Managed Kubernetes

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UNINETT

Om meg selv

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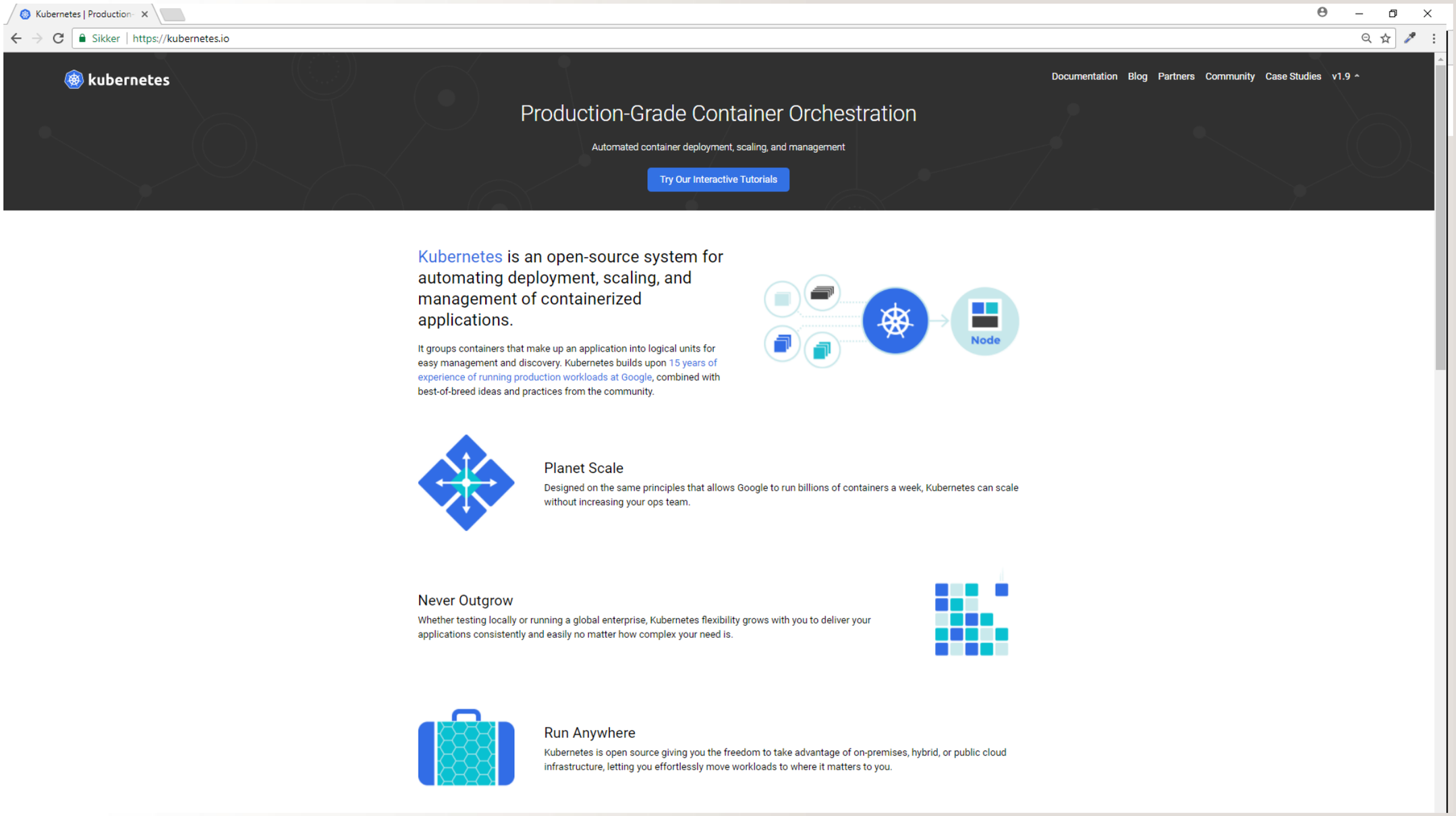
- UNINETT Avdeling system og mellomvare
- Faglig fokus på «Microsoft teknologi»

