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SAS Viya Cloud & Platform Roadmap

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Agenda

- SAS Viya4 - Only in the cloud?
- Private vs. Public cloud – Principals.
- Options for non-cloud customers?
- Private Cloud strategy using RedHat Openshift on Openstack
- 8 essential points for Openshift
- Future SAS Viya4 on-premise deployment
- Q/A

SAS Viya4

Only in the cloud?

- What is the right cloud strategy for your business?
 - Public cloud
 - Private cloud
 - Managed cloud
 - Hybrid cloud
 - Multi-cloud
 - No cloud



Private vs. Public cloud

Only in the cloud?

PRIVATE



WHAT'S
the
DIFF?

PUBLIC



Private vs. Public cloud

Principals

- Public Cloud
 - Services as owned by third party provider
 - Maintenance is bared by the service provider
 - Pay-as-you-go principal.
- Private Cloud
 - Dedicated to a single organization
 - Higher Security – internal network and servers
 - Resources are not shared
 - Greater flexibility to control the private cloud environment

The logo for SAS Viya, featuring the SAS logo symbol followed by the text "sas viya" in a lowercase, sans-serif font.

Private vs. Public cloud

Differences

Public Cloud	Private Cloud
Anyone can use the public cloud services.	Only the organization itself can use the private cloud services.
Data Center Location Anywhere on the Internet where the cloud service provider's services are located..	Data Center Location Inside the organization's network.
Cloud Service Management: The cloud service provider manages the services, where the organization merely uses them.	Cloud Service Management: The organization must have their own administrators managing their private cloud services.
Hardware Components: The CSP provides all the hardware and ensures it's working at all times.	Hardware Components: Must be provided by the organization itself, which has to buy physical servers to build the private cloud on.
Expenses: The CSP has to provide the hardware, set-up the application and provide the network accessibility according to the SLA.	Expenses: Can be quite expensive, since the hardware, applications and network have to be provided and managed by the organization itself.
In public cloud, the cloud infrastructure is made available to the general public over the internet and is owned by a cloud provider and in a private cloud, the cloud infrastructure is exclusively operated by a single organization.	Private cloud can be managed by the organization or a third party and may exist on-premise or off-premise.
AWS, Microsoft Azure, IBM's Blue Cloud and Sun Cloud are the examples of public cloud	RedHat and VMware are the examples of private cloud suppliers.

Private vs. Public cloud

RedHat Openshift Openstack



- **OpenShift** enables efficient container orchestration, allowing rapid container provisioning, deploying, scaling, and management
- The tool enhances the DevOps process by streamlining and automating the container management process
- You use **OpenStack** on top of existing resources, either on-premises or **in the cloud**, to create a unified cloud
- **OpenStack** is an open-source software that allows for the deployment and management of a cloud infrastructure as a service (IaaS) platform
- **OpenStack** supports both private and public cloud deployments. It fulfills two main requirements of the cloud: massive scalability and simplicity of implementation

RED HAT[™] CLOUD SUITE



SYSTEMS MANAGEMENT

RED HAT[™]
SATELLITE



MANAGEMENT

RED HAT[™]
CLOUDFORMS



CONTAINERS

 **OPENSIFT[™]** | Kubernetes
by Red Hat[™]



VIRTUALIZATION

VMware

Microsoft Hyper-V

RED HAT[™]
ENTERPRISE VIRTUALIZATION



PRIVATE CLOUD

RED HAT[™]
OPENSTACK[™]
PLATFORM



PUBLIC CLOUD

Amazon Web Services

Microsoft Azure



PLATFORM
Red Hat Enterprise Linux



STORAGE
Red Hat Ceph Storage



Any options for non-cloud customers

Running today on RedHat Linux on-premise servers?

- Continue with on-premise system for Viya3.5
- In SAS Viya 2021.1.4 Stable version we will deliver first integration for on-premise Kubernetes handled SAS Viya4 deployments
- Viya supported on Open Source Kubernetes
 - Red Hat OpenShift on VMWare
- August 2021.
- Other versions TBD.



