# A STORY OF LINUX ON AZURE
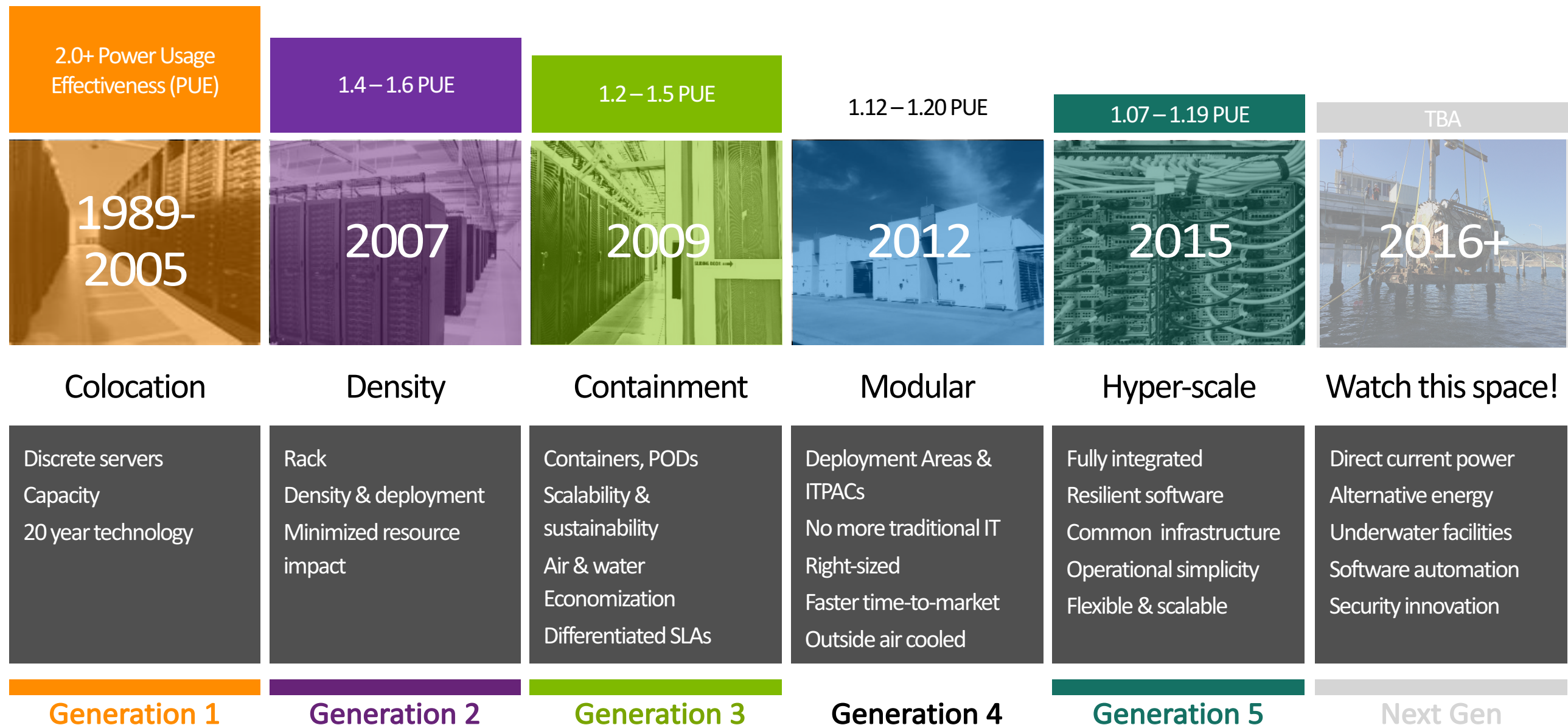
# MICROSOFT ♥ LINUX
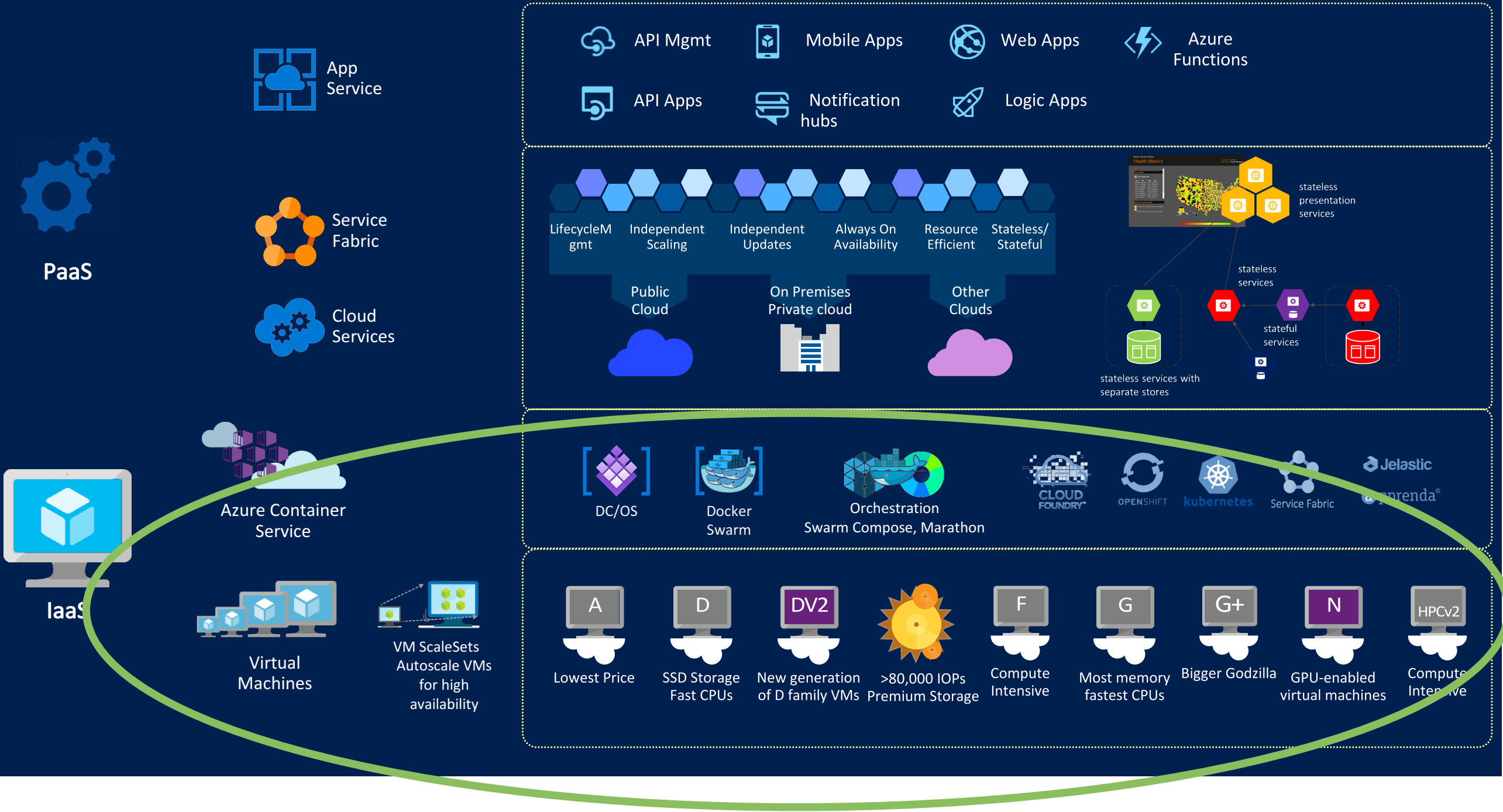
{"WTF": "SUCKER FOR DRAMA","TAKEAWAYS": [{"MOTIVATION":"CAN YOU DO IT BETTER"},{"MOTIVATION":"ASK WHY SHOULD YOU…FOCUS"}]}