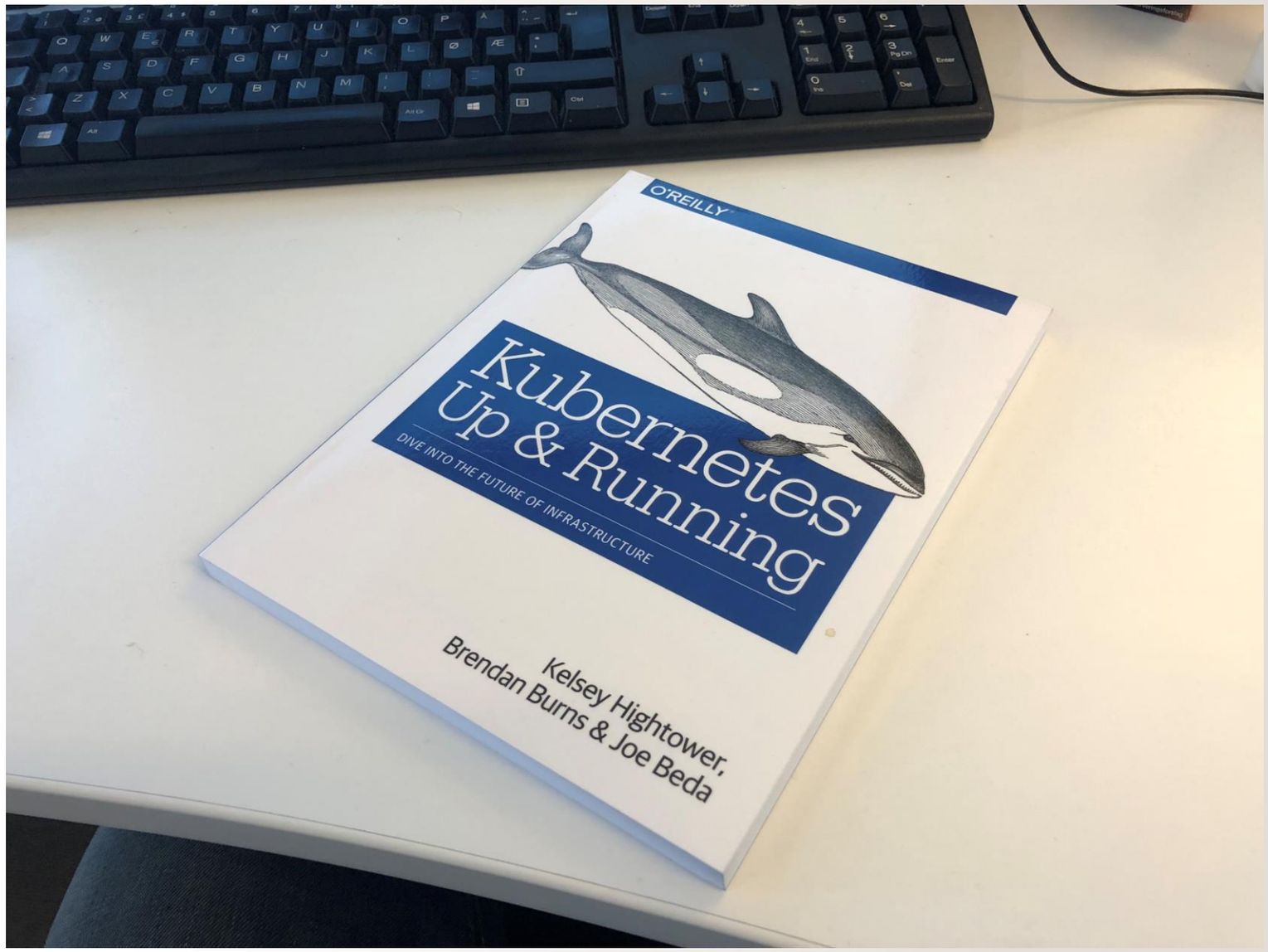
Containers & Orchestration

- Packing the container involves defining what needs to be there for your application to work – operating system, libraries, configuration files, application binaries, and other parts of your technology stack. Once the container has been defined, that *image* is used to create containers that run in any environment, from the developer's laptop to your test/QA rig, to the production data center, on-premises or in the cloud, without any changes.
- The process of deploying multiple containers to implement an application can be optimized through automation. This becomes more and more valuable as the number of containers and hosts grow. This type of automation is referred to as orchestration.
- https://www.mongodb.com/containers-and-orchestration-explained

