IS KUBERNETES TOO COMPLICATED ?

@juliafmorgado

I'M JULIA FURST MORGADO!

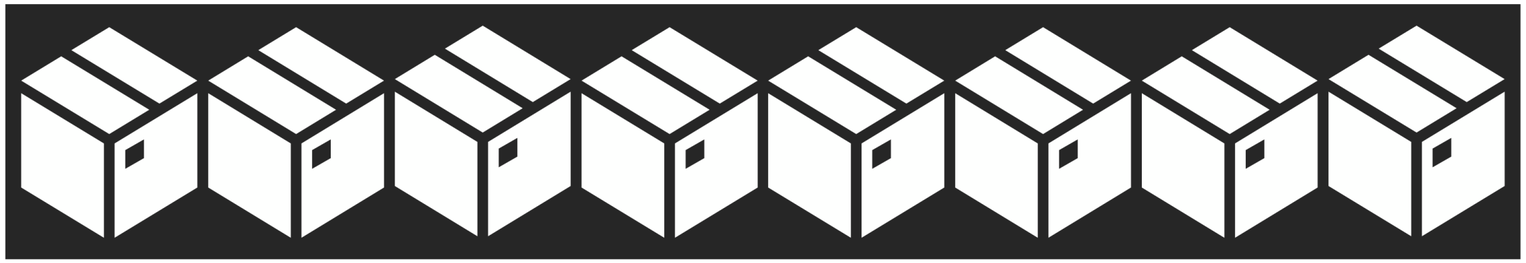
Global Technologist at Veeam

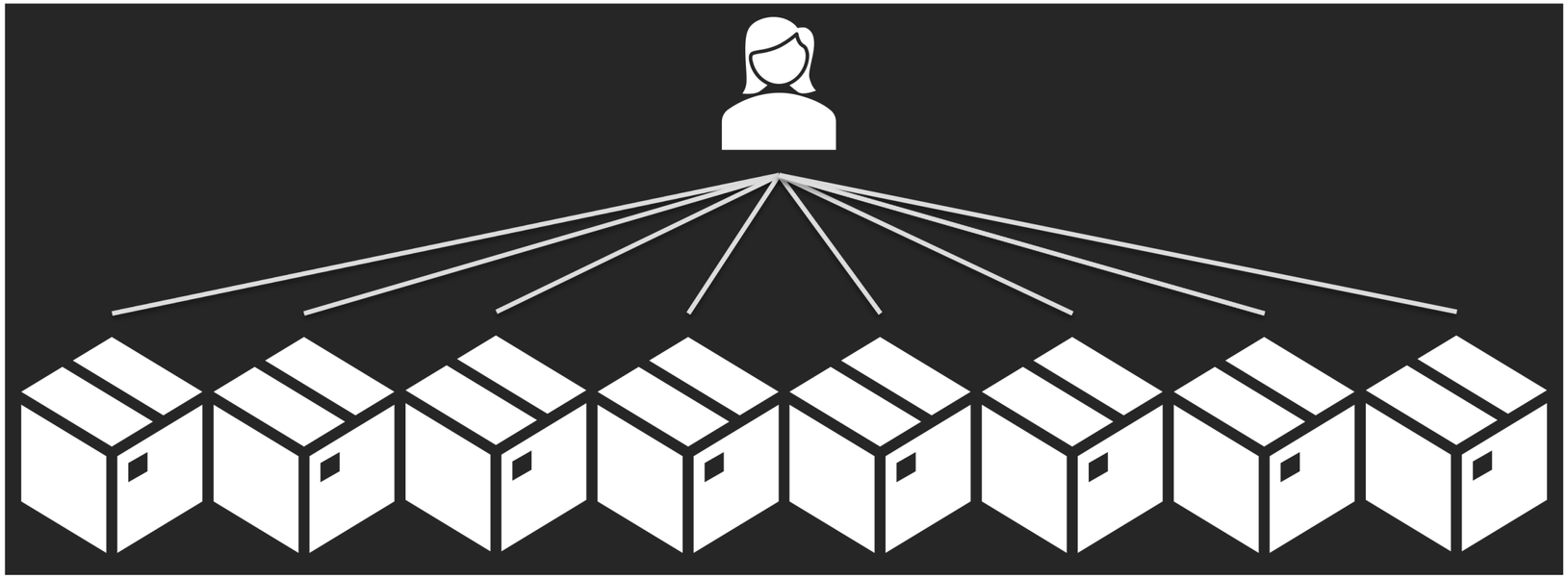
CNCF Ambassador

AWS Community Builder

Public Speaker

Containerizing





WHAT IS KUBERNETES?

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applicat
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and con

WHAT IS KUBERNETES?

K8s is an open source container orchestrator platform (it simplifies the deployment, scaling, and management of applications packaged in containers)

Maybe you DON’T need Kubernetes.

“If your application is complicated, use Kubernetes to make it simple. If your application is simple, don’t complicate it with Kubernetes.”

