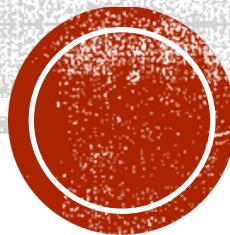


# **ELI5 KUBERNETES**

Nikhileshkumar Ikhar

Certified Kubernetes  
Administrator



I NEED TO KNOW WHY MOVING  
OUR APP TO THE CLOUD DIDN'T  
AUTOMATICALLY SOLVE ALL OUR  
PROBLEMS.



@ScottAdamsSays

Dilbert.com

YOU WOULDN'T  
LET ME RE-  
ARCHITECT THE  
APP TO BE  
CLOUD-NATIVE.  
JUST PUT IT  
IN  
CONTAINERS.



11-08-17 © 2017 Scott Adams, Inc./Dist. by Andrews McMeel

YOU CAN'T  
SOLVE A  
PROBLEM JUST  
BY SAYING  
TECHY THINGS. KUBERNETES.



# DEPLOYMENT HISTORY

---

Standalone server

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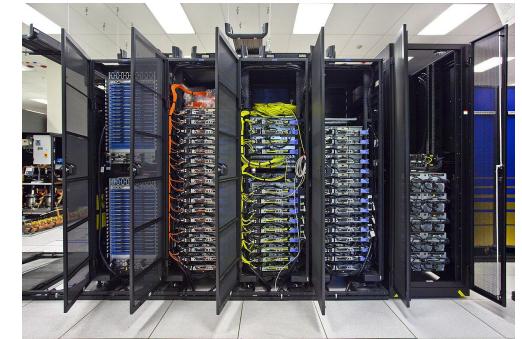
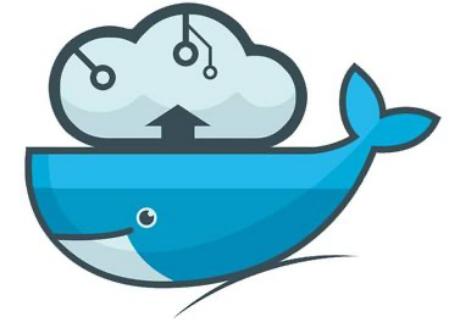
Cloud

---

Docker

---

K8s



# MONEY IS DRIVING INNOVATION



## Standalone server

High Cost  
Resource Utilization Difficult  
Scaling Is Difficult



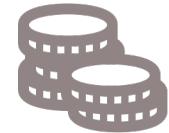
## Cloud Server

Low Cost  
Resource Utilization Difficult  
Scaling Is Difficult



## Docker

Low Cost  
Resource Utilization Easy  
Scaling Is Difficult



## Kubernetes

Low Cost  
Resource Utilization Easy  
Scaling Is Easy





# POD ANALOGY



Imagine Linux laptop with one or more application



Application can communicate with each other



You can connect to the internet



Per app, You can allocate memory and CPU



You can run commands



You can communicate with other laptops through the network



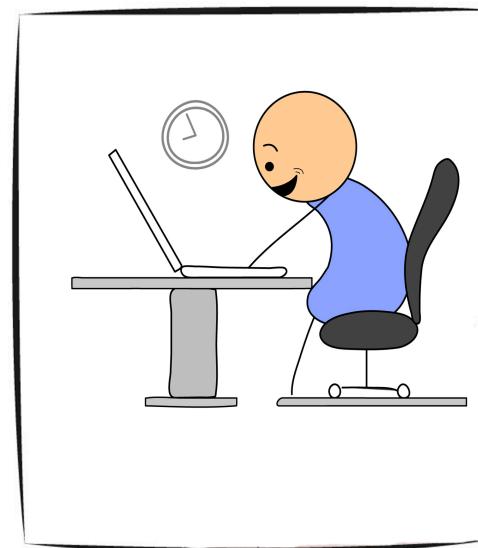
You can share file system with other laptops



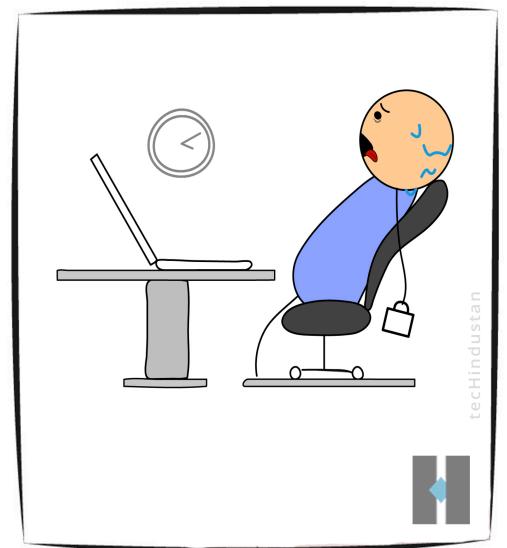
# POD DEMO

- `kubectl run nginxpod --image=nginx`
- `kubectl get po`
- `kubectl describe po`
- Pod configuration file





Programming



If you're not tired  
you're not doing it right

[www.techindustan.com](http://www.techindustan.com) - Finest IT Services Company

f t i /techindustan



# POD SCALING WITH DEPLOYMENT



# DEPLOYMENT ANALOGY

---



You have to run more instances of the application



You can't run it on same the laptop



You can run the application on another laptop



# DEPLOYMENT DEMO

- `kubectl create deployment nginx-deploy --image=nginx`
- `kubectl scale deployment nginx-deploy --replicas 3`
- Get
- Describe





I WAS HOPING FOR  
A SLIGHTLY MORE DETAILED  
EXPLANATION OF HOW  
CLOUD COMPUTING WORKS  
THAN - "IT'S MAGIC"!



