



Microsoft Cloud **Digital Series**

Learn online at your pace about AI, Analytics, Applications, IoT, Migration, Modernization and more, all powered by the Cloud

www.aka.ms/CloudDigitalSeries



Webinar: Getting Started With Kubernetes On Azure

Speaker: Diego Casati, Cloud Solution Architect

Agenda



**What is Kubernetes
and Why I should
care?**



**Setting up a cluster
on Azure**



**Getting to know the
system**



**Deploying your first
application**

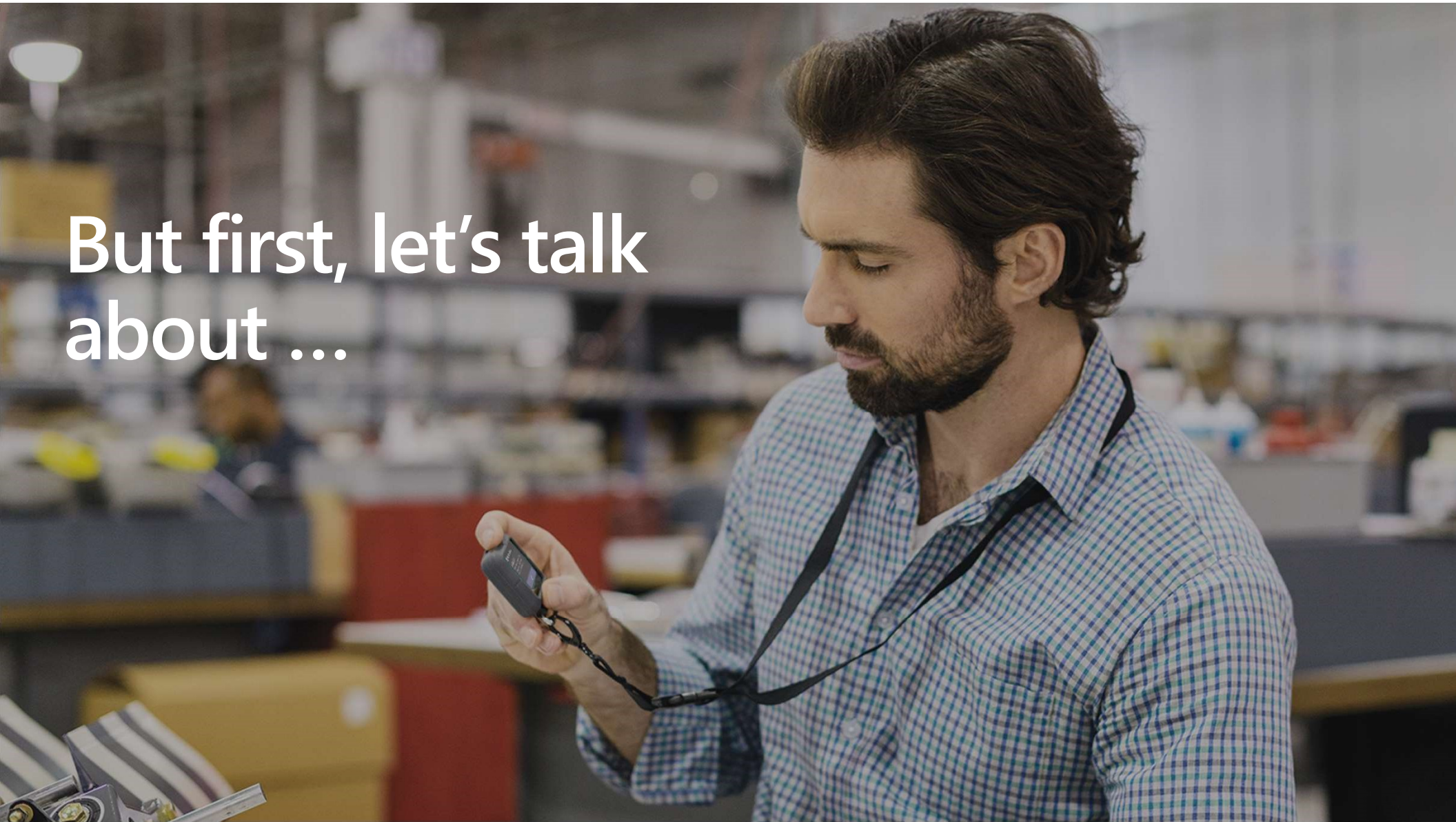


**Basic
troubleshooting
tips**



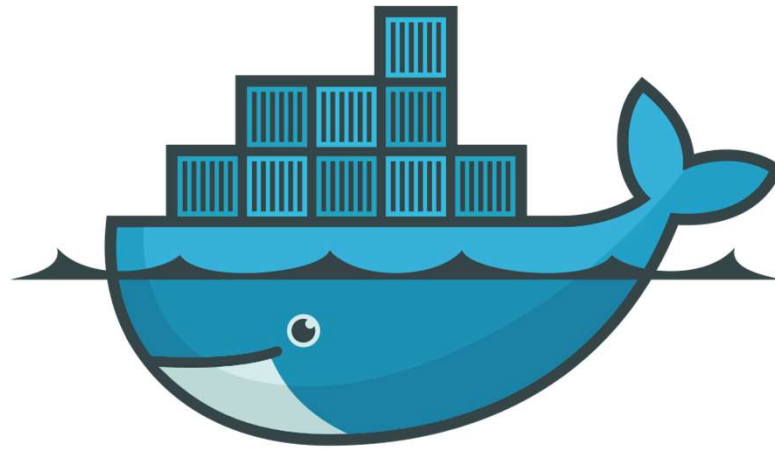
Q&A

But first, let's talk
about ...



