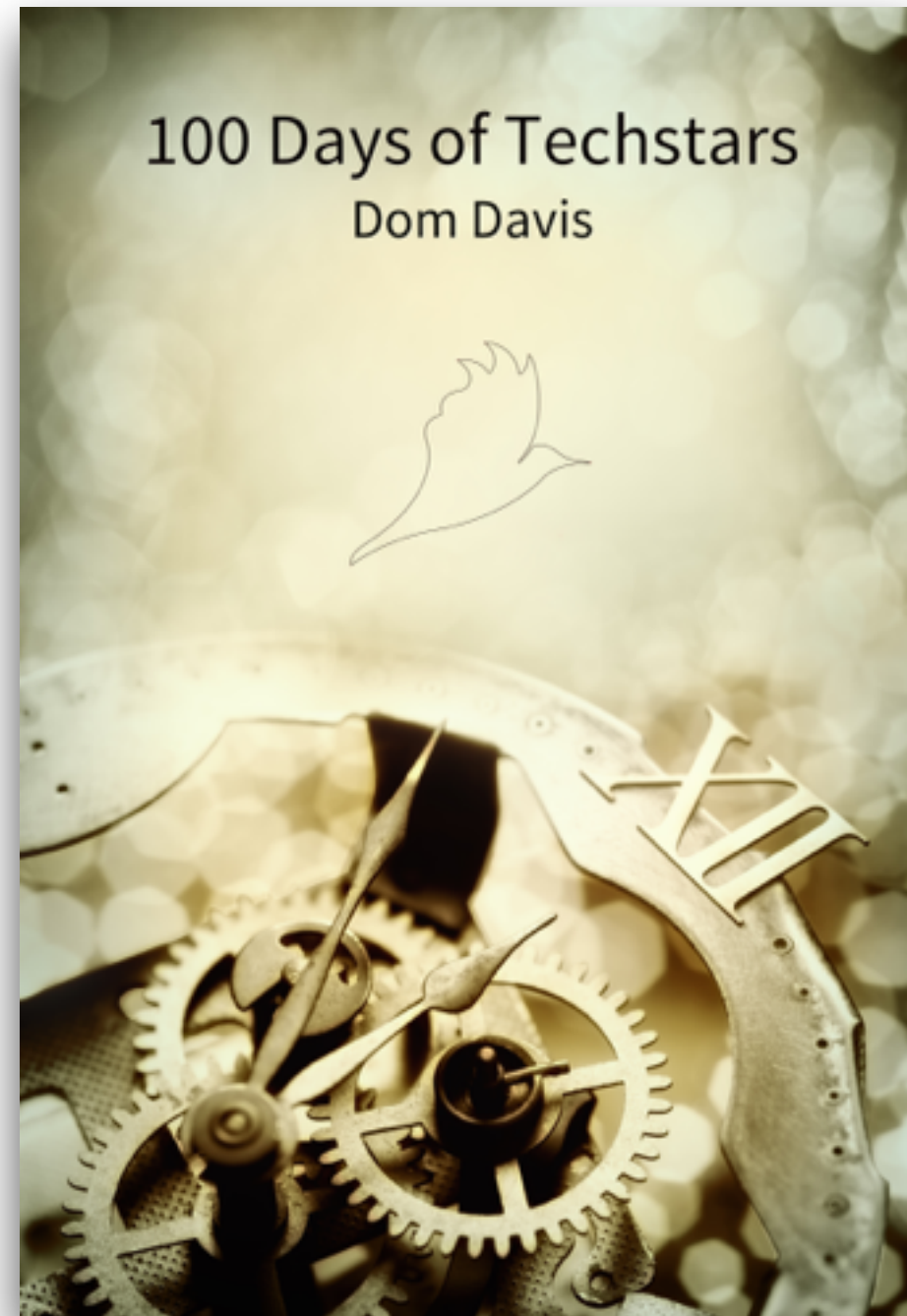




Rainbird

An Introduction to Docker

Dom Davis - CTO - @idomdavis
@RainbirdAI



[https://leanpub.com/100daysoftechstars/
@idomdavis](https://leanpub.com/100daysoftechstars/@idomdavis)

<https://github.com/RainBirdAi/docker-workshop>



Exercise 0

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-0.md>





Schedule

- 10:00 - 11:00 Introduction to Docker
- 11:00 - 11:15 Coffee Break
- 11:15 - 12:30 Basics of the Dockerfile
- 12:30 - 13:30 Lunch
- 13:30 - 14:30 Fun and games with Docker
- 14:30 - 14:45 Coffee Break
- 14:45 - 15:45 More advanced techniques
- 15:45 - 16:30 Question/Play/Overrun time



Questions?



