Workshop: Get up and running with Jenkins on Azure

Brian Benz

Senior Cloud Developer Advocate

@bbenz

Agenda

- Introduction
  - Jenkins on Azure - considerations
  - Azure Ecosystem
  - Azure tools and services
- Exercises
  - Deploying Jenkins to Azure VMs
  - Deploying Jenkins to Azure Kubernetes Service (AKS)
  - Deploying Artifacts with Azure Plugins

Deployment Choices

Four common use cases seen at customers

	Lift & Shift	Kubernetes & Containers	Cloud Native Platforms	Serverless
Definition	Traditional VM workloads. Tomcat/Spring web apps. Java EE applications. Relational databases.	Container-based deployments. Use of Netflix OSS and other related tools for service orchestration.	Cloud Foundry and OpenShift. NoSQL databases.	Event-triggered ephemeral functions with micro billing.
Partners	Red Hat, Oracle, IBM, Azul Systems, Terraform, CloudBees	Docker, CloudBees, Azul Systems, Red Hat	Pivotal, Red Hat	CloudBees, Pivotal
Common Azure Services	Azure Migrate Service, Azure VMs, Azure AD, Azure Site Recovery, Azure Database Migration Service, Azure DevTest Labs	Azure Container Service (AKS), Azure Container Instances, Azure Container Registry	Azure VMs, Azure Container Service (AKS), Azure Storage, Azure AD, Azure CosmosDB	Azure Functions, Azure Logic Apps, Azure AppInsights, Azure CosmosDB
Customer Cases	Stanley Healthcare, RCS Italy, Daimler	JB Hunt	Ford, Manulife, Merrill, Mastercard	*Large restaurant company*

Open Source tools and APIs for Infrastructure on Azure

	Development	DevOps	Monitoring	Networking	Storage	Security
Take advantage of services and tools in the Kubernetes ecosystem	HELM DRAFT	Jenkins Terraform BRIGADE JFrog CODESHIP	Prometheus fluentd Grafana OPENTRACING DATADOG JAEGER	CNI Networking TIGERA	MAPR portworx	Twistlock aqua heptio HASHICORP RBAC
OR, Leverage growing Azure support	VS Code	VSTS ARM	Azure Monitor	Azure VNET	Azure Storage	Azure Container Registry AAD Key Vault