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# COMMUNICATE WITH SERVICE



# SERVICE ANALOGY

Use LAN to connect all laptops

You can communicate with other services/ pods

Laptops can't communicate outside LAN.

- Our Pod can access internet

Outside of LAN cannot communicate with the laptop

This service type is Cluster IP



# SERVICE ANALOGY

- A load balancer is added to allow access to the outer world
- This service type is Load balancer (Very very costly)
- Load balancer is provided by the cloud provider
- Easiest one is with Node. Opens a port on each node.
- Internet can through the service through <http://IP:nodeport>
- This service type is NodePort

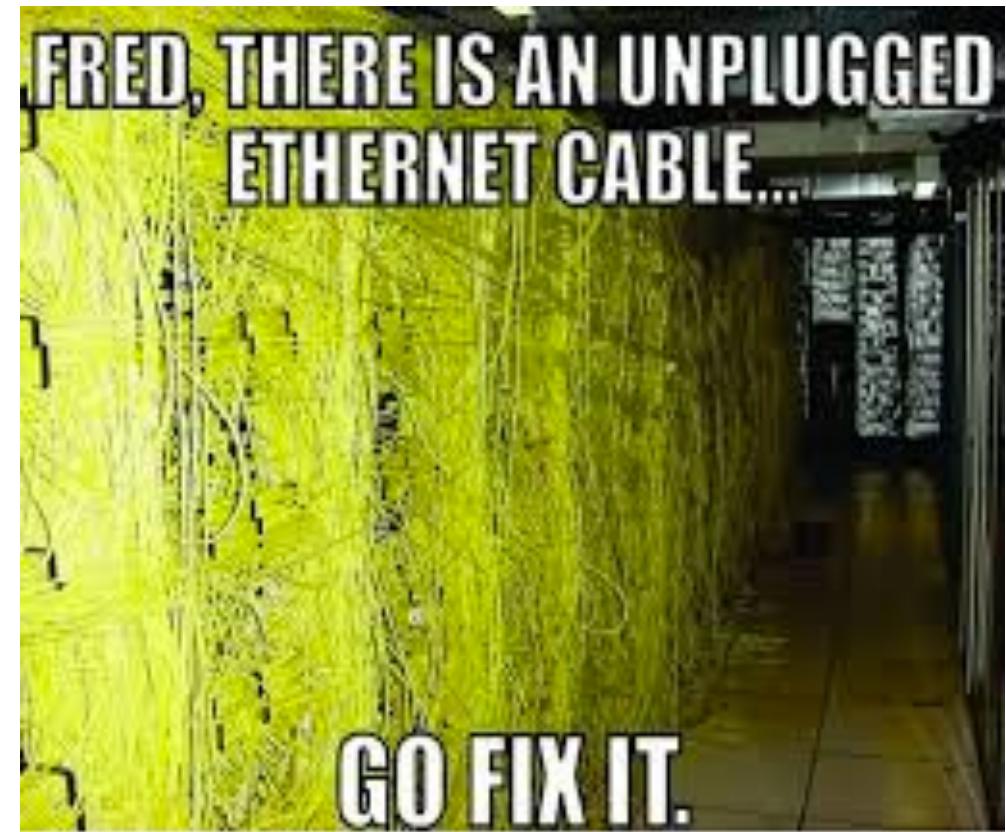


# SERVICE DEMO

- `kubectl expose deployment nginx-deploy --port=80 --target-port=80`
- `kubectl expose deployment nginx-deploy --port=80 --target-port=80 --type=NodePort`
- Get
- Describe
- EndPoint



# INGRESS



# INGRESS

- Similar to nginx/ apache web server
- It understands the domain name mapped to a service
- It understands how to direct request to a service
- Commonly used ingress is Nginx ingress controller
- L7/ L4
- Better than load balancer service? why?



# INGRESS DEMO

- <https://kubernetes.io/docs/concepts/services-networking/ingress/#the-ingress-resource>





**SECRET &  
CONFIGMAP**



# SECRET & CONFIGMAP

---



Add more and more env variable will make deployment big



Use secrets for top secret env vars (from vault)



Both are used to provide data to deployment



Yes, you can read secrets.