#IANAL



Virtual Machine

Virtual Machine

Virtualisation

Server

Virtual Machine

Virtual Machine

Type 1 Hypervisor

Bare Metal



Virtual Machine

Virtual Machine

Type 2 Hypervisor

Host Operating System

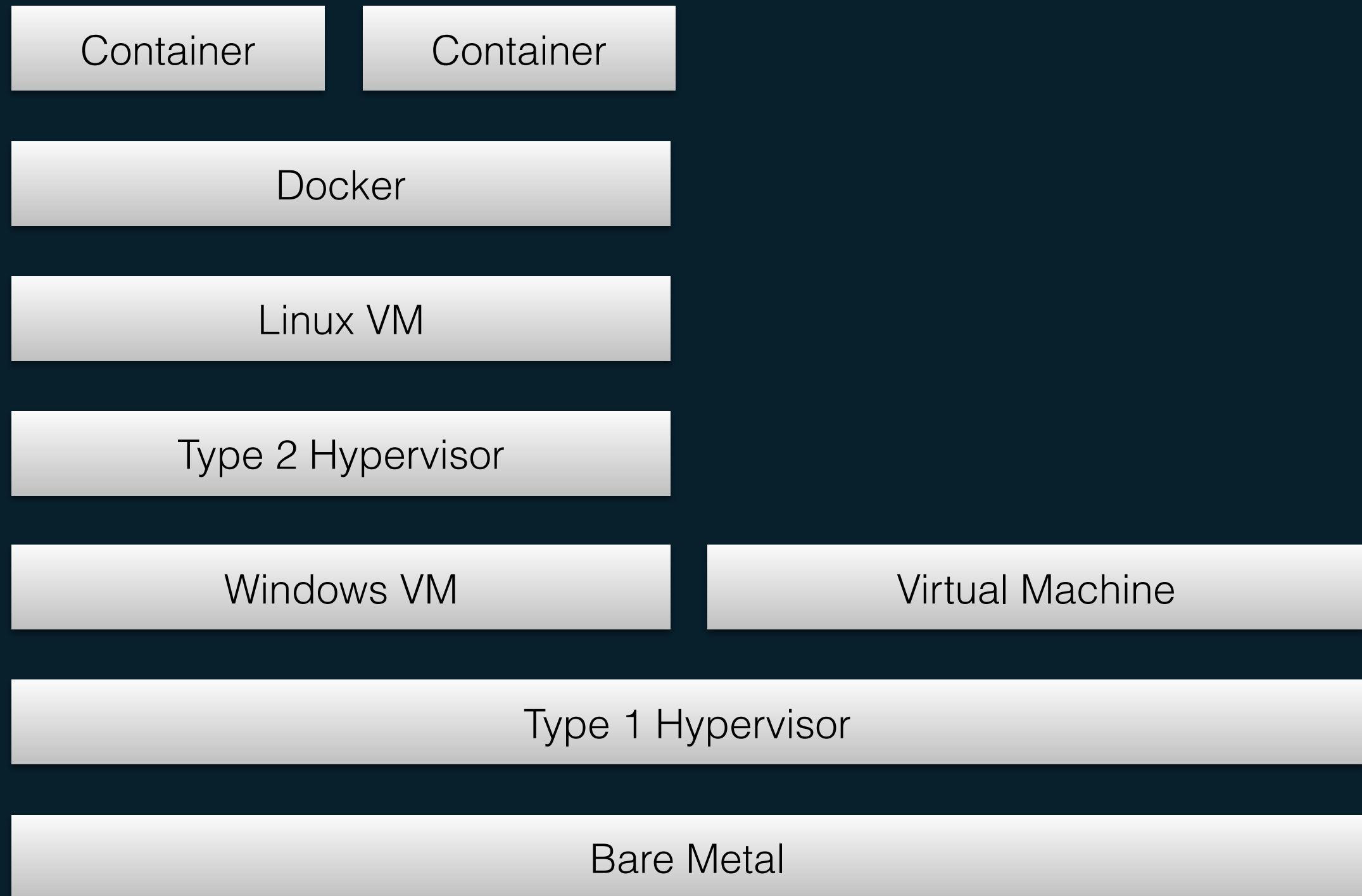


Container

Container

Docker

Host Operating System



Container

Container

Docker

Linux VM

Type 1 Hypervisor

Bare Metal



Container

Container

Docker

Linux VM

Type 2 Hypervisor

OSX

Bare Metal



Hypervisors work at the hardware level
Containers work at the OS level



LXC, libcontainer, rkt



Exercise 1

<https://www.docker.com/tryit/>



It's a bit like Git



Immutable Deployments



Docker Repositories



Exercise 2

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-2.md>



Distros

Exercise 3

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-3.md>



Container running Debian

Docker

CoreOS VM

Type 1 Hypervisor

Bare Metal



Exercise 4

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-4.md>



Coffee



Dockerfile



INSTRUCTION arguments

Comment



```
# Ping Server Dockerfile
FROM debian:latest
MAINTAINER Dom Davis <dom@rainbird.ai>

RUN apt-get update
RUN apt-get install -y curl
```



Exercise 5

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-5.md>




```
# Ping Server Dockerfile
FROM debian:latest
MAINTAINER Dom Davis <dom@rainbird.ai>

RUN apt-get update
RUN apt-get install -y curl

CMD curl www.google.com
```



Exercise 6

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-6.md>



ENTRYPOINT /bin/sh -c



Exercise 7

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-7.md>



```
docker run -i -t --rm --entrypoint bash <image>
```



Exercise 8

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-8.md>



Recap

1. Build containers from base images
2. Build containers using a Dockerfile
3. Push and pull from repositories
4. Start, stop, view and tidy up containers



Exercise 9

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-9.md>



Lunch



Talking to the
outside world



```
# Ping Server Dockerfile
FROM node:0.10.38-slim
MAINTAINER Dom Davis <dom@rainbird.ai>

COPY server.js server.js

EXPOSE 5000

ENTRYPOINT ["node"]
CMD ["server.js"]
```