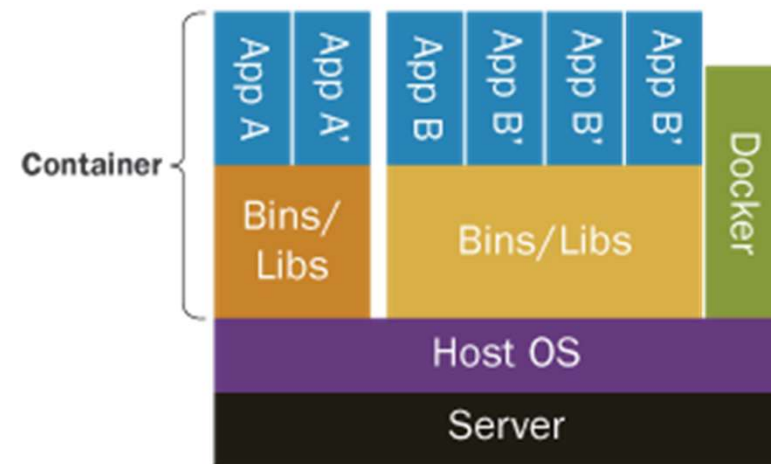
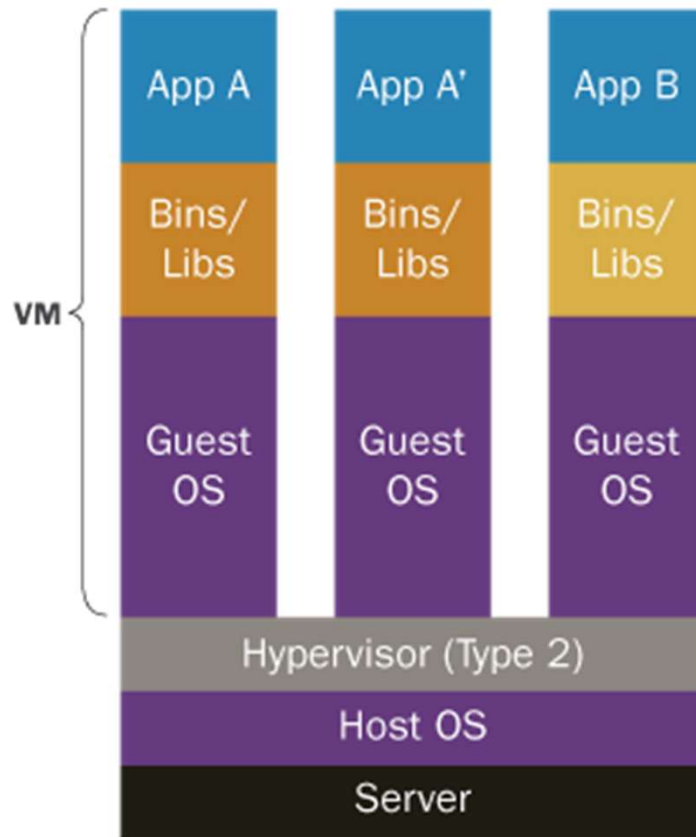
Containers





docker

Docker (Containers) vs VMs

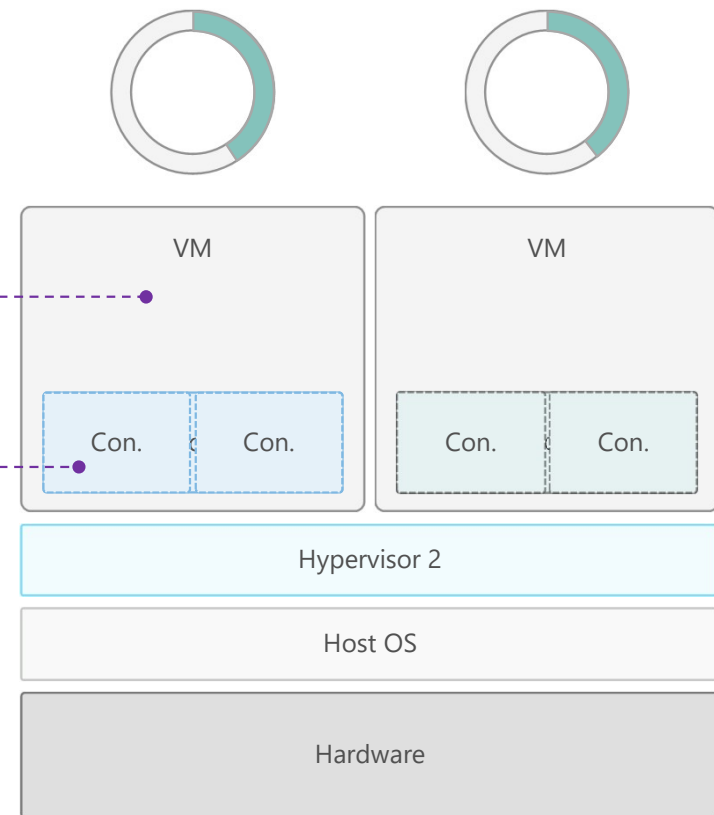


The container advantage

Traditional virtualized environment

Low utilization of container resources

Containerization of applications and their dependencies

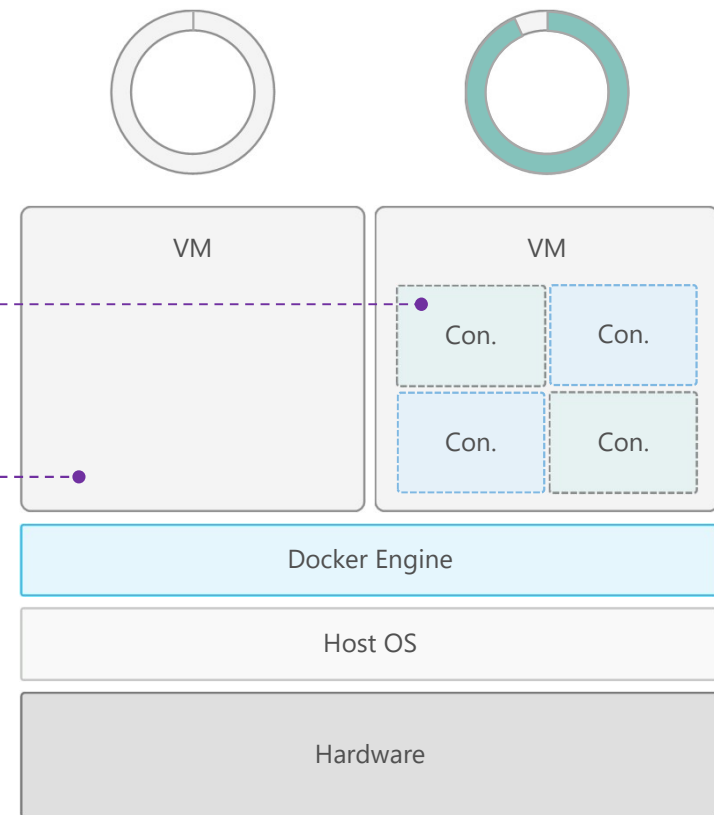


The container advantage

Containerized environment

Migrate containers and their dependencies to underutilized VMs for improved density and isolation