Kubernetes


Kubernetes | Production-
Sikker | https://kubernetes.io
kubernetes
Documentation Blog Partners Community Case Studies v1.9
Production-Grade Container Orchestration
Automated container deployment, scaling, and management
Try Our Interactive Tutorials
Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications.
It groups containers that make up an application into logical units for easy management and discovery. Kubernetes builds upon 15 years of experience of running production workloads at Google, combined with best-of-breed ideas and practices from the community.
Node
Planet Scale
Designed on the same principles that allows Google to run billions of containers a week, Kubernetes can scale without increasing your ops team.
Never Outgrow
Whether testing locally or running a global enterprise, Kubernetes flexibility grows with you to deliver your applications consistently and easily no matter how complex your need is.
Run Anywhere
Kubernetes is open source giving you the freedom to take advantage of on-premises, hybrid, or public cloud infrastructure, letting you effortlessly move workloads to where it matters to you.

Kubernetes



- 173 sider
- Har ikke hatt tid til å lese – blir til sommeren (håper jeg).
- Men kanskje trenger jeg ikke lese for å «komme i gang»?

Applikasjonsutvikler

- En applikasjonsutvikler vil generelt ikke være opptatt av teknologien som ligger i kubernetes – Det skal bare fungere.
  - Det skal være enkelt og billig

