Microsoft

Azure

Azure Developer Series

Application Migration to Azure

Peter De Tender @pdtit @007FFFLearning

CEO & Lead Technical Trainer at
007FFFLearning.com

April 2019

About Me…

Peter De Tender – MCT, Azure MVP

- CEO and Lead Technical Trainer of 007FFFLearning.com, +20 years IT experience, mainly datacenters and Microsoft Infrastructure background
- Full-time in Azure since 2013 (Readiness & Architect)
- Azure Advisor, Azure Certified Architect
- Technical Writer, Book author, Courseware Creator
- Living in Belgium, but traveling worldwide 90% of my time, helping larger Microsoft Partners, customers and Microsoft FTEs in learning about and using Azure, by providing workshops with passion

peter@pdtit.be

@pdtit @007FFFLearning

http://www.facebook.com/pdtit

http://www.linkedin.com/in/pdtit

Setting the scene

Overview of the workshop

About the workshop content…

About:

In this workshop, you will learn how to build a proof of concept (POC) that will transform an existing ASP.NET-based Web application to a container-based application. This POC will deliver a multi-tiered web app solution from a Virtual Machine architecture into Azure, leveraging Azure WebApps and different Azure container solutions available today. You will also migrate the underlying database from a SQL 2014 Virtual Machine architecture to SQL Azure. Easter Bonus: Every now and then, we will showcase similar steps using a Node.JS and MongoDB, migrating to Azure Web Apps, Containers and CosmosDB.

At the end of this workshop, you will have a good understanding of container concepts, Docker architecture and operations, Azure Container Services, Azure Kubernetes Services and SQL Azure PaaS solutioning.

Target Audience:

The workshop is targeted to Cloud Architects, Cloud Solution designers, developers and IT sysadmins, CIO's, CTO's and anybody else who is interested in learning about Azure, containers, application cloud migration and digital transformation.

Focus of the workshop (40%) is getting hands-on experience, complemented with presentations and whiteboard sessions (if in-person delivery).

Time Estimate:

16 hours (+/- 10 hours presentations, 6 hours of optional hands-on labs for attendees)

Workshop Agenda - Presentations

What we will talk about…

- Module 1: Digital App Transformation with Azure
- Module 2: Infrastructure as Code using ARM templates
- Module 3: Azure Database Solutions – SQL Azure
- Module 4: Azure App Services – Azure Web Apps (.NET + Node.JS)
- Module 5: Introduction to Docker
- Module 6: Deploying Azure Container Registry / Azure Container Instance
- Module 7: Migrating Apps to Azure Container Services / Kubernetes Services
- Module 8: Azure Container Services Management and Monitoring

Workshop Agenda – Hands-On-Labs

Learn by doing…

- **Module 2: Infrastructure as Code using ARM templates**
  - **Lab 1:** Setup your Azure subscription and deploy the source Virtual Machine environment with Visual Studio 2017
- **Module 3: Azure Database Solutions – SQL Azure**
  - **Lab 2:** Migrating a SQL VM database to SQL Azure using SQL Management Studio
- **Module 4: Azure App Services – Azure Web Apps**
  - **Lab 3:** Migrating your legacy ASP.NET application to Azure Web Apps with Visual Studio 2017
  - Easter Egg Bonus: Deploying a Node.JS app with MongoDB / CosmosDB
- **Module 5: Introduction to Docker**
  - **Lab 4:** Containerizing your legacy ASP.NET application with Docker CE for Windows

Workshop Agenda – Hands-On-Labs

Learn by doing…

- **Module 6: Deploying Azure Container Registry / Azure Container Instance**
  - **Lab 5:** Using Azure Container Registry, Azure Container Instance
- **Module 7: Migrating Apps to Azure Container Services / Kubernetes Services**
  - **Lab 6:** Deploying Azure Container Services with Kubernetes and running Pods
  - **Lab 7:** Deploying Azure Kubernetes Services
- **Module 8: AKS Monitoring and Operations**
  - **Lab 8: Integrating AKS monitoring with Azure Monitor and Deploying Kubernetes Dashboard**