Decommission unused resources for efficiency gains and cost savings



Docker Container Anatomy

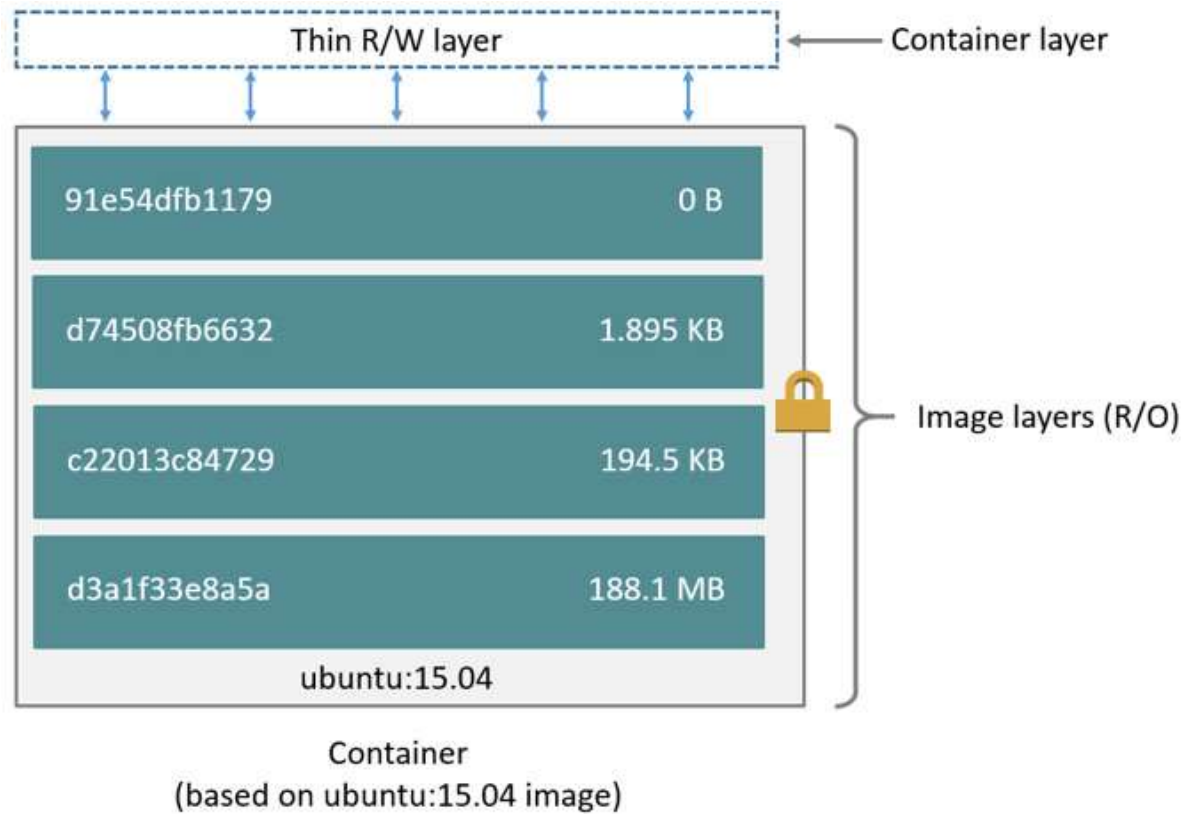


Image source: <https://docs.docker.com/engine/userguide/storagedriver/imagesandcontainers/#images-and-layers>

Anatomy of a Dockerfile

```
FROM nginx

ARG VERSION=0.59.1

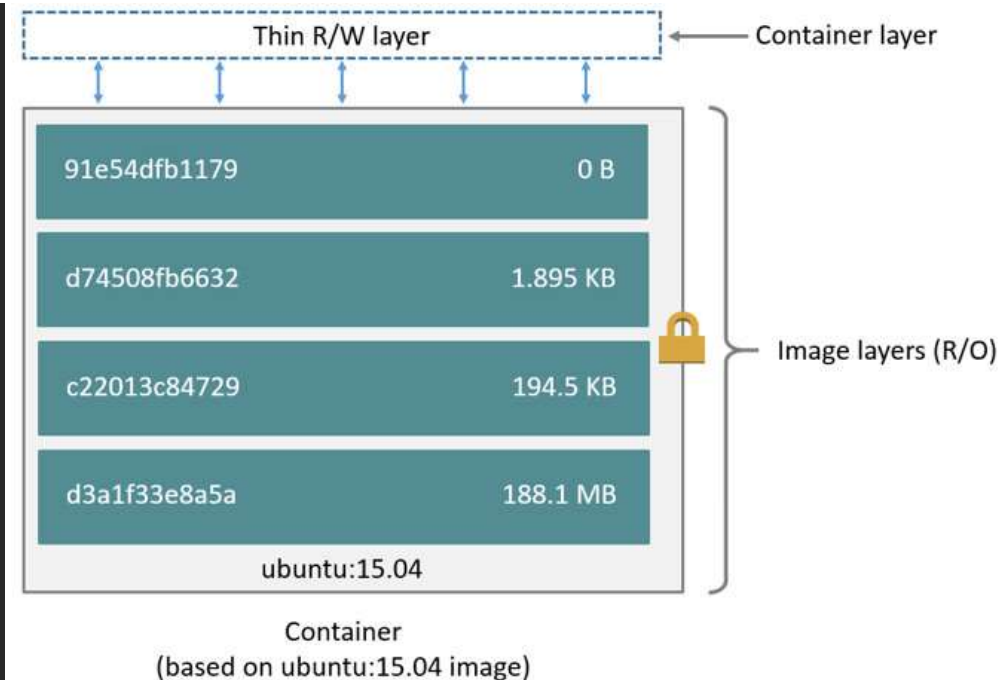
ADD
https://github.com/gohugoio/hugo/releases/download/v${
VERSION}/hugo_${VERSION}_Linux-64bit.tar.gz
/hugo.tar.gz

RUN tar -zxvf hugo.tar.gz
RUN /hugo version

WORKDIR /hugo-site
COPY hugo-site .

RUN /hugo -v -s /hugo-site -d /usr/share/nginx/html

EXPOSE 80
```



Anatomy of a Dockerfile

```
FROM nginx
```

Our base – from where we should start to build this container

```
ARG VERSION=0.59.1
```

```
ADD
```

```
https://github.com/gohugoio/hugo/releases/download/v${VERSION}/hugo_${VERSION}_Linux-64bit.tar.gz /hugo.tar.gz
```