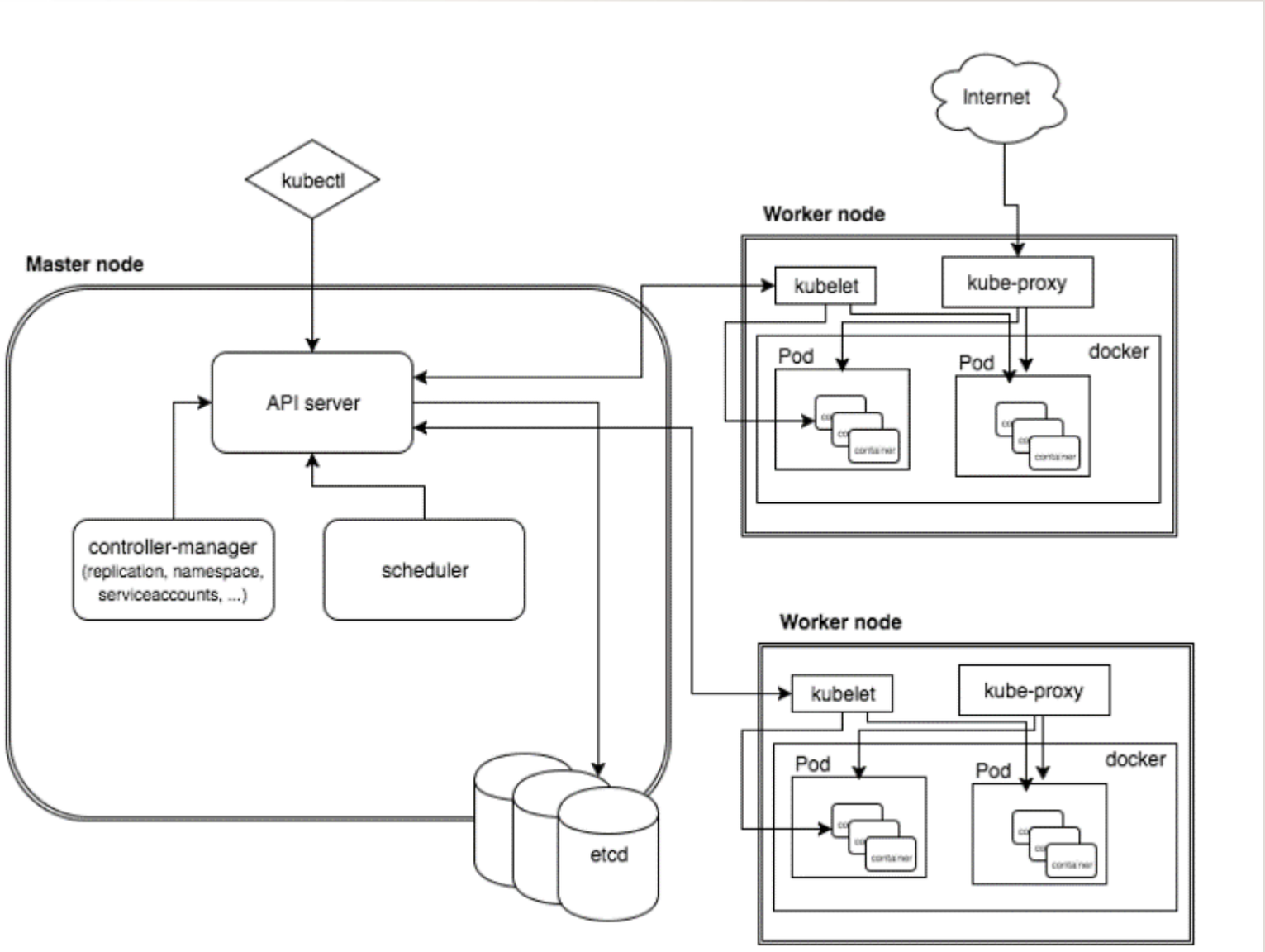
Azure Container Service ACS -> AKS

- Mesos/Mesosphere DC/OS
- Docker Swarm
- Azure Kubernetes Service

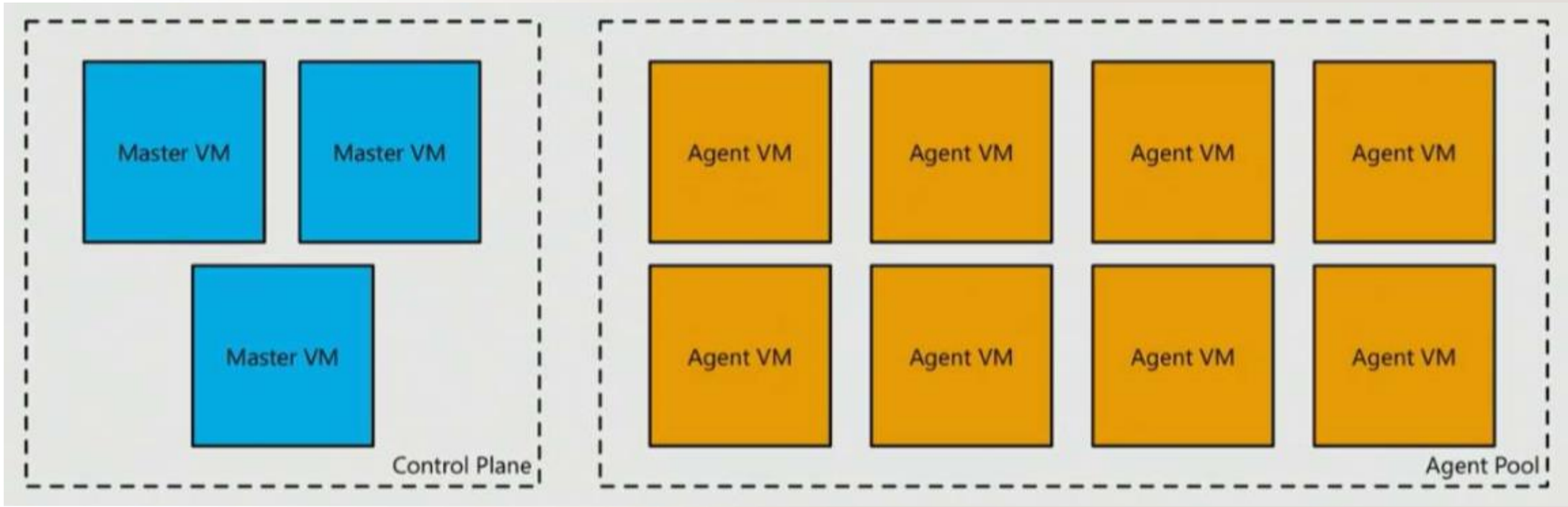
Managed Kubernetes

- Amazon Elastic Container Service for Kubernetes (Amazon EKS)
  - Is a **managed** service that makes it easy for you to run **Kubernetes** on AWS without needing to install and operate your own **Kubernetes**clusters
- Azure Kubernetes Service (AKS)
  - Azure Container Service (AKS) makes it simple to create, configure, and manage a cluster of virtual machines that are preconfigured to run containerized applications. This enables you to use your existing skills, or draw upon a large and growing body of community expertise, to deploy and manage container-based applications on Microsoft Azure
- Google Kubernetes engine
  - Kubernetes Engine is a managed environment for deploying containerized applications. It brings our latest innovations in developer productivity, resource efficiency, automated operations, and open source flexibility to accelerate your time to market.