Jenkins Plugins

Jenkins Agent Plugin for Azure

- Deploy Azure Agents on AKS, VMs
- Windows or Linux

Azure Artifact delivery plugins

Easily deploy artifacts to Azure

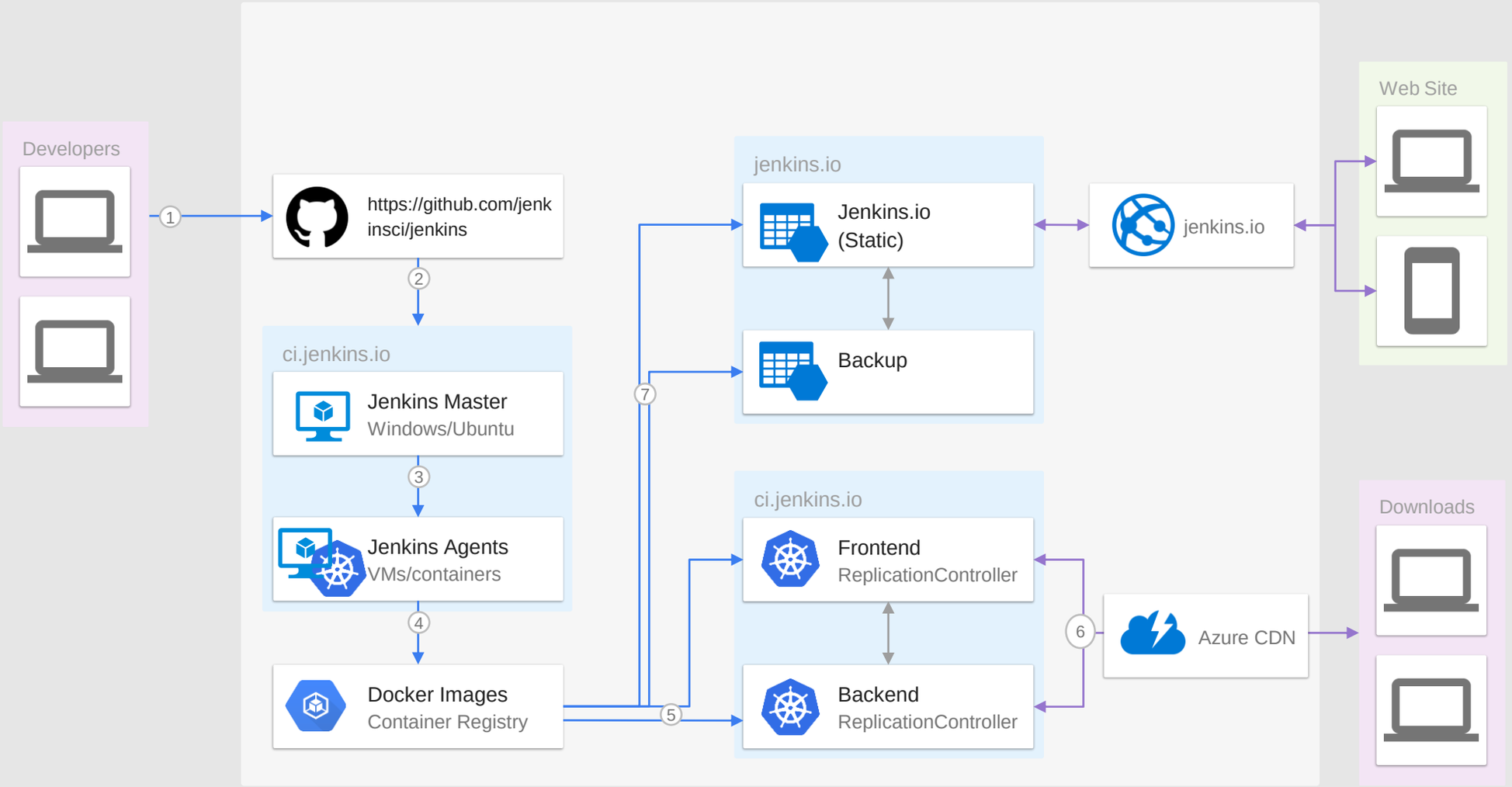
Azure Storage plugin for Jenkins

Azure AKS plugin

Azure VM plugin

Azure ACI plugin

Dev Test > Jenkins on kubernetes



1 Commit Code

2 Code Enters CD Pipeline

3 Test/Build Job Submitted to Agent

4 Push Docker images

5 Images Deployed to Staging

6 Operational and Functional Testing

7 Images Deployed to Production

Sample Java CI Pipelines in Azure

Dev commits code

Build/CI

Azure Container Registry

CD pipeline

Azure Container Service (AKS)