–SAID BY SOMEONE ON THE INTERNET

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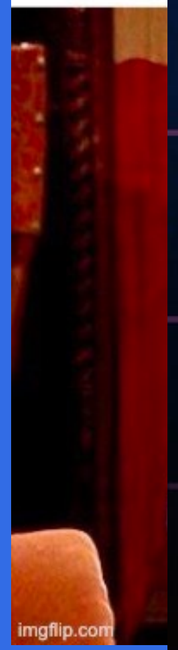
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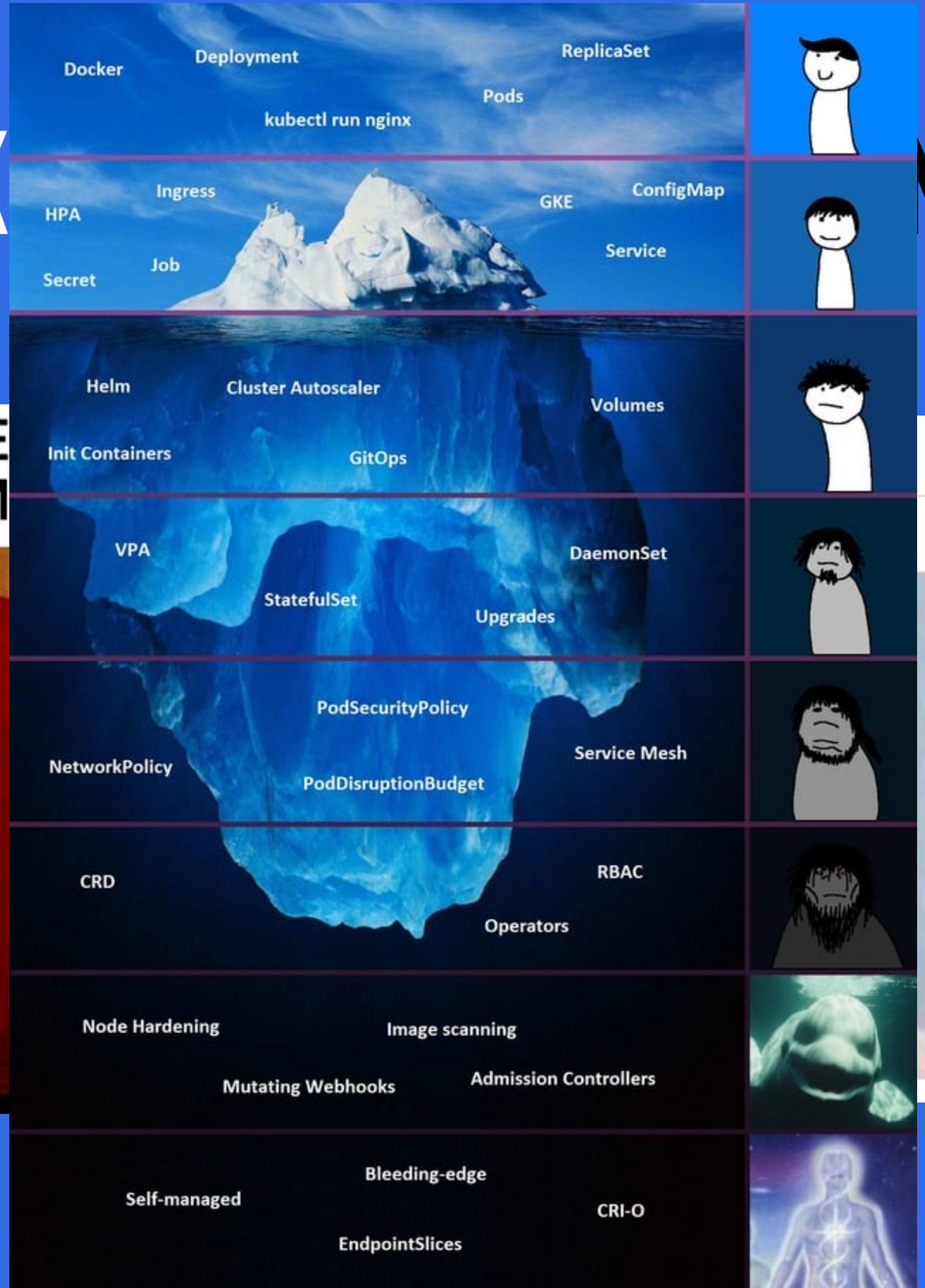
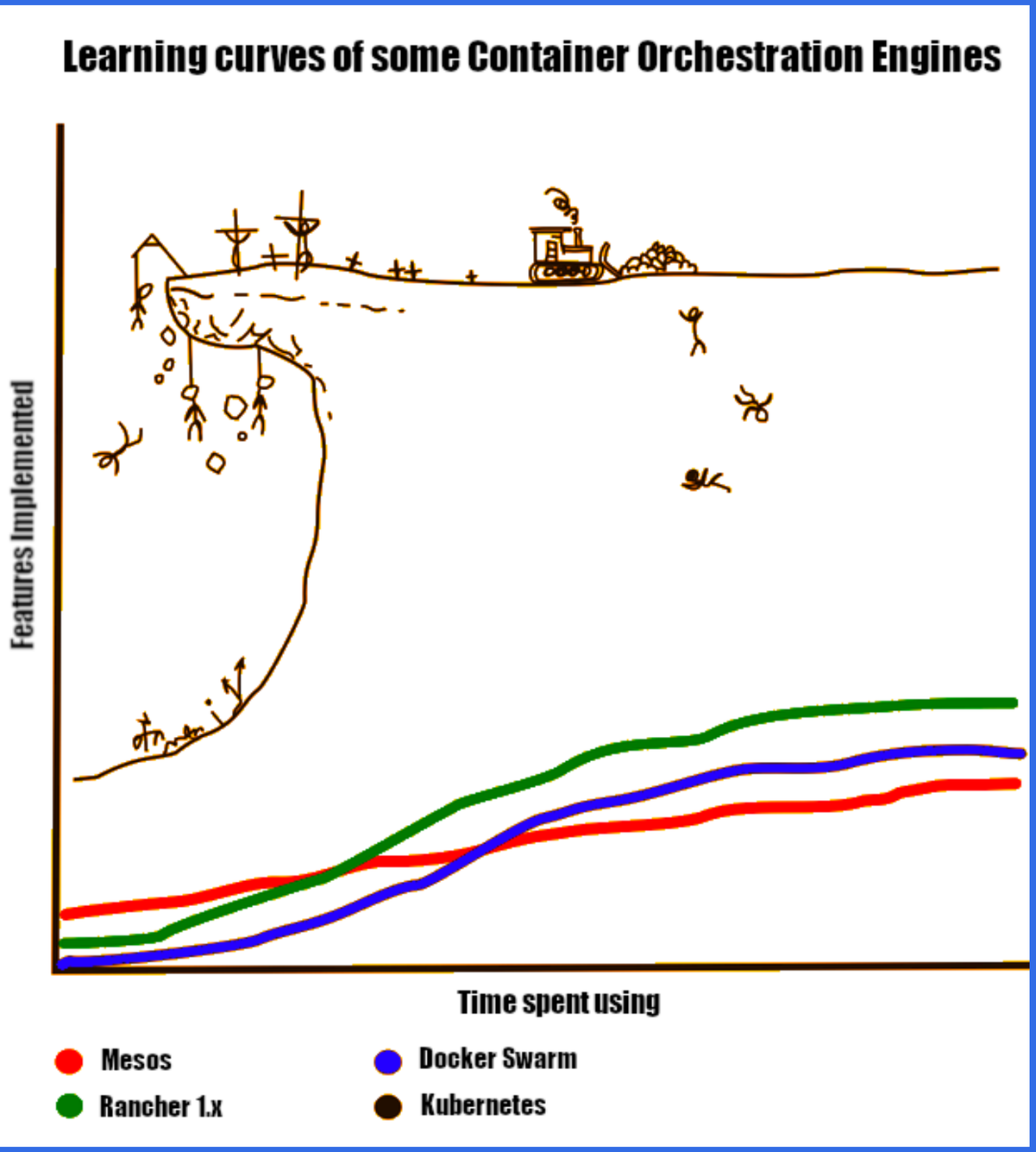

Docker
Deployment
ReplicaSet
Pods
kubectl run nginx
Ingress
HPA
GKE
ConfigMap
Service
Secret
Job
Helm
Cluster Autoscaler
Volumes
Init Containers
GitOps
VPA
DaemonSet
StatefulSet
Upgrades
PodSecurityPolicy
NetworkPolicy
Service Mesh
PodDisruptionBudget
CRD
RBAC
Operators
Node Hardening
Image scanning
Mutating Webhooks
Admission Controllers
Bleeding-edge
Self-managed
CRI-O
EndpointSlices


Learning curves of some Container Orchestration Engines
Features Implemented
Time spent using
Mesos
Rancher 1.x
Docker Swarm
Kubernetes