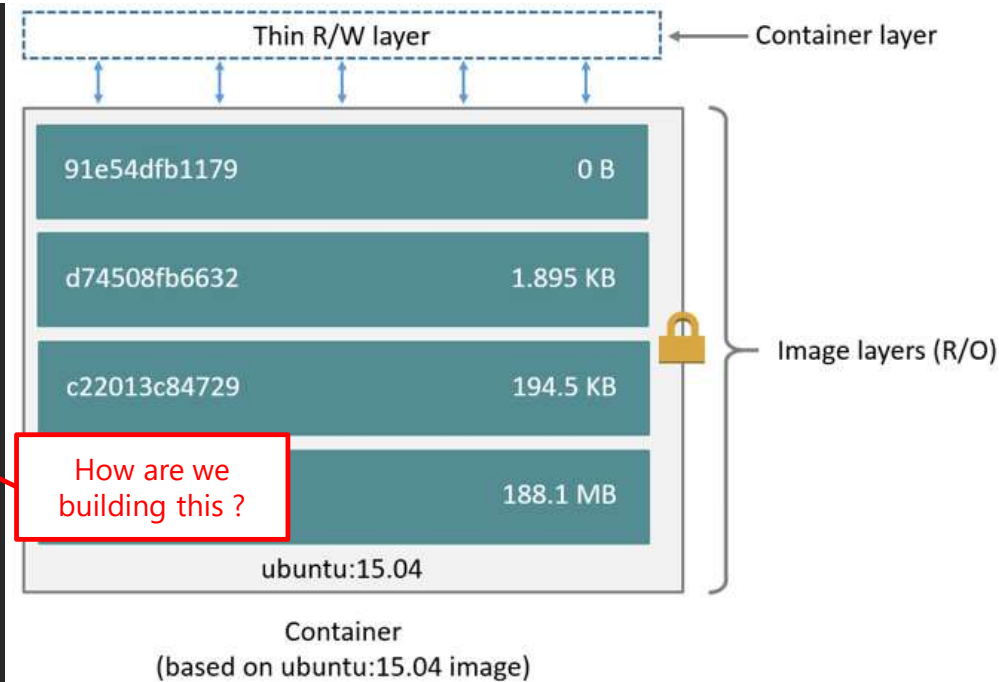
```
RUN tar -zxvf hugo.tar.gz  
RUN /hugo version
```

```
WORKDIR /hugo-site  
COPY hugo-site .
```

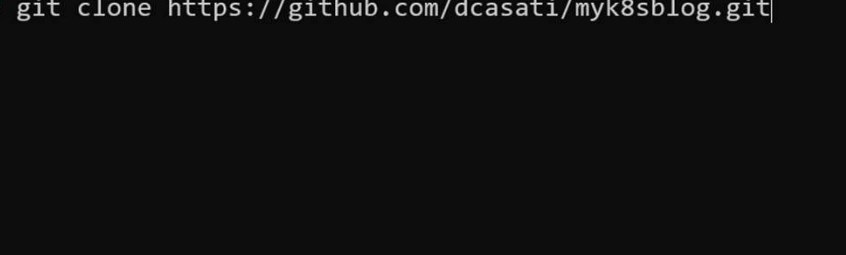
Where are we listening for traffic?

```
RUN /hugo -v -s /hugo-site -d /usr/share/nginx/html
```

```
EXPOSE 80
```



The Application



A terminal window with a dark background. The title bar at the top shows standard window controls (back, forward, zoom, and close). The command prompt is green, and the command being entered is in white text. The command is: `src git clone https://github.com/dcasati/myk8sblog.git`. The cursor is at the end of the command.

```
→ src git clone https://github.com/dcasati/myk8sblog.git|
```

```
~/dcasati | |||||
```

Github LinkedIn Show more ▾

This blog now runs on top of Kubernetes

.....

2019-11-20 :: Diego Casati

#Kubernetes #AKS

Running this blog on Kubernetes. The question is ... why?

There are a few reasons for this.

1. Getting more hands on experience
2. Eating your own dog food (I recommend it to my Partners where it makes sense, why wouldn't I use it then ?)

One question that I get all of the time: isn't this just overkill ? Yes, potentially, but look at points 1) and 2). For me, this ties really well with my learning objectives - and really, this is how I retain knowledge the best. You can read all you want on this topic (or any topic) but watching Julia Childs cooking does not make me a good cooker, right ? ;)

How is this blog setup ?

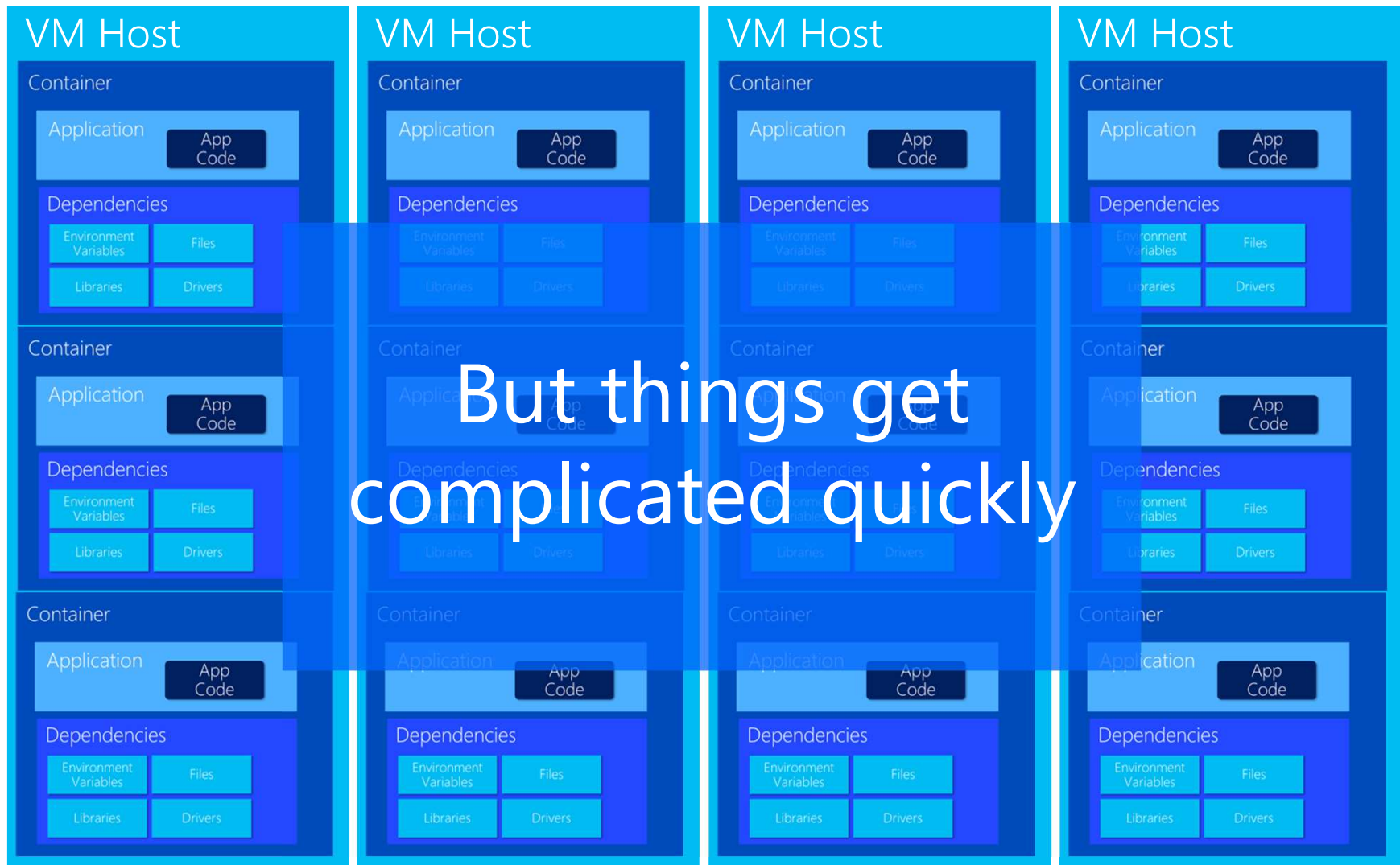
Mostly, this is an experiment around GitOps.

