Managed Kubernetes

AKS

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Basics

- Available since October 2018

- GA since June 2018

- Latest supported k8s version 1.11

- Control plane is free

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Availability and options

- Available almost worldwide (but not every region)

- Cluster create time 10-12 minutes

- Only 1 nodepool (agentpool) supported

- Managed worker nodes

- Worker node HA (update/fault domains)

- Manual cluster upgrade

Availability and options

- Maximum 110 pods per node

- Maximum 100 nodes per cluster

- No bare metal nodes

- New worker node startup time around 10 minutes

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Azure integration

- AKS works on top of Azure infrastructure

- Azure Managed Disks

- Logging and monitoring

- Autoscaling (with manually deployed cluster autoscaler)

- RBAC with Azure AD integration

Summary

- AKS is really just managed k8s master components

- Only the most important things are seamlessly integrated with Azure core infra (Networking, LB, Disks)

- Several speed and reliability improvements over the last couple months, but there are still issues however

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Stories from the trenches

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```
NAME                         STATUS     ROLES     AGE     VERSION
aks-pool-1-27255451-0        Ready      agent     1h      v1.11.5
aks-system-27255451-0        Ready      agent     1h      v1.11.5


NAME                                READY    STATUS     IP            NODE
echo-deployment-78dc57c76d-58mz5    1/1      Running    10.244.1.7    aks-system-27255451-0
echo-deployment-78dc57c76d-fpwkf    1/1      Running    10.244.0.18   aks-pool-1-27255451-0
echo-deployment-78dc57c76d-v2brg    1/1      Running    10.244.0.17   aks-pool-1-27255451-0


NAME            TYPE            CLUSTER-IP       EXTERNAL-IP       PORT(S)          AGE
echo-service    LoadBalancer    10.0.237.55      13.93.24.195      80:32651/TCP     25m




$ for i in `seq 1 100`; do curl -s http://13.93.24.195 |grep -i "hostname: "|cut -d '
' -f 2; done |sort |uniq -c
   100 echo-deployment-78dc57c76d-58mz5
```

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+ Add   ↻ Refresh

🔍 *Search backend address pools*

VIRTUAL MACHINE	VIRTUAL MACHINE STA...	NETWORK INTERFACE	PRIVATE IP ADDRESS	
▼ kubernetes (1 virtual machine)				...
aks-system-27255451-0	Running	aks-system-27255451-nic-0	10.240.0.4	...

```
$ kubectl get svc/echo-service -o yaml

apiVersion: v1
kind: Service
...
spec:
  externalTrafficPolicy: Local
...
status:
  loadBalancer:
    ingress:
    - ip: 13.93.24.195
```

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```
$ for i in `seq 1 100`; do curl -s http://13.93.24.195 |grep -i "hostname: "|cut -d ' ' -f
2; done |sort |uniq -c
   36 echo-deployment-78dc57c76d-58mz5
   33 echo-deployment-78dc57c76d-fpwkf
   31 echo-deployment-78dc57c76d-v2brg
```

```
affinity:
  nodeAffinity:
    requiredDuringSchedulingIgnoredDuringExecution:
      nodeSelectorTerms:
      - matchExpressions:
        - key: nodepool.banzaicloud.io/name
          operator: In
          values:
          - "pool-1"
```

```
NAME                                    READY  STATUS    IP            NODE
echo-deployment-575658b97c-5tvfb        1/1    Running   10.244.0.20   aks-pool-1-27255451-0
echo-deployment-575658b97c-lxn4h        1/1    Running   10.244.0.19   aks-pool-1-27255451-0
echo-deployment-575658b97c-nmgmn        1/1    Running   10.244.0.21   aks-pool-1-27255451-0
```

Home > Availability sets

Availability sets
Default Directory

+ Add   **▤▤ Edit columns**   **↻ Refresh** | **⬡ Assign tags**

Subscriptions: Free Trial

| Filter by name... | All resource groups ⌄ | All locations ⌄ |

2 items

	NAME ↑↓	RESOURCE GROUP ↑↓	LOCATION ↑↓
☐	pool-1-availabilitySet-27255451	MC_Demo_azclusterwayne769_westeu...	West Europe
☐	system-availabilitySet-27255451	MC_Demo_azclusterwayne769_westeu...	West Europe

```
# remove `echo-service`
$ kubectl delete svc/echo-service

# add annotation to `echo-service` specs
apiVersion: v1
kind: Service
metadata:
  name: echo-service
  annotations:
    service.beta.kubernetes.io/azure-load-balancer-mode: "pool-1-availabilitySet-27255451"
spec:
  externalTrafficPolicy: Local
  selector:
    app: echo-pod
  ports:
  - name: http
    protocol: TCP
    port: 80
    targetPort: 8080

# apply `echo-service`
$ kubectl apply -f echo-service.yml

# check the service
$ kubectl get svc/echo-service
NAME            TYPE          CLUSTER-IP      EXTERNAL-IP     PORT(S)        AGE
echo-service    LoadBalancer  10.0.189.194    40.115.57.212   80:31250/TCP   3m
```

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Home > Load balancers

Load balancers
Default Directory

+ Add   ⊞ Edit columns   ↻ Refresh | ⬚ Assign tags

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| Filter by name... | All resource groups ▼ | All locations ▼ |

2 items

	NAME ↑↓	RESOURCE GROUP ↑↓	LOCATION ↑↓
☐	◆ **kubernetes**	**MC_Demo_azclusterwayne769_westeurope**	West Europe
☐	◆ **pool-1-availabilityset-27255451**	**MC_Demo_azclusterwayne769_westeurope**	West Europe

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```
$ for i in `seq 1 100`; do curl -s http://40.115.57.212 |grep -i "hostname: "|cut -d ' ' -f
2; done |sort |uniq -c
    36 echo-deployment-575658b97c-5tvfb
    33 echo-deployment-575658b97c-lxn4h
    31 echo-deployment-575658b97c-nmgmn
```

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```
$ k logs -f anchore-anchore-policy-validator-68f9c79c58-qk2vh --since=1h -n
pipeline-system
Error from server: Get https://aks-system-27255451-0:10250/containerLogs/pipeline-
system/anchore-anchore-policy-validator-68f9c79c58-qk2vh/anchore-policy-validator?
follow=true&sinceSeconds=3600: dial tcp 10.240.0.4:10250: i/o timeout


$ k get cs
NAME                        STATUS        MESSAGE
ERROR
scheduler                   Unhealthy     Get http://127.0.0.1:10251/healthz: dial tcp
127.0.0.1:10251: connect: connection refused
controller-manager    Unhealthy     Get http://127.0.0.1:10252/healthz: dial tcp
127.0.0.1:10252: connect: connection refused
etcd-0                      Healthy       {"health": "true"}
```

Questions?!