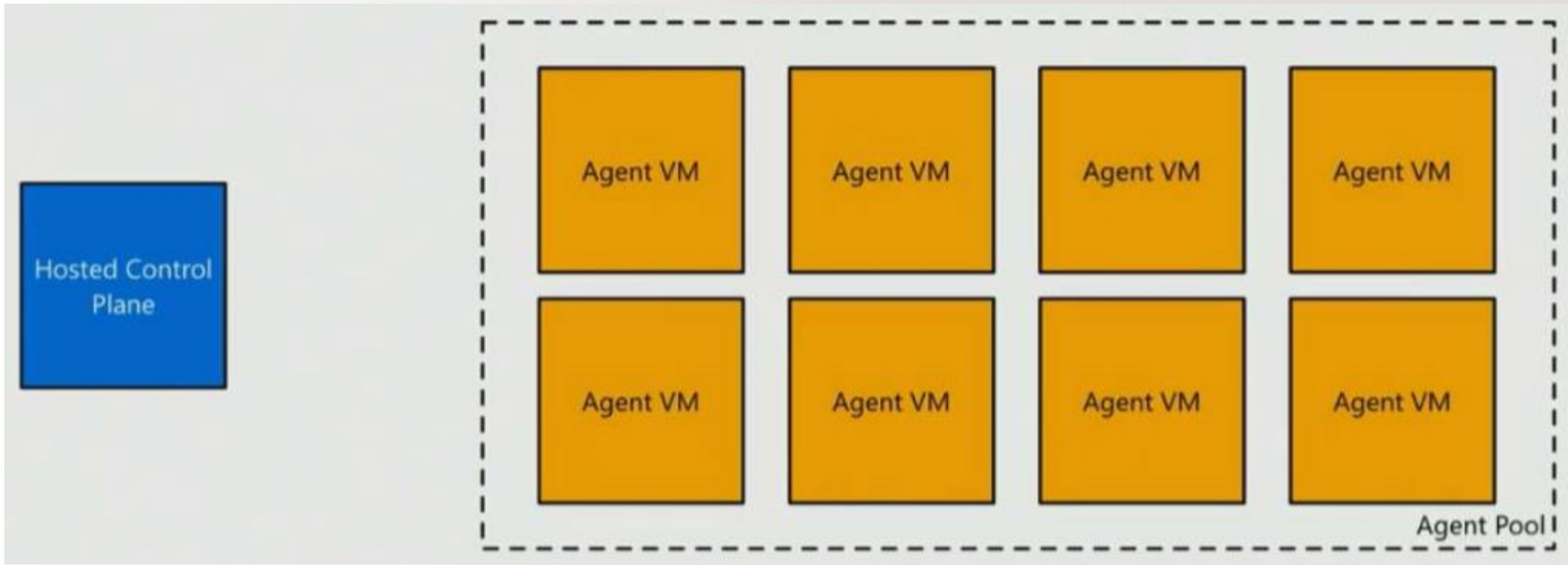
Kubernetes uten AKS



Kubernetes uten AKS

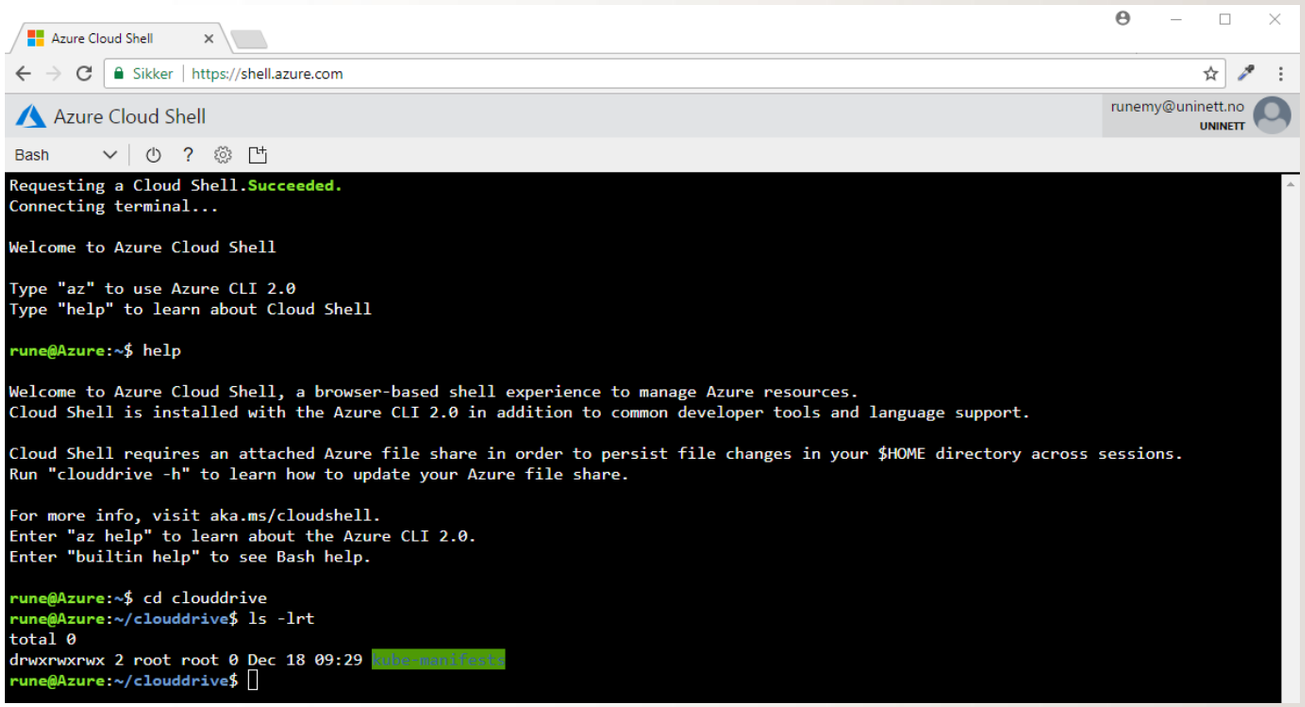


Kubernetes med AKS



- Betaler for worker-nodes

Azure Cloud Shell



- Azure Cloud Shell – benytter kubernetes
  - Bash
  - Powershell
- Kan benyttes til å opprette AKS
  - Kan også benytte Web-GUI / Terraform / Azure RMS templates

AKS cluster på 1, 2 og 3

- az login
- az group create --name UNINETT-TEST-AKS1 --location westeurope
- az aks create --resource-group UNINETT-TEST-AKS1 --name myAKSCluster1 --node-count 1 --generate-ssh-keys

Klar til å deploye kube manifests

- Kubectl create –f <my yml file>

AKS

- Automated Kubernetes upgrades
- Self-healing control plane
- Etcd SSD backed, automated, H/A, backup/restore
- Customized networking (Azure VNETs,CNI)
- Cluster scaling
- TLS everywhere. Backed by Azure KeyVault
- RBAC and Azure AD integraded
- Hybrid Clusters (futures)