SAS Viya 4

Private cloud strategy



- So to fly this car – what do you need?
 - An engine – to start with
 - A Steering wheel secondly
 - A SatNav system to guide you around
 - AutoPilot system to allow self-driving capabilities
 - Maintenance scheme
 - ++ much more

SAS Viya 4

Red Hat OpenShift OpenStack



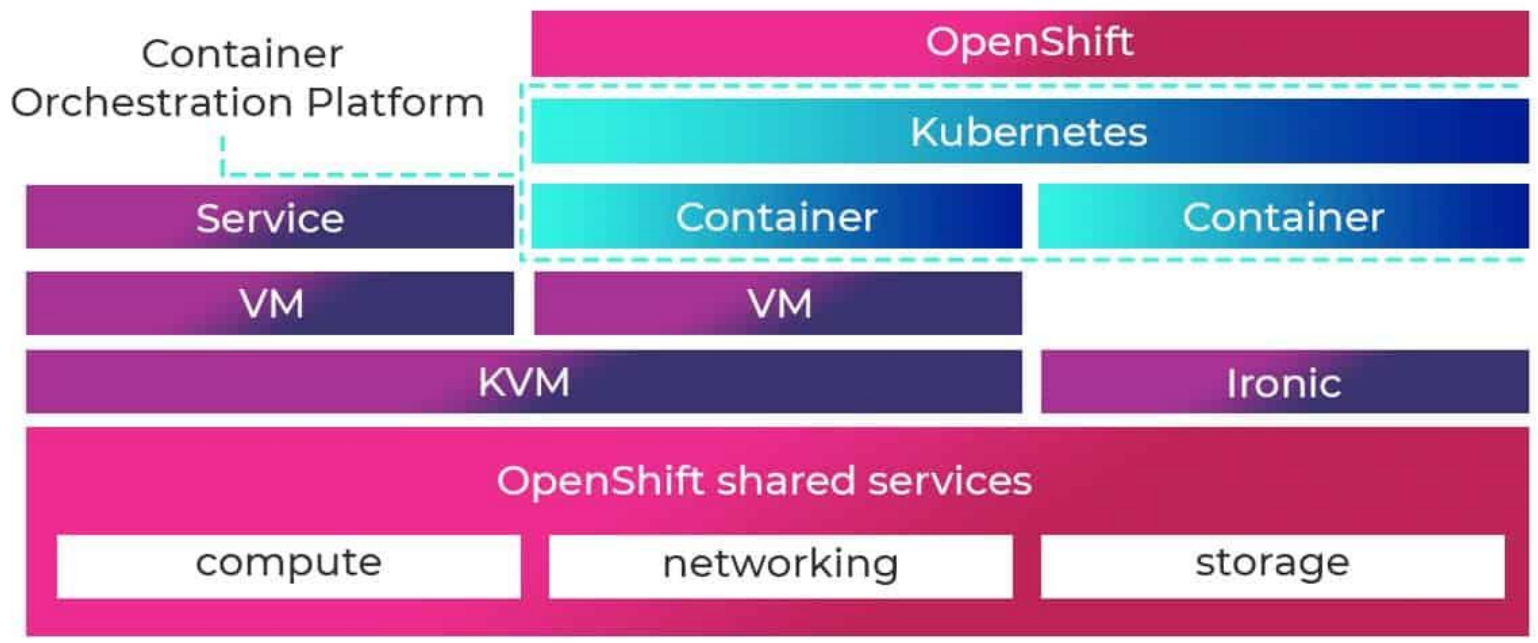
- **Question: Is RedHat OpenShift the same as Kubernetes?**
 - If Kubernetes is the satnav and autopilot, OpenShift is the car.
- Just like you cannot drive using the engine itself, you'll need a bunch of other services
 - Monitoring
 - Logging
 - Alerts
 - Storage
 - Databases
 - Alongside container orchestration (a.k.a. Kubernetes).
- A number of these essential services come out of the box with OpenShift and you have the option to [install more](#) based on your project needs.
- OpenShift offers consistent security, built-in monitoring, centralized policy management, and compatibility with Kubernetes container workloads