Dev commits code

Build/CI

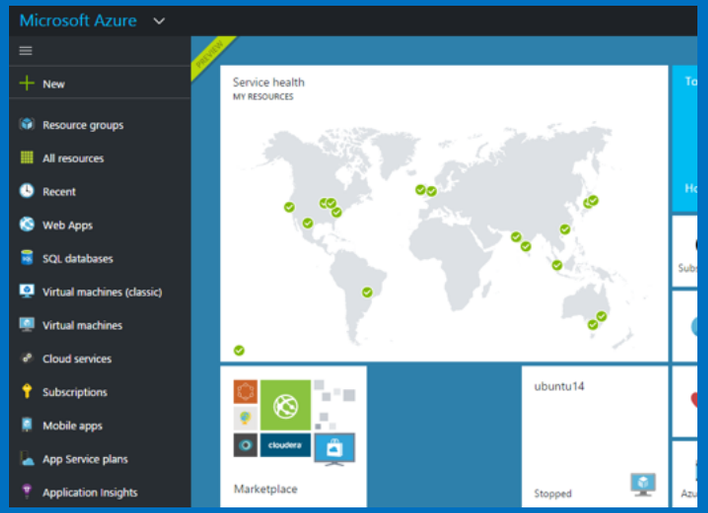
Azure Storage

CD pipeline

Azure Web App

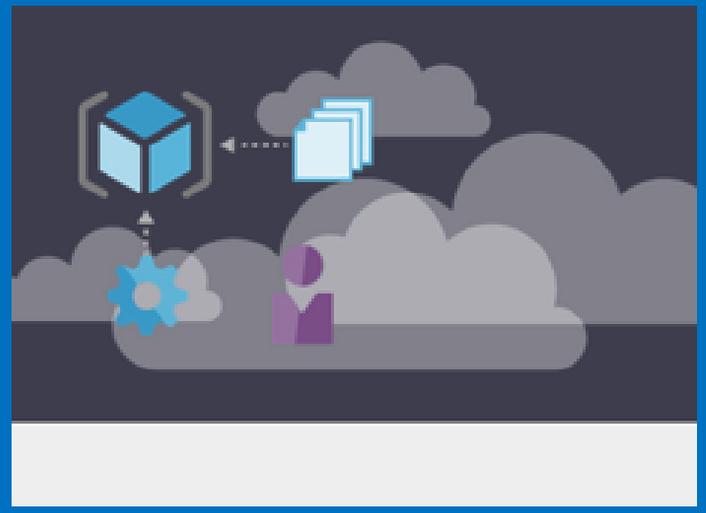
Provisioning

Portal



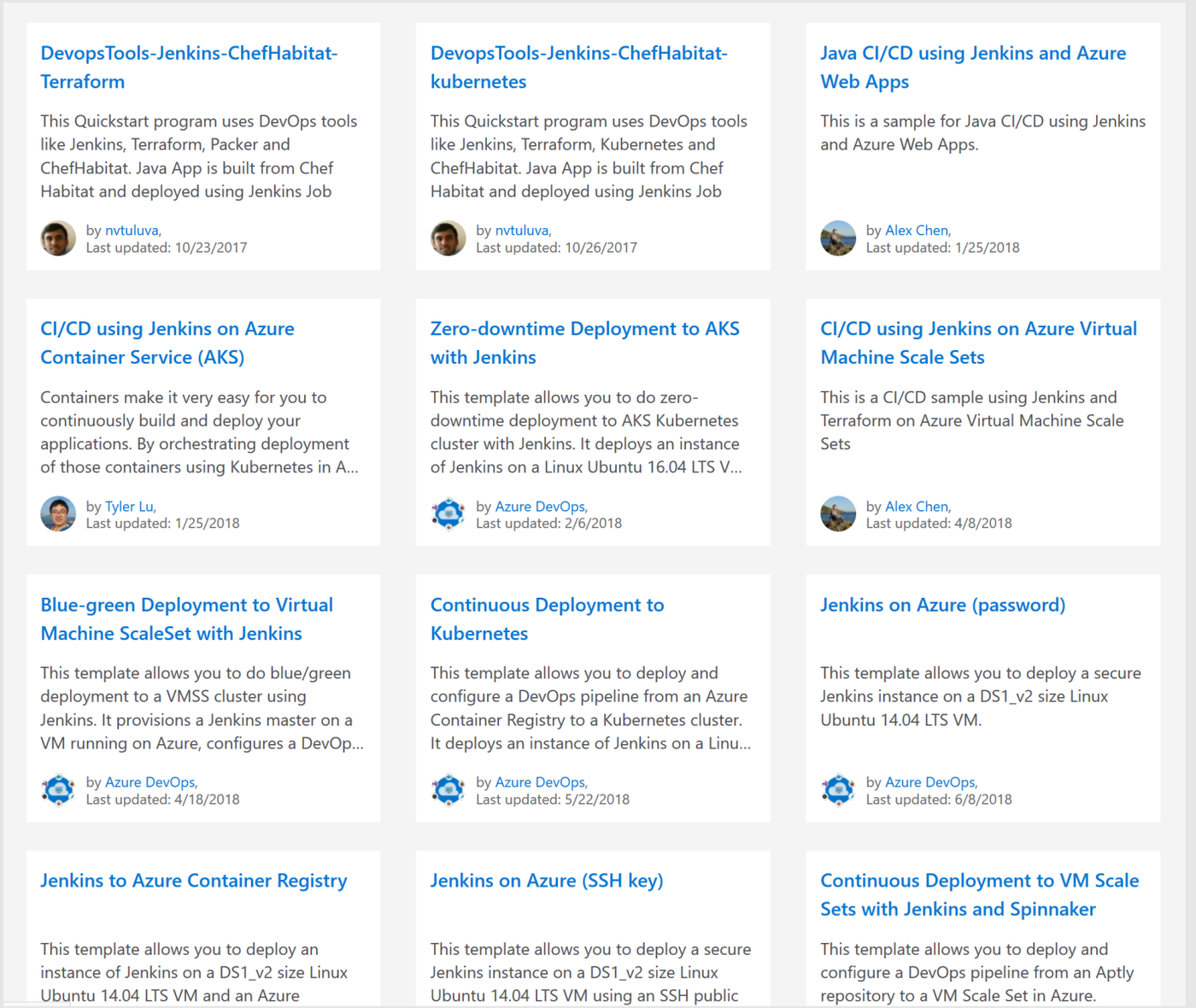
CLI

Templates and Terraform



Azure Quickstart Templates

- Azure Resource Manager
- Community contributions
- JSON-based
- Enabled via the Azure portal
- Jenkins on VMs, AKS and Azure App Service



DevopsTools-Jenkins-ChefHabitat-Terraform

This Quickstart program uses DevOps tools like Jenkins, Terraform, Packer and ChefHabitat. Java App is built from Chef Habitat and deployed using Jenkins Job

by nvtuluva,
Last updated: 10/23/2017

DevopsTools-Jenkins-ChefHabitat-kubernetes

This Quickstart program uses DevOps tools like Jenkins, Terraform, Kubernetes and ChefHabitat. Java App is built from Chef Habitat and deployed using Jenkins Job

by nvtuluva,
Last updated: 10/26/2017

Java CI/CD using Jenkins and Azure Web Apps

This is a sample for Java CI/CD using Jenkins and Azure Web Apps.

by Alex Chen,
Last updated: 1/25/2018

CI/CD using Jenkins on Azure Container Service (AKS)

Containers make it very easy for you to continuously build and deploy your applications. By orchestrating deployment of those containers using Kubernetes in A...

by Tyler Lu,
Last updated: 1/25/2018

Zero-downtime Deployment to AKS with Jenkins

This template allows you to do zero-downtime deployment to AKS Kubernetes cluster with Jenkins. It deploys an instance of Jenkins on a Linux Ubuntu 16.04 LTS V...

by Azure DevOps,
Last updated: 2/6/2018

CI/CD using Jenkins on Azure Virtual Machine Scale Sets

This is a CI/CD sample using Jenkins and Terraform on Azure Virtual Machine Scale Sets

by Alex Chen,
Last updated: 4/8/2018

Blue-green Deployment to Virtual Machine ScaleSet with Jenkins

This template allows you to do blue/green deployment to a VMSS cluster using Jenkins. It provisions a Jenkins master on a VM running on Azure, configures a DevOp...

by Azure DevOps,
Last updated: 4/18/2018

Continuous Deployment to Kubernetes

This template allows you to deploy and configure a DevOps pipeline from an Azure Container Registry to a Kubernetes cluster. It deploys an instance of Jenkins on a Linu...

by Azure DevOps,
Last updated: 5/22/2018

Jenkins on Azure (password)

This template allows you to deploy a secure Jenkins instance on a DS1_v2 size Linux Ubuntu 14.04 LTS VM.

by Azure DevOps,
Last updated: 6/8/2018

Jenkins to Azure Container Registry

This template allows you to deploy an instance of Jenkins on a DS1_v2 size Linux Ubuntu 14.04 LTS VM and an Azure

Jenkins on Azure (SSH key)

This template allows you to deploy a secure Jenkins instance on a DS1_v2 size Linux Ubuntu 14.04 LTS VM using an SSH public