# Datacenter Innovation

| 2.0+ Power Usage Effectiveness (PUE) | 1.4 − 1.6 PUE | 1.2 − 1.5 PUE | 1.12 − 1.20 PUE | 1.07 − 1.19 PUE | TBA |
|---|---|---|---|---|---|
| **1989-2005** | **2007** | **2009** | **2012** | **2015** | **2016+** |
| Colocation | Density | Containment | Modular | Hyper-scale | Watch this space! |
| Discrete servers<br>Capacity<br>20 year technology | Rack<br>Density & deployment<br>Minimized resource impact | Containers, PODs<br>Scalability & sustainability<br>Air & water Economization<br>Differentiated SLAs | Deployment Areas & ITPACs<br>No more traditional IT<br>Right-sized<br>Faster time-to-market<br>Outside air cooled | Fully integrated<br>Resilient software<br>Common infrastructure<br>Operational simplicity<br>Flexible & scalable | Direct current power<br>Alternative energy<br>Underwater facilities<br>Software automation<br>Security innovation |
| **Generation 1** | **Generation 2** | **Generation 3** | **Generation 4** | **Generation 5** | **Next Gen** |

# IAAS & CONTAINERS

## IaaS, PaaS, Microservices

**PaaS**

App Service

Service Fabric

Cloud Services

**IaaS**

Azure Container Service

Virtual Machines

VM ScaleSets Autoscale VMs for high availability

API Mgmt

API Apps

Mobile Apps

Notification hubs

Web Apps

Logic Apps

Azure Functions

LifecycleMgmt

Independent Scaling

Independent Updates

Always On Availability

Resource Efficient

Stateless/ Stateful

Public Cloud

On Premises Private cloud

Other Clouds

stateless presentation services

stateless services

stateful services

stateless services with separate stores

DC/OS

Docker Swarm

Orchestration Swarm Compose, Marathon

CLOUD FOUNDRY

OPENSHIFT

kubernetes

Service Fabric

Jelastic

aprenda

| A | D | DV2 | | F | G | G+ | N | HPCv2 |
|---|---|---|---|---|---|---|---|---|
| Lowest Price | SSD Storage Fast CPUs | New generation of D family VMs | >80,000 IOPs Premium Storage | Compute Intensive | Most memory fastest CPUs | Bigger Godzilla | GPU-enabled virtual machines | Compute Intensive |

# AZURE RESOURCES

Resource group

Compute: SKU/ CPU/ Mem

Storage account –>Managed disks

VNet + Subnet

Network interface
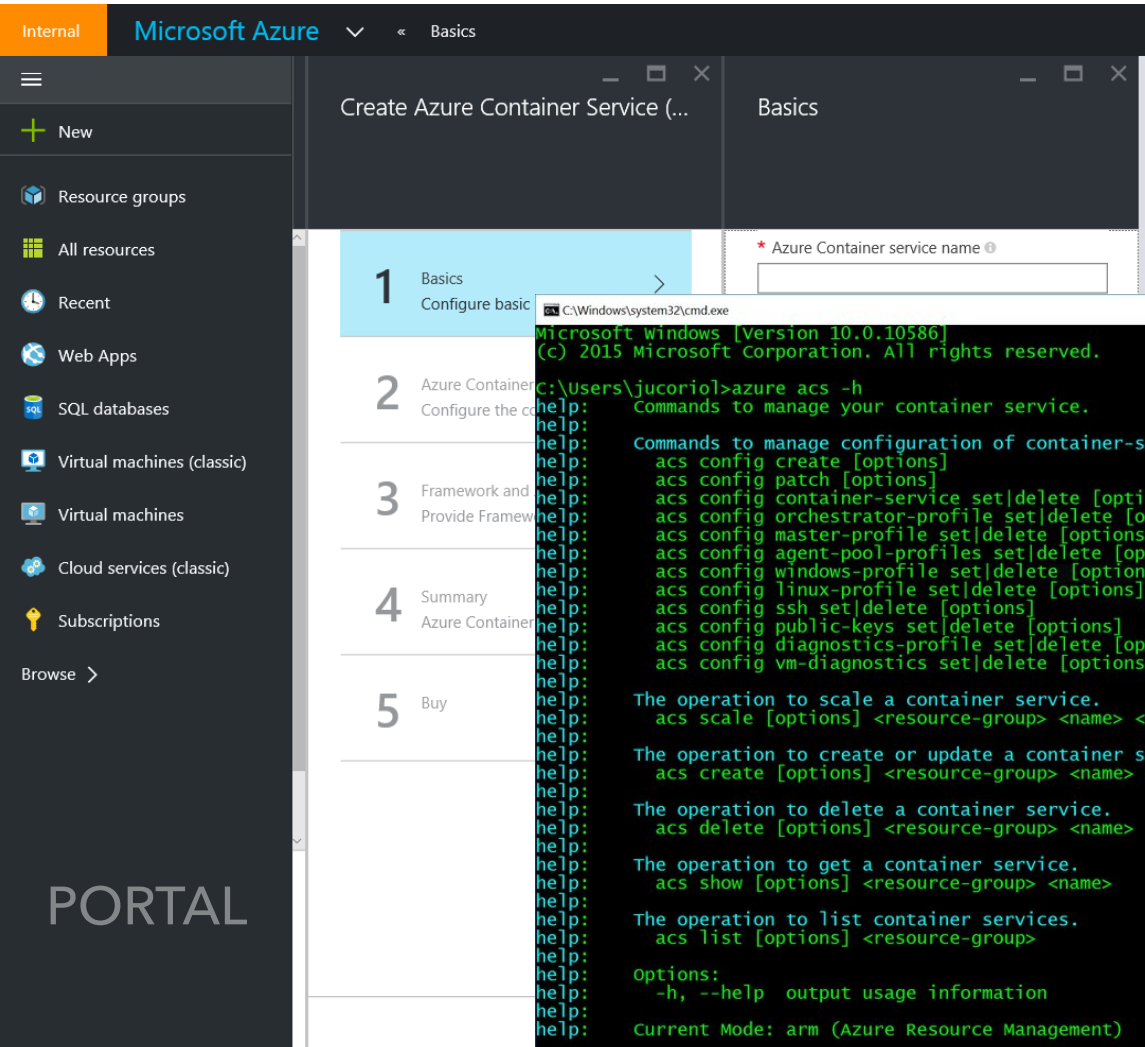
Network security group