SAS Viya 4

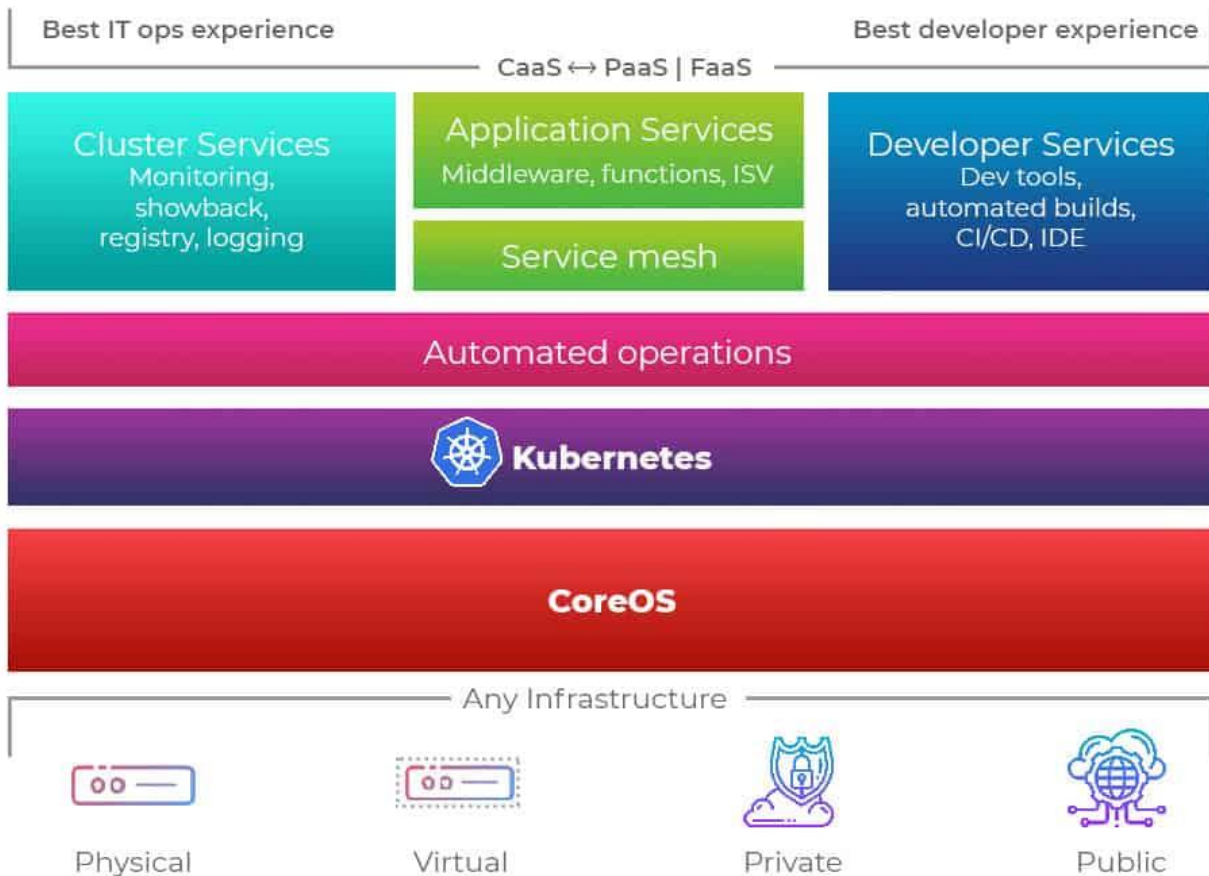
Red Hat OpenShift OpenStack



- At the heart of OpenShift IS Kubernetes
 - [100% certified Kubernetes](#),
 - Fully open source and non-proprietary
- The API to the OpenShift cluster is 100% Kubernetes.
- Nothing changes between a container running on any other Kubernetes and running on OpenShift. No changes to the application.



OpenShift



Some principles

8 essential points for OpenShift

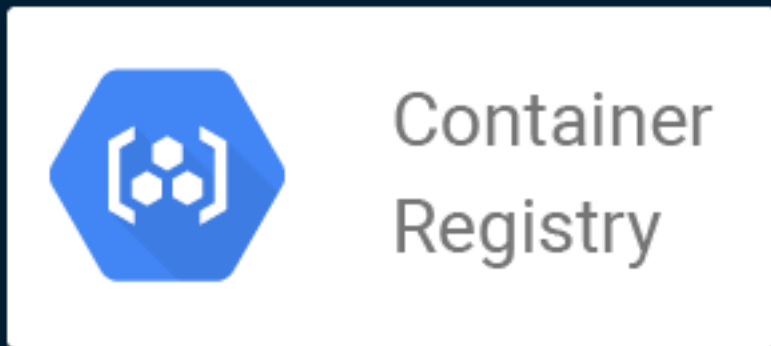
- The Essential Eight is a set of baseline recommendations published by the Australian Cyber Security Centre (ACSC) that defines the minimum-security controls that should be applied to protect systems.
- [Click here for the Essential Eight roundup](#)
- This guide looks at the Essential Eight and Red Hat OpenShift Container Platform and how you can better protect OpenShift clusters and container applications using the Essential Eight strategies.



**Essential
Eight**

#1 Application Control

- Application control is a critical component of the Essential Eight and protects against unauthorized application/process execution



- Red Hat OpenShift supports controlling the registries that worker nodes can pull images from. This allows security and ops teams to create registries with validated and verified content that can be deployed to the platform.