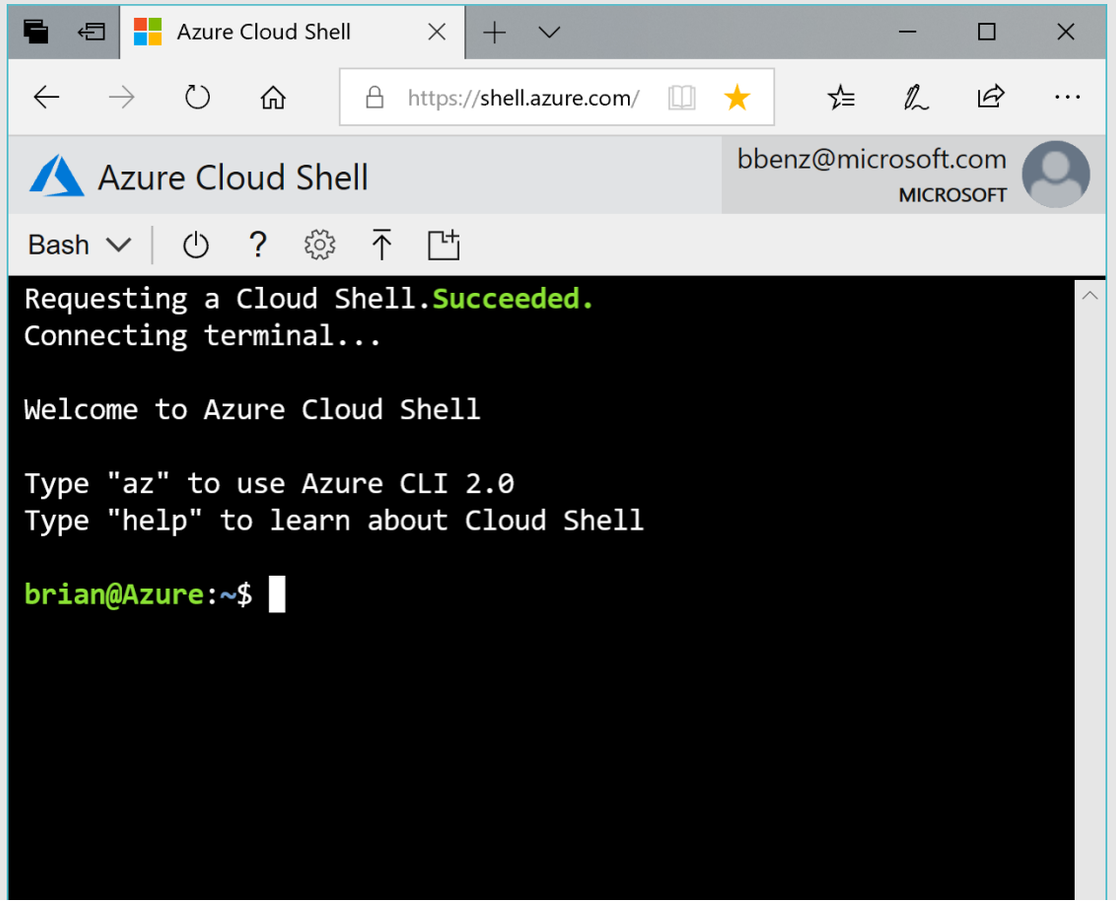
Continuous Deployment to VM Scale Sets with Jenkins and Spinnaker

This template allows you to deploy and configure a DevOps pipeline from an Aptly repository to a VM Scale Set in Azure.

https://azure.microsoft.com/en-us/resources/templates/?term=jenkins

WSL for Linux, Azure CLI and the Azure Shell

- XIX/Bash Compatibility
- Extensible/Open Source
  - Python-Based, on GitHub
- Mac, Linux and Windows
- Cloud Shell in the portal
- shell.azure.com
- Ios, Android Apps
- VS Code
- Now in DOCS!
- Look! >>>>>>



Azure CLI | Copy | Try It

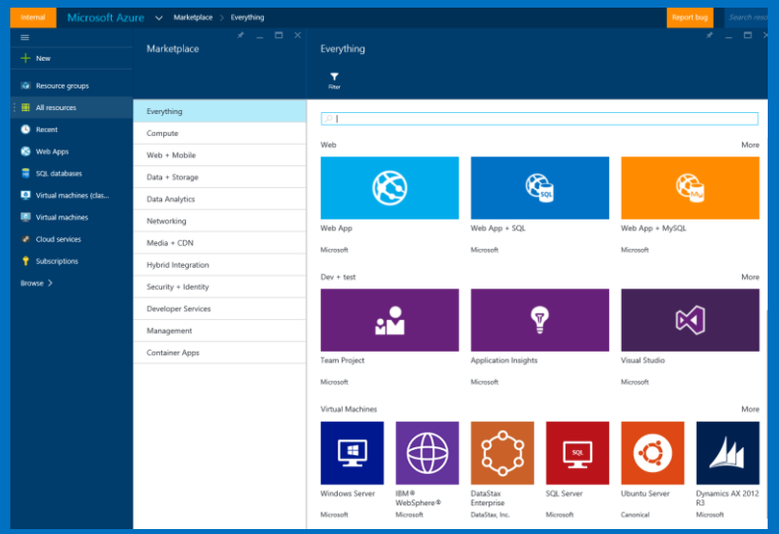
```
az group create --name myResourceGroup --location westeurope
```