LET’S USE AN ANALOGY

WHAT DOES KUBERNETES HAVE TO DO WITH THIS

KUBERNETES ARCHITECTURE

Deployment

Scheduler

ETCD

API Server

Controller Manager

Control Plane

Kube-proxy

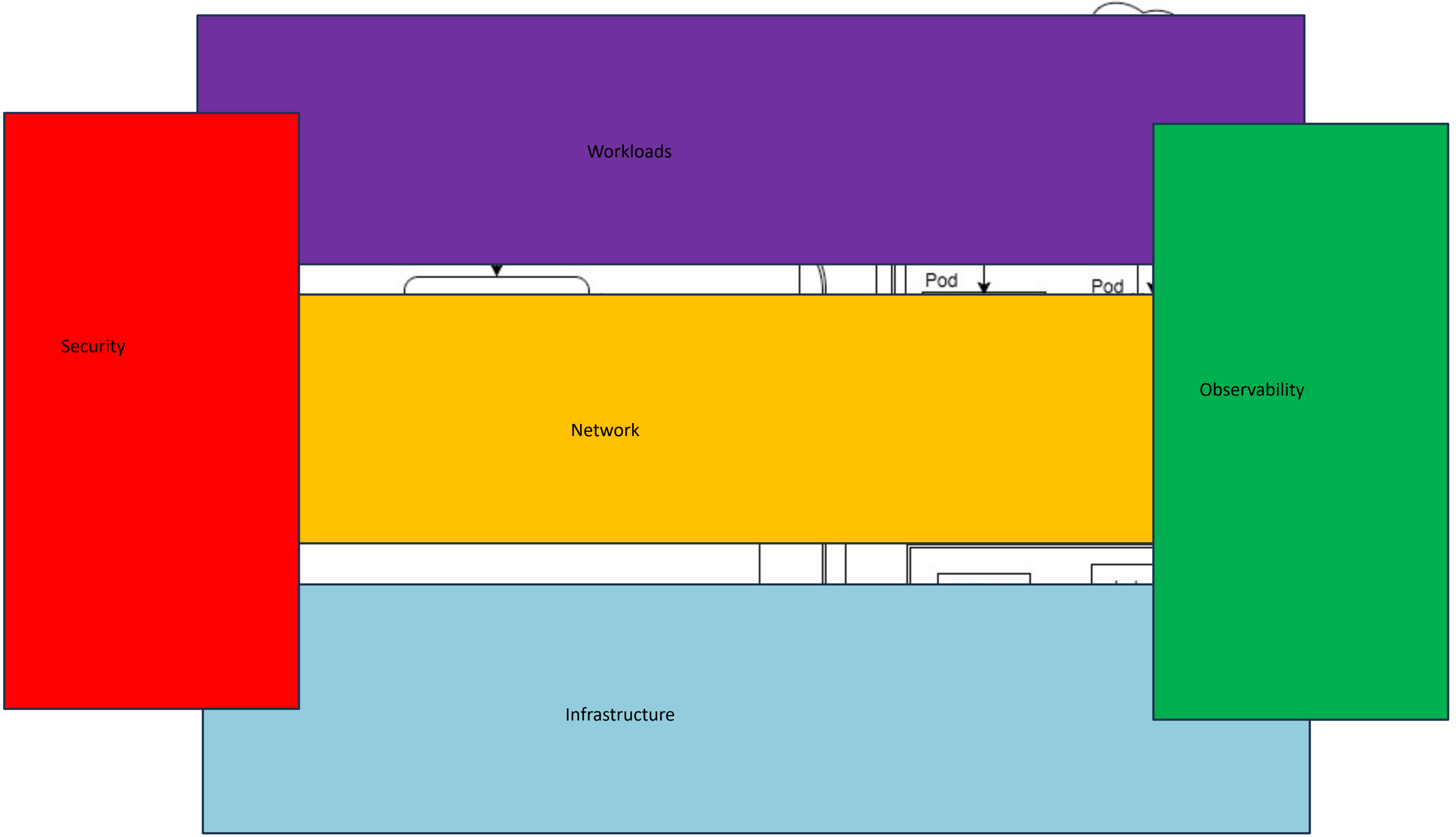
Kubelet

Container

Pod

Worker Node-n

INTERNET


Workloads
Security
Network
Observability
Infrastructure
Pod
Pod

Workloads:
Stable? Secure?
Observable?

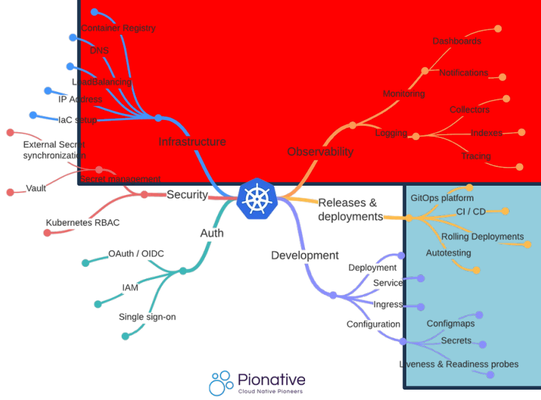
Security:
- Namespace isolation
- API access limitation
- RBAC/ServiceAccounts
- PSS/PSA

Network (inboud traffic):
- Ingress controller selection
- Gateway API
- Own custom implementation

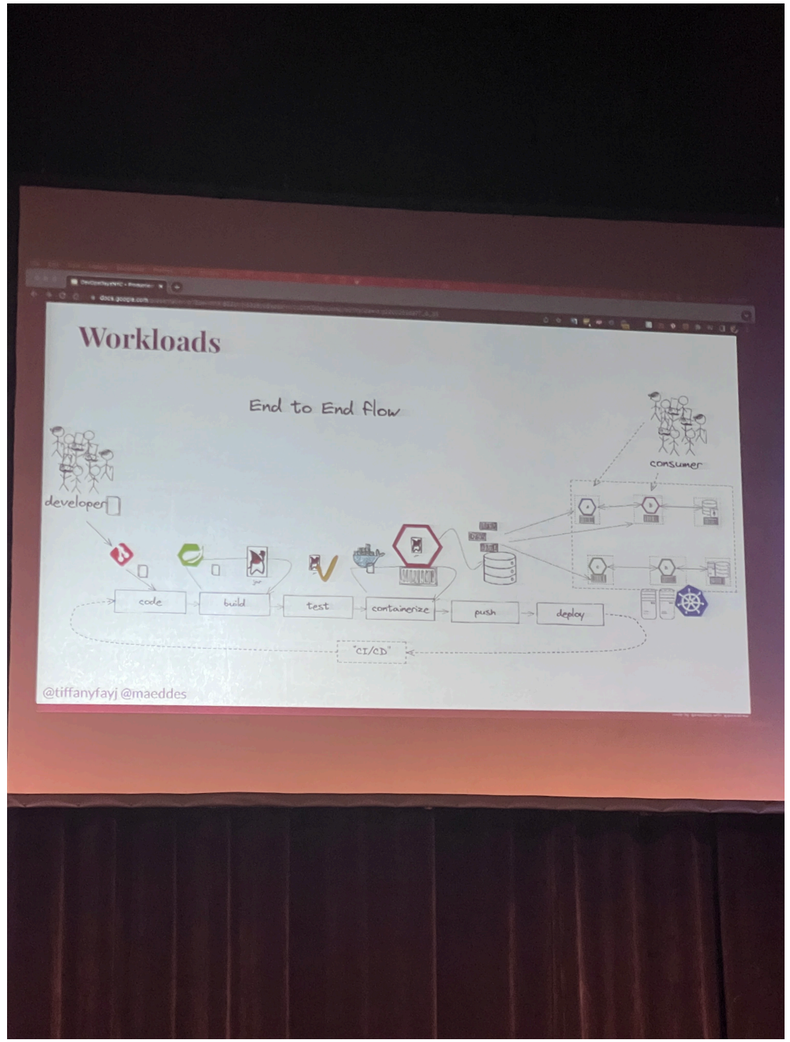
Traffic control:
Network policies
Encryption
Advanced routing

