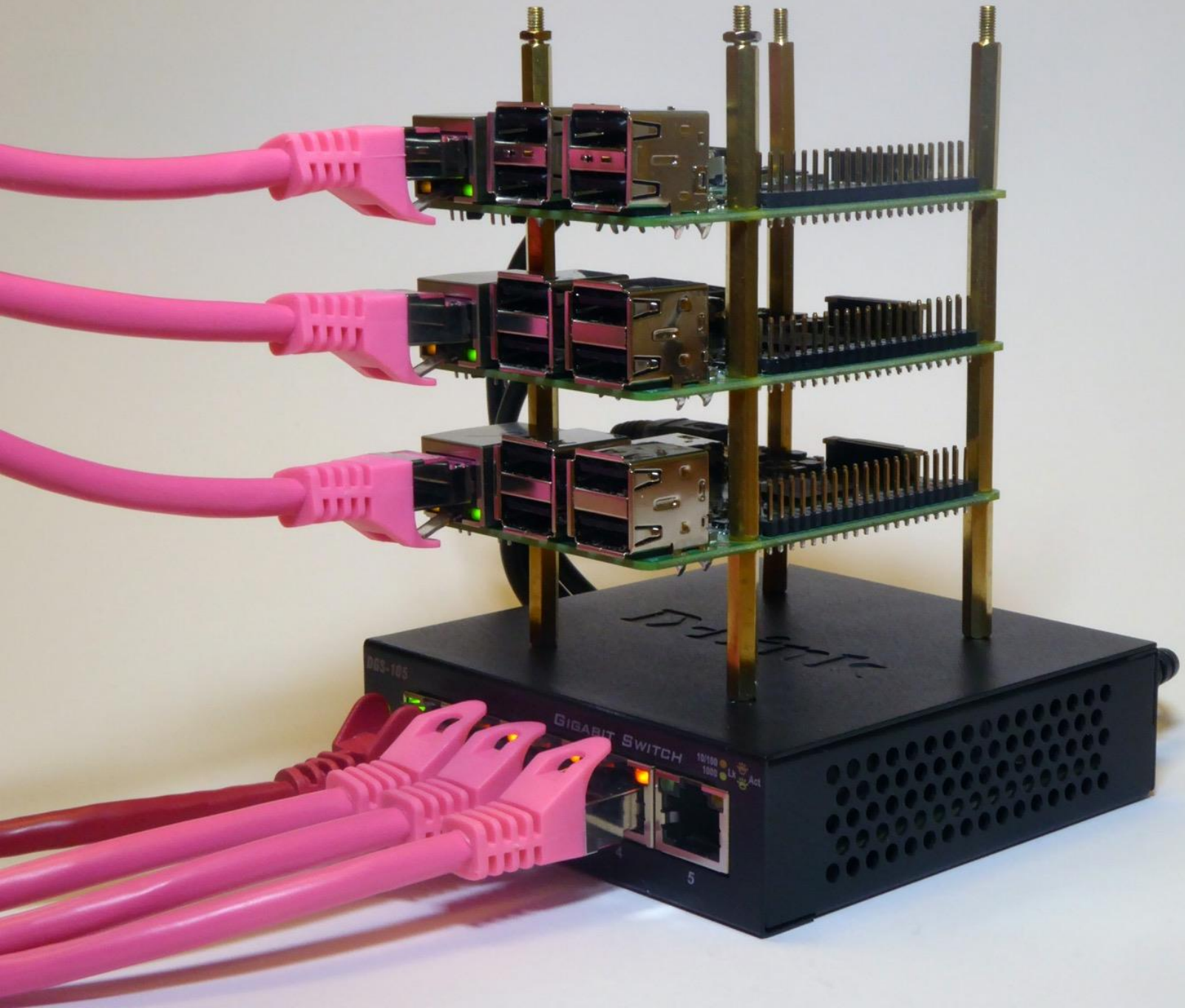
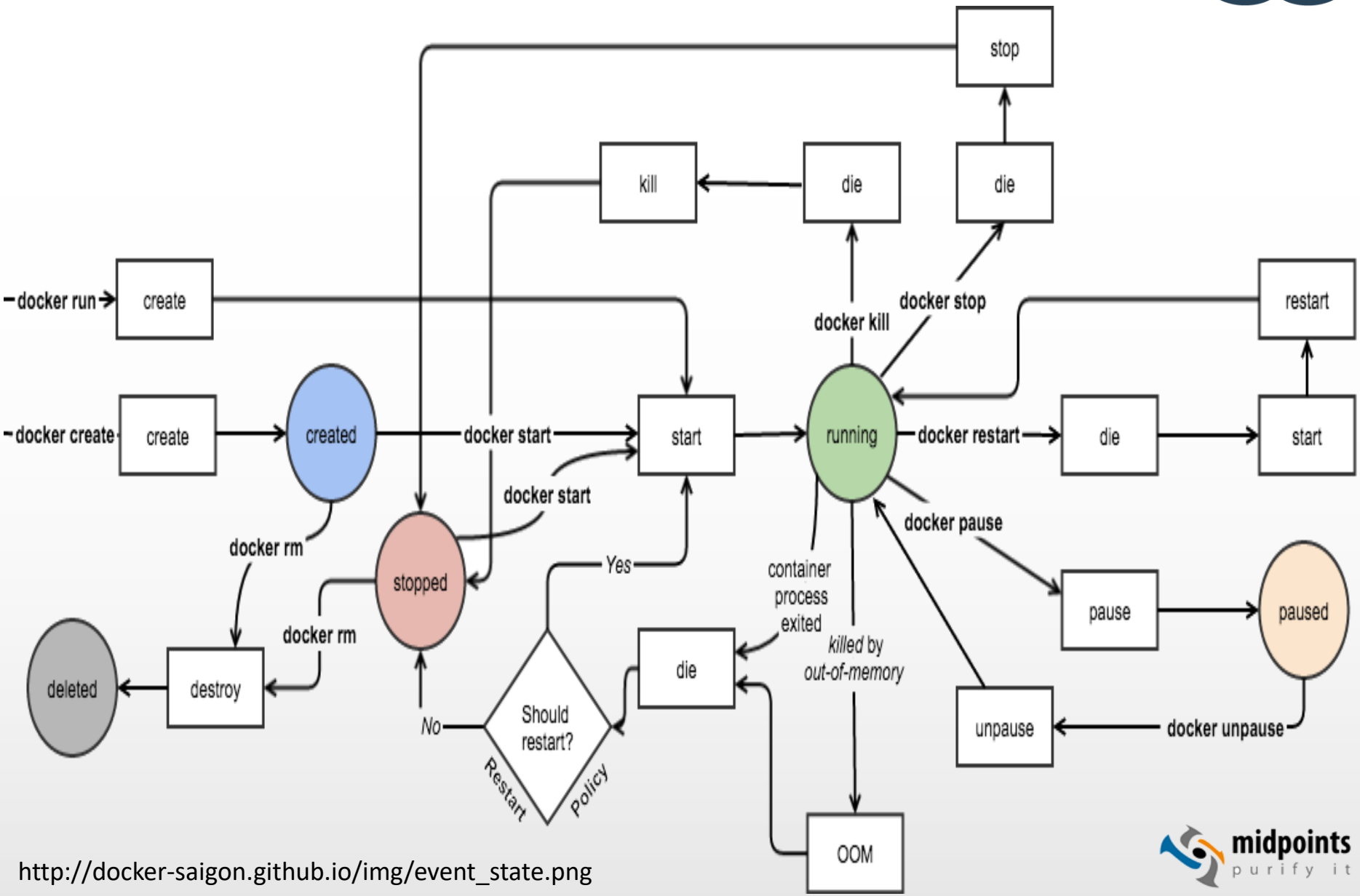