Exercise 1

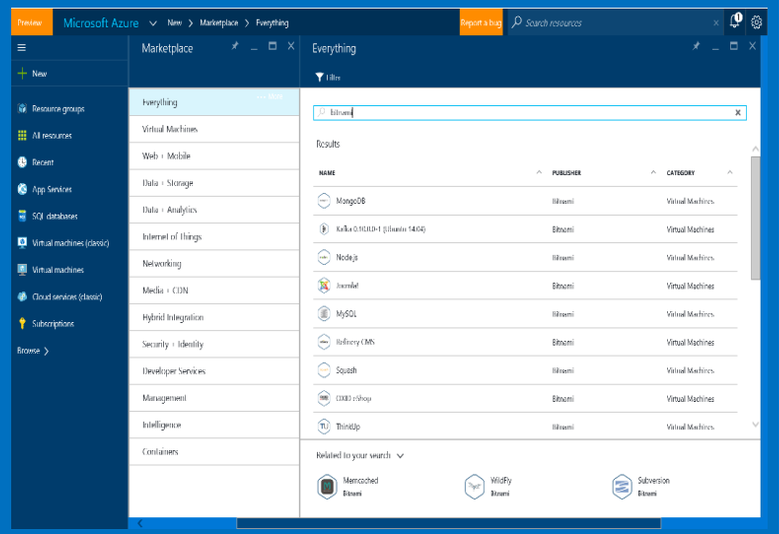
- Deploying Jenkins to Azure VMs

VMs – Many ways to get started

Marketplace



Community

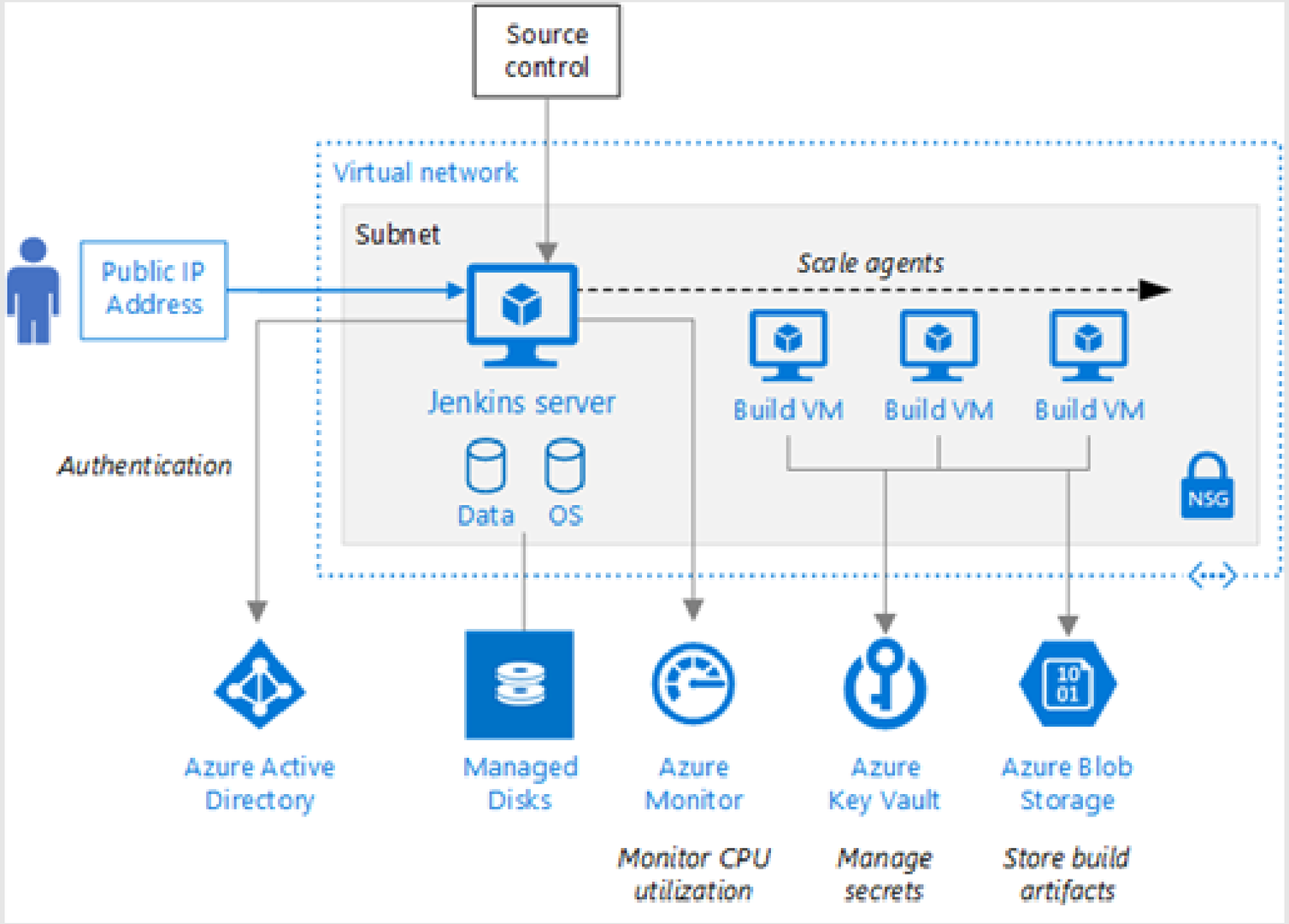


BYOI

Creating and Uploading Virtual Hard Disk that Contains the Linux Operating System

TAGS: VIRTUAL MACHINES , AZURE SERVICE MANAGEMENT

Deploying Jenkins on Azure VMs



https://docs.microsoft.com/en-us/azure/architecture/reference-architectures/jenkins/