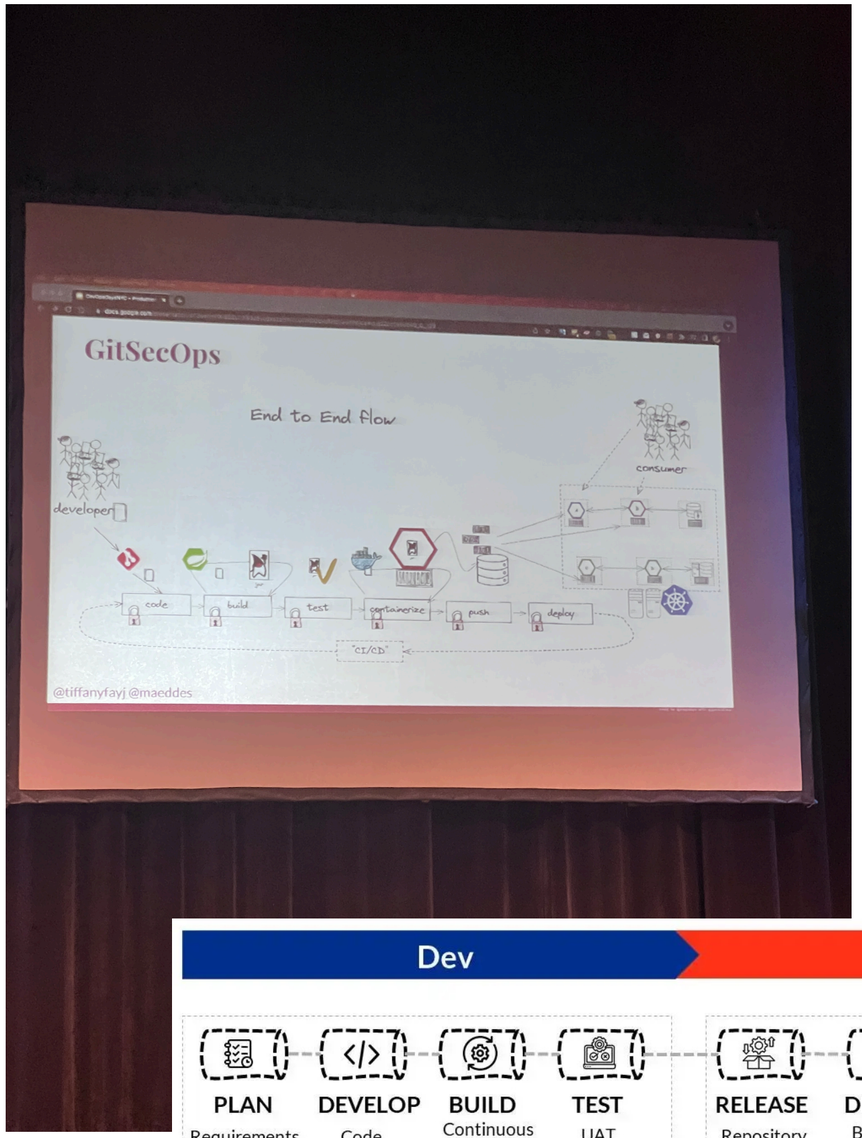
Observability:
- Tool stack
- Cluster & workload info
- Logs, metrics & traces

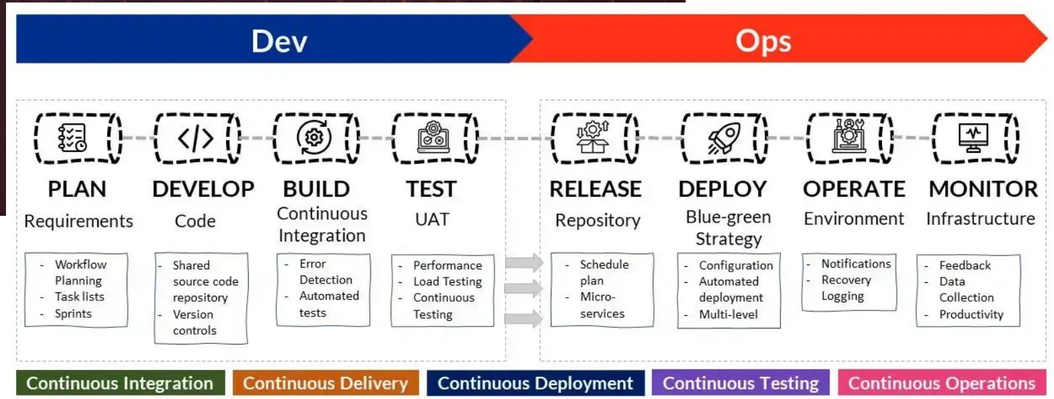
Infrastructure:
- Provide underlying hardware
- VMs for cluster
- Storage (classes) for PVs
- Provide backup (cluster & workloads)
- Access to managed services
- High-scale of nodes req. network tuning



Pionative
Cloud Native Pioneers


Workloads
End to End flow
developer
consumer
code
build
test
containerize
push
deploy
"CI/CD"
@tiffanyfayj @maeddes


GitSecOps
End to End flow
developer
consumer
code
build
test
containerize
push
deploy
"CI/CD"
@tiffanyfayj @maeddes