GIGABIT SWITCH
10/100
1000
Act
5

Container lifecycle



http://docker-saigon.github.io/img/event_state.png

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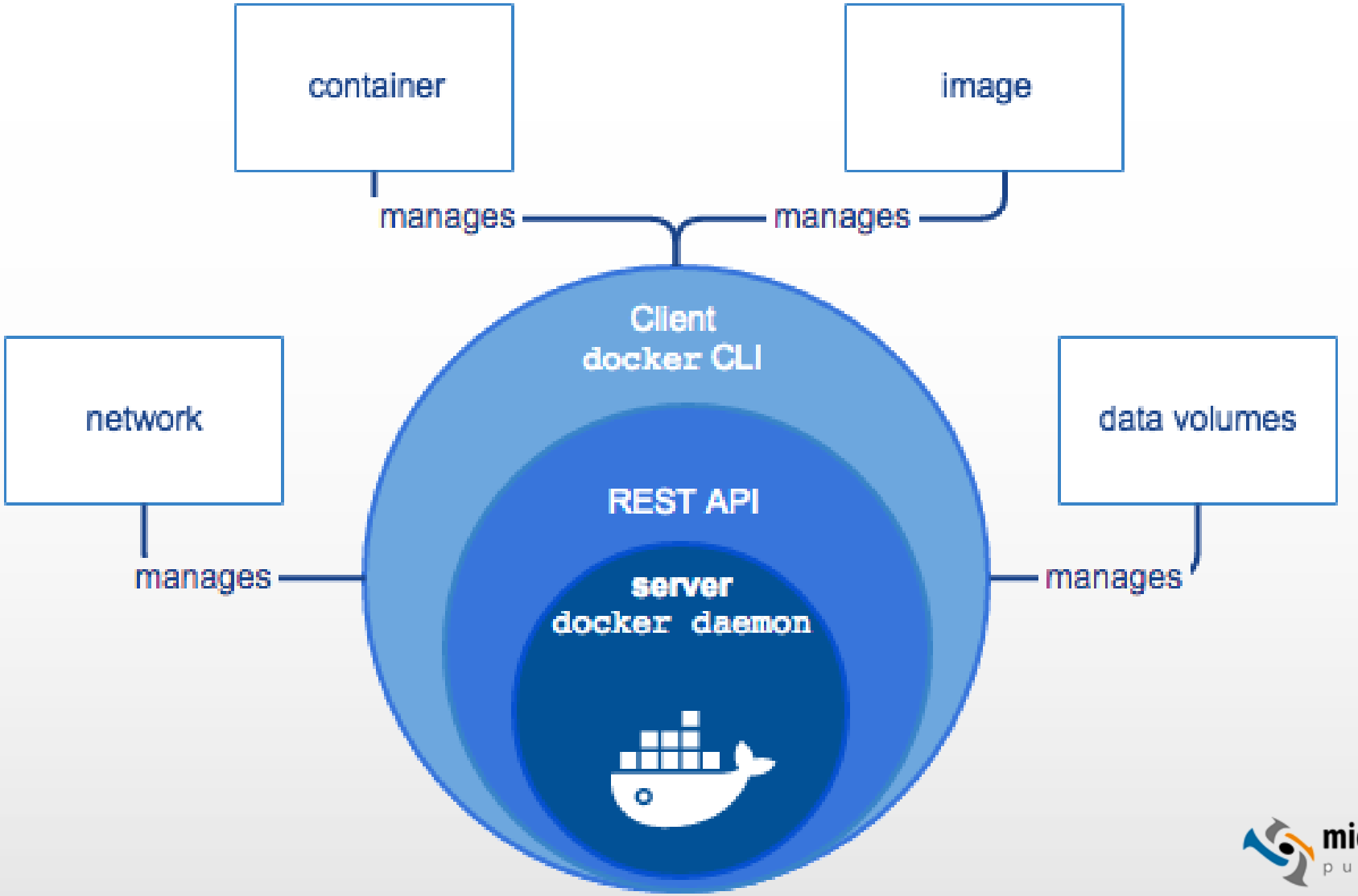
Docker Engine



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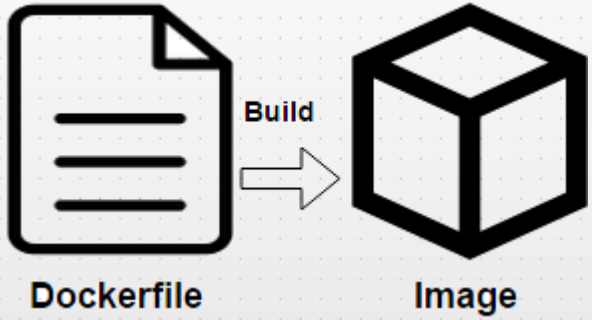
Dockerfile

- Docker can build images automatically by reading the instructions from a **Dockerfile**.
- A **Dockerfile** is a text document that contains all the commands a user could call on the command line to assemble an image.
- Using *docker build* users can create an automated build that executes several command-line instructions in succession.



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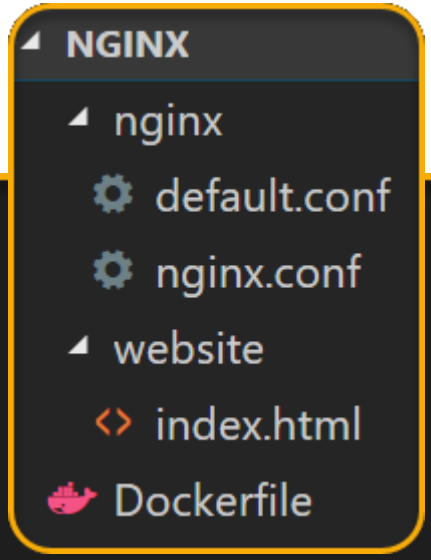
Dockerfile Example




```
FROM alpine:3.2
MAINTAINER Ulich Krause
RUN apk add --update nginx
RUN rm -rf /var/cache/apk/*
RUN mkdir -p /tmp/nginx/client-body
COPY nginx/nginx.conf /etc/nginx/nginx.conf
COPY nginx/default.conf /etc/nginx/conf.d/default.conf
COPY website /usr/share/nginx/html
CMD ["nginx", "-g", "daemon off;"]
```

```
docker build -t eknori/docker:nginx-minimal -f Dockerfile .
```

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nginx.conf & default.conf

```
user nginx;
worker_processes 1;
error_log /var/log/nginx/error.log warn;

pid /var/run/nginx.pid; events {
    worker_connections 1024;
}

http {
    include /etc/nginx/mime.types;
    default_type application/octet-stream;
    log_format main '$remote_addr - $remote_user [$time_local] "$request" '
                    '$status $body_bytes_sent "$http_referer" '
                    '"$http_user_agent" "$http_x_forwarded_for"';
    access_log /var/log/nginx/access.log main;
    sendfile off;
    #tcp_nopush on;
    keepalive_timeout 65;
    #gzip on;
    include /etc/nginx/conf.d/*.conf;
}
```

```
server {
  location / {
     proxy_pass https://dmb.eu-gb.mybluemix.net/;
     proxy_set_header  X-Real-IP  $remote_addr;  }
  }
```