For that, I'm using the following:

- ▶ Hugo as the blog engine
- ▶ Source code lives in my github repo: <https://github.com/dcasati/dcasati.net>
- ▶ Github Actions for the CI
- ▶ FluxCD
- ▶ Cluster running in Azure (Azure Kubernetes Services)
- ▶ Images are pushed into a private repository (Azure Container Registry)

I will blog about how this blog came to be as well.

Time for some hands-on with
Docker





Container Orchestration

The elements of **orchestration**



Scheduling



Affinity/anti-affinity



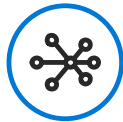
Health monitoring



Failover



Scaling



Networking



Service discovery



Coordinated app upgrades

Kubernetes: the de-facto orchestrator



Portable

Public, private, hybrid,
multi-cloud



Extensible

Modular, pluggable,
hookable, composable



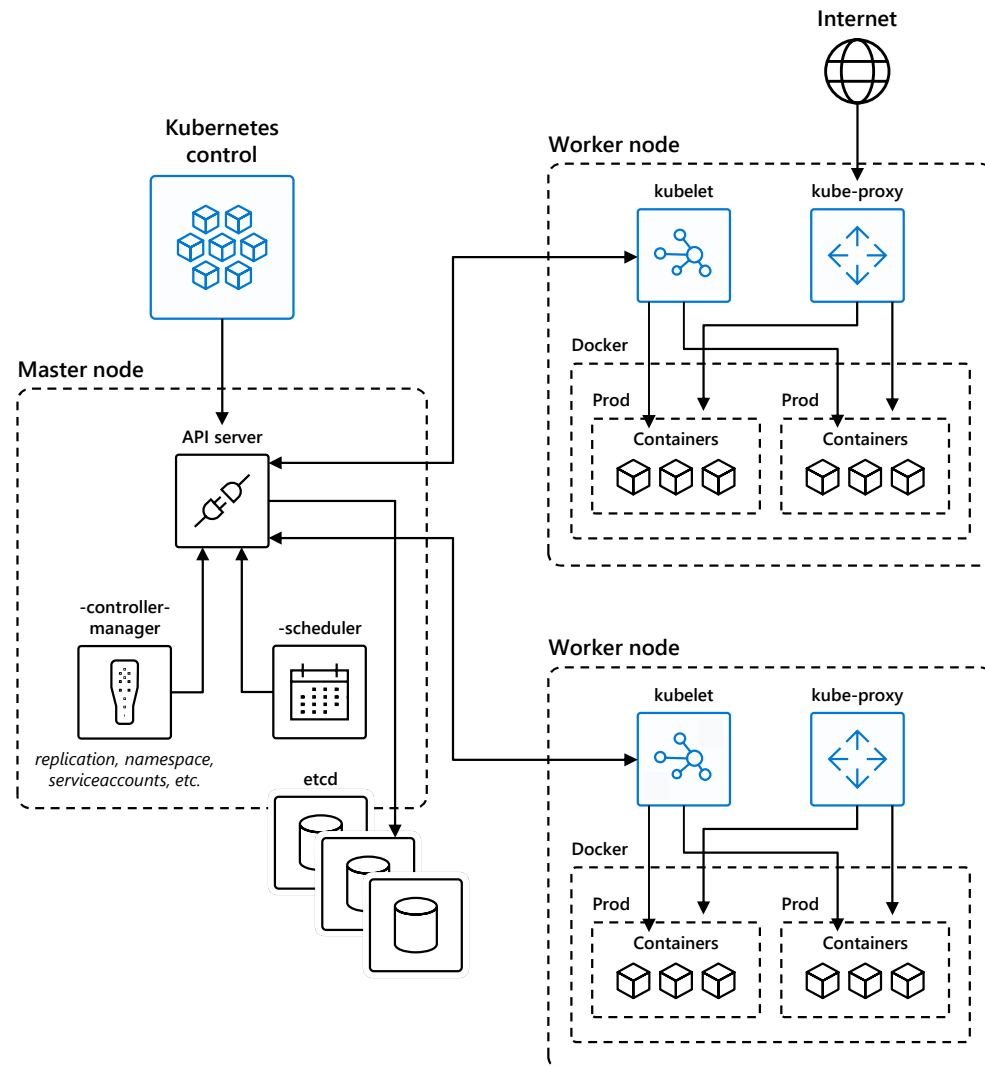
Self-healing

Auto-placement, auto-restart,
auto-replication, auto-scaling

Kubernetes 101 – Here we go !

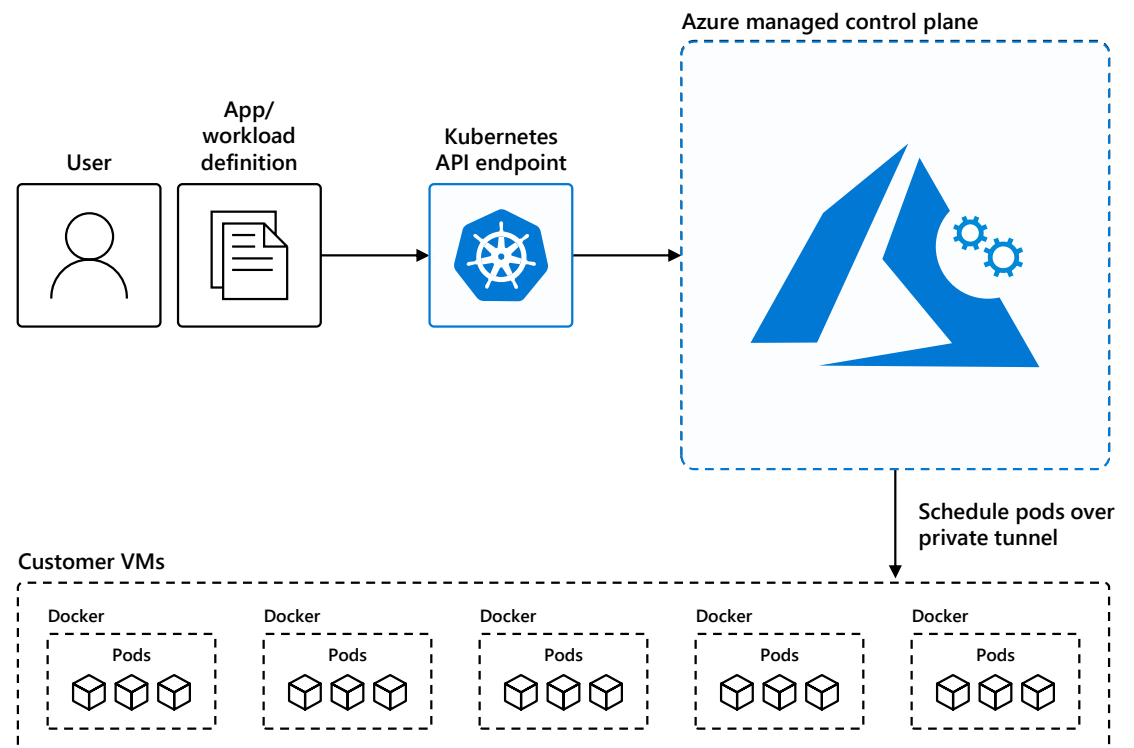
Kubernetes 101

1. Kubernetes users communicate with API server and apply desired state
2. Master nodes actively enforce desired state on worker nodes
3. Worker nodes support communication between containers
4. Worker nodes support communication from the Internet