Exercise 10

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-10.md>



COPY vs ADD



Exercise 11

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-11.md>

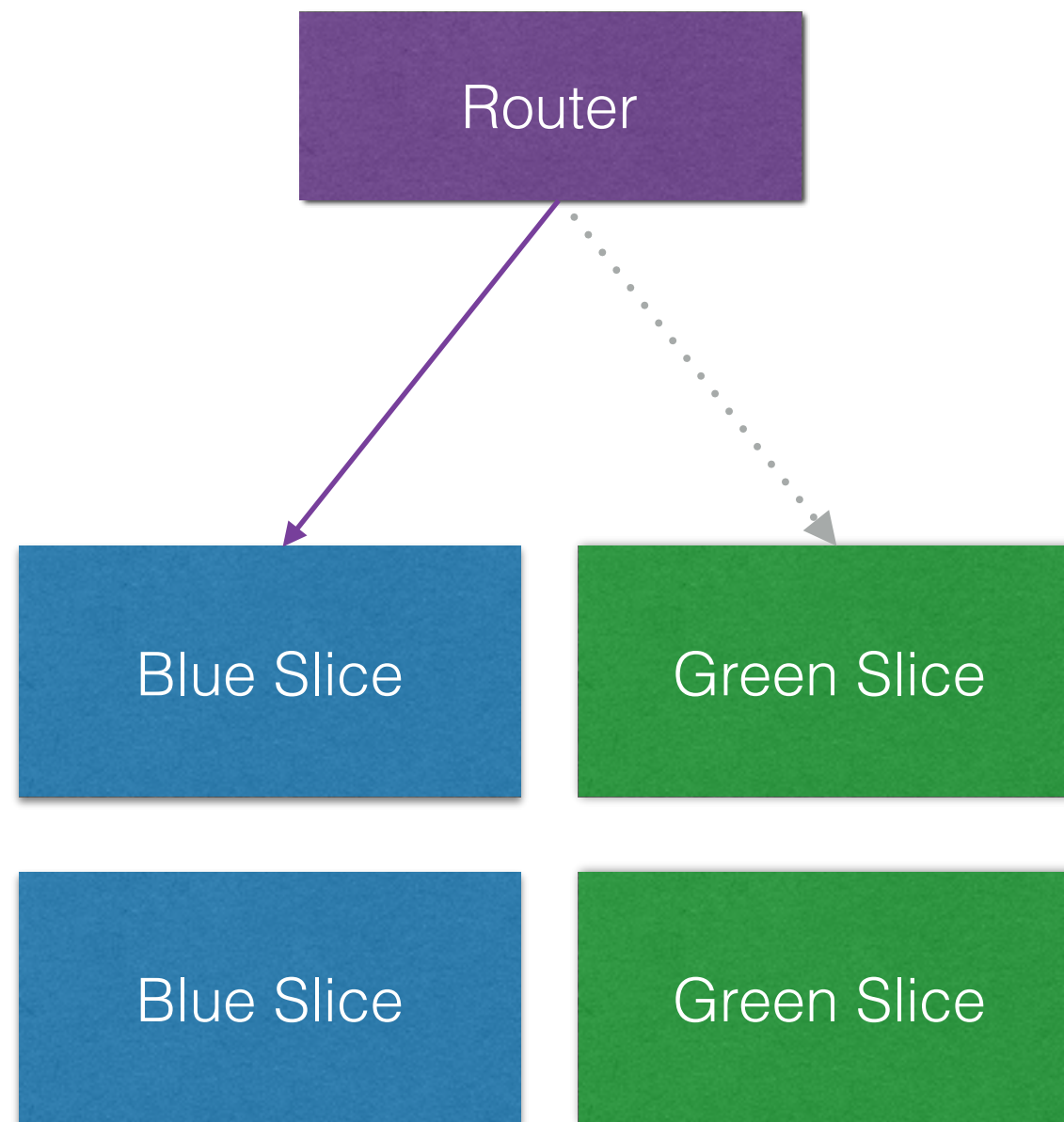


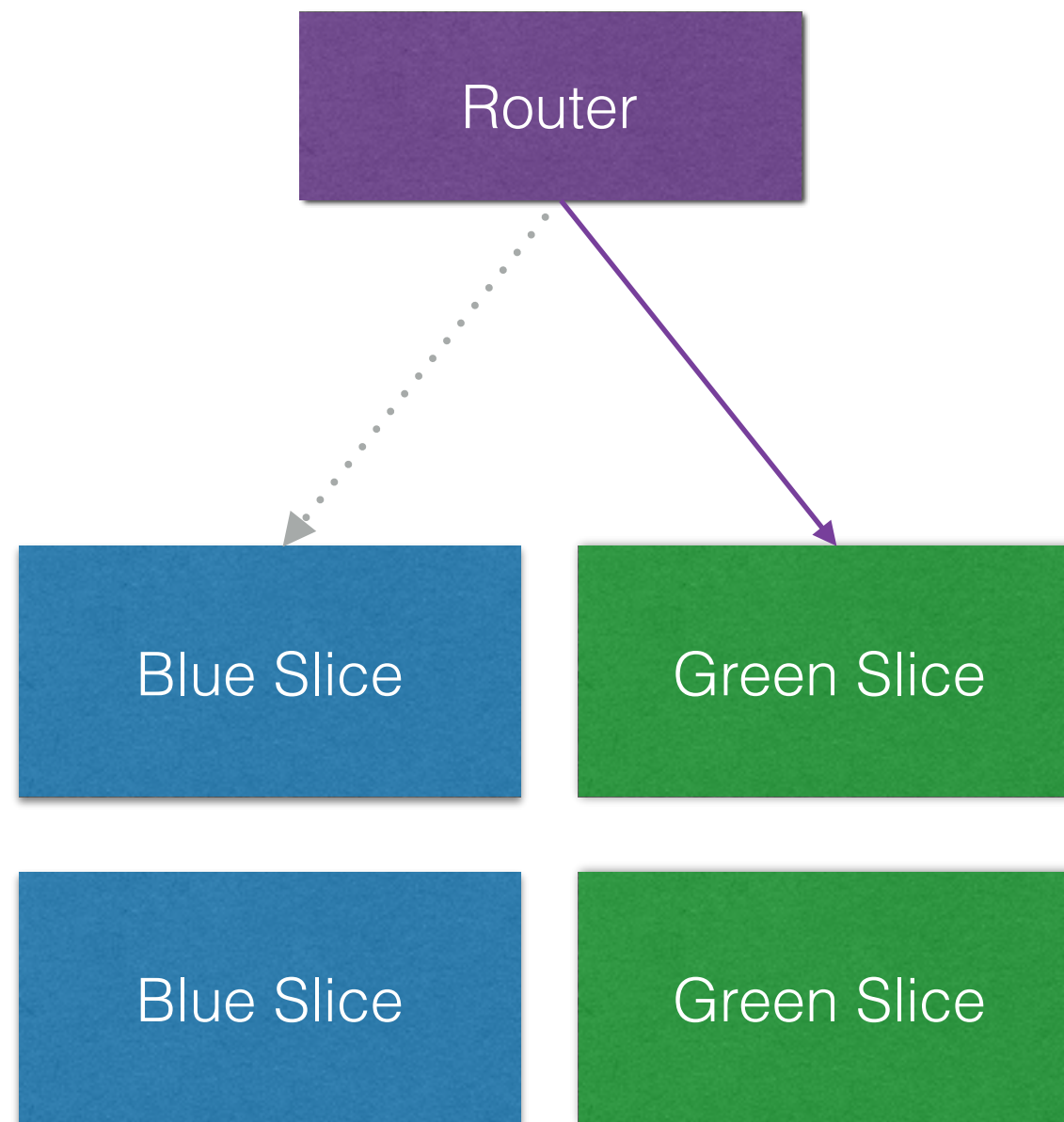
Immutable Environment



Blue/Green deployment







Exercise 12

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-12.md>



Rolling Forwards



Exercise 0xD

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-0xD.md>



Docker Everywhere



Exercise 9 (again)

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-9.md>



Coffee



Advanced Techniques



Volumes

Exercise 14

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-14.md>



Data Containers



Best Practices



Base Images

Exercise 15

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-15.md>



Slim Images

Exercise 16

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-16.md>



Each command
adds a layer



Exercise 17

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-17.md>



ONBUILD



Exercise 18