Node.JS and Cosmos DB labs are available on request

Technical Requirements

What you need…

<Could vary based on the actual delivery-method>, but overall:

- Client workstation running recent Windows, Linux or Mac OS and latest internet browser
- Access to ports 80 (HTTP), 443 (HTTPS) and 3389 (Remote Desktop)
- Full Azure subscription (MSDN, AzurePass, Paid subscription, AE, CSP,…)

- Lab consumption estimate: $15-35 (when shutdown all resources)

Questions and HOL support

msdevseriessupport@007FFFLearning.com

Subject: Azure Developer Series – Containers

Response Time: within 4-8 hours

Check GitHub for FAQ and Updates:
http://www.github.com/007FFFLearning/MSDevSeriesSupport

Microsoft

Azure

Application Migration

Managing and Monitoring Azure Kubernetes Services

Peter De Tender
@pdtit @007FFFlearning

Key Objectives

What you will learn in this section

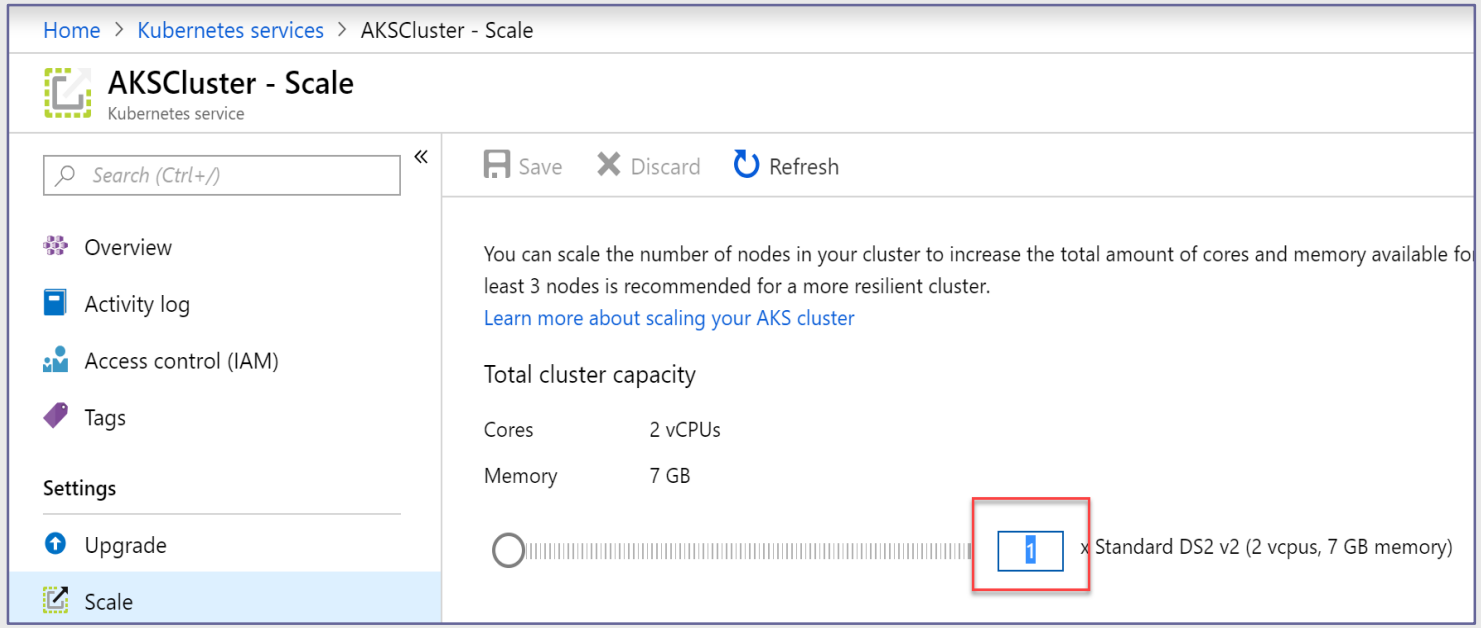
- Enabling Container Scalability in AKS
- Monitoring Azure Kubernetes Services
- Using Kubernetes dashboard with Azure Kubernetes Services