Example



Traffic Manager

West US

East US

Load Balanced
Public IP

Load Balancer

Public IP

Availability Set

Subnet

NIC    VM

NSG

vhds

Data Disk    OS Disk

Storage [Azure]

VNET

Load Balanced
Public IP

Load Balancer

Public IP

Availability Set

Subnet

NIC    VM

NSG

vhds

Data Disk    OS Disk

Storage [Azure]

VNET

https://resources.azure.com/

http://armviz.io

# AUTOMATE



PORTAL

CLI/ powershell

ARM
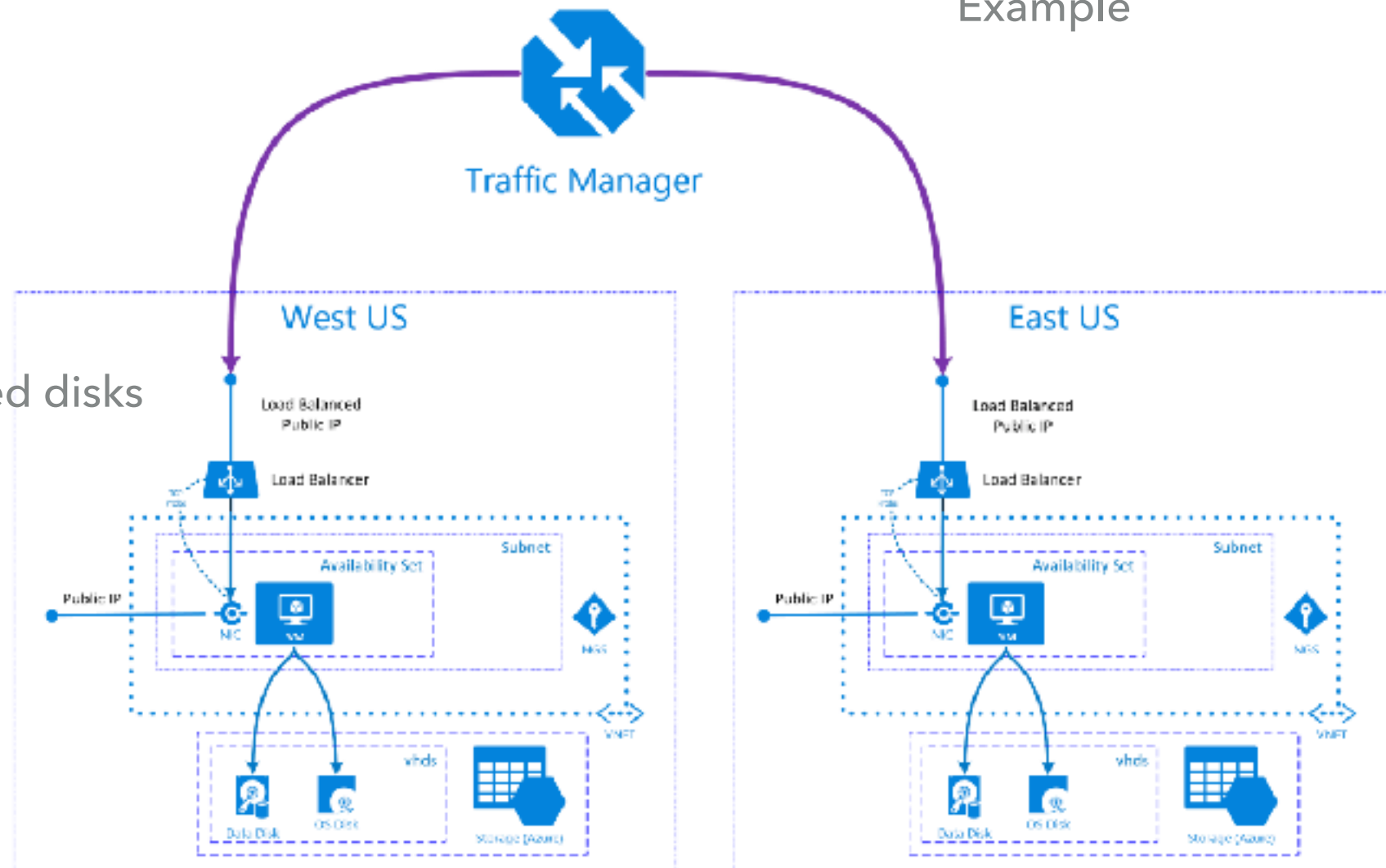
```json
{
    "apiVersion": "2015-11-01-preview",
    "type": "Microsoft.ContainerService/containerServices",
    "name": "MyContainerService",
    "location": "[resourceGroup().location]",
    "properties": {
        "orchestratorProfile": { "type": "mesos" },
        "masterProfile": {
            "count": "3",
            "dnsPrefix": "containerservicemgmt",
```

```
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\jucoriol>azure acs -h
help:     Commands to manage your container service.
help:
help:     Commands to manage configuration of container-service in the parameter file.
help:       acs config create [options]
help:       acs config patch [options]
help:       acs config container-service set|delete [options]
help:       acs config orchestrator-profile set|delete [options]
help:       acs config master-profile set|delete [options]
help:       acs config agent-pool-profiles set|delete [options]
help:       acs config windows-profile set|delete [options]
help:       acs config linux-profile set|delete [options]
help:       acs config ssh set|delete [options]
help:       acs config public-keys set|delete [options]
help:       acs config diagnostics-profile set|delete [options]
help:       acs config vm-diagnostics set|delete [options]
help:
help:     The operation to scale a container service.
help:       acs scale [options] <resource-group> <name> <new-agent-count>
help:
help:     The operation to create or update a container service.
help:       acs create [options] <resource-group> <name> <parameters>
help:
help:     The operation to delete a container service.
help:       acs delete [options] <resource-group> <name>
help:
help:     The operation to get a container service.
help:       acs show [options] <resource-group> <name>
help:
help:     The operation to list container services.
help:       acs list [options] <resource-group>
help:
help:     Options:
help:       -h, --help  output usage information
help:
help:     Current Mode: arm (Azure Resource Management)

C:\Users\jucoriol>
```