Building, step by step

```
Sending build context to Docker daemon 6.656 kB
Step 1 : FROM alpine:3.2
Trying to pull repository registry.access.redhat.com/alpine ...
Trying to pull repository docker.io/library/alpine ...
3.2: Pulling from docker.io/library/alpine
4d81bcbc8486: Pull complete
Digest: sha256:19826d59171c2eb7e90ce52bfd822993bef6a6fe3ae6bb4a49f8c1d0a01e99c7
 ---> 39be345c901f
Step 2 : MAINTAINER Ulich Krause
 ---> Running in aa69317a4715
 ---> f392c61b1dea
Removing intermediate container aa69317a4715
Step 3 : RUN apk add --update nginx &&     rm -rf /var/cache/apk/*
 ---> Running in c7d27898c0cb
fetch http://dl-cdn.alpinelinux.org/alpine/v3.2/main/x86_64/APKINDEX.tar.gz
(1/2) Installing pcre (8.38-r0)
(2/2) Installing nginx (1.8.1-r1)
Executing nginx-1.8.1-r1.pre-install
Executing busybox-1.23.2-r1.trigger
OK: 7 MiB in 17 packages
 ---> ccf96a9db0d0
Removing intermediate container c7d27898c0cb
```

Building: more steps

```
Step 4 : RUN mkdir -p /tmp/nginx/client-body
 ---> Running in 73e7cd1eb3bb
 ---> 0031e3a17027
Removing intermediate container 73e7cd1eb3bb
Step 5 : COPY nginx/nginx.conf /etc/nginx/nginx.conf
 ---> bf54d891f1e1
Removing intermediate container 4ee029f0eb6f
Step 6 : COPY nginx/default.conf /etc/nginx/conf.d/default.conf
 ---> 7e56dd1ddef0
Removing intermediate container 3dd60c707500
Step 7 : COPY website /usr/share/nginx/html
 ---> 97fdef31e51a
Removing intermediate container 1e03479bbfa2
Step 8 : CMD nginx -g daemon off;
 ---> Running in c961a947cba0
 ---> fa7eaa8143af
Removing intermediate container c961a947cba0
Successfully built fa7eaa8143af
```

Docker history (image)

```
# docker history fa7eaa8143af

IMAGE          CREATED         CREATED BY                                      SIZE
fa7eaa8143af   17 minutes ago  /bin/sh -c #(nop) CMD ["nginx" "-g" "daemon     0 B
97fdef31e51a   17 minutes ago  /bin/sh -c #(nop) COPY dir:23a37af30d5a3e9900   108 B
7e56dd1ddef0   17 minutes ago  /bin/sh -c #(nop) COPY file:b73879743d5c4eb06   129 B
bf54d891f1e1   17 minutes ago  /bin/sh -c #(nop) COPY file:e40173fe00b0a7150   602 B
0031e3a17027   17 minutes ago  /bin/sh -c mkdir -p /tmp/nginx/client-body      0 B
ccf96a9db0d0   17 minutes ago  /bin/sh -c apk add --update nginx &&     rm -   1.476 MB
f392c61b1dea   17 minutes ago  /bin/sh -c #(nop)  MAINTAINER Ulich Krause      0 B
39be345c901f   8 weeks ago     /bin/sh -c #(nop)  CMD ["/bin/sh"]              0 B
<missing>      8 weeks ago     /bin/sh -c #(nop) ADD file:e60fa9779445e1fe86   5.264 MB
```

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Docker images (-a)

```
# docker images

REPOSITORY      TAG             IMAGE ID       CREATED          SIZE
eknori/docker   nginx-minimal   fa7eaa8143af   12 minutes ago   6.742 MB


# docker images -a

REPOSITORY      TAG             IMAGE ID       CREATED          SIZE
eknori/docker   nginx-minimal   fa7eaa8143af   15 minutes ago   6.742 MB
<none>          <none>          97fdef31e51a   15 minutes ago   6.742 MB
<none>          <none>          7e56dd1ddef0   15 minutes ago   6.742 MB
<none>          <none>          bf54d891f1e1   15 minutes ago   6.741 MB
<none>          <none>          0031e3a17027   15 minutes ago   6.741 MB
<none>          <none>          ccf96a9db0d0   15 minutes ago   6.741 MB
<none>          <none>          f392c61b1dea   15 minutes ago   5.264 MB
```

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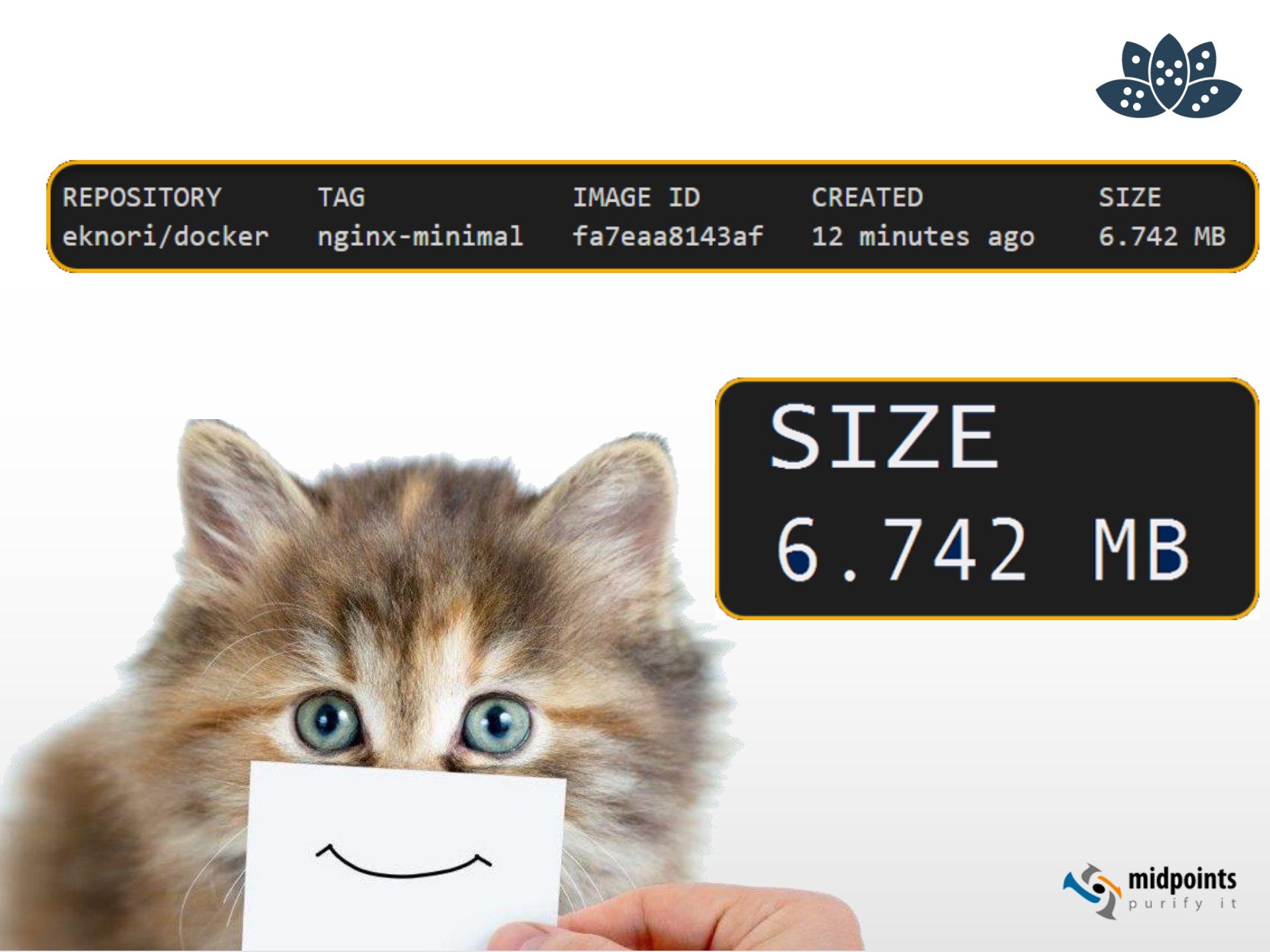
REPOSITORY TAG IMAGE ID CREATED SIZE
eknori/docker nginx-minimal fa7eaa8143af 12 minutes ago 6.742 MB
SIZE
6.742 MB
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Docker run & Docker ps -a

```
# docker run -it -p 8888:80 --name nginx eknori/docker:nginx-minimal



# docker ps -a
CONTAINER ID  IMAGE                          COMMAND                  CREATED
8918f6f22172  eknori/docker:nginx-minimal "nginx -g 'daemon off" 4 minutes ago

              STATUS         PORTS                    NAMES
              Up 4 minutes   0.0.0.0:8888->80/tcp     nginx
```

