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Introduction to Azure Kubernetes Service and SAS Viya 2020.1

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What is Kubernetes?

- Kubernetes is an Open-Source container orchestration software
- Kubernetes was originally developed by Google
- It is agnostic to the type of software inside the containers
- There are many versions of Kubernetes and many vendors
- It can work with multiple Container Engines
- Kubernetes is often abbreviated as 'K8s'
 - Representing that there are 8 characters between the K and the s

What is Docker and Container?

- A container is a standard unit of software that packages up code and all its dependencies so the application runs quickly and reliably from one computing environment to another.
- Docker containers are containers that run on Docker Engine. Docker benefits:
 - **Standard:** Docker created the industry standard for containers, so they could be portable anywhere
 - **Lightweight:** Containers share the machine's OS system kernel and therefore do not require an OS per application, driving higher server efficiencies and reducing server and licensing costs
 - **Secure:** Applications are safer in containers and Docker provides the strongest default isolation capabilities in the industry

What problem does Kubernetes solve?

Main Benefits of Kubernetes

- There are many reasons why organisations come to use containers and container APIs like Kubernetes. The main four are:
 - Velocity
 - Scaling of people and software
 - Abstracting the infrastructure
 - Efficiency

What is Kubernetes and what problem does it solve?

Velocity

- Velocity is the key component in nearly all software development today.
- SAS Institute and other software vendors have evolved from shipping products as boxed CDs or DVDs to software that is delivered over the network via web-based services that are updated frequently.
- SAS Institute operates a continuous delivery for SAS Viya 2020.1 making update process frequent and seamless

What is Azure Kubernetes Service?

- Microsoft Azure offers a hosted Kubernetes-as-a-Service as part of the Azure Container Service.
- Microsoft provides the full ecosystem:
 - Infrastructure
 - Ability to register and build containers
 - And full monitoring\orchestration tooling
 - Flexible pricing model

Key Kubernetes Terms

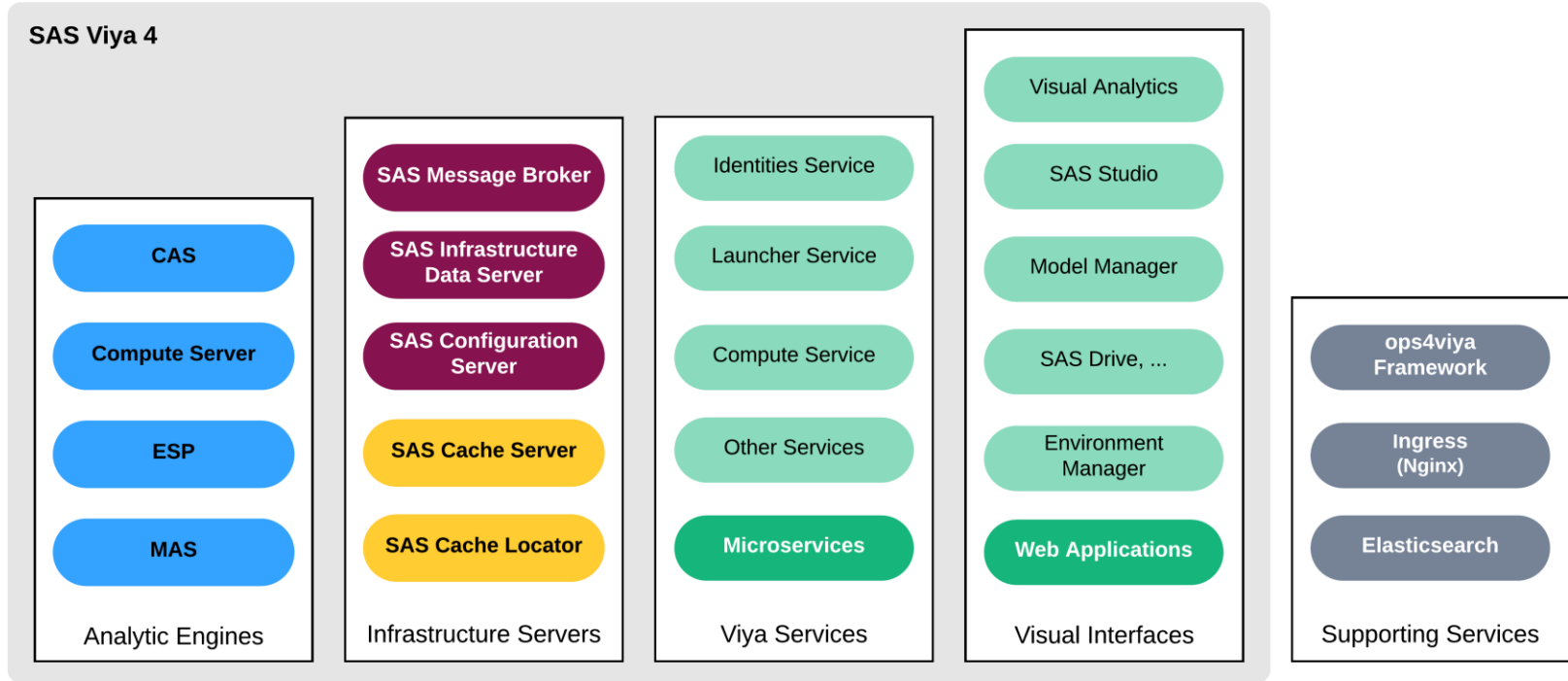
- A **Kubernetes cluster** is a set of machines (computers) for running containerized applications
- Each computer in the cluster is called a node
 - Nodes can be a physical or virtual instance of a server
 - Nodes can vary in size
- The nodes will host your applications, running as containers
- Nodes can be independently started and stopped
- The nodes could be spread across different data centers