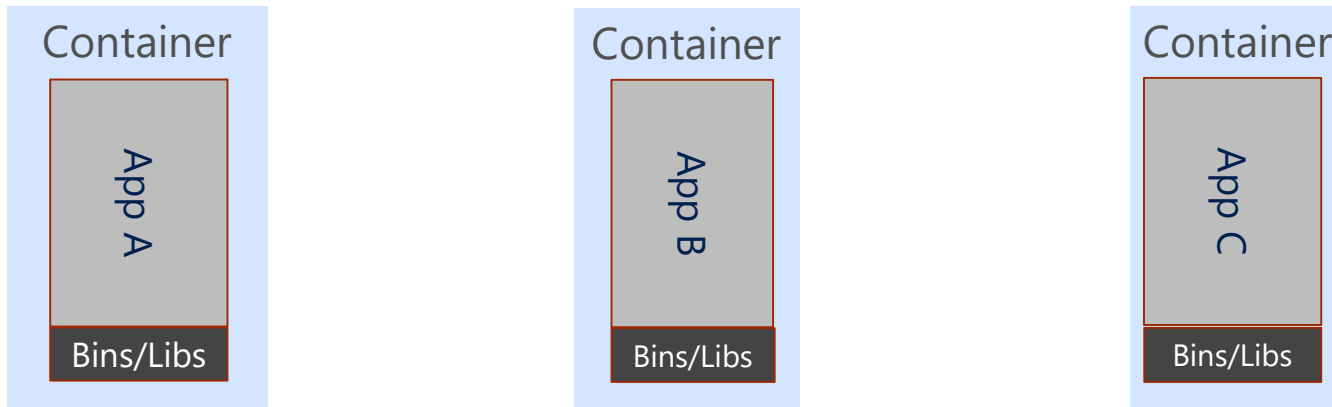
How managed Kubernetes on Azure works

- Automated upgrades, patches
- High reliability, availability
- Easy, secure cluster scaling
- Self-healing
- API server monitoring
- At no charge



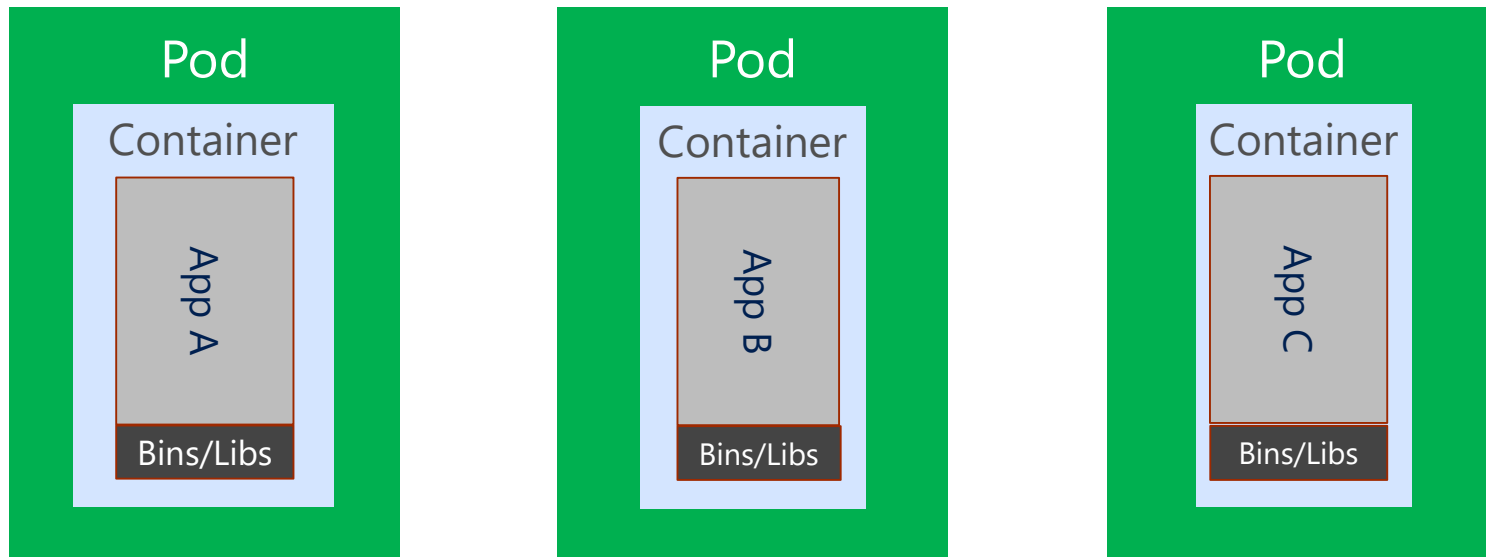
Kubernetes Architecture Components

Where do the Containers go?



Kubernetes Architecture Components

Introducing.... Pods!



Containers go inside Pods!