Dev
Ops
PLAN
Requirements
- Workflow Planning
- Task lists
- Sprints
DEVELOP
Code
- Shared source code repository
- Version controls
BUILD
Continuous Integration
- Error Detection
- Automated tests
TEST
UAT
- Performance
- Load Testing
- Continuous Testing
RELEASE
Repository
- Schedule plan
- Micro-services
DEPLOY
Blue-green Strategy
- Configuration
- Automated deployment
- Multi-level
OPERATE
Environment
- Notifications
- Recovery Logging
MONITOR
Infrastructure
- Feedback
- Data Collection
- Productivity
Continuous Integration
Continuous Delivery
Continuous Deployment
Continuous Testing
Continuous Operations
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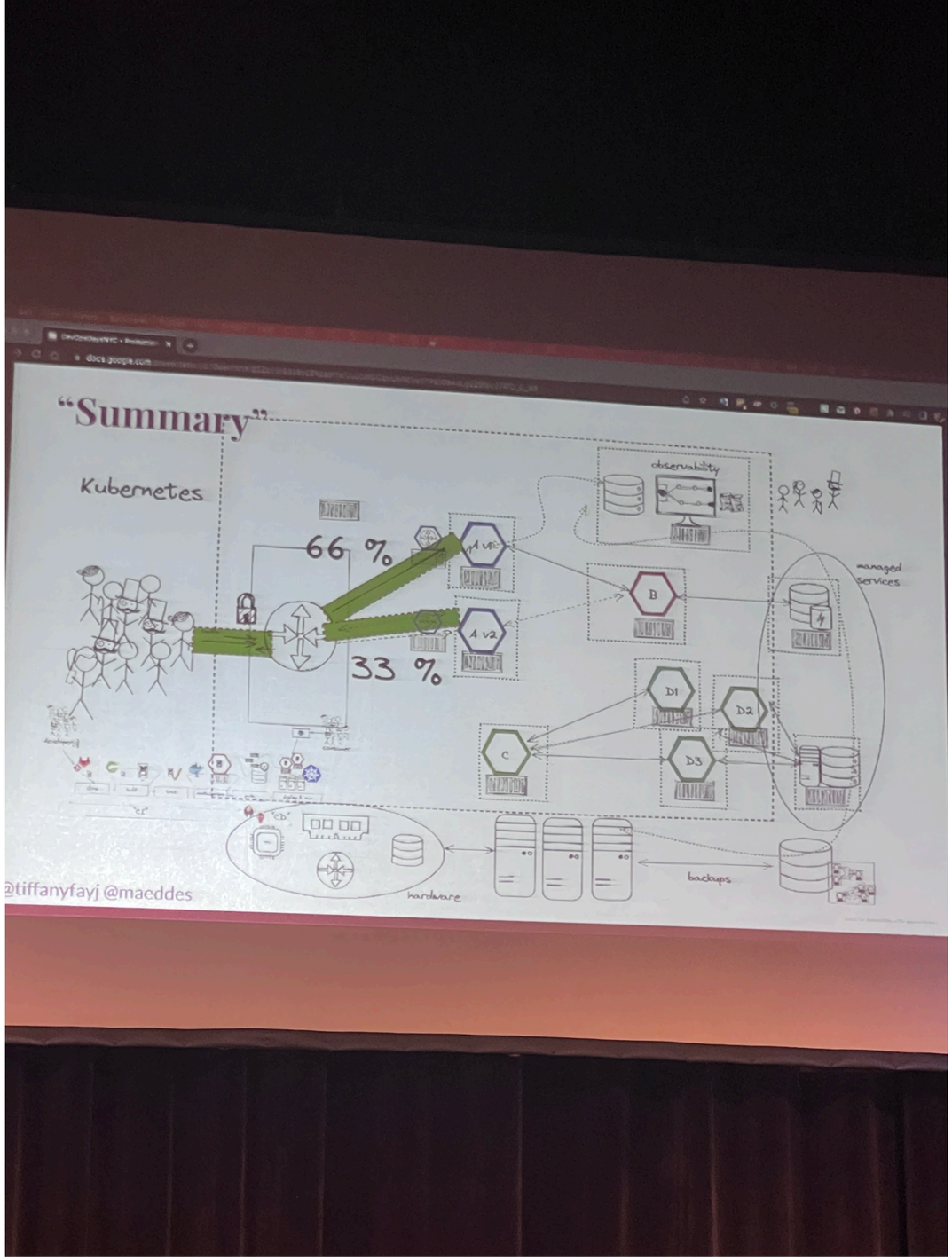
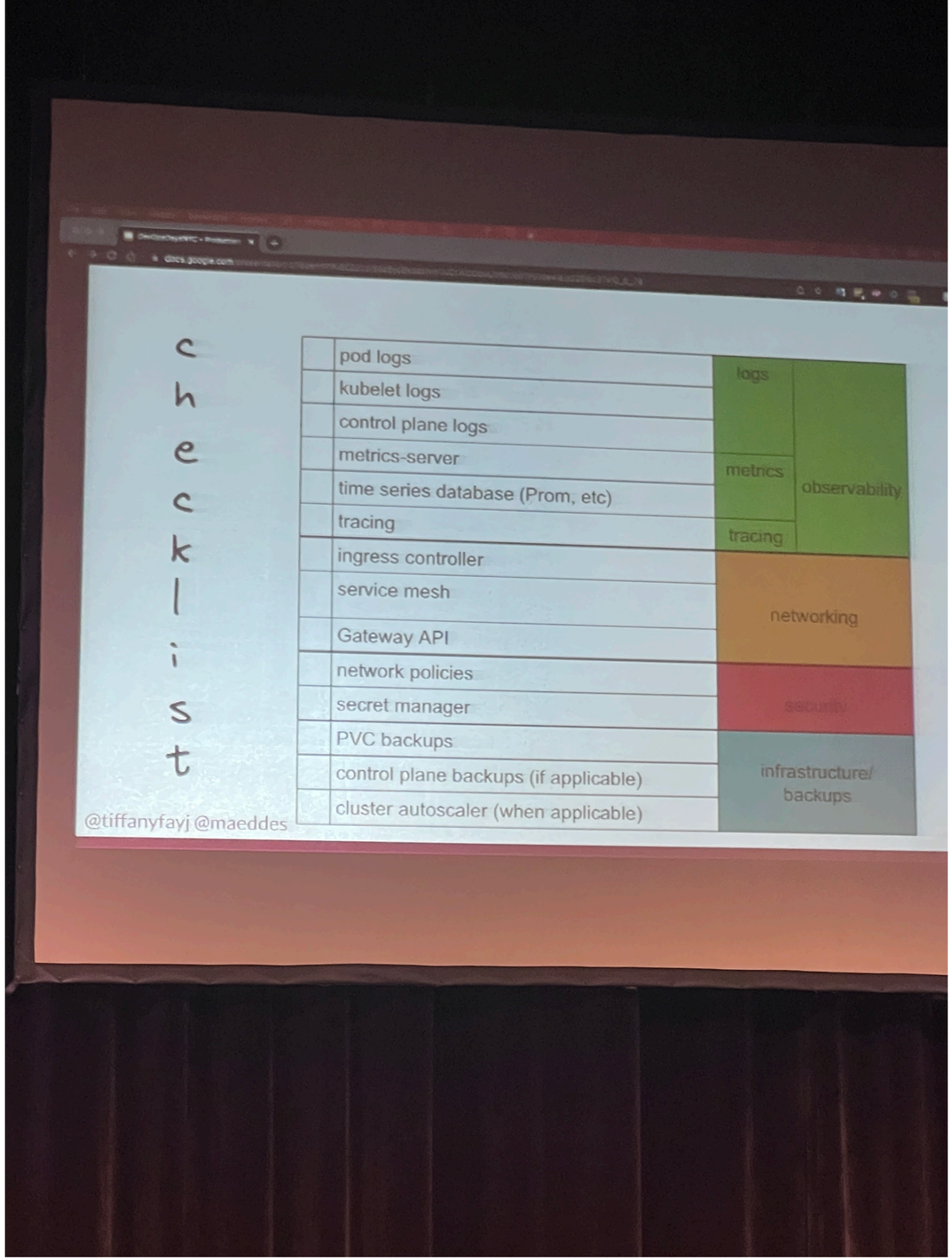