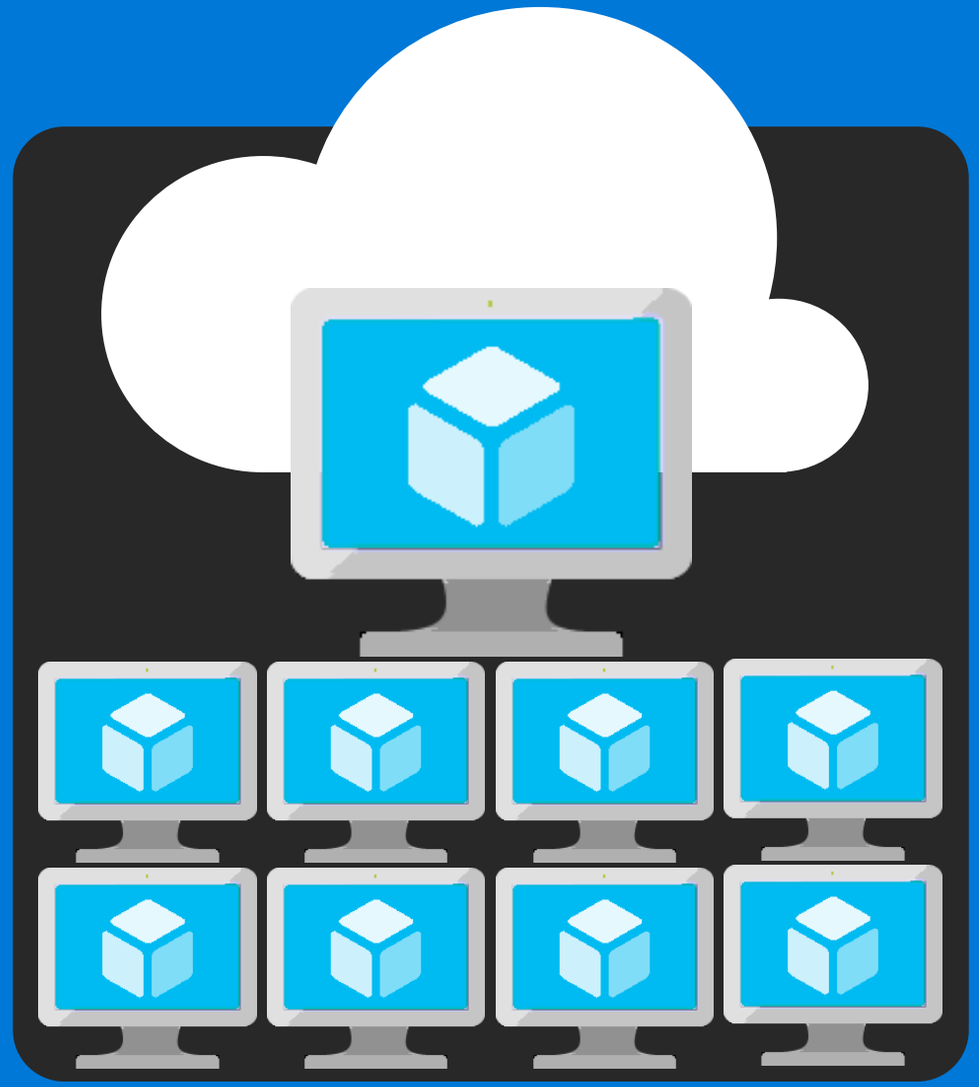
VM Scale Sets

Flexible infrastructure at scale

Dynamically scale # of VMs with auto-scale rules

Roll out VM image updates without downtime

Portal, API and CLI support

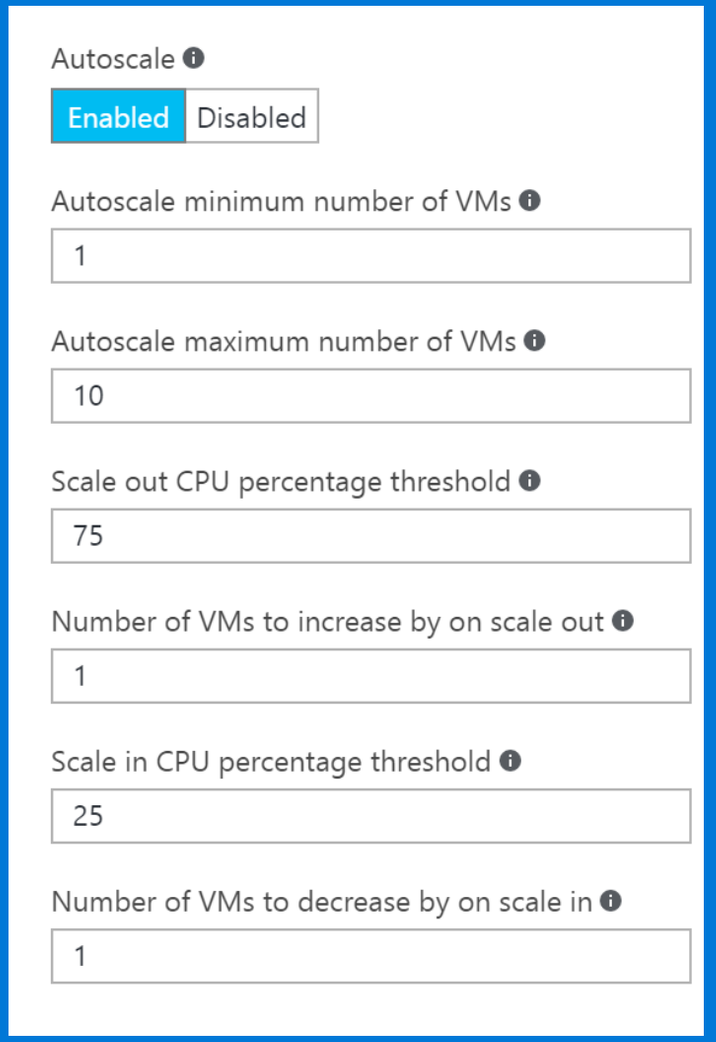


Create 1000 VMs using Azure CLI

```
$ az vmss create –g myresourcegroup
                -n mybigclusterofvms
                --image ubuntults
                --instance-count 1000
                --load-balancer ""
                --subnet-up-address-prefix 10.0.0.0/20
```

Auto-Scale Rules for VM Scale-sets

Azure Management Portal



Advanced Rules with CLI + APIs

- Scale on a specific day
- Scale on a recurring schedule
- Scale on multiple resource metrics

Or Enable Your Own Auto-Scale Engine

Built-in Over-provisioning support built-in

- Enables faster, higher success, deployments

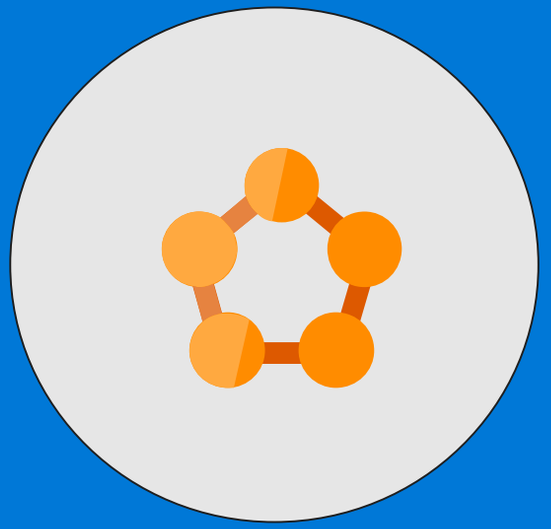
Exercise 2

- Deploying Jenkins to Azure Kubernetes Service (AKS)

