



AKS Discussion

Microsoft Services





Module 4 – Container Orchestrators

Microsoft Services



Agenda

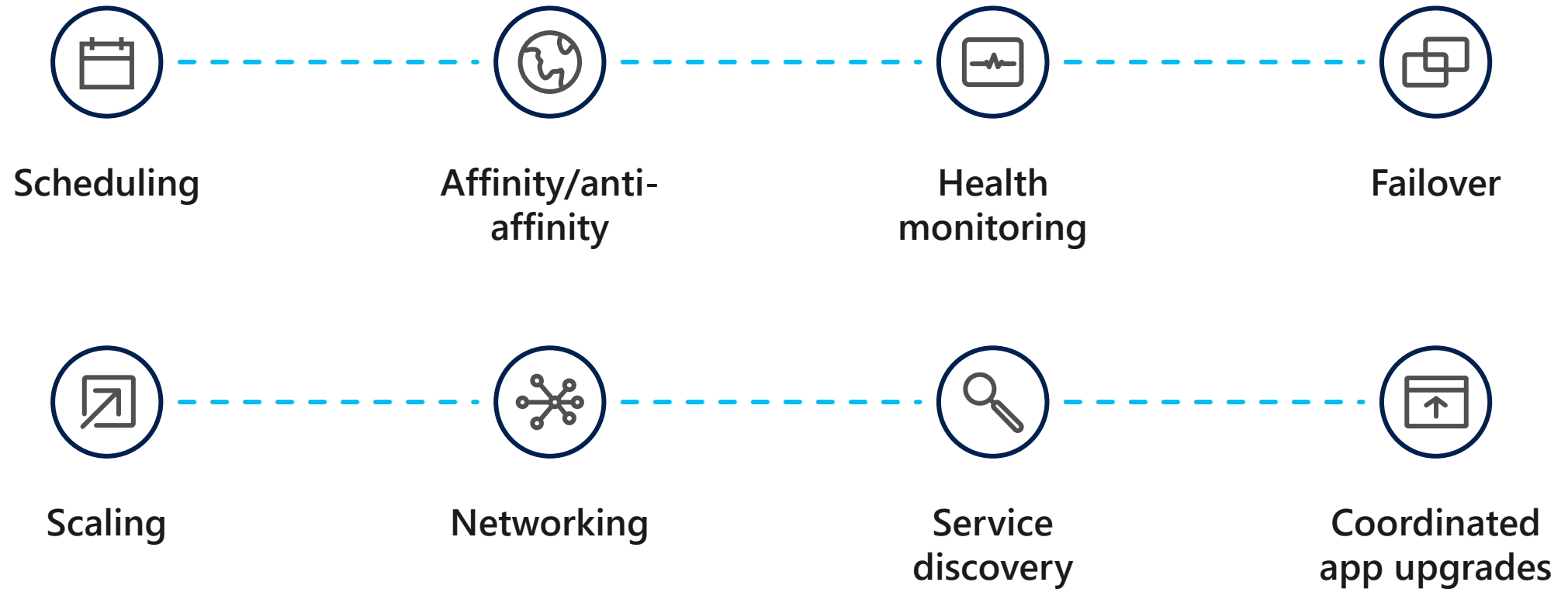
- What Is Orchestration?
- Microsoft Offerings For Containers
- Additional Options For Orchestration

Challenges Of A Containerized World

As application development has moved towards a container-based approach, the need to orchestrate and manage the inter-connected resources becomes important

- Load Balancing
 - Distributing traffic across containers at scale
- Naming and Discovery
 - How do containers or groups find one another?
- Logging and Monitoring
 - Keeping track of what containers are doing
- Debugging
 - Getting inside running containers
- Networking
 - Differentiating container networks from host networks at scale

The Elements Of Orchestration



Clustering Versus Orchestration

Clustering

- Grouping “hosts”—either VMs or bare metal—and networking them together
- A cluster should feel like a single resource rather than a group of disparate machines

Orchestration

- Managing and monitoring of the workloads running in your cluster
- Starting containers on appropriate hosts and connecting them
- May also include support for scaling, automatic failover, and node rebalancing

Microsoft Offerings for Containers

IF YOU'RE LOOKING FOR THIS...	USE THIS
Scale and orchestrate containers using Kubernetes	Kubernetes Service
Easily run containers on Azure with a single command	Container Instances
Store and manage container images across all types of Azure deployments	Container Registry
Develop microservices and orchestrate containers on Windows or Linux	Service Fabric
Deploy web applications on Linux using containers	App Service
Run repetitive compute jobs using containers	Batch