Enabling Container Scalability

AKS Scale

Option 1: Scaling the Nodes

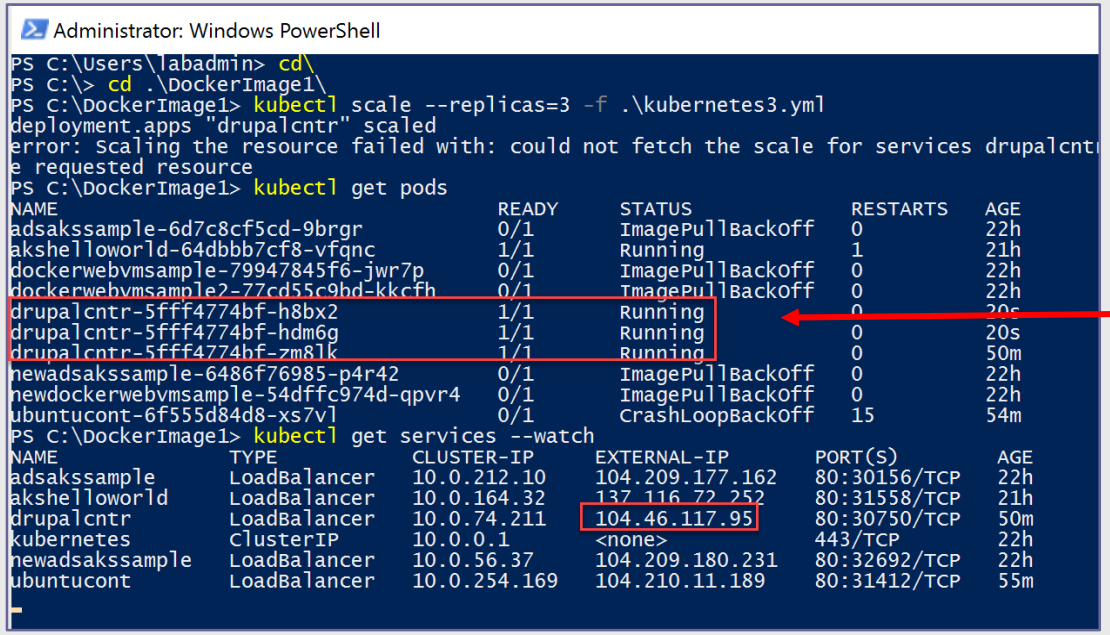
```
Az aks scale --resource-group AKSRG --name AKSCluster --node-count 3
```



AKS Scale

Option 2: Scaling the PODS

```
kubectl scale --replicas=3 -f .\kubernetes3.yml
```



Scaling PODS means you technically deploy multiple instances of your app container

AKS Container AutoScaler

Preview

```
kubectl create -f aks-cluster-autoscaler.yaml

kubectl autoscale deployment azure-vote-front --cpu-percent=50 --min=3 --max=10
```

AutoScaling checks pending PODS, based on values in the Yaml-file.

Define a min and max value

e.g. Run 3 nodes minimum, with a maximum of 10, when CPU +50%

```
        memory: 300Mi
    command:
    - ./cluster-autoscaler
    - --v=3
    - --logtostderr=true
    - --cloud-provider=azure
    - --skip-nodes-with-local-storage=false
    - --nodes=1:10:nodepool1
    env:
    - name: ARM_SUBSCRIPTION_ID
      valueFrom:
```