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http://foo.bar.tld:8888

IBM Domino meets Bluemix

- Home
- Watson Services
  - Text To Speech
  - Textübersetzung
  - Sprachklassifizierung

IBM Domino Bluemix Integration Beispiel

Diese IBM Domino Anwendung verwendet eine Reihe von unterschiedlichen Services aus dem IBM Bluemix Katalog.

Sie basiert auf dem XPages Fusion Application Project und wurde um den Dienst Sprachklassifikation und um deutsche Sprachelemente erweitert.

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Docker start & Docker stop

```
# docker start 8918f6f22172
8918f6f22172

# docker stop 8918f6f22172
8918f6f22172

    STATUS
    Exited (0) 29 seconds ago
```

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Docker Registry

- There are 3 choices for use of a Registry
  - A Public Cloud-hosted registry. The Docker Hub is the default registry used by the docker client and source of Officially maintained Docker images, however alternatives exists such as Quay.io. Limited Private repositories may be created or purchased to enable a quick Docker adoption.
  - An On-premise registry, through the commercially offered Trusted Docker Registry, providing advanced configuration options, Logging, usage and system health metrics and much more…
  - A Self-hosted registry based on the official Open Source Docker Registry. This is a fully functional Registry which you can fully setup by yourself and is the basis on which the Docker Trusted Registry is built, but it does not provide advanced monitoring & access control as well as requires manual maintenance.

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Nexus Repository OSS

https://www.sonatype.com/docker
https://www.ivankrizsan.se/2016/06/09/create-a-private-docker-registry/

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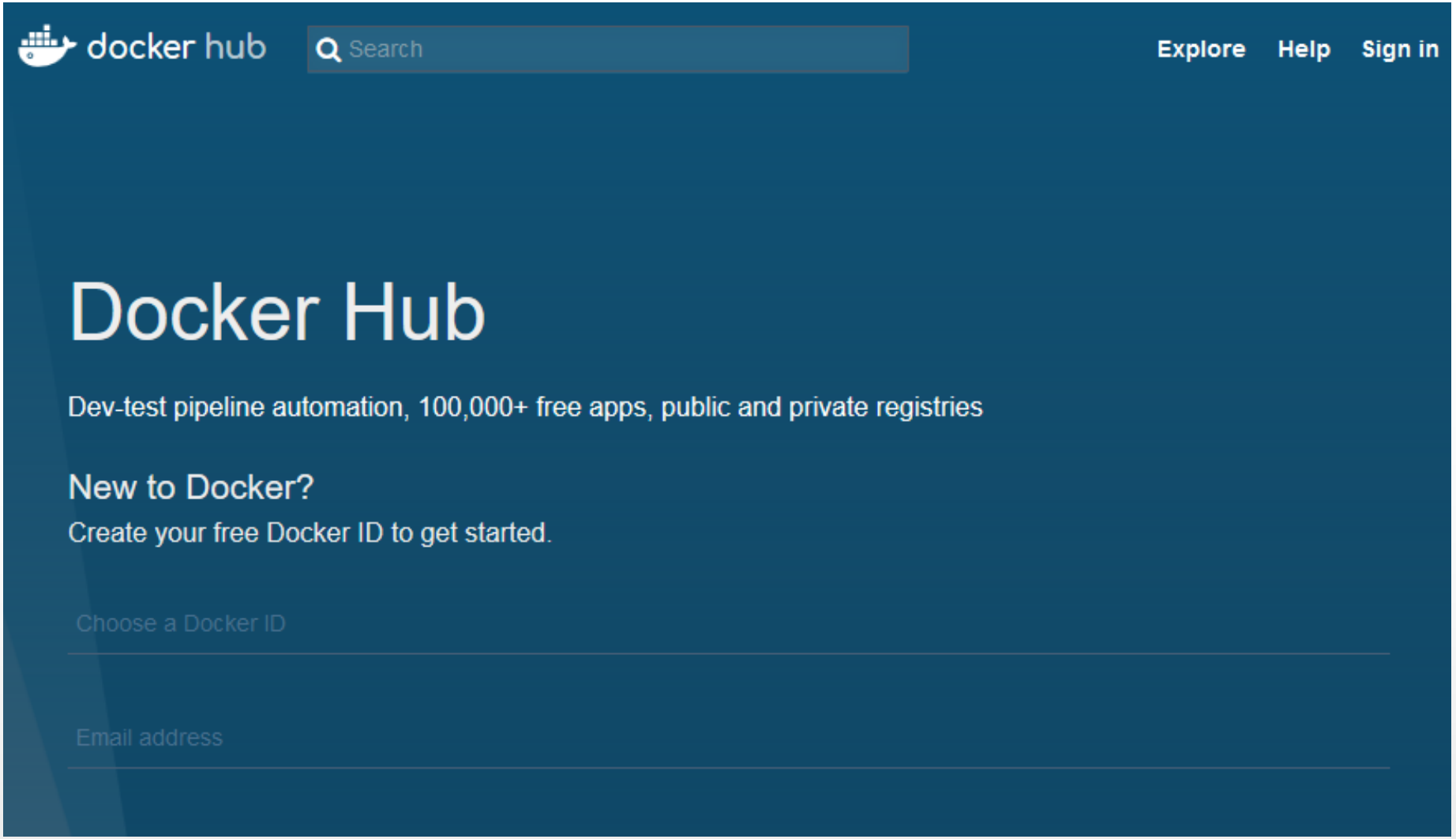
https://hub.docker.com/



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Docker login

- docker login -u eknori https://index.docker.io/v1/

- Erstellt / aktualisiert config.json in ~/.docker

```
  GNU nano 2.3.1                                File: config.json

{
        "auths": {
                "https://index.docker.io/v1/": {
                        "auth": "ZWtub3JpOlNpZ3JpZDAwMQ=="
                }
        }
}
```

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Tag image

```
# docker build -t nginx-minimal -f Dockerfile .

# docker images

REPOSITORY      TAG             IMAGE ID      CREATED          SIZE
nginx-minimal   latest          338f05f8f4da  6 seconds ago    6.742 MB

# docker tag 338f05f8f4da eknori/docker:nginx-minimal

# docker images

REPOSITORY      TAG             IMAGE ID      CREATED          SIZE
eknori/docker   nginx-minimal   338f05f8f4da  3 minutes ago    6.742 MB
nginx-minimal   latest          338f05f8f4da  3 minutes ago    6.742 MB
```

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Push Image

```
# docker push eknori/docker:nginx-minimal

The push refers to a repository [docker.io/eknori/docker]
3cdcfe12ccdf: Pushed
2cca2319326a: Pushed
09ddfe882dc2: Pushed
9419805b2450: Pushed
2e352b632e3e: Pushed
77bb3ffa4bc3: Pushed
nginx-minimal: digest: sha256:d588601bde9824fa9aa86de9b811 ... size: 1566
```