Azure App Service

Easily deploy and run container-based web apps at scale

Accelerated outer loop



Tight integration w/ Docker Hub, Azure Container Registry



Built-in CI/CD w/ Deployment Slots



Intelligent diagnostics & troubleshooting, remote debugging

Fully managed platform



Automatic scaling and load balancing



High availability w/ auto-patching



Backup & recovery

Flexibility & choices



From CLI, portal, or ARM template



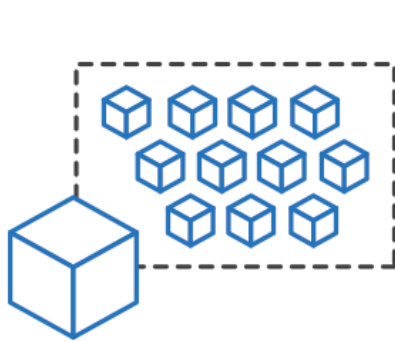
Single Docker image, multi container w/ Docker Compose



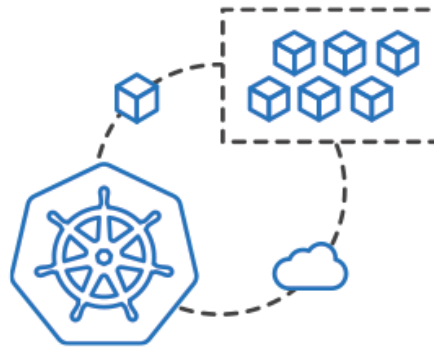
IntelliJ, , Jenkin, Maven Visual Studio family

Azure Container Instances (ACI)

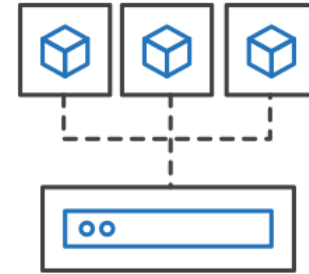
Easily run containers on Azure without managing servers



Run containers
without managing
servers



Increase agility
with containers on
demand



Secure applications
with hypervisor
isolation



Azure Container Instances (ACI)

Great for:

- Isolated Windows and Linux containers
- Simple applications
- Task automation
- Build jobs
- Hypervisor-level security
- Custom sizes for CPU cores and memory
- Public IP connectivity
- Persistent storage
- Co-scheduled groups

NOT great for:

- Full container orchestration
- Service discovery across multiple containers
- Automatic scaling
- Coordinated application upgrades

Demonstration: *Azure Container Instance*

Deploy `dwolters/pandoc-http` Image





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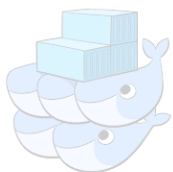
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Kubernetes

- **Kubernetes** is "an open-source software for automating deployment, scaling, and management of containerized applications"
- **Kubernetes**, in Greek κυβερνήτης, means the Helmsman, or pilot of the ship
- Keeping with the maritime theme of **Docker** containers, **Kubernetes** is the pilot of a ship of containers



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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



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Kubernetes

Empowering you to do more



Deploy your
applications quickly
and predictably

Scale your
applications
on the fly

Roll out
new features
seamlessly

Limit hardware
usage to required
resources only



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Azure Kubernetes Engine

Open source: <https://github.com/Azure/aks-engine>

- Easiest way to provision a self-managed Kubernetes cluster on Azure
- Leverages Azure Resource Manager (ARM), to help you create, destroy and maintain clusters provisioned with basic IaaS resources in Azure
- Allows you to customize Deployments
 - Deploying into existing virtual networks
 - Utilizing multiple agent pools



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Azure Kubernetes Service

Simplify the deployment, management, and operations of Kubernetes



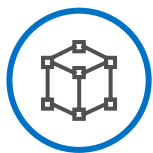
Deploy and
manage Kubernetes
with ease



Scale and run
applications with
confidence



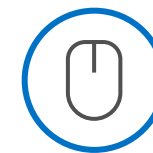
Secure your
Kubernetes
environment



Accelerate
containerized application
development



Work how you want
with open-source
tools & APIs



Set up
CI/CD in a
few clicks



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Azure Kubernetes Service

Windows Support

- Windows support available on AKS
=> Only Windows Server 2019 agent nodes
- AKS cluster with Windows Server feature will be composed of a Windows node pool and a Linux node pool
- Use **Node Selector** to specify on which nodes the workloads have to be deployed

Demonstration: *Kubernetes Cluster in Azure Kubernetes Service*

Deploy Kubernetes clusters in Azure Kubernetes Service

Deploy NGINX container into Kubernetes cluster