Azure Container Technologies

Open Source
Docker, DC/OS, Kubernetes

Container Service



Microservices platform with Windows and Linux* Containers

Service Fabric

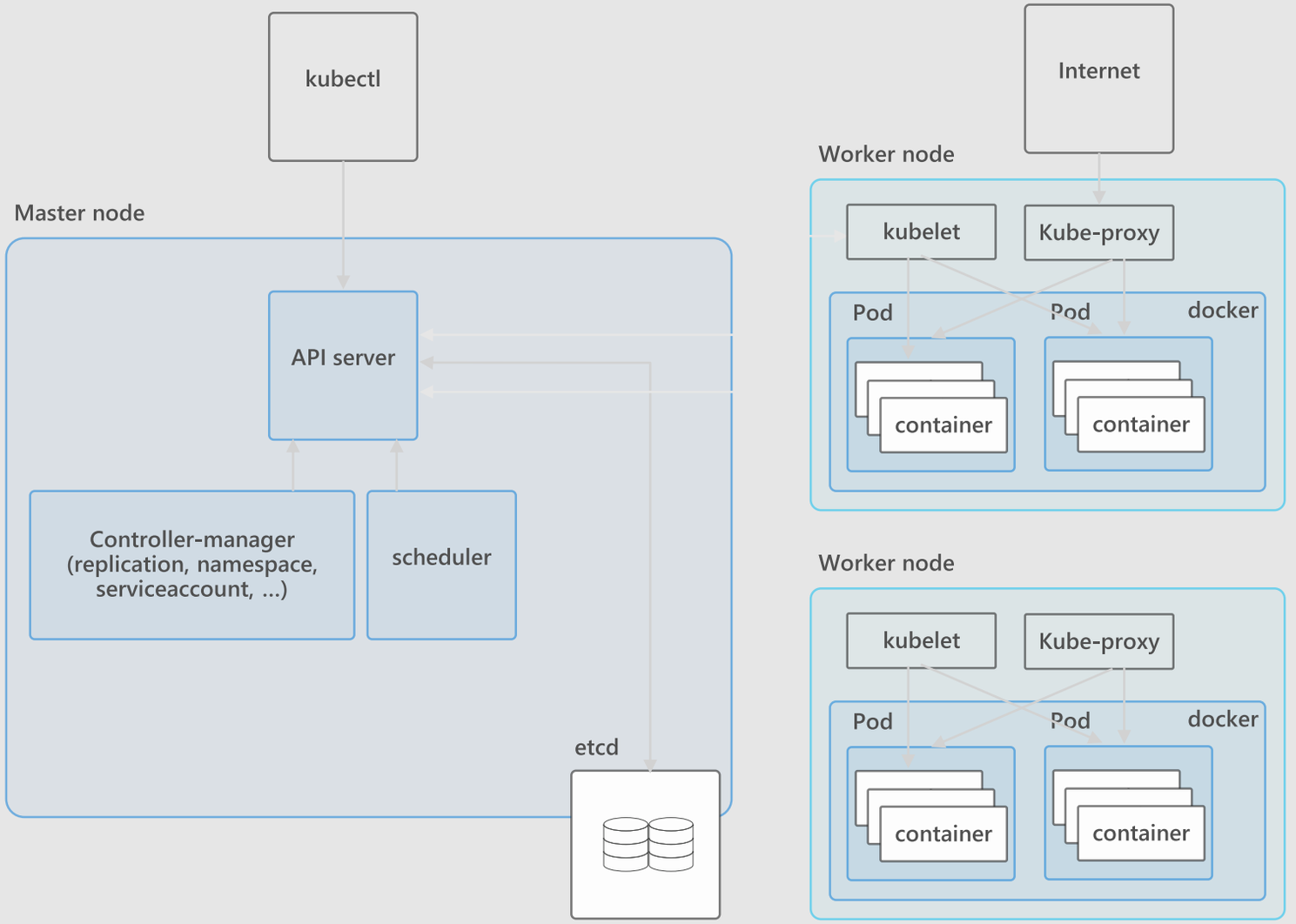
Single Container Apps

App Service

Infrastructure Control

Developer productivity

Kubernetes Architecture



Exercise 3

- Deploying Artifacts with Azure Plugins

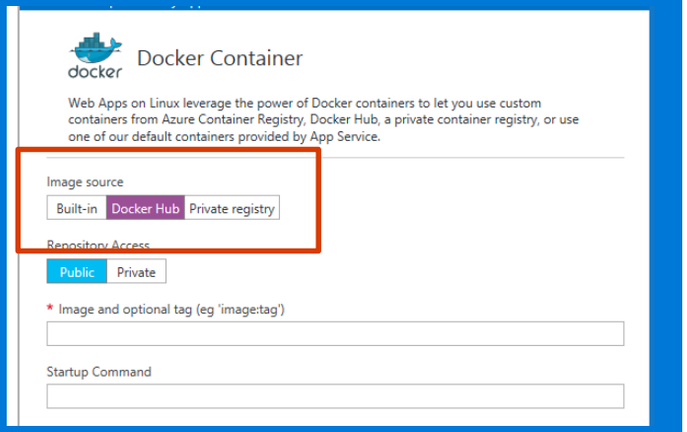
Azure App Service

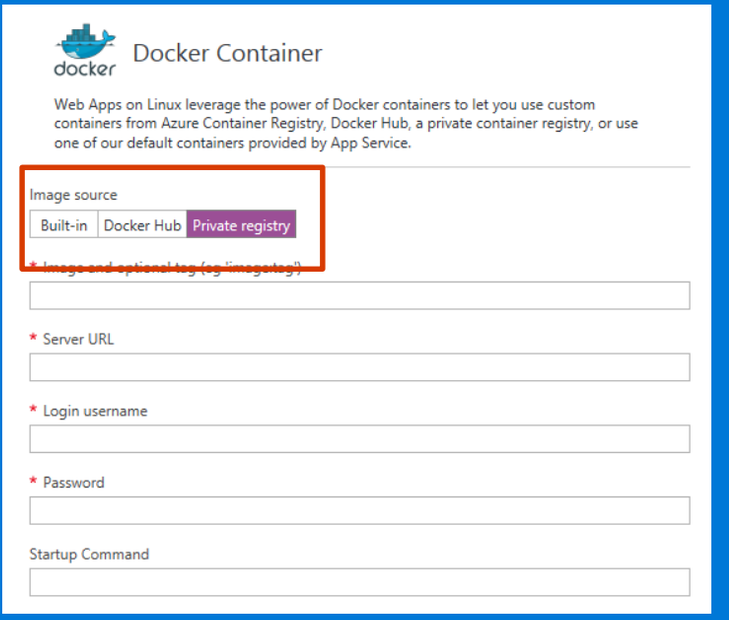
Build and scale cloud apps

- .NET, Java, Node.js, PHP, Python
- Auto patching
- Auto scale
- Integration with existing apps
- Continuous deployment