Use configmap for env vars



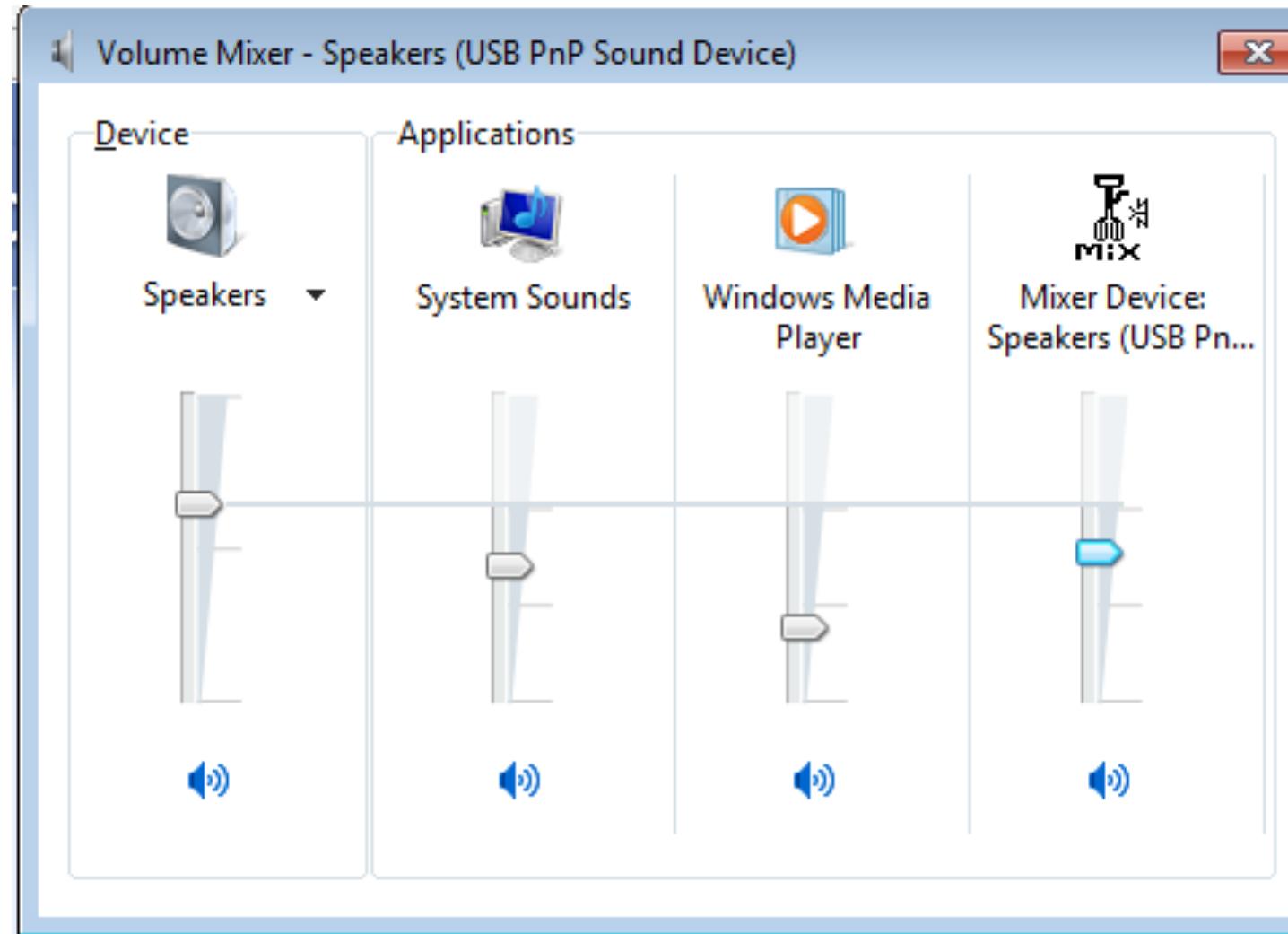
Secret are base64 encoded.



# SECRET DEMO

- `kubectl create secret generic mysecret --from-literal=username=devuser --from-literal=password='S!B\*d$zDsb='`
- <https://kubernetes.io/docs/concepts/configuration/secret/#using-secrets-as-files-from-a-pod>





VOLUME

# VOLUME

hostPath	emptyDir	Persistent Volume	Persistent Volume Claim
<ul style="list-style-type: none"><li>• Access data from the host machine</li></ul>	<ul style="list-style-type: none"><li>• Dir with a life of Pod</li></ul>	<ul style="list-style-type: none"><li>• Volume (disk) we attach to Pod</li><li>• Life is beyond Pod</li></ul>	<ul style="list-style-type: none"><li>• PV is used via PVC</li></ul>



# VOLUME DEMO

- <https://kubernetes.io/docs/concepts/storage/volumes/#example-pod>
- Get
- Describe
- PV & PVC





**HELM**

# HELM

- `helm create <name>`
- `helm template <name>`
- `helm install <name>`
  
- <https://helm.sh/docs/>



# HELM DEMO

