

# **Managed Kubernetes**

**AKS** 

Zsolt Varga @banzaicloud.com



### **Basics**

- Available since October 2018
- GA since June 2018
- Latest supported k8s version 1.11
- Control plane is free



## **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



## **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



# **Managed Kubernetes**

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Stories from the trenches

```
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
```

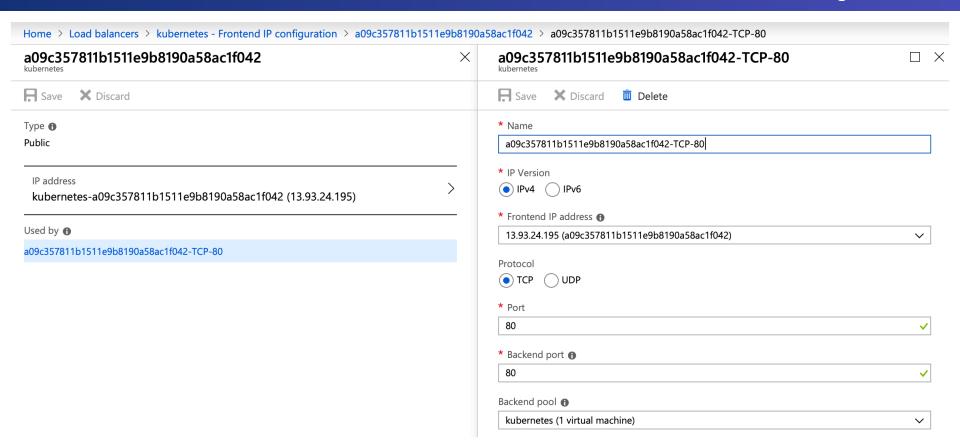
```
NAME
                                    READY
                                           STATUS
                                                    ΙP
                                                                  NODE
                                    1/1
echo-deployment-78dc57c76d-58mz5
                                           Running
                                                    10.244.1.7
                                                                  aks-system-27255451-0
                                           Running
echo-deployment-78dc57c76d-fpwkf
                                    1/1
                                                    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
```



#### AKS load balancing caveats







+ Add C Refresh

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
```

31 echo-deployment-78dc57c76d-v2brg

```
$ 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
```

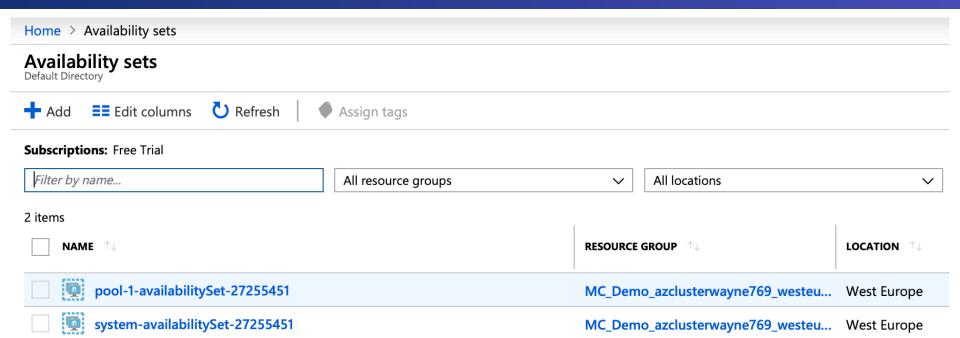
```
BANZAICLOUD
```

```
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



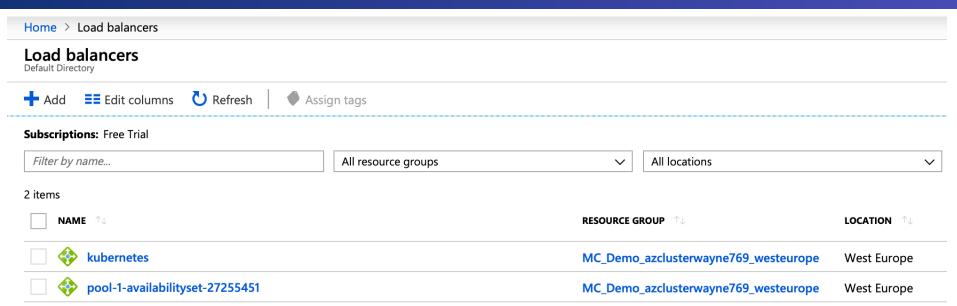
#### AKS load balancing caveats



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



#### AKS load balancing caveats



```
$ 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-1xn4h
31 echo-deployment-575658b97c-nmgmn
```

```
$ 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
```