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F@!#!!, an issue …


```
# docker push eknori/docker:nginx-minimal

The push refers to a repository [registry.access.redhat.com/eknori/eknori/docker]

b07a4e9320f9: Preparing
c7c46ef08857: Preparing
9ed48b0e340d: Preparing
b66ed4eb6b27: Preparing
77bb3ffa4bc3: Waiting
error parsing HTTP 405 response body: invalid character '<' looking for beginning
of value: "<!DOCTYPE HTML PUBLIC \"-//W3C//DTD HTML 3.2 Final//EN\">\n<title>
405 Method Not Allowed</title>\n<h1>Method Not Allowed</h1>\n<p>The method POST
is not allowed for the requested URL.</p>\n"
```

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… and how to resolve it

```
# nano /etc/sysconfig/docker

...

# If you want to add your own registry to be used for docker search and docker
# pull use the ADD_REGISTRY option to list a set of registries, each prepended
# with --add-registry flag. The first registry added will be the first registry
# searched.
# ADD_REGISTRY='--add-registry registry.access.redhat.com'

...
```

Add # to disable

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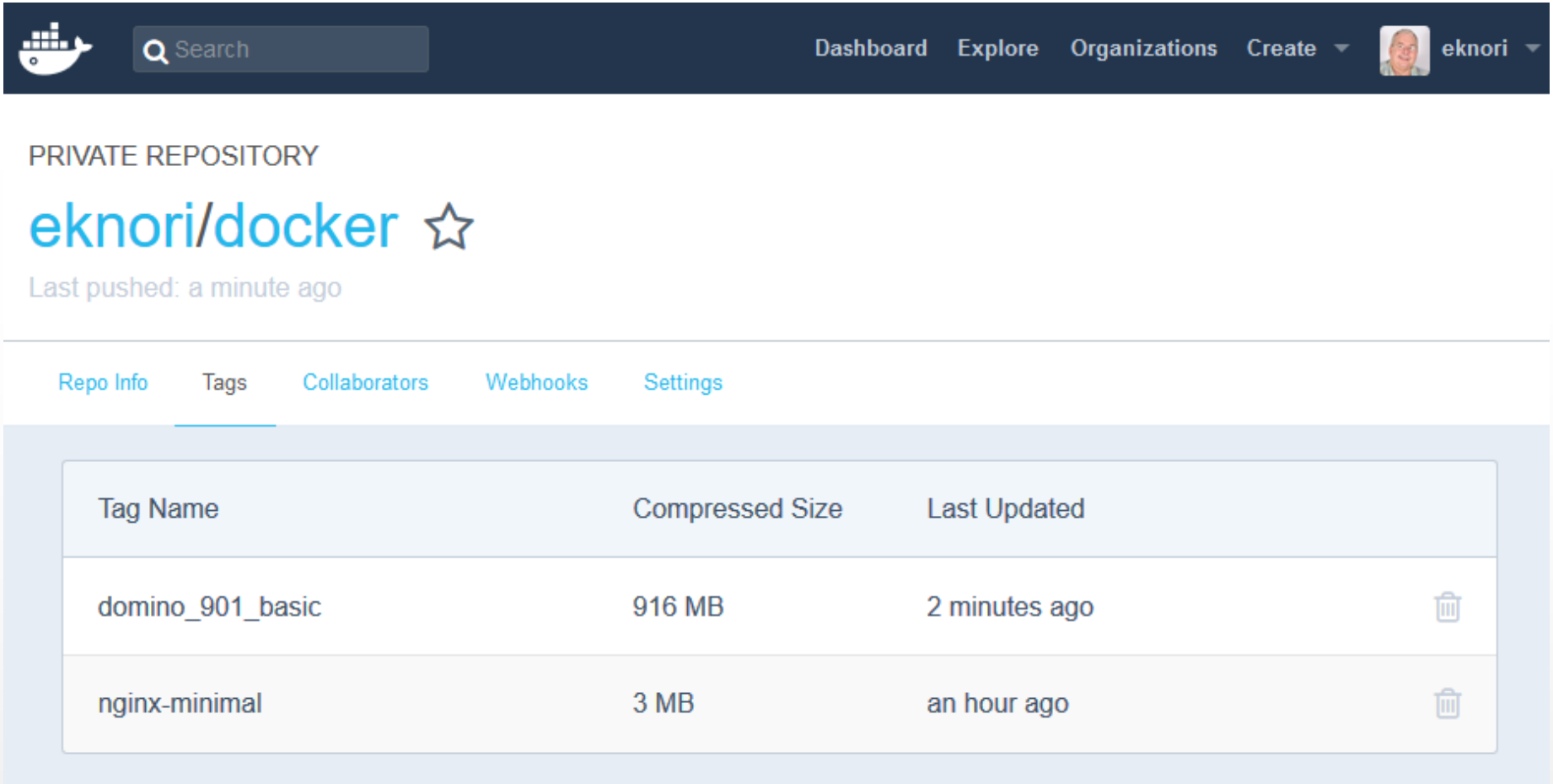
https://hub.docker.com



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Domino & Docker Support

BillMal Your Lotus Pal

IBM Domino and Docker Support Announced

mwlug

Bill Malchisky August 15 2017 08:00:00 PM

During Barry Rosen's Future directions on Notes/Domino session and again during our Linuxfest DC session last week at MWLUG, **IBM announced that they will support Domino on Docker with Domino 9.0.1 FP10**. Originally, this support would be announced in 2018, but due to the success of the IBM Application Insights Survey announced at Engage, IBM changed their task priorities and accelerated Docker support based upon your input.

FP10 is scheduled to be released by EOY 2017. The next question is, "What does support imply?" Currently, if you call IBM and ask them for support and tell them you are running Domino in a Docker container on Linux, you will be told, "That configuration is not supported." Once FP10 is released, you can use Domino on Docker as a valid platform.

Next, I asked Barry about supporting as a deliverable a Docker image file. Thus, "Will be be able to type, '`docker pull domino`' and get an image?" He replied that is not part of the original plan, but under consideration.

Archives

August 2017 (4)
June 2017 (1)
May 2017 (5)
April 2017 (1)
February 2017 (2)
January 2017 (1)

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Domino on Docker

- domino901
  - resources
    - initscripts
    - serverconfig
      - domino901_response.dat
  - Dockerfile
- domino901FP9
  - resources
    - serverconfig
      - domino901_fp9_response.dat
  - Dockerfile
- setup_domino
  - resources
    - docker-entrypoint.sh
  - Dockerfile

Domino on Docker (Domino 9.0.1 image) Pt1

```
FROM centos

ENV DOM_SCR=resources/initscripts
ENV DOM_CONF=resources/serverconfig
ENV NUI_NOTESDIR /opt/ibm/domino/

RUN yum update -y && \
    yum install -y which && \
    yum install -y nano && \
    yum install -y wget && \
    yum install -y perl && \
    useradd -ms /bin/bash notes && \
    usermod -aG notes notes && \
    usermod -d /local/notesdata notes && \
    sed -i '$d' /etc/security/limits.conf && \
    echo 'notes soft nofile 60000' >> /etc/security/limits.conf && \
    echo 'notes hard nofile 80000' >> /etc/security/limits.conf && \
    echo '# End of file' >> /etc/security/limits.conf
```

purify it

Domino on Docker (Domino 9.0.1 image) Pt2

```
COPY ${DOM_CONF}/ /tmp/sw-repo/serverconfig

RUN mkdir -p /tmp/sw-repo/ && \
    cd /tmp/sw-repo/ && \
    wget -q http://<your_repo>/DOMINO_9.0.1_64_BIT_LIN_XS_EN.tar && \
    tar -xf DOMINO_9.0.1_64_BIT_LIN_XS_EN.tar &&\
    cd /tmp/sw-repo/linux64/domino && \
    /bin/bash -c "./install -silent -options
    /tmp/sw-repo/serverconfig/domino901_response.dat" && \
    cd / && \
    rm /tmp/* -R
```