Demo

Scaling Azure Kubernetes Services

Monitoring AKS in Azure

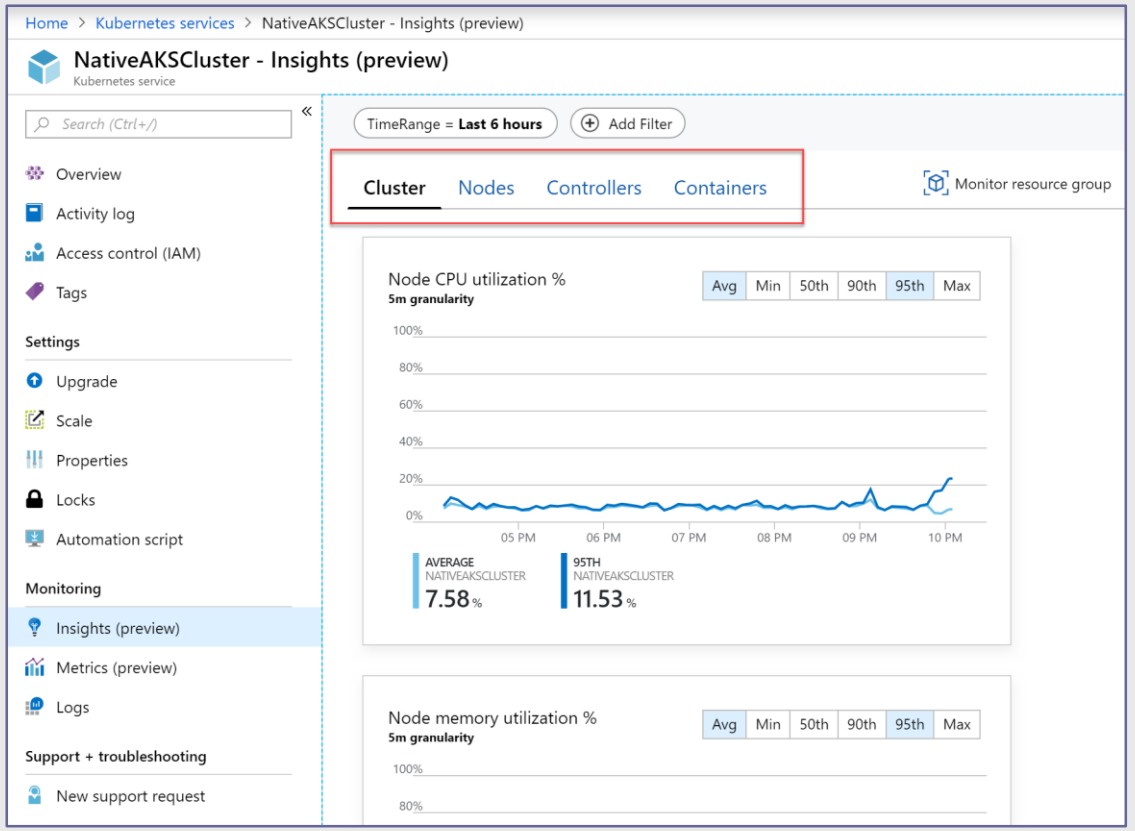
AKS Monitoring

You can't manage what you don't see…

- Identify AKS containers that are running on the node and their average processor and memory utilization.
- Identify where the container resides in a controller or a pod.
- Review the resource utilization of workloads running on the host that are unrelated to the standard processes that support the pod.
- Understand the behavior of the cluster under average and heaviest loads.