"Summary"
Kubernetes
66 %
33 %
A v1
A v2
B
C
D1
D2
D3
observability
managed services
backups
hardware
@tiffanyfayj @maeddes


checklist
pod logs
kubelet logs
control plane logs
metrics-server
time series database (Prom, etc)
tracing
ingress controller
service mesh
Gateway API
network policies
secret manager
PVC backups
control plane backups (if applicable)
cluster autoscaler (when applicable)
logs
metrics
tracing
observability
networking
security
infrastructure/ backups
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Management
un-managed
managed
*fully-managed
Apps / Workloads
Sec / Net / Obs
Kubernetes
Infrastructure / HW
Apps / Workloads
Sec / Net / Obs
Kubernetes
Infrastructure / HW
Apps / Workloads
Sec / Net / Obs
Kubernetes
Infrastructure / HW
you manage
provider managed
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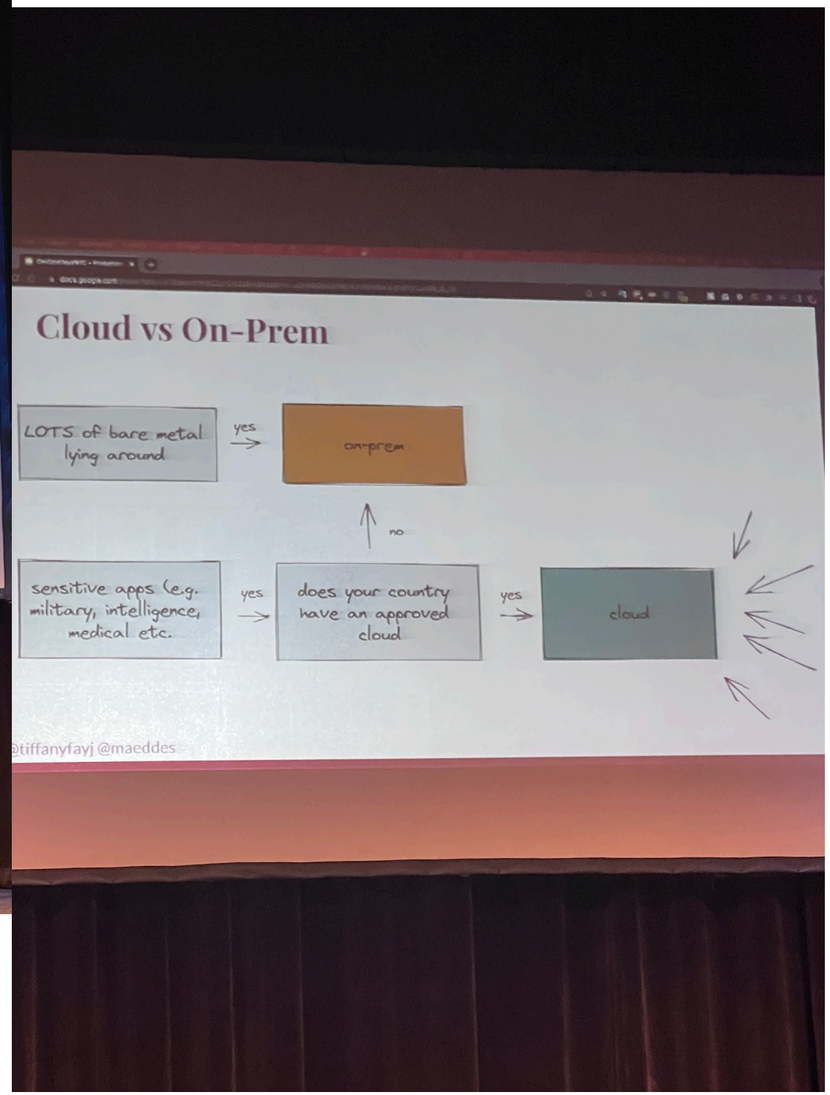
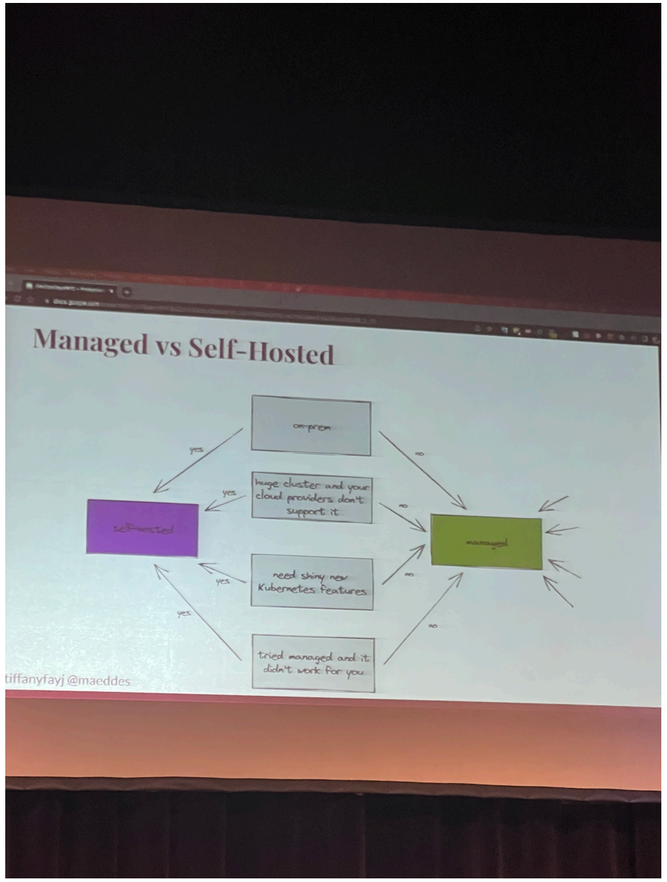
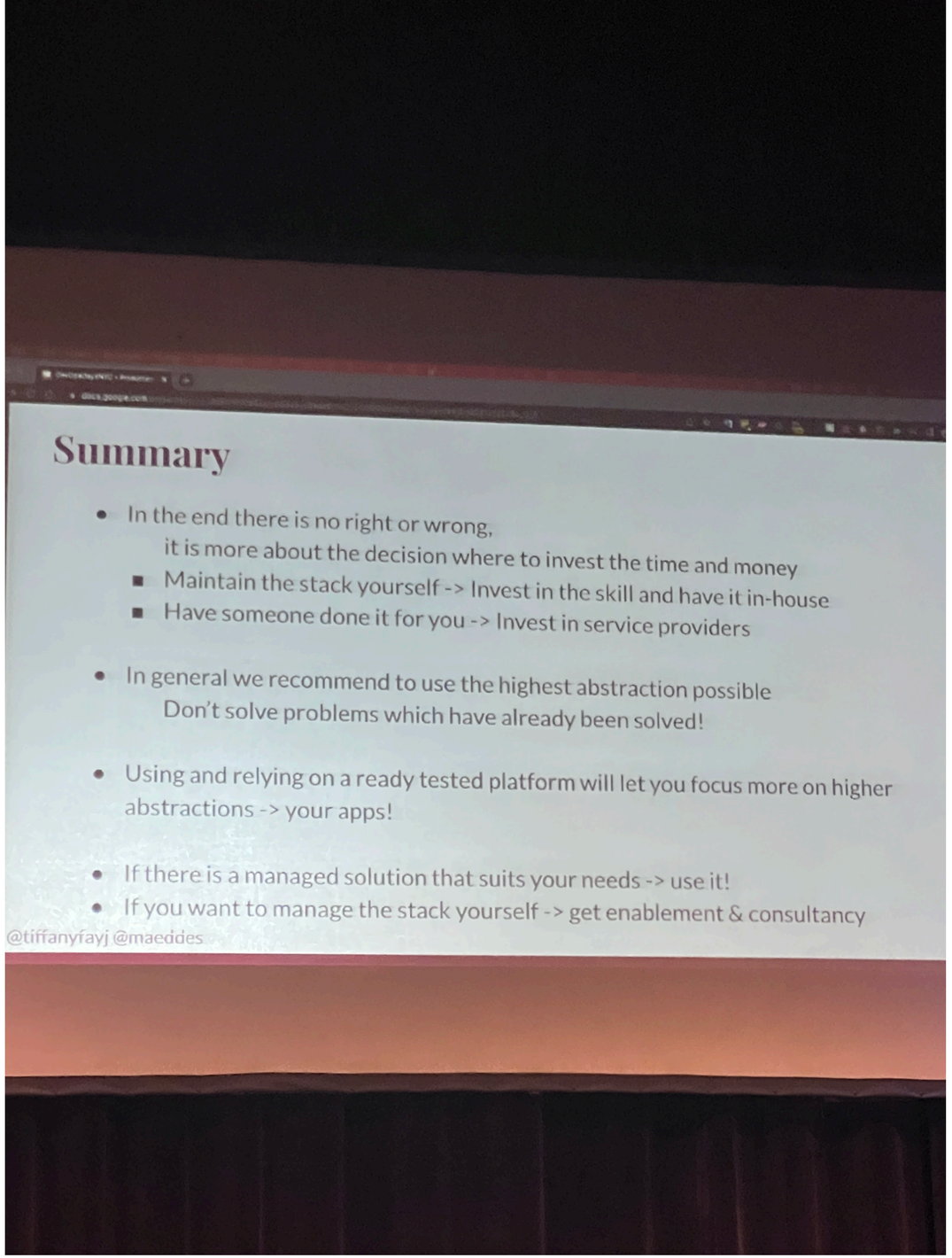