#2 Application and Operating System Patching at OpenShift

- Red Hat OpenShift is built on Red Hat Enterprise Linux CoreOS (RHCOS), a container-optimized variant of Red Hat Enterprise Linux (RHEL).
- Management is performed remotely from the Red Hat OpenShift Container Platform cluster, and on set up, RHCOS machines have only a few system settings that can be modified.
- This controlled immutability allows Red Hat OpenShift Container Platform to store the latest state



#2 Application and Operating System Patching at OpenShift

- Many Kubernetes operators support application updates for complex applications.
- You can upgrade the SAS Viya cluster by simply editing the CR and changing the value of the 'version'.
- Once you update the cluster version in the SAS instance spec, you can see the operator start to pull down the cluster pods, upgrade to the latest version, and re-deploy.



SAS Viya

#3 Configure Microsoft Office Macro Settings

- This mitigation strategy is not applicable to Kubernetes/Linux environments.
- It is worth noting that Red Hat and Microsoft are bringing Windows services and containers to Red Hat OpenShift, allowing you to run applications like Microsoft SQL Server as a containerized service.
- You can also run Windows virtual machines on Red Hat OpenShift with OpenShift Virtualization, and benefit from all the security features of a hardened Kubernetes platform.



#4 User Application Hardening

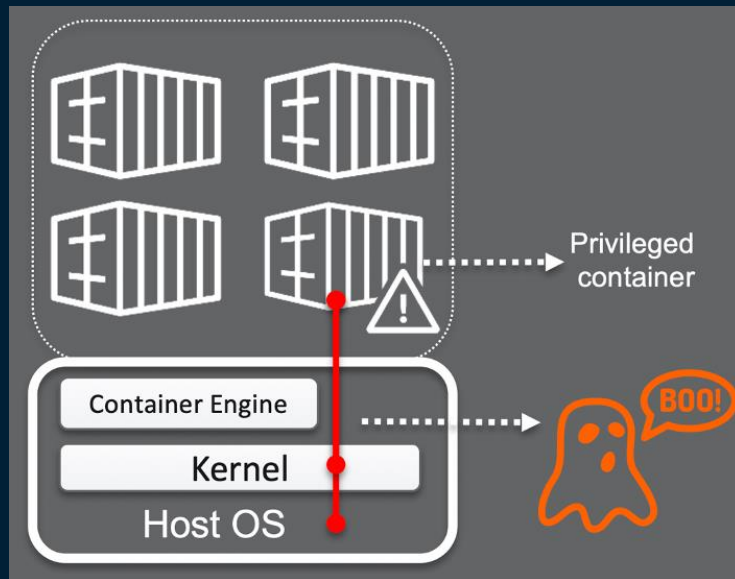
- Tekton is an open source, Kubernetes-native approach to continuous integration and continuous delivery (CI/CD)
- Tekton is managed using Kubernetes APIs and can be deployed to Red Hat OpenShift using the OpenShift Pipelines operator
- Github support
- DevSecOps
- **OpenShift Pipelines** is a Kubernetes-style CI/CD solution based on Tekton. It builds on the Tekton building blocks and provides a CI/CD experience through tight integration with **OpenShift** and Red Hat developer tools.



#5 Restricting Administrative Privileges

- Security Context Constraints, or SCCs, can greatly help to restrict the privileges available for container applications on OpenShift.
- SCCs control permissions for pods, including actions that a pod can perform and what resources it can access.
- By default, Red Hat OpenShift runs pods using the 'restricted' SCC.

- Red Hat OpenShift runs pods using the 'restricted' SCC.



#6 Multi-Factor Authentication

- Red Hat OpenShift supports external OAuth and OpenID Connect integration with the web console and API
 - Allowing users who use the Red Hat OpenShift command-line interface to also benefit from enhanced authentication/authorization.
- OAuth/OpenID connect integration also makes it much simpler to configure multi-factor authentication for the Red Hat OpenShift platform
 - It means that this can simply be configured via the OAuth provider.



#7 Daily Backups

- Red Hat OpenShift components are managed by operators, they can also be used to manage complex persistent applications on a cluster.
- Operators are available to deploy and manage various databases on Red Hat OpenShift, such as MongoDB, Crunchy PostgreSQL and Apache CouchDB.
- These Operators often support automatically backing up the database cluster



**OPERATOR
FRAMEWORK**

#8 Platform Hardening

- Red Hat OpenShift is inherently designed to be deployed across multiple public cloud providers, creating an open hybrid cloud that supports greater application portability and lower costs.
- Securing these clusters and ensuring their configuration remains consistent can be challenging

Future SAS Viya4 on-premise deployment

Supported platform coming soon

VMware Tanzu
(on-prem)

HPE Ezmeral
(on-prem)

Azure Arc (on-
prem and
hybrid cloud)

Google Anthos
(on-prem and
hybrid cloud)

—others TBD

Q/A

- Questions?

Thank You!