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Domino on Docker (Domino 9.0.1 image) Pt3

```
RUN mkdir -p /etc/sysconfig/
COPY ${DOM_SCR}/rc_domino /etc/init.d/
RUN chmod u+x /etc/init.d/rc_domino && \
    chown root.root /etc/init.d/rc_domino
COPY ${DOM_SCR}/rc_domino_script /opt/ibm/domino/
RUN chmod u+x /opt/ibm/domino/rc_domino_script && \
    chown notes.notes /opt/ibm/domino/rc_domino_script
COPY ${DOM_SCR}/rc_domino_config_notes /etc/sysconfig/
```

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Domino on Docker (Domino 9.0.1 FP 9 image)

```
FROM eknori/domino:9_0_1

ENV DOM_CONF=resources/serverconfig
ENV NUI_NOTESDIR /opt/ibm/domino/

COPY ${DOM_CONF}/ /tmp/sw-repo/serverconfig

RUN mkdir -p /tmp/sw-repo/ && \
    cd /tmp/sw-repo/ && \
    wget -q http://<your_repo>/domino901FP9_linux64_x86.tar && \
    tar -xf domino901FP9_linux64_x86.tar &&\
    cd /tmp/sw-repo/linux64/domino && \
    /bin/bash -c "./install -script
    /tmp/sw-repo/serverconfig/domino901_fp9_response.dat" && \
    cd / && \
    rm /tmp/* -R && \
    rm /opt/ibm/domino/notes/90010/linux/90010/* -R
```

Domino on Docker (Final image)

```
FROM eknori/domino:9_0_1_FP_9

EXPOSE 25 80 443 1352

COPY resources/docker-entrypoint.sh /
RUN chmod 775 /docker-entrypoint.sh

USER notes
WORKDIR /local/notesdata
ENV LOGNAME=notes
ENV PATH=$PATH:/opt/ibm/domino/

ENTRYPOINT ["/docker-entrypoint.sh"]
```

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Domino on Docker (Final image)

```
#!/bin/bash

serverID=/local/notesdata/server.id

if [ ! -f "$serverID" ]; then
    /opt/ibm/domino/bin/server -listen 1352
else
    /opt/ibm/domino/rc_domino_script start
    /bin/bash
fi
```

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Domino on Docker (Create & Run container)

```
docker volume create --name=domino_data

docker run
-it
-p 1353:1352 -p 8888:80 -p 8443:443
--name 901FP9
-v domino_data:/local/notesdata eknori/domino:domino_9_0_1_FP_9

docker start 901FP9
docker attach 901FP9
```

List and Inspect volumes

```
# docker volume ls

DRIVER              VOLUME NAME
local               domino_data

# docker volume inspect domino_data

[
    {
        "Name": "domino_data",
        "Driver": "local",
        "Mountpoint": "/var/lib/docker/volumes/domino_data/_data",
        "Labels": {},
        "Scope": "local"
    }
]
```

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List and Inspect volumes

```
[root@serv02 setup_domino]# ls /var/lib/docker/volumes/domino_data/_data
activity.ntf      certsrv.nsf      discussion9.ntf     Forms9_x.ntf              imapcl5.ntf
admin4.nsf        cldbdir4.ntf     doclbm7.ntf         francais.dic              inetlockout.ntf
admin4.ntf        clusta4.ntf      doclbs7.ntf         frstrings.dat             ini.nbf
admindata.xml     cluster.ncf      doclbw7.ntf         graphic.gif               iNotes
afrikaan.dic      core.946         doladmin.nsf        gtrhome                   islensk.dic
AgentRunner.nsf   core.949         doladmin.ntf        headline.ntf              italiano.dic
alog4.ntf         cppfbws.nsf      dolcert.id          hebrew.dic                iwaredir.ntf
arabic.dic        cppfbws.ntf      dolres.ntf          hellas.dic                JOBSCHED.NJF
archlg50.ntf      csrv50.ntf       domadmin.ntf        help                      journal6.ntf
aus.dic           czech.dic        domcfg5.ntf         homepage.nsf              link.gif
autosave.ntf      dansk.dic        domchange.ntf       httpd.cnf                 lndfr.nsf
billing.ntf       da.ntf           domino              ibm-nd-schema-2ad.ldif    lndfr.ntf
binary.gif        dba4.ntf         Domino8.lic         IBM_TECHNICAL_SUPPORT     lndsutr.nsf
bookmark.ntf      dbdirman.nsf     dominoblog.ntf      icl.ntf                   lndsutr.ntf
brasil.dic        dbdirman.ntf     domlog.ntf          IDB26163.DTF              loga4.ntf
browser.cnf       dblib4.ntf       DomShrct.sh         IDB37824.DTF              log.nsf
busytime.nsf      ddm.nsf          dschweiz.dic        IDB49237.DTF              log.ntf
busytime.ntf      ddm.ntf          dsgnsyn.ntf         IDB68134.DTF              lschema.ldif
canadien.dic      DDMRepCach.dat   error.gif           IDB68867.DTF              ltecmch1.dic
catala.dic        decomsrv.ntf     espana.dic          IDB76157.DTF              ltecmzh1.dic
catalog.ntf       decsadm.ntf      etc                 IDB76364.DTF              magyar.dic
cca50.ntf         Desktop          events4.nsf         IDB80490.DTF              mail
cert.id           deutsch2.dic     events4.ntf         IDB84715.DTF              mail9.ntf
certlog.nsf       deutsch.dic      exec.nbf            IDB93255.DTF              mail.box
certlog.ntf       dfc              fault_recovery.log  idpcat.ntf                mailbox.ntf
certpub.ntf       diagindex.nbf    feedcontent.ntf     idvault.ntf               mailjrn.ntf
certreq.ntf       dircat5.ntf      folder.gif          image.gif                 movie.gif
```

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Bind to specific IP address

```
# docker run -it
-p 192.168.178.133:1352:1352
-p 192.168.178.133:8888:80
-p 192.168.178.133:8443:443
--name 901FP5
-v domino_data:/local/notesdata eknori/domino:domino_9_0_1_FP_5
```

General I	
Networking	
Host name	ser02.fritz.box
IP addresses	1. 192.168.178.133 2. fe80::20c:29ff:fec6:b87 3. fe80::a88f:3fff:fe24:a636 4. 192.168.178.115 5. fe80::20c:29ff:fec6:b7d 6. 172.17.0.1 7. fe80::42:fbff:feff:85f5
VMware Tools	Installed and running
Storage	1 disk
Notes	

Docker container sizes

```
# docker ps -as
CONTAINER ID  NAMES              SIZE
ce7b971ef9c1  thirsty_franklin   0 B (virtual 3.296 GB)

# docker volume inspect domino_data

# du -hs /var/lib/docker/volumes/domino_data/_data
1.1G    /var/lib/docker/volumes/domino_data/_data

# du -hs /var/lib/docker/containers/ce7b971ef9c1e30972c4c ... /
160K    /var/lib/docker/containers/ce7b971ef9c1e30972c4c7 ... /
```

x = (0B + 1.1GB + 160kB) * n

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kubernetes

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Production-Grade Container Orchestration

Automated container deployment, scaling, and management

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Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications.