Node Pools

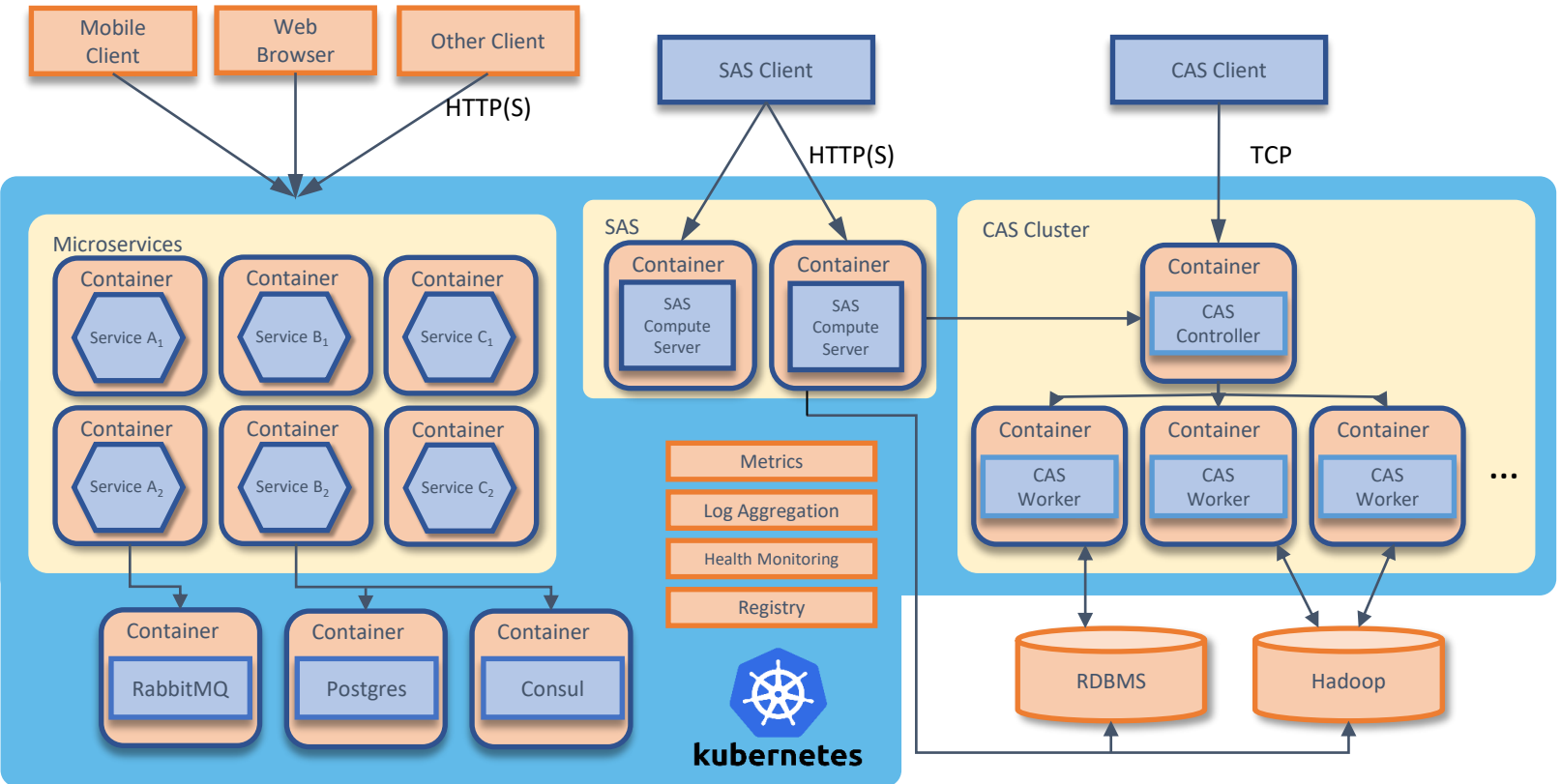
- Nodes are often pooled to ensure workload of certain type is assigned to certain type of nodes
- CAS Node Pool: benefits greatly from a very high RAM/CPU ratio
- Stateless Node Pool: used for microservices and other components that require lower RAM to CPU access
- Other pools used for SYSTEM and Ops4Viya services

What does the deployment of SAS Viya 2020.1 look like?