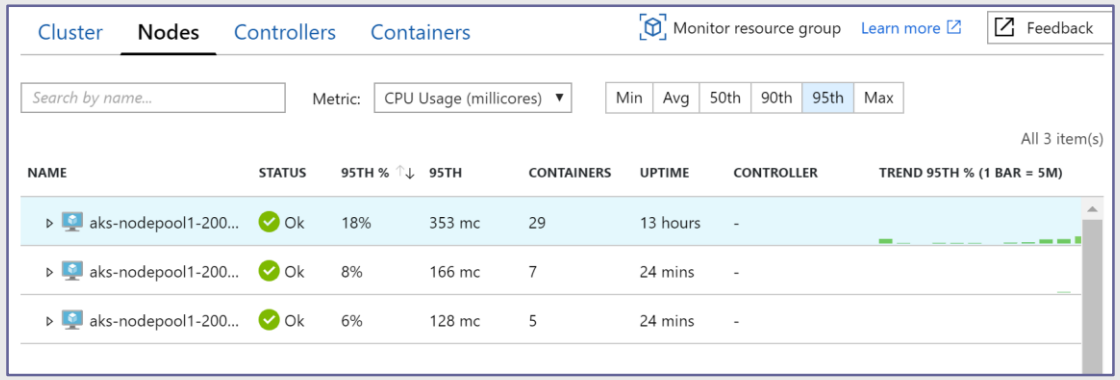
AKS Monitoring

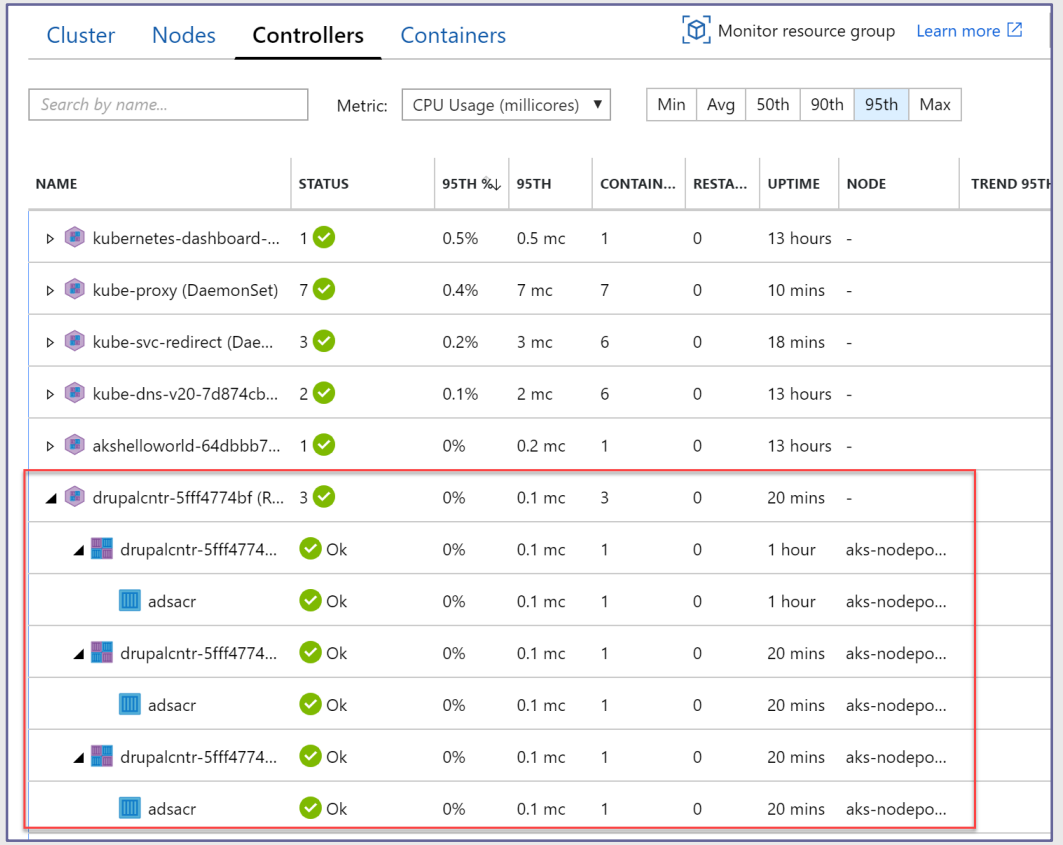
Built-in monitoring capabilities of the AKS Cluster, within Azure Monitor



AKS Monitoring

Cluster | Nodes | Controllers | Containers





Demo

Monitoring AKS in Azure

Using the Kubernetes Dashboard

Kubernetes Dashboard

You can't manage what you don't see…

- Kubernetes includes a web dashboard that can be used for basic management operations. This dashboard lets you view basic health status and metrics for your applications, create and deploy services, and edit existing applications.