Terraform

Packer

OMS + AUTOMATE

CHEF

ANSIBLE

SALTSTACK

puppet labs

# LINUX

## LINUX ON HYPER-V
## LINUX INTEGRATED SERVICES

## IMAGES CREATED BY PARTNERS,

## TESTED BY MICROSOFT

## OWN/CUSTOM IMAGES

## SUPPORTED DISTROS

Core OS  cores

debian  credativ

canonical
ubuntu

ORACLE LINUX  oracle

redhat
redhat

rogue wave
CentOS

SUSE  suse

openSUSE

# DEMO CICD: PACKER/ ARM AND ANSIBLE EXAMPLE



2) Code Repository

3) Build

4) Deploy to stage

5) Validate

6) Publish

1) Develop

8) Monitor and Improve

7) Deploy to Cloud
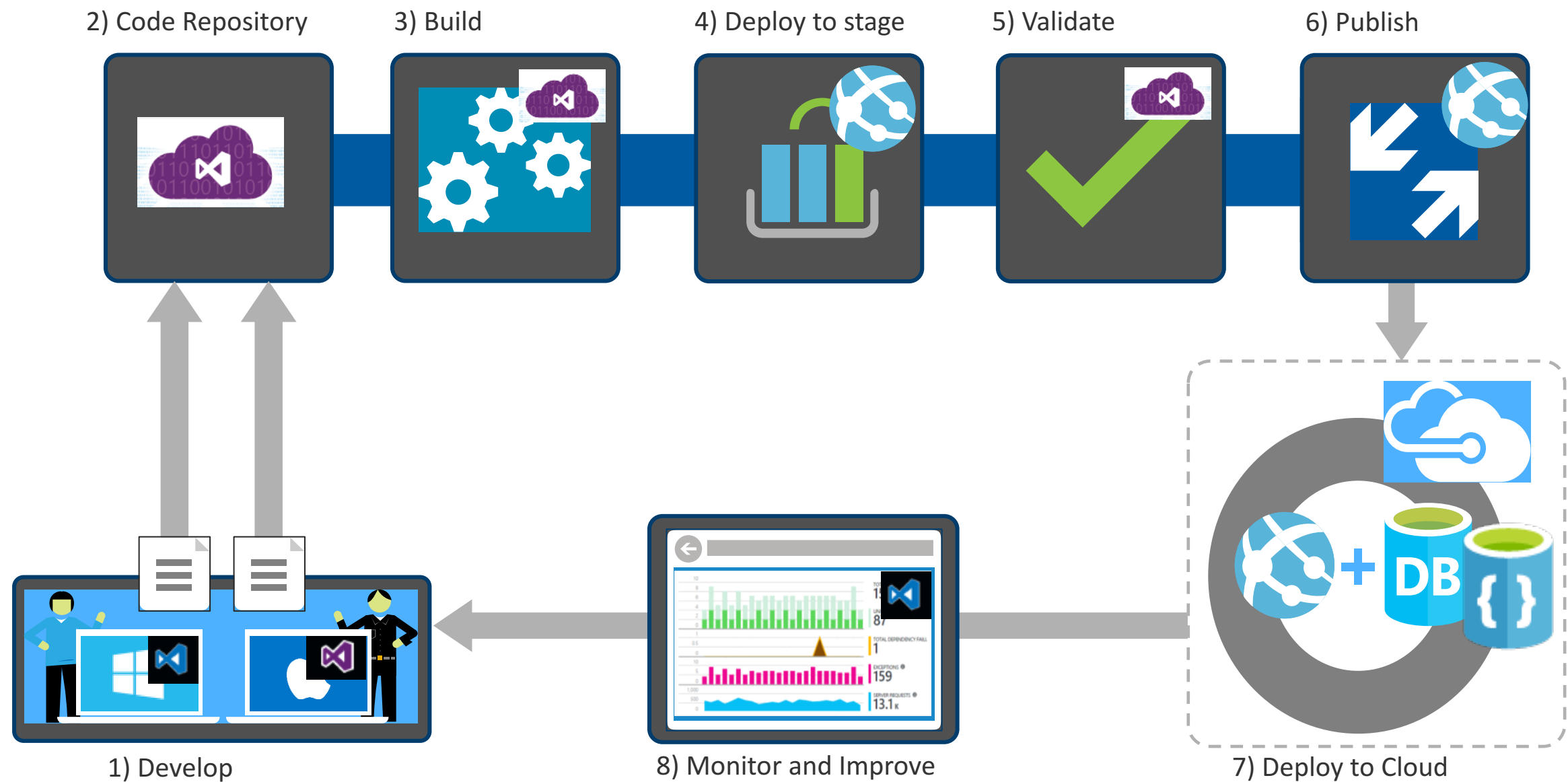
# MONITORING

# ...CONTAINERS

**Build**

Develop an app using Docker containers with any language and any toolchain.

**Ship**

Ship the "Dockerized" app and dependencies anywhere - to QA, teammates, or the cloud - without breaking anything.