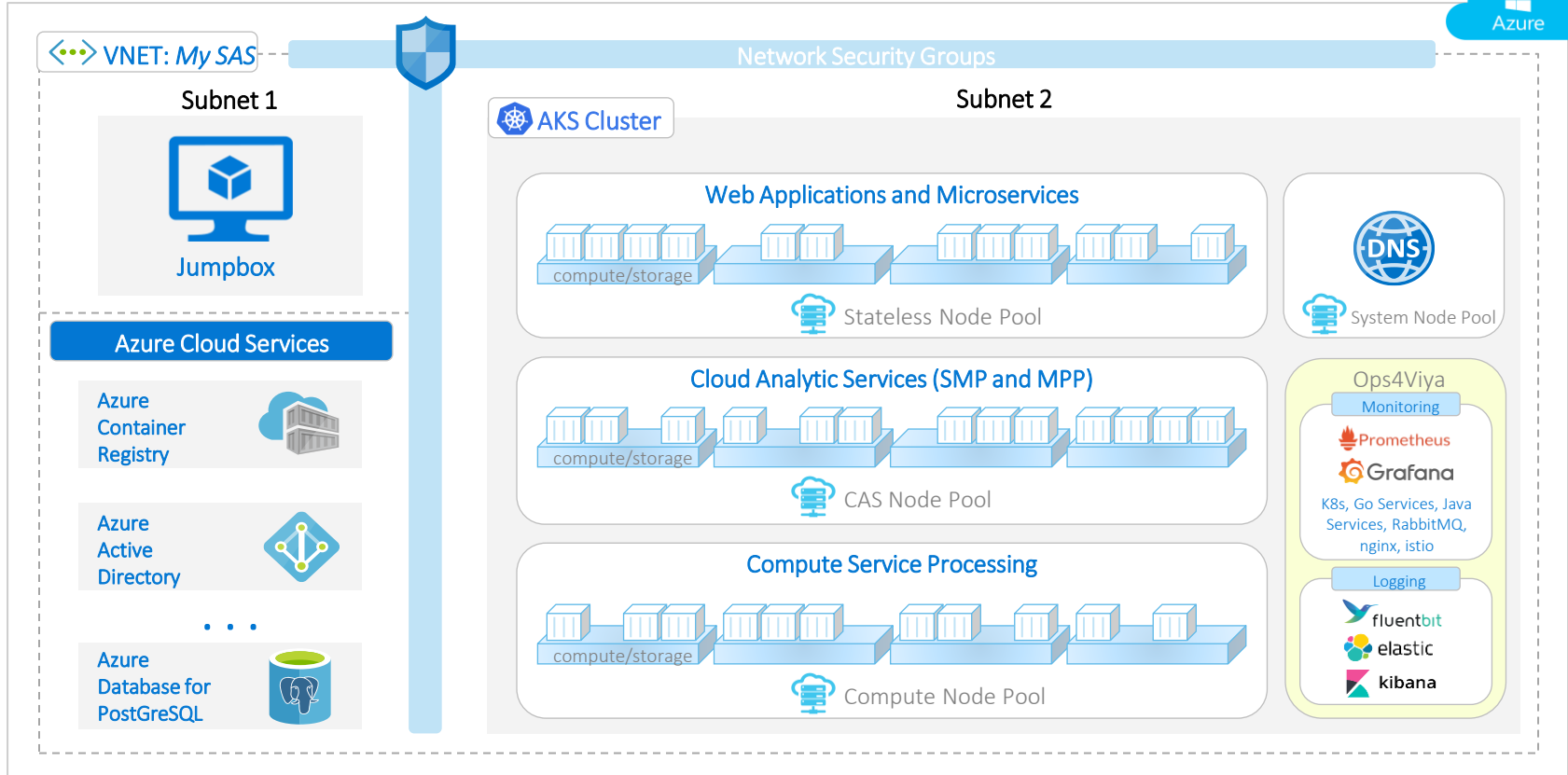
SAS Viya Services



SAS Viya 2020.1



SAS Viya 2020.1 on Azure AKS



Summary

- Kubernetes is used to orchestrate Docker Containers
- Docker Containers is a way to create and deploy software without worrying too much about infrastructure
- Azure Kubernetes Service (AKS) is a service on Azure to obtain Kubernetes Clusters with infrastructure and support services included
- SAS Viya 2020.1 Works only AKS at the moment, offering a continuous update and deployment process.

Keep in mind that:

- SAS Viya 2020.1 supports Kubernetes v1.18 on AKS
- SAS Viya 2020.1 supports Docker runtime only
- SAS Viya 2020.1 supports only Ingress ingress
- SAS Viya 2020.1 does not support CAS scaling at this time.
- Kubernetes clusters can be highly available across multiple zones, but Azure attached storage is not highly available and can be attached to pods in the same zone only

Thank you!



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