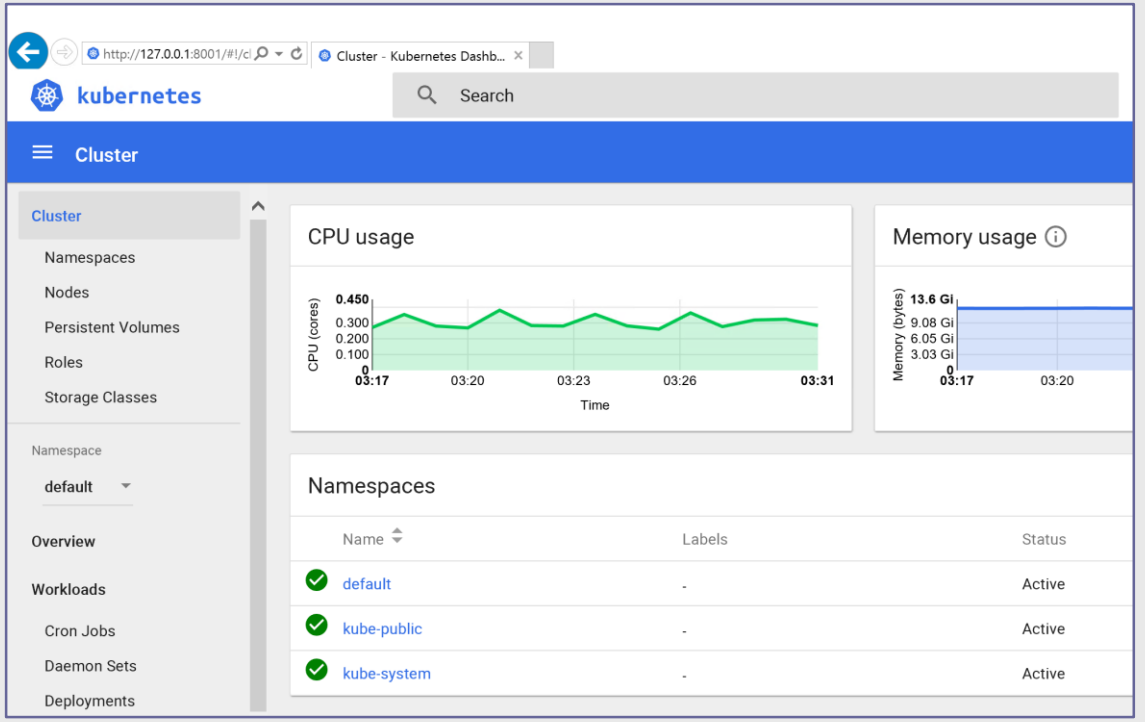
```
az aks browse --resource-group AKSResourceGroup --name AKSCluster
```