It groups containers that make up an application into logical units for easy management and discovery. Kubernetes builds upon 15 years of experience of running production workloads at Google, combined with best-of-breed ideas and practices from the community.

https://kubernetes.io/

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Kubernetes Installation

```
# subscription-manager register
    --username john.doe@foo.bar
    --password mySecretPassword
    --auto-attach --force

# subscription-manager repos
    --enable=rhel-7-server-extras-rpms

# yum update

# vi /etc/selinux/config
    SELINUX=disabled

# reboot
```

Kubernetes Installation (cont.)

```
# yum install -y kubernetes etcd

# systemctl stop firewalld
# systemctl disable firewalld

    Removed symlink
        /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
    Removed symlink
        /etc/systemd/system/basic.target.wants/firewalld.service.

# vi /etc/kubernetes/apiserver

# change
# default admission control policies
#KUBE_ADMISSION_CONTROL="--admission-control=NamespaceLifecycle, ... "
KUBE_ADMISSION_CONTROL=""
```

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Kubernetes Installation (cont.)

```
# systemctl restart etcd kube-apiserver kube-controller-manager kube-scheduler
# systemctl enable etcd kube-apiserver kube-controller-manager kube-scheduler

    Created symlink from /etc/systemd/system/multi-user.target.wants/etcd ...
    Created symlink from /etc/systemd/system/multi-user.target.wants/kube-apiserver ...
    Created symlink from /etc/systemd/system/multi-user.target.wants/kube-controller ...
    Created symlink from /etc/systemd/system/multi-user.target.wants/kube-scheduler ...

# systemctl restart kube-proxy kubelet docker
# systemctl enable kube-proxy kubelet docker

    Created symlink from /etc/systemd/system/multi-user.target.wants/kube-proxy ...
    Created symlink from /etc/systemd/system/multi-user.target.wants/kubelet ...
    Created symlink from /etc/systemd/system/multi-user.target.wants/docker ...

# kubectl get node
    NAME        STATUS    AGE
    127.0.0.1   Ready     48s
```

Kubernetes Example

proxy.yaml

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: proxy-pod
  labels:
    app: proxy-pod
spec:
  containers:
  - name: nginx-proxy
    image: "eknori/docker:nginx-alpine"
    ports:
    - containerPort: 80
      hostPort: 8888
```

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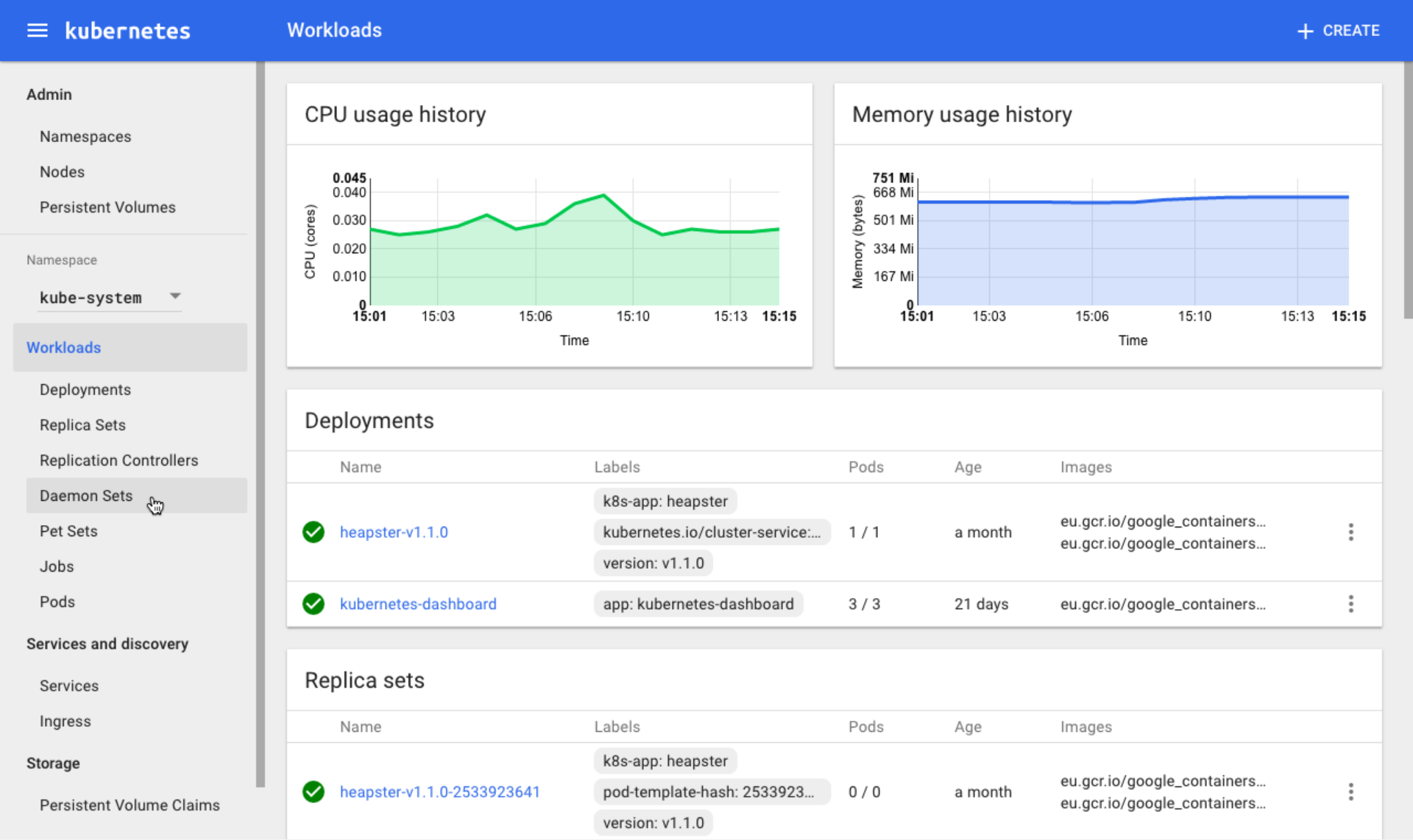
Kubernetes Example (cont.)

```
# kubectl create -f proxy.yaml
pod "proxy-pod" created


# docker ps
CONTAINER ID  IMAGE                          COMMAND                  PORTS
b09d6b4642cf  nginx-alpine                   "nginx -g 'daemon off"
9f942828eb0e  pod-infrastructure:latest      "/pod"                    0.0.0.0:8888->80/tcp