Cloud vs On-Prem
LOTS of bare metal lying around
yes
on-prem
no
sensitive apps (e.g. military, intelligence, medical etc.
yes
does your country have an approved cloud
yes
cloud
@tiffanyfayj @maeddes


Managed vs Self-Hosted
on-prem
yes
no
huge cluster and your cloud providers don't support it
yes
no
self-hosted
managed
need shiny new Kubernetes features
yes
no
yes
tried managed and it didn't work for you
no
tiffanyfayj @maeddes


Summary
In the end there is no right or wrong,
it is more about the decision where to invest the time and money
Maintain the stack yourself -> Invest in the skill and have it in-house
Have someone done it for you -> Invest in service providers
In general we recommend to use the highest abstraction possible
Don't solve problems which have already been solved!
Using and relying on a ready tested platform will let you focus more on higher abstractions -> your apps!
If there is a managed solution that suits your needs -> use it!
If you want to manage the stack yourself -> get enablement & consultancy
@tiffanyfayj @maeddes

r/devops · Posted by u/muchasxmaracas 13 days ago

Kubernetes and feeling defeated

75 upvotes 26 comments 0 awards

r/kubernetes · Posted by u/Seankala 4 days ago

Is it just me, or is Kubernetes supposed to be this frikkin hard and confusing to learn?

119 upvotes 121 comments 0 awards

IS KUBERNETES TOO COMPLICATED?

Cloud Native Weekly - All things Cloudy - 08-05-2023

8 days ago • 10 comments • 66 views

michaelcade Product Strategy • 68 comments

Kubernetes is great, it's complex

+5

This has been something that has been said in many conversations over the past 3 years and even longer. “Kubernetes is complex” I cannot really argue because yes, it is, but then I feel like so is virtualisation, cloud, and mainframes unless you work with it every day!

r/devops · Posted by u/gogorichie 3 months ago

How do I learn to love Kubernetes

211 upvotes 168 comments 1 award

r/devops · Posted by u/CS-0010 3 months ago

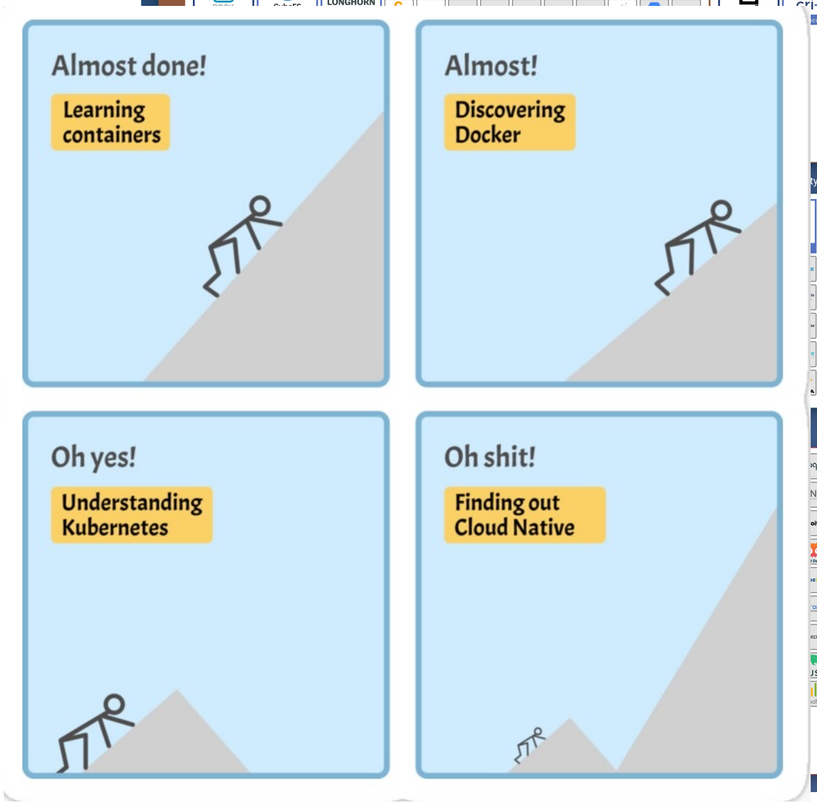
Was your first week learning Kubernetes as bad as mine?