**Run**

Scale to 1000s of nodes, move between data centers and clouds, update with zero downtime and more.

| | |
|---|---|
| Application Orchestration | CloudFoundry, Heroku, OpenShift, Deis |
| Container Orchestration | Kubernetes, Marathon, Swarm, Fleet, Lattice, ECS |
| Job Scheduling | Chronos, Kubernetes |
| Containerization | Docker, Rkt, Garden, Mesos |
| Resource Management | Mesos |
| Provisioning | Puppet, Chef, Ansible, Salt, Vagrant, Otto |
| Machine Management | AWS, Azure, GCE, OpenStack, vSphere, VirtualBox, Fusion |

**Virtual Machine**

| Apps | Apps |
|---|---|
| OS | OS |
| Kernel | Kernel |

Hypervisor

Host OS

Kernel

Hardware

**Container**

| Apps | Apps |
|---|---|
| OS | OS |
| Container | Container |

Host OS

Kernel

Hardware

docker
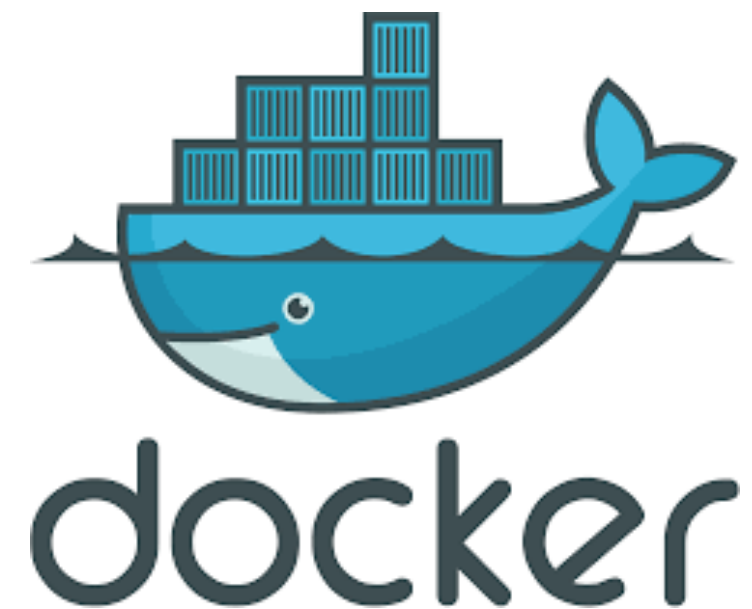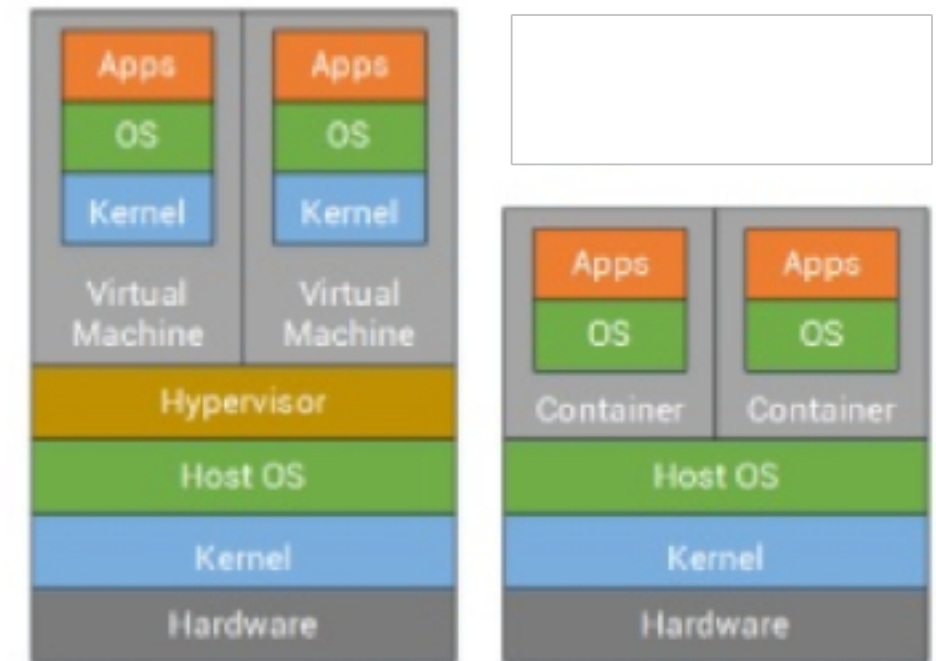
# CONTROLLING THE MADNESS
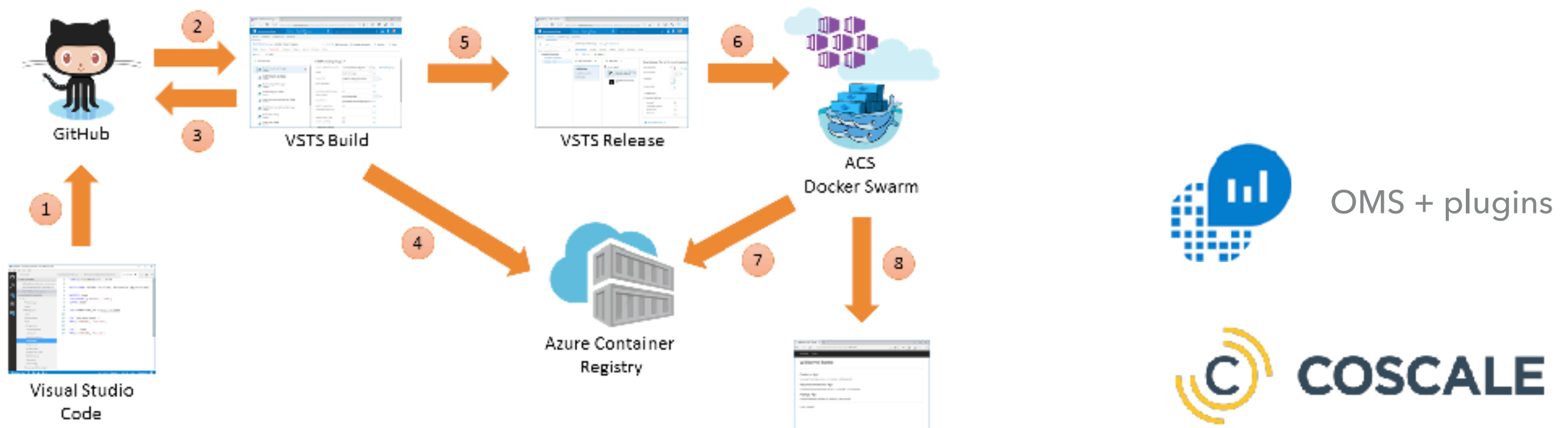