<https://github.com/RainBirdAi/docker-workshop/blob/master/exercises/exercise-18.md>



Real World Example



```
FROM debian:wheezy
MAINTAINER Rainbird AI <follow@rainbird.ai>
```

```
ENV RABBIT_MQ_VERSION 3.4.4-1
```

```
RUN apt-key adv --keyserver keyserver.ubuntu.com --recv-keys F7B8CEA6056E8E56 && \
    echo "deb http://www.rabbitmq.com/debian/ testing main" >> /etc/apt/sources.list && \
    apt-get -q update && \
    apt-get install -y -q rabbitmq-server=${RABBIT_MQ_VERSION} --no-install-recommends && \
    rm -rf /var/lib/apt/lists/* && \
    /usr/sbin/rabbitmq-plugins enable rabbitmq_management && \
    echo "[{rabbit, [{loopback_users, []}] }]." > /etc/rabbitmq/rabbitmq.config
```

```
# Order is important here. 5672 need to be exposed first.
EXPOSE 5672 15672 4369
```

```
ENTRYPOINT /usr/sbin/rabbitmq-server
```



What Else?



LABEL key=value
USER user

CPU, Memory and Network limits

Privileges and capabilities

PID Settings, restart
policies, etc.



Exercise 19

(optional) Install Docker on your machine and have a play