Kubernetes Dashboard

1. Install latest version of the kubectl CLI tool

2. Connect to the AKS Cluster with the correct credentials

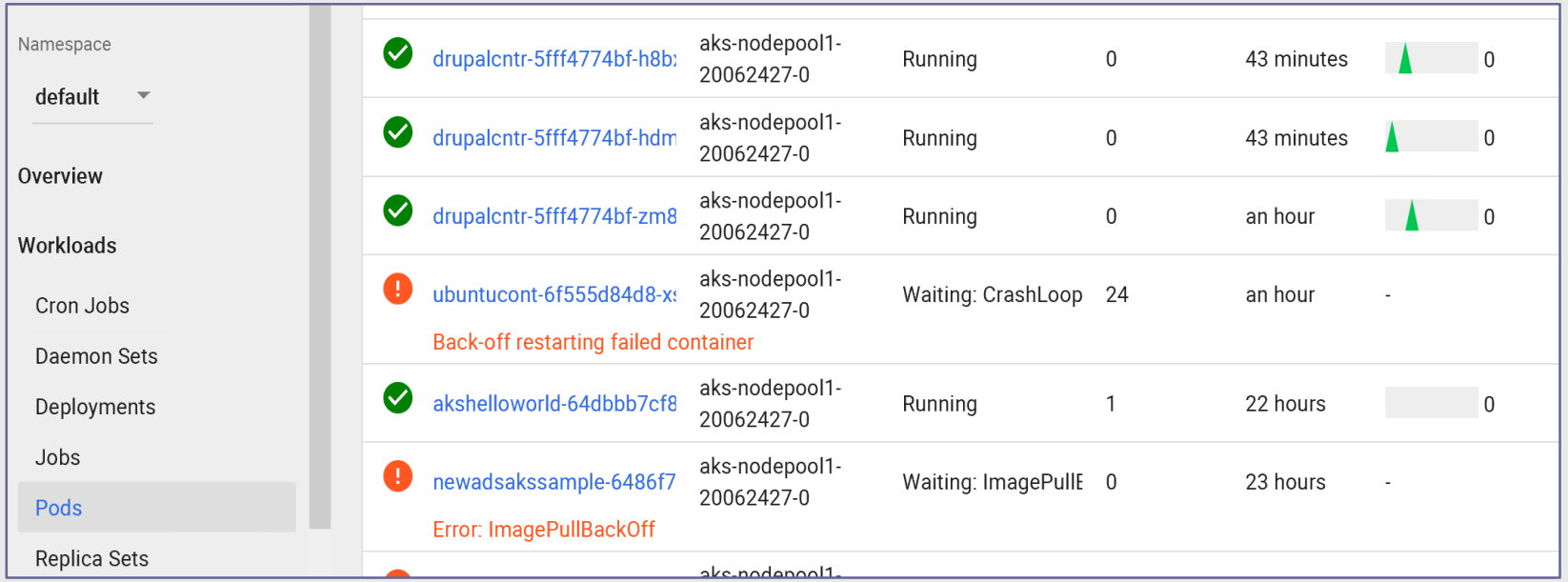
3. az aks browse...



Kubernetes Dashboard

Shows detailed information on:

- Jobs
- Pods
- Nodes
- …



If AKS cluster is using RBAC, your dashboard will fail because of missing rolebinding:

```
kubectl create clusterrolebinding kubernetes-dashboard --clusterrole=cluster-admin --serviceaccount=kube-system:kubernetes-dashboard
```

Demo

Using the Kubernetes Dashboard

Lab

Managing and Monitoring Azure Kubernetes Services

Lab 8 Instructions

1. (Assumption is you finished all prior labs to these)
2. Download the “Lab 8” Guide from GitHub (PDF)
3. Task 1: Enable AKS Scalability
4. Task 2: Monitoring AKS using the Azure Portal Dashboard
5. Task 3: Monitoring and Managing AKS using the Kubernetes Dashboard
6. When having questions: msdevseriessupport@007FFFLearning.com

Section Take-Aways

1. Azure Kubernetes Services has built-in scaling features
2. Azure Kubernetes Services provides Azure-integrated Monitoring
3. AKS provides deployment of a specific « Kubernetes Dashboard »

Workshop Take-Aways

1. Azure has all services available to assist in application migration and digital transformation

2. Azure integrates with Docker Containers, as an enabler for cloud migration and integration of your business-critical workloads

3. Azure provides several « Container Services », from low-level to enterprise-grade solutions, including end-to-end monitoring

Microsoft

Azure

Questions?

Peter De Tender
@pdtit @007FFFlearning

Microsoft

Azure

Thank you for attending this workshop

peter@pdtit.be

Peter De Tender

@pdtit @007FFFlearning