# kubectl delete pod proxy-pod
pod "proxy-pod" deleted
```

http://192.168.178.134:8888/



https://github.com/kubernetes/dashboard

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IBM Cloud private

IBM Cloud private v1.2.0 documentation

Welcome to the IBM® Cloud private documentation, where you can find information about how to install, maintain, and use IBM Cloud private. **IBM Cloud private is a re-branding of the former IBM Spectrum Conductor for Containers offering.**

Getting started

- Overview
- System requirements
- Release notes
- Accessibility features for IBM Cloud private

Common tasks

- Installing IBM Cloud private
- Managing applications
- Managing images
- Managing your cluster

Troubleshooting and support

- Troubleshooting
- IBM Cloud Technology Slack channel]
- Technical community

https://www.ibm.com/support/knowledgecenter/SSBS6K_1.2.0/kc_welcome_containers.html

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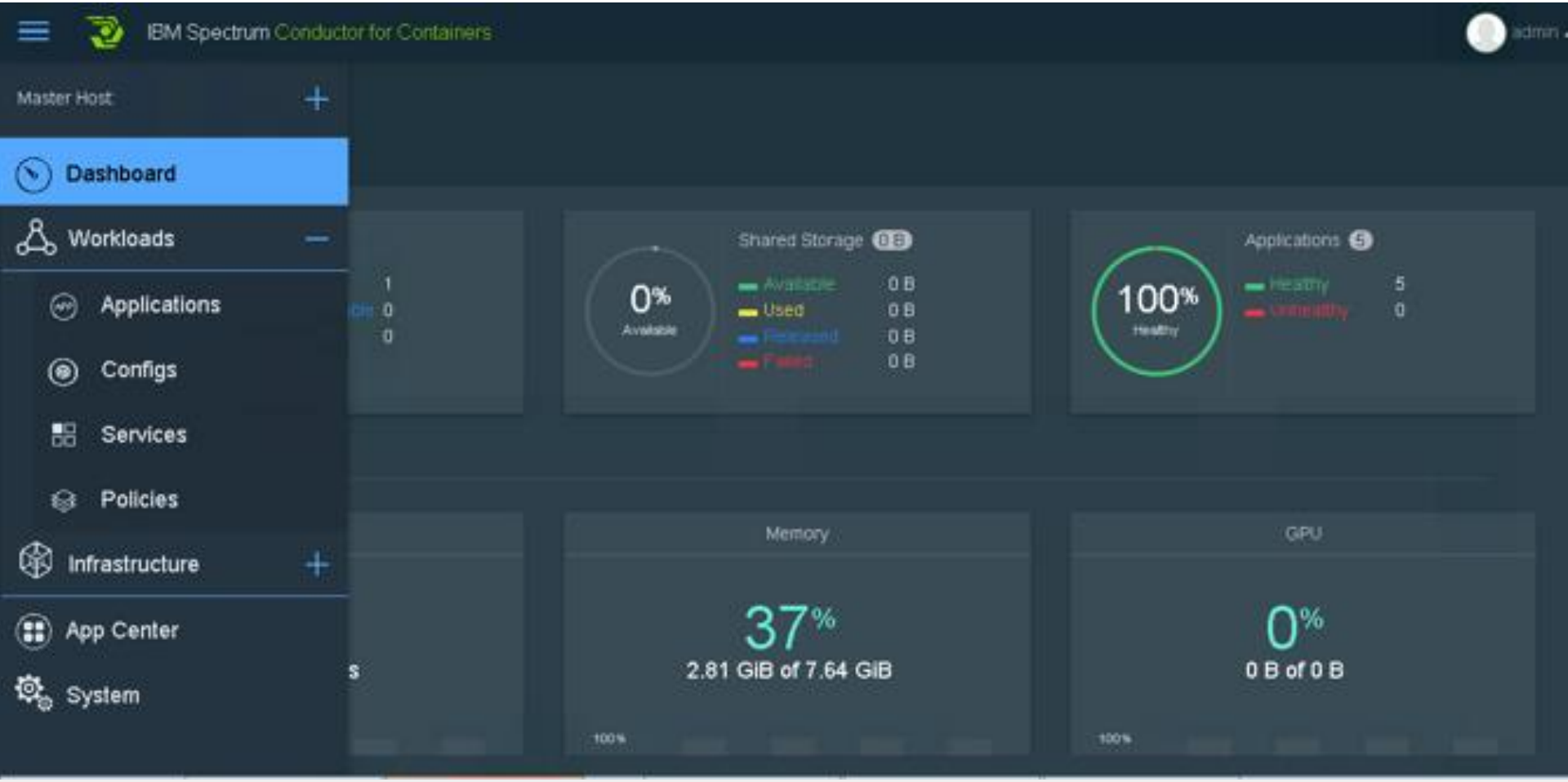

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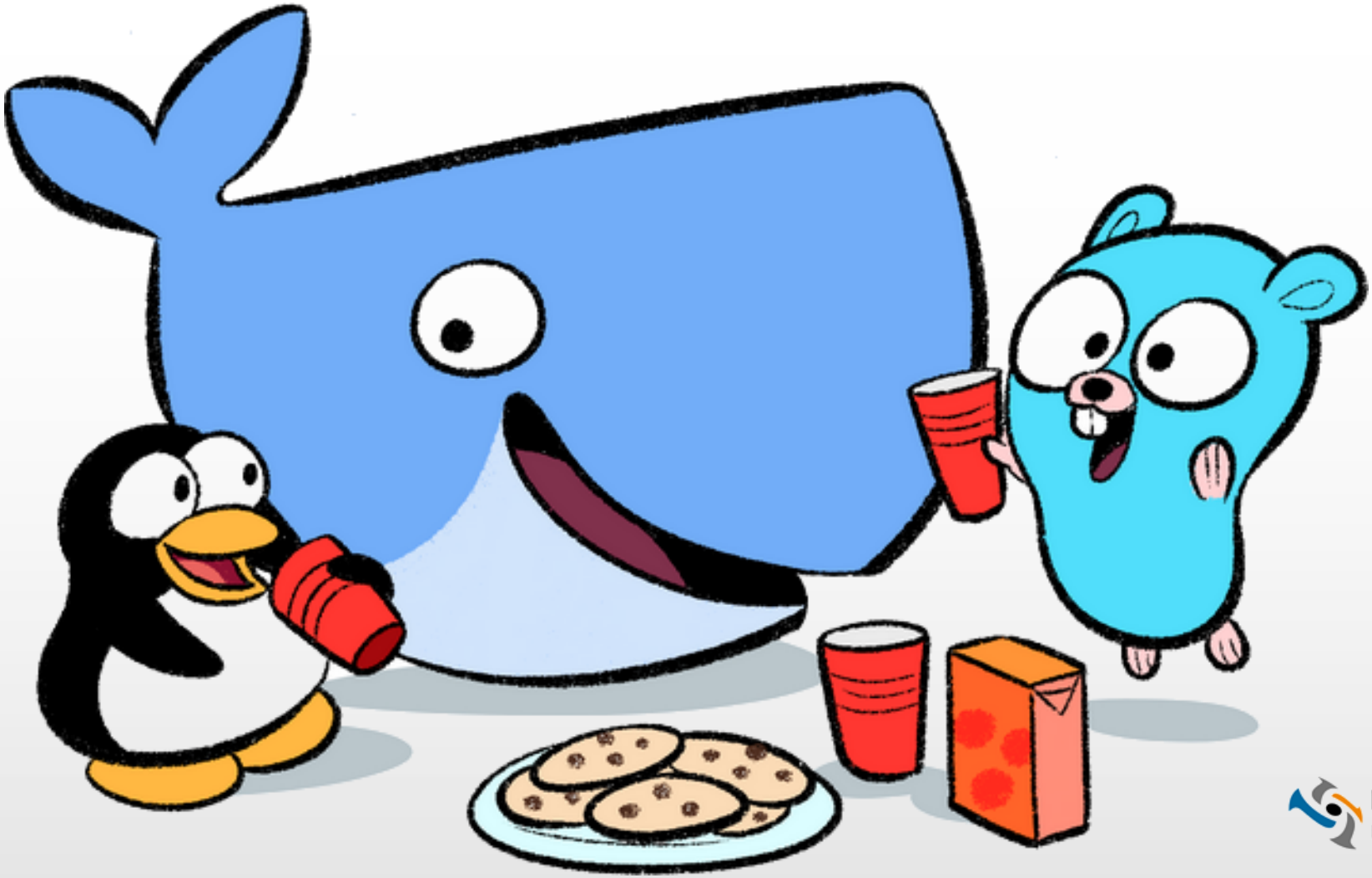
Gerald Peters, Erste Schritte mit Docker

Dienstag, 19.09.2017 09:00 – 10:30



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Friedhelm Klein, Server-Installationen leichtgemacht

Dienstag, 19.09.2017 16:00 – 17:30

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So ich habe fertig!

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Developer

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