AKS Persistent lagring

- For Azure there are 2 kinds of Volumes available in Kubernetes.
  - AzureDisk maps to a vhd.
  - AzureFile maps to a directory in an Azure Storage Account on a Fileshare. Self-healing control plane.
- The big difference between AzureFile and AzureDisk is the AccessMode. There are 3 AccessModes.
  - ReadWriteOnce – the volume can be mounted as read-write by a single node
  - ReadOnlyMany – the volume can be mounted read-only by many nodes
  - ReadWriteMany – the volume can be mounted as read-write by many nodes
- AzureFile supports all three. AzureDisk supports ReadWriteOnce only.
  In the situation where a pod is configured to use a volume to write or read data to and is being restarted on a different host for whatever reason, you can't use AzureDisk.
- https://pascalnaber.wordpress.com/2018/01/26/persistent-storage-and-volumes-using-kubernetes-on-azure-with-aks-or-azure-container-service/

Azure Container Registry

- Azure Container Registry er en «managed docer registry» tjeneste som er basert på «Docker Registry 2.0».
  - For dine private docker container images

SKU feature matrix

The following table details the features and limits of the Basic, Standard, and Premium service tiers.

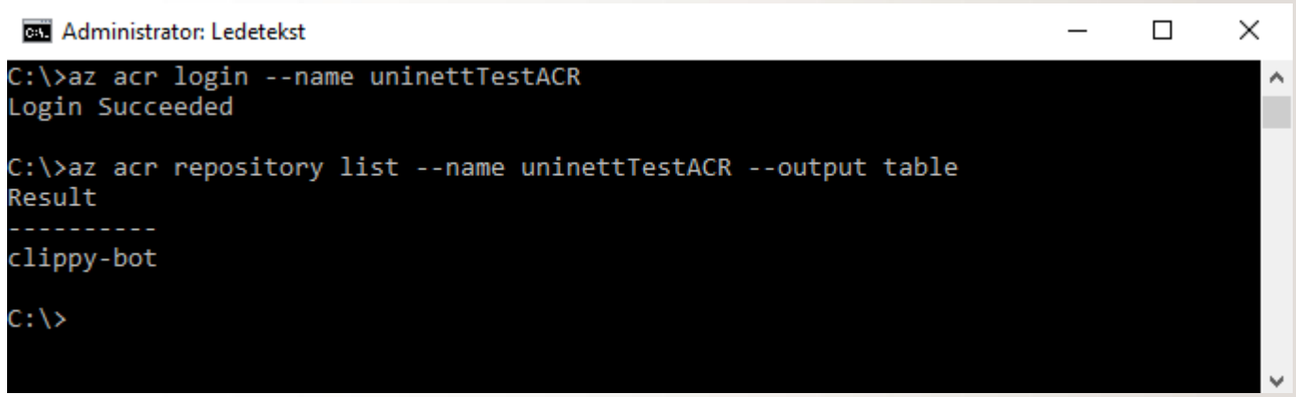
Resource	Basic	Standard	Premium
Storage	10 GiB	100 GiB	500 GiB
ReadOps per minute[1, 2]	1000	3000	10000
WriteOps per minute[1, 3]	100	500	2000
Download bandwidth MBps[1]	30	60	100
Upload bandwidth MBps[1]	10	20	50
Webhooks	2	10	100
Geo-replication	N/A	N/A	Supported *(preview)*