Pods

pod	
myk8sblog	
port	8080

pod	
aci-connector	
port	443

pod	
core-dns	
port	27017

Deployment

label	app=myk8sblog, tier=web
image	azurecr.io/myk8sblog:db245a8

pod

myk8sblog1

port	8080
------	------

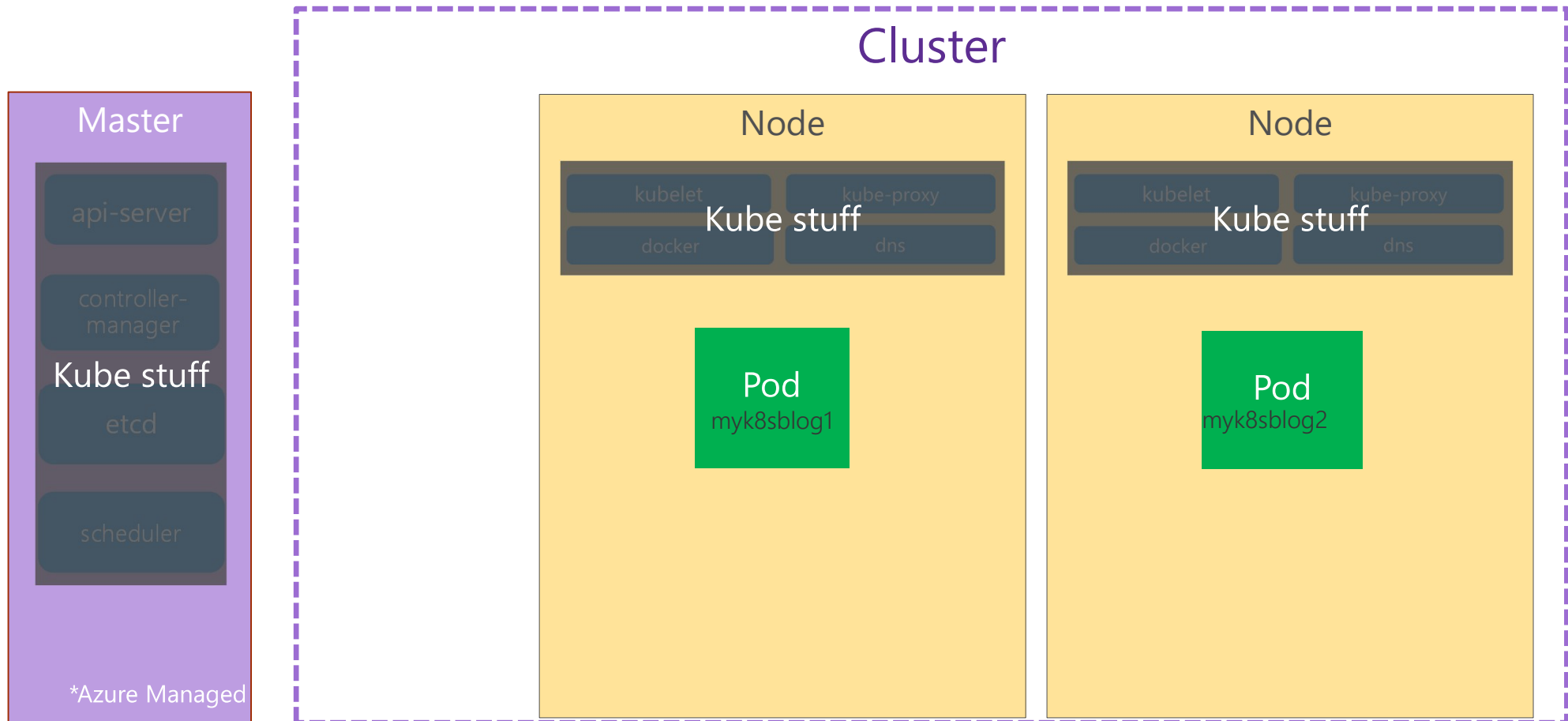
pod

myk8sblog2

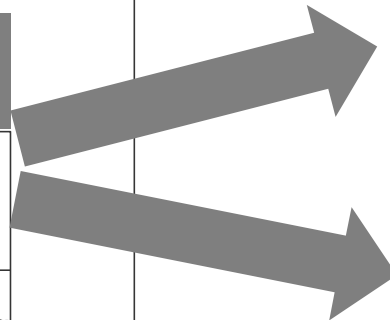
port	8080
------	------

myk8sblog

Kubernetes Architecture Components



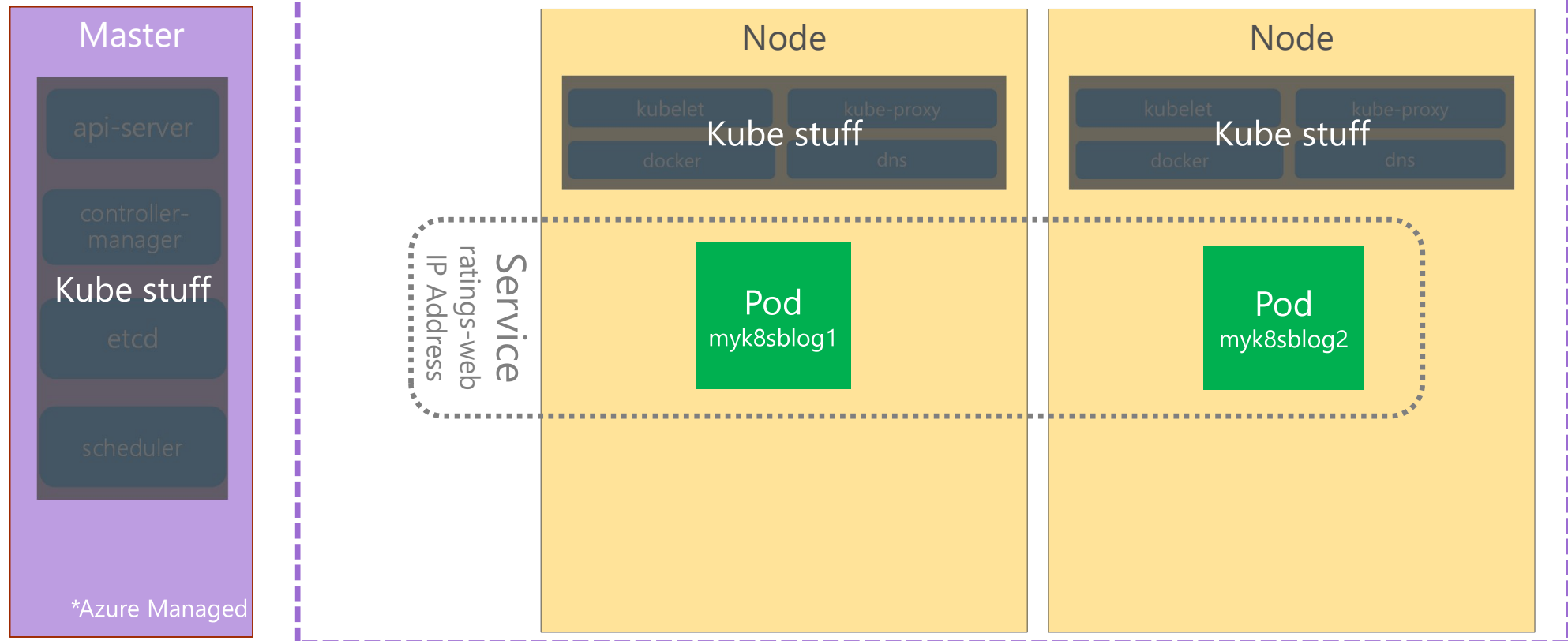
Service	
myk8sblog-load-balancer	
selector	app=myk8sblog
port	80:8080
IP	10.0.2.20