# ORCHESTRATORS, PIPELINES, MONITORING

# ON AZURE…



**AZURE CONTAINER SERVICE (ENGINE)**

kubernetes

docker SWARM

DC/OS

RED HAT OPENSHIFT

Pivotal Cloud Foundry
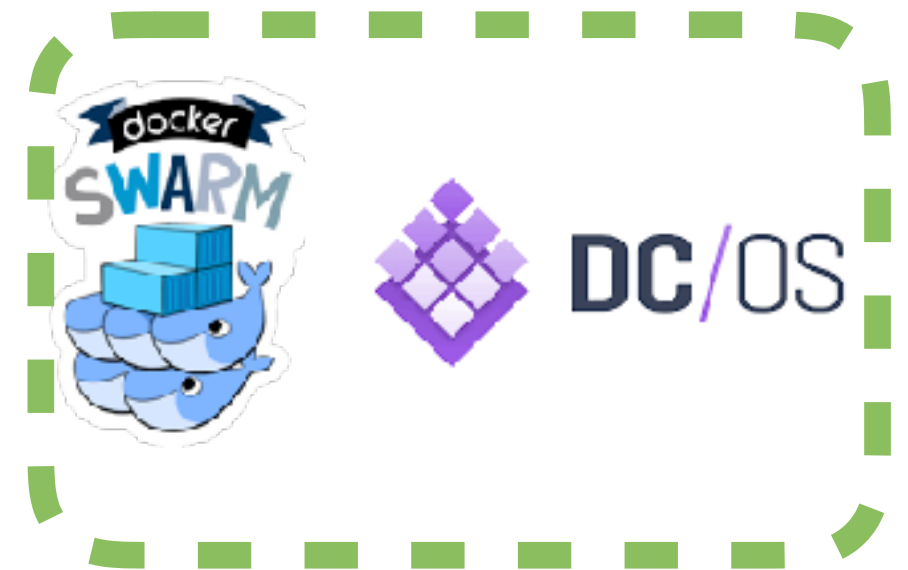
**AZURE CONTAINER REGISTRY**

**AZURE CONTAINER INSTANCE**