133 upvotes 89 comments 0 awards

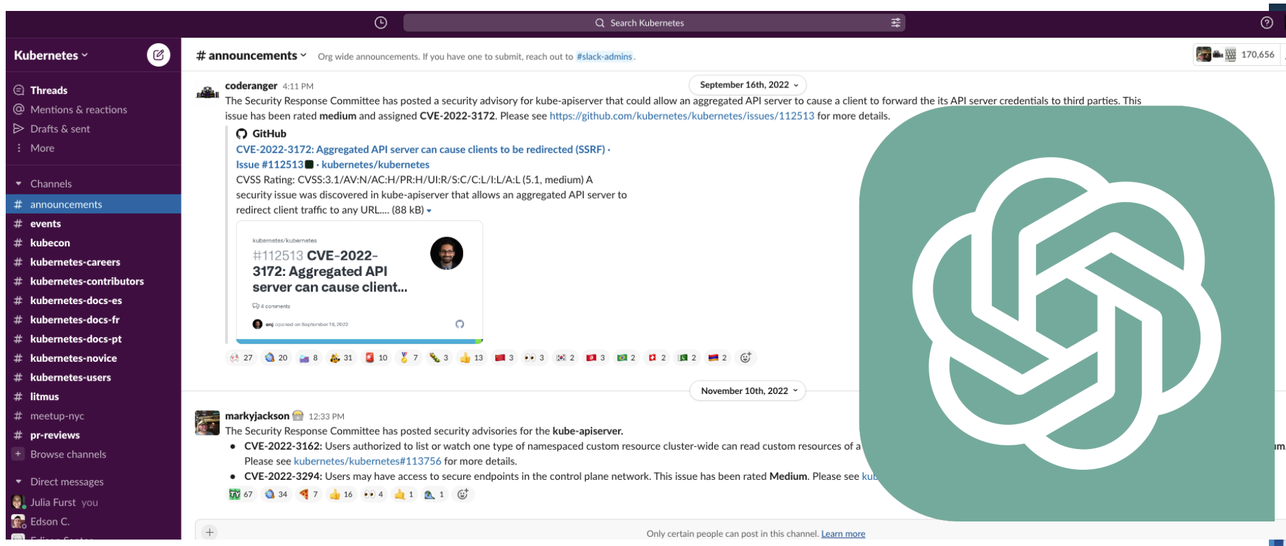
http://vee.am/4az5Dw

Kelsey Hightower
@kelseyhightower
Kubernetes is a platform for building platforms. It's a better place to start; not the endgame.
Tweet übersetzen
22:04 · 27.11.17 · Twitter Web Client
248 Retweets 39 Zitierte Tweets 735 „Gefällt mir“-Angaben

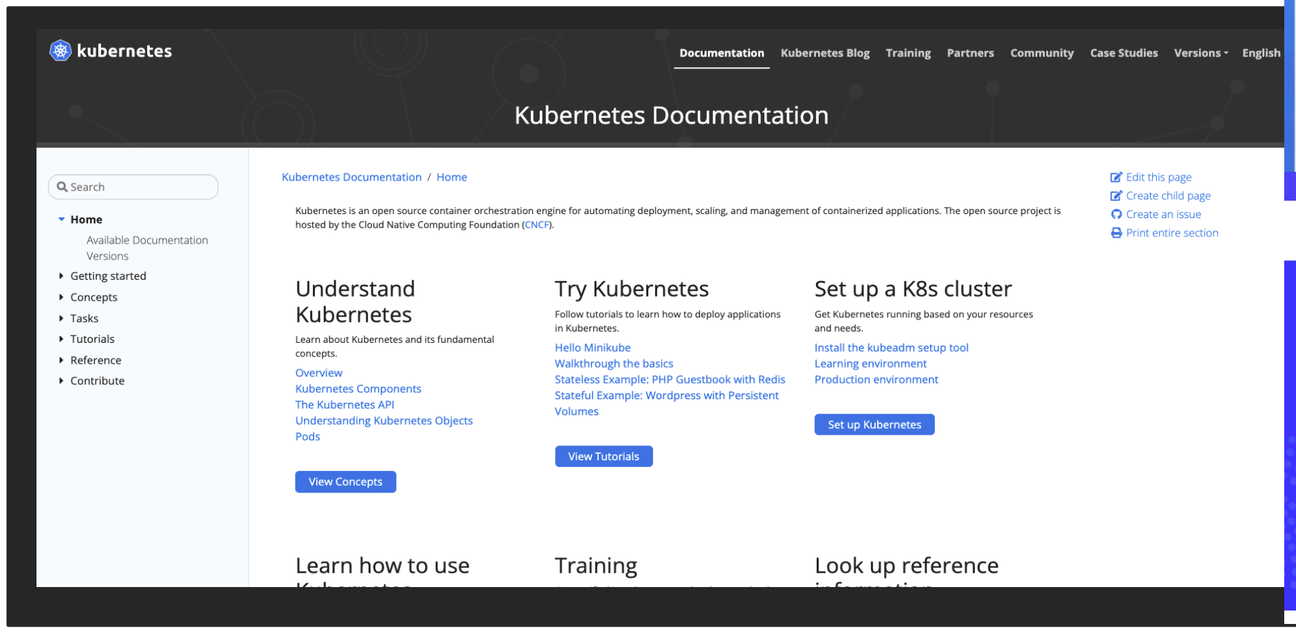
Greyed logos are not open source
Platform
Certified Kubernetes - Distribution
Serverless
teractive landscape are at l.cncf.io
& Delivery
OpenKruise
ACCORDION
AGORA KUBE
Kubernetes Training Partner

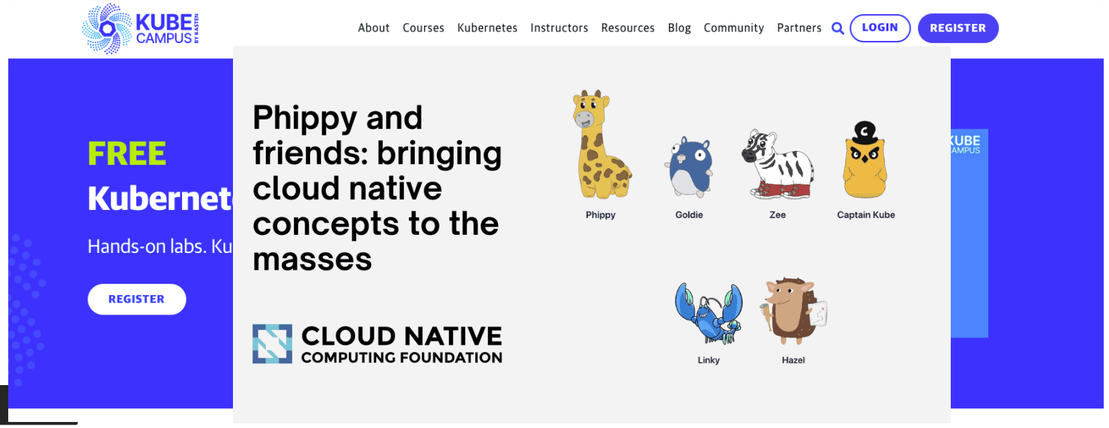

Almost done!
Learning containers
Almost!
Discovering Docker
Oh yes!
Understanding Kubernetes
Oh shit!
Finding out Cloud Native

SHOULD YOU LEARN KUBERNETES?



FREE RESOURCES





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KubeCon EU 2023

Questions

THANK YOU

@juliafmorgado