Deployment									
label	app=myk8sblog, tier=web								
image	azurecr.io/myk8sblog:db245a8								
<div>pod</div> <table><tr><td colspan="2">myk8sblog-1</td></tr><tr><td>port</td><td>8080</td></tr></table> <div>pod</div> <table><tr><td colspan="2">myk8sblog-2</td></tr><tr><td>port</td><td>8080</td></tr></table>		myk8sblog-1		port	8080	myk8sblog-2		port	8080
myk8sblog-1									
port	8080								
myk8sblog-2									
port	8080								
myk8sblog									

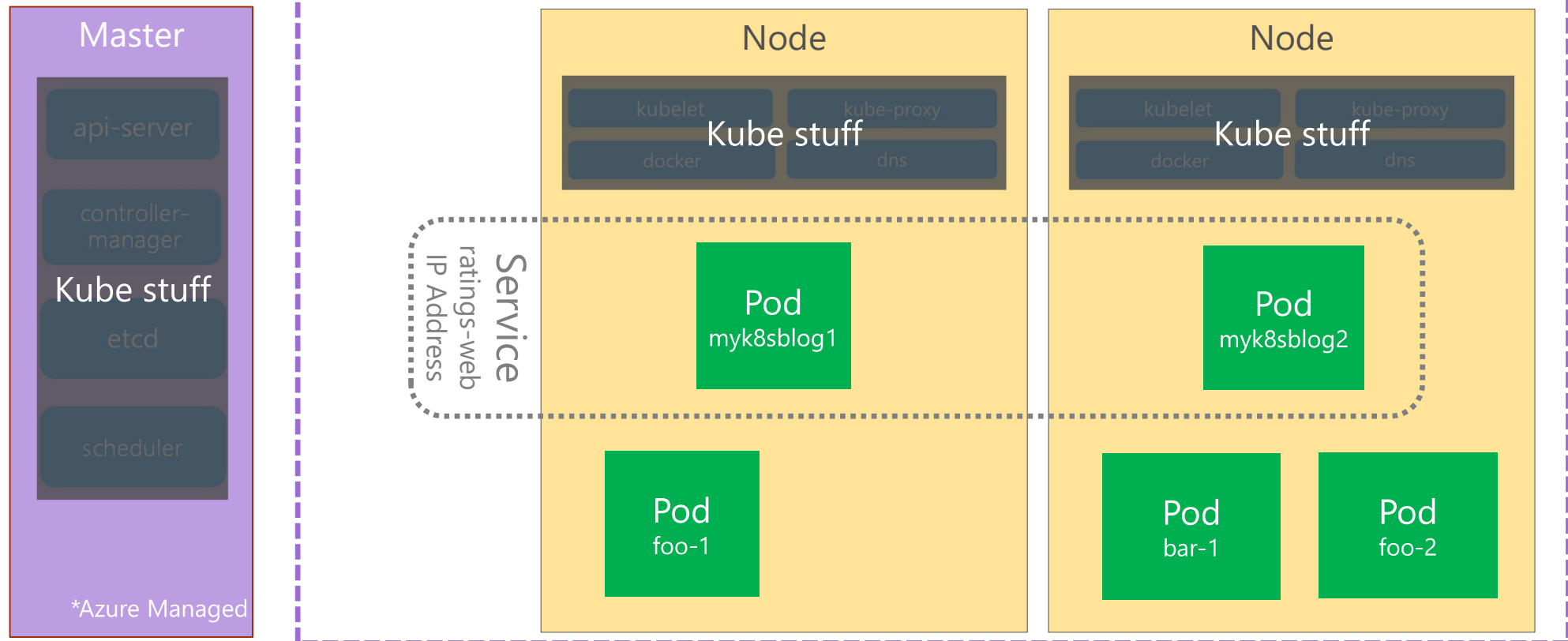
Kubernetes Architecture Components

Pods



Kubernetes Architecture Components

Pods



Time for some hands-on with
Kubernetes

Getting Started with AKS – Start here

How do I create a cluster on Azure ?

```
az aks create -g myResourceGroup -n myCluster --generate-ssh-keys
```

How do I install the kubectl ?

```
az aks install-cli
```

How do I access my cluster?

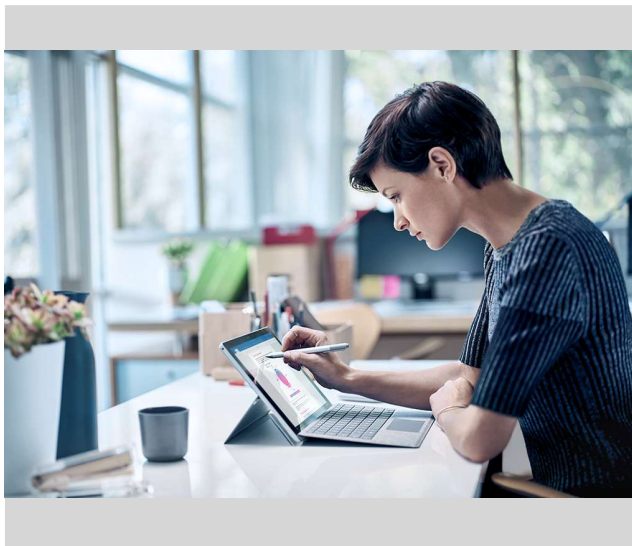
```
$ az aks get-credentials -g myResourceGroup -n myCluster
```

What's Next?

<https://aka.ms/learnkubernetes>

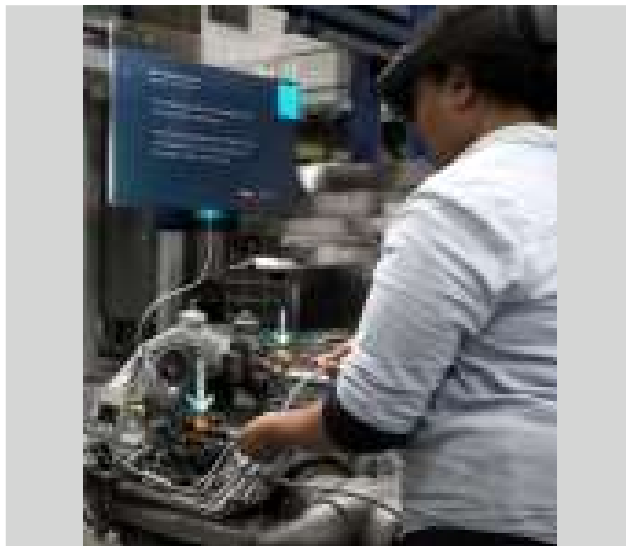
Q&A

Next steps in your learning journey



Register for the next webinar at:

www.aka.ms/CloudDigitalSeries



Register for in-person technical learning
or a hands-on experience at:

www.aka.ms/MicrosoftTrainingDaysCanada
www.aka.ms/AzureHands-OnLabs



For more learning resources, please
visit:

www.aka.ms/MSLearn