Azure App Service on Linux

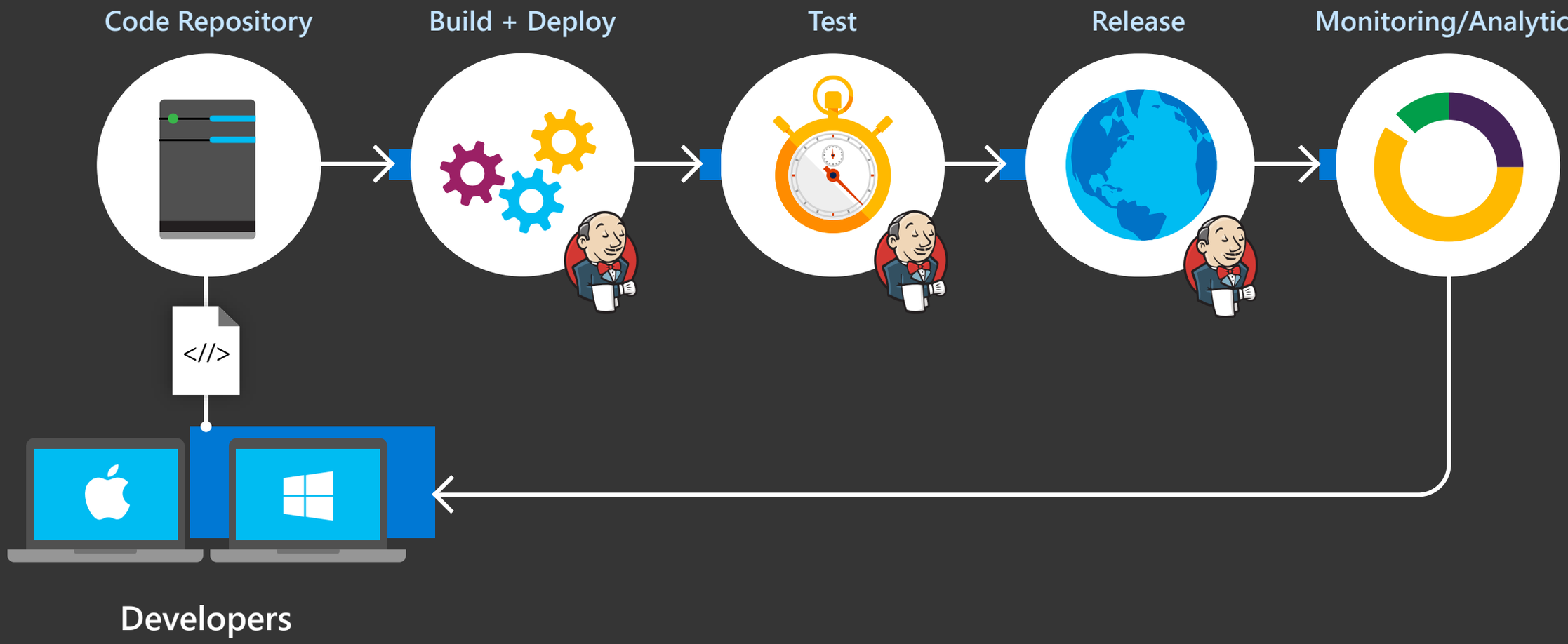
Web Apps on Linux leverage the power of Docker containers to let you use custom containers from Azure Container Registry, Docker Hub, a private container registry, or use one of our default containers provided by App Service.





Azure DevOps Services and Jenkins Integration

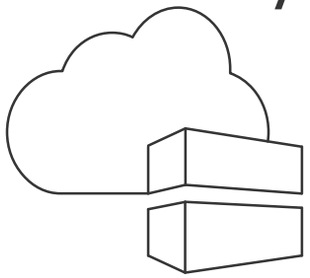
Complete Java DevOps solution



Connecting and Monitoring Jenkins on Azure

- VSTS and plugins for Java
- App Insights

Azure Container Registry (ACR) Build



Native Container Build Service in the cloud

Follows docker **build** semantics

```
docker build –t helloworld:v1 .
az acr build –t helloworld{{.Build.ID}} .
```

Trigger based builds (git commits, base image updates)

```
az acr build-task create
 --image        helloworld{{.Build.ID}}
 --name         myBuildTask
 --registry     jengademos
 --context      https://github.com/me/helloworld
 --branch       master
 --git-access-token $PAT
```

Azure SDKs and services for Java

Storage

Key Vault

Resource Manager

SQL Database

Data Lake

Management

Service Bus

Full developer ecosystems in Azure for your deployment needs and beyond

SQL Azure

Active Directory

ApplicationInsights

CosmosDB

Web Apps

Media Services

Scheduler

Notification Hubs

Resources – Java on Azure

- Azure – http://azure.com
- Java on Azure docs https://docs.com
- Announcements - https://azure.microsoft.com/blog/

Resources

- Jenkins solution template in Azure Marketplace
- All Jenkins on Azure resources: Jenkins Hub
- Azure plugins:

  VM agent - https://aka.ms/azjenkinsagents
  VMSS - https://aka.ms/azjenkinsvmss
  Container agent - https://aka.ms/azcontaineragent
  AKS - https://aka.ms/azjenkinsacs
  App Service - https://aka.ms/azapp-service
  Storage – https://aka.ms/azjenkinsstore

Developer Advocates - https://developer.microsoft.com/advocates/

Microsoft

Q&A

Brian Benz

bbenz@microsoft.com

@bbenz