- https://docs.microsoft.com/en-us/azure/container-registry/

Slack Clippy bot

- https://jeremyrickard.github.io/post/fun-with-aci/

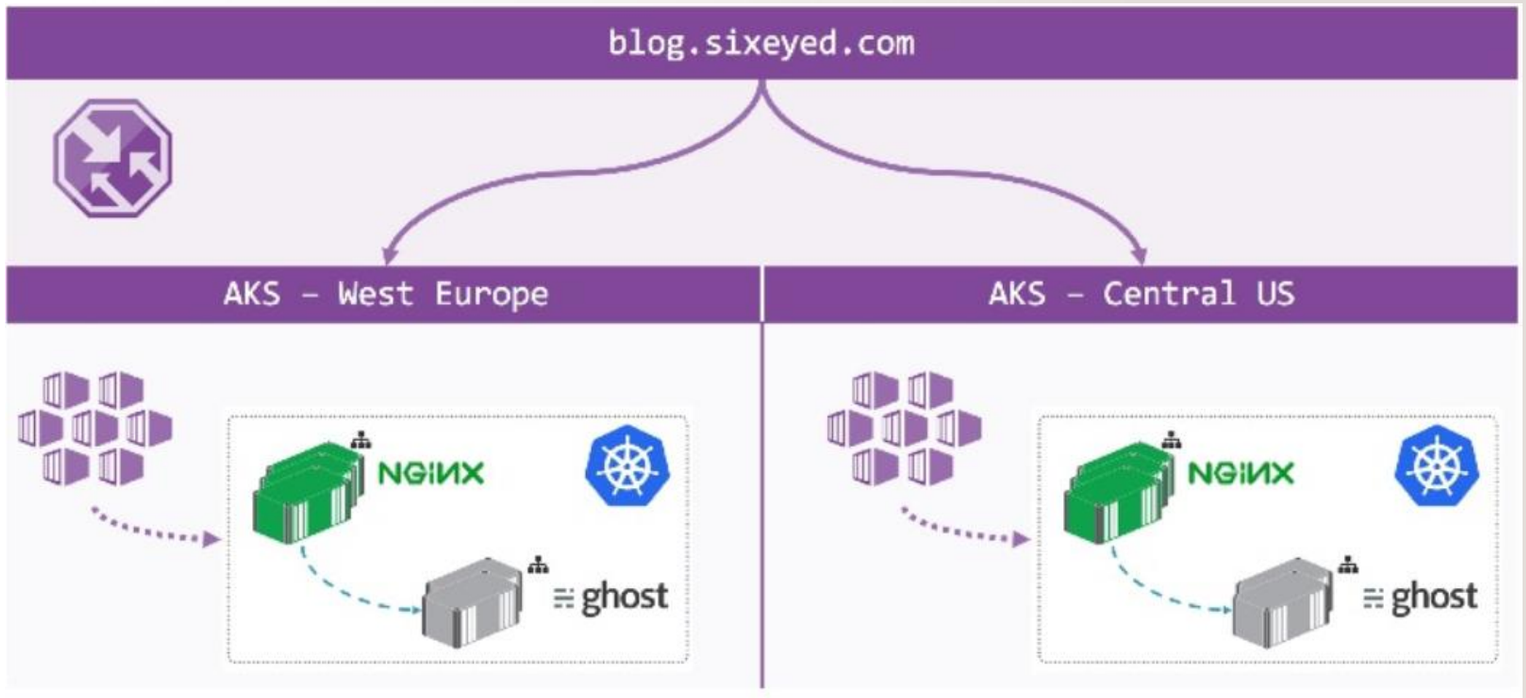
- Bygger docker image og laster opp til Azure Container Registry



- kubectl delete -f clippy-bot.yml
- kubectl create -f clippy-bot.yml

Azure Traffic Manager

- Kubernetes cluster in two azure regions
- https://docs.microsoft.com/nb-no/azure/traffic-manager/



- https://blog.sixeyed.com/this-blog-runs-on-docker-and-kubernetes-in-azure/

Kubernetes

- B-series burstable VM support in AKS
  - https://azure.microsoft.com/nb-no/blog/introducing-burstable-vm-support-in-aks/
- Running a Distributed Database on Kubernetes on Azure
  - https://lenadroid.github.io/posts/stateful-sets-kubernetes-azure.html?wt.mc_id=AID625426_QSG_SCL_213105
- Deploy Java Application on AKS
  - https://open.microsoft.com/2018/03/28/deploy-java-application-azure-kubernetes-service-cosmos-db/
- Andre ressurser:
  - https://blog.headforcloud.com/2017/10/24/aks-azure-managedk8s/
  - https://thenewstack.io/closer-look-aks-managed-kubernetes-azure-container-service/
  - https://hackernoon.com/kubernetes-adventures-on-azure-part-1-e0f68b486679
  - https://medium.com/@pjbgf/azure-kubernetes-service-aks-pulling-private-container-images-from-azure-container-registry-acr-9c3e0a0a13f2
  - https://thorsten-hans.com/how-to-use-a-private-azure-container-registry-with-kubernetes-9b86e67b93b6