Containers for IT Ops

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Agenda

- Containers?
- Container orchestrators!
- Deploy
- Deploy an app
- Monitor all things!
Why do deployments hurt?

Mostly manual
Complex applications
Way to many versions
No documentation
‘throw over the fence politics’
   it worked on my computer!
   Not my problem!
Fight the pain

Automate the process
Divide the monolith into small services
Deploy small and fast
Encapsulate
What is a container

A container image is a lightweight, stand-alone, executable package of a piece of software that includes everything needed to run it: code, runtime, system tools, system libraries, settings. Available for both Linux and Windows based apps, containerized software will always run the same, regardless of the environment. Containers isolate software from its surroundings, for example differences between development and staging environments and help reduce conflicts between teams running different software on the same infrastructure.
Containers and images

**Containers** are the running micro applications – like a VM like an App-V package instance

**Images** include all the requirements for running the container. – Like a sysprepped image \template an App-V package
This is all dev related, why do I care?

Knowing is half the battle!
This is all dev related, why do I care?

**Developers:**
take care of the contents of the container

**IT Operations:**
takes care of the operations of the container
Container managers orchestrators

system for automating deployment, scaling, and management of containerized applications.
DEMO
Deploy k8s
# Add AzureAccount

push

$rgname="cluks@demo01-rg" 

$location="eastus"

$acrName="cluks@demo01acr"

$sakshame="cluks@demo01"

$email="stijn.callebaut@tinetx.be"

# Create resource group

az group create --location $location --name $rgname

# Create registry

az acr create --location $location --name $acrName --resource-group $rgname --sku Basic --admin-enabled

# Get acr credential

az acr credential show --name $acrName --query "passwords[0].value" -o tsv

# Create cluster

az aks create --location $location --name $sakshame --resource-group $rgname --node-count 4 --generate-ssh-keys

az aks get-credentials --resource-group $rgname --name $sakshame

PS /home/stijn> []
Introducing kubernetes (k8s)

**Pods** represent the smallest deployable artifact in k8s. It is a collection of containers running in the same execution environment.

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx
spec:
  containers:
    - name: nginx
      image: nginx:1.7.9
      ports:
        - containerPort: 80
```
Pod

Container

Container

IP

volumes
a **replicaset** defines a single scalable, self-healing state of a pod.

**Deployments** manage replicaset and amongst others. It describes the desired state

```yaml
apiVersion: apps/v1beta1
kind: Deployment
metadata:
  name: nginx-deployment
spec:
  replicas: 2
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:1.7.9
          ports:
            - containerPort: 80
```
**Services** is an abstraction which defines a logical set of pods\deployments and a policy by which to access them.

**Ingress**: An API object that manages external access to the services in a cluster, typically HTTP.

**Namespaces**: Namespaces are a way to divide cluster resources.

**Volumes**: a way to share files between containers and to preserve files between restarts.
Virtual IP

Service

Deployment\ Pod
DEMO
Deploy our application
Monitoring

Prometheus
Datadog
Elasticsearch + kibana
Grafana (influxdb – heapster)
‘fluentd’ and OMS
DEMO

K8s and OMS
Recap

Containers are here to stay
Declarative syntax end-to-end
Faster deployments
Stateless and statefull
PaaS integrations
Monitoring
Containers on Azure

Azure web apps
Azure Batch
Azure Container Service \ ACS-Engine
Azure Kontainer Service (AKS)
Azure Container Instances
Azure Service Fabric
Useful information

Kubernetes up and running
Kubernetes the hard way
Kubernetes.io
The illustrated guide to kubernetes (video)
Containers on Azure
Useful information

Kubernetes Azure interest group
Docker file reference
OMS container solution
Session demo’s and examples
Questions?